```
0000                    FLO     1.  FORTRAN II COMPILER  PASS 1
0001                            G   D. E. KNUTH 1962 [for UNIVAC Solid State 80/90 computers]
0002
0003                            G   TO BEGIN READING THIS LISTING, LOOK FIRST
0004                            G   AT THE CONSTANTS AT THE END AND FAMILIARIZE
0005                            G   YOURSELF WITH THEIR NAMES AND VALUES
0006                            X   THE TRANSLATOR IS DIVIDED INTO TWO MAJOR
0007                            X   CO-ROUTINES, 'SCAN' AND 'GEN'.
0008                            X   SCAN HAS THE DUTY OF READING CARDS, CONDEN-
0009                            X   SING IDENTIFIERS AND CONSTANTS INTO SINGLE
0010                            X   ENTITIES AND TO FEED ITEMS, IN A CONVENIENT
0011                            X   INTERNAL CODE, ONE AT A TIME TO GEN.
0012                            X   GEN HAS THE DUTY OF PRODUCING OBJECT
0013                            X   CODE FROM THESE ITEMS.  CONTROL IS
0014                            X   PASSED BETWEEN GEN AND SCAN IN A FASHION
0015                            X   SUCH THAT EACH ROUTINE LOOKS LIKE A
0016                            X   SUBROUTINE OF THE OTHER.
0017                            X   THE PROGRAM BEGINS BY PRINTING THE TITLE LINE
0018                            X   FEEDING A CARD, AND GOING TO THE
0019                            X   INITIALIZATION ROUTINE, STEP Z1.
0020                            TABLE OF CONTENTS
0021                            X   A. ARRAY SUBSCRIPTING
0022                            X   B. BINARY AND ARITHMETIC OPERATORS
0023                            X   C. CONSTANT SCANNER
0024                            X   D. DO LOOP CONTROL
0025                            X   E. EQUIVALENCE PROCESSING
0026                            X   F. FUNCTION CALLS
0027                            X   G. GENERATOR CONTROL
0028                            X   I. ASSEMBLER STRUCTURE
0029                            X   L. LINKED MEMORY SUBROUTINES
0030                            X   N. 'GET NEXT CHARACTER' ROUTINE
0031                            X   P. FUNCTION AND SUBROUTINE DECLARATIONS
0032                            X   Q. SPECIAL SCANNING ROUTINES
0033                            X   S. SCANNER CONTROL
0034                            X   T. SYMBOL TABLE SEARCH
0035                            X   U. UNARY OPERATORS AND SPECIAL GENERATORS
0036                            X   W. INPUT OUTPUT (READ PUNCH PRINT)
0037                            X   X. PROCESSING FORMAT STRING
0038                            X   Z. INITIALIZATION AND TERMINATION
0039                            X   FRANKLY, IT'S A MIRACLE IF THIS PROGRAM
0040                            X            EVER WORKS.
0041                        TYP             0000009000
0042                STORE   EQU     4195
0043                UNIQU   BLR     4196
0044                COMON   BLR     4198
0045                WDDO    BLR     4100
0046                SIGN%   BLR     4101
0047                UN-     BLR     4102
0048                BIN-    BLR     4103
```

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PHILADELPHIA, PA.

0049	SIGN-	BLR	4	104
0050	SIGN+	BLR	4	105
0051	BIN%	BLR	4	106
0052	WDIF	BLR	4	107
0053	IF%	BLR	4	108
0054	TARA*	BLR	4	109
0055	TARA%	BLR	4	110
0056	SIGN*	BLR	4	111
0057	BIN*	BLR	4	112
0058	SIGN'	BLR	4	113
0059	SIGN$	BLR	4	114
0060	SIGN/	BLR	4	115
0061	BIN**	BLR	4	116
0062	SIGN#	BLR	4	117
0063	BIN:#	BLR	4	118
0064	SQRTF	BLR	4	119
0065	SINF	BLR	4	120
0066	COSF	BLR	4	121
0067	TANF	BLR	4	122
0068	ATANF	BLR	4	123
0069	LNF	BLR	4	124
0070	EXPF	BLR	4	125
0071	ABSF	BLR	4	126
0072	OPO	BLR	4	127
0073	GO%	BLR	4	128
0074	LABL	BLR	4	129
0075	ASSI	BLR	4	130
0076	WDGO	BLR	4	131
0077	WDNO	BLR	4	132
0078	WDLIS	BLR	4	133
0079	WDFOR	BLR	2	200
0080	SIGN'	BLR	4	135
0081	WDTRC	BLR	4	136
0082	WDCOR	BLR	4	137
0083	WDTRU	BLR	4	138
0084	DIM%	BLR	4	139
0085	NORMX	BLR	4	140
0086	WDPOZ	BLR	4	141
0087	WDSTP	BLR	4	142
0088	WDEND	BLR	4	143
0089	WDFUN	BLR	4	144
0090	WDSUB	BLR	4	145
0091	WDRED	BLR	4	146
0092	WDPRT	BLR	4	147
0093	WDFMT	BLR	4	149
0094	WDRTN	BLR	4	150
0095	WDDIM	BLR	4	151
0096	WDCOM	BLR	4	152
0097	WDEQU	BLR	4	153
0098	FLOTF	BLR	4	154

```
0099                                    FIXF    BLR   4155
0100                                    EQU%    BLR   4156
0101                                    DONT1   BLR   4157
0102                                    FC%     BLR   4158
0103                                    WDPCH   BLR   4159
0104                                    WDCAL   BLR   4160
0105                                    BCOMP   BLR   4161
0106                                    BLAND   BLR   4162
0107                                    BOR     BLR   4163
0108                                    DO$1    BLR   4164
0109                                    I02,1   BLR   4165
0110                                    WDPRG   BLR   4166
0111                                    A0000   BLR   1100     1119      G   TYPE SWITCHING FOR BINARY OPERATORS
0112                                    B0000   BLR   4000     4008      G   ARITH ROUTINE
0113                                    C0000   BLR   4010     4015      G   ASIGN ROUTINE
0114                                            BLR   C0009    C0012
0115                                    E0000   BLR   4050     4074      G   CONTROL IN SCANNER
0116                                    F0000   BLR   4024     4029      G   CONTROL IN FUNCTION CALL
0117                                            BLA   F0004
0118                                    H0000   EQU   0000               G   HSR BAND
0119                                            OFF   9000
0120        *** OFF **                          OFF   9001
0121        *** OFF **                          OFF   9002
0122        *** OFF **                          BLR   H0013    H0097 012
0123        *** OFF **                          BLR   H0018    H0090 012
0124        *** OFF **                          BLR   H0118    H0190 012
0125        *** OFF **                          BLR   H0111    H0195 012
0126        *** OFF **                          BLR   H0006    H0011 005
0127        *** OFF **                  HWD1    EQU   H0118
0128        *** OFF **                  HDW2    EQU   0001
0129        *** OFF **                  HDW3    EQU   0025
0130        *** OFF **                          OFF   8001
0131        *** OFF **                          OFF   8002
0132                                            ON    9000
0133                                            ON    9001
0134                                            ON    9002
0135                                            BLR   H0001    H0096 005
0136                                            BLR   H0102    H0197 005
0137                                    HWD1    EQU   H0011
0138                                    HDW2    EQU   0000
0139                                    HDW3    EQU   0021
0140                                            ON    8001
0141                                            ON    8002
0142                                    I0000   BLR   1300     1399      G   ASM1 OP TABLES
0143                                            BLA   I0025    I0073
0144                                    J0000   BLR   1700     1739      G   MACRO TABLES
0145                                            BLA   J0005
0146                                    K0000   EQU   0200               G   PRINTER BAND - CARD IMAGES
0147                                            BLR   K0000    K0005 005
0148                                            BLR   K0081    K0086 005
```

```
0149                                    BLR   K0165     K0170 005
0150                                    BLR   K0050     K0055 005
0151                                    BLR   K0134     K0139 005
0152                                    BLR   K0018     K0023 005
0153                                    BLR   K0103     K0108 005
0154                                    BLR   K0041     K0046 005
0155                                    BLR   K0125     K0130 005
0156                                    BLR   K0009     K0014 005
0157                                    BLR   K0094     K0099 005
0158                                    BLR   K0178     K0183 005
0159                                    BLR   K0062     K0067 005
0160                            L0000   BLR    1280      1282       G   PROCESSING OF LABELS
0161                                    BLR   L0004     L0006
0162                            N0001   BLR    4031      4039       G   INPUT ROUTINE
0163                            00001   BLR    1550      1599       G   HEADER CARD INFORMATION
0164                            P0000   EQU    0400                 G   PRINTER BAND - COMPILED INSTRUCTIONS
0165                                    BLR   P0000     P0005 005
0166                                    BLR   P0081     P0086 005
0167                                    BLR   P0165     P0170 005
0168                                    BLR   P0050     P0055 005
0169                                    BLR   P0134     P0139 005
0170                                    BLR   P0018     P0023 005
0171                                    BLR   P0103     P0108 005
0172                                    BLR   P0041     P0046 005
0173                                    BLR   P0125     P0130 005
0174                                    BLR   P0009     P0017 005
0175                                    BLR   P0094     P0099 005
0176                                    BLR   P0178     P0183 005
0177                                    BLR   P0062     P0067 005
0178                            Q0000   BLR    1000      1045       G   SUBROUTINE ENTRANCES TABLE
0179                            R0000   EQU    0800                 G   RPU BAND - OBJECT DECK
0180                                    OFF    9000
0181        *** OFF **                  OFF    9001
0182        *** OFF **                  OFF    9002
0183        *** OFF **                  BLR   R0018     R0090 012
0184        *** OFF **                  BLR   R0011     R0095 012
0185        *** OFF **                  BLR   R0102     R0186 012
0186        *** OFF **                  BLR   R0107     R0191 012
0187        *** OFF **                  BLR   R0113     R0197 012
0188        *** OFF **                  BLR   R0106     R0190 012
0189        *** OFF **                  BLR   R0111
0190        *** OFF **          RWD1    EQU   R0102
0191        *** OFF **                  OFF    8001
0192        *** OFF **                  OFF    8002
0193                                    ON     9000
0194                                    ON     9001
0195                                    ON     9002
0196                                    BLR   R0101     R0196 005
0197                                    BLR   R0002     R0097 005
0198                                    BLR   R0103     R0198 005
```

```
0199                                                RWD1    EQU   R0108
0200                                                        ON    8001
0201                                                        ON    8002
0202                                                S0000   BLR   4040      4049        G   SEND ROUTINE
0203                                                        BLA   S0001     S0002
0204                                                        BLA   S0004
0205                                                T0000   BLR   1050      1096        G   CONSTANTS FOR DIVRT
0206                                                        BLA   T0006
0207                                                V0000   BLR   4080      4085        G   ASM2 ROUTINE
0208                                                        BLA   V0004
0209                                                W0000   BLR   1750      1754        G   NAMES OF LIBRARY PACKAGES
0210                                                X0000   BLR   1150      1173        G   PROCESSING OF FORMAT STRINGS
0211                                                Z0000   BLR   1420      1519        G   SCRAMBLE TABLE FOR SRCH ROUTINE
0212                                                50001   BLR   4181      4186        G   CONTROL IN PUNCH ROUTINE ASM5
0213                                                90000   BLR   2201      2211
0214                                                        BLR   0000      0001
0215  0000  888 0 30  4140  0042                    0000    LDL   NORMX    BME
0216  0001  888 0 HH  HHHH  HHHH                    0001    CON   HHHHH     HHHHH       G   USED IN TESTING END OF DO LOOP
0217                                                        BLR   0100      0110 010
0218  0110  888 0 00  0100  0100                    0110    JMP   0100                  G   IN CASE MACHINE HAS HSR INTERRUPT
0219                                                RAND    BLR   1190      1229        G   OPERAND STACK
0220                                                        BLR   1185      1189        G   PROTECTION ON BOTTOM OF OPERAND STACK
0221  1185  888 0 02  4098  5000                    1185    CON   02409     85000       G   CONSTANT ZERO
0222  1186  888 0 02  4098  5000                    1186    CON   02409     85000       G   CONSTANT ZERO
0223  1187  888 0 02  4098  5000                    1187    CON   02409     85000       G   CONSTANT ZERO
0224  1188  888 0 02  4098  5000                    1188    CON   02409     85000       G   CONSTANT ZERO
0225  1189  888 0 02  4098  5000                    1189    CON   02409     85000       G   CONSTANT ZERO
0226  1190  888 0 02  4098  5000                    RAND    CON   02409     85000
0227                                                MODE    BLR   1520      1549        G   MODE STACK
0228                                                DUMMY   BLR   4088      4099
0229  4088  888 0 00  0000  0000                    4088    CON   00000     00000       G   DUMMY DO VARIABLE IN I-O LIST
0230  4089  888 0 02  1208  B98B                    4089    ALF   *I*
0231  4090  888 0 69  4135  0000                    4090    CON   69413     50000
0232  4091  888 0 00  0000  000H                    4091    CON   00000     0000H       G   APOSTROPHE
0233  4092  888 0 00  0000  0000                    4092    CON   00000     00000
0234                                                00P0    EQU   4093                   G   SPECIAL LPREN WHICH INDICATES EXTRA RPREN
0235  4098  888 0 05  0000  0000                    4098    CON   05000     00000
0236  4099  888 0 00  0000  0000                    4099    CON   00000     00000       G   CONSTANT ZERO
0237  4096  888 0 05  0000  0000                    4096    CON   05000     00000
0238                                                KON1    EQU   4097                  G   CONSTANT 1
0239  4094  888 0 05  0000  0000                    4094    CON   05000     00000
0240                                                KON2    EQU   4095                  G   CONSTANT 2
0241                                                SCAN1   EQU   E0000
0242                                                $       EQU   T0014
0243                                                .       EQU   T0024
0244                                                OBIN&   EQU   T0002
0245                                                CON0    EQU   T0001
0246                                                                          X
0247                                                                          X
0248                                                                          TABLE OF FORMATS
```

```
0249
0250
0251
0252
0253
0254
0255
0256
0257
0258
0259
0260
0261
0262
0263
0264
0265
0266
0267
0268
0269
0270
0271
0272
0273
0274
0275
0276
0277
0278
0279
0280
0281
0282
0283
0284
0285
0286
0287
0288
0289
0290
0291
0292
0293
0294
0295
0296
0297
0298
```

```
X   INFORMATION INSIDE THE COMPILER IS TREATED IN
X   TWO PRINCIPAL FORMATS, ONE FOR THE SYMBOL
X   TABLE ENTRIES IN THE SCANNER, AND ANOTHER FOR
X   GENERATOR CO-ROUTINE.
X
X
X   SYMBOL TABLE EQUIVALENTS ARE IN THE FORMAT
X
X           KM AAAA LLLL
X   WHERE LLLL IS A LINK TO THE NEXT SYMBOL,
X   FOR SEARCHING
X
X        K EQUALS 0:   SIMPLE VARIABLE
X          M IS 0:   NO MEMORY ASSIGNMENT AS YET
X                    AAAA IS 0000
X          M IS 1:   ASSIGNED AAAA IN UNIQUE
X                    STORAGE
X          M IS 2:   EQUIVALENCED, NOT YET
X                    ASSIGNED.  AAAA IS LINK TO
X                    OTHER MEMBERS OF THE
X                    EQUIVALENCE CLASS
X          M IS 3:   ASSIGNED AAAA IN COMMON
X          M IS 4:   A FORMAL PARAMETER, WHOSE
X                    SUBROUTINES ARE ASSIGNED
X                    AAAA, AAAA+1, AND AAAA+2
X                    IN UNIQUE.
X          M IS 5:   THE SYMBOL IS A 10 DIGIT
X                    CONSTANT.  IF AAAA IS 0,
X                    THIS CONSTANT HAS NOT BEEN
X                    NEEDED IN OBJECT PROGRAM
X                    YET, ELSE IT IS ASSIGNED TO
X                    LOCATION AAAA IN UNIQUE.
X
X      K EQUALS 3:   ARRAY
X         AAAA LINKS TO THE DIMENSION TABLE
X         ENTRY, M IS IGNORED.  THE DIMENSION
X         TABLE HAS N+1 ENTRIES IF THERE ARE N
X         SUBSCRIPTS TO THIS ARRAY.
X
X           AAAA+0:   3 M BBBB RRRR
X           AAAA+1:   0 0 TTTT SSSS
X           AAAA+2:   0 0 CCCC 0000
X           AAAA+3:   0 0 CCCC 0000   ETC
X
X         SSSS IS LINK BACK TO SYMBOL TABLE
X         ENTRY
X         CCCC WORDS, IF PRESENT, ARE LINKS TO
X         SYMBOL TABLE ENTRIES FOR CONSTANTS
X         (EXCEPT FOR THE LAST DIMENSION)
X         TTTT IS THE TOTAL LENGTH OF THE ARRAY
```

```
0299
0300
0301
0302
0303
0304
0305
0306
0307
0308
0309
0310
0311
0312
0313
0314
0315
0316
0317
0318
0319
0320
0321
0322
0323
0324
0325
0326
0327
0328
0329
0330
0331
0332
0333
0334
0335
0336
0337
0338
0339
0340
0341
0342
0343
0344
0345
0346
0347
0348
```

```
X
X          M IS 0:   NO MEMORY ASSIGNMENT HAS
X                    BEEN MADE AS YET, BBBB IS 0
X          M IS 1:   THE ADDRESS BBBB IS FOR
X                    A(1), I.E. THE FIRST CELL
X                    OF THE ARRAY, IN UNIQUE
X                    STORAGE
X          M IS 2:   EQUIVALENCED ARRAY A(RRRR),
X                    BBBB IS LINK TO OTHER
X                    ELEMENTS IN EQUIVALENCE
X                    CLASS
X          M IS 3:   SAME AS M EQUAL TO 1 EXCEPT
X                    COMMON STORAGE
X          M IS 4:   FORMAL PARAMETER, BASE
X                    ADDRESS IS STORED IN BBBB
X                    OF UNIQUE STORAGE.
X
X       K EQUALS 5:   LABEL
X                    AAAA IS THE ASSIGNMENT IN
X                    PROGRAM STORAGE.
X
X          M IS 0:   UNASSIGNED AS YET.
X          M IS 1:   TEMPORARY ASSIGNMENT FOR DO
X                    LOOPS. AAAA LINKS TO AN ITEM
X                    IN LLIST.
X
X                       AAAA+0:  02 TTTT XXXX
X                       AAAA+1:  SS SSSS LLLL
X
X                    WHERE XXXX IS LLIST LINK,
X                    TTTT IS TEMPORARY ASSIGNMENT
X                    OF THE LABEL, SS SSSS IS
X                    LIKE A PERMENENT SYMBOL
X                    TABLE ENTRY FOR LABELS, AND
X                    LLLL IS A LINK BACK TO THE
X                    SYMBOL TABLE ENTRY.
X          M IS 2:   AAAA IS THE ASSIGNMENT FOR
X                    THE LABEL.
X
X       K EQUALS 6:   FUNCTION
X          M IS 2:   ASSIGNED AAAA IN PROGRAM
X                    STORAGE
X          M IS 5:   ASSIGNED AAAA, EXTERNAL
X                    REFERENCE
X          M IS 9:   SPECIAL OPERATOR FOR SCANNER
X                    ONLY
X
X       K EQUALS 7, 8, OR 9   OPERATOR, RESERVED
X                                        WORD
X
```

```
0349
0350
0351
0352
0353
0354
0355
0356
0357
0358
0359
0360
0361
0362
0363
0364
0365
0366
0367
0368
0369
0370
0371
0372
0373
0374
0375
0376
0377
0378
0379
0380
0381
0382
0383
0384
0385
0386
0387
0388
0389
0390
0391
0392
0393
0394
0395
0396
0397
0398
```

```
X          KM AAAA IS CODE FOR OPERATORS.
X
X
X   IN EQUIVALENCE LOOPS, A SPECIAL MEANING IS
X   GIVEN FOR K EQUAL TO 9, WHEN M AAAA IS A
X   CHANGE IN REFERENCE POINT OF THE EQUIVALENCE
X   LOOP, PLUS 50000.
X
X
X
X   GENERATOR CODE FORMATS
X
X        K T SSSS COOP
X
X   FOR OPERANDS: P IS THE SIGN: 0 PLUS: 5 MINUS
X   T IS THE TYPE:  0 FLOATING, 1 INTEGER,
X                     2 UNSPECIFIED
X
X        K EQUALS 0:   SIMPLE VARIABLE, OR
X                    A CONSTANT (IF C IS 5)
X                    PERHAPS A HAPPY ARRAY.
X                    SSSS IS A LINK TO THE
X                    CORRESPONDING SYMBOL TABLE
X                    ENTRY.
X        K EQUALS 1:   COMPUTED RESULT IN RA
X        K EQUALS 2:   INDEX REGISTER 1
X                    (DO VARIABLE)
X        K EQUALS 3:   ARRAY
X                    SSSS LINKS TO DIMENSION
X                    TABLE ENTRY WHEN THIS ARRAY
X                    IS SENT FROM SCAN, AND THEN
X                    AFTER THE SUBSCRIPT FOR THE
X                    ARRAY IS PROCESSED, SSSS
X                    LINKS TO AN ENTRY ON THE
X                    ARAS LIST.SEE ROUTINE A FOR
X                    THE FORMATS IN ARAS.
X          K EQUALS 4:   TEMP STORAGE.
X                    SSSS IS THE ASSIGNMENT IN
X                    UNIQUE.
X          K EQUALS 5:   LABEL
X                    HERE SSSS IS A LINK TO THE
X                    CORRESPONDING SYMBOL TABLE
X                    ENTRY.
X          K EQUALS 6:   FUNCTION
X                    SSSS IS LINK TO SYMBOL TABLE
X          K EQUALS 7:   SPECIAL
X                    IN THE OPERAND STACK THIS IS
X                    SOMETIMES USED FOR AN ARRAY
X                    WITHOUT A SUBSCRIPT
X          K EQUALS 7, 8, OR 9:     OPERATOR
```

```
0399                X                       KT SSSS IS THE SAME AS THE
0400                X                       SYMBOL TABLE ENTRY KM AAAA.
0401                X                       KT IS THE PRIORITY OF THE
0402                X                       OPERATOR.  99 MEANS ACTION
0403                X                       FOR THE OPERATOR IMMEDIATELY
0404                X                       UPON ENTRY TO GEN.  98 MEANS
0405                X                       THE OPERATOR IS A UNARY
0406                X                       OPERATOR.  ELSE T EQUAL TO
0407                X                       1, 3, 6, OR 8 MEANS
0408                X                       IMMEDIATE ACTION BEFORE
0409                X                       ENTERING ON THE OPERATOR
0410                X                       STACK (SEE GEN CONTROL)
0411                X
0412                X
0413                X   RESERVED WORD CODES WHICH FOLLOW GIVE THE
0414                X   SYMBOL TABLE ENTRIES FOR ALL RESERVED
0415                X   IDENTIFIERS AND SPECIAL CHARACTERS,
0416                X   TOGETHER WITH A SYMBOLIC REFERENCE
0417                X   CORRESPONDING TO THE ASSEMBLY LISTING OF
0418                X
0419                X              )))FORTRAN(((
0420                X
0421                X
0422                X   RESERVED WORD CODES
0423                X     ITEM:        CODE:    SYMBOLIC:
0424                X   &           9941050000 99 SIGN&
0425                X   -           9941040000 99 SIGN-
0426                X   /           8441150000 84 SIGN/
0427                X   %           9941010000 99 SIGN%
0428                X   *           9941110000 99 SIGN*
0429                X   $           7341140000 73 SIGN$
0430                X   (           7000000000 70 0000
0431                X   ,           7841130000 78 SIGN,
0432                X   +           9941050000 99 SIGN&
0433                X   #           9941170000 99 SIGN#
0434                X   (           9941010000 99 SIGN%
0435                X   )           7000000000 70 0000
0436                X   $           7341140000 73 SIGN$
0437                X   NO          6941320000 69 WDNO
0438                X   LIST        6941330000 69 WDLIS
0439                X   CORE        6941370000 69 WDCOR
0440                X   TRACE       6941360000 69 WDTRC
0441                X   TO          6940500000 69 SCAN1
0442                X   THROUGH     9941380000 99 WDTRU
0443                X   GO          9941310000 99 WDGO
0444                X   ASSIGN      9941300000 99 ASS1
0445                X   IF          9941070000 99 WDIF
0446                X   DO          9941000000 99 WDDO
0447                X   CONTINUE    6940500000 69 SCAN1
0448                X   PAUSE       9841410000 98 WDPOZ
```

```
0449
0450
0451
0452
0453
0454
0455
0456
0457
0458
0459
0460
0461
0462
0463
0464
0465
0466
0467
0468
0469
0470
0471
0472
0473
0474
0475
0476
0477      *** OFF **
0478      *** OFF **
0479      *** OFF **
0480      *** OFF **
0481      *** OFF **
0482      *** OFF **
0483      *** OFF **
0484      *** OFF **
0485      *** OFF **
0486      *** OFF **
0487      *** OFF **
0488      *** OFF **
0489      *** OFF **
0490      *** OFF **
0491      *** OFF **
0492      *** OFF **
0493      *** OFF **
0494      *** OFF **
0495      *** OFF **
0496      *** OFF **
0497      *** OFF **
0498      *** OFF **
```

```
                    OFF   9000
                    OFF   9001
                    OFF   8001
INCR1     EQU       0007
MEMLL     BLR       2100          2399
MEML1     EQU       2099
MEML2     EQU       2279
MEMU2     EQU       2400
          BLR       2400          3999
          BLR       4200          4999
DON       EQU       80AC
TWOB      EQU       81AC
THREF     EQU       82AC
NINEF     EQU       83AC
FS        EQU       84AC
ACC       EQU       85AC
TYPE      EQU       86AC
AVAIL     EQU       87AC
BAND      EQU       88AC
NXLOC     EQU       89AC
COL15     EQU       80FC
COMT      EQU       81FC
```

```
X   STOP        9841420000 98 WDSTP
X   END         9941430000 99 WDEND
X   FUNCTION    9941440000 99 WDFUN
X   SUBROUTINE  9941450000 99 WDSUB
X   READ        9941460000 99 WDRED
X   PRINT       9941470000 99 WDPRT
X   FORMAT      9941490000 99 WDFMT
X   RETURN      9941500000 99 WDRTN
X   DIMENSION   9941510000 99 WDDIM
X   COMMON      9941520000 99 WDCOM
X   EQUIVLENCE  9941530000 99 WDEQU
X   SIN         9841200000 98 SINF
X   COS         9841210000 98 COSF
X   SQRT        9841190000 98 SQRTF
X   TAN         9841220000 98 TANF
X   ARCTAN      9841230000 98 ATANF
X   LN          9841240000 98 LNF
X   EXP         9841250000 98 EXPF
X   ABS         9841260000 98 ABSF
X   FLOAT       9841540000 98 FLOTF
X   FIX         9841550000 98 FIXF
X   PUNCH       9941590000 99 WDPCH
X   CALL        9941600000 99 WDCAL
X   NOT         9841610000 98 BCOMP
X   OR          7941630000 79 BOR
X   AND         8041620000 80 BLAND
X   CARDS       6941660000 69 WDPRG
```

```
          G   INTERLACE FOR CORE PROGRAMS
          G   POOLED MEMORY AREA
          G   MEML1 IS MEMLL - 1
          G   AREA BETWEEN MEMLL AND MEML2 IS USED FOR
          G   OVERLAYABLE PROGRAM
          G   TOP OF POOLED MEMORY
```

```
0499          *** OFF **        DIVBS     EQU    B2FC
0500          *** OFF **        DOTAG     EQU    B3FC
0501          *** OFF **        DOVAR     EQU    B4FC
0502          *** OFF **        INCRE     EQU    B5FC
0503          *** OFF **        IWORD     EQU    B6FC
0504          *** OFF **        LAST      EQU    B7FC
0505          *** OFF **        LEVEL     EQU    B8FC
0506          *** OFF **        NEXTC     EQU    B9FC
0507          *** OFF **        EXIT1     EQU    B1FB
0508          *** OFF **        EXIT2     EQU    B2FB
0509          *** OFF **        EXIT3     EQU    B3FB
0510          *** OFF **        EXIT4     EQU    B4FB
0511          *** OFF **        EXIT5     EQU    B5FB
0512          *** OFF **        EXIT6     EQU    B6FB
0513          *** OFF **        EXIT7     EQU    B7FB
0514          *** OFF **        EXIT8     EQU    B8FB
0515          *** OFF **        EXIT9     EQU    B9FB
0516          *** OFF **        GENX      EQU    B0FB
0517          *** OFF **        NNUMS     EQU    B0AG
0518          *** OFF **        NZONS     EQU    B1AG
0519          *** OFF **        NOTAG     EQU    B2AG
0520          *** OFF **        OHOLD     EQU    B3AG
0521          *** OFF **        NWORD     EQU    B4AG
0522          *** OFF **        OLDLC     EQU    B5AG
0523          *** OFF **        OTYPE     EQU    B6AG
0524          *** OFF **        PAR1      EQU    B7AG
0525          *** OFF **        PAR2      EQU    B8AG
0526          *** OFF **        PAR3      EQU    B9AG
0527          *** OFF **        MEMU      EQU    B0AH
0528          *** OFF **        RWORD     EQU    B1AH
0529          *** OFF **        SCANX     EQU    B2AH
0530          *** OFF **        SCNXX     EQU    B3AH
0531          *** OFF **        MEML      EQU    B4AH
0532          *** OFF **        SHFT      EQU    B5AH
0533          *** OFF **        ARAS      EQU    B6AH
0534          *** OFF **        DOOST     EQU    B7AH
0535          *** OFF **        TEMPS     EQU    B8AH
0536          *** OFF **        LLIST     EQU    B9AH
0537          *** OFF **        LESW      EQU    B0FG
0538          *** OFF **        TEMP1     EQU    B1FG
0539          *** OFF **        TEMP2     EQU    B2FG
0540          *** OFF **        TEMP3     EQU    B3FG
0541          *** OFF **        TEMP4     EQU    B4FG
0542          *** OFF **        TEMP5     EQU    B5FG
0543          *** OFF **        TEMP6     EQU    B6FG
0544          *** OFF **        TEMP7     EQU    B7FG
0545          *** OFF **        TEMP8     EQU    B8FG
0546          *** OFF **        TEMP9     EQU    B9FG
0547          *** OFF **        TMP10     EQU    B0FH
0548          *** OFF **        TMP11     EQU    B1FH
```

```
0549            *** OFF **
0550            *** OFF **
0551            *** OFF **
0552            *** OFF **
0553            *** OFF **
0554            *** OFF **
0555            *** OFF **
0556            *** OFF **
0557            *** OFF **
0558            *** OFF **
0559            *** OFF **
0560            *** OFF **
0561            *** OFF **
0562            *** OFF **
0563            *** OFF **
0564            *** OFF **
0565            *** OFF **
0566            *** OFF **
0567            *** OFF **
0568            *** OFF **
0569            *** OFF **
0570
0571
0572
0573  4800  BBB 0 00  0000  0008   80000  CON  00000  00008   G  0-0
0574  4801  BBB 0 00  0000  0000   80001  CON  00000  00000   G  0-1
0575  4802  BBB 0 00  0000  0001   80002  CON  00000  00001   G  0-2
0576  4803  BBB 0 00  0020  0008   80003  CON  00002  00008   G  0-3
0577  4805  BBB 0 00  0000  0005   80005  CON  00000  00005   G  0-5
0578  4806  BBB 0 00  0020  0004   80006  CON  00002  00004   G  0-6
0579  4807  BBB 0 00  0010  0002   80007  CON  00001  00002   G  0-7
0580  4808  BBB 0 00  0030  0008   80008  CON  00003  00008   G  0-8
0581  4810  BBB 0 00  0000  0007   80010  CON  00000  00007   G  1-0
0582  4811  BBB 0 00  0010  0003   80011  CON  00001  00003   G  1-1
0583  4812  BBB 0 00  0020  0009   80012  CON  00002  00009   G  1-2
0584                                      BLA  80013           G
0585  4815  BBB 0 00  0010  0007   80015  CON  00001  00007   G  1-5
0586  4816  BBB 0 00  0030  0004   80016  CON  00003  00004   G  1-6
0587  4817  BBB 0 00  0030  0002   80017  CON  00003  00002   G  1-7
0588  4818  BBB 0 00  0010  000H   80018  CON  00001  0000H   G  1-8
0589  4820  BBB 0 00  0000  0009   80020  CON  00000  00009   G  2-0
0590  4821  BBB 0 00  0020  0003   80021  CON  00002  00003   G  2-1
0591  4822  BBB 0 00  0000  0002   80022  CON  00000  00002   G  2-2
0592                                      BLA  80023           G
0593  4825  BBB 0 00  0000  0006   80025  CON  00000  00006   G  2-5
0594  4826  BBB 0 00  0020  0005   80026  CON  00002  00005   G  2-6
0595  4827  BBB 0 00  0010  0001   80027  CON  00001  00001   G  2-7
0596                                      BLA  80028           G
0597  4830  BBB 0 00  0000  0008   80030  CON  00000  00008   G  3-0
0598  4831  BBB 0 00  0030  0007   80031  CON  00003  00007   G  3-1

TMP12   EQU   B2FH
TMP13   EQU   B3FH
ASMST   EQU   B4FH
UASW    EQU   B5FH
CHOLD   EQU   B6FH
CRDSW   EQU   B7FH
LSW     EQU   B8FH
TRSW    EQU   B9FH
DSAVE   EQU   B0AB
NXTCH   EQU   B1AB
LC      EQU   B4AB
DOESW   EQU   B9AB
RATOR   EQU   B000
THETA   EQU   B3AB
WDS     EQU   B5AB
WD      EQU   B6AB                          G  THESE CARDS MAY BE DELETED IF RB5-RB9 NEEDED
ALF     EQU   B7AB
CHI     EQU   B8AB
        HHH       C
        OFF   9002
        OFF   8002
        ON    9000
80000   BLR   4800     4879                  G  TRANSLATE TABLE - 90CARD TO MC-6
        BLA   80004   80079 005
```

```
0599    4832  BBB 0 00  0010  0006    80032  CON  00001  00006   G  3-2
0600                                          BLA  80033          G
0601    4835  BBB 0 00  0030  0009    80035  CON  00003  00009   G  3-5
0602    4836  BBB 0 00  0000  000F    80036  CON  00000  0000F   G  3-6
0603    4837  BBB 0 00  0030  0000    80037  CON  00003  00000   G  3-7
0604                                          BLA  80038          G
0605    4840  BBB 0 00  0000  0003    80040  CON  00000  00003   G  0-4
0606    4841  BBB 0 00  0010  0005    80041  CON  00001  00005   G  0-A
0607    4842  BBB 0 00  0020  0006    80042  CON  00002  00006   G  0-B
0608                                          BLA  80043          G
0609    4845  BBB 0 00  0010  0009    80045  CON  00001  00009   G  0-9
0610    4846  BBB 0 00  0010  0004    80046  CON  00001  00004   G  0-F
0611    4847  BBB 0 00  0020  0001    80047  CON  00002  00001   G  0-G
0612                                          BLA  80048          G
0613    4850  BBB 0 00  0010  0008    80050  CON  00001  00008   G  1-4
0614    4851  BBB 0 00  0030  0006    80051  CON  00003  00006   G  1-A
0615    4852  BBB 0 00  0020  0007    80052  CON  00002  00007   G  1-B
0616                                          BLA  80053          G
0617    4855  BBB 0 00  0020  0008    80055  CON  00002  00008   G  1-9
0618    4856  BBB 0 00  0000  000A    80056  CON  00000  0000A   G  1-F
0619    4857  BBB 0 00  0000  000C    80057  CON  00000  0000C   G  1-G
0620    4858  BBB 0 00  0010  000C    80058  CON  00001  0000C   G  1-H
0621    4860  BBB 0 00  0000  0004    80060  CON  00000  00004   G  2-4
0622    4861  BBB 0 00  0030  0005    80061  CON  00003  00005   G  2-A
0623    4862  BBB 0 00  0030  0008    80062  CON  00003  00008   G  2-B
0624                                          BLA  80063          G
0625    4865  BBB 0 00  0020  0002    80065  CON  00002  00002   G  2-9
0626    4866  BBB 0 00  0030  000A    80066  CON  00003  0000A   G  2-F
0627    4867  BBB 0 00  0010  000A    80067  CON  00001  0000A   G  2-G
0628    4868  BBB 0 00  0020  000A    80068  CON  00002  0000A   G  2-H
0629    4870  BBB 0 00  0030  0003    80070  CON  00003  00003   G  3-4
0630                                          BLA  80071          G
0631    4872  BBB 0 00  0010  000B    80072  CON  00001  0000B   G  3-B
0632    4873  BBB 0 00  0000  000H    80073  CON  00000  0000H   G  3-C
0633    4875  BBB 0 00  0030  0001    80075  CON  00003  00001   G  3-9
0634                                          BLA  80076          G
0635    4877  BBB 0 00  0000  000G    80077  CON  00000  0000G   G  3-G
0636                                          BLA  80078          G
0637                                          ON   9001
0638                                          ON   8001
0639                                  INCR1   EQU  0057           G  INTERLACE FOR NON-CORE PROGRAMS
0640                                  MEMLL   BLR  3100    3999   G  POOLED MEMORY AREA
0641                                  MEML1   EQU  3099           G  MEML1 IS MEMLL - 1
0642                                  MEML2   EQU  3299           G  AREA BETWEEN MEMLL AND MEML2 IS USED FOR
0643                                                             G  OVERLAYABLE PROGRAM
0644                                  MEMU2   EQU  4000           G  TOP OF POOLED MEMORY
0645                                  10000   BLR  1250    1258   G  PANIC - ALARM ROUTINE
0646                                          BLR  10009   10013 002
0647                                  20000   EQU  0600           G  PRINTER BAND - ALARM ROUTINE
0648                                          BLR  20000   20005 005
```

```
0649                                                BLR  20081      20086 005
0650                                                BLR  20165      20170 005
0651                                                BLR  20050      20055 005
0652                                                BLR  20134      20139 005
0653                                                BLR  20018      20023 005
0654                                                BLR  20103      20108 005
0655                                                BLR  20041      20046 005
0656                                                BLR  20125      20130 005
0657                                                BLR  20009      20014 005
0658                                                BLR  20094      20099 005
0659                                                BLR  20178      20183 005
0660                                                BLR  20062      20067 005
0661                                  30000         BLR   1650       1699      G   ALARM DICTIONARY OF WORDS
0662                                                HHH        H
0663                                                ON   8002
0664                                                ON   9002
0665                                                                             G.  GENERATOR CONTROL
0666                                                                             X   THIS ROUTINE CONTROLS THE
0667                                                                             X   GENERATOR CO-ROUTINE.
0668                                                                             X   THE NORMAL EXIT AT THE COMPLETION OF A GENER-
0669                                                                             X   ATED ITEM IS TO G1. WHICH STARTS THE
0670                                                                             X   PROCESSING OF THE NEXT ITEM. AT THE END OF
0671                                                                             X   GENERATING CODE FOR CERTAIN OPERATORS, EXIT
0672                                                                             X   OCCURS TO G10 RATHER THAN G1. SINCE WE MAY
0673                                                                             X   WISH TO PERFORM SEVERAL OPERATIONS BEFORE
0674                                                                             X   SCANNING ANOTHER ITEM.
0675  4140  BBB 0 30  4042  4044        NORMX   LDL  NORM       SCAN      G1. SCAN NEXT ITEM.
0676  4044  BBB 0 50  4246  4248        SCAN    STL  GENX       SCANX     G   THIS SHOWS TYPICAL TRANSFER OF CONTROL
0677  4248  BBB 0 30  4050  4202        SCANX   LDL  E0000      NXTCH     G   BETWEEN TWO COROUTINES
0678  4028  BBB 0 05  4030  4232        GEN     LDX  LAST                      ACTIVATE THE SCANNER COROUTINE.
0679  4232  BBB 0 50  4248  4200                STL  SCANX                     NORMALLY THIS MEANS WE ENTER STEP S1.
0680  4200  BBB 0 30  4402  4204                LDL  LEOFF
0681  4204  BBB 0 50  4206  4208                STL  LESW
0682  4208  BBB 0 60  4030  4246                STA  LAST        GENX
0683  4042  BBB 0 77  4042  4245        NORM    ATL              1F        G2. ISIT AN OPERATOR
0684  4245  BBB 0 70  4247  4400        1       ADD  BIG30       -OP1      YES:IF THE ITEM SCANNED IS AN OPERATOR, GO TO#G6.
0685                                                                       NO:
0686  4400  BBB 1 0G  0001  4404        -OP1    IIR3  0001                 G3. OPERAND STACKED
0687  4404  BBB 1 54  0000  4602                STL3  0000                     PUT THE ITEM AT THE TOP OF THE OPERAND STACK.
0688  4602  BBB 0 25  4604  4406                LDA  BIG25                 G4. IS IT AN ARRAY
0689  4406  BBB 0 87  4017  4009                TGR  1F     +08            YES:IF THE OPERAND IS A DIMENSIONED VARIABLE,
0690  4009  BBB 0 70  000A  4214                ADD  RA                        GO TO#A1.
0691  4214  BBB 0 87  4217  4017                TGR  ARRAY       1F        NO:
0692  4017  BBB 0 30  4219  4044        1       LDL              SCAN      G5. SCAN NEXT ITEM
0693  4219  BBB 0 30  4221  4023                LDL  LPREN                 (:  IF THE NEXT ITEM IS A LEFT PARENTHESIS, WE
0694  4023  BBB 0 82  4226  4042                TEQ  FUNCT       NORM          TENTATIVELY HAVE A FUNCTION CALL SO WE GO
0695                                                                       X   TO     STEP#F1.
0696                                                                       OTH:OTHERWISE WE GO BACK TO STEP#G2.
0697  4401  BBB 0 70  4203  4606        &OP1    ADD  BIG71       -OP2      G6. WHAT KIND OPERATOR
0698  4607  BBB 0 00  000A  000A        &OP2    JMP  RA                    IMM:IF THE OPERATOR JUST SCANNED IS ONE THAT
```

```
0699                                                                    X   REQUIRES IMMEDIATE ACTION (CODE 99), BRANCH
0700                                                                    X   TO THE ROUTINE FOR THIS#OP.
0701                                                                    UN: IF WE HAVE A UNARY OPERATOR (CODE 98) SUCH
0702                                                                    X   AS LN OR ABS, GO TO#G20.
0703                                                                    OTH:        OTHERWISE WE HAVE A BINARY OPERATOR
0704                                                                    X   OR A DELIMITER WHOSE PRECEDENCE IS TO BE
0705                                                                    X   TESTED.
0706  4406  BBB 0 70  4408  4211  -OP2    ADD   BIG01    -OP4
0707  4211  BBB 0 50  4213  4215  -OP4    STL   OHOLD    OPX         G7. PUT OP IN OHOLD.
0708                                                                    X   PUT THE OPERATOR JUST SCANNED INTO LOCATION
0709                                                                    X   'OHOLD' BEFORE DECIDING WHAT TO DO WITH IT.
0710  4215  BBB 0 25  4417  4419  OPX     LDA   RATOR                  G10.P(RATOR):P(OHOLD)
0711  4419  BBB 0 70  4421  000A          ADD                RA          CHECK THE PRECEDENCE OF THE TOP OPERATOR ON
0712  4421  BBB 0 30  0001  4403          LDL    0001                   THE OPERATOR STACK AGAINST THE PRECEDENCE OF
0713  4403  BBB 0 25  4213  4415          LDA   OHOLD                   THE OPERATOR IN 'OHOLD'.
0714  4415  BBB 0 35  4617  4619          ERS   X0                     LSS:IF IT IS LESS (E.G., IN A+B*C, + IS LESS
0715  4619  BBB 0 87  4222  4422          TGR   1F                      THAN *), WE MUST WAIT BEFORE OPERATING
0716  4422  BBB 0 30  4224  4426          LDL   2F           REMRT      FURTHER SO WE GO TO#G19.
0717  4426  BBB 0 08  4417  4229  REMRT   LIR1  RATOR        REM        GEQ:IF IT HAS GREATER PRECEDENCE OR
0718  4224  BBB 0 07  HHHH  4227  2       IIR    HHHH                    EQUAL PRECEDENCE,HOWEVER,THE OPERATOR ON TOP
0719  4227  BBB 0 39  0001  000A          ERS1   0001       RA          OF THE STACK IS REMOVED AND WE BRANCH TO THE
0720                                                                    X   APPROPRIATE ROUTINE FOR THIS#OP.
0721                                                                    X   PRECEDENCE IS 70 FOR VARIOUS KINDS OF LEFT
0722                                                                    X   PARENTHESES,   73 FOR :    75 FOR  EQUALS
0723                                                                    X   78 FOR COMMA, 79 FOR OR, 80 FOR AND,
0724                                                                    X   82 FOR PLUS AND MINUS, 84 FOR UNARY MINUS,
0725                                                                    X   FOR MULTIPLY, AND FOR DIVIDE,   87 FOR POWER,
0726                                                                    X   AND 98 FOR UNARY OPERATORS
0727  4222  BBB 0 05  4213  4615  1       LDX   OHOLD                  G19.COMMA OR SEMICOLON
0728  4615  BBB 0 25  4267  4819          LDA   XM1                    YES:IF OHOLD HAS A PRECEDENCE WHOSE UNITS DIGIT
0729  4819  BBB 0 35  000C  4223          ERS   RX                       IS1,3,6,OR 8 IT MEANS WE ARE TO BRANCH TO
0730  4223  BBB 0 70  4225  4428          ADD   BIG99      -OP3          THIS #OP NOW THAT THE PRECEDENCE HAS BEEN
0731  4429  BBB 0 00  000A  000A  &OP3     JMP   RA                     CHECKED.  AT PRESENT THIS IS USED ONLY FOR
0732  4428  BBB 0 25  000C  4432  -OP3     LDA   RX          3F         SEMICOLON (EON OF STATEMENT) OR COMMA AND THI
0733  4212  BBB 0 25  000B  4432  &OP4     LDA   RL          3F         MEANS BRANCH TO THE ROUTINE SPECIFIED BY THE
0734  4234  BBB 1 07  0001  4238  MDOP2    IIR2   0001       MDOP1      CURRENT MODE.
- 0735  4235  BBB 1 07  0004  4238  MDOP    IIR2   0004       MDOP1   NO:         OTHERWISE WE GO TO G20 TO PUT OHOLD
0736  4238  BBB 1 50  0000  4428  MDOP1   STL2   0000       -OP3       ON THE OPERATOR STACK
0737  4432  BBB 0 30  4140  4242  3       LDL   NORMX        INSRT      G20.OPERATOR STACKED
0738  4242  BBB 0 08  4417  4445  INSRT   LIR1  RATOR        INS        THE OPERATOR IS PUT ON TOP OF THE OPERATOR
0739                                                                    X   STACK AND WE RETURN TO#G1.
0740                                                                    CODING DETAILS:
0741                                                                    X   UPON ENTRY TO GET, REGISTER A CONTAINS THE
0742                                                                    X   CURRENT ITEM AND REGISTER X CONTAINS THE
0743                                                                    X   PREVIOUS ITEM. THESE ARE IN 'GENERATOR CODE'
0744                                                                    X   WHICH IS EXPLAINED IN THE TABLE OF FORMATS
0745                                                                    X   IN THE BEGINNING OF THE FLOWCHARTS.
0746                                                                    S.  SCANNER CONTROL
0747                                                                    X   THIS ROUTINE CONTROLS THE SCANNER CO-ROUTINE.
0748                                                                    X   NORMALLY ENTRY TO THE SCANNER IS TO STEP S1
```

```
0749
0750  4050  BBB 0 30  4252  4202      SCAN1   LDL             NXTCH    X   WHICH BEGINS TO SCAN A NEW ITEM.
0751                                                                   S1. NEXT CHARACTER
0752                                                                   X   GET THE NEXT CHARACTER FORM THE INPUT CARD
0753  4252  BBB 0 0B  4050  4205              LIR1 E0000      KIND     X   (ROUTINE N).
0754                                                                   S2. WHAT KIND
0755                                                                   N:  IF THE CHARACTER IS NUMERIC, IT IS THE
0756                                                                   X   BEGINNING OF A CONSTANT, SO WE GO TO#C1.
0757                                                                   .:  A DECIMAL POINT ALSO MEANS A CONSTANT, GO TO
0758                                                                   X   STEP#C2.
0759                                                                   ALF:IF THE CHARACTER IS ALPHABETIC IT MEANS THE
0760                                                                   X   FIRST LETTER OF AN IDENTIFIER, SO WE GO TO
0761                                                                   X   #S3.
0762                                                                   BLNKIF THE CHARACTER IS BLANK,RETURN TO#S1.
0763                                                                   OTH:OTHERWISE WE HAVE A SPECIAL CHARACTER.  EACH
0764                                                                   X   SPECIAL CHARACTER IS TREATED EXACTLY AS AN
0765  4053  BBB 0 30  4405  4207      E0003   LDL  B05                X   IDENTIFIER TO LENGTH 1 AND WE GO TO STEP#S5.
0766  4207  BBB 0 50  4209  4411              STL  TEMP2              S3. LOOK FOR IJKLMN
0767  4411  BBB 0 30  4413  4265              LDL  LIT8                   IF THIS CHARACTER IS THE LETTER I THROUGH N,
0768  4265  BBB 0 87  4018  4218              TGR             1F          RECORD FOR FUTURE REFERENCE THAT THIS
0769  4018  BBB 0 30  4220  4622              LDL# 00001      00005       IDENTIFIER IS INTEGER TYPE. ALSO PREPARE TO
0770  4622  BBB 0 87  4218  4425              TGR  1F                     BUILD UP TO FIVE CHARACTERS OF EVERY IDEN-
0771  4425  BBB 0 25  4408  4210              LDA  BIG01      2F          TIFIER IN A COMPUTER WORD, IN THE FORM
0772  4218  BBB 0 26  4210  4210      1       CLA  2F                     ZZZZZNNNNN WITH LEADING BLANKS.
0773  4210  BBB 0 60  4412  4414      2       STA  TYPE
0774  4414  BBB 0 25  4016  4418              LDA  LIT1       1F
0775  4625  BBB 0 70  4016  4418      5       ADD  LIT1       1F
0776  4418  BBB 0 60  4420  4272      1       STA  TEMP3
0777  4272  BBB 0 30  4424  4626              LDL  LIT5
0778  4626  BBB 0 87  4629  4829              TGR  3F         2F
0779  4829  BBB 0 25  4209  4611      2       LDA  TEMP2
0780  4611  BBB 0 37  0100  4465              SHL   0100
0781  4465  BBB 0 35  4467  4269              ERS# HHHH0      HHHHH
0782  4269  BBB 0 20  000C  4423              BUF  RX                 S4. NEXT CHARACTERS
0783  4423  BBB 0 60  4209  4629              STA  TEMP2      3F          SUCCESSIVELY GET CHARACTERS FROM THE CARD
0784  4629  BBB 0 30  4231  4202      3       LDL             NXTCH       (ROUTINE N) UNTIL THE FIRST NON-ALPHNUMERIC
0785  4231  BBB 0 0B  4055  4205              LIR1 E0005      KIND        CHARACTER APPEARS. IF THE TERMINAL CHARACTER
0786  4056  BBB 0 30  4055  4407      E0006   LDL  E0005      SETNS       IS NONBLANK, PUT IT BACK ON THE CARD SO IT
0787  4059  BBB 0 30  4055  4407      E0009   LDL  E0005      SETNS       WILL COME THROUGH AGAIN NEXT TIME.
0788  4058  BBB 0 25  4420  4625      E0008   LDA  TEMP3      5B
0789  4057  BBB 0 25  4420  4625      E0007   LDA  TEMP3      5B
0790  4055  BBB 0 06  4608  4608      E0005   CLX                     S5. SEARCH SYMBOL TABLE
0791  4608  BBB 0 30  4410  4612              LDL  SEND       SRCH1       ACTIVATE ROUTINE T TO SEARCH FOR THIS IDENT-
0792  4051  BBB 0 65  4209  4261      E0001   STX  TEMP2                 IFIER OR SPECIAL CHARACTER IN THE SYMBOL
0793  4261  BBB 0 26  4614  4614              CLA                         TABLE. IF NOT FOUND, IT IS ENTERED IN THE
0794  4614  BBB 0 60  4412  4814              STA  TYPE                   TABLE AS A SIMPLE VARIABLE.  IF FOUND, THE
0795  4814  BBB 0 25  4016  4618              LDA  LIT1                   CODE FOUND IS USED IN STEP S10.
0796  4618  BBB 0 60  4420  4055              STA  TEMP3      E0005
0797  4410  BBB 0 50  4420  4472      SEND    STL  TEMP3      SEND1   S10.TRANSLATE TO GEN CODE.
0798  4472  BBB 0 25  4624  4076      SEND1   LDA  TEMP4                  WE HAVE AN ITEM WHICH WE WANT TO SEND
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0799  4076  BBB 0 77  4076  4079            ATL                          TO THE GENERATOR, BUT IT IS IN SYMBOL TABLE
0800  4079  BBB 0 06  4632  4632            CLX                          FORMAT RATHER THAN GENERATOR FORMAT.
0801  4632  BBB 0 32  0900  4244            SHR   0900                   SPECIFICATIONS OF THESE FORMATS ARE GIVEN AT
0802  4244  BBB 0 70  4446  000A            ADD                  RA      THE BEGINNING OF THE FLOWCHART LISTINGS.
0803  4446  BBB 0 25  000B  4040            LDA   RL             S0000   THE CONVERSION IS MADE AT THIS POINT. IF THE
0804  4040  BBB 0 25  4420  4672  S0000     LDA   TEMP3                  SPECIAL CODE 69 OCCURS HERE A BRANCH IS MADE
0805  4672  BBB 0 30  4824  4276            LDL   DOVAR                  TO THE SPECIAL SCANNER OPERATOR WHICH NEVER
0806  4276  BBB 0 82  4279  4479            TEQ   2F             3F      GETS TO THE GENERATOR CO-ROUTINE, SUCH AS
0807  4479  BBB 0 20  4412  4264  3         BUF   TYPE           SCAN9   TRACE,LIST,CARDS,ETC. THE APOSTROPHE OPERATOR
0808  4279  BBB 0 25  4431  4264  2         LDA   BIG21          SCAN9   (MEANING END OF CARD), ROUTINE Q, IS ONE OF
0809  4043  BBB 0 35  4645  4479  S0003     ERS                  3B      THESE SPECIAL SCANNER OPERATORS   , THE
0810  4645  BBB 0 H0  HHHH  0000            CON   H0HHH          H0000   OTHERS ARE MENTIONED IN STEP U29.
0811  4045  BBB 0 35  4617  4469  S0005     ERS   X0
0812  4469  BBB 0 20  4420  4264            BUF   TEMP3          SCAN9
0813  4046  BBB 0 70  4448  4451  S0006     ADD                  -SEND
0814  4448  BBB 0 31  0000  0000            CON   31000          00000
0815  4452  BBB 0 05  4804  4256  &SEND     LDX   NOTAG
0816  4256  BBB 0 32  0F00  000C            SHR   0F00           RX
0817  4451  BBB 0 25  4603  4605  -SEND     LDA   BIG60
0818  4605  BBB 0 20  4420  4479            BUF   TEMP3          3B
0819  4049  BBB 0 35  4201  4264  S0009     ERS   X0M            SCAN9
0820  4048  BBB 0 35  4201  4264  S0008     ERS   X0M            SCAN9
0821  4047  BBB 0 35  4201  4264  S0007     ERS   X0M            SCAN9
0822  4264  BBB 0 30  4050  4028  SCAN9     LDL   SCAN1          GEN     S20.SEND TO GEN
0823                                                                     X   THE CODED ITEM IS SENT TO GEN, USUALLY
0824                                                                     X   THIS IS TO STEP G1. UPON REENTRY, SCAN WILL
0825                                                                     X   START UP AGAIN AT#S1.
0826                                                                     N.  'GET NEXT CHARACTER' ROUTINE
0827  4407  BBB 0 65  4409  4461  SETNS     STX   NEXTC                  G   SUBROUTINE SETNS PUTS BACK PREV CHAR ON CARD
0828  4461  BBB 0 25  4613  4665            LDA   NXTW                   N1. WAS CHAR PUT BACK
0829  4665  BBB 0 60  4202  000B            STA   NXTCH          RL      YES:IF A CHARACTER HAS BEEN 'PUT BACK' ONTHE CARD
0830  4613  BBB 0 05  4409  4661  NXTW      LDX   NEXTC                      RE-EMIT THIS CHARACTER AND#EXIT.
0831  4661  BBB 0 25  4813  4315            LDA   NXTN
0832  4315  BBB 0 60  4202  000B            STA   NXTCH          RL
0833  4202  BBB 0 25  4456  4258  NXTCH     LDA   NZONS          1F      G   NXTCH IS SET TO EITHER NXTW OR NXTN
0834  4813  BBB 0 25  4456  4258  NXTN      LDA   NZONS          1F      NO:
0835  4258  BBB 0 05  000A  4262  1         LDX   RA
0836  4262  BBB 0 50  4464  4216            STL   EXIT1                  N2. END OF WORD
0837  4216  BBB 0 70  000A  4321            ADD   RA            -INP1   NO: IF WE ARE NOT AT THE END OF THE CURRENT
0838                                                                     X   TEN-COLUMN PART OF THE CARD, GO TO STEP#N10,
0839                                                                     X   ELSE WE MUST BRING UP ANOTHER SECTION OF THE
0840  4322  BBB 0 07  0001  4075  &INP1     IIR    0001                  YES:          CARD.
0841  4075  BBB 0 70  4427  4230            ADD   NWORD                  N3. END OF CARD
0842  4230  BBB 0 60  4427  000A            STA   NWORD          RA      YES:IF WE ARE AT THE END OF THIS CARED,   GO TO
0843  4427  BBB 0 00  4038  4038  NWORD     JMP   N0008                      STEP#N20.
0844  4037  BBB 0 08  0303  4240  N0007     LIR1  K0103          1F      NO:
0845  4031  BBB 0 08  0200  4240  N0001     LIR1  K0000          1F      N4. GET NEW WORD
0846  4032  BBB 0 08  0281  4240  N0002     LIR1  K0081          1F          BRING UP THE NEW WORD. THIS MEANS USUALLY
0847  4033  BBB 0 08  0365  4240  N0003     LIR1  K0165          1F          THAT THE NEXT TEN ZONES AND NEXT TEN
0848  4034  BBB 0 08  0250  4240  N0004     LIR1  K0050          1F          NUMERICS ARE BROUGHT UP. SPECIAL ACTION IS
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0849  4035  BBB 0 0B  0334  4240   N0005   LIR1 K0134      1F
0850  4036  BBB 0 0B  0218  4240   N0006   LIR1 K0018      1F
0851  4240  BBB 0 29  0000  4652   1       LDA1 0000
0852  4652  BBB 0 09  0005  4257           LDX1 0005      SHFT
0853  4257  BBB 0 60  4609  4311   SHFT    STA  NNUMS     BKSW
0854                                       OFF  9000
0855        *** OFF **                     OFF  9001
0856        *** OFF **                     OFF  9002
0857        *** OFF **             N0008   LDX  K0041
0858        *** OFF **                     LDA  K0046
0859        *** OFF **                     BUF            SHFTF
0860        *** OFF **                     CON  00500     00000
0861        *** OFF **             -INP1   CLA  3F
0862        *** OFF **             BKSW    LDL  B10       1F
0863        *** OFF **             BKON    LDL  B10       1F
0864        *** OFF **             1       TEQ            BKOF
0865        *** OFF **                     LDA  RX
0866        *** OFF **                     CLL
0867        *** OFF **                     TEQ            BKOF
0868        *** OFF **                     LDX  BIG05     3F
0869        *** OFF **             BKOF    LDA  BIG50     3F
0870        *** OFF **                     OFF  8001
0871        *** OFF **                     OFF  8002
0872                                       ON   9001
0873                                       ON   9002
0874        *** OFF **             N0008   LIR1 K0041     1B
0875        *** OFF **             -INP1   CLA  BKSW
0876        *** OFF **             BKSW    LDL  B10       1F
0877        *** OFF **             BKON    LDL  B10       1F
0878        *** OFF **             1       TEQ            2F
0879        *** OFF **                     LDA  RX
0880        *** OFF **                     CLL
0881        *** OFF **                     TEQ            2F
0882        *** OFF **                     LDX  BIG05     3F
0883        *** OFF **             2       LDA  BIG50     3F
0884        *** OFF **             BKOF    LDA  BIG50
0885        *** OFF **                     SHR  0900
0886        *** OFF **                     STA  NZONS
0887        *** OFF **                     SHR  0100
0888        *** OFF **                     LDX  NNUMS
0889        *** OFF **                     SHR  0900
0890        *** OFF **                     STA  NNUMS
0891        *** OFF **                     SHR  0600
0892        *** OFF **                     MTC
0893        *** OFF **                     SHL  0500
0894        *** OFF **                     SHR  0900
0895        *** OFF **                     ERS  X49
0896        *** OFF **                     LDX  RA        4F
0897        *** OFF **                     OFF  9001
0898        *** OFF **                     OFF  9002
```

TAKEN ON THE 8TH WORD OF 80-COLUMN CARDS TO STOP AFTER COLUMN 72, AND ON THE FIRST WORD TO START EITHER AT COLUMN 7 OR AT COLUMN 1 IF THERE IS A LABEL.

```
                                                    ON    9000
4038  BBB 0 08  0241  4240   N0008      LIR1 K0041        1B
4321  BBB 0 26  4311  4311   -INP1      CLA  BKSW
4311  BBB 0 31  4664  4664   BKSW       CLL  1F
4253  BBB 0 31  4664  4664   BKON       CLL  1F
4664  BBB 0 20  000C  4268   1          BUF  RX
4268  BBB 0 82  4621  4275              TEQ               2F     +04
4621  BBB 0 05  4623  4275              LDX  BIG50        2F
4275  BBB 0 25  4627  4679   2          LDA# 40000        00000
4679  BBB 0 35  4609  4511              ERS  NNUMS
4511  BBB 0 32  0400  4468              SHR   0400
4468  BBB 0 70  000C  4823              ADD  RX
4823  BBB 0 35  4475  4077              ERS# HHHHH        00000
4077  BBB 0 77  4077  4430              ATL
4430  BBB 0 20  4282  4434              BUF# 00005        00000
4434  BBB 0 32  0500  4442              SHR   0500
4442  BBB 0 60  4456  4458              STA  NZONS
4458  BBB 0 06  4711  4711              CLX
4711  BBB 0 25  4609  4911              LDA  NNUMS
4911  BBB 0 32  0900  4273              SHR   0900
4273  BBB 0 65  4609  4361              STX  NNUMS
4361  BBB 0 37  0400  4668              SHL   0400
4668  BBB 0 20  000B  4522              BUF  RL
4522  BBB 0 35  4274  4476              ERS# 0000H        80000
4476  BBB 0 70  4228  000A              ADD               RA
4228  BBB 0 05  4800  4302              LDX  80000        4F
4675  BBB 0 25  4277  4879   BKOF       LDA  BIG50        3F
                                        ON    9001
                                        ON    9002
                                        ON    8001
                                        ON    8002
4879  BBB 0 32  0900  4041   3          SHR   0900                N10.EXTRACT NEXT CHAR
4041  BBB 0 60  4456  4658              STA  NZONS                    REMOVE THE NEXT CHARACTER FROM THE CARD AND
4658  BBB 0 25  000C  4462              LDA  RX                       #EXIT.
4462  BBB 0 37  0400  4669              SHL   0400
4669  BBB 0 05  4609  4561              LDX  NNUMS
4561  BBB 0 32  0900  4473              SHR   0900
4473  BBB 0 60  4609  4302              STA  NNUMS        4F
4302  BBB 0 30  4254  4656   4          LDL  STAN
4656  BBB 0 50  4257  4464              STL  SHFT         EXIT1
4254  BBB 0 60  4609  4311   STAN       STA  NNUMS        BKSW    N20.GET NEW CARD
4039  BBB 0 07  4030  4642   N0009      IIR  N0000                    UNLOAD HSR BUFFER IF IT HAS NOT ALREADY BEEN
4642  BBB 0 30  4444  4646              LDL  SHFT4                    UNLOADED. IF NO CARD IS CURRENTLY IN PROCESS,
4646  BBB 0 50  4257  4809              STL  SHFT                     GIVE 2223 ERROR HALT.
4809  BBB 0 60  4427  4329              STA  NWORD        CREAD
4444  BBB 0 20  4277  4529   SHFT4      BUF  BIG50
4529  BBB 0 32  0400  4236              SHR   0400        SHFTF
4236  BBB 0 32  0F00  4254   SHFTF      SHR   0F00        STAN
                                        HHH
4329  BBB 0 25  0131  0133   CREAD      LDA  CMOVE                N21.MOVE BUFFERS
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 0899                                                  ON    9000
-- 0900   4038  BBB 0 08  024₁  4240      N0008       LIR1  K0041     1B
 0901   4321  BBB 0 26  4311  4311      -INP1       CLA   BKS#
 0902   4311  BBB 0 31  4664  4664      BKS#        CLL   1F
 0903   4253  BBB 0 31  4664  4664      BKON        CLL   1F
 0904   4664  BBB 0 20  000C  4268      1           BUF   RX
 0905   4268  BBB 0 82  4621  4275                  TEQ               2F     +04
 0906   4621  BBB 0 05  4623  4275                  LDX   BIG50       2F
 0907   4275  BBB 0 25  4627  4679      2           LDA#  40000       00000
 0908   4679  BBB 0 35  4609  4511                  ERS   NNUMS
 0909   4511  BBB 0 32  0400  4468                  SHR    0400
 0910   4468  BBB 0 70  000C  4823                  ADD   RX
 0911   4823  BBB 0 35  4475  4077                  ERS#  HHHHH       00000
 0912   4077  BBB 0 77  4077  4430                  ATL
 0913   4430  BBB 0 20  4282  4434                  BUF#  00005       00000
 0914   4434  BBB 0 32  0500  4442                  SHR    0500
 0915   4442  BBB 0 60  4456  4458                  STA   NZONS
 0916   4458  BBB 0 06  4711  4711                  CLX
 0917   4711  BBB 0 25  4609  4911                  LDA   NNUMS
 0918   4911  BBB 0 32  0900  4273                  SHR    0900
 0919   4273  BBB 0 65  4609  4361                  STX   NNUMS
 0920   4361  BBB 0 37  0400  4668                  SHL    0400
 0921   4668  BBB 0 20  000B  4522                  BUF   RL
 0922   4522  BBB 0 35  4274  4476                  ERS#  0000H       80000
 0923   4476  BBB 0 70  4228  000A                  ADD                 RA
 0924   4228  BBB 0 05  4800  4302                  LDX   80000       4F
 0925   4675  BBB 0 25  4277  4879      BKOF        LDA   BIG50       3F
 0926                                                 ON    9001
 0927                                                 ON    9002
 0928                                                 ON    8001
 0929                                                 ON    8002
 0930   4879  BBB 0 32  0900  4041      3           SHR    0900                 N10.EXTRACT NEXT CHAR
 0931   4041  BBB 0 60  4456  4658                  STA   NZONS                      REMOVE THE NEXT CHARACTER FROM THE CARD AND
 0932   4658  BBB 0 25  000C  4462                  LDA   RX                       #EXIT.
 0933   4462  BBB 0 37  0400  4669                  SHL    0400
 0934   4669  BBB 0 05  4609  4561                  LDX   NNUMS
 0935   4561  BBB 0 32  0900  4473                  SHR    0900
 0936   4473  BBB 0 60  4609  4302                  STA   NNUMS       4F
 0937   4302  BBB 0 30  4254  4656      4           LDL   STAN
- 0938   4656  BBB 0 50  4257  4464                  STL   SHFT        EXIT1
 0939   4254  BBB 0 60  4609  4311      STAN        STA   NNUMS       BKSW     N20.GET NEW CARD
 0940   4039  BBB 0 07  4030  4642      N0009       IIR   N0000                      UNLOAD HSR BUFFER IF IT HAS NOT ALREADY BEEN
 0941   4642  BBB 0 30  4444  4646                  LDL   SHFT4                    UNLOADED. IF NO CARD IS CURRENTLY IN PROCESS,
 0942   4646  BBB 0 50  4257  4809                  STL   SHFT                     GIVE 2223 ERROR HALT.
 0943   4809  BBB 0 60  4427  4329                  STA   NWORD       CREAD
 0944   4444  BBB 0 20  4277  4529      SHFT4       BUF   BIG50
 0945   4529  BBB 0 32  0400  4236                  SHR    0400       SHFTF
 0946   4236  BBB 0 32  0F00  4254      SHFTF       SHR    0F00       STAN
 0947                                                HHH
 0948   4329  BBB 0 25  0131  0133      CREAD       LDA   CMOVE                  N21.MOVE BUFFERS
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```
0949  0133  BBB 0 05  0135  0337                LDX  CHALT   BU          INITIATE READING NEXT CARD, AND TRANSFER
0950  0150  BBB 0 25  000C  0337  BU1           LDA  RX      BU          HSR INTERLACE TO PRINTER INTERLACE.
0951  0337  BBB 0 60  0139  0141  BU            STA  CHI     CRDSW       PRINT OUT THE CARD IMAGE, TOGETHER WITH
0952  0141  BBB 0 31  0144  0144  CRDSW         CLL  3F                  LEVEL + BAND.
0953                                                                X   RESET EMITTER AND GO TO#N4.
0954  0154  BBB 0 31  0144  0144  CRDC          CLL  3F
0955  0144  BBB 0 08  0150  0347  3             LIR1 0150    2F
0956  0347  BBB 0 42  0151  0350  2             HBT  4F
0957  0350  BBB 0 0G  9999  0354                IIR1 9999
0958  0354  BBB 0 82  000C  0347                TEQ  RX      2B
0959  0135  BBB 0 67  2223  0023  CHALT         HLT  2223
0960  0023  BBB 0 30  0154  0156                LDL  CRDC    HCC
0961  0156  BBB 0 72  000A  0159  HCC           HCC  RA      -CRD
0962  0160  BBB 0 67  2222  000A  &CRD          HLT  2222    RA
0963  0159  BBB 0 25  0154  0356  -CRD          LDA  CRDC
0964  0356  BBB 0 60  0141  000B                STA  CRDSW   RL
0965
0966        *** OFF **                          OFF  9000
0967        *** OFF **                          OFF  9001
0968        *** OFF **                4         HBU  H0001
0969        *** OFF **                          LDL  H10
0970        *** OFF **                          LDA  H0025
0971        *** OFF **                          TEQ          CRDC
0972        *** OFF **                          LDA  &OP2               G   &OP2 IS A 'JMP RA'
0973        *** OFF **                          STA  CRDSW   CHI
0974        *** OFF **                CMOVE     LDL          HCC
0975        *** OFF **                          LDA  H0118   1F
0976        *** OFF **                1         LDX  H0123
0977        *** OFF **                          LDL  H0166
0978        *** OFF **                          STA  K0000
0979        *** OFF **                          STX  K0005
0980        *** OFF **                          STL  K0134
0981        *** OFF **                          LDA  H0142
0982        *** OFF **                          LDX  H0147
0983        *** OFF **                          LDL  H0154
0984        *** OFF **                          STA  K0165
0985        *** OFF **                          STX  K0170
0986        *** OFF **                          LDA  H0178
0987        *** OFF **                          LDX  H0183
0988        *** OFF **                          STA  K0018
0989        *** OFF **                          STX  K0023
0990        *** OFF **                          STL  K0050
0991        *** OFF **                          LDL  H0171
0992        *** OFF **                          LDA  H0006
0993        *** OFF **                          LDX  H0011
0994        *** OFF **                          STA  K0041
0995        *** OFF **                          STX  K0046
0996        *** OFF **                          LDA  H0130
0997        *** OFF **                          LDX  H0135
0998        *** OFF **                          STL  K0139
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```
0949   0133  BBB 0 05  0135  0337                LDX  CHALT    BU          INITIATE READING NEXT CARD, AND TRANSFER
0950   0150  BBB 0 25  000C  0337   BU1          LDA  RX       BU          HSR INTERLACE TO PRINTER INTERLACE.
0951   0337  BBB 0 60  0139  0141   BU           STA  CHI      CRDSW       PRINT OUT THE CARD IMAGE, TOGETHER WITH
0952   0141  BBB 0 31  0144  0144   CRDSW        CLL  3F                    LEVEL + BAND.
0953                                                                    X   RESET EMITTER AND GO TO#N4.
0954   0154  BBB 0 31  0144  0144   CRDC         CLL  3F
0955   0144  BBB 0 08  0150  0347   3            LIR1 0150     2F
0956   0347  BBB 0 42  0151  0350   2            HBT  4F
0957   0350  BBB 0 0G  9999  0354                IIR1 9999
0958   0354  BBB 0 82  000C  0347                TEQ  RX       2B
0959   0135  BBB 0 67  2223  0023   CHALT        HLT  2223
0960   0023  BBB 0 30  0154  0156                LDL  CRDC     HCC
0961   0156  BBB 0 72  000A  0159   HCC          HCC  RA       -CRD
0962   0160  BBB 0 67  2222  000A   &CRD         HLT  2222     RA
0963   0159  BBB 0 25  0154  0356   -CRD         LDA  CRDC
0964   0356  BBB 0 60  0141  000B                STA  CRDSW    RL
0965                                             OFF  9000
0966         *** OFF **                          OFF  9001
0967         *** OFF **                          OFF  9002
0968         *** OFF **             4            HBU  H0001
0969         *** OFF **                          LDL  H10
0970         *** OFF **                          LDA  H0025
0971         *** OFF **                          TEQ            CRDC
0972         *** OFF **                          LDA  &OP2                 G   &OP2 IS A 'JMP RA'
0973         *** OFF **                          STA  CRDSW     CHI
0974         *** OFF **             CMOVE        LDL            HCC
0975         *** OFF **                          LDA  H0118     1F
0976         *** OFF **             1            LDX  H0123
0977         *** OFF **                          LDL  H0166
0978         *** OFF **                          STA  K0000
0979         *** OFF **                          STX  K0005
0980         *** OFF **                          STL  K0134
0981         *** OFF **                          LDA  H0142
0982         *** OFF **                          LDX  H0147
0983         *** OFF **                          LDL  H0154
0984         *** OFF **                          STA  K0165
0985         *** OFF **                          STX  K0170
0986         *** OFF **                          LDA  H0178
0987         *** OFF **                          LDX  H0183
0988         *** OFF **                          STA  K0018
0989         *** OFF **                          STX  K0023
0990         *** OFF **                          STL  K0050
0991         *** OFF **                          LDL  H0171
0992         *** OFF **                          LDA  H0006
0993         *** OFF **                          LDX  H0011
0994         *** OFF **                          STA  K0041
0995         *** OFF **                          STX  K0046
0996         *** OFF **                          LDA  H0130
0997         *** OFF **                          LDX  H0135
0998         *** OFF **                          STL  K0139
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0999            *** OFF **
1000            *** OFF **
1001            *** OFF **
1002            *** OFF **
1003            *** OFF **
1004            *** OFF **
1005            *** OFF **
1006            *** OFF **
1007            *** OFF **
1008            *** OFF **
1009            *** OFF **
1010            *** OFF **
1011            *** OFF **
1012            *** OFF **
1013
1014                                        CTP     NEW1  77000     0B3AG
1015                                                OFF    9000
1016                                                ON     9001
1017                                                ON     9002
1018            *** OFF **                  CTP     NEW   12220     00003
1019                                                ON     9000
1020    0151    BBB 0 96   0009   0013      4       HBU   H0000
1021    0013    BBB 0 30   0015   0017              LDL   H10
1022    0017    BBB 0 25   0021   0823              LDA   H0021
1023    0823    BBB 0 82   0226   0154              TEQ                CRDC
1024    0226    BBB 0 25   4607   0059              LDA   &OP2                    G   &OP2 IS A 'JMP RA'
1025    0059    BBB 0 60   0141   0139              STA   CRDSW        CHI
1026    0131    BBB 0 30   0333   0156      CMOVE   LDL                HCC
1027    0333    BBB 0 25   0031   0033              LDA   H0031
1028    0033    BBB 0 05   0036   0038              LDX   H0036
1029                                                CTP
1030    0038    BBB 0 60   0281   0083              STA   K0081
1031    0083    BBB 0 65   0286   0088              STX   K0086
1032    0088    BBB 0 25   0112   0114              LDA   H0112
1033    0114    BBB 0 05   0117   0119              LDX   H0117
1034                                                CTP
1035    0119    BBB 0 60   0334   0136              STA   K0134
1036    0136    BBB 0 65   0339   0341              STX   K0139
1037    0341    BBB 0 25   0051   0053              LDA   H0051
1038    0053    BBB 0 05   0056   0058              LDX   H0056
1039                                                CTP
1040    0058    BBB 0 60   0365   0367              STA   K0165
1041    0367    BBB 0 65   0370   0372              STX   K0170
1042    0372    BBB 0 25   0011   0213              LDA   H0011
1043    0213    BBB 0 05   0016   0018              LDX   H0016
1044                                                CTP
1045    0018    BBB 0 60   0200   0002              STA   K0000
1046    0002    BBB 0 65   0205   0007              STX   K0005
1047    0007    BBB 0 25   0071   0073              LDA   H0071
1048    0073    BBB 0 05   0076   0078              LDX   H0076
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1049
1050    0078  BBB 0 60  0250  0052
1051    0052  BBB 0 65  0255  0057
1052    0057  BBB 0 25  0132  0134
1053    0134  BBB 0 05  0137  0939
1054
1055    0939  BBB 0 60  0218  0020
1056    0020  BBB 0 65  0223  0025
1057    0025  BBB 0 25  0027  0029
1058    0029  BBB 0 70  0231  0034
1059
1060          *** OFF **
1061          *** OFF **
1062          *** OFF **
1063          *** OFF **
1064
1065    0034  BBB 0 20  0236  0238
1066    0238  BBB 0 17  0238  0841
1067    0841  BBB 0 35  0043  0045
1068    0045  BBB 0 60  0325  0327
1069    0327  BBB 0 65  0330  0332
1070
1071
1072    0332  BBB 0 25  0152  0554
1073    0554  BBB 0 05  0157  0359
1074
1075    0359  BBB 0 60  0303  0105
1076    0105  BBB 0 65  0308  0310
1077    0310  BBB 0 25  0172  0174
1078    0174  BBB 0 05  0177  0179
1079
1080    0179  BBB 0 60  0241  0243
1081    0243  BBB 0 65  0246  0048
1082
1083
1084    0048  BBB 0 25  0050  0252
1085    0252  BBB 0 70  0054  0257
1086    0258  BBB 0 60  0050  0452      &CRD2
1087    0452  BBB 0 11  0218  0189
1088    0257  BBB 0 60  0050  0652      -CRD2
1089    0652  BBB 0 11  0202  0189
1090    0190  BBB 0 05  0392  0194      &CRD3
1091    0392  BBB 0 67  3333  0533
1092    0194  BBB 0 60  0533  0150      1
1093    0189  BBB 0 05  0200  0202      -CRD3
1094    0202  BBB 0 25  0205  0207
1095    0207  BBB 0 35  0009  0211
1096    0211  BBB 0 32  0500  0019
1097    0019  BBB 0 37  0500  0227
1098    0227  BBB 0 20  000C  0431
```

```
CTP
STA   K0050
STX   K0055
LDA   H0132
LDX   H0137
CTP
STA   K0018
STX   K0023
LDA   LEVEL
ADD   BAND
OFF    9000
BUF#  BB000       0B8B8
STA   K0125
OFF    9001
OFF    9002
ON     9000
BUF#  33000       03333
MTC
ERS   XM
STA   K0125
STX   K0130
ON     9001
ON     9002
LDA   H0152
LDX   H0157
CTP
STA   K0103
STX   K0108
LDA   H0172
LDX   H0177
CTP
STA   K0041
STX   K0046
ON     8001
ON     8002
LDA   LC
ADD   BIG04       -CRD2
STA   LC
PRN   K0018       -CRD3
STA   LC
PRN   K0002       -CRD3
LDX               1F
HLT    3333       THETA
STA   THETA       BU1
LDX   K0000
LDA   K0005
ERS   H5
SHR    0500
SHL    0500
BUF   RX
```

```
1099  0431  BBB 0 60  0233  0035                    STA   COL15
1100  0035  BBB 0 35  0037  0039                    ERS   X05
1101  0039  BBB 0 30  1241  0443                    LDL   2F
1102  0443  BBB 0 82  4329  0846                    TEQ   CREAD
1103  0846  BBB 0 25  0200  0402                    LDA   K0000
1104                                                OFF    9000
1105        *** OFF **                              ERS   X5
1106        *** OFF **                              CLL
1107        *** OFF **                              TGR   &INP1       1F
1108        *** OFF **                        1     LDX   X9          EXIT1
1109        *** OFF **                        2     ALF   C0000
1110        *** OFF **                              OFF    9001
1111        *** OFF **                              OFF    8001
1112        *** OFF **                         BBAH NEW1  00001       00000      G   CAUSES ASSEMBLY INTO UPPER 200 OF CORE
1113        *** OFF **                              HHH          C
1114        *** OFF **                              OFF    8002
1115        *** OFF **                              OFF    9002
1116                                                ON     9000
1117  0402  BBB 0 05  0205  0407                    LDX   K0005
1118  0407  BBB 0 12  0407  0010                    CTM
1119  0010  BBB 0 35  0012  0014                    ERS   X5
1120  0014  BBB 0 31  0217  0217                    CLL
1121  0217  BBB 0 82  0220  4322                    TEQ                &INP1
1122  0220  BBB 0 05  0022  4464                    LDX   X9          EXIT1
1123  1241  BBB 0 10  0001  0000              2     CON   10000       10000
1124                                                ON     9001
1125                                                ON     8001
1126                                                HHH          H
1127                                                ON     9002
1128                                                ON     8002
1129  4729  BBB 0 60  4420  4612        SRCH        STA   TEMP3       SRCH1      T.  SYMBOL TABLE SEARCH.
1130  4612  BBB 0 65  4624  4676        SRCH1       STX   TEMP4                      THIS SUBROUTINE IS ISED TO LOOK UP IDENTIFIER
1131  4676  BBB 0 25  4628  4630                    LDA   MZERO                      SPECIAL CHARACTERS, CONSTANTS, AND STATEMENT
1132  4630  BBB 0 70  4209  4662                    ADD   TEMP2                      NUMBERS (LABELS) IN THE BIG TABLE.  IF NOT
1133  4662  BBB 0 50  4464  4416                    STL   EXIT1                      IN THE TABLE, THE ITEM IS ENTERED IN.
1134  4416  BBB 0 37  0100  4620                    SHL    0100               T1. SCRAMBLE
1135  4620  BBB 0 77  4620  4673                    ATL                             MULTIPLY ITEM BY 1010101010 AND THEN  ADD
1136  4673  BBB 0 85  4325  4502                    MUL#  10101       01010       (0 FOR CONSTANTS, LENGTH FOR IDENTIFIERS,
1137  4502  BBB 0 70  4420  4323                    ADD   TEMP3                      OR 99 FOR STATEMENT NUMBERS). TAKE THE
1138  4323  BBB 0 32  0600  4482                    SHR    0600                      RESULT MOD 100, GIVING THE STACK HEAD NUMBER
1139  4482  BBB 0 07  00HH  4435                    IIR    00HH                      FOR THIS SYMBOL.
1140  4435  BBB 0 35  000C  4239                    ERS   RX
1141  4239  BBB 0 70  4241  000A                    ADD                RA
1142  4241  BBB 0 08  1420  4447                    LIR1  Z0000
1143  4447  BBB 0 30  4209  4761                    LDL   TEMP2
1144  4761  BBB 0 29  0000  4702                    LDA1   0000        1F         T2. IS STACK EXHAUSTED
1145  4702  BBB 0 70  4454  4307              1     ADD                -SCRM      YES:IF THISSTACK HAS BEEN ENTIRELY PROCESSED,
1146  4454  BBB 0 99  9999  0000                    CON   99999       90000           INSERT THIS ITEM INTO THE TABLE ON THIS
1147  4307  BBB 0 25  000B  4961        -SCRM       LDA   RL                        STACK. #EXIT.
1148  4961  BBB 0 05  4624  4876                    LDX   TEMP4       INS99      NO:
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1149  4308  888 0 05  000A  4312   &SCRM  LDX  RA                 T3. DOES SYMBOL MATCH
1150  4312  888 0 70  4864  000A          ADD                RA      COMPARE THE CURRENT ITEM IN THE STACK
1151  4864  888 0 25  0002  4654          LDA   0002               NO: AGAINST THE DESIRED SYMBOL. IF THERE IS NO
1152  4654  888 0 82  4457  4657          TEQ   2F                     MATCH, GO BACK TO #T2.
1153  4657  888 0 25  000C  4512          LDA   RX                 YES:
1154  4512  888 0 70  4314  000A          ADD                RA
1155  4314  888 0 25  0001  4453          LDA   0001
1156  4453  888 0 37  0600  4712          SHL   0600
1157  4712  888 0 32  0200  4702          SHR   0200         1B
1158  4457  888 0 07  0001  4610   2      IIR   0001               T4. GET TABLE ENTRY
1159  4610  888 0 70  000C  4515          ADD   RX                    GET THE CORRESPONDING ENTRY FOR THE SYMBOL WE
1160  4515  888 0 77  4515  4318          ATL                        HAVE JUST FOUND. #EXIT.
1161  4318  888 0 70  4270  000A          ADD                RA      CODING DETAILS:
1162  4270  888 0 05  0000  4902          LDX   0000                 AT INPUT, REGISTER A CONTAINS THE LENGTH OF
1163  4902  888 0 65  4624  4464          STX   TEMP4        EXIT1   SYMBOL, REGISTER X CONTAINS THE CODE TO USE
1164                                                           X     IF NOT FOUND IN THE TABLE, RL CONTAINS THE
1165                                                           X     EXIT INSTRUCTION, TEMP2 CONTAINS THE SYMBOL.
1166                                                           X     AT EXIT, RL CONTAINS THE LOCATIONS OF THE
1167                                                           X     TABLE ENTRY IN ITS M ADDRESS, AND TEMP4 IS
1168                                                           X     THE EQUIVALENT OF THE SYMBOL.
1169  4445  888 0 50  4464  4876   INS    STL   EXIT1        INS99   L.  LINKED MEMORY SUBROUTINES.
1170                                                           X     THESE SUBROUTINES ARE USED IMPLICITLY IN MANY
1171                                                           X     PLACES OF THE PROGRAM, TO STORE AND RETRIEVE
1172                                                           X     INFORMATION FROM A POOLED MEMORY AREA.
1173                                                           X     THE FORMAT FOR POOLED MEMORY IS
1174                                                           X         STACK HEAD:  00 LINK 0000
1175                                                           X         AVAIL STACK  00 LINK 0000
1176                                                           X     OTHER ITEMS ARE IN TWO WORD FORMAT:
1177                                                           X           LINK     INFO1  LINK   1111112222
1178                                                           X           LINK+1       I N F O 2 1111111111
1179                                                           X     ZERO LINK INDICATES THE END. THE POOL IS
1180                                                           X     KEPT BETWEEN LOCATIONS MEML1 AND MEMU1
1181                                                           X     THE SYMBOL TABLE AND STACKS WORK DOWN FROM
1182                                                           X     MEMU1, DIMENSIONS AND EQUIVALENCE ENTRIES
1183                                                           X     ARE INSERTED UP FROM MEML1.
1184                                                           X     IN THIS SECTION, ENTRANCE L1 IS CALLED 'INS'
1185                                                           X     AND IT IS FOR INSERTING ITEMS, WHILE ENTRANCE
1186                                                           X     L10 IS FOR DELETING ITEMS FROM STACKS AND IT
1187                                                           X     IS CALLED 'REM'.
1188  4876  888 0 31  4929  4929   INS99  CLL                        L1. IS AVAIL EMPTY
1189  4929  888 0 60  4631  4233          STA   TEMP1                NO: IF THE AVAIL STACK IS NOT EMPTY,REMOVE AN
1190  4233  888 0 25  4635  4237          LDA   AVAIL                    ITEM AND GO TO#L4.
1191  4237  888 0 82  4440  4640          TEQ                1F      YES:
1192  4440  888 0 25  4292  4644          LDA   MEMU                 L2. MEML:MEMU
- 1193  4644  888 0 75  4095  4648          SUB   KON2                 GEQ IF THERE IS NO ROOM FOR ANOTHER ITEM, GIVE
1194  4648  888 0 30  4600  4352          LDL   MEML                     THE I'M FULL ERROR#ALARM.
1195  4352  888 0 87  4255  4455          TGR                2F      LSS:
1196  4255  888 0 60  4292  4844          STA   MEMU                 L3. RESERVE TWO
1197  4844  888 0 77  4844  4647          ATL                3F          DECREASE MEMU BY 2, WE WILL USE THESE TWO
1198  4455  888 0 25  4507  4259   2      LDA# 01020         00000   G   I'M FULL
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1199  4259  888 0 30  4912  4514                LDL          ALARM       LOCATIONS FOR THE NEW ITEM.
1200  4912  888 0 67  1212  4455                HLT   1212   2B
1201  4640  888 0 77  4640  4243  1             ATL                    L4. INSERT ITEM
1202  4243  888 0 70  4295  000A                ADD          RA            PUT THE NEW ITEM INTO THE MEMORY, FIX UP
1203  4295  888 0 25  0000  4552                LDA   0000                 LINKS PROPERLY. #EXIT.
1204  4552  888 0 60  4635  4647                STA   AVAIL  3F
1205  4647  888 0 25  4249  4601  3             LDA   1F               CODING DETAILS FOR INS:
1206  4601  888 0 70  000B  4306                ADD   RL                  RB1 CONTAINS STACK HEAD LOCATION
1207  4306  888 0 32  0600  4715                SHR   0600                RL  CONTAINS EXIT INSTRUCTION
1208  4715  888 0 35  4667  4869                ERS   X0C                 RA  CONTAINS INFO2,RX CONTAINS INFO1
1209  4869  888 0 24  0000  4752                BUF1  0000                AT EXIT, RL IS NEW CONTENTS OF STACK HEAD.
1210  4752  888 0 32  0400  000C                SHR   0400    RX      G   ASSUMPTION MADE THAT RX WAS POSITIVE
1211  4249  888 0 60  0000  4952  1             STA   0000                RX IS INFO2.
1212  4952  888 0 05  4631  4433                LDX   TEMP1
1213  4433  888 0 25  0008  4437                LDA   RL
1214  4437  888 0 70  4439  4492                ADD   1F
1215  4492  888 0 54  0000  000A                STL1  0000    RA
1216  4439  888 0 65  0001  4464  1             STX   0001    EXIT1
1217  4229  888 0 50  4464  4616  REM           STL   EXIT1            L10.IS STACK EMPTY
1218  4616  888 0 34  0000  4653                LDL1  0000             YES:IF STACK HAS NO ITEMS,GO TO#EXIT2.
1219  4653  888 0 26  4506  4506                CLA                    NO:
1220  4506  888 0 82  000C  4459                TEQ   RX
1221  4459  888 0 05  4635  4637                LDX   AVAIL            L11.REMOVE ITEM
1222  4637  888 0 06  0000  4441                IIR1  0000                REMOVE TOP ITEM OF STACK
1223  4441  888 0 20  4443  4495                BUF   1F
1224  4495  888 0 60  4631  4633                STA   TEMP1
1225  4633  888 0 25  0008  4087                LDA   RL
1226  4087  888 0 50  4635  4287                STL   AVAIL            L12.MAKE LOCATION AVAIL
1227  4287  888 0 30  4639  4641                LDL          BR            PUT THE LOCATION JUST FREED ONTO THE AVAIL
1228  4639  888 0 77  4639  4692                ATL                        STACK. #EXIT1.
1229  4692  888 0 37  0400  4449                SHL   0400               CODING DETAILS FOR REM:
1230  4449  888 0 35  0043  4631                ERS   XM      TEMP1        RB1 IS THE STACK HEAD LOCATION,
1231  4443  888 0 60  0000  4853  1             STA   0000                RX IS THE EMPTY EXIT (EXIT2),
1232  4853  888 0 69  0000  4464                STX1  0000    EXIT1       RL IS THE ORDINARY EXIT1.
1233  4833  888 1 29  0000  4303  BR2           LDA3  0000    BR1         OUTPUT: RB1 IS THE LOCATION, RL IS INFO1.
1234  4303  888 0 35  0043  4641  BR1           ERS   XM      BR          INFO2 IS STILL IN MEMORY.
1235  4641  888 0 20  4643  000A  BR            BUF          RA
1236  4643  888 0 08  0000  4848                LIR1  0000
1237  4848  888 0 29  0000  000B                LDA1  0000    RL
1238  4205  888 0 30  000C  4659  KIND          LDL   RX                 G   KIND SUBROUTINE IS 5-WAY BRANCH TO
1239  4659  888 0 25  4362  4714                LDA   LITB               G   RB1   IF CHARACTER IS BLANK
1240  4714  888 0 88  0000  4518                TEQ1  0000               G   RB1+1 IF SPECIAL CHARACTER
1241  4518  888 0 25  4628  4280                LDA   MZERO              G   RB1+2 NUMERIC 999990000N
1242  4280  888 0 70  000C  4285                ADD   RX      1F         G   RB1+3 ALPHABETIC
1243  4285  888 0 82  4438  4638  1             TEQ          1F         G   RB1+4 DECIMAL POINT
1244  4438  888 0 30  4290  4892                LDL#  00003   00001
1245  4892  888 0 88  0001  4296                TEQ1  0001
1246  4296  888 0 30  4298  4250                LDL   KON30
1247  4250  888 0 88  0001  4854                TEQ1  0001
1248  4854  888 0 70  4706  4309                ADD          -KIND
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1249  4706  888 0 99  9990  0000                 CON  99999     00000
1250  4309  888 0 04  0002  0002  -KIND          JMP1  0002
1251  4310  888 0 04  0003  0003  &KIND          JMP1  0003
1252  4638  888 0 25  4490  4342  1              LDA# 00001     0000A
1253  4342  888 0 88  0004  4496                 TEQ1  0004
1254  4496  888 0 04  0001  0001                 JMP1  0001
1255  4655  888 0 50  4464  4266  NOMLZ          STL  EXIT1                C.  CONSTANT SCANNER
1256  4266  888 0 25  4209  4562                 LDA  TEMP2                G   NORMALIZE IS USED TO CONVERT TO
1257  4562  888 0 31  4915  4915                 CLL                       G   FLOATING POINT FORM
1258  4915  888 0 82  4464  4718                 TEQ  EXIT1
1259  4718  888 0 06  4271  4271                 CLX
1260  4271  888 0 08  0000  4474                 LIR1  0000     1F
1261  4474  888 0 32  0100  4828  1              SHR  0100
1262  4828  888 0 82  4281  4481                 TEQ  1F
1263  4481  888 0 32  0100  4485                 SHR  0100
1264  4485  888 0 82  4838  4288                 TEQ  2F
1265  4288  888 0 60  4209  4762                 STA  TEMP2
1266  4762  888 0 0G  0002  4466                 IIR1  0002
1267  4466  888 0 25  4209  4474                 LDA  TEMP2     1B
1268  4281  888 0 0G  0050  4685  1              IIR1  0050     3F
1269  4838  888 0 0G  0051  4685  2              IIR1  0051     3F
1270  4685  888 0 75  4420  4523  3              SUB  TEMP3
1271  4523  888 0 32  0200  4078                 SHR  0200
1272  4078  888 0 37  0600  4487                 SHL  0600
1273  4487  888 0 20  000C  4464                 BUF  RX        EXIT1
1274  4064  888 0 05  4209  4962  E0014          LDX  TEMP2     2F         C1. SET TYPE INTEGER
1275  4962  888 0 26  4365  4365  2              CLA  1F                       INITIALIZE  N  TO THE NUMBER JUST SCANNED,
1276                                                                          SET TYPE INTEGER. GO TO#C3.
1277  4052  888 0 07  0001  4365  E0002          IIR  0001      1F         C2. SET FLOATING TYPE.
1278  4054  888 0 06  4962  4962  E0004          CLX  2B                       SET  N TO FLOATING POINT TYPE.
1279  4365  888 0 60  4412  4914  1              STA  TYPE
1280  4914  888 0 65  4209  4263                 STX  TEMP2                C3. NEXT CHARACTER
1281  4263  888 0 26  4666  4666                 CLA  1F                       GET THE NEXT NON-BLANK CHARACTER FROM THE
1282  4666  888 0 60  4420  4060  1              STA  TEMP3     E0010          CARD (ROUTINE N).
1283  4060  888 0 30  4463  4202  E0010          LDL            NXTCH
1284  4463  888 0 08  4060  4205                 LIR1 E0010     KIND       C4. WHAT KIND
1285  4062  888 0 25  4209  4663  E0012          LDA  TEMP2                NUM:IF CHARACTER IS NUMERIC,SET N TO 10N+CHAR,
1286  4663  888 0 37  0100  4317                 SHL   0100                    GO TO#C3.
1287  4317  888 0 20  000C  4471                 BUF  RX                   .:  IF A DECIMAL POINT, GO TO#C2.
1288  4471  888 0 60  4209  4863                 STA  TEMP2                ALF:IF ALPHABETIC, GO TO#C5.
1289  4863  888 0 07  0001  4316                 IIR   0001                OTH:IF SPECIAL CHARACTER,PUT IT BACK ON THE CARD,
1290  4316  888 0 70  4420  4666                 ADD  TEMP3     1B             AND GO TO#C6.
1291  4063  888 0 60  4631  4283  E0013          STA  TEMP1                C5. E H OR M
1292  4283  888 0 25  4402  4304                 LDA  LEOFF                    IN A STATEMENT LABEL CONTEXT WE GO IMMEDIATEL
1293  4304  888 0 30  4206  4508                 LDL  LESW                 E:  TO C6,  OTHERWISE WE GO TO#C10 FOR AN E,
1294  4508  888 0 82  4313  4061                 TEQ            E0011      M:  TO #C20 FOR AN M,
1295  4313  888 0 25  4631  4483                 LDA  TEMP1                H:  TO#C30 FOR AN H,
1296  4483  888 0 30  4424  4326                 LDL  LIT5                 OTH:
1297  4326  888 0 82  4179  4379                 TEQ  EROUT                    OTHERWISE IT IS THE END OF THE CONSTANT
1298  4379  888 0 30  4413  4565                 LDL  LIT8                     (PROBABLY SYNTACTICALLY INCORRECT) AND WE GO
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1299  4565  888 0 82  4918  4168                TEQ  HROUT                    TO STEP C6.
1300  4168  888 0 30  4470  4722                LDL# 00001       00004
1301  4722  888 0 82  4525  4061                TEQ  MROUT       E0011
1302  4061  888 0 30  4513  4407  E0011        LDL  5F          SETNS     C6. ADJUST FOR TYPE
1303  4513  888 0 25  4412  4364  5            LDA  TYPE                      IF FLOATING POINT TYPE OCCURRED, CONVERT N TO
1304  4364  888 0 31  4517  4517                CLL                            FLOATING POINT FORMAT, ELSE SET N TO 1000
1305                                                                       X   TIMES N.
1306  4517  888 0 82  4670  4320                TEQ                 1F
1307  4670  888 0 30  4206  4655                LDL  LESW        NOMLZ
1308  4320  888 0 25  4209  4713  1            LDA  TEMP2
1309  4713  888 0 37  0400  4206                SHL   0400       LESW
1310  4206  888 0 30  4708  4260  LESW         LDL  1F          CONST     C7. IS IT A LABEL
1311  4402  888 0 30  4708  4260  LEOFF        LDL  1F          CONST     YES:IF#LABEL CONTEXT,ENTER SPECIAL ROUTINE FOR
1312  4708  888 0 50  4420  4922  1            STL  TEMP3                     THIS CASE,DEPENDING ON THE SETTING OF THE
1313  4922  888 0 25  4209  4913                LDA  TEMP2                     LABEL SWITCH. THE LABEL SWITCH IS AUTOMAT-
1314  4913  888 0 31  4516  4516                CLL                       NO:        ICALLY SET OFF EVERY TIME GEN IS
1315  4516  888 0 82  4319  4519                TEQ  1F                        ENTERED; GEN WILL SET IT WHENEVER A LABEL MAY
1316  4519  888 0 25  4412  4564                LDA  TYPE        2F            BE EXPECTED.
1317  4319  888 0 07  0002  4564  1            IIR   0002       2F        C8. LOOK UP IN TABLE
1318  4564  888 0 37  0400  4671  2            SHL   0400                     ACTIVATE ROUTINE T FOR THIS CONSTANT, THEN GO
1319  4671  888 0 20  4723  4725                BUF  KON.5                     TO#S10 TO SEND A CONSTANT CODE TO GEN.
1320  4725  888 0 60  4412  4472                STA  TYPE        SEND1
1321  4179  888 0 25  4412  4764  EROUT        LDA  TYPE                  C10.NORMALIZE
1322  4764  888 0 87  4717  4917                TGR                 1F         INSERT A DECIMAL POINT IF NONE PRECEDED,
1323  4717  888 0 30  4064  4407                LDL  E0014       SETNS         E.G. 2E5.
1324  4917  888 0 30  4719  4655  1            LDL                 NOMLZ
1325  4719  888 0 60  4209  4065                STA  TEMP2       E0015
1326  4065  888 0 30  4167  4202  E0015        LDL                 NXTCH     C11.NEXT CHARACTER
1327  4167  888 0 08  4065  4205                LIR1 E0015       KIND           ACTIVATE ROUTINE N FOR THE NEXT CHARACTER.
1328  4066  888 0 25  4298  4450  E0016        LDA  KON30                 C12.WHAT KIND
1329  4450  888 0 82  4503  4703                TEQ  6F                        ;IF BLANK, RETURN TO#C11.
1330  4703  888 0 25  4305  4707                LDA  LITA                  N   ;IF NUMERIC,PUT BACK ON CARD,RECORD + SIGN.
1331  4707  888 0 82  4460  4660                TEQ  7F                        TO#C13.
1332  4660  888 0 25  4363  4765                LDA# 00001       0000C     +- ;IF PLUS OR MINUS, RECORD THE SIGN. TO#C13.
1333  4765  888 0 82  4503  4069                TEQ  6F          E0019     OTH:OTHERWISE GIVE THE BAD CONSTANT#ALARM.
1334  4067  888 0 30  4503  4407  E0017        LDL  6F          SETNS
1335  4069  888 0 30  4871  4407  E0019        LDL  CALRM       SETNS
1336  4068  888 0 30  4871  4407  E0018        LDL  CALRM       SETNS
1337  4871  888 0 30  4513  4965  CALRM        LDL  5B
1338  4965  888 0 25  4367  4514                LDA              ALARM
1339  4367  888 0 03  3000  0000                CON  03300       00000     G   BAD CONSTANT
1340  4460  888 0 25  4563  4503  7            LDA  2F          6F
1341  4503  888 0 60  4420  4172  6            STA  TEMP3
1342  4172  888 0 26  4925  4925                CLA  1F
1343  4925  888 0 60  4624  4070  1            STA  TEMP4       E0020
1344  4070  888 0 30  4372  4202  E0020        LDL                 NXTCH     C13.NEXT NUMBERS
1345  4372  888 0 08  4070  4205                LIR1 E0020       KIND           CONTINUE ACTIVATING ROUTINE N UNTIL A NON-BLA
1346  4074  888 0 30  4526  4407  E0024        LDL  9F          SETNS          NK, NON-NUMERIC CHARACTER APPEARS.
1347  4073  888 0 30  4526  4407  E0023        LDL  9F          SETNS
1348  4071  888 0 30  4526  4407  E0021        LDL  9F          SETNS
```

```
1349  4072  BBB 0 25  4624  4563        E0022   LDA  TEMP4      2F
1350  4563  BBB 1 37  0100  4368        2       SHL2  0100
1351  4368  BBB 0 20  000C  4925                BUF  RX         1B
1352  4526  BBB 0 25  4420  4572        9       LDA  TEMP3
1353  4572  BBB 0 36  4175  4175                CAA
1354  4175  BBB 0 20  4624  4726                BUF  TEMP4
1355  4726  BBB 0 37  0800  4687                SHL  0800
1356  4687  BBB 0 70  4209  4963                ADD  TEMP2      -ERUT
1357  4964  BBB 0 60  4209  4871        &ERUT   STA  TEMP2      CALRM
1358  4963  BBB 0 31  4716  4716        -ERUT   CLL
1359  4716  BBB 0 87  4206  4919                TGR  LESW
1360  4919  BBB 0 25  4209  4763                LDA  TEMP2
1361  4763  BBB 0 82  4206  4871                TEQ  LESW       CALRM
1362  4260  BBB 0 60  4209  4916        CONST   STA  TEMP2
1363  4916  BBB 0 50  4568  4520                STL  EXIT2
1364  4520  BBB 0 05  4623  4375                LDX  BIG05
1365  4375  BBB 0 26  4278  4278                CLA
1366  4278  BBB 0 30  4480  4729                LDL              SRCH
1367  4480  BBB 0 25  000B  4634                LDA  RL
1368  4634  BBB 0 20  4436  000A                BUF              RA
1369  4436  BBB 0 0B  0000  4568                LIR1  0000       EXIT2
1370  4525  BBB 0 26  4478  4478        MROUT   CLA  1F
1371  4478  BBB 0 60  4420  4772        1       STA  TEMP3
1372  4772  BBB 0 25  4209  4366                LDA  TEMP2
1373  4366  BBB 0 31  4169  4169                CLL
1374  4169  BBB 0 82  4972  4923                TEQ  9F
1375  4923  BBB 0 75  4016  4369                SUB  LIT1
1376  4369  BBB 0 60  4209  4566                STA  TEMP2
1377  4566  BBB 0 30  4768  4202                LDL              NXTCH
1378  4768  BBB 0 25  000C  4173                LDA  RX
1379  4173  BBB 0 32  0500  4681                SHR  0500
1380  4681  BBB 0 70  000A  4636                ADD  RA
1381  4636  BBB 0 70  000A  4291                ADD  RA
1382  4291  BBB 0 37  0500  4649                SHL  0500
1383  4649  BBB 0 20  000C  4903                BUF  RX
1384  4903  BBB 0 37  0400  4510                SHL  0400
1385  4510  BBB 0 05  4420  4373                LDX  TEMP3
1386  4373  BBB 0 32  0900  4478                SHR  0900       1B
1387  4918  BBB 0 30  4972  4674        HROUT   LDL  9F         HOLSB
1388  4674  BBB 0 50  4926  4678        HOLSB   STL  EXIT3
1389  4678  BBB 0 25  4675  4477                LDA  BKOF
1390  4477  BBB 0 60  4311  4766                STA  BKSW
1391  4766  BBB 0 06  4569  4569                CLX
1392  4569  BBB 0 65  4420  4573                STX  TEMP3
1393  4573  BBB 0 25  4209  4966                LDA  TEMP2      1F
1394  4966  BBB 0 31  4769  4769        1       CLL
1395  4769  BBB 0 82  4773  4973                TEQ  8F
1396  4973  BBB 0 75  4016  4969                SUB  LIT1
1397  4969  BBB 0 60  4624  4176                STA  TEMP4
1398  4176  BBB 0 30  4878  4202                LDL  2F         NXTCH
```

C14.ADJUST EXPONENT
ADD THE EXPONENT TO THE FLOATING POINT
BAD:CONSTANT, IF OVERFLOW OR UNDERFLOW OCCURS;
GIVE THE BAD CONSTANTNALARM.
OK: OTHERWISE RETURN TO#C7.

C20.GET N CHARACTERS
GET NEXT N CHARACTERS FROM CARD INCLUDING
BLANKS AND BUILD MACHINE CODE CONSTANT. GO
TO#C32.

C30.GET N CHARACTERS
SET HOLLERITH SWITCH IN ROUTINE N: THIS
SWITCH SIGNALS THAT ROUTINE TO TRANSMIT
CHARACTERS IN CARD CODE ON 90-COLUMN SYSTEMS
AND ALSO TO SUPPRESS A SPECIAL HIGH-SPEED
SKIP OVER BLANK COLUMNS WHICH IT USUALLY
HAS. GET THE NEXT N CHARACTERS FROM THE
CARD, AND BUILD AN ALPHA CODE CONSTANT
IN CARD CODE.

```
1399    4878  BBB 0 25  4420  4874      2       LDA  TEMP3
1400    4874  BBB 0 37  0100  4328              SHL   0100
1401    4328  BBB 0 20  000C  4682              BUF  RX
1402    4682  BBB 0 60  4420  4324              STA  TEMP3
1403    4324  BBB 0 25  4624  4966              LDA  TEMP4      1B
1404    4773  BBB 0 25  4209  4567      8       LDA  TEMP2                  C31.ZERO FILL
1405    4567  BBB 0 30  4720  4524              LDL  LIT4                       IF N IS LESS THAN 5, ADD ZEROES TO FILL THE
1406    4524  BBB 0 87  4677  4327              TGR  8F                         CONSTANT. RESTORE THE HOLLERITH SWITCH
1407    4327  BBB 0 70  4016  4920              ADD  LIT1                       TO NORMAL.  IF N IS MORE THAN 5, CRAZY
1408    4920  BBB 0 60  4209  4767              STA  TEMP2                      CONSTANTS ARE GENERATED
1409    4767  BBB 0 06  4878  4878              CLX  2B
1410    4677  BBB 0 25  4253  4505      8       LDA  BKON
1411    4505  BBB 0 60  4311  4926              STA  BKSW       EXIT3
1412    4972  BBB 0 07  0002  4575      9       IIR   0002                  C32.TYPE UNSPECIFIED.
1413    4575  BBB 0 60  4412  4967              STA  TYPE                       SET THE TYPE OF THIS CONSTANT TO UNSPECIFIED.
1414    4967  BBB 0 25  4420  4206              LDA  TEMP3      LESW            GO TO#C7.
1415    4135  BBB 0 25  1064  4968      SIGN'   LDA  $                   Q.  SPECIAL SCANNING ROUTINES
1416                                                                    X   ENTRANCE TO Q1 OCCURS WHEN THE END OF CARD
1417                                                                    X   ( WHICH IS DETECTED BY AN APOSTROPHE INSERTED
1418                                                                    X   BY ROUTINE N) IS SENSED.  ENTRANCE Q10 IS
1419                                                                    X   USED TO DIVERT NORMAL CONTROL OF SCAN, IN
1420                                                                    X   ORDER TO EMIT A STRING OF INSERTED ITEMS
1421                                                                    X   BEFORE RESUMING ORDINARY SCANNING.
1422    4968  BBB 0 30  4170  4028              LDL  DOESW      GEN     Q1. SEND SEMICOLON
1423                                                                    X   SEND SEMICOLON TO GEN ROUTINE, INDICATING
1424                                                                    X   END OF THE STATEMENT.
1425    4170  BBB 0 25  0233  4885      DOESW   LDA  COL15      3F      Q2. END OF DO RANGE
1426    4376  BBB 0 25  0233  4885      DOEOF   LDA  COL15      3F      YES:IF THE CARD JUST COMPLETED IS THE END OF A
1427                                                                    X   DO RANGE, GO TO#D40.
1428                                                                    NO:
1429                                              OFF   9000
1430          *** OFF **                  3       LDL  805                Q3. ANY LABEL
1431          *** OFF **                          TEQ  SCAN1              NO: IF COLS 1-5 OF THE NEXT CARD ARE BLANK,TO#S1.
1432          *** OFF **                          LDL  4F                 #:  IF COL 1 IS NUMBER SIGN GO TO SPECIAL #RESERV
1433          *** OFF **                          TEQ  MEMLL      1F          WORD ENTERING PROCEDURE.
1434          *** OFF **                  1       LDL  3F         2F      YES:
1435          *** OFF **                  2       STL  SHFT               Q4. SCAN FROM COL 1
1436          *** OFF **                          LDA  LABEL      SCAN9       SET TO SCAN THIS CARD AT COLUMN 1 RATHER THAN
1437          *** OFF **                  3       BUF             STAN        COLUMN 6, AND SET THE LABEL SWITCH (C7) TO
1438          *** OFF **                          NUM  00000       0000       JUMP TO THE CHECKING ROUTINE MENTIONED IN THE
1439          *** OFF **                  4       ALF  #                      COMMENT JUST BEFORE STEP D40. THEN RETURN#S1.
1440          *** OFF **                          OFF   9001
1441          *** OFF **                          OFF   9002
1442          *** OFF **                          OFF   8002
1443          *** OFF **                          OFF   8001
1444                                              ON    9000
1445    4885  BBB 0 31  4488  4488      3       CLL
1446    4488  BBB 0 82  4050  4491              TEQ  SCAN1              Q3. ANY LABEL
1447    4491  BBB 0 30  4843  4695              LDL# 10000      80000   NO: IF COLS 1-5 OF THE NEXT CARD ARE BLANK,TO#S1.
1448    4695  BBB 0 82  3100  4498              TEQ  MEMLL              #:  IF COL 1 IS NUMB SIGN GO TO SPECIAL#RESERVED
                                                                            WORD ENTERING PROCEDURE.
```

```
1449  4498  BBB 0 30  4650  4353            LDL  3F                    YES:
1450  4353  BBB 0 50  4257  4859            STL  SHFT                  Q4. SCAN FROM COL 1
1451  4859  BBB 0 25  4370  4264            LDA  LABEL      SCAN9          SET TO SCAN THIS CARD AT COLUMN 1 RATHER THAN
- 1452  4650  BBB 0 35  4553  4254  3         ERS                 STAN       COLUMN 7.AND SET THE LABEL SWTICH (C7) TO
1453  4553  BBB 0 HH  HHH0  HHHH            CON  HHHHH     0HHHH          JUMP TO THE CHECKING ROUTINE MENTIONED IN THE
1454                                                                   X    COMMENT JUST BEFORE STEP D40.  THEN
1455                                                                   X    RETURN TO#S1.
1456                                        ON    9001
1457                                        ON    9002
1458                                        ON    8002
1459                                        ON    8001
1460  4710  BBB 0 05  4030  4882  DIVT2     LDX  LAST                  Q10.ADJUST CO-ROUTINE LINKS.
1461  4882  BBB 0 65  4834  4086            STX  DSAVE      DIVT1          STORE CURRENT STARTING PLACE FOR SCAN CO-RTNE
1462  4086  BBB 0 05  4042  4294  DIVT1     LDX  NORM                      IN EXIT OF THIS DIVRT SUBROUTINE. WE WILL
1463  4294  BBB 0 65  4246  4698            STX  GENX       DIVRT          COME BACK TO THIS AFTER ALL SPECIAL ITEMS
1464  4698  BBB 0 60  4300  4753  DIVRT     STA  DIVBS                     HAVE BEEN INSERT IN THE PSEUDOCODE.
1465  4753  BBB 0 25  4248  4500            LDA  SCANX
1466  4500  BBB 0 30  4953  4705            LDL  2F                    Q11.NEXT ITEM.
1467  4705  BBB 0 82  4908  4358            TEQ  1F                    ZEROLOOK AT THE NEXT ITEM TAKEN FROM THE INSER-
1468  4358  BBB 0 60  4910  4908            STA  SCNXX      1F             TION TABLE. IF IT IS ZERO, WE ARE DONE
1469  4908  BBB 0 25  4300  4504  1         LDA  DIVBS      3F             INSERTING AND SO WE#EXIT TO RESTART THE SCAN
1470  4504  BBB 0 70  4906  000A  3         ADD             RA     OK              CO-ROUTINE.
1471  4906  BBB 0 25  0000  4704            LDA   0000                 Q12.SEND TO GEN.
1472  4704  BBB 0 31  4907  4907            CLL                            SEND ITEM TO GEN.THEN RETURN TO#Q11.
1473  4907  BBB 0 82  4360  4560            TEQ  1F                    CODING DETAILS: DIVT2 IS USED TO RE-INSERT THE
1474  4560  BBB 0 30  4953  4028            LDL  2F         GEN            PREVIOUSLY SCANNED ITEM AT THE END OF THE
1475  4953  BBB 0 07  0001  4356  2         IIR   0001                     OTHER INSERTS. DIVT1 IS USED TO RESET GEN
1476  4356  BBB 0 70  4300  4904            ADD  DIVBS                     TO ENTER AT G1. DIVRT IS THE NORMAL ENTRY.
1477  4904  BBB 0 60  4300  4504            STA  DIVBS      3B             REGISTER A CONTAINS THE STARTING T-TABLE
1478  4360  BBB 0 25  4834  4286  1         LDA  DSAVE                     ENTRY. THIS ROUTINE IS ENTERED FROM GEN.
1479  4286  BBB 0 82  4910  4839            TEQ  SCNXX
1480  4839  BBB 0 50  4834  4486            STL  DSAVE
1481  4486  BBB 0 30  4910  4028            LDL  SCNXX      GEN
1482
1483                                        I.  ASSEMBLER STRUCTURE
1484                                        TABLE OF CONTENTS
1485                                            THIS SECTION IS A COMPLEX OF SUBROUTINES FOR
1486                                        X   ASSEMBLING THE MACHINE LANGUAGE INSTRUCTIONS.
1487                                        X   THE NAMES OF THESE VARIOUS LEVELS AND THEIR
1488                                        X   FUNCTIONS ARE
1489                                        X   I1.  ASM1  MACRO ASSEMBLER ... ASSEMBLES
1490                                        X              1 TO 5 INSTRUCTIONS AND/OR
1491                                        X              PSEUDO-INSTRUCTIONS.
1492                                        X   I25. ASM2  ASSEMBLES ENCODED INSTRUCTIONS,
1493                                        X              FIXING UP THE ADDRESSES OF OPERAND
1494                                        X   I30. ASM25  HALF ASMBLER,LIKE ASM2 EXCEPT IT
1495                                        X        DEALS WITH ONE ADDRESS  M,C  ONLY.
1496                                        X   I35. ASM28 SPECIAL ASSEMBLER FOR ADDRESSES OF
1497                                        X        SIMPLE VARIABLES AND CONSTANTS.
1498                                        X   I50. ASIGN  FINDS ADDRESSES OF OPERANDS
                                            X   I60. LSW   FINDS ADDRESSES OF STATEMENT LABEL
```

```
1499
1500
1501
1502
1503
1504
1505
1506  4556  888 0 05  4016  4570  ASM32  LDX  LIT1  ASM3
1507  4357  888 0 05  4509  4570  ASM33  LDX        ASM3
1508  4509  888 0 01  0000  0001         CON  01000 00001
1509  4709  888 0 65  4770  4357  ASM34  STX  COMT  ASM33
1510  4760  888 0 65  4770  4556  ASM35  STX  COMT  ASM32
1511  4970  888 0 35  4724  4576  ASM36  ERS  XC
1512  4576  888 0 20  4528  4680         BUF  LIR1
1513  4680  888 0 05  4332  4570         LDX        ASM3
1514  4332  888 0 00  5010  0010         CON  00501 00010
1515  4521  888 0 05  4924  4570  ASM37  LDX        ASM3
1516  4924  888 0 00  0010  0001         CON  00001 00001
1517  4570  888 0 65  4624  4776  ASM3   STX  TEMP4 ASM31
1518  4776  888 0 60  4420  4174  ASM31  STA  TEMP3
1519  4174  888 0 50  4926  4728         STL  EXIT3
1520  4728  888 0 25  4880  4532         LDA  NXLOC
1521  4532  888 0 31  4335  4335         CLL
1522  4335  888 0 82  4688  4888         TEQ  2F.
1523  4888  888 0 50  4880  4732         STL  NXLOC 3F
1524  4688  888 0 05  4732  4084  2      LDX  3F    FARNL
1525  4732  888 0 30  4284  4686  3      LDL        FILUP
1526  4284  888 0 25  000B  4338         LDA  RL
1527  4338  888 0 32  0800  4849         SHR   0800
1528  4849  888 0 37  0500  4557         SHL   0500
1529  4557  888 0 32  0600  4721         SHR   0600
1530  4721  888 0 25  4374  4976         LDA  OLDLC
1531  4976  888 0 20  4928  4330         BUF  RWORD
1532  4330  888 0 65  4374  4527         STX  OLDLC
1533  4527  888 0 05  4579  4881         LDX  IWORD
1534  4881  888 0 30  4683  4535         LDL        ASM4
1535  4683  888 0 05  4624  4727         LDX  TEMP4
1536  4727  888 0 65  4928  4530         STX  RWORD
1537  4530  888 0 05  4420  4574         LDX  TEMP3
1538  4574  888 0 65  4579  4926         STX  IWORD EXIT3
1539  4289  888 0 65  4568  4921  ASM43  STX  EXIT2 ASM44
1540  4921  888 0 60  4209  4171  ASM44  STA  TEMP2
1541  4171  888 0 05  4774  4927         LDX        INCUQ
1542  4774  888 0 25  000B  4178         LDA  RL
1543  4178  888 0 31  4331  4331         CLL  1F
1544  4494  888 0 65  4568  4331  ASM42  STX  EXIT2 1F
1545  4331  888 0 32  0400  4538  1      SHR   0400
1546  4538  888 0 35  4724  4177         ERS  XC
1547  4177  888 0 20  000B  4531         BUF  RL
1548  4531  888 0 35  4667  4371         ERS  XOC
```

```
X   I70. CASIN  FINDS ADDRESSES OF CONSTANTS.
X   I80. ASM3     ASSEMBLES INSTRUCTIONS AND
X              FIXES UP REFERENCES TO 'NEXT INST.'
X   I90. ASM4    PROCESSES ASSEMBLED INSTRUCTIONS
X            AND LOCATIONS, IN OR OUT OF SEQUENCE,
X            AND PERHAPS LISTS THEM.
X   I95. ASM5  PUT ONE ITEM ON OUTPUT CARD.
I.  I80. ASSEMBLER 3
    THIS SUBROUTINE ASSMELBES ABSOLUTE INSTRUC-
    TIONS AND FIXES UP REFERENCES TO 'NEXT'.
    A ONE-CYCLE DELAY IS KEPT, AN INSTRUCTION IS
    NO PUT OUT UNTIL THE NEXT INSTRUCTION COMES
    ALONG.

I80.IS NXLOC SET
    IF NO PARTICULAR LOCATION FOR THE CURRENT
    INSTRUCTION HAS BEEN CHOSEN, CHOOSE THE NEXT
    LOCATION IN THE INTERLACE SEQUENCE.

I81.FILL PREV INST
    FILL BLANK ADDRESSES IN PREVIOUS INSTRUCTION,
    IF ANY, WITH THE LOCATION OF THIS ONE.

I82.ASSEMBLER 4.
    ACTIVATE ROUTINE I91 TO OUTPUT THE PRECEDING
    INSTRUCTION. #EXIT.
CODING DETAILS: RX IS ORRO5OOOFF  WHERE RR ARE
    RELOCATION DIGITS FOR M AND C, S IS SIGN, AND
    FF ARE 0 OR 1 FOR NON-BLANK OR BLANK ADDRESS,
    RESPECTIVELY.  RA IS THE INSTRUCTION, RL IS
    THE EXIT. ASM31-ASM37 ARE SPECIAL ENTRANCES
    FOR THE MOST COMMON CASES IN SETTING RX.

I.  I90. ASSEMBLER 4.
    THIS SUBROUTINE PROCESSES ASSEMBLED INSTRUC-
    TIONS AND LOCATIONS. ENTRY I90 IS USED FOR
    OUT-OF-SEQUENCE LINES, I91 FOR THE PROGRAM
    SEQUENCE.
I90.SET **********
    SAVE COMMENT RESERVED FOR NEXT INSTRUCTION IN
    PROGRAM SEQUENCE, AND INSERT THE COMMENT
    **********.
```

```
1549  4371  888 0 20  4974  4377                BUF  BIG10     1F
1550  4700  888 0 50  4568  4377   ASM41        STL  EXIT2     1F
1551  4377  888 0 05  4779  4731   1            LDX  CHOLD
1552  4731  888 0 65  4770  4775                STX  COMT
1553  4775  888 0 05  4577  4979                LDX  810
1554  4979  888 0 65  0503  4905                STX  P0103
1555  4905  888 0 65  0508  4960                STX  P010_     1F
1556  4536  888 0 65  4209  4571   ASM4         SIX  TEMP2
1557  4571  888 0 50  4568  4960                STL  EXIT2     1F          I91.PRINT, MAYBE
1558  4960  888 0 60  4631  4883   1            STA  TEMP1     PRTSW           IF LIST MODE IS ON, PRINT THE ASSEMBLED LINE
1559                                            OFF  9000                      AND THE COMMENT.
1560        *** OFF **            PRON         LDX  TEMP2
1561        *** OFF **                         LDL  PROF      1F
1562        *** OFF **            PRNT         SHR  0F00      1F
1563        *** OFF **            1            STL  -PR2
1564        *** OFF **                         STX  P0134
1565        *** OFF **                         BUF# 00080     80000
1566        *** OFF **                         STA  P0165
1567        *** OFF **                         OFF  8001
1568        *** OFF **                         OFF  8002
1569        *** OFF **                         OFF  9002
1570        *** OFF **                         OFF  9001
1571                                           ON   9000
1572  4975  888 0 05  0503  4355   PRON         LDX  P0103
1573  4355  888 0 25  0508  4771                LDA  P0108
1574  4771  888 0 35  0009  4971                ERS  H5
1575  4971  888 0 32  0500  4730                SHR  0500
1576  4730  888 0 37  0500  4738                SHL  0500
1577  4738  888 0 20  000C  4542                BUF  RX
1578  4542  888 0 17  4542  4895                MTC
1579  4895  888 0 60  0503  4555                STA  P0103
1580  4555  888 0 65  0508  4777                STX  P0108
1581  4777  888 0 25  4631  4333                LDA  TEMP1
1582  4333  888 0 30  4735  4887                LDL  PROF      1F
1583  4533  888 0 60  4209  4977   PRNT         STA  TEMP2
1584  4977  888 0 25  000C  4887                LDA  RX        1F
1585  4887  888 0 50  4689  4691   1            STL  -PR2
1586  4691  888 0 17  4691  4694                MTC
1587  4694  888 0 32  0F00  4757                SHR  0F00
1588  4757  888 0 35  4909  4378                ERS# HHHOH     OHHHH
1589  4378  888 0 65  0565  4578                STX  P0165
1590  4578  888 0 60  0570  4778                STA  P0170
1591  4778  888 0 25  4209  4978                LDA  TEMP2
1592  4978  888 0 17  4978  4931                MTC
1593  4931  888 0 60  0534  4886                STA  P0134
1594  4886  888 0 65  0539  4891                STX  P0139
1595                                           ON   9001
1596                                           ON   9002
1597                                           ON   8001
1598                                           ON   8002
```

```
1599    4891  BBB 0 25  0050  4354                LDA   LC
1600    4354  BBB 0 70  4756  4380                ADD   BIG02     -PR1
1601    4381  BBB 0 60  0050  4554    &PR1        STA   LC
1602    4554  BBB 0 11  0417  4689                PRN   P0017     -PR2
1603    4380  BBB 0 60  0050  4754    -PR1        STA   LC
1604    4754  BBB 0 11  0401  4689                PRN   P0001     -PR2
1605    4690  BBB 0 00  0190  0190    &PR2        JMP   &CRD3
1606    4883  BBB 0 25  4770  4930    PRTS=       LDA   COMT      1F
1607    4735  BBB 0 25  4770  4930    PROF        LDA   COMT      1F
1608    4930  BBB 0 60  4779  4581    1           STA   CHOLD
1609    4581  BBB 0 05  4733  4935                LDX   B5
1610    4935  BBB 0 32  0500  4293                SHR    0500
1611    4293  BBB 0 37  0500  4251                SHL    0500
1612    4251  BBB 0 65  0503  4755                STX   P0103
1613    4755  BBB 0 60  0508  4180                STA   P0108
1614    4180  BBB 0 05  4405  4957                LDX   B05
1615    4957  BBB 0 65  4770  4580                STX   COMT
- 1616  4580  BBB 0 25  4631  4933                LDA   TEMP1
1617    4933  BBB 0 30  4385  4337                LDL                ASM5
1618    4385  BBB 0 26  4938  4938                CLA
1619    4938  BBB 0 20  4209  4780                BUF   TEMP2
1620    4780  BBB 0 30  4568  4337                LDL   EXIT2      ASM5
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632    4337  BBB 0 50  4464  4980    ASM5        STL   EXIT1     ASM5T
- 1633  4980  BBB 0 00  4181  0000    ASM5T       JMP   50001      0000
1634                                              OFF    9000
1635          *** OFF **                           OFF    9001
1636          *** OFF **                           OFF    9002
1637          *** OFF **              50001        STA   R0114     1F
1638          *** OFF **              50002        STA   R0126     1F
1639          *** OFF **              50003        STA   R0138     1F
1640          *** OFF **              50004        STA   R0150     1F
1641          *** OFF **              50005        STA   R0162     1F
1642          *** OFF **              1            LDA   ASM5T
1643          *** OFF **                           ADD   KON1      8F
1644          *** OFF **              8            STA   ASM5T     EXIT1
1645          *** OFF **              50006        STA   R0174     PCHSW
1646          *** OFF **              PCHSW        CLL   1F
1647          *** OFF **              PCHON        CLL   1F
1648          *** OFF **              1            LIR1   1000     2F
```

I92.ASSEMBLER 5
PUT THE CONTROL WORD INTO THE OUTPUT
(ROUTINE I95)
AND ALSO STORE THE COMMENT FOR THE NEXT
INSTRUCTION LINE.

I93.ASSEMBLER 5
PUT THE INSTRUCTION WORD INTO THE OUTPUT
(ROUTINE I95). #EXIT.
CODING DETAILS:
X ASM43,ASM44 PUT REGISTER A AS OUT-OF-SEQUENCE
X LINE INTO NEXT LOCATION OF UNIQUE STORAGE
X ASM42 PUTS TEMP2 AS OUT-OF-SEQUENCE INTO
X LOC SPECIFIED BY 7 ADDRESS OF RA, RELOCATION
X DIGIT FOR M BEING SPECIFIED IN REGISTER L.
X ASM41,ASM4 HAVE CONTROL WORD IN REGISTER A,
X INSTRUCTION WORD IN REGISTER X.
I. I95. ASSEMBLER 5
X THIS SUBROUTINE IS THE SOLE COMMUNICATION
X BETWEEN THE COMPILER AND THE OUTPUT CARDS.

I95.STORE WORD
PUT THE OUTPUT WORD IN THE PUNCH INTERLACE.
I96.END OF CARD
NO: IF THE CARD IS NOT FULL YET, #EXIT.
YES:

I97.CHECK CARD
UNLESS NO CARDS MODE IS IN EFFECT, UNLOAD
THE BUFFER. IF THE 2ND READ STATION IS NON-

```
1649          *** OFF **                2       IIR1  9999                    BLANK, SUM CHECK THE IMAGE AVAILABLE THERE.
1650          *** OFF **                        TEQ   9F                      GIVE 1112 HALT IF THIS FAILS, AND DUMP HSR
1651          *** OFF **                        RBT                 2B        BUFFER.
1652          *** OFF **                        RBU   R0001
1653          *** OFF **                        LDL   B10
1654          *** OFF **                        LDA   R0018
1655          *** OFF **                        TEQ   9F
1656          *** OFF **                        ERS   X5
1657          *** OFF **                        ADD   XOM           -5ASM
1658          *** OFF **                &5ASM   RSS    0100        -5ASM     G   EJECT HEADER CARDS (80-COLUMN ONLY)
1659          *** OFF **                -5ASM   LIR1   0000
1660          *** OFF **                        LDX                 3F
1661          *** OFF **                        LIR1   0036
1662          *** OFF **                        LDX                 2F
1663          *** OFF **                        LDL   R0106
1664          *** OFF **                        TEQ   9F
1665          *** OFF **                        LDX                 BU1
1666          *** OFF **                        HLT    1112         9F
1667          *** OFF **                9       LIR1   0084                   I98.COMPUTE CHECK SUM.
1668          *** OFF **                        LDX                 3F            COMPUTE SUM OF NUMERIC PORTIONS OF FIRST
1669          *** OFF **                        LIR1   0120                       SEVEN WORDS, AND PLACE IN WORD 8 OF CARD.
1670          *** OFF **                        LDX                 2F
1671          *** OFF **                        STA   R0186         1F
1672          *** OFF **                1       RCC   R0001         -ASM5     I99.PUNCH
1673          *** OFF **                &ASM5   LDX                 BU1           PUNCH CARD, INCREASE SEQUENCE NUMBER,#EXIT.
1674          *** OFF **                        HLT    1111         1B
1675          *** OFF **                PCHOF   EQU   -ASM5
1676          *** OFF **                -ASM5   LDA   RWD1
1677          *** OFF **                        ADD   LIT1
1678          *** OFF **                        STA   RWD1
1679          *** OFF **                        IIR   50001         8B
1680          *** OFF **                3       LDA1  R0018         2F
1681          *** OFF **                2       ADD1  R0030         -A5SM
1682          *** OFF **                &A5SM   ADD1  R0042         -AS5M
1683          *** OFF **                -A5SM   ADD1  R0042         -AS5M
1684          *** OFF **                &AS5M   ADD1  R0054         RX
1685          *** OFF **                -AS5M   ADD1  R0054         RX
1686          *** OFF **                        OFF    8002
1687          *** OFF **                        OFF    8001
1688                                           ON     9000
1689                                           ON     9001
1690                                           ON     9002
1691    4181  BBB 0 60  0928  4781       50001  STA   R0128         1F        I95.STORE WORD
1692    4182  BBB 0 60  0948  4781       50002  STA   R0148         1F            PUT THE OUTPUT WORD IN THE PUNCH INTERLACE.
1693    4183  BBB 0 60  0968  4781       50003  STA   R0168         1F        I96.END OF CARD
1694    4184  BBB 0 60  0918  4781       50004  STA   R0118         1F        NO: IF THE CARD IS NOT FULL YET, #EXIT.
1695    4185  BBB 0 60  0938  4781       50005  STA   R0138         1F        YES:
1696    4781  BBB 0 25  4980  4932       1      LDA   ASM5T
1697    4932  BBB 0 70  4097  4900              ADD   KON1          8F
1698    4900  BBB 0 60  4980  4464       8      STA   ASM5T         EXIT1
```

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1699  4186  888 0 60  0958  4981    50006   STA  R0158    PCHS#
1700  4981  888 0 31  4484  4484    PCHSW   CLL  1F
1701  4651  888 0 31  4484  4484    PCHON   CLL  1F                    I97.CHECK CARD
1702  4484  888 0 08  1000  4537    1       LIR1  1000    2F                UNLESS NO CARDS MODE IS IN EFFECT, UNLOAD
1703  4537  888 0 0G  9999  4341    2       IIR1  9999                      THE BUFFER. THE THE 2ND READ STATEION IS NON-
1704  4341  888 0 82  4894  4344            TEQ  9F                        BLANK, SUM CHECK THE IMAGE AVAILABLE THERE.
1705  4344  888 0 22  4898  4537            RBT              2B            GIVE 1112 HALT IF THIS FAILS, AND DUMP HSR
1706  4898  888 0 46  0800  4956            RBU  R0000                     BUFFER.
1707  4956  888 0 25  0911  4382            LDA  R0111
1708  4382  888 0 82  4894  4585            TEQ  9F
1709  4585  888 0 08  0000  4188            LIR1  0000
1710  4188  888 0 05  4890  4742            LDX              3F
1711  4890  888 0 08  9881  4493            LIR1  9881
1712  4493  888 0 05  4345  4297            LDX              2F
1713  4345  888 0 30  0872  4582            LDL  R0072
1714  4582  888 0 82  4894  4785            TEQ  9F
1715  4785  888 0 05  4737  0150            LDX              BU1
1716  4737  888 0 67  1112  4894            HLT   1112       9F
1717  4894  888 0 08  9997  4497    9       LIR1  9997                    I98.COMPUTE CHECK SUM.
1718  4497  888 0 05  4299  4742            LDX              3F              COMPUTE SUM OF NUMERIC PORTIONS OF FIRST
1719  4299  888 0 08  9987  4954            LIR1  9987                      SEVEN WORDS, AND PLACE IN WORD 8 OF CARD.
1720  4954  888 0 05  4558  4297            LDX              2F
1721  4558  888 0 60  0978  4782            STA  R0178       1F
1722  4782  888 0 81  0800  4758    1       RCC  R0000       -ASM5         I99.PUNCH
1723  4759  888 0 05  4982  0150    &ASM5   LDX              BU1               PUNCH CARD, INCREASE SEQUENCE NUMBER, #EXIT.
1724  4982  888 0 67  1111  4782            HLT   1111       1B
1725  4758  888 0 25  0908  4383    -ASM5   LDA  RWD1
1726                              PCHOF   EQU  -ASM5
1727  4383  888 0 70  4016  4583            ADD  LIT1
1728  4583  888 0 60  0908  4783            STA  RWD1
1729  4783  888 0 07  4181  4900            IIR  50001       8B
1730  4742  888 0 29  0911  4297    3       LDA1 R0111       2F
1731  4297  888 0 74  0931  4984    2       ADD1 R0131       -A5SM
1732  4985  888 0 74  0951  4958    &A5SM   ADD1 R0151       -AS5M
1733  4984  888 0 74  0951  4958    -A5SM   ADD1 R0151       -AS5M
1734  4959  888 0 74  0971  000C    &AS5M   ADD1 R0171       RX
1735  4958  888 0 74  0971  000C    -AS5M   ADD1 R0171       RX
1736                                        ON    8001
1737                                        ON    8002
1738                                                          1.
1739  4084  888 0 25  0027  4983    FARNL   LDA  LEVEL                    G   FIND AND RESERVE NEXT LOCATION
1740  4983  888 0 70  4336  4489            ADD  INCRE                    G   IN PROGRAM INTERLACE
1741  4489  888 0 30  4541  4693            LDL  KN200                    G   RX IS EXIT, RA GETS 02LLLL0000
1742  4693  888 0 82  4696  4396            TEQ  1F
1743  4896  888 0 87  4499  4955            TGR              2F    +05
1744  4499  888 0 75  000B  4955            SUB  RL          2F
1745  4955  888 0 60  0027  4684    2       STA  LEVEL
1746  4684  888 0 70  0231  000C            ADD  BAND        RX
1747  4696  888 0 70  0231  4884    1       ADD  BAND
1748  4884  888 0 60  0231  4134            STA  BAND
```

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1749  4134  888 0 26  4955  4955                    CLA  2B
1750  4686  888 0 50  4388  4340  FILUP             STL  -FIL2              G  FILL BLANK ADDRESSES IN PREV INSTRUCTION
1751  4340  888 0 77  4340  4893                    ATL                     G  RA # PLACE TO FILL WITH, FORM ORLLLL0000
1752  4893  888 0 25  492B  4334                    LDA  RWORD              G  RL # EXIT LINE.
1753  4334  888 0 05  000A  4588                    LDX  RA
1754  4588  888 0 37  0800  4699                    SHL  0800
1755  4699  888 0 70  4301  4936                    ADD  BIG00    -FIL1
1756  4937  888 0 07  HHHH  4540  &FIL1            IIR  HHHH
1757  4540  888 0 35  000B  4544                    ERS  RL
1758  4544  888 0 20  4579  4534                    BUF  IWORD
1759  4534  888 0 60  4579  4734                    STA  IWORD
1760  4734  888 0 25  000B  4788                    LDA  RL
1761  4788  888 0 35  4740  4942                    ERS  X1
1762  4942  888 0 20  000C  4346                    BUF  RX
1763  4346  888 0 35  4201  4359                    ERS  XOM
1764  4359  888 0 60  4928  4936                    STA  RWORD    -FIL1
1765  4936  888 0 25  000B  4940  -FIL1            LDA  RL
1766  4940  888 0 35  4617  4934                    ERS  XO
1767  4934  888 0 32  0100  4988                    SHR  0100
1768  4988  888 0 70  4301  4388                    ADD  BIG90    -FIL2
1769  4389  888 0 20  4928  4384  &FIL2            BUF  RWORD
1770  4384  888 0 35  4201  4559                    ERS  XOM
1771  4559  888 0 60  4928  4584                    STA  RWORD
1772  4584  888 0 25  000B  4889                    LDA  RL
1773  4889  888 0 32  0400  4546                    SHR  0400
1774  4546  888 0 35  4724  4784                    ERS  XC
1775  4784  888 0 20  4579  4536                    BUF  IWORD
1776  4536  888 0 60  4579  4388                    STA  IWORD    -FIL2
1777  4736  888 0 05  000A  4190  GOTO              LDX  RA                 G  'GO TO' SUBROUTINE
1778  4190  888 0 25  4928  4386                    LDA  RWORD              G  RX IS OR00000000, RL IS EXIT LINE,
1779  4386  888 0 37  0800  4697                    SHL  0800               G  IF PREV INST HAS BLANK ADDRESS,MERELY FILUP.
1780  4697  888 0 70  4225  4586                    ADD  BIG99    -GOTO
1781  4587  888 0 25  000C  4686  &GOTO            LDA  RX       FILUP
1782  4586  888 0 25  4880  4786  -GOTO            LDA  NXLOC              G  ELSE IF NXLOC IS NONZERO, ASSEMBLE A JMP
1783  4786  888 0 70  4201  4986                    ADD  XOM      -GOT1     G  INSTRUCTION
1784  4986  888 0 00  000B  0000  -GOT1            JMP  RL        0000
1785                             JMPRL             EQU  -GOT1
1786  4987  888 0 25  4740  4192  &GOT1            LDA  X1
1787  4192  888 0 35  000C  4746                    ERS  RX
1788  4746  888 0 60  4624  4187                    STA  TEMP4
1789  4187  888 0 75  000C  4776                    SUB  RX       ASM31
1790  4927  888 0 30  4196  4148  INCUQ            LDL  UNIQU              G  UNIQU TO RL
1791  4148  888 0 07  0001  4501                    IIR   0001              G  INCREMENT UNIQU BY 1
1792  4501  888 0 70  000B  4387                    ADD  RL                 G  EXIT TO RX
1793  4387  888 0 60  4196  000C                    STA  UNIQU    RX
1794  4744  888 0 65  4013  4787  ASIGN            STX  C0003              I. I50.  ASIGN SUBROUTINE
1795                                                                      X  THIS SUBROUTINE FINDS,OR MAKES,THE MEMORY
1796                                                                      X  ASSIGNMENT FOR SIMPLE VARIABLES, ARRAYS, OR
1797                                                                      X  TEMP STORAGES. IT IS NOT A TRUE SUBROUTINE,
1798                                                                      X  FOR IF THE ITEM TURNS OUT TO BE A CONSTANT
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1799
1800
1801    4787  888 0 70  4603  4589                ADD   BIG60     -ASN4    X   OR HAPPY ARRY, IT JUMPS INTO THE MIDDLE OF
1802    4589  888 0 50  4014  4339   -ASN4        STL   C0004     1F       X   ASM28 ROUTINE.
1803    4339  888 0 35  0043  4545   1            ERS   XM        ASGN1    I50.IS IT A TEMP
1804    4545  888 0 30  4897  4641   ASGN1        LDL   6F        BR       YES:IF THE ITEM TO BE ASSIGNED IS A TEMP STORAGE,
1805    4897  888 0 60  4631  4539   6            STA   TEMP1               GO TO#I52.
1806    4539  888 0 35  4741  4343                ERS   XMM                 NO:
1807    4343  888 0 77  4343  4946                ATL                       I51.WHAT IS TABLE ENTRY
1808    4946  888 0 06  4899  4899                CLX                       DEF:IF THE TABLE ENTRY INDICATES THIS ITEM IS
1809    4899  888 0 32  0400  4739                SHR    0400                   DEFINED IN UNIQUE OR COMMON,GOTO#DEFX.
1810    4739  888 0 70  4941  000A                ADD                RA     PAR:IF THE ITEM IS A PARAMETER,GO TO THE#PARAMETE
1811    4941  888 0 00  4010  0000                JMP   C0000         0000   CON:EXIT. IF THE ITEM IS A CONSTANT, GO TO STEP
1812    4019  888 0 37  0700  4939   C0009        SHL    0700               I38 IN#ASM28,OR IF DOING A FUNCTION CALL GO
1813    4939  888 0 70  4191  4944                ADD   TEMP5               TO CASIN,STEP I70.
1814    4944  888 0 60  4191  4543                STA   TEMP5               EQU:IF THE ITEM IS UNDEFINED AND EQUIVALENCED TO
1815    4543  888 0 25  4631  4189                LDA   TEMP1                  OTHER ITEMS,GO TO#E1.
1816    4189  888 0 37  0400  4339                SHL    0400          1B     UND:IF THE ITEM IS UNDEFINED,NOT EQUIVALENCED,
1817    4590  888 0 60  4209  4789   &ASN4        STA   TEMP2         TRSW      ASSIGN IT IN UNIQUE STORAGE AND GO TO#DEFX.
1818    4789  888 0 05  000A  4743   TRSW         LDX   RA            1F     HAP:FINALLY IF THE ITEM IS A HAPPY ARRAY,ASSUME
1819    4989  888 0 05  000A  4743   TRON         LDX   RA            1F        WE HAVE BEEN CALLED BY ASM28;ADJUST OP CODE
1820    4743  888 0 30  4745  4347   1            LDL   TROFF                   FOR INDEXING IF NECESSARY,THEN CONVERT TO A
1821    4347  888 0 08  4701  4445                LIR1  TEMPS           INS     SIMPLE VARIABLE AND RECYCLE AT#I51.
1822    4745  888 0 07  HHHH  4348   TROFF        IIR    HHHH                I52.REINSTATE TEMP
1823    4348  888 0 35  4209  4390                ERS   TEMP2                  UNLESS PROCESSING A DO STATEMENT, THE TEMP
1824    4390  888 0 20  4408  4790                BUF   BIG01                  STORAGE LOCATION IS PUT BACK ON THE LIST OF
1825    4790  888 0 08  1749  4943                LIR1  W9999                  POTENTIAL TEMP STORAGES FOR FURTHER USE.
1826    4943  888 0 77  4943  4013                ATL                C0003      GO TO#DEFX
1827    4010  888 0 25  4631  4990   C0000        LDA   TEMP1
1828    4990  888 0 70  4392  4395                ADD   BIG70         -ASN1   CODING DETAILS:   RA IS THE OPERAND STACK ENTRY,
1829    4396  888 0 07  HHHH  4349   &ASN1        IIR    HHHH                   RL IS THE EXIT FOR A PARAMETER, RX IS THE
- 1830  4349  888 0 39  0001  4391                ERS1   0001        1F        EXIT FOR A DEFINED NON-PARAMETER.
1831    4395  888 0 07  0001  4391   -ASN1        IIR    0001        1F
1832    4391  888 0 30  4196  4548   1            LDL   UNIQU
1833    4548  888 0 70  000B  4591                ADD   RL
1834    4591  888 0 60  4196  4748                STA   UNIQU
1835    4748  888 0 25  4631  4791                LDA   TEMP1
1836    4791  888 0 20  000B  4945                BUF   RL
1837    4945  888 0 64  0000  4897                STA1   0000        6B
1838    4011  888 0 00  4013  4013   C0001        JMP   C0003
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I.  I25. ASSEMBLER 2.
X   THIS SUBROUTINE ASSEMBLES MACHINE LANGUAGE
X   INSTRUCTIONS OF AN ALMOST SYMBOLIC NATURE;
X   THE OP-CODE IS THE TRUE OP BEFORE INDEXING,
X   AND THE ADDRESSES ARE EITHER ABSOLUTE,REFER
X   TO NEXT INSTRUCTION,OR REFER TO OPERANDS.
X   IN PARTICULAR,AN ARRAY OPERAND IS ALLOWED,
X   AND THIS MAY CAUSE MANY INSTRUCTIONS TO BE
X   GENERATED. IF THE OPERAND IS NOT A LABEL,
X   HOWEVER, THE ASSUMPTION IS MADE THAT IT GOES
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1849
1850  4350  BBB 0 60  4991  4193  ASM2   STA  TMP10          X   IN M ADDRESS AND THAT C ADDRESS REFERS TO NXT
1851  4193  BBB 0 50  4195  4547         STL  EXIT6          I25.ASSEMBLE 2.5 ON M
1852  4547  BBB 0 35  4617  4592         ERS  XC                 SEND THE M ADDRESS TO ASM2.5 FOR ASSEMBLY.
1853  4592  BBB 0 60  4194  4596         STA  TEMP7              (IF IT IS AN OPERAND,WE WILL NEVER COME BACK
1854  4596  BBB 0 30  4948  4550         LDL  1F                 FROM ASM2.5,SEE THAT ROUTINE.)
1855  4550  BBB 0 25  4991  4393         LDA  TMP10   ASM25
1856  4948  BBB 0 60  4750  4792  1      STA  TEMP8
1857  4792  BBB 0 65  4394  4796         STX  TEMP9
1858  4796  BBB 0 25  4991  4593         LDA  TMP10              I26.ASSEMBLE 2.5 ON C
1859  4593  BBB 0 37  0400  4950         SHL   0400              SEND C ADDRESS TO ASM2.5 FOR ASSEMBLY.
- 1860  4950  BBB 0 30  4992  4393         LDL          ASM25
1861  4992  BBB 0 77  4992  4595         ATL
1862  4595  BBB 0 25  4394  4996         LDA  TEMP9              I27.ASSEMBLE 3
1863  4996  BBB 0 37  0100  4901         SHL   0100              SEND THE COMPILED INSTRUCTION TO ASM3 FOR
1864  4901  BBB 0 20  000C  4793         BUF  RX                 OUTPUT AND FINAL TOUCHES. #EXIT.
1865  4793  BBB 0 60  4624  4993         STA  TEMP4              CODING DETAILS: ADDRESS 9999 MEANS NEXT. ADDRESS
1866  4993  BBB 0 25  0008  4747         LDA  RL                 9911 MEANS OPERAND STACK + 11. FOR EXAMPLE,
1867  4747  BBB 0 32  0400  4594         SHR   0400              9901 IS THE TOP OF THE OPERAND STACK.  ADDRES
1868  4594  BBB 0 35  4724  4794         ERS  XC                 SES LESS THAN 9901 ARE ABSOLUTE.
1869  4794  BBB 0 20  4750  4994         BUF  TEMP8              AT INPUT RA IS A CODED INSTRUCTION.RL IS EXIT
- 1870  4994  BBB 0 30  4195  4776         LDL  EXIT6   ASM31      LINE.
1871                                                         I.  I30. ASSEMBLERS 2.5 AND 2.8
1872                                                             ASM2.5 DOES HALF THE JOB OF ASM2, Q.V.
1873                                                             ASM2.8 IS USED FOR SIMPLE VARIABLES, TEMP
1874                                                         X   STORAGES, AND SUBSCRIPTS.
1875  4393  BBB 0 35  0043  4795  ASM25  ERS  XM               I30.WHAT ADDRESS
1876  4795  BBB 0 60  4191  4995         STA  TEMP5              ABS:IF THE ADDRESS TO BE ASSEMBLED IS ABSOLUTE,
1877  4995  BBB 0 70  4947  4397         ADD          -HF1       SET CORRESPONDING R-DIGIT ZERO AND#EXIT.
1878  4947  BBB 0 99  0001  0000         CON  99000   10000      NXT:IF THE ADDRESS REFERS TO NEXT INSTRUCTION,
1879  4398  BBB 0 05  4016  4197  &HF1   LDX  LIT1    1F         TRANSMIT THIS INFORMATION AND TEMPORARILY SET
1880  4397  BBB 0 70  4549  4597  -HF1   ADD          -HF2       THE ADDRESS ZERO.#EXIT.
1881  4549  BBB 0 00  0098  0000         CON  00009   80000      RAND          OTHERWISE THE ADDRESS IS AN OPERAND
1882  4597  BBB 0 06  4351  4351  -HF2   CLX                     AND FURTHER TESTS ARE NECESSARY.
1883  4351  BBB 0 25  4191  4197         LDA  TEMP5   1F
1884  4197  BBB 0 20  4194  000B  1      BUF  TEMP7   RL
1885  4598  BBB 0 50  4551  4797  &HF2   STL  EXIT5
1886  4797  BBB 0 77  4797  4751         ATL
1887  4751  BBB 0 25  4997  4749         LDA  1F
1888  4749  BBB 0 75  0008  000A         SUB  RL      RA         I31.WHAT KIND OF OPERAND
1889  4997  BBB 1 29  0000  4798  1      LDA3  0000   8F         FETCH THE OPERAND SPECIFIED AND CHECK TO SEE
1890  4798  BBB 0 77  4798  4951  8      ATL                     WHAT KIND IT IS.
1891  4951  BBB 0 32  0900  4998         SHR   0900              VAR:FOR A SIMPLE VARIABLE OR TEMP STORAGE, GO TO
1892  4998  BBB 0 35  4413  4949         ERS  LIT8               G   TREAT TEMP STORE(4) AS SIMPLE VAR(0)
- 1893  4949  BBB 0 70  4199  000A         ADD          RA         ASM28,STEP#I35,AFTER WHICH WE EXIT FROM ASM2.
1894  4199  BBB 0 25  0008  4080         LDA  RL      V0000      ACC:FOR AN ACCUMULATOR SYMBOL THIS IS A BAD#MESS.
1895  4080  BBB 0 30  4195  4399  V0000  LDL  EXIT6              INX:FOR AN INDEX VARIABLE,ASSUME WE WERE CALLED B
1896  4399  BBB 0 05  4194  4599         LDX  TEMP7   ASM28      BY ASSEMBLER 1 FOR A STORE OPERATION. TRANS-
1897  4081  BBB 0 30  4195  4799  V0001  LDL  EXIT6   EEE        FER BACK TO#ASM1 EMITTING THE INSTRUCTIONS
- 1898  4799  BBB 0 25  4999  4514  EEE    LDA          ALARM      TO LOAD RB1.
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    1899  4999  BBB 0 21  0005  0000                    CON  21000     50000    G   EXP #     ERROR
 ¦  1900  0042  BBB 0 25  0044  4514  BME               LDA            ALARM
    1901  0044  BBB 0 03  0400  0000                    CON  03040     00000    G   BAD MESS
 ¦¦ 1902  4082  BBB 0 25  0084  0886  V0002            LDA# 00057     67814    ARR:FOR AN ARRAY VARIABLE GO TO STEP#I44.
 ¦¦ 1903  0886  BBB 0 05  0288  0090                    LDX  TMP13              LAB:FOR A LABEL,GO TO THE LABEL ASSIGN ROUTINE
 ¦  1904  0090  BBB 0 32  0600  0099                    SHR   0600     LOOP1        (I60) AND THEN #EXIT.
 ¦¦ 1905  4085  BBB 0 30  0087  0089  V0005            LDL            LSW
 ¦¦ 1906  0087  BBB 0 05  0289  0291                    LDX# 00200     00000
 ¦  1907  0291  BBB 0 35  0043  0245                    ERS  XM
    1908  0245  BBB 0 20  4194  4551                    BUF  TEMP7     EXIT5
 ¦¦ 1909  4599  BBB 0 50  0201  0003  ASM28            STL  EXIT4              I35.ASSIGN VARIABLE
 ¦  1910  0003  BBB 0 65  4191  0643                    STX  TEMP5     9F           GO TO ROUTINE I50 TO GET THE ASSIGNMENT FOR
 ¦¦ 1911  0643  BBB 0 05  0445  0047  9                 LDX  NPAR                   THIS SIMPLE VARIABLE.
 ¦  1912  0047  BBB 0 30  0049  4744                    LDL            ASIGN    NPARIF IT IS NOT A PARAMETER,GO TO STEP#I42
 ¦  1913  0049  BBB 0 09  0001  0203                    LDX1  0001              CON IF IT IS A CONSTANT,WE GET TO STEP#I38.
 ¦  1914  0203  BBB 0 65  4770  0222                    STX  COMT               PAR:          OTHERWISE IT'S A PARAMETER.
 ¦¦ 1915  0222  BBB 0 50  0024  0426                    STL  TEMP6              I36.CHECK OP CODE
 ¦  1916  0426  BBB 0 30  4191  0843                    LDL  TEMP5                   FOR A SIMPLE VARIABLE PARAMETER, WE CHOOSE
 ¦  1917  0843  BBB 0 25  4247  0249                    LDA  BIG30                   ONE OF THREE SUBROUTINES IN THE OBJECT CODE,
 ¦¦ 1918  0249  BBB 0 82  1852  2052                    TEQ  1F                      DEPENDING WHETHER THE OP IS TO BE LDL, LDA,
 ¦  1919  2052  BBB 0 70  000A  0457                    ADD  RA                      OR STL.  FOR A STA WE DO ATL, STL. FOR OTHER
 ¦¦ 1920  0457  BBB 0 82  0060  0260                    TEQ  2F                      OPERATIONS, WE DO LDL, OP RL.
 ¦  1921  0260  BBB 0 25  4604  0106                    LDA  BIG25
 ¦¦ 1922  0106  BBB 0 82  0109  0309                    TEQ  3F
 ¦  1923  0309  BBB 0 70  000A  0314                    ADD  RA
 ¦¦ 1924  0314  BBB 0 82  0317  0517                    TEQ  4F
 ¦  1925  0517  BBB 0 07  0001  0120                    IIR   0001
 ¦¦ 1926  0120  BBB 0 30  0322  0124                    LDL            6F
 ¦  1927  0322  BBB 0 30  4986  0138                    LDL  JMPRL     NPAR2
 ¦  1928  0060  BBB 0 30  0317  0319  2                 LDL  4F        ATL
 ¦  1929  0319  BBB 0 25  0121  4556  ATL               LDA  BIG77     ASM32
 ¦  1930  0317  BBB 0 07  0002  0320  4                 IIR   0002     5F
    1931  1852  BBB 0 07  0001  0320  1                 IIR   0001     5F
    1932  0109  BBB 0 07  0000  0320  3                 IIR   0000     5F
    1933  0320  BBB 0 30  0201  0124  5                 LDL  EXIT4     6F
 ¦  1934  0124  BBB 0 74  0000  0403  6                 ADD1  0000
 ¦  1935  0403  BBB 0 32  0400  0210                    SHR   0400
 ¦  1936  0210  BBB 0 35  4724  0626                    ERS  XC
 ¦¦ 1937  0626  BBB 0 05  0028  0030                    LDX# 00100     00010
    1938  0030  BBB 0 20  4623  4570                    BUF  BIG05     ASM3
 ¦¦ 1939  4015  BBB 0 30  0417  0219  C0003            LDL  FCEX
 ¦  1940  0219  BBB 0 25  4013  0065                    LDA  C0003                   G   CHECK IF DOING A FUNCTION CALL.
 ¦¦ 1941  0065  BBB 0 82  0068  0268                    TEQ            1F
 ¦  1942  0068  BBB 0 05  000A  0072                    LDX  RA        CASIN
 ¦  1943  0268  BBB 0 29  0001  0603  1                 LDA1  0001                   I38.CHECK FOR ZERO
 ¦  1944  0603  BBB 0 31  0206  0206                    CLL                     SUBSIF THE CONSTANT IS ZERO,AND IF THIS IS A
 ¦¦ 1945  0206  BBB 0 82  0809  1409                    TEQ            1F           ZERO SUBSCRIPT ON A PARAMETRIC ARRAY GO TO
 ¦  1946  0809  BBB 0 30  0201  0803                    LDL  EXIT4                  STEP#I46. OTHERWISE FOR A ZERO CONSTANT, ADD
 ¦¦ 1947  0803  BBB 0 25  0005  0607                    LDA  AREX               ZRO:ONE TO THE OP CODE AND SET 7 AND C TO NXT.
 ¦¦ 1948  0607  BBB 0 82  0410  0610                    TEQ  AREX1                  GO TO ASM3 AND THEN#EXIT FOR ASM2.
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 1949  0610  BBB 0 25  4191  1243          LDA  TEMP5          N2RO
 1950  1243  BBB 0 70  4408  0261          ADD  BIG01
 1951  0261  BBB 0 05  0063  4570          LDX  LIT11     ASM3
 1952  1409  BBB 0 35  4667  0419  1       ERS  X^C                 I39.CHECK FOR IIR
 1953  0419  BBB 0 82  0422  0622          TEQ            1F        YES:SEE IF THE OP IS LDA AND IF IT CAN BE CHANGED
 1954  0422  BBB 0 25  4191  1643          LDA  TEMP5               INTO IIR: IF SO, DO THIS AND#EXIT.
 1955  1643  BBB 0 30  4604  0256          LDL  BIG25               FROM ASM2 VIA ASM3.
 1956  0256  BBB 0 82  0259  0622          TEQ            1F        NO:
 1957  0259  BBB 0 29  0001  1403          LDA1 0001
 1958  1403  BBB 0 70  0805  0008          ADD  BIG07
 1959  0008  BBB 0 30  0201  4556          LDL  EXIT4     ASM32     I40.ASSIGN CONSTANT
 1960  0622  BBB 0 05  0224  0072  1       LDX            CASIN          USE THE CASIN ROUTINE (I70), DISPLAY THE
 1961  0224  BBB 0 25  0826  0228          LDA            NPAR1          COMMENT 'CONST'.
 1962  0826  BBB 0 12  2333  6523          ALF  CONST
 1963                                      OFF  8002
 1964                                      OFF  9002
 1965                                      HHH
 1966                                      ON   9002
 1967                                      ON   8002
 1968  0445  BBB 0 29  0001  0228  NPAR    LDA1 0001      NPAR1     I42.ASSEMBLE 3
 1969  0228  BBB 0 60  4770  0138  NPAR1   STA  COMT      NPAR2          GIVE APPROPRIATE COMMENT, THEN #EXIT FROM
 1970  0138  BBB 0 25  000B  0342  NPAR2   LDA  RL                      ASM2 VIA ASM3.
 1971  0342  BBB 0 35  4740  0592          ERS  X1
 1972  0592  BBB 0 20  4016  0818          BUF  LIT1
 1973  0818  BBB 0 60  4624  1626          STA  TEMP4
 1974  1626  BBB 0 07  HHHH  0229          IIR  HHHH
 1975  0229  BBB 0 35  000B  0433          ERS  RL
 1976  0433  BBB 0 20  4191  1843          BUF  TEMP5
 1977  1843  BBB 0 30  0201  4776          LDL  EXIT4     ASM31
 1978  4083  BBB 0 30  0085  4303  V0003   LDL            BR1
 1979  0085  BBB 0 09  0001  1603          LDX1 0001
 1980  1603  BBB 0 65  1405  1407          STX  TMP11                I44.GET SUBSCRIPT
 1981  1407  BBB 0 37  0400  0814          SHL  0400                      IN ASM2.5 WE HAVE AN ARRAY OPERAND.
 1982  0814  BBB 0 30  0216  4641          LDL            BR              IF THE SUBSCRIPT IS NOT ALREADY IN REGISTER
 1983  0216  BBB 0 09  0001  1803          LDX1 0001                      A, COMPILE CODE TO STORE A IN TEMP IF NEC-
 1984  1803  BBB 0 65  1605  1607          STX  TMP12                     ESSARY, AND THEN TO LOAD A WITH THE SUBSCRIPT
 1985  1607  BBB 0 60  4191  2043          STA  TEMP5                     (USING ASM2.8, STEP I35).
 1986  2043  BBB 0 35  0645  0247          ERS  H1
 1987  0247  BBB 0 30  4974  0276          LDL  BIG10
 1988  0276  BBB 0 82  0005  0079          TEQ  AREX
 1989  0079  BBB 0 05  0881  0283          LDX            CLACC
 1990  0881  BBB 0 25  4191  0093          LDA  TEMP5
 1991  0093  BBB 0 05  4604  0306          LDX  BIG25
 1992  0306  BBB 0 30  0005  4599          LDL  AREX      ASM28
 1993  0005  BBB 0 25  1405  1807  AREX    LDA  TMP11                I45.WHAT KIND ARRAY
 1994  1807  BBB 0 30  4336  0438          LDL  INCRE                     (REFER TO STEP A24 WHERE THE VARIOUS CASES OF
 1995  0438  BBB 0 06  1641  1641          CLX                            ARRAY WERE DEFINED.) HAPPY ARRAYS DO NOT
 1996  1641  BBB 0 65  2243  0845          STX  ACC                       COME THROUGH THIS PART;BUT WE MUST BRANCH
 1997  0845  BBB 0 32  0900  0657          SHR  0900                      3 WAYS FOR THE OTHER TYPES OF ARRAYS:
 1998  0657  BBB 0 70  0459  000A          ADD            RA        SAD:SAD, GO TO#I47.
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1999  0459  BBB 0 07  0007  4019                IIR   0007      C0009      ORD:ORDINARY, GO TO#I48.
2000  4020  BBB 0 82  1623  1823  C0010         TEQ   C0R10                PAR:      PARAMETRIC;GO TO NEXT STEP.
2001  1823  BBB 0 05  0225  0427                LDX               1F       I46.PARAMETER CODE
2002  0225  BBB 0 00  0000  0070                CON   00000       00070        IF CORE MODE IS ON, COMPILE
2003  0410  BBB 0 05  0212  0427  AREX1         LDX   2F          1F               ADD 1F;LDX RA;LDA PAR;ADD RX RA.
2004  0212  BBB 0 00  0000  0025  2             CON   00000       00025        ELSE COMPILE ADD PAR (OR LDA PAR IF SUBSCRIPT
2005  0427  BBB 0 25  1405  2007  1             LDA   TMP11                    IS ZERO), ADD NXT RA.  GO TO#I49.
2006  2007  BBB 0 37  0600  0416                SHL   0600
2007  0416  BBB 0 32  0200  0221                SHR   0200
2008  0221  BBB 0 30  2023  0425                LDL   3F          4F
2009  0425  BBB 0 05  0627  4709  4             LDX   1F          ASM34
2010  2023  BBB 0 30  0625  1627  3             LDL   8F          ADDNX
2011  1627  BBB 0 25  0429  0631  ADDNX         LDA#  70000       0000A
2012  0631  BBB 0 05  0633  4570                LDX   LIT10       ASM3
2013  0625  BBB 0 25  1405  2407  8             LDA   TMP11
2014  2407  BBB 0 35  4741  2443                ERS   XMH
2015  2443  BBB 0 06  1046  1046                CLX   7F
2016  1046  BBB 0 75  4623  0476  7             SUB   BIG05       AREX2
2017  0627  BBB 0 21  2127  1914  1             ALF   PARAM
2018  1623  BBB 0 30  0825  1827  COR10         LDL               CORES
2019  0825  BBB 0 05  0212  1414                LDX   2B
2020  1414  BBB 0 32  0200  0619                SHR   0200
2021  0619  BBB 0 30  0421  0425                LDL   5F          4B
2022  4021  BBB 0 82  0424  0624  C0011         TEQ   C0R11                I47.SAD CODE
2023  0624  BBB 0 25  1405  2607                LDA   TMP11                    IF CORE MODE IS ON, COMPILE ADD 1F,
2024  2607  BBB 0 35  4741  2643                ERS   XMH                      LDX RA; IIR ORELATIVE; ADD RX RA.
2025  2643  BBB 0 30  1245  4260                LDL               CONST        ELSE COMPILE ADD FUDGE, ADD NXT RA.
2026  1245  BBB 0 05  0447  0072                LDX               CASIN        GO TO#I49.
2027  0447  BBB 0 25  000B  0251                LDA   RL
2028  0251  BBB 0 05  0253  0055                LDX   1F
2029  0055  BBB 0 30  1857  0659                LDL               7F
2030  1857  BBB 0 30  0859  1627                LDL               ADDNX
2031  0859  BBB 0 25  1405  2807                LDA   TMP11
2032  2807  BBB 0 37  0600  0616                SHL   0600
2033  0616  BBB 0 05  000A  0420                LDX   RA
2034  0420  BBB 0 32  0200  1625                SHR   0200
2035  1625  BBB 0 26  1046  1046                CLA   7B
2036  0253  BBB 0 13  1116  4475  1             ALF   FUDGE
- 2037  0424  BBB 0 30  1826  1827  COR11       LDL               CORES
2038  1826  BBB 0 20  0633  0235                BUF   LIT10
2039  0235  BBB 0 05  000A  0239                LDX   RA
2040  0239  BBB 0 32  0100  2843                SHR   0100
2041  2843  BBB 0 25  0805  3007                LDA   BIG07
2042  3007  BBB 0 30  0421  4570                LDL   5F          ASM3
2043  0421  BBB 0 25  2223  1825  5             LDA#  70000       C000A
2044  1825  BBB 0 06  0428  0428                CLX
2045  0428  BBB 0 30  0230  4570                LDL               ASM3
2046  0230  BBB 0 05  0032  4927                LDX               INCUQ
2047  0032  BBB 0 50  4880  0625                STL   NXLOC       8B
2048  0283  BBB 0 31  1886  1886  CLACC         CLL                        G   SUBROUTINE TO STORE A IN TEMP IF IT IS IN USE
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2049  1886  BBB 0 25  2243  1645            LDA   ACC
2050  1645  BBB 0 82  000C  0248            TEO   RX                    G   IN THE OBJECT PROGRAM
2051  0248  BBB 0 65  4926  0278            STX   EXIT3
2052  0278  BBB 0 05  0080  0082            LDX   2F
2053  0082  BBB 0 30  0284  2086            LDL   1F
2054  2086  BBB 0 08  4701  4229            LIR1  TEMPS     REM           G   IF TEMPS STACK IS EMPTY, RESERVE A NEW PLACE
2055  0080  BBB 0 05  0284  4927  2         LDX   1F        INCUQ         G   IN UNIQUE.
2056  0284  BBB 0 25  2243  1845  1         LDA   ACC
2057  1845  BBB 0 70  0647  000A            ADD             RA
2058  0647  BBB 0 08  0000  0453            LIR1   0000
2059  0453  BBB 0 29  0000  0602            LDA1   0000
2060  0602  BBB 0 35  4667  0819            ERS   XOC
2061  0819  BBB 0 06  1622  1622            CLX
2062  1622  BBB 0 65  2243  2045            STX   ACC
2063  2045  BBB 0 05  000A  0449            LDX   RA
2064  0449  BBB 0 07  HHHH  2252            IIR    HHHH
2065  2252  BBB 0 35  000B  0456            ERS   RL
2066  0456  BBB 0 77  0456  1859            ATL
2067  1859  BBB 0 20  000C  0263            BUF   RX
2068  0263  BBB 0 70  4247  0300            ADD   BIG30
2069  0300  BBB 0 64  0000  1402            STA1   0000
2070  1402  BBB 0 25  4603  0855            LDA   BIG60
2071  0855  BBB 0 20  000B  2059            BUF   RL
2072  2059  BBB 0 05  1750  0352            LDX   W0000
2073  0352  BBB 0 30  4926  4709            LDL   EXIT3     ASM34
2074  1827  BBB 0 50  0201  2003  CORES     STL   EXIT4                   G   THIS SUBROUTINE PUTS OUT THE CORE ONLY
2075  2003  BBB 0 25  4196  0448            LDA   UNIQU                   G   PAIR OF INSTRUCTIONS
2076  0448  BBB 0 30  0850  2452            LDL   3F
2077  2452  BBB 0 05  0254  0659            LDX   1F        7F
2078  0659  BBB 0 70  0461  4709  7         ADD   BIG69     ASM34
2079  0850  BBB 0 25  2652  0454  3         LDA#  05000     A0000
2080  0454  BBB 0 05  0656  0458            LDX   2F
2081  0458  BBB 0 30  0460  4760            LDL             ASM35
2082  0460  BBB 0 25  1405  0208            LDA   TMP11
2083  0208  BBB 0 37  0600  0201            SHL    0600     EXIT4
2084  0254  BBB 0 01  221F  3695  1         ALF   (CORE
2085  0656  BBB 0 22  2306  538C  2         ALF   ONLY)
2086  4022  BBB 0 30  0824  1627  C0012     LDL             ADDNX         I48.ORDINARY CODE
2087  0824  BBB 0 25  4740  0242            LDA   X1                          COMPILE ADD NXT RA.
2088  0242  BBB 0 35  1405  0408            ERS   TMP11
2089  0408  BBB 0 05  000A  0412            LDX   RA
2090  0412  BBB 0 07  HHHH  0215            IIR    HHHH
2091  0215  BBB 0 35  1405  0608            ERS   TMP11
2092  0608  BBB 0 77  0608  0411            ATL
2093  0411  BBB 0 25  1405  0808            LDA   TMP11
2094  0808  BBB 0 37  0600  0617            SHL    0600
2095  0617  BBB 0 32  0100  0621            SHR    0100
2096  0621  BBB 0 20  000B  0476            BUF   RL        AREX2
2097  0476  BBB 0 70  4194  0097  AREX2     ADD   TEMP7                   I49.COMPILE OP
2098  0097  BBB 0 30  1605  1408            LDL   TMP12                       NOW COMPILE THE ORIGINAL OP-CODE DESIRED FOR
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2099  1408  BBB 0 50  4770  4551          STL  COMT      EXIT5      THIS ARRAY OPERAND, PLUS 4 IF INDEXING IS
2100                                                              X   SPECIFIED. PUT NAME OF ARRAY AS COMMENT.
2101                                                             CODING DETAILS WILL BE OMITTED SINCE ASM2.5
2102                                                              X   AND ASM2.8 ARE ONLY FOR INTERNAL USE BY ASM2.
2103  0089  BBB 0 06  0092  0092  LSW      CLX  1F               I.  I60. LSW  FOR ASSIGNING STATEMENT LABELS.
2104                                                              X   THIS ROUTINE HANDLES THE LOGIC FOR LABEL
2105                                                              X   ADDRESSES. THE PROBLEMS SOLVED ARE THOSE
2106                                                              X   OF FORWARD REFERENCES AND OF POTENTIAL GO TO
2107                                                              X   OUT OF DO LOOPS.
2108  0108  BBB 0 06  0092  0092  LSWOF    CLX  1F               I60.CHECK LABEL
2109  0509  BBB 0 05  0054  0092  LSWON    LDX  BIG04    1F          CHECK THAT THE OPERAND WHICH IS SUPPOSED TO
2110  0092  BBB 0 50  4568  0520  1        STL  EXIT2             BAD:BE A LABEL IS ACTUALLY A STATEMENT NUMBER.
2111  0520  BBB 0 30  4277  0129          LDL  BIG50                 IF NOT, GIVE THE BAD LABEL#ALARM.
2112  0129  BBB 0 87  0532  0732          TGR            1F      OK:
2113  0532  BBB 0 30  4603  0155          LDL  BIG60
2114  0155  BBB 0 87  0732  0158          TGR  1F        2F
2115  0732  BBB 0 25  0934  0336  1       LDA            NOMAL
2116  0934  BBB 0 03  1900  0000          CON  03190     00000   G   BAD LABEL
2117  0158  BBB 0 30  0360  4303  2       LDL            BR1     I61.IN DO LOOP
2118  0360  BBB 0 70  000C  0165          ADD  RX                YES:IF WE ARE IN A DO LOOP GO TO STEP#I64 UNLESS
2119  0165  BBB 0 32  0800  0176          SHR   0800                 WE WANT THE ABSOLUTE LOCATION OF THE LABEL
2120  0176  BBB 0 70  0178  000A          ADD            RA      NO:
2121  0178  BBB 0 29  0000  1230          LDA1  0000     L9950   I62.ASSIGN
2122  1280  BBB 0 05  0282  4084  L0000    LDX            FARNL      IF THE LABEL IS UNDEFINED,PICK LOCATION,
2123  0282  BBB 0 24  0000  1602          BUF1  0000                DEFINE IT, AND EXIT. IF THE LABEL IS TEMPO-
2124  1602  BBB 0 64  0000  1282          STA1  0000     L0002      RARILY UNDEFINED (SEE BELOW),DO STEP I62 ON
2125  1281  BBB 0 06  0158  0158  L0001    CLX  2B                   THE AUXILIARY WORD. IF THE LABEL IS ALREADY
2126  1282  BBB 0 35  4741  4568  L0002    ERS  XMH       EXIT2      DEFINED, SIMPLY#EXIT.
2127  1286  BBB 0 35  4201  0103  L0006    ERS  XOM       1F
2128  1284  BBB 0 35  4201  0103  L0004    ERS  XOM       1F      I64.TEMP ASSIGN
2129  0103  BBB 0 60  4209  0111  1        STA  TEMP2             IN DO LOOP (AS OPPOSED TO DONT LOOP) WE MAKE
2130  0111  BBB 0 05  0113  4084          LDX            FARNL      A TEMPO-A-Y ASS&GNMENT FOR THE LOCATION TO GO
2131  0113  BBB 0 77  0113  0116          ATL                       TO,WHICH STORES RB1 BEFORE GOING TO THE
2132  0116  BBB 0 06  0000  0720          IIR1  0000                ACTUAL LOCATION. THE EXTRA INFORMATION IS
2133  0720  BBB 0 32  0400  0527          SHR   0400                KEPT IN LLIST, IN THE FORM
2134  0527  BBB 0 35  4724  0376          ERS  XC                   SYMBOL TABLE ENTRY LLLL: 51AAAAXXXX
2135  0376  BBB 0 20  4209  0611          BUF  TEMP2                                 AAAA:    02TTTT
2136  0611  BBB 0 08  0415  1614          LIR1 LLIST                                 AAAA+1:  XSSSSSLLLL
2137  1614  BBB 0 05  0008  1418          LDX  RL                   WHERE XSSSSS IS THE OLD SYMBOL TABLE ENTRY,
2138  1418  BBB 0 30  0620  4445          LDL            INS        TTTT IS THE TEMPORARY ASSIGNMENT.
2139  0620  BBB 0 25  000C  1624          LDA  RX                   IN THIS STEP,WE CREATE THE LLIST ENTRY IF
2140  1624  BBB 0 37  0400  0831          SHL   0400                NONE HAS BEEN MADE YET FOR THIS LABEL. OTHER-
2141  0831  BBB 0 30  0833  4303          LDL            BR1        WISE WE USE THE TEMPORARY ADDRESS. ALSO IF
2142  0833  BBB 0 35  0435  0237          ERS  XC0                  THE  LABEL  HAD NO PERMANENT ADDRESS AND THE
2143  0237  BBB 0 20  0415  1417          BUF  LLIST                LABEL HAS NOW OCCURRED IN COLS 1-5, WE SET
2144  1417  BBB 0 70  1419  1822          ADD  ONE15                THE PERMANENT ADDRESS EQUAL TO THE TEMPORARY
2145  1822  BBB 0 64  0000  1285          STA1  0000     L0005      ADDRESS.   #EXIT.
2146  1285  BBB 0 30  0287  4303  L0005    LDL            BR1     CODING DETAILS:
2147  0287  BBB 0 35  4741  0293          ERS  XMH                  ENTRANCE LSW IS USED FOR THE BRANCH ON DO
2148  0293  BBB 0 31  0296  0296          CLL                       LOOP, ENTRANCE LSWOF IS USED FOR GETTING
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2149  0296  BBB 0 82  0899  1099                 TEQ          1F          ABSOLUTE LOCATIONS AS WITH A FORMAT OR
2150  0899  BBB 0 30  4568  0920                 LDL  EXIT2               ASSIGN STTATEMENT.  RL IS THE EXIT LINE.
2151  0920  BBB 0 25  0522  0324                 LDA  LABLX               OUTPUT IS 02AAAA0000 IN REGISTER A.
2152  0324  BBB 0 82  0727  1099                 TEQ          1F
2153  0727  BBB 0 29  9999  0401                 LDA1 9999
2154  0401  BBB 0 35  4741  3043                 ERS  XMH
2155  3043  BBB 0 24  0000  1802                 BUF1 0000
2156  1802  BBB 0 64  0000  2002                 STA1 0000    LBLX1
2157  1099  BBB 0 29  9999  1282  1             LDA1 9999    L0002
2158  0072  BBB 0 07  HHHH  0075  CASIN         IIR  HHHH                I.  I70. CASIN  ASSIGNING CONSTANTS.
2159  0075  BBB 0 39  0000  2402                 ERS1 0000                I70.ALREADY ASSIGNED
2160  2402  BBB 0 31  1805  1805                 CLL                      YES:IF THE CONSTANT HAS ALREADY BEEN ASSIGNED,
2161  1805  BBB 0 82  1608  1808                 TEQ          1F              OUTPUT THE ASSIGNMENT.#EXIT.
2162  1608  BBB 0 65  4926  0628                 STX  EXIT3               NO:
2163  0628  BBB 0 07  HHHH  1231                 IIR  HHHH                I71.PICK UNIQUE
2164  1231  BBB 0 35  4196  0648                 ERS  UNIQU                   PICK THE NEXT LOCATION IN UNIQUE STORAGE FOR
2165  0648  BBB 0 24  0000  2602                 BUF1 0000                    THIS CONSTANT
2166  2602  BBB 0 64  0000  2802                 STA1 0000
2167  2802  BBB 0 09  0001  2403                 LDX1 0001
2168  2403  BBB 0 65  4209  0811                 STX  TEMP2               I72.COMPILE CONSTANT
2169  0811  BBB 0 05  0413  4494                 LDX          ASM42           OUTPUT THE CONSTANT OUT-OF-SEQUENCE USING ASS
- 2170  0413  BBB 0 05  4926  4927               LDX  EXIT3   INCUQ            EMBLER 4(I90). #EXIT.
- 2171  1808  BBB 0 20  4408  0660  1           BUF  BIG01               CODING DETAILS:RX IS EXIT LINE, RB1 IS SYMBOL
2172  0660  BBB 0 77  0660  000C                 ATL          RX              TABLE REFERENCE. OUTPUT IS 01AAAA0000 IN RL.
2173  0173  BBB 0 65  0175  0377  ASM1           STX  PAR2    ASM11       I.  I1.  ASSEMBLR 1
2174  0377  BBB 0 50  0379  0181  ASM11          STL  EXIT7   LOOP            THIS IS A MACRO-ASSEMBLR
2175  0181  BBB 0 06  0184  0184  LOOP           CLX                          WHICH IS GIVEN A LIST OF TWO-DIGIT INSTRUC-
2176  0184  BBB 0 32  0800  0099                 SHR  0800    LOOP1           TION NUMBERS.  THESE NUMBERS ARE EITHER
2177  0099  BBB 0 65  0288  0290  LOOP1          STX  TMP13                   REFERENCES TO A LIST OF STANDARD INSTRUCTIONS
2178  0290  BBB 0 37  0400  0297                 SHL  0400                    WHICH ARE PROCESSED BY ASSEMBLER 2, OR THEY A
2179  0297  BBB 0 70  1299  000A                 ADD          RA              ARE REFERENCES TO PSEUDO-INSTRUCTIONS NUMBER
2180  1299  BBB 0 05  1300  0717                 LDX  I0000   1F    +15       I2 THRU I23.  THE PSEUDO-INSTRUCTIONS ARE
2181  0717  BBB 0 30  0519  0321  1             LDL          2F              GIVEN HER IN THIS SECTION.  THE PURPOSE OF
2182  0519  BBB 0 05  1340  0542                 LDX  I0040   1F              ASM1 IS TO STEP THROUGH ALL 2-DIGIT
2183  0321  BBB 0 87  0524  000C  2             TGR          RX              CODES, AS AN INTERPRETIVE ROUTINE.
2184  0524  BBB 0 25  000C  0128                 LDA  RX      TASM2           'LOOP' REPRESENTS THE PLACE TO RETURN TO
2185  0128  BBB 0 30  0130  4350  TASM2          LDL  IX      ASM2            STEP TO THE NEXT 2-DIGIT CODE.
2186  0130  BBB 0 25  0288  0181  IX             LDA  TMP13   LOOP
2187  1300  BBB 0 25  0175  0577  I0000          LDA  PAR2
2188  0577  BBB 0 32  0500  0185                 SHR  0500
2189  0185  BBB 0 35  0022  0379                 ERS  X9      EXIT7
2190  1324  BBB 0 26  0379  0379  I0024         CLA  EXIT7
2191                                                                  G   LIST OF INSTRUCTIONS
2192  1399  BBB 0 25  9901  9999  I0099         LDA  9901    9999       G   LDA1
2193  1398  BBB 0 25  9902  9999  I0098         LDA  9902    9999       G   LDA2
2194  1397  BBB 0 30  9901  9999  I0097         LDL  9901    9999       G   LDL1
2195  1396  BBB 0 30  9902  9999  I0096         LDL  9902    9999       G   LDL2
2196  1395  BBB 0 60  9901  9999  I0095         STA  9901    9999       G   STA1
2197  1394  BBB 0 50  9901  9999  I0094         STL  9901    9999       G   STL1
2198  1393  BBB 0 87  9905  9999  I0093         TGR  9905    9999       G   TGR5
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2199  1392  BBB 0 87  9903  9999   I0092  TGR   9903       9999       G   TGR3
2200  1391  BBB 0 82  9904  9903   I0091  TEQ   9904       9903       G   TEQ43
2201  1390  BBB 0 82  9904  9905   I0090  TEQ   9904       9905       G   TEQ45
2202  1389  BBB 0 00  9902  9999   I0089  JMP   9902       9999       G   JMP2
2203  1388  BBB 0 0G  0000  9999   I0088  IIR1  0000       9999       G   IIR10
2204  1387  BBB 0 85  9901  9999   I0087  MUL   9901       9999       G   MUL1
2205  1386  BBB 0 26  9999  9999   I0086  CLA   9999       9999       G   CLA
2206  1385  BBB 0 75  9901  9999   I0085  SUB   9901       9999       G   SUB1
2207  1384  BBB 0 75  0008  9999   I0084  SUB   0008       9999       G   SUBRL
2208  1383  BBB 0 87  9905  9904   I0083  TGR   9905       9904       G   TGR54
2209  1382  BBB 0 87  9903  9904   I0082  TGR   9903       9904       G   TGR34
2210  1381  BBB 0 20  9901  9999   I0081  BUF   9901       9999       G   BUF1
2211  1380  BBB 0 20  0008  9999   I0080  BUF   0008       9999       G   BUFRL
2212  1379  BBB 0 60  9903  9999   I0079  STA   9903       9999       G   STA3
2213  1378  BBB 0 70  9999  000A   I0078  ADD   9999       000A       G   ADD0A
2214  1377  BBB 0 00  9999  0000   I0077  JMP   9999       0000       G   JMP
2215  1376  BBB 0 25  0008  9999   I0076  LDA   0008       9999       G   LDARL
2216  1375  BBB 0 0G  8888  9999   I0075  IIR1  8888       9999       G   IIR1N
2217  1374  BBB 0 30  9905  9999   I0074  LDL   9905       9999       G   LDL3
2218  1302  BBB 0 25  0104  0506   I0002  LDA   PAR1                      I1. CHECK SPECIAL CASES
2219  0506  BBB 0 30  1908  0510          LDL   C0P                           I1,I2,AND I3 ARE USED TO PROVICE SLIGHTLY
2220  0510  BBB 0 82  0521  0313          TEQ   2F     +08  3F                BETTER CODE FOR CERTAIN BINARY OPERATORS
2221  1301  BBB 0 25  0104  0313   I0001  LDA   PAR1       3F                OR FOR IF-STATEMENTS WITH LABELS EQUAL, BY
2222  0313  BBB 0 30  0115  0917   3      LDL   C4#5                        CHANGING THE ORDER OF OPERATION. #LOOP.
2223  0917  BBB 0 82  0521  0130          TEQ   2F         IX
2224  0521  BBB 0 25  0123  0181   2      LDA                LOOP
2225  0123  BBB 0 98  0900  0000          CON   98090      00000      G   LDA2 P01
- 2226  1303  BBB 0 25  0104  0706   I0003  LDA   PAR1
2227  0706  BBB 0 30  0115  1917          LDL   C4#5
2228  1917  BBB 0 82  0542  0130          TEQ   1F         IX
2229  0542  BBB 0 25  0344  0181   1      LDA                LOOP
2230  0344  BBB 0 97  9811  0000          CON   97981      10000      G   LDL1 LDA2 PORL
2231  1304  BBB 0 07  HHHH  0307   I0004  IIR    HHHH                      I4. CHECK SUBSCRIPT
2232  0307  BBB 1 39  0001  2603          ERS3  0001                           WHEN A BINARY OPERATION BETWEEN TWO ARRAY
2233  2603  BBB 0 70  2005  000A          ADD                RA              VARIABLES IS USED, A TEST IS MADE HERE TO
2234  2005  BBB 0 25  0000  3002          LDA   0000                         SEE WHETHER EITHER SUBSCRIPT IS ALREADY IN
- 2235  3002  BBB 0 37  0400  1609          SHL   0400                         THE ACCUMULATOR, FOR EFFICIENCY.   #LOOP.
2236  1609  BBB 0 30  2243  2245          LDL   ACC
2237  2245  BBB 0 82  0130  0848          TEQ   IX
2238  0848  BBB 0 07  HHHH  0451          IIR    HHHH
2239  0451  BBB 1 39  0000  2803          ERS3  0000
2240  2803  BBB 0 70  2405  000A          ADD                RA
2241  2405  BBB 0 25  0000  3003          LDA   0000
2242  3003  BBB 0 37  0400  0810          SHL   0400
2243  0810  BBB 0 82  0542  1303          TEQ   1B         I0003
2244  1305  BBB 0 05  0130  0283   I0005  LDX   IX         CLACC      I5. CLEAR ACC
2245                                                                  X   IF THE ACCUMULATOR IN THE OBJECT PROGRAM
2246                                                                  X   IS IN USE, COMPILE THE INSTRUCTION
2247                                                                  X   'STA TEMP.'  #LOOP.
2248  1306  BBB 0 26  0709  0709   I0006  CLA                            I6. SET ACC AVAIL
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2249  0709  BBB 0 60  2243  0130          STA  ACC      IX        THE ACCUMULATOR IS SET AVAILABLE. SINCE THE
2250                                                           X   PREVIOUSLY COMPUTED RESULT IS TO BE USED
2251                                                           X   NEXT.  #LOOP.
2252  1307  BBB 0 00  1300  1300  I0007  JMP  I0000               I7. TRACE
2253                                TRCSW  EQU  I0007              NO: IF TRACE MODE IS NOT ON:#EXIT FROM ASM1.
2254                                TRCOF  EQU  I0000              YES:OTHERWISE PREPARE THE INSTRUCTION LDX NAME
2255  1855  BBB 0 25  4779  1881  TRCON  LDA  CHOLD                  PREPARATORY TO TRACING.  #LOOP.
2256  1861  BBB 0 30  0483  4260        LDL            CONST
2257  0483  BBB 0 05  0285  0072        LDX            CASIN
2258  0285  BBB 0 25  000B  0489        LDA  RL
2259  0489  BBB 0 70  0054  2057        ADD  BIG04
2260  2057  BBB 0 05  2259  0661        LDX  1F
2261  0661  BBB 0 30  0130  4709        LDL  IX        ASM34
2262  2259  BBB 0 32  1113  9135  1     ALF  TRACE
2263  1308  BBB 0 25  0104  1906  I0008 LDA  PAR1                I8. OP V2
2264  1906  BBB 0 05  1389  0191        LDX  I0089     1F            EITHER OP V2 NXT  OR
2265                                                           X      LDL V2,OP RL IS COMPILED.
2266                                                           X   'WE ARE WORKING ON THE BINARY OPERATION
2267                                                           X       V1 OP V2)  THEN#LOOP.
2268  1309  BBB 0 05  0104  2106  I0009 LDX  PAR1                I9. PO V1
2269  2106  BBB 0 25  0175  0777        LDA  PAR2                    NOTE: V1 OP V2   EQUALS  V2 PO V1
2270  0777  BBB 0 32  0500  0385        SHR   0500                   EITHER  PO V1 NXT  OR
2271  0385  BBB 0 60  0104  2306        STA  PAR1                    LDL V1, PO RL IS COMPILED.  #LOOP.
2272  2306  BBB 0 65  0175  0977        STX  PAR2
2273  0977  BBB 0 32  0500  0585        SHR   0500
2274  0585  BBB 0 05  0387  0191        LDX            1F
2275  0387  BBB 0 00  9901  9999        JMP   9901      9999
2276  0191  BBB 0 30  1908  0710  1     LDL  COP
2277  0710  BBB 0 82  0513  0713        TEQ  3F
2278  0713  BBB 0 25  000C  2117        LDA  RX
2279  2117  BBB 0 20  4247  0149        BUF  BIG30
2280  0149  BBB 0 30  1310  4350        LDL  I0010     ASM2
2281  0513  BBB 0 25  0175  1177  3     LDA  PAR2
2282  1177  BBB 0 35  4617  1619        ERS  X0
2283  1619  BBB 0 20  000C  0128        BUF  RX        TASM2
2284  1310  BBB 0 25  0104  2506  I0010 LDA  PAR1      1F        I10.OP RL
2285  1311  BBB 0 05  0104  2706  I0011 LDX  PAR1                I11.PO RL
2286  2706  BBB 0 25  0175  1777        LDA  PAR2                    THIS PSEUDO OP IS USED TO SELECT ONE OF TWO
2287  1777  BBB 0 32  0500  0785        SHR   0500                   ALTERNATIVES, WHICH ARE GIVEN AS PARAMETERS
2288  0785  BBB 0 60  0104  2906        STA  PAR1                    TO ASM1, DEPENDING ON WHICH OPERAND IS IN
2289  2906  BBB 0 65  0175  2506        STX  PAR2      1F            RL AND WHICH IS IN RA.  #LOOP.
2290  2506  BBB 0 35  0009  0181  1     ERS  H5        LOOP
2291  1312  BBB 0 05  0514  0513  I0012 LDX            3B        I12.OP RL NXT
2292  0514  BBB 0 00  000B  9999        JMP  RL         9999         COMPILE OP RL NXT.  #LOOP.
2293  1313  BBB 0 25  0175  1977  I0013 LDA  PAR2                I13.LIRJ NXT SUB
2294  1977  BBB 0 32  0400  0384        SHR   0400                   THIS COMPILES THE LINKAGE TO SUBROUTINES,
2295  0384  BBB 0 30  0186  0188        LDL  1F        CALPK         INCLUDING THE CONTROL INFORMATION TO BRING A
2296  0188  BBB 0 50  0201  0004  CALPK STL  EXIT4                  NEW SUBROUTINE IF THE SUBROUTINE HAS NOT
2297  0004  BBB 0 35  0406  2008        ERS  X45                     BEEN USED BEFORE. #LOOP.
2298  2008  BBB 0 70  1410  000A        ADD            RA
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2299    1410  BBB 0 0B  0000  0816                LIR1  0000
2300    0816  BBB 0 34  1750  0552                LDL1  W0000
2301    0552  BBB 0 25  4628  0180                LDA   MZERO
2302    0180  BBB 0 24  1750  0752                BUF1  W0000
2303    0752  BBB 0 60  4770  0572                STA   COMT
2304    0572  BBB 0 82  0201  0375                TEQ   EXIT4
2305    0375  BBB 0 64  1750  0952                STA1  W0000
2306    0952  BBB 0 06  0000  0556                I1R1  0000
2307    0556  BBB 0 05  0201  0204                LDX   EXIT4      SUBDF
2308    0186  BBB 0 25  0175  2177  1             LDA   PAR2
2309    2177  BBB 0 32  0600  0386                SHR    0600
2310    0386  BBB 0 30  0130  4970                LDL   IX         ASM36
2311    1314  BBB 0 25  4824  0126  I0014        LDA   DOVAR                    I14.STORE INTO RB1
2312    0126  BBB 0 70  0328  000A                ADD               RA               COMPILE  LIR1 0000 NXT. WITH THE DO VARIABLE
2313    0328  BBB 0 25  0001  0404                LDA    0001                      AS COMMENT.  #LOOP.
2314    0404  BBB 0 60  4770  1323                STA   COMT         I0023
2315    1323  BBB 0 25  4528  0930  I0023        LDA   LIR1         TAS32
2316    0930  BBB 0 30  0130  4556  TAS32        LDL   IX          ASM32
2317    4528  BBB 0 0B  0000  0000  LIR1         LIR1  0000        0000
2318    1315  BBB 0 25  4617  0719  I0015        LDA   XO                       I15.ATL CONDITIONALLY
2319    0719  BBB 0 35  4579  0331                ERS   IWORD                        COMPILE  ATL 0000 NXT  UNLESS THE PRECEDING
2320    0331  BBB 0 30  4528  0380                LDL   LIR1                         INSTRUCTION IN SEQUENCE WAS AN LIR3 (IN WHICH
2321    0380  BBB 0 82  0130  0183                TEQ   IX                           CASE THE ANSWER IS ALREADY IN RL). #LOOP.
2322    0183  BBB 0 30  0130  0319                LDL   IX          ATL
2323                                                                           I16.SHIFT
2324                                                                           X    I16 AND I17 ARE USED FOR SHIFT COMMANDS
2325                                                                           X    WHEN COMPILING CODE TO MULTIPLY BY POWERS
2326                                                                           X    OF 10.  #LOOP.
2327    1318  BBB 0 25  0175  2377  I0018        LDA   PAR2                    I18.UNARY OPERATOR
2328    2377  BBB 0 37  0400  0584                SHL    0400                        DEPENDING ON THE UNARY OPERATOR, THE
2329    0584  BBB 0 70  000A  0389                ADD   RA          -I18             SUBROUTINE REFERENCE IS COMPILED USING#I13.
2330    0390  BBB 0 05  0104  0507  &I18         LDX   PAR1
2331    0507  BBB 0 32  0500  0315                SHR    0500       1F
2332    0389  BBB 0 25  0104  0315  -I18         LDA   PAR1        1F
2333    0315  BBB 0 31  0118  0118  1            CLL
2334    0118  BBB 0 82  0130  0721                TEQ   IX
2335    0721  BBB 0 60  0175  1313                STA   PAR2        I0013
2336    1319  BBB 0 05  1121  4084  I0019        LDX                FARNL       I19.GO TO 3F,2:
2337    1121  BBB 0 60  0323  0125                STA   THREF                        USED FOR MAKING FORWARD REFERENCES AT
2338    0125  BBB 0 30  0927  4736                LDL   TOBSW       GOTO             THE BEGINNING OF DO LOOPS AND IN INPUT-
2339    0927  BBB 0 05  0329  4084  TOBSW        LDX   1F          FARNL            OUTPUT LISTS.  #LOOP.
2340    0140  BBB 0 05  0329  4084  TOB          LDX   1F          FARNL
2341    0329  BBB 0 60  0531  0733  1            STA   TWOB        2F
2342    0742  BBB 0 25  0544  0733  TOB10        LDA   NINEF       2F
2343    0733  BBB 0 60  4880  0130  2            STA   NXLOC       IX
2344    1320  BBB 0 05  0722  4084  I0020        LDX                FARNL       I20.TGR 9F 3F
2345    0722  BBB 0 32  0400  0529                SHR    0400                        THIS IS FOR THE TRANSFER INSTRUCTION FOR
2346    0529  BBB 0 35  4724  0576                ERS   XC                           EXITING FROM DO LOOPS.  #LOOP.
2347    0576  BBB 0 60  0544  0146                STA   NINEF
2348    0146  BBB 0 37  0400  0153                SHL    0400
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2349  0153  BBB 0 20  0355  0357                BUF   BIG87
2350  0357  BBB 0 05  0559  0161                LDX#  02000     00001
2351  0161  BBB 0 30  0163  4570                LDL               AS43
2352  0163  BBB 0 25  0323  0925                LDA   THREF
2353  0925  BBB 0 30  0130  0932                LDL   IX          FILNX
2354  0932  BBB 0 60  4880  4686  FILNX        STA   NXLOC       FILUP
2355  1321  BBB 0 25  0544  0346  I0021        LDA   NINEF                  I21.NINEF DO
2356  0346  BBB 0 20  4408  0560                BUF   BIG01                      THIS IS SIMPLY USED TO MARK THIS AS A DO
2357  0560  BBB 0 60  0544  0130                STA   NINEF       IX           RATHER THAN A DONT LOOP.
2358  1322  BBB 0 05  0724  4084  I0022        LDX               FARNL  I22.BUF      1F
2359  0724  BBB 0 60  0323  1125                STA   THREF                    USED AT BEGINNING OF FUNCTION OR SUBROUTINE.
2360  1125  BBB 0 32  0400  1132                SHR    0400                    #LOOP.
2361  1132  BBB 0 35  4724  0776                ERS   XC
2362  0776  BBB 0 20  1178  0580                BUF   BIG20
2363  0580  BBB 0 05  0382  0784                LDX#  00200     00010
2364  0784  BBB 0 30  0130  4570                LDL   IX          ASM3
2365                                                                  B.  ARITHMETIC OPERATORS
2366                                                                  X   THIS SECTION CONTAINS THE GENERATORS FOR
2367                                                                  X   ARITHMETIC OPERATORS, ENTERED FROM STEP G6
2368                                                                  X   OR FROM STEP G10.  AN ODD NUMBERED STEP HERE
2369                                                                  X   INDICATES AN ENTRY FROM STEP G6 (WHEN SYMBOL
2370                                                                  X   IS FIRST SENSED) AND AN EVEN NUMBERED STEP
2371                                                                  X   IN THIS SECTION INDICATES AN ENTRY FROM
2372                                                                  X   G10 ( OFF THE OPERATOR STACK ).
2373  0373  BBB 1 29  0000  0604  ARITH        LDA3  0000                G   ARITH SUBROUTINE
2374  0604  BBB 0 32  0400  1411                SHR    0400               G   DECIDES WHETHER WE HAVE FLT-FLT, FLT-FIX,
2375  1411  BBB 0 35  0613  0615                ERS   KON3               G   FIX-FLT, OR FIX-FIX ON BINARY OPERATORS
2376  0615  BBB 0 77  0615  1618                ATL                      G   AND ALSO DETERMINES TYPE OF RESULT.
2377  1618  BBB 0 70  000A  2423                ADD   RA
2378  2423  BBB 0 70  0008  0828                ADD   RL
2379  0828  BBB 0 77  0828  1631                ATL
2380  1631  BBB 1 29  9999  0601                LDA3  9999
- 2381  0601  BBB 0 32  0400  2408                SHR    0400
2382  2408  BBB 0 35  0613  0815                ERS   KON3
2383  0815  BBB 0 70  0008  0820                ADD   RL
2384  0820  BBB 0 70  2022  000A                ADD               RA
2385  2022  BBB 0 00  4000  4000                JMP   B0000
2386  4000  BBB 0 0G  0000  0654  B0000         IIR1   0000       2F
2387  4001  BBB 0 0G  0001  0654  B0001         IIR1   0001       2F
2388  4002  BBB 0 0G  0000  0654  B0002         IIR1   0000       2F
2389  4003  BBB 0 0G  0002  0654  B0003         IIR1   0002       2F
2390  4004  BBB 0 0G  0003  2608  B0004         IIR1   0003       1F
- 2391  4005  BBB 0 0G  0003  2608  B0005         IIR1   0003       1F
2392  4006  BBB 0 0G  0000  0654  B0006         IIR1   0000       2F
2393  4007  BBB 0 0G  0003  2608  B0007         IIR1   0003       1F
2394  4008  BBB 0 0G  0003  0612  B0008         IIR1   0003
2395  0612  BBB 0 05  4756  0658                LDX   BIG02       4F
-- 2396  2608  BBB 0 05  4408  0658  1           LDX   BIG01       4F
2397  0654  BBB 0 06  0658  0658  2             CLX   4F
2398  0658  BBB 0 65  0860  000A  4             STX   OTYPE       RA
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2399  0199  BBB 0 05  0801  0804  BINSB  LDX  CSUB   1F        G  BINSB GENERATES REFERENCE TO BINARY
2400  0800  BBB 0 05  1908  0804  BINOP  LDX  COP    1F        G  SUBROUTINE, BINOP IS FOR BINARY MACHINE OP.
2401  0804  BBB 0 30  4215  1617  1      LDL  OPX    BINAL     G  RB1 IS THE Q-TABLE ENTRY FOR THE ++ CASE.
2402  1617  BBB 0 50  1819  0821  BINAL  STL  &SAC
2403  0821  BBB 0 65  0104  0707         STX  PAR1
2404  0707  BBB 1 29  0000  1404         LDA3 0000                G  PICK UP THE PROPER J TABLE ENTRY --
2405  1404  BBB 0 05  000A  2808         LDX  RA                  G  SEE THE J-TABLE, J0000 THRU J0015.
2406  2808  BBB 0 35  4247  0649         ERS  BIG30
2407  0649  BBB 0 32  0F00  0062         SHR  0F00
2408  0062  BBB 0 35  0022  1824         ERS  X9
2409  1824  BBB 0 70  000A  0629         ADD  RA
2410  0629  BBB 0 77  0629  0232         ATL
2411  0232  BBB 0 25  0234  0436         LDA# 80000    0000H
2412  0436  BBB 1 39  9999  1401         ERS3 9999
2413  1401  BBB 0 70  0008  0606         ADD  RL
2414  0606  BBB 0 70  000A  1611         ADD  RA       -BM
2415  1612  BBB 0 30  1814  0042  &BM    LDL  ANSL     BME
2416  1611  BBB 0 77  1611  2014  -BM    ATL
2417  2014  BBB 0 37  0300  1620         SHL  0300
2418  1620  BBB 0 70  2222  000A         ADD           RA
2419  2222  BBB 0 0G  0000  0829         IIR1 0000
2420  0829  BBB 1 0G  9999  1233         IIR3 9999
2421  1233  BBB 0 25  0008  0437         LDA  RL
2422  0437  BBB 0 35  4617  0069         ERS  X0
2423  0069  BBB 0 32  0500  0077         SHR  0500
2424  0077  BBB 0 70  000A  0482         ADD  RA
2425  0482  BBB 0 70  000C  0487         ADD  RX
2426  0487  BBB 0 70  0689  000A         ADD           RA
2427  0689  BBB 0 25  1700  0302         LDA  J0000
2428  0302  BBB 0 09  0000  1604         LDX1 0000     7F
2429  1604  BBB 0 30  0806  0173  7      LDL           ASM1
2430  0806  BBB 0 70  0860  0463         ADD  OTYPE    SACC
2431  0463  BBB 0 70  4974  1818  SACC   ADD  BIG10    -SAC      G  MARK COMPUTER RESULT AS IN ACCUMULATOR
2432  1818  BBB 1 64  0000  1804  -SAC   STA3 0000                G  UNLESS TYPE IS 9 (FOR STORE OPERATORS).
2433  1804  BBB 1 0G  0000  3008         IIR3 0000
2434  3008  BBB 0 60  2243  1819         STA  ACC      &SAC
2435  1814  BBB 1 0G  0000  2018  ANSL   IIR3 0000                G  ANSL MEANS  L #  L OP R
2436  2018  BBB 0 30  2243  2445         LDL  ACC
2437  2445  BBB 0 82  1048  1248         TEQ           DOCK3
2438  1048  BBB 0 31  0651  0651         CLL
2439  0651  BBB 0 50  2243  1248         STL  ACC      DOCK3
2440  1248  BBB 1 0G  9999  4215  DOCK3  IIR3 9999     OPX
2441  1841  BBB 0 30  4215  0067  UNOP   LDL  OPX      1F        G  UNOP ENTRIES ARE STANDARD OPTIONS FOR
2442  0442  BBB 0 25  4301  0653  UNOP3  LDA  BIG90               G  UNARY OPERATORS
2443  0653  BBB 0 60  0860  0067         STA  OTYPE    1F
2444  0067  BBB 1 29  0000  2004  1      LDA3 0000     UNOP1
2445  2645  BBB 0 35  0009  1811  UNOP2  ERS  H5       1F
2446  2004  BBB 0 50  1819  1811  UNOP1  STL  &SAC      1F
2447  1811  BBB 0 65  0104  0907  1      STX  PAR1
2448  0907  BBB 0 32  0500  0515         SHR  0500
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2449  0515 888 0 35 0613 1415                ERS  KON3
2450  1415 888 0 70 1817 000A                ADD             RA
2451  1817 888 0 29 0000 1604                LDA1  0000      7B      G   SELECT J-TABLE ENTRY.
2452  4104 888 0 25 1907 0909  SIGN-         LDA  TWO9S              B1. MINUS SIGN
2453  0909 888 0 70 000C 0714                ADD  RX         -L1         CHECK IF THE PRECEDING ITEM WAS AN OPERAND OR
2454                                                                  X   RIGHT PARENTHESIS. IF SO, A BINARY MINUS
2455  0715 888 0 05 2317 4428  &L1           LDX  OUN-       -OP3    BIN:OPERATOR IS SUBSTITUTED AND WE GO TO STEP#G7.
2456  0714 888 0 30 0316 4211  -L1           LDL  OBIN-      -OP4    UN: IF NOT, A UNARY MINUS OPERATOR IS SUBSTITUTED
2457                                                                  X   AND WE GO TO STEP#G20.
2458  4105 888 0 25 1907 1909  SIGN&         LDA  TWO9S              B3. PLUS SIGN.
2459  1909 888 0 70 000C 0914                ADD  RX         -L2         CHECK AS IN STEP B1 FOR UNARY OR BINARY.
2460  0915 888 0 00 4140 4140  &L2           JMP  NORMX              BIN:ON BINARY PLUS,CHANGE TO THE BINARY ADD
2461                                                                  X   OPERATOR AND GO TO STEP#G7.
2462  0914 888 0 30 1052 4211  -L2           LDL  OBIN&      -OP4    UN: A UNARY PLUS IS IGNORED. GO TO#G1.
2463  4103 888 0 25 4417 0919  BIN-          LDA  RATOR              B4. SUBTRACTION OP
2464  0919 888 0 70 1921 000A                ADD             RA      IF: CHECK IF THE OPERATOR IN OHOLD IS A RIGHT
2465  1921 888 0 30 0001 2404                LDL   0001              PARENTHESIS AND IF THE TOP OF THE OPERATOR
2466  2404 888 0 25 1406 1809                LDA  OIF%               STACK IS LEFT PARENTHESIS AFTER AN IF. IN
2467  1809 888 0 82 1412 1812                TEQ             1F      THIS CASE AND IF THE SIGNS OF THE TOP TWO
- 2468  1412 888 0 30 4213 0265               LDL  OHOLD              OPERANDS ARE EQUAL, SUBTRACTION IS NOT
2469  0265 888 0 25 4392 0094                LDA  BIG70              CARRIED OUT, THE IF OPERATOR IS REMOVED
2470  0094 888 0 82 0497 1812                TEQ             1F      FROM THE STACK AND WE GO TO STEP #B27.
2471  0497 888 1 29 0000 2604                LDA3  0000              SUB:OTHERWISE NEGATE THE TOP OPERAND AND
2472  2604 888 0 37 0900 1416                SHL   0900              CHANGE TO BINARY PLUS, STEP#B8.
2473  1416 888 0 77 1416 2019                ATL
2474  2019 888 1 29 9999 1601                LDA3  9999
2475  1601 888 0 37 0900 0813                SHL   0900
2476  0813 888 0 82 1616 1812                TEQ             1F
2477  1616 888 0 30 2218 4426                LDL  COLON      REMRT
2478  1812 888 1 29 0000 2804  1             LDA3  0000
2479  2804 888 0 70 4424 2027                ADD  LIT5
2480  2027 888 1 64 0000 4106                STA3  0000      BIN&
2481  4102 888 1 29 0000 3004  UN-           LDA3  0000              B6. NEGATION OP
2482  3004 888 0 70 4424 2227                ADD  LIT5               CHANGE SIGN OF TOP OPERAND, EXIT TO#G10.
2483  2227 888 1 64 0000 4215                STA3  0000      OPX
2484  4106 888 0 08 1100 0373  BIN&           LIR1 A0000      ARITH   B8. ADDITION OP
2485  1100 888 0 08 1000 0199  A0000          LIR1 Q0000      BINSB   FLFXCHECK TYPES OF OPERANDS. IF THEY ARE MIXED
2486  1101 888 0 25 1903 0305  A0001          LDA             BINER       GIVE AN ERROR#ALARM.
2487  1903 888 0 07 0500 0000                CON  07050      00000   G   I&A ERR
- 2488  1102 888 0 25 0304 0305  A0002        LDA             BINER   FLFLIF BOTH ARE FLOATING POINT,GO TO#B90.
2489  0304 888 0 06 0500 0000                CON  06050      00000   G   A&I ERR
- 2490  0305 888 0 30 1814 4514  BINER        LDL  ANSL       ALARM   FXFXIF FIXED POINT, CHECK IF WE ARE ADDING A
2491  1103 888 0 25 4417 1919  A0003          LDA  RATOR              CONSTANT IN AN ARRAY SUBSCRIPT. IF NOT,
2492  1919 888 0 70 2121 000A                ADD             RA      GO TO#B89. HOWEVER IF WE ARE ADDING  0 + V
2493  2121 888 0 25 0001 2605                LDA   0001              THE ADDITION IS SUPPRESSED.
2494  2605 888 0 30 2009 2011                LDL  OARA%      ARR     IN THE ARRAY SUBSCRIPT CASE, RECORD IF THE
2495  2011 888 0 82 2214 2414                TEQ  2F                 CONSTANT IS GREATER THAN +1. MULTIPLY THE
2496  2414 888 0 30 1816 2418                LDL  OARA*              CONSTANT BY THE APPROPRIATE DIMENSION
2497  2418 888 0 82 2214 2421                TEQ  2F         -ADD    AND ADD THIS TO THE BASE. EXIT TO#G10.
2498  2421 888 1 29 9999 1801  -ADD          LDA3  9999
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2499  1801  BBB 0 30  1051  0853            LDL  CONO
2500  0853  BBB 0 82  0856  1056            TEQ  ANSR
2501  1056  BBB 0 08  1030  0800            LIR1 Q0030      BINOP
2502  0856  BBB 1 29  0000  2805  ANSR      LDA3  0000                    G   ANSR MEANS   R EQUALS  L OP R
2503  2805  BBB 1 64  9999  2001            STA3  9999
2504  2001  BBB 1 0G  0000  3005            IIR3  0000
2505  3005  BBB 0 30  2243  2845            LDL  ACC
2506  2845  BBB 0 82  1648  1248            TEQ                 DOCK3
2507  1648  BBB 1 0G  9999  2852            IIR3  9999
2508  2852  BBB 0 60  2243  4215            STA  ACC        OPX
2509  2214  BBB 1 29  0000  1606  2         LDA3  0000
2510  1606  BBB 0 06  2409  2409            CLX
2511  2409  BBB 0 32  0100  1413            SHR   0100
2512  1413  BBB 0 37  0700  2623            SHL   0700
2513  2623  BBB 0 70  000A  2421            ADD  RA         -ADD
2514  2422  BBB 0 07  HHHH  2025  &ADD      IIR   HHHH
2515  2025  BBB 1 39  0000  1806            ERS3  0000
2516  1806  BBB 0 70  2609  000A            ADD              RA
2517  2609  BBB 0 30  0001  2006            LDL   0001
2518  2006  BBB 0 26  2809  2809            CLA
2519  2809  BBB 0 75  000C  2614            SUB  RX
2520  2614  BBB 0 36  2017  2017            CAA
2521  2017  BBB 0 20  000B  1621            BUF  RL
2522  1621  BBB 0 77  1621  2024            ATL
2523  2024  BBB 0 25  4095  1047            LDA  KON2
2524  1047  BBB 0 87  1850  2050            TGR  1F
2525  2050  BBB 1 25  9999  2401            LDA2  9999
2526  2401  BBB 0 20  4424  2026            BUF  LIT5
2527  2026  BBB 1 60  9999  1850            STA2  9999      1F
2528  1850  BBB 1 85  9998  0275  1         MUL2  9998
2529  0275  BBB 1 25  9999  2601            LDA2  9999
2530  2601  BBB 0 70  000C  2406            ADD  RX
2531  2406  BBB 1 60  9999  1814            STA2  9999      ANSL
2532                                        HHH
2533  4111  BBB 0 30  1913  4044  SIGN*      LDL             SCAN        B11.ASTERISK
2534  1913  BBB 0 30  1915  2517            LDL  0*                         CHECK FOR SECOND ASTERISK AND CHANGE TO A
2535  2517  BBB 0 82  1120  2120            TEQ  SGN**      &FNC1           MULTIPLY OR POWER OPERATOR; GO TO#G7.
2536  2120  BBB 0 07  1054  4710  &FNC1      IIR  T0004      DIVT2
2537  4112  BBB 0 08  1104  0373  BIN*       LIR1 A0004      ARITH       B12.MULTIPLY
2538  1104  BBB 0 08  1004  0199  A0004      LIR1 Q0004      BINSB       FLFLIF FLOAT-FLOAT, GO TO#B90.
2539  1105  BBB 0 25  2107  0305  A0005      LDA             BINER       FLFXIF MIXED TYPE, GIVE ERROR#ALARM.
2540  2107  BBB 0 11  1310  0905            CON  11131      00905       G   FLOATING SUBSCRIPT OR I*A ERROR
2541  1106  BBB 0 25  2108  0305  A0006      LDA             BINER
2542  2108  BBB 0 08  0500  0000            CON  08050      00000       G   A*I ERR
2543  1107  BBB 1 29  0000  2606  A0007      LDA3  0000                  FXFXIF FIX-FIX, SET 0*V EQUAL TO 0. IN OTHER
2544  2606  BBB 0 30  1051  1853            LDL  CONO                       CASES, WE MAY CHECK FOR POSSIBILITY OF
2545  1853  BBB 0 82  0856  1856            TEQ  ANSR       KON*E           ADD RA  AND/OR  SHIFT COMMNDS TO IMPLEMENT
2546                                                                    X   MULTIPLICATION, ELSE GO TO#B90.
2547  4101  BBB 0 05  2103  4428  SIGN%      LDX  OLPRN      -OP3        B15.LEFT PARENTHESIS
2548  4113  BBB 0 07  HHHH  0516  SIGN.      IIR   HHHH
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2549  0516 BBB 1 35 0000 000A            ERS2  0000     RA          PUT A LEFT PARENTHESIS OPERATOR ON THE STACK,
2550  4114 BBB 1 25 0000 2806 SIGN$      LDA2  0000                 STEP#G20. WHEN IT COMES OFF THE STACK IT WILL
2551  2806 BBB 0 35 4724 2226            ERS   X*                   NECESSARILY BE FORCED OFF BY ITS MATCHING
2552                                                              X   RIGHT PARENTHESIS AND IN THIS CASE
2553                                                              X   WE WILL SIMPLY GO TO STEP G1.
2554  2226 BBB 0 37 0400 000A            SHL   0400     RA
2555  4115 BBB 0 08 1108 0373 SIGN/      LIR1  A0008    ARITH       B18.DIVISION
2556  1108 BBB 0 08 1008 0199 A0008      LIR1  Q0008    BINSB       FLFXGIVE ERROR#ALARM IF MIXED TYPE, OTHER#ISE
2557  1109 BBB 0 25 0311 0305 A0009      LDA           BINER       OTH:GO TO#B90.
2558  0311 BBB 0 16 0500 0000            CON   16050    00000       G   I/A ERR
2559  1110 BBB 0 25 0312 0305 A0010      LDA           BINER
2560  0312 BBB 0 15 0500 0000            CON   15050    00000       G   A/I ERR
2561  1111 BBB 0 08 1012 0199 A0011      LIR1  Q0012    BINSB
2562  1120 BBB 0 05 0922 4428 SGN**      LDX   OBN**    -OP3
2563  4116 BBB 0 08 1112 0373 BIN**      LIR1  A0012    ARITH       B20.EXPONENTIATION
2564  1112 BBB 0 08 1016 0199 A0012      LIR1  Q0016    BINSB       FXFLGIVE ERROR#ALARM IF FIX**FLOAT
2565  1113 BBB 0 25 2115 0305 A0013      LDA           BINER       **2:IF RAISING TO THE SECOND POWER, GO TO THE
2566  2115 BBB 0 17 0500 0000            CON   17050    00000       G   I**A ERR
2567  1114 BBB 0 08 1020 2717 A0014      LIR1  Q0020    1F              UNARY SQUARING OPERATOR,STEP#U10.
- 2568  1115 BBB 0 08 1025 2717 A0015      LIR1  Q0025    1F          OTH:OTHERWISE GO TO#B90.
2569  2717 BBB 1 29 0000 3006 1          LDA3  0000
2570  3006 BBB 0 30 3009 2411            LDL   CON2
2571  2411 BBB 0 82 2814 0199            TEQ   SQUAR    BINSB
2572  4162 BBB 0 08 1038 0965 BLAND      LIR1  Q0038    1F          B22.AND,OR
- 2573  4163 BBB 0 08 1042 0965 BOR        LIR1  Q0042    1F              FOR BOOLEAN AND,OR WE SET THE TYPE OF THE
2574  0965 BBB 0 05 4756 1610 1          LDX   BIG02                   RESULT TO UNSPECIFIED, THEN GO TO#B89.
2575  1610 BBB 0 65 0860 0800            STX   OTYPE    BINOP
2576  4107 BBB 0 30 2109 4044 WDIF       LDL           SCAN        B25.WORD IF
2577  2109 BBB 0 30 4221 0523            LDL   LPREN                   CHECK THAT A LEFT PARENTHESIS FOLLOWS,ELSE
2578  0523 BBB 0 82 0326 0526            TEQ           MLP             GIVE AN ERROR ALARM. PUT A SPECIAL IF-LEFT-
2579  0326 BBB 0 05 1406 4428            LDX   OIF%     -OP3            PARENTHESIS ON THE STACK,AT STEP#G20.
2580  4108 BBB 1 0G 0001 0512 IF%        IIR3  0001                 B26.IF-LEFT-PAREN
2581  0512 BBB 0 30 1051 2053            LDL   CONO                    AT THIS POINT WE HVE PROCESSED THE EXPRESSION
2582  2053 BBB 1 54 0000 2218            STL3  0000     COLON          IN AN IF-STATEMENT AND MUST COMPARE IT
2583  2218 BBB 1 07 0001 2622 COLON      IIR2  0001                    AGAINST ZERO.THEREFORE THE CONSTANT ZERO IS
2584  2622 BBB 0 25 2224 2426            LDA   IFMD                    PUT ON TOP OF THE OPERAND STACK.
2585  2426 BBB 1 60 0000 1810            STA2  0000     EXPL        B27.FINISH IF-STATEMENT
2586  1810 BBB 0 30 4140 0642 EXPL       LDL   NORMX    EXPLB           SET UP IF MODE, THEN PROCESS THE STATEMENT
2587  0642 BBB 0 25 0244 1246 EXPLB      LDA   LEXP                    NUMBERS. CHECK THAT THERE ARE EXACTLY THREE,
2588  1246 BBB 0 60 4206 000B            STA   LESW     RL             THEN CHOOSE THE BEST CODING SEQUENCE BASED
2589  0589 BBB 0 30 1810 2012 IF,        LDL   EXPL     DOIF           ON EQUALITIES BETWEEN THESE.
2590  2012 BBB 1 25 0000 2010 DOIF       LDA2  0000
2591  2010 BBB 0 70 2212 2015            ADD   BIG40    -IF1
2592  2016 BBB 0 25 2618 0336 &IF1       LDA           NOMAL
2593  2618 BBB 0 18 0020 0000            CON   18002    00000       G   EXTRA COMMA
2594  2015 BBB 1 60 0000 000B -IF1       STA2  0000     RL
2595  0195 BBB 1 25 0000 2410 IF$        LDA2  0000
2596  2410 BBB 0 70 2212 2215            ADD   BIG40    -IF2
- 2597  2215 BBB 0 30 2216 2818 -IF2       LDL   &IF2     MCAL
2598  2818 BBB 0 25 1820 4514 MCAL       LDA           ALARM
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2599   1820  888 0 32  2000  0000            CON  32200    00000        G   MISSING COMMA
2600   2216  888 1 29  9996  0198  &IF2      LDA3  9996
2601   0198  888 0 37  0900  2610            SHL   0900
2602   2610  888 0 70  000A  2415            ADD   RA        -IF3
2603   2416  888 1 34  0000  3052  &IF3      LDL3  0000              +50
2604   3052  888 1 29  9998  2250            LDA3  9998              +50
2605   2250  888 1 64  0000  2253            STA3  0000              +50
2606   2253  888 1 54  9998  2810            STL3  9998        1F    +02
2607   2415  888 1 29  0000  2810  -IF3      LDA3  0000        1F
2608   2810  888 1 34  9999  2801  1         LDL3  9999
2609   2801  888 0 82  3010  2611            TEQ   5F
2610   2611  888 1 34  9998  1400            LDL3  9998
2611   1400  888 0 82  2811  3011            TEQ   3F
2612   3011  888 1 29  9999  3001            LDA3  9999
2613   3001  888 0 82  2412  2612            TEQ   4F
2614   2612  888 0 05  3014  2616            LDX   C345      1F
- 2615  2412  888 0 05  1615  2616  4         LDX   C3#4      1F
2616   2811  888 0 05  1613  2616  3         LDX   C3#5      1F
2617   3010  888 0 05  0115  2616  5         LDX   C4#5      1F
2618   2616  888 1 0G  9997  2020  1         IIR3  9997
2619   2020  888 0 30  2822  1617            LDL   D1M$      BINAL
2620   2220  888 0 30  3022  2424  UASW       LDL   DUA       1F
- 2621  1821  888 0 30  3022  2424  MISUB      LDL   DUA       1F
2622   2424  888 0 25  2626  1628  1         LDA             PANIC
2623   2626  888 0 32  1300  0000            CON  32130    00000        G   MISSING SUBSCRIPT
2624   0526  888 0 60  4834  0536  MLP       STA   DSAVE     1F
2625   0536  888 0 30  0338  0340  1         LDL   1F
2626   0340  888 0 25  0942  4514            LDA             ALARM
2627   0942  888 0 32  2425  0000            CON  32242    50000        G   MISSING LEFT PARENTHESIS
2628   0338  888 0 07  1066  4698  1         IIR   T0016     DIVRT
2629   1629  888 0 30  1831  1633  MRP       LDL   1F
2630   1633  888 0 25  0635  4514            LDA             ALARM
2631   0635  888 0 32  2200  2500            CON  32220    02500        G   MISSING RIGHT     PARENTHESIS
2632   1831  888 0 07  1063  4698  1         IIR   T0013     DIVRT
2633                       BINOP
2634
2635
2636
2637
2638
2639
2640
2641
2642
2643                       $INSB
2644
2645
2646
2647
2648
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B89.GENERATE MACHINE OP
X   GENERATE CODING FOR THE MACHINE OPS
X   ADD,SUB,ERS, OR BUF, USING ASSEMBLER
X   1 (ROUTINE I), AND USING ONE OF 16 TABLE
X   ENTRIES DEPENDING ON WHETHER THE OPERANDS
X   ARE       0 SIMPLE VARIABLES, ETC.
X             1 IN THE ACCUMULATOR
X             2 INDEX REGISTER 1
X             3 ARRAY VARIABLES
X   EXIT TO#G10.
B90.GENERATE LIBRARY REF
X   GENERATE A REFERENCE TO A BINARY LIBRARY
X   SUBROUTINE. THERE ARE 8 CASES DEPENDING
X   ON WHETHER EITHER OPERAND IS NEGATED, AND
X   DEPENDING WHICH OPERAND WAS MOST CONVENIENT
X   TO PLACE IN REGISTER L.  THESE CASES ARE
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2649                                                                    X   SELECTED BY REFERENCING A TABLE ENTRY
2650                                                                    X   AS IN STEP B89 AND GOING TO ASSEMBLER 1
2651                                                                    X   (ROUTINE I). EXIT TO#G10.
2652  4217  BBB 0 30  2219  4044   ARRAY   LDL                SCAN      A.  PROCESSING OF ARRAY SUBSCRIPTS
2653  2219  BBB 0 30  4221  2823           LDL   LPREN                      WHEN A DIMENSIONED VARIABLE IS SENT FROM THE
2654  2823  BBB 0 82  2826  2220           TEQ                UASW          SCANNER. ENTRY IS MADE TO A1.  A COMMA
2655  2826  BBB 0 07  1050  4086           IIR   T0000        DIVT1         BETWEEN SUBSCRIPTS CAUSES ENTRY TO A10.
2656  4110  BBB 0 07  HHHH  2113   TARA%   IIR   HHHH                    A1. IS LEFT PAREN NEXT
2657  2113  BBB 1 39  0000  2812           ERS3  0000                     NO: SCAN NEXT ITEM. IF IT IS NOT A LEFT
2658  2812  BBB 1 60  0001  3012           STA2  0001                         PARENTHESIS,GO TO THE UNDIMENSIONED ARRAY
2659  3012  BBB 0 25  4016  3018           LDA   LIT1                         #SWTCH. THIS SWITCH IS NORMALLY SET TO THE
2660  3018  BBB 1 60  0002  1813           STA2  0002                         'MISSING LEFT PARENTHESIS' ALARM WHICH
2661  1813  BBB 0 25  1815  2217           LDA   FOR9S                        INSERTS A LEFT PARENTHESIS INTO THE
2662                                                                    X   STATEMENT AND RETURNS HERE.
2663  2217  BBB 1 60  0003  2013           STA2  0003                   YES:
2664  2013  BBB 0 30  2615  2417           LDL   ARAMD                  A2. SET ARRAY MODE
2665  2417  BBB 0 05  2009  4235           LDX   0ARA%       MDOP
2666                                                                    X   THE MODE STACK RECEIVES FOUR NEW ENTRIES:
2667                                                                    X   2 0000  ARRAY MODE (A10 FOR COMMA,
2668                                                                    X                MISSING RIGHT PAREN FOR $)
2669                                                                    X   2 9999  BASE CALCULATION
2670                                                                    X   2 9998  CURRENT PRODUCT OF DIMENSIONS
2671                                                                    X   2 9997  REFERENCE TO DIMENSION LIST
2672                                                                    A3. EMIT % 0 +
2673                                                                    X   FOR CONVENIENCE, THE CHARACTER ( 0 + ARE
2674                                                                    X   INSERTED. THIS LEFT PARENTHESIS IS A SPECIAL
2675                                                                    X   ONE WHICH SENDS CONTROL TO STEP A20 WHEN
2676                                                                    X   THE MATCHING RIGHT PARENTHESIS COMES ALONG.
2677                                                                    X   EXIT TO#G1.
2678  0478  BBB 1 29  0000  2213   INDEX   LDA3  0000                   A10.CHECK INDEX.
2679  2213  BBB 0 30  4431  1833           LDL   BIG21                      IF THIS IS THE FIRST SUBSCRIPT AND ITS
2680  1833  BBB 0 82  0636  000C           TEQ                RX            CURRENT VALUE IS RB1 CODE, INDEXING IS SET
2681  0636  BBB 1 30  9999  2413           LDL2  9999                       UP AND THE SUBSCRIPT IS REPLACED BY ZERO.
2682  2413  BBB 0 25  2815  2617           LDA#  04997        00000         THIS OCCURS ONLY IF THE FIRST SUBSCRIPT IS
2683  2617  BBB 0 87  000C  2420           TGR   RX                         DOVAR & CONSTANT, WHERE THE CONSTANT IS
2684  2420  BBB 0 25  3023  2225           LDA   XMC                        GREATER THAN -30, AND IF WE ARE NOT CALLING
2685  2225  BBB 1 35  9996  0398           ERS2  9996                       A FUNCTION.
2686  0398  BBB 0 30  1600  2613           LDL   FCMD                       THE IMPORTANT ASSUMPTION IS MADE HARE THAT
2687  2613  BBB 0 82  000C  2816           TEQ   RX                         NEITHER UNIQUE NOR COMMON STORAGE WILL BE
2688  2816  BBB 1 25  9999  2813           LDA2  9999                       ASSIGNED TO CORE LOCATIONS B000 - B029.
2689  2813  BBB 0 20  3015  2817           BUF#  00000        04000         WITH THIS CONVENTION, THE NUMBER OF SAD
2690  2817  BBB 1 60  9999  3013           STA2  9999                       ARRAYS(SEE SECTION A24) IS GREATLY REDUCED.
2691  3013  BBB 0 25  1051  2453           LDA   CONO
2692  2453  BBB 1 64  0000  000C           STA3  0000         RX
2693  0493  BBB 1 25  9999  3016   PNSUB   LDA2  9999                   A11.POTENTIAL NEGATIVITY
2694  3016  BBB 0 37  0900  1828           SHL   0900                       IF ANY CONSTANTS GREATER THAN 1 OCCURRED
2695  1828  BBB 0 70  000A  2033           ADD   RA           -PN           DURING THE LAST SUBSCRIPT ALONG WITH
2696  2034  BBB 0 30  1051  2653   &PN     LDL   CONO                      ANYTHING OTHER THAN DOVAR, THIS ARRAY IS
2697  2653  BBB 1 29  0000  3017           LDA3  0000                       MARKED AS HAVING A POTENTIALLY NEGATIVE
2698  3017  BBB 0 82  2620  2820           TEQ   2F                         SUBSCRIPT.
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2699  2820  BBB 0 30  4431  2233          LDL  BIG21
2700  2233  BBB 0 82  2620  0836          TEQ  2F
2701  0836  BBB 0 25  4016  0468          LDA  LIT1
2702  0468  BBB 1 20  9999  2419          BUF2  9999      1F
2703  2620  BBB 1 25  9999  2419  2       LDA2  9999      1F
2704  2419  BBB 0 35  2021  2624  1       ERS#  HHHHH     HHHHC
2705  2624  BBB 1 60  9999  000C          STA2  9999      RX
2706  2033  BBB 0 00  000C  000C  -PN      JMP   RX
2707  2307  BBB 0 25  4417  2319  ARA,    LDA   RATOR
2708  2319  BBB 0 70  2321  000A          ADD             RA
2709  2321  BBB 0 30  0001  2619          LDL    0001
2710  2619  BBB 0 25  2009  2819          LDA   0ARA%
2711  2819  BBB 0 82  2824  3024          TEQ             1F     +02
2712  2824  BBB 0 05  3024  0478          LDX   1F        INDEX
2713  3024  BBB 0 05  3026  0493  1       LDX             PNSUB
2714  3026  BBB 0 07  0001  1829          IIR    0001                    A12.ADJUST MULTIPLIER
2715  1829  BBB 1 70  9997  1800          ADD2  9997                        IF THERE ARE NO MORE DIMENSIONS, THE EXTRA
2716  1800  BBB 1 60  9997  0399          STA2  9997                        SUBSCRIPT ALARM IS GIVEN, ELSE IT IS
2717  0399  BBB 0 70  3019  000A          ADD             RA                MULTIPLIED TO GIVE THE CURRENT PRODUCT OF
2718  3019  BBB 0 25  0001  3020          LDA    0001                       DIMENSIONS.
2719  3020  BBB 0 77  3020  2425          ATL
2720  2425  BBB 0 35  0043  3045          ERS   XM
2721  3045  BBB 0 82  1848  2048          TEQ   1F
2722  2048  BBB 0 30  2450  2853          LDL   2F
2723  2853  BBB 0 25  2055  4514          LDA             ALARM
2724  2055  BBB 0 18  0013  0000          CON   18001     30000       G   EXTRA SUBSCRIPT
2725  1848  BBB 0 20  2650  3053  1       BUF#  01000     05000       A13.EMIT  + N ( 0 +
2726  3053  BBB 0 60  1058  1260          STA   T0008                     FOR CONVENIENCE, THE COMMA IS TRANSFORMED
2727  1260  BBB 0 25  0008  0064          LDA   RL                        INTO THE CHARACTERS +N(0+    THIS LEFT
2728  0064  BBB 0 70  0266  000A          ADD             RA              PARENTHESIS IS LIKE A MULTIPLICATION SYMBOL,
2729  0266  BBB 0 30  0001  2221          LDL    0001                     ONLY THE CHECK AT STEP A11 IS MADE FIRST.
2730  2221  BBB 1 85  9998  0475          MUL2  9998
2731  0475  BBB 0 30  000C  0279          LDL   RX
2732  0279  BBB 0 32  0400  2286          SHR    0400
2733  2286  BBB 1 65  9998  2000          STX2  9998
2734  2000  BBB 1 25  9999  2621          LDA2  9999
2735  2621  BBB 0 75  000B  2427          SUB   RL
2736  2427  BBB 1 60  9999  2450          STA2  9999      2F
2737  2450  BBB 0 07  1057  4698  2       IIR   T0007     DIVRT
2738  0538  BBB 0 05  4112  0493  ARA*    LDX   BIN*      PNSUB
2739  1139  BBB 0 05  0541  0478  ARA%    LDX             INDEX       A20.INDEXING,NEGATIVITY
2740  0541  BBB 0 05  0143  0493          LDX             PNSUB           WE HAVE NOW SCANNED THE ENTIRE SUBSCRIPT
2741  0143  BBB 1 29  0000  2821          LDA3   0000                     OF THE ARRAY. STEPS A10 AND A11 ARE PERFORMED
2742  2821  BBB 0 35  4740  1242          ERS   X1                        THEY ARE REDUNDANT UNLESS THE ARRAY IS
2743  1242  BBB 0 70  4225  0678          ADD   BIG99     -CHFL           SINGLY SUBSCRIPTED.
2744  0678  BBB 0 30  0679  2081  -CHFL    LDL   &CHFL                   A21.CHECK FIXED POINT
2745  2081  BBB 0 25  0683  4514          LDA             ALARM           IF SUBSCRIPT IS FLOATING, GIVE ERROR ALARM.
2746  0683  BBB 0 11  1300  0000          CON   11130     00000       G   FLOATING SUBSCRIPT
2747  0679  BBB 0 05  2281  0883  &CHFL    LDX   1F        MAGET       A22.COMPUTE SUBSCRIPT
2748  0883  BBB 1 29  0000  3021  MAGET    LDA3   0000
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2749  3021  BBB 0 35  2625  2627                ERS# C0000   00005
2750  2627  BBB 0 77  2627  0430                ATL
2751  0430  BBB 0 37  0900  1642                SHL   0900
2752  1642  BBB 0 20  000B  1646                BUF   RL
2753  1646  BBB 0 70  0355  0758                ADD   BIG87   -MAG
2754  0759  BBB 0 30  000C  0363  &MAG          LDL   RX      GET
2755  0758  BBB 0 00  000C  000C  -MAG          JMP   RX
2756  2281  BBB 1 25  9996  0598  1            LDA2  9996
2757  0598  BBB 0 30  2400  2825                LDL   EQUMD
2758  2825  BBB 0 82  2028  2228                TEQ   AEQU
2759  2228  BBB 1 29  9999  3025                LDA3  9999
2760  3025  BBB 0 30  2827  2029                LDL   7F
2761  2029  BBB 0 05  2031  4744                LDX           ASIGN
2762  2031  BBB 0 07  HHHH  0434                IIR   HHHH
2763  0434  BBB 0 35  000B  0638                ERS   RL
2764  0638  BBB 1 70  9999  3027                ADD2  9999
2765  3027  BBB 1 60  9999  2428                STA2  9999
2766  2428  BBB 0 25  000B  0432                LDA   RL
2767  0432  BBB 0 35  4740  1842                ERS   X1
2768  1842  BBB 0 60  4209  0861                STA   TEMP2
2769  0861  BBB 0 06  0264  0264                CLX
2770  0264  BBB 0 32  0400  0271                SHR   0400
2771  0271  BBB 0 70  0273  000A                ADD           RA
2772  0273  BBB 0 30  4195  0697                LDL   STORE
2773  0697  BBB 1 25  9999  2628                LDA2  9999
2774  2628  BBB 0 75  4623  0676                SUB   BIG05
2775  0676  BBB 0 70  4209  0712                ADD   TEMP2
2776  0712  BBB 0 87  2315  2515                TGR   6F
2777  2515  BBB 0 30  4209  0361                LDL   TEMP2
2778  0361  BBB 0 70  4298  2828                ADD   KON30
2779  2828  BBB 0 87  2231  2315                TGR           6F
2780  2231  BBB 0 37  0900  0444                SHL   0900
2781  0444  BBB 0 87  2315  1247                TGR   6F
2782  1247  BBB 1 29  0000  3028                LDA3  0000
2783  3028  BBB 0 30  1051  0854                LDL   CON0
2784  0854  BBB 0 82  2257  2457                TEQ   5F
2785  2457  BBB 1 25  9999  2229                LDA2  9999
2786  2229  BBB 0 35  3023  2429                ERS   XMC
2787  2429  BBB 0 20  4209  1861                BUF   TEMP2
2788  1861  BBB 0 20  4247  1899                BUF   BIG30   9F
2789  2315  BBB 0 25  4209  0561  6             LDA   TEMP2
2790  0561  BBB 0 06  0164  0164                CLX
2791  0164  BBB 0 32  0500  0772                SHR   0500
2792  0772  BBB 0 20  1178  0780                BUF   BIG20   8F
2793  2827  BBB 0 25  000B  2431  7             LDA   RL
2794  2431  BBB 0 32  0400  0838                SHR   0400
2795  0838  BBB 0 35  4724  0876                ERS   XC
2796  0876  BBB 0 20  4974  0780                BUF   BIG10   8F
2797  0780  BBB 0 77  0780  1183  8             ATL
2798  1183  BBB 1 25  9999  2629                LDA2  9999
```

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                    ITSELF, PRODUCE CODE TO LOAD IT WITH TRUE
                    SIGN INTO THE ACCUMULATOR.

                A23.EQUIVALENCE DECL.
                YES:IF WE ARE IN AN EQUIVALENCE DECLARATION,
                    EXIT TO THE EQUIVALENCE ROUTINE#E30.
                NO:
                A24.WHAT TYPE ARRAY
                    THERE ARE FOUR KINDS OF ARRAYS, AND WE DECIDE
                    NOW WHAT KIND THIS IS.
                PAR:IF THE ARRAY IS PARAMETRIC, GO TO#A27.
                SAD:CONSTANTS IN THE SUBSCRIPT ARE ADDED TO THE
                    BASE. IF THE BASE HAS THEREBY BECOME NEGATIVE
                    OR TOO LARGE OR IF THE SUBSCRIPT IS
                    POTENTIALLY NEGATIVE, THIS IS CALLED A SAD
                    ARRAY, AND WE GO TO#A26.
                    EXAMPLE: A(J+2), WHERE J MAY BE NEGATIVE
                HAP:IF THE SUBSCRIPT IS NOW ZERO, THIS INDICATES
                    THAT IT WAS ALL CONSTANT EXCEPT PERHAPS FOR
                    INDEX REGISTER MODIFICATION, SO GO TO#A28.
                ORD:          ELSE IT IS AN ORDINARY ARRAY.




                G   CHECK IF BASE LESS THAN -30

                A25.CODE 3SLLLLI000
                    FOR AN ORDINARY ARRAY, THE CODE 3SLLLLI000
                    IS SET UP,WHERE  S  IS THE STORAGE TYPE,
                    LLLL IS THE BASE LOCATION, AND  I  IS 0 OR 4
                    FOR INDEXING.  TO#A29.
                A26.CODE 2BBBBBS000
                    FOR A SAD ARRAY,THE CODE 2BBBBBS000 IS SET
                    UP, WHERE  S  IS THE STORAGE TYPE, BBBB IS
                    THE BASE LOCATION PLUS 50000, PLUS 40000 IF
                    INDEXING.  TO#A29.
                A27.CODE 1BBBBBPPPP
                    FOR A PARAMETRIC ARRAY THE CODE 1BBBBBPPPP
                    IS SET UP, WHERE BBBBB IS THE BASE LOCATION
                    PLUS 50000, PLUS 40000 IF INDEXING, AND
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2799  2629  BBB 0 37  0500  0637          SHL   0500                    PPPP IS THE LOCATION OF THE PARAMETER. TO#A29
2800  0637  BBB 0 35  4740  2042          ERS   X1
2801  2042  BBB 1 70  9999  2829          ADD2  9999
2802  2829  BBB 0 35  4741  0644          ERS   XMH
2803  0644  BBB 0 20  000B  1899          BUF   RL      9F
2804  1899  BBB 0 06  0502  0502  9       CLX   6F
2805  2257  BBB 0 07  HHHH  1860  5       IIR   HHHH                A28.CODE AS SIMPLE VAR.
2806  1860  BBB 1 35  9999  3029          ERS2  9999                    THIS ARRAY IS CHANGED TO LOOK ALMOST LIKE
2807  3029  BBB 0 20  4209  2061          BUF   TEMP2                   A SIMPLE VARIABLE.
2808  2061  BBB 1 64  0000  0630          STA3  0000
2809  0630  BBB 1 25  9999  0830          LDA2  9999
2810  0830  BBB 0 37  0200  0835          SHL   0200
2811  0835  BBB 0 35  1237  0439          ERS   X49
2812  0439  BBB 0 20  2041  0844          BUF   BIG09
2813  0844  BBB 0 05  000A  0502          LDX   RA      6F
2814  0502  BBB 0 60  4209  0511  6       STA   TEMP2               A29.MOVE SUBSCRIPT
2815  0511  BBB 0 65  4420  1122          STX   TEMP3                   THE STATUS OF THINGS IS CHANGED TO:
2816                                                                X   SAD:        PAR:        HAP:        ORD:
2817  1122  BBB 0 29  0001  1230          LDA1  0001                            OPERAND STACK ENTRY:
2818                                                                X    3TAAAA0000 3TAAAA0000 0TAAAA0000 3TAAAA0000
2819                                                                X         LOCATIONS AAAA AND AAAA+1:
2820                                                                X    000000CCCC 000000CCCC 090100CCCC 000000CCCC
2821                                                                X    2BBBBBS000 1BBBBBPPPP 0901000000 3SLLLL1000
2822                                                                X         LOCATIONS CCCC AND CCCC+1:
2823                                                                X    SUBSCRIPT  SUBSCRIPT  0SLLLL**** SUBSCRIPT
2824                                                                X    ZZZZZNNNNN ZZZZZNNNNN ZZZZZNNNNN ZZZZZNNNNN
2825  1230  BBB 0 37  0400  1637          SHL   0400                    WHERE ZZZZZNNNNN IS THE ARRAY NAME, AND
2826  1637  BBB 0 35  0043  1846          ERS   XM                      T INDICATES THE TYPE.   EXIT TO#G1.
2827  1846  BBB 0 70  2248  000A          ADD           RA
2828  2248  BBB 0 25  0001  1630          LDA   0001
2829  1630  BBB 1 09  0000  1830          LDX3  0000
2830  1830  BBB 0 30  0632  0634          LDL           INS2
2831  0632  BBB 1 0G  0000  1236          IIR3  0000
2832  1236  BBB 0 30  2243  2046          LDL   ACC
2833  2046  BBB 0 82  0849  1049          TEQ           1F
2834  0849  BBB 0 25  0851  1854          LDA   ARAS
2835  1854  BBB 0 60  2243  1049          STA   ACC     1F
2836  1049  BBB 0 25  4209  2261  1       LDA   TEMP2
2837  2261  BBB 0 05  4420  0272          LDX   TEMP3
2838  0272  BBB 0 30  0074  0634          LDL           INS2
2839  0074  BBB 0 25  000C  0878          LDA   RX
2840  0878  BBB 0 70  4301  0504          ADD   BIG90   -AR2
2841  0634  BBB 0 0B  0851  4445  INS2    LIR1  ARAS    INS
2842  0505  BBB 0 30  4247  0349  &AR2    LDL   BIG30   1F
2843  0504  BBB 0 31  0349  0349  -AR2    CLL   1F
2844  0349  BBB 1 0G  9999  0353  1       IIR3  9999
2845  0353  BBB 1 29  0000  2030          LDA3  0000
2846  2030  BBB 0 35  4740  2242          ERS   X1
2847  2242  BBB 0 20  000B  2246          BUF   RL
2848  2246  BBB 0 20  0851  2054          BUF   ARAS
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2849  2054  BBB 1 64  0000  2230            STA3  0000
2850  2230  BBB 1 07  9996  4140            IIR2  9996      NORMX
2851                                ARA$    EQU   MRP
2852
2853  4117  BBB 0 30  2519  2521  SIGN#     LDL   LDLON     1F
2854
2855
2856  2056  BBB 0 30  2519  2521  #OFF      LDL   LDLON     1F
2857  2521  BBB 0 50  4118  0170  1         STL   BIN:#
2858  0170  BBB 0 05  0972  4428            LDX   0BIN#     -OP3
2859  4118  BBB 0 67  4118  4118  BIN:#     HLT             *
2860  2519  BBB 0 0B  1116  0373  LDLON     LIR1  A0016     ARITH
2861  1116  BBB 0 0B  1732  2719  A0016     LIR1  J0032     1F
2862  1118  BBB 0 05  1920  1922  A0018     LDX   FIXA      2F
2863  1117  BBB 0 05  2919  1922  A0017     LDX   FLOTA     2F
2864  1119  BBB 0 08  1732  2719  A0019     LIR1  J0032     1F
2865  2719  BBB 1 29  9999  2430  1         LDA3  9999
2866  2430  BBB 0 70  4301  2254            ADD   BIG90     -INRA
2867  2254  BBB 0 07  4092  2657  -INRA     IIR   4092
2868  2657  BBB 0 30  4417  0269            LDL   RATOR
2869  0269  BBB 0 82  0472  2255            TEQ             &INRA
2870  0472  BBB 0 30  1300  0702            LDL   TRCOF
2871  0702  BBB 0 25  1307  2309            LDA   TRCSW
2872  2309  BBB 0 82  0912  2255            TEQ             &INRA
2873  0912  BBB 0 30  1914  0363            LDL             GET
2874  1914  BBB 1 0G  9999  0318            IIR3  9999
2875  0318  BBB 0 25  1395  0397            LDA   I0095
- 2876  0397  BBB 0 30  0599  4350            LDL   7F        ASM2
2877  2255  BBB 1 09  0000  2630  &INRA     LDX3  0000
2878  2630  BBB 0 32  0100  0834            SHR   0100
2879  0834  BBB 0 70  000A  0639            ADD   RA        -RE
2880  0640  BBB 0 0B  1728  1244  &RE       LIR1  J0028
2881  1244  BBB 0 30  2446  0442            LDL             UNOP3
2882  2446  BBB 0 30  2448  0319            LDL   3F        ATL
- 2883  1922  BBB 0 0B  1724  0639  2         LIR1  J0024     -RE
2884  0639  BBB 0 30  2448  0442  -RE       LDL   3F        UNOP3
2885  2448  BBB 1 0G  9999  2454  3         IIR3  9999      LDLOF
2886  2454  BBB 1 29  0000  2830  LDLOF     LDA3  0000
2887  2830  BBB 0 70  4603  2856            ADD   BIG60     -EEE
2888  2857  BBB 0 30  2856  4799  &EEE      LDL   -EEE      EEE
2889  2856  BBB 0 30  0599  3030  -EEE      LDL   7F        ASMTR
2890  0599  BBB 0 30  2454  2256  7         LDL   LDLOF
2891  2256  BBB 0 50  4118  0070            STL   BIN:#
2892  0070  BBB 1 0G  9999  4215            IIR3  9999      OPX
2893  3030  BBB 0 05  1232  1234  ASMTR     LDX   TRACE
2894  1234  BBB 0 25  1636  0173            LDA   CTRC      ASM1
2895  4155  BBB 0 05  1920  2122  FIXF      LDX   FIXA
2896  2122  BBB 0 31  1325  1325            CLL
2897  1325  BBB 0 25  4408  0760            LDA   BIG01
2898  0760  BBB 0 60  0860  1262            STA   OTYPE     2F
```

U. UNARY OPERATORS AND SPECIAL GENERATORS
    COMPARE WITH THE INTRODUCTORY REMARKS OF
X   SECTION 8, ODD-NUMBERED STEPS INDICATE ENTRY
X   FROM G6, EVEN NUMBERED, FROM G10.

U1. EQUALS SIGN
    THIS IS A SWITCH WHICH IS SET IN SEVERAL
DO: PLACES. IF THIS EQUALS SIGN OCCURS IN A DO
    STATEMENT, GO TO #D3. IF IT IS IN AN INPUT-
I/O: OUTPUT STATEMENT, GO TO #W17. OTHERWISE THIS
OTH: IS A PLAIN OLD EQUALS SIGN, AND WE PUT A
    REPLACEMENT OPERATOR ON THE STACK, #G20.

U2. REPLACEMENT SETUP.
    IN A MULTIPLE ASSIGNMENT STATEMENT WE ENTER
    AT STEP U2 THE FIRST REPLACEMENT OPERATOR,
    STEP U4 SUCCEEDING TIMES. CHECK TYPES, AND
    IF DIFFERENCE IS PRESENT PUT OUT THE CODE TO
    FIX OR FLOAT. IF THE TYPES ARE THE SAME,
    DECIDE WHETHER TO PUT THE RIGHT-HAND SIDE IN
    REGISTER A OR NOT. REGISTER L IS SELECTED IF
    THERE IS A MULTIPLE ASSIGNMENT STATEMENT, OR
    IF THE LEFT-HAND PART IS NOT A SIMPLE VARIABL
    OR IF TRACE MODE IS ON.
    THE CODING TO PUT THE RIGHT-HAND SIDE, WITH
    TRUE SIGN, INTO THE SELECTED RIGISTER, IS
    ACCOMPLISHED BY SELECTING A
    TABLE ENTRY AND ACTIVATING ASM1(ROUTINE I).

U4. REPLACEMENT OPERATOR
    PUT OUT CODING TO STORE A OR L IN THE
    APPROPRIATE LOCATION AND POSSIBLY TO
    CAUSE TRACING, USING ASSEMBLER 1(ROUTINE I).
    REMOVE OPERAND FROM STACK. EXIT TO #G10.

U10. UNARY OPERATORS
    IN THE CASE OF FIX, EXP, SIN, COS, TAN, ATAN, LN,
    SQRT, CHECK THAT THE ARGUMENT IS FLOATING
    POINT. SQUARING, THE 'NOT' OPERATOR, AND

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2899  4125 888 0 05 1127 0729  EXPF   LDX  EXP      1F          FLOAT PLUS THE ONES MENTIONED EARLIER ARE
2900  4120 888 0 05 2322 0729  SINF   LDX  SIN      1F          THAN CALLED FROM THE LIBRARY SUBROUTINES,
2901  4121 888 0 05 0723 0729  COSF   LDX  COS      1F          USING A TABLE ENTRY AND ACTIVATING ASSEMBLER
2902  4122 888 0 05 0924 0729  TANF   LDX  TAN      1F          1. THERE ARE TWO CASES,DEPENDING WHETHER THE
2903  4123 888 0 05 1925 0729  ATANF  LDX  ATAN     1F          ARGUMENT IS NEGATED OR NOT.  IN THE CASE OF
2904  4124 888 0 05 0726 0729  LNF    LDX  LN       1F          ABS, A SPECIAL TABLE ENTRY FOR AN OPEN
2905  4119 888 0 05 2721 0729  SQRTF  LDX  SQRT     1F          SUBROUTINE IS USED.
2906  0729 888 0 31 1332 1332  1      CLL
2907  1332 888 0 50 0860 1262         STL  OTYPE    2F
2908  1262 888 1 29 0000 2631  2      LDA3 0000
2909  2631 888 0 35 4740 2442         ERS  X1
2910  2442 888 0 82 2646 2846         TEQ  1F       2F
2911  4154 888 0 05 2919 2921  FLOTF  LDX  FLOTA
2912  2921 888 0 31 1124 1124         CLL
2913  1124 888 1 29 0000 2831         LDA3 0000
2914  2831 888 0 35 4740 2642         ERS  X1
2915  2642 888 0 82 4140 3046         TEQ  NORMX    5F
2916  4161 888 0 05 0563 1365  BCOMP  LDX  COMPL
2917  1365 888 0 30 4756 3046         LDL  BIG02    5F
2918  3046 888 0 50 0860 2646  5      STL  OTYPE    1F
2919  2646 888 0 0B 1724 1841  1      LIR1 J0024    UNOP
2920  2846 888 0 25 2648 0336  2      LDA           NOMAL
2921  2648 888 0 34 0500 0000         CON  34050    00000       G   F(I) ERR
2922  4126 888 0 0B 1736 0929  ABSF   LIR1 J0036    1F
2923  2814 888 1 0G 9999 3031  SQUAR  IIR3 9999
2924  3031 888 0 09 0004 1632         LDX1 0004     2F
2925  4141 888 0 05 0343 0145  WDPOZ  LDX  PAUSF    3F
2926  4142 888 0 05 0744 0145  WDSTP  LDX  STOPF    3F
2927  0145 888 1 07 0001 0549  3      IIR2 0001
2928  0549 888 0 30 0351 0553         LDL  POZMD
2929  0553 888 1 50 0000 1632         STL2 0000     2F
2930  1130 888 1 0B 1190 1133  POZ$   LIR3 RAND     BOOL$
2931  1632 888 0 0B 1724 0929  2      LIR1 J0024    1F
2932  0929 888 1 29 0000 1832  1      LDA3 0000
2933  1832 888 0 35 4740 2842         ERS  X1
2934  2842 888 0 60 0860 1841         STA  OTYPE    UNOP
2935  4127 888 0 30 1129 0731  OPO    LDL  1F                   G   THIS OPERATOR IS PERMANENTLY ON THE BOTTOM
2936  0731 888 0 25 1333 4514         LDA           ALARM       G   OF THE OPERATOR STACK, IS ACTIVE ONLY ON AN
2937  1333 888 0 18 0022 0025         CON  18002    20025       G   EXTRA RIGHT PARENTHESIS
2938  1129 888 0 05 4093 4428  1      LDX  OOPO     -OP3
2939                     NO,    EQU  &IF1
2940                     POZ,   EQU  NO,
2941  0336 888 0 30 4140 4514  NOMAL  LDL  NORMX    ALARM
2942  1133 888 1 07 9999 4114  BOOL$  IIR2 9999     SIGN$
2943  0543 888 0 30 4417 0169  NO$    LDL  RATOR                U12.END OF STATEMENT
2944  0169 888 0 07 4092 1372         IIR  4092                     AT THE END OF MOST STATEMENTS WE CHECK THAT
2945  1372 888 0 82 0575 1629         TEQ  4F       MRP             THE OPERATOR AND OPERAND STACKS ARE EMPTY,
2946  0575 888 0 25 1051 2654  4      LDA  CONO                     ELSE GIVE THE ERROR 'MISSING RIGHT PARENTHE-
2947  2654 888 1 64 0000 2032         STA3 0000                     SIS' OR 'MISSING OPERAND' OR 'EXTRA OPERAND'.
2948  2032 888 1 0G 0000 1816         IIR3 0000
```

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2949  1836  BBB 0 30  1238  0040                LDL   CRAND
2950  0040  BBB 0 82  1644  1844                TEQ   1F
2951  1844  BBB 0 87  1647  1847                TGR   2F
2952  1847  BBB 1 0G  0001  1851                IIR3  0001
2953  1851  BBB 0 25  2854  2456                LDA         3F
2954  2854  BBB 0 32  2800  0000                CON   32280       00000     G   MISSING OPERAND
2955  1647  BBB 1 0G  9999  2051  2           IIR3  9999
2956  2051  BBB 0 25  3054  2456                LDA         3F
2957  3054  BBB 0 18  0028  0000                CON   18002       80000     G   EXTRA OPERAND
2958  2456  BBB 0 30  0575  4514  5             LDL   4B          ALARM
2959  1644  BBB 0 05  2047  1249  1             LDX   1F
2960  1249  BBB 0 0B  0851  2455                LIR1  ARAS
2961  2455  BBB 0 30  0543  4229                LDL   NO$         REM
2962  2047  BBB 0 60  2243  4140  1             STA   ACC         NORMX
2963  1238  BBB 0 00  1190  0000  CRAND         JMP   RAND         0000
2964  0363  BBB 0 50  1819  2232  GET           STL   &SAC                    G   SUBROUTINE TO BRING OPERAND INTO REGISTER A
2965  2232  BBB 1 09  0000  2432                LDX3  0000
2966  2432  BBB 0 32  0100  2036                SHR   0100
2967  2036  BBB 0 70  000A  3041                ADD   RA          -GET
2968  3042  BBB 0 0B  1728  2247  &GET          LIR1  J0028       1F
2969  3041  BBB 0 0B  1724  2247  -GET          LIR1  J0024       1F
2970  2247  BBB 0 25  4740  0292  1             LDA   X1
2971  0292  BBB 1 39  0000  2632                ERS3  0000
2972  2632  BBB 0 60  0860  1862                STA   OTYPE
2973  1862  BBB 0 32  0900  0274                SHR   0900
2974  0274  BBB 0 06  2645  2645                CLX   UNOP2
2975  4131  BBB 0 30  1933  0642  WDGO          LDL         EXPLB         U13. WORD 'GO'
2976  1933  BBB 0 30  0335  4044                LDL         SCAN              SET LABEL CONTEXT ON. AND SCAN THE NEXT ITEM
2977  0335  BBB 0 30  4221  0573                LDL   LPREN                   (ROUTINE S). THE WORD TO IS IGNORED BY
2978  0573  BBB 0 82  1176  1776                TEQ   1F                N:    FORTRAN. IF THE NEXT ITEM IS A LABEL. PUT IT
2979  1776  BBB 0 30  4974  2832                LDL   BIG10                   IN A BLANK ADDRESS OF THE PRECEDING
2980  2832  BBB 0 87  1235  1635                TGR         2F                INSTRUCTION OR ELSE CREATE A JMP INSTRUCTION.
2981  1235  BBB 0 30  1837  0089                LDL         LSW               THEN GO TO#G1.
2982  1837  BBB 0 30  4140  4736                LDL   NORMX       GOTO      V:  IF THE NEXT ITEM IS A VARIABLE. COMPILE CODE
2983  1635  BBB 1 64  0001  3032  2             STA3  0001                    TO STORE RB1 IF WE ARE IN A DO LOOP. THEN
2984  3032  BBB 0 25  1634  2236                LDA   DOTAG                   CODE TO JUMP TO THE VARIABLE ITSELF. #U21
2985  2236  BBB 0 31  0839  0839                CLL                       (:  FINALLY IF IT IS A LEFT PARENTHESIS.
2986  0839  BBB 0 82  2044  2244                TEQ         2F
2987  2044  BBB 0 25  4824  1276                LDA   DOVAR
2988  1276  BBB 1 64  0002  2433                STA3  0002
2989  2433  BBB 0 25  1835  2037                LDA         3F
2990  1835  BBB 0 88  7989  0000                CON   88798       90000     G   IIR10 STA3 JMP2
2991  2244  BBB 0 25  2447  2037  2             LDA         3F
2992  2447  BBB 0 89  0000  0000                CON   89000       00000     G   JMP2
2993  2037  BBB 0 30  1239  0377  3             LDL         ASM11
2994  1239  BBB 1 0G  0001  2444                IIR3  0001                    WE SET UP GO MODE, COMPILE EACH LABEL
2995  2444  BBB 0 26  2647  2647                CLA                           OUT OF SEQUENCE, THEN WHEN THE RIGHT
2996  2647  BBB 0 30  4151  4686                LDL   WDDIM       FILUP       PARENTHESIS COMES ALONG WE RETURN TO#G1 TO
2997  1176  BBB 1 07  0002  0980  1             IIR2  0002                    PROCESS THE EXPRESSION.
2998  0980  BBB 0 05  0582  4927                LDX         INCUQ
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2999  0562  BBB 1 50  9999  2633          STL2  9999
3000  2633  BBB 0 30  2035  0642          LDL             EXPLB
3001  2035  BBB 0 30  2237  1639          LDL   GOMD
3002  1639  BBB 0 05  2241  4238          LDX   OGO%      MDOP1
3003  2833  BBB 0 30  2235  0642  GO.     LDL   1F        EXPLB
3004  2235  BBB 0 05  0089  0491  1       LDX   LSW
3005  0491  BBB 0 30  4140  1142          LDL   NORMX     GOSUB
3006  1142  BBB 0 50  4926  1778  GOSUB   STL   EXIT3
3007  1778  BBB 1 0G  9999  0782          IIR3  9999
3008  0782  BBB 1 29  0001  3033          LDA3  0001
3009  3033  BBB 0 30  2435  000C          LDL             RX
3010  2435  BBB 0 35  0043  2847          ERS   XM
3011  2847  BBB 0 60  4209  2461          STA   TEMP2
3012  2461  BBB 0 05  0663  4927          LDX             INCUQ
3013  0663  BBB 0 25  000B  1267          LDA   RL
3014  1267  BBB 0 30  4756  2308          LDL   BIG02
3015  2308  BBB 0 05  4926  4494          LDX   EXIT3     ASM42
3016  4128  BBB 0 30  1330  4044  GO%     LDL             SCAN
3017  1330  BBB 0 30  1074  1876          LDL   ,
3018  1876  BBB 0 82  2235  0479          TEQ   1B
3019  0479  BBB 0 30  2235  2818          LDL   1B        MCAL
3020  1834  BBB 0 30  2436  0363  GO$     LDL             GET       U14.END COMPUTED GO.
3021  2436  BBB 0 25  1638  0240          LDA# 78770      60000     G   ADDOA JMP UZACC
3022  0240  BBB 0 30  2644  0377          LDL             ASM11         COMPILE CODE TO GET THE EXPRESSION WITH
3023  2644  BBB 1 25  9999  2234          LDA2  9999                    TRUE SIGN IS REGISTER A. THEN
3024  2234  BBB 0 60  4880  0682          STA   NXLOC                   ADD NXT RA.  JMP TO THE TABLE.
3025  0682  BBB 0 30  0484  4736          LDL             GOTO
3026  0484  BBB 1 07  9998  0488          IIR2  9998
3027  0488  BBB 1 0G  9999  4114          IIR3  9999      SIGN$
3028  4130  BBB 0 30  1932  0642  ASS1    LDL             EXPLB     U17.WORD 'ASSIGN'
3029  1932  BBB 0 05  1134  4428          LDX             -OP3          SET LABEL CONTEXT,AND PLACE THE ASSIGN
3030  1134  BBB 0 75  0736  0000          SUB   ASS2       0000         OPERATOR ON THE STACK. THE WORD 'TO'
3031  0736  BBB 0 25  4196  0148  ASS2    LDA   UNIQU                   IS IGNORED BY FORTRAN.
3032  0148  BBB 0 70  0550  0753          ADD   BIG29           U18. ASSIGN OP
3033  0753  BBB 0 30  0555  4357          LDL             ASM33         CREATE A CONSTANT FOR THE ABSOLUTE LOCATION
3034  0555  BBB 1 0G  9999  0959          IIR3  9999                    OF THE LABEL (USE I62), THEN INTERCHANGE
3035  0959  BBB 0 05  0108  0910          LDX   LSWOF                   OERANDS AND TREAT ANALOGOUS TO REPLACEMENT
3036  0910  BBB 0 30  1912  1142          LDL             GOSUB         AT STEP#U2.
3037  1912  BBB 1 0G  0002  0716          IIR3  0002
3038  0716  BBB 0 30  0518  3030          LDL             ASMTR
3039  0518  BBB 1 0G  9998  4215          IIR3  9998      OPX
3040  4151  BBB 0 30  1353  0755  WDDIM   LDL   DIMMD     INSMD     U21.'DIMENSION'
3041  0755  BBB 1 07  0001  1359  INSMD   IIR2  0001      ISMD1         WHEN A DIMENSION DECLARATION APPEARS THE REST
3042  1359  BBB 1 50  0000  4140  ISMD1   STL2  0000      NORMX         OF THE COMPILER IS RIGGED UP TO HANDLE THIS
3043  2844  BBB 0 07  HHHH  3047  DIM     IIR   HHHH                    STATEMENT PROPERLY BY STTING UP DIMENSION
3044  3047  BBB 1 39  0000  2434          ERS3  0000                    MODE. WHEN A NAME COMES ALONG, A SECOND MODE
3045  2434  BBB 1 60  0001  2634          STA2  0001                    IS SET UP, AND THIS MODE CREATES THE
3046  2634  BBB 0 20  2636  000A          BUF             RA            TABLE ENTRIES FOR AN ARRAY VARIABLE.
3047  2636  BBB 0 0B  0000  2441          LIR1  0000                    AT THE END, EXIT TO#G1.  NO STORAGE
3048  2441  BBB 0 07  0002  3044          IIR   0002                    ASSIGNMENTS ARE MADE YET, THEY ARE MADE
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3049  3044  888 0 70  4600  2655          ADD  MEML                    WHEN THE ARRAY IS FIRST REFERENCED.
3050  2655  888 0 60  4600  0902          STA  MEML
3051  0902  888 1 60  0002  2834          STA2  0002
3052  2834  888 0 70  1907  1910          ADD  TWOS
3053  1910  888 0 77  1910  2313          ATL
3054  2313  888 0 29  0000  3034          LDA1  0000
3055  3034  888 0 05  000A  1838          LDX  R*
3056  1838  888 0 35  4724  2076          ERS  X*
3057  2076  888 0 20  0008  0280          BUF  RL
3058  0280  888 0 64  0000  2635          STA1  0000
3059  2635  888 0 25  000C  1839          LDA  RX
3060  1839  888 0 20  4247  1649          BUF  BIG30
3061  1649  888 0 35  4201  2855          ERS  XOM
3062  2855  888 0 05  000A  2459          LDX  RA
3063  2459  888 0 25  0008  0863          LDA  RL
3064  0863  888 0 70  0465  000A          ADD            RA
3065  0465  888 0 35  0000  2835          ERS   0000                 G   30 + ERS # STX
3066  2835  888 0 07  0001  2038          IIR   0001
3067  2038  888 1 60  0003  3035          STA2  0003
3068  3035  888 0 30  2437  2039          LDL   DIMMD
3069  2039  888 0 05  2641  4235          LDX   0DIM%      MDOP
3070                          DIM$        EQU   MRP
3071  0471  888 0 07  HHHH  0474  DIM,     IIR    HHHH
3072  0474  888 1 39  0000  2836          ERS3  0000
3073  2836  888 0 05  000A  0440          LDX  RA
3074  0440  888 0 70  2848  000A          ADD            RA
3075  2848  888 0 30  0001  3036          LDL   0001
3076  3036  888 0 07  0001  2239          IIR   0001
3077  2239  888 0 70  4600  3055          ADD  MEML
3078  3055  888 0 60  4600  1902          STA  MEML
3079  1902  888 0 70  0704  000A          ADD            RA
3080  0704  888 0 65  0000  2637          STX   0000
3081  2637  888 1 85  9999  2276          MUL2  9999
3082  2276  888 0 32  0400  1283          SHR   0400
3083  1283  888 1 65  9999  2837          STX2  9999       DIM,
3084  4139  888 0 07  HHHH  1342  DIM%    IIR    HHHH
3085  1342  888 1 39  0000  3037          ERS3  0000
3086  3037  888 0 70  2439  000A          ADD            RA
3087  2439  888 0 30  0001  2238          LDL   0001
3088  2238  888 1 85  9999  2476          MUL2  9999
3089  2476  888 0 32  0800  0687          SHR   0800
3090  0687  888 1 25  9997  0799          LDA2  9997
3091  0799  888 0 37  0200  2438          SHL   0200
3092  2438  888 0 32  0600  3048          SHR   0600
3093  3048  888 0 77  3048  2251          ATL
3094  2251  888 1 25  9998  2600          LDA2  9998
3095  2600  888 0 70  2638  000A          ADD            RA
3096  2638  888 0 50  0000  2838          STL   0000
3097  2838  888 1 07  9996  1849          IIR2  9996
3098  1849  888 0 07  FFFF  2656          IIR   FFFF
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3099  2656  BBB 0 87  2837  2659                TGR  D1M*
3100  2659  BBB 0 30  2837  2639                LDL  D1M*
3101  2639  BBB 0 25  2841  4514                LDA            ALARM
3102  2841  BBB 0 03  3500  0000                CON  03350     00000     G   BAD DIMENSION
3103  2837  BBB 1 0G  9999  4140  D1M*          IIR3  9999     NORMX
3104  2822  BBB 1 0G  9999  1133  D1M$          IIR3  9999     BOOL$
3105  4152  BBB 0 25  0754  0756  WDCOM         LDA  1F                  U27.'COMMON'
3106  0756  BBB 0 60  2220  3038                STA  UASW                    SET UP COMMON MODE, MARK EACH IDENTIFIER
3107  3038  BBB 0 30  0840  0755                LDL  COMMD     INSMD         THAT COMES ALONG AS COMMON AND ALLOCATE
3108  2508  BBB 0 07  0001  0711  COM*          IIR   0001     2F            THE STORAGE FOR IT.
3109  0754  BBB 0 07  HHHH  0557  1             IIR   HHHH
3110  0557  BBB 1 39  0000  2839                ERS3  0000
3111  2839  BBB 0 70  2049  000A                ADD            RA
3112  2049  BBB 0 25  0001  3039                LDA   0001
3113  3039  BBB 0 35  0043  0711                ERS  XM        2F
3114  0711  BBB 0 30  4198  0750  2             LDL  COMON
3115  0750  BBB 0 50  4631  1783                STL  TEMP1
3116  1783  BBB 0 70  0008  0388                ADD  RL
3117  0388  BBB 0 60  4198  2800                STA  COMON
3118  2800  BBB 0 30  1240  4833                LDL            BR2
3119  1240  BBB 0 20  4631  1883                BUF  TEMP1
3120  1883  BBB 0 64  0000  1640                STA1  0000
3121  1640  BBB 1 0G  9999  2249                IIR3  9999
3122  2249  BBB 0 25  4030  1882                LDA  LAST
3123  1882  BBB 0 30  1064  0466                LDL  $
3124  0466  BBB 0 82  0469  4140                TEQ  EQ1$      NORMX
3125  0469  BBB 0 25  1821  1840  EQ1$          LDA  MISUB
3126  1840  BBB 0 60  2220  1133                STA  UASW      BOOL$
3127                          COM$              EQU  COM*
3128  0528  BBB 0 25  1930  4514  BED           LDA            ALARM
3129  1930  BBB 0 03  2300  0000                CON  03230     00000     G   BAD EQUIV
3130  4132  BBB 0 25  4277  0579  WDNO          LDA  BIG50
3131  0579  BBB 0 60  4804  4050                STA  NOTAG     SCAN1     U29.CONTROL WORDS
3132  4136  BBB 0 70  000A  1741  WDTRC         ADD  RA        -TRC          THE WORDS NO.TRACE.LIST.CORE.CARDS REALLY
3133  1742  BBB 0 60  4804  1356  &TRC          STA  NOTAG                   NEVER GET PAST THE SCANNER. THEY ARE
3134  1356  BBB 0 25  1300  2102                LDA  TRCOF     1F            DETECTED AT STEP S10. THEY MERELY SET
3135  1741  BBB 0 25  1855  2102  -TRC          LDA  TRCON     1F            INTERNAL SWITCHES INSIDE THE COMPILER.
3136  2102  BBB 0 60  1307  4050  1             STA  TRCSW     SCAN1         AND RUN OFF TO#G1.
3137  4133  BBB 0 70  000A  1338  WDLIS         ADD  RA        -LIS
3138  1339  BBB 0 60  4804  1756  &LIS          STA  NOTAG
3139  1756  BBB 0 25  4735  0587                LDA  PROF      1F
3140  1338  BBB 0 25  4975  0587  -LIS          LDA  PRON      1F
3141  0587  BBB 0 60  4883  4050  1             STA  PRTSW     SCAN1
3142  4137  BBB 0 70  000A  1942  WDCOR         ADD  RA        -COR
3143  1943  BBB 0 60  4804  1956  &COR          STA  NOTAG
3144  1956  BBB 0 07  0057  1759                IIR   0057     1F
3145  1942  BBB 0 07  0007  1759  -COR          IIR   0007     1F
3146  1759  BBB 0 60  4336  4050  1             STA  INCRE     SCAN1
3147  4166  BBB 0 70  000A  1771  WDPRG         ADD  RA        -PRG
3148  1772  BBB 0 60  4804  2040  &PRG          STA  NOTAG
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3149  2040  BBB 0 25  4758  2060          LDA   PCHOF     1F
3150  1771  BBB 0 25  4651  2060  -PRG    LDA   PCHON     1F
3151  2060  BBB 0 60  4981  4050  1       STA   PCHSW     SCAN1
3152  4100  BBB 0 05  4740  2142  WDDO    LDX   X1        1F        D.  DO LOOP CONTROL
3153  4138  BBB 0 06  2142  2142  WDTRU   CLX   1F                      WHEN THE WORD DO OR THROUGH IS SENSED, ENTRY
3154  2142  BBB 0 25  0944  0546  1       LDA   3F                      IS MADE TO STEP D1.
3155  0546  BBB 0 60  4206  0358          STA   LESW      #DO01     D1. SET UP FOR LABEL
3156  0358  BBB 1 65  0001  2240  WDD01   STX2  0001                    DO MODE IS SET UP. A SWITCH IS SET SO THAT
3157  2240  BBB 1 07  0002  2449          IIR2  0002                    WHEN THE NEXT EQUAL SIGN OCCURS,CONTROL GOES
3158  2449  BBB 0 30  2451  3056          LDL   1F        2F            TO STEP D3. SEMI-LABEL CONTEXT IS SET UP
3159  3056  BBB 0 50  4117  0669  2       STL   SIGN#                   SO THAT THE LABEL FOLLOWING COMES IN AS A
3160  0669  BBB 0 30  0671  1359          LDL   DOMD      ISMD1         CONSTANT,YET STEP C5 GOES IMMEDIATELY TO C6
3161                                                                X   IN THE CONSTANT SCANNER. GO TO#G1.
3162  2451  BBB 1 25  0000  2440  1       LDA2  0000                D3. ZERO COMMA COUNT
3163  2440  BBB 0 35  3023  2640          ERS   XMC                     THE FACT THAT A COMMA MAY HAVE OCCURRED
3164  2640  BBB 1 60  0000  2840          STA2  0000                    BEFORE THE CONTROLLED VARIABLE IS FORGOTTEN.
3165  2840  BBB 0 30  2056  3056          LDL   #OFF     2B            AT THE END OF THIS STATEMENT,CONTROL WILL
3166  0944  BBB 0 30  4402  0954  3       LDL   LEOFF                   PASS TO STEP D5. GO TO#G1.
3167  0954  BBB 0 50  4206  000B          STL   LESW      RL
3168  0168  BBB 0 30  0970  2012  DO,     LDL           DOIF
3169  0970  BBB 0 05  4140  0883          LDX   NORMX     MAGET
3170  1370  BBB 0 30  1972  0374  DO$     LDL   DOO       DO$SB     D5. CHECK COMMAS
3171  0374  BBB 0 50  1976  4164  DO$SB   STL   EXIT8     DO$1          IF LESS THAN TWO COMMAS HAVE OCCURRED,
3172  4164  BBB 1 25  0000  3040  DO$1    LDA2  0000                    INSERT ',1' IN THE PSEUDOCODE.
3173  3040  BBB 0 70  2212  2849          ADD   BIG40     -DO2
3174  2849  BBB 0 07  1074  4086  -DO2    IIR   TO024     DIVT1
3175  2850  BBB 1 07  9998  3057  &DO2    IIR2  9998                D6. STORE EXP IN TEMP
3176  3057  BBB 0 05  2859  0283          LDX           CLACC           COMPILE CODE TO STORE REGISTER A IF THERE IS
3177  2859  BBB 0 30  4745  1097          LDL   TROFF                   A COMPUTED RESULT THERE. SET A SWITCH SO THAT
3178  1097  BBB 0 50  4789  0741          STL   TRSW                    THE TEMP STORAGES USED TO HOLD COMPUTED
3179  0741  BBB 0 07  HHHH  1144          IIR   HHHH                    RESULTS ARE MADE PERMANENT STORAGES
3180  1144  BBB 1 39  9996  0798          ERS3  9996                    (SEE STEP I52).
3181  0798  BBB 0 70  3000  000A          ADD           RA
3182  3000  BBB 0 25  0001  2649          LDA   0001
3183  2649  BBB 0 60  2651  0858          STA   DON
3184  0858  BBB 1 29  9997  0999          LDA3  9997
3185  0999  BBB 0 60  1079  2481          STA   TO029               D7. DO OR DONT
3186  2481  BBB 1 35  0001  3049          ERS2  0001                    THIS IS A DONT LOOP UNLESS:
3187  3049  BBB 0 35  1634  3050          ERS   DOTAG                   A) THE WORD THROUGH WAS NOT USED
3188  3050  BBB 0 31  1858  1858          CLL                           B) NO DO IS IN PROGRESS
3189  1858  BBB 0 82  2661  2861          TEQ   DONT                    C) BOTH THE STARTING VALUE AND INCREMENT
3190  2861  BBB 1 29  0000  2851          LDA3  0000                    ARE CONSTANTS.
3191  2851  BBB 0 35  4723  0675          ERS   KON.5           DONTIN CASE OF A DONT LOOP,GO TO STEP#D10.
3192  0675  BBB 1 39  9998  3051          ERS3  9998            DO:
3193  3051  BBB 0 82  2661  2058          TEQ   DONT
3194  2058  BBB 0 50  1634  2258          STL   DOTAG
3195  2258  BBB 0 25  0509  1911          LDA   LSWON               D8. BEGIN DOO
3196  1911  BBB 0 60  0089  0691          STA   LSW                     SET THINGS UP FOR PUTTING VARIABLE IN AN
3197  0691  BBB 1 06  9995  0095          IIR3  9995                    INDEX REGISTER. SET SWITCH FOR SPECIAL
3198  0095  BBB 0 07  HHHH  0098          IIR   HHHH                    HANDLING OF LABELS. COMPILE LIR1 N 3F,
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3199  0098  BBB 1 39  0005  2458          ERS3  0005                    2 IIR1 M, LDL V, TGR 9F.  GO TO STEP#D20.
3200  2458  BBB 0 70  2260  000A          ADD             RA
3201  2260  BBB 0 25  0001  2658          LDA   0001
3202  2658  BBB 0 20  1388  0590          BUF   I0088
3203  0590  BBB 0 60  1375  2577          STA   I0075
3204  2577  BBB 0 07  HHHH  1180          IIR   HHHH
3205  1180  BBB 1 39  0003  2858          ERS3  0003
3206  2858  BBB 0 70  2460  000A          ADD             RA
3207  2460  BBB 0 25  0001  3058          LDA   0001
3208  3058  BBB 0 20  2660  2062          BUF#  0B000     09999
3209  2062  BBB 0 30  0464  4350          LDL             ASM2
3210  0464  BBB 0 07  HHHH  1867          IIR   HHHH
3211  1867  BBB 1 39  0002  3059          ERS3  0002
3212  3059  BBB 0 60  4824  2676          STA   DOVAR
3213  2676  BBB 0 25  1278  0480          LDA             7F
3214  1278  BBB 0 19  7574  2021          CON   19757     42021     G   3F2H IIR1N LDL5 TGR9F MK9F
3215  2661  BBB 1 34  9998  2860  DONT    LDL3  9998                D10.LDA INIT 3F
3216  2860  BBB 1 0G  0001  0664          IIR3  0001                    COMPILE LDA WITH INITIAL VALUE.
3217  0664  BBB 1 54  0000  3060          STL3  0000
3218  3060  BBB 0 30  2262  0363          LDL             GET
3219  2262  BBB 1 0G  9999  0666          IIR3  9999
3220  0666  BBB 0 25  0668  0270          LDA#  06190     00000     G   UZACC 3F2H
3221  0270  BBB 0 30  0672  0377          LDL             ASM11     D11.  V + INC
3222  0672  BBB 0 07  1078  4698          IIR   T0028     DIVRT         ARTIFICIALLY INSERT  +V  INTO THE PROGRAM,
3223  4157  BBB 1 0G  9995  0761  DONT1   IIR3  9995                    THUS RUNNING THROUGH THE ORDINARY ADD
3224  0761  BBB 0 25  0763  0480          LDA             7F            GENERATOR TO CREATE CODE TO PUT THE SUM OF
3225  0763  BBB 0 74  2079  0600          CON   74207     90600     G   LDL5 TGR9F STA3 UZACC
3226  0480  BBB 0 30  2082  0377  7       LDL             ASM11         V + INC IN REGISTER A.
3227  2082  BBB 0 25  4989  0891          LDA   TRON                D12.LDL, TGR
3228  0891  BBB 0 60  4789  1976          STA   TRSW      EXIT8         COMPILE  3 LDL FIN, TGR 9F, STA V
3229  1972  BBB 0 25  2651  3061  DOO     LDA   DON                 D20.LABEL IN TABLE
3230  3061  BBB 0 20  0544  0746          BUF   NINEF                   PUT THE LABEL NUMBER,TOGETHER WITH THE PER-
3231  0746  BBB 0 05  0531  2133          LDX   TW08                    TINENT ADDRESSES FOR LINKING UP CONTROL
3232  2133  BBB 0 08  0537  1136          LIR1  DOOST                   (9F,2B) INTO THE DO STACK. EXIT TO#U12.
3233  1136  BBB 0 30  0543  4445          LDL   NO$      INS
3234  4226  BBB 1 25  0000  2462  FUNCT   LDA2  0000                F.  FUNCTION CALLS
3235  2462  BBB 0 30  1353  0955          LDL   DIMMD                   TRANSFER IS MADE TO STEP F1 IF WE HAVE AN
3236  0955  BBB 0 82  2844  0558          TEQ   DIM                     UNDIMENSIONED IDENTIFIER FOLLOWED BY A LEFT
3237  0558  BBB 0 30  0960  0362          LDL             FASIN         PARENTHESIS,NOT OCCURRING IN A DIMENSION DEC.
3238  0960  BBB 0 05  3022  2662          LDX   DUA               F1.  ASSIGN F
3239  2662  BBB 0 65  2220  2862          STX   UASW                    IF THIS IS A NEW FUNCTION DEFINE IT. IF IT IS
3240  2862  BBB 0 05  0864  0866          LDX   OFC%                    A CONSTANT OR SIMPLE VARIABLE,TREAT AS
3241  0866  BBB 0 30  1600  4234          LDL   FCMD      MDOP2         IMPLIED MULTIPLICATION.
3242  3062  BBB 0 30  1264  1266  FC,     LDL             PARSB     F2. SET FUNC MODE
3243  1264  BBB 1 25  0000  1863          LDA2  0000                    SET UP FUNCTION MODE,AND ALSO PUT A SPECIAL
3244  1863  BBB 0 70  4408  2111          ADD   BIG01                   LEFT PARENTHESIS OPERATOR ON THE STACK,
3245  2111  BBB 1 60  0000  4140          STA2  0000      NORMX         AS WE PASS OVER THE LIST OF PARAMETERS,
3246                          FC$   EQU   MRP                         CODE IS COMPILED TO COMPUTE THEM  AND STORE
3247  4158  BBB 0 30  1360  1266  FC%     LDL             PARSB         THEM IN TEMP, IF THE PARAMETER IS A CONSTANT
3248                                                              X   OR INDEX REGISTER. AS THE RIGHT PARENTHESIS
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3249
3250
3251  1360  888 0 30  0562  0364                LDL  DOWN      NAMEC     F4. BEGIN REVERSE PASS
3252  0364  888 0 50  0166  0368  NAME^        STL  EXIT9                   BEGIN NOW A RIGHT-TO-LEFT PASS OVER THE
3253  0368  888 1 25  0000  2063                LDA2  0000                  PARAMETERS. RESERVE THE UNIQUE STORAGE FOR
3254  2063  888 0 32  0400  0470                SHR   0400                  THEM, THEN PROCESS EACH PARAMETER IN TURN.
3255  0470  888 0 35  0406  2263                ERS  X45                    THE TYPES OF CODE PRODUCED ARE:
3256  2263  888 0 70  4095  0298                ADD  KON2                   FOR SIMPLE VARIABLE PARAMETER-PARAMETER
3257  0298  888 0 30  4196  0348                LDL  UNIQU
3258  0348  888 0 70  000B  1953                ADD  RL                           IIR HHHH, ERS PARAM, STA LIST
3259  1953  888 0 60  4196  1798                STA  UNIQU     9F                 AND LIST IS MARKED AS TEMP STORAGE.
3260  1798  888 0 75  4097  2463  9             SUB  KON1                   FOR A LABEL (I-O SUBROUTINES ONLY), CODE
3261  2463  888 1 60  0001  2663                STA2  0001                        00 LLLL 0000 (OUT OF SEQUENCE).
3262  2663  888 1 29  0000  2863                LDA3  0000                  FOR AN ARRAY,  IIR A0, STA LIST.
3263  2863  888 0 06  1866  1866                CLX                         FOR A SIMPLE VARIABLE OR TEMP STORAGE:
3264  1866  888 0 32  0900  1878                SHR   0900                        00 LLLL 0000 (OUT-OF-SEQUENCE).
3265  1878  888 0 70  0680  000A                ADD              RA
3266  0680  888 1 29  0000  4029                LDA3  0000       F0005
3267  4029  888 0 30  3063  4025  F0005         LDL  1F          F0001
3268  4025  888 0 05  0417  4744  F0001         LDX  FCEX        ASIGN
3269  3063  888 0 50  4191  0693  1             STL  TEMP5
3270  0693  888 0 25  0295  1297                LDA# 07HHH       H0000
3271  1297  888 0 30  2099  4556                LDL              ASM32
3272  2099  888 0 07  HHHH  2302                IIR   HHHH
3273  2302  888 0 35  4191  0743                ERS  TEMP5
3274  0743  888 0 20  0345  0547                BUF# 35000       00000
3275  0547  888 0 30  0749  4357                LDL  8F          ASM33
3276  4024  888 0 30  1864  0108  F0000         LDL              LSWOF
3277  1864  888 0 77  1864  2067                ATL              1F
3278  0417  888 0 25  000B  2067  FCEX          LDA  RL          1F
3279  4027  888 0 30  4623  2067  F0003         LDL  BIG05       1F
3280  2067  888 0 35  0043  2064  1             ERS  XM          2F
3281  2064  888 0 60  4209  2311  2             STA  TEMP2
3282  2311  888 1 25  0001  2264                LDA2  0001
3283  2264  888 0 05  2066  4494                LDX  7F          ASM42
3284  1266  888 0 50  1976  1978  PARSB         STL  EXIT8
3285  1978  888 1 29  0000  2464                LDA3  0000
3286  2464  888 0 77  2464  2267                ATL
3287  2267  888 0 37  0900  0879                SHL   0900
3288  0879  888 0 70  000A  0684                ADD  RA          -PAR1
3289  0685  888 0 30  1287  0363  &PAR1         LDL  1F          GET
3290  0684  888 0 25  4431  2333  -PAR1         LDA  BIG21
3291  2333  888 0 82  0685  1287                TEQ  &PAR1       1F
3292  1287  888 0 05  1976  0283  1             LDX  EXIT8       CLACC
3293  3022  888 0 07  1068  4710  DUA           IIR  T0018       DIVT2
3294  4026  888 0 25  2664  2266  F0002         LDA# 07990       19999
3295  2266  888 0 30  0749  4350                LDL  8F          ASM2
3296  0749  888 1 25  0001  2864  8             LDA2  0001
3297  2864  888 0 20  2212  3064                BUF  BIG40
3298  3064  888 1 64  0000  0665                STA3  0000
```

```
3299  0665  BBB 0 25  1395  0597            LDA   I0095
3300  0597  BBB 0 30  2066  4350            LDL   7F          ASM2
3301  2066  BBB 1 0G  9999  0670  7         IIR3   9999
3302  0670  BBB 1 25  0000  0865            LDA2  0000
3303  0865  BBB 0 70  4225  2078            ADD   BIG99       -PAR4
3304  2079  BBB 1 60  0000  1865  &PAR4      STA2  0000
3305  1865  BBB 1 25  0001  1798            LDA2  0001        9B
3306  2078  BBB 0 30  0860  2282  -PAR4      LDL               4F
3307  0860  BBB 1 25  0001  2065            LDA2  0001
3308  2065  BBB 0 75  4097  0500            SUB   KON1
3309  0500  BBB 0 30  0166  0932            LDL   EXIT9       FILNX
3310  2282  BBB 1 29  0000  2265  4         LDA3   0000
- 3311  2265  BBB 0 32  0400  4970            SHR    0400      ASM36
3312  0562  BBB 0 05  1821  2465  DOWN      LDX   MISUB
3313  2465  BBB 0 65  2220  2665            STX   UASW
3314  2665  BBB 1 07  9999  0869            IIR2   9999
3315  0869  BBB 1 29  0000  2865            LDA3  0000
3316  2865  BBB 0 35  4740  0492            ERS   X1
3317  0492  BBB 0 30  4140  2342            LDL   NORMX
3318  2342  BBB 0 50  1819  0463            STL   &SAC        SACC
3319                       CAL.    EQU   NO.
3320  2320  BBB 1 29  0000  3065  CAL$      LDA3   0000
3321  3065  BBB 0 35  0645  2466            ERS   H1
3322  2466  BBB 0 30  4974  2876            LDL   BIG10
3323  2876  BBB 0 82  2822  1279            TEQ   D1M$
3324  1279  BBB 0 30  2681  0362            LDL               FASIN
3325  2681  BBB 0 30  2083  2282            LDL               4B
3326  2083  BBB 0 05  0485  4084            LDX               FARNL
3327  0485  BBB 0 30  2822  0932            LDL   D1M$        FILNX
3328  4160  BBB 0 30  0762  0755  WDCAL      LDL   CALMD       INSMD
3329  0362  BBB 0 50  0201  2666  FASIN      STL   EXIT4
3330  2666  BBB 0 30  0868  4833            LDL               BR2
3331  0868  BBB 0 77  0868  0871            ATL
3332  0871  BBB 0 70  2212  2866            ADD   BIG40       -FUNC
3333  2866  BBB 0 70  1268  2119  -FUNC      ADD               -FNC1
3334  1268  BBB 0 59  9999  0000            CON   59999       90000
3335  2119  BBB 0 07  0100  2522  -FNC1      IIR    0100
3336  2522  BBB 0 70  1924  1327            ADD   FS
3337  1327  BBB 0 60  1924  1126            STA   FS
3338  1126  BBB 0 32  0200  1131            SHR    0200
3339  1131  BBB 0 34  0001  3066            LDL1   0001
3340  3066  BBB 0 05  1868  0204            LDX               SUBDF
3341  1868  BBB 0 30  0870  4833            LDL               BR2
3342  0870  BBB 0 20  1924  1326            BUF   FS
3343  1326  BBB 0 77  1326  1329            ATL
3344  1329  BBB 0 64  0000  2867            STA1   0000       &FUNC
3345  2867  BBB 1 29  0000  2467  &FUNC      LDA3   0000
3346  2467  BBB 0 35  4740  0692            ERS   X1
3347  0692  BBB 0 20  0008  0496            BUF   RL
- 3348  0496  BBB 1 64  0000  0201            STA3   0000       EXIT4
```

F5. LIR3
AFTER ALL PARAMETERS HAVE BEEN PROCESSED,
COMPILE THE INSTRUCTION
LIR3 U(I)FUNCT, AND THE
NEXT INSTRUCTION GOES TO LOCATION U(I).
THE PARAMETERS HAVE BEEN LISTED IN U(I+1),
U(I+2), ETC.
IF THIS CALL IS NOT IN A CALL STATEMENT, TREA
THE RESULT AS A COMPUTED QUANTITY IN
REGISTER A. GO TO#G1.
NOTE: IF A CALL STATEMENT IS GIVEN WITH
NO PARAMETERS, NO REFERENCE TO UNIQUE
STORAGE IS MADE.

```
3349  0204  BBB 0 65  4926  2667     SUBDF   STX  EXIT3
3350  2667  BBB 0 50  4209  2511             STL  TEMP2
3351  2511  BBB 0 32  0200  1916             SHR   0200
3352  1916  BBB 0 35  0718  2520             ERS# 00000      0HH00
3353  2520  BBB 0 20  4603  1355             BUF  BIG60
3354  1355  BBB 0 30  0757  4700             LDL              ASM41
3355  0757  BBB 0 05  4209  1361             LDX  TEMP2      1F
3356  2196  BBB 0 50  4926  1361     SHEAD   STL  EXIT3      1F
3357  1361  BBB 0 25  1363  1765     1       LDA  HEAD
3358  1765  BBB 0 75  4097  3067             SUB  KON1       2F
3359  3067  BBB 0 60  1363  1965     2       STA  HEAD
3360  1965  BBB 0 31  0568  0568             CLL
3361  0568  BBB 0 82  0171  0371             TEQ              1F
3362  0171  BBB 0 50  0773  0775             STL  WARN
3363  0775  BBB 0 07  0050  3067             IIR   0050       2B
3364  0371  BBB 0 70  1373  000A     1       ADD              RA
3365  1373  BBB 0 65  1549  4926             STX  00000      EXIT3
3366  4129  BBB 0 25  1331  2533     LABL    LDA  LEXP1                    D.  D40. CLOSE OF DO RANGE.
3367  2533  BBB 0 60  4206  1358             STA  LESW                        AS EACH STATEMENT LABEL IS SCANNED IT IS
3368  1358  BBB 0 30  1760  4044             LDL              SCAN            CHECKED AGAINST THE TOP OF THE DO STACK
3369  1760  BBB 0 30  0522  0089             LDL  LABLX       LSW             TO SEE WHETHER THIS STATEMENT IS THE END OF
3370  0522  BBB 0 29  0000  2002     LABLX   LDA1  0000      LBLX1           THE DO RANGE. IF IT IS, THE NEXT APOSTROPHE
3371  2002  BBB 0 35  4741  2068     LBLX1   ERS  XMH                        OPERATOR (END OF STATEMENT) SENDS CONTROL
3372  2068  BBB 0 60  4191  0893             STA  TEMP5                       TO STEP D40.
3373  0893  BBB 0 30  0495  4736             LDL              GOTO
3374  0495  BBB 0 05  4191  1143             LDX  TEMP5
3375  1143  BBB 0 65  4880  4140             STX  NXLOC       NORMX
3376  1331  BBB 0 77  1331  1334     LEXP1   ATL
3377  1334  BBB 0 25  0537  1939             LDA  DOOST
3378  1939  BBB 0 70  1141  000A             ADD              RA
3379  1141  BBB 0 25  0001  2268             LDA   0001
3380  2268  BBB 0 35  0043  2468             ERS  XM
3381  2468  BBB 0 82  1271  1871             TEQ              1F
3382  1271  BBB 0 25  0473  0875             LDA  DOEON
3383  0875  BBB 0 60  4170  1871             STA  DOESW       1F
3384  1871  BBB 0 50  4209  2711     1       STL  TEMP2       2F
3385  0244  BBB 0 60  4209  2711     LEXP    STA  TEMP2       2F
3386  2711  BBB 0 05  4277  1929     2       LDX  BIG50
3387  1929  BBB 0 65  4412  0564             STX  TYPE
3388  0564  BBB 0 25  0366  0768             LDA  LIT99
3389  0768  BBB 0 30  4410  4729             LDL  SEND        SRCH
3390  0473  BBB 0 08  0537  3076     DOEON   LIR1 DOOST                    D40. GO TO 2B
3391  3076  BBB 0 30  2278  4229             LDL              REM             EFFECTIVELY COMPILE GO TO THE INCREMENTATION
3392  2278  BBB 0 29  0001  2668             LDA1  0001                       PHASE AT THE BEGINNING OF THE DO LOOP CODING,
3393  2668  BBB 0 60  4191  1293             STA  TEMP5                       AND SET THE NEXT INSTRUCTION LOCATION TO BE
3394  1293  BBB 0 35  0043  2868             ERS  XM                          OF, THE ADDRESS FOR EXHAUSTION OF THE DO.
3395  2868  BBB 0 60  0024  3068             STA  TEMP6                   D41.DO OR DONT
3396  3068  BBB 0 25  000B  1272             LDA  RL                      DONTIF THE LOOP JUST ENDED WAS A DONT LOOP,
3397  1272  BBB 0 35  4741  1893             ERS  XMH                         SKIP TO STEP#D50.
3398  1893  BBB 0 30  0695  4736             LDL              GOTO        DO!
```

```
3399  0695  888 0 25  4191  1343          LDA   TEMP5
3400  1343  888 0 37  0400  0950          SHL    0400
3401  0950  888 0 35  0043  1269          ERS   XM
3402  1269  888 0 20  4756  2708          BUF   BIG02
3403  2708  888 1 64  0003  1869          STA3   0003
3404  1869  888 0 25  4191  2093          LDA   TEMP5
3405  2093  888 0 35  4740  2542          ERS   X1
3406  2542  888 0 31  0545  0545          CLL
3407  0545  888 0 82  0548  0748          TEQ   8F
3408  0748  888 0 60  1634  2069          STA   DOTAG
3409  2069  888 0 25  0108  2110          LDA   LSWOF
3410  2110  888 0 60  0089  1291          STA   LSW
3411  1291  888 0 25  4824  1926          LDA   DOVAR
3412  1926  888 1 64  0002  2269          STA3   0002      7F
3413  2269  888 0 05  2071  0673    7     LDX   9F                    D42.EMPTY LLIST
3414  0673  888 0 08  0415  0277          LIR1  LLIST                     TURN OFF THE VARIOUS INDICATORS WHICH ARE
- 3415  0277  888 0 30  1879  4229          LDL                 REM       SET DIFFERENTLY WHILE WE ARE IN A DO LOOP.
3416  1879  888 0 50  4631  2283          STL   TEMP1                     THEN FOR ALL LABELS WHICH WERE GIVEN
3417  2283  888 0 29  0001  2469          LDA1   0001                     TEMPORARY ASSIGNMENTS, WE HAVE AN LLIST
3418  2469  888 0 35  4741  2293          ERS   XMH                       ENTRY AND WE NOW OUTPUT THE INSTRUCTIONS
3419  2293  888 0 05  000A  1897          LDX   RA                              T     IIR1 0
3420  1897  888 0 29  0001  2669          LDA1   0001                             STA  V     P
3421  2669  888 0 37  0400  0477          SHL    0400                      WHERE V IS THE DO VARAIBLE, T IS THE TEM-
3422  0477  888 0 35  0043  2869          ERS   XM                        PORARY ASSIGNMENT, P IS THE PERMANENT
3423  2869  888 0 20  4277  2279          BUF   BIG50                     ASSIGNMENT. THE TEMP ASSIGNMENT IS THEN
3424  2279  888 1 64  0001  3069          STA3   0001                     FORGOTTEN.
3425  3069  888 0 30  2271  4303          LDL                 BR1
3426  2271  888 0 35  0435  1270          ERS   X00
3427  1270  888 0 20  000C  0674          BUF   RX
3428  0674  888 0 64  0000  1870          STA1   0000
3429  1870  888 0 30  000C  0874          LDL   RX
3430  0874  888 0 25  4631  2483          LDA   TEMP1
3431  2483  888 0 35  4741  2493          ERS   XMH
3432  2493  888 0 82  2269  0696          TEQ   7B
3433  0696  888 0 60  4880  2132          STA   NXLOC
3434  2132  888 0 25  1934  1336          LDA#  88790       00000       G    IIR10 STA3
3435  1336  888 0 30  0738  0377          LDL                AS111
3436  0738  888 1 29  0001  2070          LDA3   0001
3437  2070  888 0 30  1872  0089          LDL                LSW
3438  1872  888 0 30  2269  4686          LDL   7B           FILUP
3439  2071  888 0 60  4824  0548    9     STA   DOVAR        8F
3440  0548  888 1 29  0003  2270    8     LDA3   0003                    D50. ANY MORE
3441  2270  888 0 60  4880  2482          STA   NXLOC                     YES:IF ANOTHER DO LOOP ENDS ON THIS
3442  2482  888 0 25  0537  2139          LDA   DOOST                        STATEMENT,RETURN TO STEP#D40. ELSE
3443  2139  888 0 70  1341  000A          ADD                RA           NO: GO TO#Q3.
3444  1341  888 0 25  0001  2470          LDA    0001
3445  2470  888 0 35  0043  2670          ERS   XM
3446  2670  888 0 30  0024  2870          LDL   TEMP6
3447  2870  888 0 82  0473  0873          TEQ   DOEON
3448  0873  888 0 25  4376  2478          LDA   DOEOF
```

```
3449  2478  BBB 0 60  4170  000A          STA  DOESW     RA
3450                                                    X.  PROCESSING FORMAT STRING
3451                                                    X1. COMPILE 02
3452  4149  BBB 0 25  4196  1998  WDFMT   LDA  UNIQU          THE INSTRUCTION 02 MMMM CCCC IS COMPILED
3453  1998  BBB 0 70  4408  3070          ADD  BIG01         WHERE MMMM IS THE STARTING LOCATION OF THE
3454  3070  BBB 0 30  2072  4357          LDL  RESET   ASM33  FORMAT CODE. WITH THIS TRICK, A FORMAT LABEL
3455                                                    X   IS LIKE ANY STATEMENT LABEL.
3456                                                    X   NOW WE TRANSLATE THE FORMAT INTO A SPECIAL
3457                                                    X   PSEUDOCODE. THIS CODE GENERATES INSTRUCTIONS
3458                                                    X   OF THE FORM OP NNN WWW DD, CORRESPONDING
3459                                                    X   TO FORMAT SPECIFICATION 'NNN E WWW.DD'.
3460                                                    X   OPCODES 0-10 CORRESPOND RESPECTIVELY TO
3461                                                    X   ()PIEFXAHM/
3462  2072  BBB 0 25  1274  0677  RESET   LDA  FSWOF         X2. RESET OP,N,W,D
3463  0677  BBB 0 60  2479  2881          STA  FSW       G    N#TEMP5  OP#TEMP6  D#TEMP7  W#TEMP8
3464  2881  BBB 0 30  2683  0885          LDL       CLD        CLEAR OP, N, W, AND D TO ZERO
3465  2683  BBB 0 60  4191  2693          STA  TEMP5
3466  2693  BBB 0 60  0024  2471          STA  TEMP6
3467  2471  BBB 0 60  4750  1150          STA  TEMP8   X0000
3468  1150  BBB 0 30  1352  4202  X0000   LDL       NXTCH      X3. NEXT CHARACTER
3469  1352  BBB 0 08  1150  4205          LIR1 X0000   KIND       GET THE NEXT CHARACTER FROM THE FORMAT LIST.
3470  1152  BBB 0 25  4194  0196  X0002   LDA  TEMP7             ;IF IT IS BLANK, DO#X3 AGAIN.
3471  0196  BBB 0 37  0100  2671          SHL   0100         .   ;IF IT IS A DECIMAL POINT, CYCLE N,W,D LEFT 1
3472  2671  BBB 0 20  000C  1275          BUF  RX                AND RETURN TO#X3
3473  1275  BBB 0 60  4194  1150          STA  TEMP7   X0000     IF IT IS NUMERIC, SET D TO 10*D PLUS CHAR #X3
3474  1154  BBB 0 25  2356  1758  X0004   LDA  FSWON            IF IT IS ALPHABETIC OR SPECIAL CHARACTER,
3475  1758  BBB 0 60  2479  3081          STA  FSW     CYCLE     LOOK IT UP IN A TABLE TO SEE WHAT TO DO.
3476  1153  BBB 0 26  2556  2556  X0003   CLA  1F              EFI;AN E F I A OR M MEANS GO TO#X4.
3477  1151  BBB 0 26  2556  2556  X0001   CLA  1F              +- ;A PLUS OR MINUS MEANS GO TO#X5.
3478  2556  BBB 0 32  0500  0764  1        SHR   0500         XP ;AN X OR P MEANS GO TO#X6.
3479  0764  BBB 0 37  0400  0571          SHL   0400         (  ;A LEFT PARENTHESIS MEANS GO TO#X7.
3480  0571  BBB 0 32  0900  1983          SHR   0900         ,/);COMMA SLASH AND RIGHT PARENTHESIS GO TO#X8.
3481  1983  BBB 0 77  1983  0586          ATL                H  ;THE LETTER H MEANS GO TO#X9.
3482  0586  BBB 0 60  4394  0396          STA  TEMP9         '  ;AN APOSTROPHE MEANS WE GO TO#X11.
3483  0396  BBB 0 20  2198  2871          BUF  3F
3484  2871  BBB 0 60  1155  0957          STA  X0005
3485  0957  BBB 0 08  1173  1960          LIR1 X0023   2F
3486  1960  BBB 0 29  0000  3071  2       LDA1  0000
3487  3071  BBB 0 35  1273  1875          ERS  X89
3488  1875  BBB 0 82  2678  2878          TEQ  1F
3489  2878  BBB 0 0G  9999  1960          IIR1  9999   2B
3490  2678  BBB 0 29  0000  2272  1       LDA1  0000
3491  2272  BBB 0 32  0200  1277          SHR   0200
3492  1277  BBB 0 35  1273  0054          ERS  X89     BIG04
3493  2198  BBB 0 00  2472  0000  3       JMP           0000
3494  2472  BBB 0 25  4394  0896          LDA  TEMP9   VAR
3495  1173  BBB 0 00  0975  003A  X0023   JMP  FORCE     003A      G   ,
3496  1172  BBB 0 00  0574  003B  X0022   JMP  LEFT      003B      G   %
3497  1171  BBB 0 00  0975  011B  X0021   JMP  FORCE     011B      G   :
3498  1170  BBB 0 00  0975  1031  X0020   JMP  FORCE     1031      G   /
```

```
3499  1169  BBB 0 00  0896  0415  X0019  JMP  VAR     0415     G  E
3500  1168  BBB 0 00  0896  0516  X0018  JMP  VAR     0516     G  F
3501  1167  BBB 0 00  0896  0319  X0017  JMP  VAR     0319     G  I
3502  1166  BBB 0 00  1368  0637  X0016  JMP  POP     0637     G  X
3503  1165  BBB 0 00  0896  0711  X0015  JMP  VAR     0711     G  A
3504  1164  BBB 0 00  0896  0924  X0014  JMP  VAR     0924     G  M
3505  1163  BBB 0 00  2165  0818  X0013  JMP  HOL     0818     G  H
3506  1162  BBB 0 00  0964  990H  X0012  JMP  ONWRD   990H     G  '
3507  1161  BBB 0 00  1368  0227  X0011  JMP  POP     0227     G  P
3508  1160  BBB 0 00  0962  010A  X0010  JMP  FSIGN   010A     G  -
3509  1159  BBB 0 00  0962  001C  X0009  JMP  FSIGN   001C     G  &
3510  1158  BBB 0 00  0962  0030  X0008  JMP  FSIGN   0030     G  +
3511  1157  BBB 0 00  0975  010C  X0007  JMP  FORCE   010C     G  )
3512  1156  BBB 0 00  0574  000F  X0006  JMP  LEFT    000F     G  (
3513  0896  BBB 0 60  0024  3081  VAR    STA  TEMP6   CYCLE    X4. SET OP,CYCLE.
3514                                                           X   SET OP TO THE APPROPRIATE NUMBER, AND CYCLE
3515                                                           X   N,W, AND D LEFT 1. RETURN TO#X3.
3516  0962  BBB 0 60  4750  1150  FSIGN  STA  TEMP8   X0000    X5. SET SIGN INTO W
3517                                                           X   SET W TO 0 OR 1 (PLUS OR MINUS),RETURN TO#X3.
3518  1368  BBB 0 05  2072  1874  POP    LDX  RESET   ASMF1    X6. ASSEMBLE THIS OP
3519                                                           X   MOVE D TO N, THEN ASSEMBLE
3520                                                           X   OPNNNWWWDD INTO THE FORMAT CODE.RETURN TO#X2.
3521  0574  BBB 0 05  2176  1874  LEFT   LDX                  ASMF1    X7. ASSEMBLE 2 LINES
3522  2176  BBB 0 26  0779  0779        CLA                             MOVE D TO N AND ASSEMBLE, THEN INSERT A WORD
3523  0779  BBB 0 05  2072  4289        LDX  RESET   ASM43              OF ZEROES INTO THE FORMAT CODE. THIS WORD
3524                                                           X   IS USED AS A SCRATCH PAD BY THE FORMAT
3525                                                           X   PROCESSING PACKAGE. RETURN TO#X2.
3526  0975  BBB 0 60  4394  0596  FORCE  STA  TEMP9                    X8. ASSEMBLE TWO OPS
3527  0596  BBB 0 05  2398  2479        LDX                 FSW          IF DECIMAL POINT HAS NOT APPEARED, CYCLE
3528  2398  BBB 0 25  4394  2672        LDA  TEMP9                       N,W,D LEFT 1. IF PREVIOUS OP IS WAITING
- 3529  2672  BBB 0 05  2072  2074        LDX  RESET   ASMF3          ASSEMBLE IT, AND CLEAR W. IF CURRENT IS NOT
3530                                                           X   A COMMA, ASSEMBLE IT TOO.
3531                                                           X   NOTE THAT ON  N/  THE COUNT N COMES OUT IN W.
3532  2165  BBB 0 05  0567  1874  HOL    LDX  1F      ASMF1    X9. ASSEMBLE H OP
3533  0567  BBB 0 25  4191  0193  1      LDA  TEMP5               MOVE D TO N AND ASSEMBLE.
3534  0193  BBB 0 30  0395  0797        LDL# 99999   99995    X10.INSERT LITERAL
3535  0797  BBB 0 70  0008  2872        ADD  RL      -HOT        OUTPUT 5 CHARACTERS OF THE LITERAL AT A TIME
3536  2873  BBB 0 60  4191  2893  &HOT  STA  TEMP5               UNTIL THE H LITERAL IS COMPLETED.
3537  2893  BBB 0 25  4424  2126        LDA  LIT5                THE ROUTINE FOR H LITERALS IN THE CONSTANT
3538  2126  BBB 0 30  0567  0369        LDL  1B      FHSUB       CONDENSER IS USED, WITH ZERO FILL AT THE
3539  2872  BBB 0 82  2072  2075  -HOT  TEQ  RESET               RIGHT. RETURN TO#X2.
3540  2075  BBB 0 75  0008  1880        SUB  RL
3541  1880  BBB 0 30  2072  0369        LDL  RESET   FHSUB
3542  2479  BBB 0 30  2356  1958  FSW    LDL  FSWON   CYC1
3543  1274  BBB 0 30  2356  1958  FSWOF  LDL  FSWON   CYC1
3544  3081  BBB 0 30  1150  1958  CYCLE  LDL  X0000   CYC1
3545  1958  BBB 0 25  4750  3072  CYC1   LDA  TEMP8
3546  3072  BBB 0 60  4191  3093        STA  TEMP5
- 3547  3093  BBB 0 25  4194  1146        LDA  TEMP7
3548  1146  BBB 0 60  4750  0885        STA  TEMP8   CLD
```

```
 3549  0885  888 0 26  0688  0688  CLD     CLA
 3550  0688  888 0 60  4194  0008          STA   TEMP7     RL
 3551  2356  888 0 25  0024  2074  FSWON   LDA   TEMP6     ASMF3
 3552  2074  888 0 31  1877  1877  ASMF3   CLL
 3553  1877  888 0 82  000C  2080          TEQ   RX        ASMF2
 3554  1874  888 0 30  4194  1296  ASMF1   LDL   TEMP7
 3555  1296  888 0 50  4191  2080          STL   TEMP5     ASMF2
 3556  2080  888 0 37  0300  2486  ASMF2   SHL    0300
 3557  2486  888 0 20  4191  0894          BUF   TEMP5
 3558  0894  888 0 37  0300  0700          SHL    0300
-3559  0700  888 0 20  4750  1952          BUF   TEMP8
 3560  1952  888 0 37  0200  1357          SHL    0200
 3561  1357  888 0 20  4194  0796          BUF   TEMP7
 3562  0796  888 0 31  1799  1799          CLL
-3563  1799  888 0 50  4750  4289          STL   TEMP8     ASM43
 3564  0369  888 0 50  4568  1873  FHSUB   STL   EXIT2
 3565  1873  888 0 60  4209  2911          STA   TEMP2
 3566  2911  888 0 30  2513  4674          LDL             HOLSB
-3567  2513  888 0 25  4420  4921          LDA   TEMP3     ASM44
 3568  0964  888 0 05  4135  2080  ONWRD   LDX   SIGN+     ASMF2
 3569
 3570
 3571                      N78   NEW   78000     00000
 3572  4146  888 0 05  1148  1350  WDRED   LDX             1F
 3573  1148  888 0 78  1348  0405          N78   IN         0405
 3574  4159  888 0 05  1761  1350  WDPCH   LDX             1F
 3575  1761  888 0 78  1961  0406          N78   OUT        0406
-3576  4147  888 0 05  0949  1350  WDPRT   LDX             1F
 3577  0949  888 0 78  1961  0407          N78   OUT        0407
 3578  1350  888 0 65  2152  1354  1       STX   IOOP                  W1. SET TWO OPERANDS
 3579  1354  888 1 06  0002  2158          IIR3   0002                     SET UP TWO OPERANDS, ONE FOR THE EDITING
 3580  2158  888 0 32  0600  0767          SHR    0600                     SUBROUTINE AND ONE FOR THE DRIVER SUBROUTINE
 3581  0767  888 0 35  0043  2073          ERS   XM                       (I-O DEVICE).  SET UP TO EXPECT A LABEL.
 3582  2073  888 0 20  1178  1780          BUF   BIG20                    GO TO#G1, WE WILL RETURN TO STEP W2 WHEN
 3583  1780  888 1 64  0000  2273          STA3   0000                    THE COMMA IS SENSED.
 3584  2273  888 0 32  0200  3078          SHR    0200
 3585  3078  888 0 30  2280  0188          LDL             CALPK
 3586  2280  888 0 30  2682  0642          LDL             EXPLB
 3587  2682  888 0 25  0884  2686          LDA   IO#
 3588  2686  888 0 60  4117  2720          STA   SIGN#
 3589  2720  888 0 25  2722  2124          LDA#  00040     00000
 3590  2124  888 1 64  9999  2473          STA3   9999
 3591  2473  888 0 30  2275  0755          LDL   IO1MD     INSMD
 3592  0792  888 0 30  0394  2818  IO1$    LDL   IO2$      MCAL        G   MISSING COMMA
 3593  0393  888 0 30  0595  0364  IO1+    LDL             NAMEC       W2. CALL FUNCTION
 3594  0595  888 0 25  0997  1999          LDA   IOARA                     USE THE FUNCTION CALL ROUTINE (ROUTINE F) TO
 3595  1999  888 0 60  2220  2673          STA   UASW                      CREATE INITIAL ENTRY TO THE I/O SUBROUTINE.
 3596  2673  888 0 25  2475  2077          LDA   IO2MD                     THEN SET UP I/O MODE.  IF AN UNDIMENSIONED
 3597  2077  888 1 60  0000  3073          STA2   0000     IO2+            ARRAY VARIABLE OCCURS WE WILL GO TO STEP
 3598  0997  888 0 30  2199  4033  IOARA   LDL             BR2             W5. ON A COMMA WE GO TO STEP W10.
```

```
3599
3600
3601  2199  BBB 0 29  0001  2274                    LDA1  0001
3602  2274  BBB 0 35  0043  2474                    ERS   XM
3603  2474  BBB 0 30  2277  4260                    LDL                CONST
3604  2277  BBB 0 0G  0000  2882                    IIR1  0000
3605  2882  BBB 0 20  1884  2886                    BUF#  01000        05000
3606  2886  BBB 0 60  1093  0895                    STA   T0043
3607  0895  BBB 0 30  2097  4426                    LDL                REMRT
3608  2097  BBB 0 07  1082  4710                    IIR   T0032        DIVT2
3609  3073  BBB 0 30  2675  4044  I02,              LDL                SCAN
3610  2675  BBB 0 30  1064  2674                    LDL   $
3611  2674  BBB 0 82  0394  2477                    TEQ   I02$
3612  2477  BBB 0 30  4221  1123                    LDL   LPREN
3613  1123  BBB 0 82  4165  2326                    TEQ   I02,1
3614  2326  BBB 0 65  4209  2161                    STX   TEMP2
3615  2161  BBB 0 25  2152  1954                    LDA   I00P
3616  1954  BBB 0 30  2756  4242                    LDL                INSRT
3617  2756  BBB 0 05  4209  2361                    LDX   TEMP2        RESCN
3618  4165  BBB 0 25  0967  0569  I02,1            LDA#  19000        00000
3619  0569  BBB 0 30  0771  0173                    LDL                ASM1
3620  0771  BBB 0 25  1773  1175                    LDA   0I0%
3621  1175  BBB 0 30  2777  4242                    LDL                INSRT
3622  2777  BBB 1 07  0003  0381                    IIR2  0003
3623  0381  BBB 0 25  2183  0985                    LDA   I03MD
3624  0985  BBB 1 60  0000  2874                    STA2  0000
3625  2874  BBB 0 25  0323  2125                    LDA   THREF
3626  2125  BBB 1 60  9999  3074                    STA2  9999
3627  3074  BBB 0 25  0531  2733                    LDA   TW08
3628  2733  BBB 1 60  9998  3073                    STA2  9998         I02,
3629  1348  BBB 0 30  1950  2352  IN                LDL                ENTER
3630  1950  BBB 0 30  1814  3030                    LDL   ANSL        ASMTR
3631  1961  BBB 0 30  1763  0363  OUT               LDL                GET
3632  1763  BBB 0 30  1814  2352                    LDL   ANSL        ENTER
3633  2352  BBB 1 29  0000  2875  ENTER             LDA3  0000
3634  2875  BBB 0 32  0200  2480                    SHR   0200
3635  2480  BBB 0 35  3082  2084                    ERS   X3
3636  2084  BBB 0 70  3086  0889                    ADD#  04010        00000
3637  0889  BBB 0 05  000A  1294                    LDX   RA
3638  1294  BBB 0 25  1896  0173                    LDA   BIG13        ASM1
3639  0884  BBB 0 30  1887  4426  I0#               LDL                REMRT
3640  1887  BBB 0 30  1289  1891                    LDL                IMPDO
3641  1289  BBB 0 06  0358  0358                    CLX   WDD01
3642  3075  BBB 1 25  0000  2677  I0%               LDA2  0000
3643  2677  BBB 0 35  3023  2877                    ERS   XMC
3644  2877  BBB 0 30  0671  3077                    LDL   DOMD
3645  3077  BBB 0 82  2680  2880                    TEQ                IF
3646  2680  BBB 0 05  0742  1344                    LDX   T0B10
3647  1344  BBB 0 65  0927  2129                    STX   T0BSW
3648  2129  BBB 0 30  1931  0374                    LDL                DO$S3
```

```
X    AT THE END OF THE STATEMENT, WE GO TO STEP
X    W50.NOW WE GO TO THE COMMA ROUTINE,STEP#W10.
W5.  UNDIM ARRAY
     AN UNDIMENSIONED ARAY A IS CONVERTED INTO
     (A(*I*), *I* IS 1,N)
     USING ROUTINE#Q10     WHERE *I* IS A DUMMY
     VARIABLE AND N IS THE PRODUCT OF THE ARRAY
     DIMENSIONS.


W10.SCAN FOR (
     SCAN NEXT ITEM (CO-ROUTINE S). IF IT IS THE
;:   END OF THE STATEMENT,GO TO STEP#W50. IF IT IS
(:   A LEFT PARENTHESIS, GO TO STEP#W12.
OTH:OTHERWISE INSERT AN  IN  OR  OUT  OPERATOR
     ON THE STACK THEN GO TO#G2.  IN IS STEP W14,
     OUT IS STEP W15.


G    3F2H
W12.INTERRUPT SEQUENCE
     CREATEA BREAK IN THE INSTRUCTION SEQUENCE,
     FOR WHICH CODE WILL BE INSERTED LATER. PUT A
     SPECIAL LEFT PARENTHESIS ON THE STACK.  THIS
     SPECIAL LEFT PARENTHESIS IS STEP W20.
     GO TO STEP #W10 AGAIN.


W14.IN
     COMPILE LIR3    SUB, STL V. GO TO#G10.
W15.OUT
     COMPILE LDA V, LIR3    SUB. GO TO#G10.
     SUB IS ONE OF THREE ENTRIES, DEPENDING ON
     THE TYPE (FLOAT,FIX,UNSPECIFIED) OF V.


G    LIR3
W17.EQUALS SIGN
     AN EQUALS SIGN HAS APPEARED, SO WE PULL THE
     SPURIOUS IN OR OUT OPERATOR OFF THE STACK.
     WE NOW COURAGEOUSLY JUMP INTO THE MIDDLE
     OF THE THROUGH ROUTINE, STEP#D1.
W20.  (LIST)
     THE RIGHT PARENTHESIS MATCHING A LEFT HAS BEE
     ENCOUNTERED. IF AN IMPLIED DO LOOP OCCURRED
     INSIDE, WE USE PARTS OF ROUTINE D TO CREATE
     CODING FOR THE DONT LOOP CONTROL.  FINALLY
```

```
3649  1931  BBB 0 05  0140  2742          LDX  T0B                    THE INTERRUPTIONS FROM STEP W12 ARE ALL
3650  2742  BBB 0 65  0927  2329          STX  T0BSW                  LINKED TOGETHER PROPERLY.  GO TO#G1.
3651  2329  BBB 1 0G  0001  2933          IIR3  0001
3652  2933  BBB 0 25  0884  2087          LDA  I0#
3653  2087  BBB 0 60  4117  2920          STA  SIGN#      2F
3654  2880  BBB 0 30  2920  1891  1       LDL  2F         IMPD0
3655  2920  BBB 1 25  9998  2679  2       LDA2  9998
3656  2679  BBB 0 30  2883  4736          LDL             GOTO
3657  2883  BBB 0 25  0544  1346          LDA  NINEF
3658  1346  BBB 0 37  0400  2153          SHL  0400
3659  2153  BBB 0 20  4756  2358          BUF  BIG02
3660  2358  BBB 0 60  4880  0982          STA  NXLOC
3661  0982  BBB 1 07  9997  4140          IIR2  9997       NORMX
3662  1891  BBB 0 50  4195  2297  IMPD0   STL  EXIT6
3663  2297  BBB 0 05  2299  4084          LDX              FARNL
3664  2299  BBB 0 60  0544  1746          STA  NINEF
3665  1746  BBB 0 30  1748  4686          LDL              FILUP
3666  1748  BBB 1 25  9999  2879          LDA2  9999
- 3667  2879  BBB 0 60  4880  4195        STA  NXLOC      EXIT6
3668  0394  BBB 0 05  1796  2598  I02$    LDX# 04040      00000
3669  2598  BBB 0 25  1896  0498          LDA  BIG13                  W50.END
3670  0498  BBB 0 30  0900  0173          LDL              ASM1           COMPILE LIR3    SUB, THE ENDING SUBROUTINE.
3671  0900  BBB 1 0G  9999  0904          IIR3  9999                      AND THEN#EXIT.
3672  0904  BBB 0 25  2056  3079          LDA  #0FF
3673  3079  BBB 0 60  4117  0469          STA  SIGN#      EQ1$
3674                        I03$    EQU  N0$
3675                        I03.    EQU  I02.
3676  4144  BBB 0 05  1946  1948  WDFUN   LDX              1F         P.  FUNCTION AND SUBROUTINE DECLARATIONS
3677  1946  BBB 0 88  2223  9915          CON  88222      39915      G   IIR10 BUF1F LIR10 LDA1 ATL
- 3678  4145  BBB 0 05  0747  1948  WDSUB   LDX              1F
3679  0747  BBB 0 88  2223  0000          CON  88222      30000      G   IIR10 BUF1F LIR10
3680  1948  BBB 0 65  2651  3080  1       STX  DON                    P1. COMPILE PREAMBLE
3681  3080  BBB 0 05  0231  3083          LDX  BAND                       COMPILE IIR1 0000, BUF    1F, LIR1 0000,
3682  3083  BBB 0 65  4880  2332          STX  NXLOC                      (AND LDA 0001, ATL  IF FUNCTION)
3683  2332  BBB 0 05  1419  2284          LDX  ONE15
3684  2284  BBB 0 65  2287  1889          STX  XLINE
3685  1889  BBB 0 30  2091  4044          LDL              SCAN
3686  2091  BBB 1 64  0001  2484          STA3  0001
3687  2484  BBB 0 35  0043  2684          ERS  XM
3688  2684  BBB 0 70  2487  000A          ADD              RA
3689  2487  BBB 0 30  0001  2884          LDL  0001
3690  2884  BBB 0 05  2687  2089          LDX  1F         NAME
3691  2089  BBB 0 65  4464  2116  NAME    STX  EXIT1
3692  2116  BBB 1 0G  0001  2922          IIR3  0001
3693  2922  BBB 0 25  2324  2526          LDA  HEAD1
3694  2526  BBB 0 70  0728  000A          ADD              RA
3695  0728  BBB 0 50  1549  0551          STL  00000
3696  0551  BBB 0 25  000B  1755          LDA  RL
3697  1755  BBB 0 05  4974  2376          LDX  BIG10
3698  2376  BBB 0 32  0500  0984          SHR  0500
```

```
3699    0984  BBB 0 37  0500  0992                  SHL   0500
3700                                                OFF   9000
3701          *** OFF **                            OFF   9001
3702          *** OFF **                            OFF   9002
3703          *** OFF **                            STX   R0102
3704          *** OFF **                            STA   R0107
3705          *** OFF **                            STL   R0126     EXIT1
3706          *** OFF **                            OFF   8001
3707          *** OFF **                            OFF   8002
3708                                                ON    9000
3709                                                ON    9001
3710                                                ON    9002
3711    0992  BBB 0 65  0908  2310                  STX   R0108
3712    2310  BBB 0 60  0913  2715                  STA   R0113
3713    2715  BBB 0 50  0948  4464                  STL   R0148     EXIT1
3714                                                ON    8001
3715                                                ON    8002
3716    2687  BBB 0 25  2289  2291    1             LDA   BIGOG               P2. SET UP CARD
3717    2291  BBB 0 30  1894  4521                  LDL                ASM37        SET UP THE NAME OF THE FUNCTION INTO THE
3718    1894  BBB 0 25  2096  0698                  LDA# 01000         20000        OUTPUT CARDS. INITIALIZE OTHER THINGS LIKE
3719    0698  BBB 0 60  4196  2148                  STA   UNIQU                     THE MEANING OF RETURN.  A MAIN PROGRAM
3720    2148  BBB 0 25  4603  1955                  LDA   BIG60                    IS DISTINGUISED FROM A SUBPROGRAM
-3721   1955  BBB 0 30  1757  4357                  LDL                ASM33        ONLY BY DEFAULT.
3722    1757  BBB 0 25  2651  3084                  LDA   DON
3723    3084  BBB 0 30  2887  0377                  LDL                ASM11
3724    2887  BBB 0 25  4408  2510                  LDA   BIG01
3725    2510  BBB 0 30  2112  4686                  LDL                FILUP
3726    2112  BBB 0 25  0323  2325                  LDA   THREF
3727    2325  BBB 0 60  4880  2532                  STA   NXLOC
3728    2532  BBB 0 25  2134  1936                  LDA# 60000         10000
3729    1936  BBB 0 30  1138  4357                  LDL                ASM33
3730    1138  BBB 0 25  0540  2942                  LDA# 70200         00000
3731    2942  BBB 0 06  0745  0745                  CLX
3732    0745  BBB 0 30  0947  4535                  LDL                ASM4
3733    0947  BBB 0 30  1149  0751                  LDL# 34000         20000
3734    0751  BBB 0 50  2651  1885                  STL   DON                 P3. SCAN PARAMETERS
3735    1885  BBB 0 30  3087  0755                  LDL   PARMD        INSMD        SCAN UNTIL THE END OF THE STATEMENT,
3736    2136  BBB 0 07  0001  2339    PAR,          IIR    0001                     COLLECTING ALL PARAMETERS ON THE OPERAND
3737    2339  BBB 0 70  2651  2085                  ADD   DON                       STACK. WE GET TO STEP P4 AT THE END
3738    2085  BBB 0 60  2651  4140                  STA   DON          NORMX        OF THE STATEMENT.
3739    2539  BBB 0 30  1941  4044    PAR$          LDL                SCAN      P4. SCAN AHEAD
3740    1941  BBB 0 30  1743  0945                  LDL   OWDIM                  DIM:IF THE NEXT ITEM SCANNED IS ANOTHER END OF
3741    0945  BBB 0 82  4042  2348                  TEQ   NORM                       STATEMENT OR DIMENSION, GO TO#G2.
3742    2348  BBB 0 30  1064  2285                  LDL   $                    OTH:
3743    2285  BBB 0 82  2539  0888                  TEQ   PAR$        8F       P5. GENERATE THUNKS
3744                                                                           X   ELSE WE ASSUME ALL DIMENSIONED PARAMETERS
3745                                                                           X   HAVE BEEN NAMED, AND WE COMPILE CODE TO TRANS
3746    0888  BBB 1 0G  9999  1292    8             IIR3   9999                     FER FROM THE PARAMETER LIST TO UNIQUE STORAGE
3747    1292  BBB 0 30  1238  2485                  LDL   CRAND                     TEN INSTRUCTIONS FOR NON-DIMENSIONED
3748    2485  BBB 0 82  1288  1888                  TEQ   1F                        PARAMETERS AND TWO FOR DIMENSIONED ONES.
```

```
3749  1888  888 0 25  2651  2685            LDA  DON          ASM37     THEN OFF TO#G2.
3750  2685  888 0 75  4097  1900            SUB  KON1
3751  1900  888 0 60  2651  2885            STA  DON
3752  2885  888 0 30  2088  4521            LDL               ASM37
3753  2088  888 1 29  0001  3085            LDA3  0001
3754  3085  888 0 30  2288  4303            LDL               BR1
3755  2288  888 0 70  4392  2295            ADD  BIG70        -FB
3756  1288  888 1 07  9999  2361  1         IIR2  9999        RESCN
3757  2361  888 0 25  4030  4042  RESCN     LDA  LAST         NORM
3758  2295  888 0 30  2497  2499  -FB       LDL               FBSB1
3759  2497  888 0 25  4196  2548            LDA  UNIQU
3760  2548  888 0 60  0288  0490            STA  TMP13
3761  0490  888 0 70  0613  2488            ADD  KON3
3762  2488  888 0 60  4196  0898            STA  UNIQU
3763  0898  888 0 25  4604  2507            LDA  BIG25
3764  2507  888 0 30  2509  2312            LDL               FBSUB
3765  2509  888 0 25  4247  1349            LDA  BIG30
3766  1349  888 0 30  1351  2312            LDL               FBSUB
3767  1351  888 0 25  4277  0979            LDA  BIG50
3768  0979  888 0 30  0888  2312            LDL  88           FBSUB
3769  2296  888 0 30  1098  4303  &FB       LDL               BR1
3770  1098  888 0 30  2100  2499            LDL               FBSB1
3771  2100  888 0 05  2502  4927            LDX               INCUQ
3772  2502  888 0 70  1904  2707            ADD# 48999        90000
3773  2707  888 0 30  0888  4357            LDL  88           ASM33
3774  2499  888 0 25  4196  2748  FBSB1     LDA  UNIQU
3775  2748  888 0 70  2150  2353            ADD  BIG03
3776  2353  888 0 24  0000  2688            BUF1  0000
3777  2688  888 0 64  0000  0008            STA1  0000        RL
3778  2312  888 0 50  0379  0581  FBSUB     STL  EXIT7
3779  0581  888 0 20  0022  2888            BUF  X9
3780  2888  888 0 30  0690  4260            LDL               CONST
3781  0690  888 0 05  1892  0072            LDX               CASIN
3782  1892  888 0 25  0008  2496            LDA  RL
3783  2496  888 0 70  1298  0101            ADD  BIG24
3784  0101  888 0 30  2303  4357            LDL               ASM33
3785  2303  888 0 25  1380  1182            LDA  I0080
3786  1182  888 0 30  1184  4350            LDL               ASM2
3787  1184  888 0 25  0288  0890            LDA  TMP13
3788  0890  888 0 70  4097  2300            ADD  KON1
3789  2300  888 0 60  0288  1290            STA  TMP13
3790  1290  888 0 70  2092  1295            ADD# 58999        90000
3791  1295  888 0 30  0379  4357            LDL  EXIT7        ASM33
3792  4150  888 0 30  4140  1792  WDRTN     LDL  NORMX        RETRN
3793  1792  888 0 25  2287  4736  RETRN     LDA  XLINE        GOTO
- 3794  0594  888 0 30  4095  3088  INIT    LDL  KON2                 Z.  INITIALIZATION AND TERMINATION
3795  3088  888 0 25  1363  2365            LDA  HEAD                     Z1 IS ENTERED AT THE BEGINNING OF EACH
3796  2365  888 0 87  1768  1968            TGR  1F                       PROGRAM AND SUBPROGRAM.
3797  1968  888 0 50  0773  1775            STL  WARN                 Z1. SET UP HEADER TABLE
3798  1775  888 0 07  0050  1768            IIR  0050         1F          THE HEADER CARD INFORMATION IS KEPT IN A 50-
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```
3799  1768  888 0 60  2324  2726      1        STA  HEAD1                    POSITION CIRCULAR TABLE. IF MORE THAN 50
3800  2726  888 0 75  0008  2131               SUB  RL                       TOTAL ITEMS ARE PUT IN, A FLAG IS SET
3801  2131  888 0 60  1363  2565               STA  HEAD                     SO THAT LOAD-AND-GO OPERATION IS DISALLOWED.
3802  2565  888 0 30  1367  0769               LDL  2F
3803  0769  888 0 05  1371  2089               LDX            NAME
3804  1371  888 0 07  4038  0774               IIR  N0008
3805  0774  888 0 60  4427  1179               STA  NWORD     INITT
3806  1367  888 0 21  1224  1958      2        ALF  MAIN*
3807  1179  888 0 07  3099  1782      INITT    IIR  MEML1                  Z2. CLEAR SYMBOL TABLE
3808  1782  888 0 60  4600  2489               STA  MEML                     ALL SYMBOLS EXCEPT RESERVED WORDS ARE
3809  2489  888 0 05  2491  2094               LDX  MEMU1                    REMOVED FROM THE SYMBOL TABLE.
3810  2094  888 0 65  4292  1744               STX  MEMU
3811  1744  888 0 07  0099  1147               IIR   0099     1F
3812  1147  888 0 60  4420  2172      1        STA  TEMP3     2F
3813  2172  888 0 70  0974  000A      2        ADD            RA
3814  0974  888 0 08  1420  1980               LIR1 Z0000
3815  1980  888 0 34  0000  2689               LDL1  0000
3816  2689  888 0 25  2491  2294               LDA  MEMU1
3817  2294  888 0 87  2697  2699               TGR            2F     +02
3818  2697  888 0 05  2699  0301               LDX  2F
3819  0301  888 0 30  2503  4229               LDL            REM
3820  2503  888 0 25  4420  2172               LDA  TEMP3     2B
3821  2699  888 0 25  4420  1923      2        LDA  TEMP3
3822  1923  888 0 31  2926  2926               CLL
3823  2926  888 0 82  2529  2729               TEQ  1F
3824  2729  888 0 75  4097  1147               SUB  KON1      1B
3825  2529  888 0 50  0027  2889      1        STL  LEVEL
3826  2889  888 0 50  4635  0737               STL  AVAIL
3827  0737  888 0 50  4928  2180               STL  RWORD
3828  2180  888 0 50  4579  3089               STL  IWORD
3829  3089  888 0 50  4088  0740               STL  DUMMY
3830  0740  888 0 05  2143  1145               LDX# 60090     00000
3831  1145  888 0 65  1924  1927               STX  FS
- 3832  1927  888 0 05  4577  1779               LDX  B10                  Z3. INITIALIZE COUNTERS
3833  1779  888 0 65  0503  0705               STX  P0103                    VARIOUS THINGS ARE RESET, E.G. SUBROUTINE
3834  0705  888 0 65  0508  2710               STX  P0108                    PACKAGE REQUESTS, STORAGE ALLOCATION REQUESTS
3835  2710  888 0 08  0004  2713               LIR1  0004                    COUNTERS ARE SET UP TO INDICATE A MAIN
3836  2713  888 0 31  2316  2316               CLL  1F                       PROGRAM, THESE WILL BE EFFECTIVE UNLESS
3837  2316  888 0 26  2123  2123      1        CLA                           A FUNCTION OR SUBROUTINE DECLARATION FOLLOWS.
3838  2123  888 0 24  1750  2552               BUF1 W0000                    START COMPILING BY TROTTING FORTH TO#G1.
3839  2552  888 0 64  1750  2752               STA1 W0000
3840  2752  888 0 06  9999  2956               IIR1  9999
3841  2956  888 0 82  1959  2316               TEQ            1B
3842  1959  888 0 25  4408  1890               LDA  BIG01
3843  1890  888 0 60  4196  1898               STA  UNIQU
3844  1898  888 0 70  4408  2512               ADD  BIG01
3845  2512  888 0 60  0231  2090               STA  BAND
3846  2090  888 0 70  4408  2712               ADD  BIG01
3847  2712  888 0 60  4198  2350               STA  COMON
3848  2350  888 0 05  4277  1979               LDX  BIG50
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3849   1979   BBB 0 65   4456   2290                STX   NZONS
3850   2290   BBB 0 05   4623   2525                LDX   BIG05
3851   2525   BBB 0 65   4094   2146                STX    4094
- 3852   2146   BBB 0 65   4096   2798                STX    4096
- 3853   2798   BBB 0 65   4098   2490                STX    4098
3854   2490   BBB 0 50   4374   2127                STL   OLDLC
3855   2127   BBB 0 50   4701   2553                STL   TEMPS
3856   2553   BBB 0 07   0004   1957                IIR    0004
3857   1957   BBB 0 60   4880   1982                STA   NXLOC
3858   1982   BBB 0 07   0010   1785                IIR    0010
3859   1785   BBB 0 60   2287   2690                STA   XLINE
3860   2690   BBB 0 07   4183   2494                IIR   50003
3861   2494   BBB 0 60   4980   2732                STA   ASM5T
3862                                                 OFF    9000
3863          *** OFF **                             OFF    9001
3864          *** OFF **                             OFF    9002
3865          *** OFF **                             STL   R0114
3866                                                 ON     9000
3867                                                 ON     9001
3868                                                 ON     9002
3869                                                 OFF    8001
3870                                                 OFF    8002
3871   2732   BBB 0 50   0928   2130                STL   R0128
3872                                                 ON     8001
3873                                                 ON     8002
3874   2130   BBB 1 02   1520   2334                LIR2  MODE
3875   2334   BBB 1 08   1190   4140                LIR3  RAND      NORMX
3876   4143   BBB 0 30   1345   1792   WDEND        LDL           RETRN      Z50.END IS SENSED
3877   1345   BBB 0 30   1347   1627                LDL           ADDNX           AN END CARD MEANS WE SIMULATE A RETURN
3878   1347   BBB 0 30   1749   1951                LDL           ASM5D           STATEMENT (I.E. GO TO EXIT).
3879   1749   BBB 0 25   0908   2910                LDA   RWD1
3880   2910   BBB 0 35   0009   2890                ERS   H5
3881   2890   BBB 0 60   0908   2912                STA   RWD1
3882   2912   BBB 0 25   2114   2516                LDA   1F
3883   2516   BBB 0 20   2324   000A                BUF   HEAD1     RA
3884   2114   BBB 1 02   0000   2917   1            LIR2   0000                 Z51.PUNCH HEADERS
3885   2917   BBB 0 25   0231   3090                LDA   BAND                      PUNCH AND PRINT HEADER INFORMATION.
- 3886   3090   BBB 0 70   4541   1944                ADD   KN200
3887   1944   BBB 0 05   4198   2550                LDX   COMON
3888   2550   BBB 0 32   0400   2157                SHR    0400
3889   2157   BBB 0 35   4724   2576                ERS   XC
3890   2576   BBB 0 20   2178   2380                BUF#  71000     10000
3891   2380   BBB 1 60   1547   1949                STA2  09998
3892   1949   BBB 0 25   4196   2998                LDA   UNIQU
3893   2998   BBB 0 37   0200   2691                SHL    0200
3894   2691   BBB 0 32   0600   2500                SHR    0600
3895   2500   BBB 0 35   3023   2891                ERS   XMC
3896   2891   BBB 0 20   2212   3091                BUF   BIG40
3897   3091   BBB 1 60   1548   2750                STA2  09999
3898   2750   BBB 0 06   2753   2753                CLX
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- 3899  2753  BBB 0 30  2155  2156          LDL          SHEAD
  3900  2155  BBB 0 25  2357  2159          LDA  1F
  3901  2159  BBB 0 05  2561  1963          LDX  2F
  3902  1963  BBB 0 60  0503  0905          STA  P0103
  3903  0905  BBB 0 65  0508  2913          STX  P0108      3F
  3904                                      OFF   9000
  3905        *** OFF **              1     NUM  (HEAD      ERS)
  3906        *** OFF **              2     ZON  (HEAD      ERS)
  3907        *** OFF **                    OFF   8002
  3908        *** OFF **                    OFF   8001
  3909        *** OFF **                    OFF   9001
  3910        *** OFF **                    OFF   9002
  3911                                      ON    9000
  3912  2357  BBB 0 64  A7FA  27G0    1     CON  64A7F      A27G0
  3913  2561  BBB 0 31  0200  1110    2     CON  31020      01110
  3914                                      ON    9001
  3915                                      ON    9002
  3916                                      ON    8001
  3917                                      ON    8002
  3918  2913  BBB 1 25  1549  2151    3     LDA2 00000
  3919  2151  BBB 0 31  2154  2154          CLL
  3920  2154  BBB 0 82  2557  2757          TEQ  3F
  3921  2757  BBB 0 05  4577  2179          LDX  B10
  3922  2179  BBB 0 30  0781  4533          LDL              PRNT
  3923  0781  BBB 1 25  1549  2351          LDA2 00000
  3924  2351  BBB 0 30  2953  4337          LDL              ASM5
  3925  2953  BBB 1 07  9999  2957          IIR2 9999
  3926  2957  BBB 0 31  2160  2160          CLL
  3927  2160  BBB 0 82  2163  2913          TEQ              3B
  3928  2163  BBB 1 02  0050  2913          LIR2 0050        3B
  3929  2557  BBB 0 30  2359  1951    3     LDL              ASM5D     Z52•READ NEXT CARD
  3930  2359  BBB 0 25  2761  2363          LDA  1F                    EMP:IF NO MORE INPUT CARDS ARE IN THE BUFFER,
  3931  2363  BBB 0 05  2765  0337          LDX              BU            PUNCH OUT SEVERAL BLANK CARDS AND#STOP.
  3932  2765  BBB 0 30  0135  0937          LDL  CHALT       POUT      LOADIF THE NEXT CARD IS THE BEGINNING OF#PASS2,
  3933  2761  BBB 0 25  0011  2292    1     LDA  HWD1                      TRANSFER TO THE SECOND PASS UNLESS AN ERROR
  3934  2292  BBB 0 30  2694  2696          LDL  *LOAD                     OCCURRED IN THE PRECEDING PROGRAMS.
  3935  2696  BBB 0 82  2899  0594          TEQ  PASS2       INIT      OTH:OTHERWISE WE GO TO#Z1 TO PROCESS ANOTHER
  3936  2694  BBB 0 82  663B  3B01  *LOAD    NUM  *BOOT       L 01
  3937  2899  BBB 0 30  0501  0937  PASS2   LDL  HALT        POUT
  3938  0937  BBB 0 50  1976  2378  POUT    STL  EXIT8
  3939  2378  BBB 0 30  0050  2492          LDL  LC                    G    SUBROUTINE TO EJECT CARDS AND PAPER
  3940  2492  BBB 0 85  2894  1971          MUL  1F
  3941  1971  BBB 0 70  1973  000A          ADD              RA
  3942  1973  BBB 0 16  0049  2580          PFD   0049       -POT
  3943  2581  BBB 0 67  3333  000A  &POT    HLT   3333       RA
  3944  2580  BBB 0 30  2182  1784  -POT    LDL              ASM5C
- 3945  2182  BBB 0 30  1984  1784          LDL              ASM5C
  3946  1984  BBB 0 30  0786  1784          LDL              ASM5C
  3947  0786  BBB 0 16  0017  0790          PFD   0017       -POT1
  3948  0791  BBB 0 67  3333  000A  &POT1   HLT   3333       RA
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3949   0790  BBB 0 16  0086  0794   -POT1    PFD   0086    -POT2
3950   0795  BBB 0 67  3333  000A   &POT2    HLT   3333    RA
3951   0794  BBB 0 30  1976  1784   -POT2    LDL   EXIT8   ASM5C
3952   2894  BBB 1 00  0050  0000   1        CON1  00005   00000
3953   0501  BBB 0 25  0773  1975   HALT     LDA   WARN
3954   1975  BBB 0 70  000A  2780            ADD   RA      -PAS2
3955   2781  BBB 0 05  2383  1985   &PAS2    LDX   1F      2F
3956   1985  BBB 0 72  000C  000C   2        HCC   RX      RX
3957   2383  BBB 0 42  0787  1985   1        HBT           2B
3958   0787  BBB 0 96  0000  2692            HBU   HDW2
3959   2692  BBB 0 72  000A  1895            HCC   RA
3960   1895  BBB 0 96  0000  2892            HBU   HDW2    3F
3961   2892  BBB 0 07  2896  2095   3        IIR   2F
3962   2095  BBB 0 60  2892  2781            STA   3B      &PAS2
3963   2896  BBB 1 07  1548  2700   2        IIR2  09999
3964   2700  BBB 0 08  0000  0021            LIR1  0000    HDW3
3965   2780  BBB 0 67  0A2A  0A2A   -PAS2    HLT   0A2A     0A2A
3966   1784  BBB 0 50  4568  3092   ASM5C    STL   EXIT2   1F
3967   3092  BBB 0 26  2495  2495   1        CLA
3968   2495  BBB 0 30  2897  4337            LDL   2F      ASM5
3969   1951  BBB 0 50  4568  2897   ASM5D    STL   EXIT2   2F
3970   2897  BBB 0 07  4181  2900   2        IIR   50001
3971   2900  BBB 0 30  4980  2932            LDL   ASM5T
3972   2932  BBB 0 82  4568  3092            TEQ   EXIT2   1B
3973   2491  BBB 0 00  4000  0000   MEMU1    JMP   MEMU2    0000
3974   4514  BBB 0 05  2780  2382   ALARM    LDX   -PAS2                 G   ERROR PRINTOUT SUBROUTINE
3975   2382  BBB 0 65  0501  1628            STX   HALT    PANIC
3976                                          OFF   8001
3977                                          OFF   9000
3978         *** OFF **                       OFF   9001
3979         *** OFF **             PANIC     LDX   H10     PRNT
3980         *** OFF **             KON*E     LIR1  00034   BINSB
3981         *** OFF **             WDEQU     LDL   NORMX   BED
3982         *** OFF **                       OFF   9002
3983         *** OFF **                       OFF   8002
3984                                          ON    9000
3985                                          ON    9001
3986                                          ON    8001
3987   4012  BBB 0 07  0001  3094   C0002    IIR   0001                  E.  EQUIVALENCE DECLARATIONS.
3988   3094  BBB 0 60  4209  2314            STA   TEMP2                     IT IS ALMOST IMPOSSIBLE TO EXPLAIN HOW THE
3989   2314  BBB 0 26  1918  1918            CLA                           PROCESSING OF EQUIVALENCE DECLARATIONS
3990   1918  BBB 0 60  4420  2323            STA   TEMP3                   WORKS IN THIS COMPILER. IT DOES SEEM TO
3991   2323  BBB 0 25  4631  2534            LDA   TEMP1   2F              WORK, HOWEVER. EQUIVALENCE CLASSES ARE KEPT
3992   2534  BBB 0 05  000A  1938   2        LDX   RA                      IN CIRCULARLY-LINKED CHAINS. IT IS EASY TO
3993   1938  BBB 0 70  4974  2977            ADD   BIG10   -ASN2           MERGE TWO CHAINS INTO ONE. WHEN AN ITEM
3994   2978  BBB 0 35  4741  0593   &ASN2    ERS   XMH                     OF A CHAIN IS FIRST REFERENCED AFTER AN
3995   0593  BBB 0 75  4623  2695            SUB   BIG05                   EQUIVALENCE DECLARATION, WE GO TO E1. FORMATS
3996   2695  BBB 0 60  4624  2327            STA   TEMP4                   OF THE CHAIN ENTRIES APPEAR IN THE TABLE
3997   2327  BBB 0 70  4209  1362            ADD   TEMP2                   OF FORMATS.
3998   1362  BBB 0 31  2965  2965            CLL                       E1. SEARCH THROUGH CHAIN
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41 3999  2965  B0B 0 87  3096  2168          TGR  1F   +03          TRAVERSE THE CHAIN ONCE TO SEE HOW MUCH
   4000  2168  B8B 0 07  0001  3096          IIR   0001     1F      UNIQUE STORAGE IS TO BE RESERVED.
   4001  3096  B8B 0 60  4209  2514  1       STA  TEMP2     3F
   4002  2514  B8B 0 25  4420  2523  3       LDA  TEMP3
 - 4003  2523  B8B 0 75  4624  2578          SUB  TEMP4
   4004  2578  B8B 0 87  1181  1781          TGR  1F
   4005  1781  B8B 0 50  4420  2895          STL  TEMP3     6F
   4006  1181  B8B 0 60  4420  2895  1       STA  TEMP3     6F
   4007  2977  B8B 0 70  4603  3097  -ASN2    ADD  BIG60     -ASN3
   4008  3098  B8B 0 37  0400  1705  &ASN3    SHL   0400
   4009  1705  B8B 0 35  0043  2098          ERS  XM
   4010  2098  B8B 0 30  4209  2714          LDL  TEMP2
   4011  2714  B8B 0 87  2118  2171          TGR            1F     +54
   4012  2118  B8B 0 60  4209  2171          STA  TEMP2     1F
   4013  2171  B8B 0 77  2171  1174  1       ATL
   4014  1174  B8B 0 07  HHHH  2778          IIR   HHHH
   4015  2778  B8B 0 39  0001  2298          ERS1  0001
   4016  2298  B8B 0 75  0008  2703          SUB  RL
   4017  2703  B8B 0 30  4420  2723          LDL  TEMP3
   4018  2723  B8B 0 87  2527  2980          TGR            1F     +54
   4019  2527  B8B 0 60  4420  2980          STA  TEMP3     1F
   4020  2980  B8B 0 25  000C  3097  1       LDA  RX        -ASN3
   4021  2895  B8B 0 32  0600  3097  6       SHR   0600     -ASN3
   4022  3097  B8B 0 30  3099  4303  -ASN3    LDL            BR1
   4023  3099  B8B 0 30  4631  2734          LDL  TEMP1
   4024  2734  B8B 0 82  1137  2534          TEQ            2B
   4025  1137  B8B 0 25  4196  2948          LDA  UNIQU
   4026  2948  B8B 0 70  4209  1762          ADD  TEMP2
   4027  1762  B8B 0 77  1762  0566          ATL
   4028  0566  B8B 0 70  4420  2173          ADD  TEMP3
   4029  2173  B8B 0 60  4196  2399          STA  UNIQU
   4030  2399  B8B 0 25  4545  2498          LDA  ASGN1     EQASN
   4031  2498  B8B 0 50  4631  2934  EQASN    STL  TEMP1                  E2. ASSIGN CHAIN
   4032  2934  B8B 0 60  4464  0766          STA  EXIT1                      TRAVERSE THE CHAIN AGAIN, ASSIGNING EVERY
   4033  0766  B8B 0 25  4740  1992          LDA  X1                         VARIABLE IN THE CHAIN RELATIVE TO THE OTHERS.
   4034  1992  B8B 0 35  000B  1996          ERS  RL                         GO TO#DEFX.
   4035  1996  B8B 0 60  4420  2698          STA  TEMP3
   4036  2698  B8B 0 0G  0000  2702          IIR1  0000
   4037  2702  B8B 0 60  4209  2914          STA  TEMP2
   4038  2914  B8B 0 29  0000  2898          LDA1  0000
   4039  2898  B8B 0 70  4392  2345          ADD  BIG70     -EQV3
   4040  2346  B8B 0 37  0400  2354  &EQV3    SHL   0400
   4041  2354  B8B 0 35  0043  0701          ERS  XM
   4042  0701  B8B 0 70  4631  0535          ADD  TEMP1
   4043  0535  B8B 0 60  4631  2345          STA  TEMP1     -EQV3
   4044  2345  B8B 0 29  0000  1901  -EQV3    LDA1  0000     2F
   4045  1901  B8B 0 05  000A  1905  2       LDX  RA
   4046  1905  B8B 0 70  4974  2727          ADD  BIG10     -EQV1
   4047  2728  B8B 0 35  4741  2343  &EQV1    ERS  XMH
   4048  2343  B8B 0 70  4631  2184          ADD  TEMP1
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4049  2184  BBB 0 75  4623  2101          SUB   BIG05
4050  2101  BBB 0 60  4631  0735          STA   TEMP1
4051  0735  BBB 0 32  0600  2144          SHR   0600        3F
4052  2727  BBB 0 70  4603  2558  -EQV1    ADD   BIG60       -EQV2
4053  2559  BBB 0 37  0400  1366  &EQV2    SHL   0400
4054  1366  BBB 0 35  0043  2301          ERS   XM          1F
4055  2558  BBB 0 07  0001  2301  -EQV2    IIR   0001        1F
4056  2301  BBB 0 75  4631  0935  1        SUB   TEMP1
4057  0935  BBB 0 77  0935  2138          ATL
4058  2138  BBB 0 25  000C  2543          LDA   RX
4059  2543  BBB 0 70  4392  2195          ADD   BIG70       -EQV4
4060  2196  BBB 0 25  4247  2501  &EQV4    LDA   BIG30       1F
4061  2195  BBB 0 35  4724  2501  -EQV4    ERS   XC          1F
4062  2501  BBB 0 20  000B  2105  1        BUF   RL
4063  2105  BBB 0 64  0000  2701          STA1  0000
4064  2701  BBB 0 35  4740  2743          ERS   X1
4065  2743  BBB 0 30  4420  2372          LDL   TEMP3
4066  2372  BBB 0 82  2175  2375          TEQ   1F
4067  2375  BBB 0 30  4464  0528          LDL   EXIT1       BED
4068  2175  BBB 0 25  000C  2144  1        LDA   RX          3F
4069  2144  BBB 0 35  0043  2901  3        ERS   XM
4070  2901  BBB 0 30  4209  2915          LDL   TEMP2
4071  2915  BBB 0 82  4464  2318          TEQ   EXIT1
4072  2318  BBB 0 70  2923  000A          ADD                RA
4073  2923  BBB 0 08  0000  2345          LIR1  0000        -EQV3
4074  4153  BBB 0 30  2355  2758  WDEQU    LDL   EQ1MD
4075  2758  BBB 1 50  0001  2902          STL2  0001
4076  2902  BBB 0 25  3022  2903          LDA   DUA
4077  2903  BBB 0 60  2220  2104          STA   UASW
4078  2104  BBB 1 07  0001  2908          IIR2  0001        EQ1,
4079  2908  BBB 0 30  2716  4044  EQ1,     LDL                SCAN
4080  2716  BBB 0 30  4221  2524          LDL   LPREN
4081  2524  BBB 0 82  2927  0526          TEQ                MLP
4082  2927  BBB 0 31  2330  2330          CLL
4083  2330  BBB 1 50  0001  2304          STL2  0001
4084  2304  BBB 0 50  2907  2709          STL   RRRR
4085  2709  BBB 0 50  2916  2518          STL   ZLINK
4086  2518  BBB 1 50  0003  2504          STL2  0003
4087  2504  BBB 0 30  2400  2704          LDL   EQUMD
4088  2704  BBB 0 05  2909  4235          LDX   0EQU%        MDOP
4089  2904  BBB 0 30  4140  2943  EQU,     LDL   NORMX        EQSVB
4090  2943  BBB 0 50  4464  1766  EQSVB    STL   EXIT1
4091  1766  BBB 1 29  0000  2305          LDA3  0000
4092  2305  BBB 0 70  4301  2554          ADD   BIG90       -EQ,
4093  2555  BBB 0 30  2958  0528  &EQ,     LDL   8F          BED
4094  2554  BBB 0 30  2759  4833  -EQ,     LDL                BR2
4095  2759  BBB 0 35  4741  0793          ERS   XMH
4096  0793  BBB 0 05  000A  1797          LDX   RA
4097  1797  BBB 0 31  2505  2505          CLL
4098  2505  BBB 0 82  2718  2918          TEQ   1F
```

E3. 'EQUIVALENCE'
ON THE EQUIVALENCE DECLARATION, VARIOUS MODES ARE SET UP. AT THE END OF EACH EQUIVALENCE, A CHECK IS MADE TO SEE IF ANY OF THE ITEMS WAS PREVIOUSLY DEFINED. IF SO, THE ENTIRE CHAIN IS THEN DEFINED, AS IN STEP #E2.

```
4099   2918  BBB 0 35  4740  2344            ERS  X1
4100   2344  BBB 0 30  4756  2959            LDL  BIG02
4101   2959  BBB 0 82  1962  2162            TEQ  2F
4102   2162  BBB 1 25  9999  2705            LDA2  9999
4103   2705  BBB 0 31  2724  2724            CLL
4104   2724  BBB 0 82  1128  2555            TEQ                &EQ1
4105   1128  BBB 1 65  9999  2905            STX2  9999
4106   2905  BBB 0 0G  0000  2924            IIR1  0000
4107   2924  BBB 1 60  9998  2725            STA2  9998         3F
4108   2718  BBB 0 0G  0000  2725  1         IIR1  0000         3F
4109   2725  BBB 1 30  9997  2599  3         LDL2  9997         4F
4110   2599  BBB 1 60  9997  2799  4         STA2  9997
4111   2799  BBB 0 25  2907  2925            LDA  RRRR
4112   2925  BBB 0 32  0400  1135            SHR   0400
4113   1135  BBB 0 35  4724  2776            ERS  XC
4114   2776  BBB 0 05  000A  1981            LDX  RA
4115   1981  BBB 0 26  2384  2384            CLA
4116   2384  BBB 0 82  0987  1787            TEQ                1F
4117   0987  BBB 0 0G  0000  0391            IIR1  0000
4118   0391  BBB 0 60  2916  1787            STA  ZLINK         1F
4119   1787  BBB 0 29  0000  1328  1         LDA1  0000
4120   1328  BBB 0 35  0435  1928            ERS  XC0
4121   1928  BBB 0 20  000B  1335            BUF  RL
4122   1335  BBB 0 20  4756  2360            BUF  BIG02
4123   2360  BBB 0 20  000C  1364            BUF  RX
4124   1364  BBB 0 64  0000  2958            STA1  0000        8F
4125   1962  BBB 0 29  0000  2128  2         LDA1  0000
4126   2128  BBB 0 70  4392  2545            ADD  BIG70         -EQ1
4127   2545  BBB 0 07  HHHH  2149  -EQ1      IIR   HHHH
4128   2149  BBB 0 39  0000  2725            ERS1  0000        3B
4129   2546  BBB 0 37  0400  2754  &EQ1      SHL   0400
4130   2754  BBB 0 35  0043  2328            ERS  XM
4131   2328  BBB 0 77  2328  2331            ATL
4132   2331  BBB 0 07  HHHH  1935            IIR   HHHH
4133   1935  BBB 0 35  2907  2528            ERS  RRRR
4134   2528  BBB 0 82  2545  2531            TEQ  -EQ1
4135   2531  BBB 0 75  000B  2336            SUB  RL
4136   2336  BBB 0 60  4209  2961            STA  TEMP2
4137   2961  BBB 0 70  4623  2976            ADD  BIG05
4138   2976  BBB 0 20  4301  2928            BUF  BIG90
4139   2928  BBB 0 60  4631  2135            STA  TEMP1
4140   2135  BBB 1 25  9997  2999            LDA2  9997
4141   2999  BBB 0 31  2929  2929            CLL
4142   2929  BBB 0 50  2907  2530            STL  RRRR
4143   2530  BBB 0 82  2335  2535            TEQ                1F
4144   2335  BBB 0 07  0001  2338            IIR   0001
4145   2338  BBB 0 70  4600  2954            ADD  MEML
4146   2954  BBB 0 60  2916  2730            STA  ZLINK
4147   2730  BBB 0 26  2535  2535            CLA  1F
4148   2535  BBB 0 06  2538  2538  1         CLX
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4149   2538  BBB 0 32  0400  1745                SHR   0400
4150   1745  BBB 0 20  4631  2583                BUF   TEMP1
4151   2583  BBB 0 77  2583  1786                ATL
4152   1786  BBB 0 07  0001  0789                IIR   0001
4153   0789  BBB 0 70  4600  2930                ADD   MEML
4154   2930  BBB 0 60  4420  2572                STA   TEMP3
4155   2572  BBB 0 70  1774  000A                ADD                RA
4156   1774  BBB 0 50  0000  2731                STL   0000
4157   2731  BBB 0 25  4623  2575                LDA   BIG05
4158   2575  BBB 0 75  4209  2931                SUB   TEMP2
4159   2931  BBB 0 20  4301  2755                BUF   BIG90
4160   2755  BBB 0 60  4631  2783                STA   TEMP1
4161   2783  BBB 0 07  HHHH  1986                IIR   HHHH
4162   1986  BBB 0 39  0000  2735                ERS1  0000
4163   2735  BBB 0 32  0400  2544                SHR   0400
4164   2544  BBB 0 20  4631  2983                BUF   TEMP1
4165   2983  BBB 0 77  2983  2186                ATL
4166   2186  BBB 0 07  0002  0989                IIR   0002
4167   0989  BBB 0 70  4600  2935                ADD   MEML
4168   2935  BBB 0 60  4600  2952                STA   MEML
4169   2952  BBB 0 70  2955  000A                ADD                RA
4170   2955  BBB 0 50  0000  2536                STL   0000
4171   2536  BBB 0 25  4600  2560                LDA   MEML
4172   2560  BBB 0 30  4420  2599                LDL   TEMP3         4B
4173   2958  BBB 1 0G  9999  4464  8             IIR3  9999          EXIT1
4174   2028  BBB 1 29  0000  2736  AEQU          LDA3  0000                      G   CHECK THAT SUBSCRIPT WAS CONSTANT
4175   2736  BBB 0 30  1051  2936                LDL   CONO
4176   2936  BBB 0 82  2739  2939                TEQ   1F            3F
4177   2939  BBB 0 30  2141  0528  3             LDL   2F            8ED
4178   2739  BBB 1 25  9999  1337  1             LDA2  9999
4179   1337  BBB 0 70  4097  2950                ADD   KON1
4180   2950  BBB 0 30  1815  1937                LDL   FOR9S
- 4181   1937  BBB 0 87  0940  2939                TGR                3B
4182   0940  BBB 0 60  2907  2141                STA   RRRR          2F
4183   2141  BBB 1 07  9996  1945  2             IIR2  9996
4184   1945  BBB 1 0G  9999  2349                IIR3  9999
4185   2349  BBB 0 07  HHHH  2760                IIR   HHHH
4186   2760  BBB 1 39  0000  2137                ERS3  0000
4187   2137  BBB 1 64  0000  4140                STA3  0000          NORMX
4188   4156  BBB 0 30  2960  2943  EQU%          LDL                EQSV8
4189   2960  BBB 0 25  2916  2337                LDA   ZLINK
4190   2337  BBB 0 31  1140  1140                CLL
4191   1140  BBB 0 82  2744  2944                TEQ   4F            1F
4192   2744  BBB 0 30  2746  0528  4             LDL   8F            8ED
4193   2944  BBB 0 30  2946  4641  1             LDL                BR
4194   2946  BBB 0 70  000A  2562                ADD   RA            -EQU%
4195   2563  BBB 1 25  9997  2537  &EQU%         LDA2  9997
4196   2537  BBB 0 06  1340  1340                CLX
4197   1340  BBB 0 32  0400  1747                SHR   0400          1F
4198   2562  BBB 1 25  9997  1747  -EQU%         LDA2  9997          1F
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4200  2737  BBB 0 64  0000  2937               STA1  0000
4201  2937  BBB 1 30  9999  2738               LDL2  9999
4202  2738  BBB 0 26  2341  2341               CLA
4203  2341  BBB 0 82  2746  2145               TEQ   8F
4204  2145  BBB 0 25  0054  2938               LDA   BIG04
4205  2938  BBB 0 87  2541  2744               TGR             4B
4206  2541  BBB 1 25  9996  1740               LDA2  9996
4207  1740  BBB 0 20  2745  000A               BUF             RA
4208  2745  BBB 0 08  0000  2551               LIR1  0000
4209  2551  BBB 0 25  2746  2498               LDA   8F        EQASN
4210  2746  BBB 1 07  9996  4140      8        IIR2  9996      NORMX
4211                          EQU$     EQU   MRP
4212  1856  BBB 1 09  9999  1940      KON*E    LDX3  9999                  G   ROUTINE FOR N*() WHERE N IS A COSTANT
4213  1940  BBB 0 32  0100  2945               SHR   0100
4214  2945  BBB 0 70  000A  2762               ADD   RA        -MUL
4215  2762  BBB 0 32  0300  2368      -MUL     SHR   0300
4216  2368  BBB 0 70  000A  2373               ADD   RA        -MUL1
4217  2374  BBB 0 07  HHHH  2379      &MUL1    IIR   HHHH
4218  2379  BBB 1 39  9999  2140               ERS3  9999
4219  2140  BBB 0 70  1947  000A               ADD             RA
4220  1947  BBB 0 25  0001  2340               LDA   0001
4221  2340  BBB 0 31  2147  2147               CLL
4222  2147  BBB 0 82  1814  2751               TEQ   ANSL
4223  2751  BBB 0 06  2362  2362               CLX
4224  2362  BBB 0 32  0500  1770               SHR   0500
4225  1770  BBB 0 82  2573  2773               TEQ   1F
4226  2773  BBB 0 32  0100  2579               SHR   0100
4227  2579  BBB 0 82  2582  2782               TEQ   2F
4228  2782  BBB 0 32  0100  2386               SHR   0100
4229  2386  BBB 0 82  1789  1989               TEQ   3F
4230  1989  BBB 0 32  0100  1793               SHR   0100
4231  1793  BBB 0 82  2396  2763               TEQ   4F        &MUL
4232  2582  BBB 0 07  0100  2573      2        IIR   0100      1F
4233  1789  BBB 0 07  0200  2573      3        IIR   0200      1F
4234  2396  BBB 0 07  0300  2573      4        IIR   0300      1F
4235  2573  BBB 0 60  2775  2779      1        STA   PAR3
4236  2779  BBB 0 30  000C  2584               LDL   RX
4237  2584  BBB 0 25  4974  2540               LDA   BIG10
4238  2540  BBB 0 82  2347  2547               TEQ   1F
4239  2547  BBB 0 70  000A  2962               ADD   RA
4240  2962  BBB 0 82  2347  1966               TEQ   1F
4241  1966  BBB 0 31  0969  0969               CLL
4242  0969  BBB 0 25  4305  2740               LDA   LITA      2F
4243  2740  BBB 0 32  0900  2963      2        SHR   0900
4244  2963  BBB 0 82  2166  2366               TEQ   2F
4245  2366  BBB 0 32  0F00  2740               SHR   0F00      2B
4246  2166  BBB 0 25  000C  1970      2        LDA   RX
4247  1970  BBB 0 30  2772  4260               LDL             CONST
4248  2772  BBB 0 06  0000  2979               IIR1  0000
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4249  2979  BBB 0 20  4723  2940          BUF  KON.5
4250  2940  BBB 1 64  9999  2741          STA3 9999
4251  2741  BBB 0 06  2747  2747          CLX
4252  2747  BBB 0 0B  1716  2951          LIR1 J0016      3F
4253  2347  BBB 0 0B  1720  2951  1       LIR1 J0020      3F
4254  2951  BBB 1 0G  9999  1764  3       IIR3 9999
4255  1764  BBB 1 29  0001  2941          LDA3 0001
4256  2941  BBB 0 30  4215  2004          LDL  OPX        UNOP1
4257  2763  BBB 0 0B  1034  0199  &MUL    LIR1 Q0034      BINSB
4258  2373  BBB 0 0B  1034  0199  -MUL1   LIR1 Q0034      BINSB
4259  1316  BBB 0 07  0100  2947  I0016   IIR  0100       1F
4260  2947  BBB 0 70  2775  2181  1       ADD  PAR3
4261  2181  BBB 0 70  2784  0930          ADD  BIG37      TAS32
4262  1317  BBB 0 25  0104  2549  I0017   LDA  PAR1
4263  2549  BBB 0 30  1178  2381          LDL  BIG20
4264  2381  BBB 0 82  2984  2185          TEQ             2F
4265  2984  BBB 0 25  2586  0588          LDA# 70000      A0000
4266  0588  BBB 0 30  2185  4556          LDL  2F         ASM32
4267  2185  BBB 0 30  2775  2981  2       LDL  PAR3
4268  2981  BBB 0 26  2385  2385          CLA
4269  2385  BBB 0 82  0130  2947          TEQ  IX         1B
4270  1628  BBB 0 50  2566  2568  PANIC   STL  -ALRM
4271  2568  BBB 0 0B  1250  2371          LIR1 10000      5F
4272  2371  BBB 0 06  1974  1974  5       CLX
4273  1974  BBB 0 32  0800  2585          SHR  0800
4274  2585  BBB 0 65  1987  2189          STX  WDS
4275  2189  BBB 0 37  0400  2596          SHL  0400       4F
4276  2596  BBB 0 60  2749  1964  4       STA  WD
4277  1964  BBB 0 70  2766  000A          ADD              RA
4278  2766  BBB 0 25  1650  2949          LDA  30000
4279  2949  BBB 0 60  2164  2966          STA  ALF
4280  2966  BBB 0 06  1369  1369          CLX
4281  1369  BBB 0 32  0500  2982          SHR  0500
4282  2982  BBB 0 37  0500  0990          SHL  0500
4283  0990  BBB 0 04  0000  0000          JMP1 0000
4284  1256  BBB 0 60  0533  2364  10006   STA  THETA      1F
4285  1254  BBB 0 60  0533  2364  10004   STA  THETA      1F
4286  1252  BBB 0 60  0533  2364  10002   STA  THETA      1F
4287  1250  BBB 0 60  0533  2364  10000   STA  THETA      1F
4288  2364  BBB 0 65  0139  2564  1       STX  CHI        3F
4289  1257  BBB 0 32  0500  2764  10007   SHR  0500       2F
4290  1255  BBB 0 32  0500  2764  10005   SHR  0500       2F
4291  1253  BBB 0 32  0500  2764  10003   SHR  0500       2F
4292  1251  BBB 0 32  0500  2764  10001   SHR  0500       2F
4293  2764  BBB 0 20  0533  2964  2       BUF  THETA
4294  2964  BBB 0 32  0F00  2785          SHR  0F00
4295  2785  BBB 0 20  0139  1767          BUF  CHI
4296  1767  BBB 0 04  0008  0008          JMP1 0008
4297  1265  BBB 0 60  0650  1967  10015   STA  20050
4298  1967  BBB 0 65  0655  2564          STX  20055      3F
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4300    2167    BBB 0 65    0770    2564                    STX   20170       3F
4301    1261    BBB 0 60    0681    2367        10011       STA   20081
4302    2367    BBB 0 65    0686    2564                    STX   20086       3F
4303    1259    BBB 0 60    0600    2767        10009       STA   20000
4304    2767    BBB 0 65    0605    2564                    STX   20005       3F
4305    2564    BBB 0 0G    0001    2768        3           IIR1  0001
4306    2766    BBB 0 25    2164    2967                    LDA   ALF
4307    2967    BBB 0 70    0015    2968                    ADD   H10         -AL2
4308    2969    BBB 0 07    0001    2972        &AL2        IIR   0001
4309    2972    BBB 0 70    2749    2596                    ADD   WD          4B
4310    2968    BBB 0 25    1987    2371        -AL2        LDA   WDS         5B
4311    1258    BBB 0 25    0050    1769        10008       LDA   LC
4312    1769    BBB 0 70    0054    2169                    ADD   BIG04       -AL1
4313    2170    BBB 0 60    0050    1969        &AL1        STA   LC
4314    1969    BBB 0 11    0618    2566                    PRN   20018       -ALRM
4315    2169    BBB 0 60    0050    2369        -AL1        STA   LC
4316    2369    BBB 0 11    0602    2566                    PRN   20002       -ALRM
4317    2567    BBB 0 00    0190    0190        &ALRM       JMP   &CRD3
4318    0739    BBB 0 00    0000    0000        20139       ZON
4319    0623    BBB 0 00    0000    0000        20023       ZON
4320    0708    BBB 0 00    0000    0000        20108       ZON
4321    0646    BBB 0 00    0000    0000        20046       ZON
4322    0730    BBB 0 00    0000    0000        20130       ZON
4323    0614    BBB 0 00    0000    0000        20014       ZON
4324    0699    BBB 0 00    0000    0000        20099       ZON
4325    0783    BBB 0 00    0000    0000        20183       ZON
4326    0667    BBB 0 00    0000    0000        20067       ZON
4327                                                        OFF   9000
4328            *** OFF **                      30000       ALF1
4329            *** OFF **                      30001       ALF1 I'M
4330            *** OFF **                      30002       ALF1 FULL
4331            *** OFF **                      30003       ALF1 BAD
4332            *** OFF **                      30004       ALF1 MESS
4333            *** OFF **                      30005       ALF1 ERROR
4334            *** OFF **                      30006       ALF1 A+I
4335            *** OFF **                      30007       ALF1 I+A
4336            *** OFF **                      30008       ALF1 A*I
4337            *** OFF **                      30009       ALF1 I*A
4338            *** OFF **                      30010       ALF1 OR
4339            *** OFF **                      30011       ALF  FLOAT
4340            *** OFF **                      30012       ALF1 ING
4341            *** OFF **                      30013       ALF  SUBSC
4342            *** OFF **                      30014       ALF1 RIPT
4343            *** OFF **                      30015       ALF1 A/I
4344            *** OFF **                      30016       ALF1 I/A
4345            *** OFF **                      30017       ALF1 I**A
4346            *** OFF **                      30018       ALF1 EXTRA
4347            *** OFF **                      30019       ALF1 LABEL
4348            *** OFF **                      30020       ALF1 COMMA
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4349                *** OFF **                    30021      ALF1 EXP #
4350                *** OFF **                    30022      ALF1 RIGHT
4351                *** OFF **                    30023      ALF1 EQUIV
4352                *** OFF **                    30024      ALF1 LEFT
4353                *** OFF **                    30025      ALF  PAREN
4354                *** OFF **                    30026      ALF  THESI
4355                *** OFF **                    30027      ALF1 S
4356                *** OFF **                    30028      ALF  OPERA
4357                *** OFF **                    30029      ALF1 ND
4358                *** OFF **                    30030      ALF  CONST
4359                *** OFF **                    30031      ALF1 ANT
4360                *** OFF **                    30032      ALF  MISSI
4361                *** OFF **                    30033      ALF1 NG
4362                *** OFF **                    30034      ALF1 F(I)
4363                *** OFF **                    30035      ALF  DIMEN
4364                *** OFF **                    30036      ALF1 SION
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4368                *** OFF **                    20041      NUM
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4370                *** OFF **                    20009      NUM
4371                *** OFF **                    20094      NUM
4372                *** OFF **                    20178      NUM
4373                *** OFF **                    20062      NUM
4374                *** OFF **                               OFF   8001
4375                *** OFF **                               OFF   9001
4376                                                         ON    9000
4377     1650  BBB 1 00  0000  0000                30000      CON1 00000     00000
4378     1651  BBB 1 03  0009  C400                30001      CON1 03000     9C400
4379     1652  BBB 1 31  2202  6110                30002      CON1 31220     26110
4380     1653  BBB 1 02  0007  7F00                30003      CON1 02000     77F00
4381     1654  BBB 1 00  1106  A770                30004      CON1 00110     6A770
4382     1655  BBB 1 01  101A  22B2                30005      CON1 01101     A22B2
4383     1656  BBB 1 23  0007  7900                30006      CON1 23000     77900
4384     1657  BBB 1 03  2009  7700                30007      CON1 03200     97700
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4387     1660  BBB 1 01  000B  2000                30010      CON1 01000     B2000
4388     1661  BBB 0 32  0232  1B74                30011      CON  32023     21B74
4389     1662  BBB 1 02  1009  6500                30012      CON1 02100     96500
4390     1663  BBB 0 11  0117  6771                30013      CON  11011     76771
4391     1664  BBB 1 10  1302  9B40                30014      CON1 10130     29B40
4392     1665  BBB 1 23  0007  9900                30015      CON1 23000     79900
4393     1666  BBB 1 03  2009  9700                30016      CON1 03200     99700
4394     1667  BBB 1 00  0209  3370                30017      CON1 00020     93370
4395     1668  BBB 1 03  312A  1427                30018      CON1 03312     A1427
4396     1669  BBB 1 22  0021  77A1                30019      CON1 22002     177A1
4397     1670  BBB 1 10  0021  B667                30020      CON1 10002     1B667
4398     1671  BBB 1 03  101A  1B08                30021      CON1 03101     A1B08
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Remington Rand Univac
DIVISION OF SPERRY RAND CORPORATION
PHILADELPHIA, PA.

4399	1672	888	1	10	1132	9544	30022	CON	10113	29544	
4400	1673	888	1	01	102A	969A	30023	CON	01102	A969A	
4401	1674	888	1	20	3301	A240	30024	CON	20330	1A240	
4402	1675	888	0	12	102B	72A6	30025	CON	12102	872A6	
4403	1676	888	0	31	0104	4A79	30026	CON	31010	44A79	
4404	1677	888	1	10	0007	0000	30027	CON	10000	70000	
4405	1678	888	0	01	012B	8A27	30028	CON	01012	BBA27	
4406	1679	888	1	20	C005	F000	30029	CON	20000	6F000	
4407	1680	888	0	10	2131	B674	30030	CON	10213	1B674	
4408	1681	888	1	22	3007	6400	30031	CON	22300	76400	
4409	1682	888	0	00	1106	9779	30032	CON	00110	69779	
4410	1683	888	1	21	0006	5000	30033	CON	21000	65000	
4411	1684	888	1	33	0102	69G0	30034	CON	33010	269G0	
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4413	1686	888	1	10	0207	9B60	30036	CON	10020	79B60	
4414	0734	888	0	00	0000	0000	20134	ZON			
4415	0618	888	0	00	0000	0000	20018	ZON			
4416	0703	888	0	00	0000	0000	20103	ZON			
4417	0641	888	0	00	0000	0000	20041	ZON			
4418	0725	888	0	00	0000	0000	20125	ZON			
4419	0609	888	0	00	0000	0000	20009	ZON			
4420	0694	888	0	00	0000	0000	20094	ZON			
4421	0778	888	0	00	0000	0000	20178	ZON			
4422	0662	888	0	00	0000	0000	20062	ZON			
4423								ON	8001		
4424								ON	9001		
4425								ON	9002		
4426								ON	8002		

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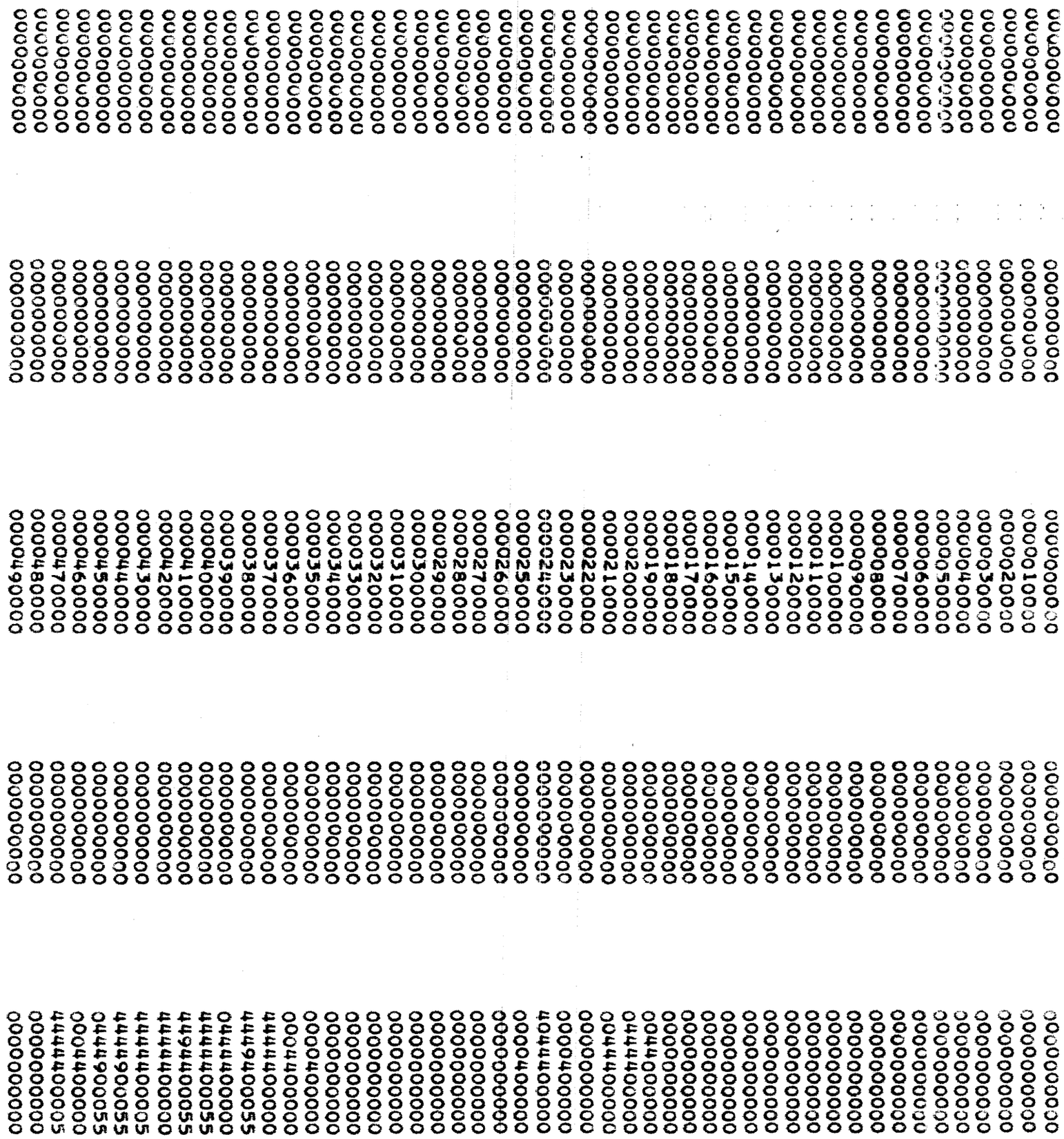

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4429                                                    BLR   WDFOR
4430                                                    BLR   MEMLL
4431                                                    BLR    2201      2211
4432   3100  BBB 0 25  2491  3293   MEMLL              LDA   MEMU1                  G   ROUTINE FOR INSERTING RESERVED WORDS
4433   3293  BBB 0 60  4292  3144                      STA   MEMU
4434   3144  BBB 0 20  3146  000A                      BUF             RA
4435   3146  BBB 0 08  0000  3151                      LIR1  0000
4436   3151  BBB 0 31  3154  3154                      CLL
4437   3154  BBB 0 54  9994  2796                      STL1  9994
4438   2796  BBB 0 0G  9994  3200                      IIR1  9994
4439   3200  BBB 0 60  4635  3237                      STA   AVAIL
4440   3237  BBB 0 25  3239  4264                      LDA             SCAN9
4441   3239  BBB 0 90  3241  0000                      SML   LCARD      0000
4442   3241  BBB 0 07  HHHH  3244   LCARD              IIR    HHHH
4443   3244  BBB 1 39  9999  3201                      ERS3  9999
4444   3201  BBB 0 20  3203  000A                      BUF             RA
4445   3203  BBB 0 08  0000  3208                      LIR1  0000
4446   3208  BBB 0 07  HHHH  3211                      IIR   HHHH
4447   3211  BBB 1 39  0000  3202                      ERS3  0000
4448   3202  BBB 0 77  3202  3205                      ATL
4449   3205  BBB 0 70  3207  000A                      ADD             RA
4450   3207  BBB 0 25  0001  3204                      LDA   0001
4451   3204  BBB 0 24  0000  3206                      BUF1  0000
4452   3206  BBB 0 64  0000  3209                      STA1  0000
4453   3209  BBB 0 25  2491  3294                      LDA   MEMU1
- 4454   3294  BBB 0 75  4095  3148                    SUB   KON2
4455   3148  BBB 0 60  2491  3295                      STA   MEMU1
4456   3295  BBB 0 08  1519  3298                      LIR1  Z0099     1F
4457   3298  BBB 0 29  0000  3210   1                  LDA1  0000
4458   3210  BBB 0 82  3213  3214                      TEQ   1F
4459   3214  BBB 0 0G  9999  3298                      IIR1  9999      1B
4460   3213  BBB 1 0G  9998  3217   1                  IIR3  9998
- 4461   3217  BBB 0 30  1179  4229                    LDL   INITT      REM
4462   3262  BBB 0 11  0200  2389   PRIME              PRN   K0000     -GOD        G   FIRST TIME INITIALIZATION,SET UP TEMP STORES
4463   2390  BBB 0 67  3333  000A   &GOD               HLT    3333     RA
4464   2389  BBB 0 30  0591  1993   -GOD               LDL             ZZONS
4465   0591  BBB 0 72  000A  0994                      HCC   RA        -GOD1
4466   0995  BBB 0 67  2222  2389   &GOD1              HLT    2222     -GOD
4467   0994  BBB 0 31  1997  1997   -GOD1              CLL   1F
4468   1997  BBB 0 50  0050  3252   1                  STL   LC
4469   3252  BBB 0 50  0415  3218                      STL   LLIST
4470   3218  BBB 0 50  2243  3245                      STL   ACC
4471   3245  BBB 0 50  0851  3253                      STL   ARAS
4472   3253  BBB 0 50  0537  3139                      STL   DOOST
4473   3139  BBB 0 50  4701  3153                      STL   TEMPS
4474   3153  BBB 0 50  4824  3176                      STL   DOVAR
4475   3176  BBB 0 50  4834  2786                      STL   DSAVE
4476   2786  BBB 0 07  0057  2589                      IIR   INCR1
```

```
4477   2589  BBB 0 60  4336  3238            STA   INCRE
4478   3238  BBB 0 07  0050  3242            IIR    0050
4479   3242  BBB 0 60  1363  3165            STA   HEAD
4480   3165  BBB 0 50  4804  3212            STL   NOTAG
4481   3212  BBB 0 05  4376  3228            LDX   DOEOF
4482   3228  BBB 0 65  4170  3272            STX   DOESW
4483   3272  BBB 0 05  4402  3104            LDX   LEOFF
4484   3104  BBB 0 65  4206  3108            STX   LESW
4485   3108  BBB 0 05  4405  3157            LDX   BOS
4486   3157  BBB 0 65  4770  3172            STX   COMT
4487   3172  BBB 0 05  0154  3156            LDX   CRDC
4488   3156  BBB 0 65  0141  3143            STX   CRDSW
4489   3143  BBB 0 05  4408  3160            LDX   BIGO1
4490   3160  BBB 0 65  1634  3236            STX   DOTAG
4491   3236  BBB 0 05  1821  3223            LDX   MISUB
4492   3223  BBB 0 65  2220  3222            STX   UASW
4493   3222  BBB 0 05  4735  3240            LDX   PROF
4494   3240  BBB 0 65  4883  3285            STX   PRTSW
4495   3285  BBB 0 05  4050  3102            LDX   SCAN1
4496   3102  BBB 0 65  4248  3150            STX   SCANX
4497   3150  BBB 0 05  0108  3110            LDX   LSWOF
4498   3110  BBB 0 65  0089  3291            STX   LSW
4499   3291  BBB 0 05  4989  3141            LDX   TRON
4500   3141  BBB 0 65  4789  1791            STX   TRSW
4501   1791  BBB 0 05  1300  3103            LDX   TRCOF
4502   3103  BBB 0 65  1307  3109            STX   TRCSW
4503   3109  BBB 0 08  0000  3112            LIR1   0000      -ISIS
4504   3112  BBB 0 0G  0001  3116  -ISIS     IIR1   0001
4505   3116  BBB 0 70  3118  3112            ADD                -ISIS
4506   3118  BBB 0 99  9980  0000            CON   99998       00000
4507   3113  BBB 0 47  0100  3117  &ISIS     HSS    0100
4508   3117  BBB 0 30  0594  4613            LDL   INIT        NXTW
4509                           LDCN4          EQU    1521
4510   3111  BBB 0 0G  0010  1525  LDCN3     IIR1   0010        1525
4511   3114  BBB 0 23  2120  0000  LDCN2     ZON   *TRAN       40000
4512   3115  BBB 0 83  9154  0000  LDCN1     NUM   *TRAN       40000
4513   2200  BBB 0 07  4181  3215  WDFOR     IIR   50001                    G   ROUTINE IN 2200 IS TO PUNCH OUT THE TRANSLATR
4514   3215  BBB 0 60  4980  3232            STA   ASM5T
4515   3232  BBB 0 30  3234  1993            LDL                ZZONS
4516   3234  BBB 0 25  3115  3119            LDA   LDCN1
4517   3119  BBB 0 05  3114  3120            LDX   LDCN2
4518                                          OFF    9000
4519         *** OFF **                       OFF    9001
4520         *** OFF **                       OFF    9002
4521         *** OFF **                       STA   R0102
4522         *** OFF **                       STX   R0107
4523         *** OFF **                       LIR2   9999
4524         *** OFF **                       LDA#  ABABA       00000
4525         *** OFF **                       BUF#  00000       BABAB
4526         *** OFF **                       STA   FGFG
```

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4527                *** OFF **                          STA  H0118
4528                *** OFF **                          STA  H0130
4529                *** OFF **                          STA  H0142
4530                *** OFF **                          STA  H0154
4531                *** OFF **                          STA  H0166
4532                *** OFF **                          STA  H0178
4533                *** OFF **                          STA  H0190
4534                *** OFF **                          STA  H0006      4F
4535                *** OFF **                          OFF   8001
4536                *** OFF **                          OFF   8002
4537                                                    ON    9000
4538                                                    ON    9001
4539                                                    ON    9002
4540    3120  BBB 0 60  0908  3121                       STA  R0108
4541    3121  BBB 0 65  0913  3122                       STX  R0113
4542    3122  BBB 1 02  9999  3125                       LIR2  9999
4543    3125  BBB 0 25  3127  3129                       LDA# ABABA      00000
4544    3129  BBB 0 20  3131  3133                       BUF# 00000      BABAB
4545    3133  BBB 0 60  3135  3137                       STA  FGFG
4546    3137  BBB 0 60  0011  3216                       STA  H0011
4547    3216  BBB 0 60  0031  3233                       STA  H0031
4548    3233  BBB 0 60  0051  3254                       STA  H0051
4549    3254  BBB 0 60  0071  3273                       STA  H0071
4550    3273  BBB 0 60  0112  3123                       STA  H0112
4551    3123  BBB 0 60  0132  3134                       STA  H0132
4552    3134  BBB 0 60  0152  3155                       STA  H0152
4553    3155  BBB 0 60  0172  2174                       STA  H0172      4F
4554                                                    ON    8001
4555                                                    ON    8002
4556    2174  BBB 1 07  0001  3178      4              IIR2  0001
4557    3178  BBB 1 25  2201  3219                       LDA2 90000
4558    3219  BBB 0 30  3221  3224                       LDL# CCCCC      CCCCC
4559    3224  BBB 0 87  3227  000A                       TGR             RA
4560    3227  BBB 0 37  0400  3235                       SHL   0400
4561    3235  BBB 0 35  0043  3246                       ERS  XM
4562    3246  BBB 0 60  4420  3274                       STA  TEMP3
4563    3274  BBB 0 20  3276  3278                       BUF# 08000      0000C
4564    3278  BBB 0 30  3280  3282                       LDL             ASM5E
4565    3280  BBB 0 25  3283  3286                       LDA  1F
4566    3286  BBB 0 20  4420  000A                       BUF  TEMP3      RA
4567    3283  BBB 1 08  0000  3287      1              LIR3  0000        1F
4568    3168  BBB 1 0G  0000  2973      7              IIR3  0000
4569    2973  BBB 1 30  2201  3220                       LDL2 90000
4570    3220  BBB 0 87  3225  3226                       TGR             5F
4571    3225  BBB 0 30  2174  3177                       LDL  4B         ASM5F
4572    3226  BBB 1 0G  0001  3287      5              IIR3  0001        1F
4573    3173  BBB 1 0G  0010  3287      PRM5           IIR3  0010        1F
4574    3287  BBB 1 29  0000  3229      1              LDA3  0000
4575    3229  BBB 0 36  3243  3243                       CAA
4576    3243  BBB 0 31  3247  3247                       CLL
```

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4577  3247  BBB 0 82  3250  3251          TEQ  3F
4578  3251  BBB 0 25  4980  3284          LDA  ASM5T
4579  3284  BBB 0 70  3288  000A          ADD                RA
4580  3288  BBB 0 25  0000  3230          LDA   0000
4581  3230  BBB 0 35  4201  3255          ERS  XOM
4582  3255  BBB 0 70  3257  3260          ADD  2F
4583  3260  BBB 0 77  3260  3263          ATL
4584  3263  BBB 0 25  4016  000B          LDA  LIT1          RL
4585  3257  BBB 0 00  0005  3231  2       JMP   0005        1F
4586  3231  BBB 0 26  3248  3248  1       CLA
4587  3248  BBB 1 24  0000  3249          BUF3  0000        2F
4588  3250  BBB 1 29  0000  3249  3       LDA3  0000        2F
4589  3249  BBB 0 30  3256  4337  2       LDL                ASM5
4590  3256  BBB 0 07  4181  3259          IIR  50001
4591  3259  BBB 0 30  4980  3289          LDL  ASM5T
4592  3289  BBB 0 82  3292  3168          TEQ                7B
4593  3292  BBB 0 30  3168  3177          LDL  7B            ASM5F
4594  3282  BBB 0 05  0908  3124  ASM5E    LDX  RWD1
4595  3124  BBB 0 32  0F00  3138          SHR   0F00
4596  3138  BBB 0 20  3140  3142          BUF#  00000        50000
4597  3142  BBB 0 32  0F00  3158          SHR   0F00
4598  3158  BBB 0 65  0908  4337          STX  RWD1          ASM5
4599  3177  BBB 0 50  4568  3258  ASM5F   STL  EXIT2         1F
4600  3258  BBB 0 07  4181  3261  1       IIR  50001
4601  3261  BBB 0 30  4980  3290          LDL  ASM5T
4602  3290  BBB 0 82  3296  3297          TEQ  1F
4603  3297  BBB 0 25  3135  3145          LDA  FGFG
4604  3145  BBB 0 30  3258  4337          LDL  1B            ASM5
4605  3296  BBB 0 25  0908  3126  1       LDA  RWD1
4606  3126  BBB 0 35  3128  3130          ERS#  HHHHH        CHHHH
4607  3130  BBB 0 60  0908  3132          STA  RWD1
4608  3132  BBB 0 30  4568  1993          LDL  EXIT2         ZZONS
4609  1993  BBB 0 26  2996  2996  ZZONS   CLA
4610                                      OFF   9000
4611        *** OFF **                    OFF   9001
4612        *** OFF **                    OFF   9002
4613        *** OFF **                    STA  R0119
4614        *** OFF **                    STA  R0131
4615        *** OFF **                    STA  R0143
4616        *** OFF **                    STA  R0155
4617        *** OFF **                    STA  R0167
4618        *** OFF **                    STA  R0179         RL
4619        *** OFF **                    OFF   8001
4620        *** OFF **                    OFF   8002
4621                                      ON    9000
4622                                      ON    9001
4623                                      ON    9002
4624  2996  BBB 0 60  0923  3136          STA  R0123
4625  3136  BBB 0 60  0933  3147          STA  R0133
4626  3147  BBB 0 60  0943  3149          STA  R0143
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4627   3149  BBB 0 60  0953  3159           STA   R0153
4628   3159  BBB 0 60  0963  3166           STA   R0163
4629   3166  BBB 0 60  0973  000B           STA   R0173      RL
4630                                        ON     8002
4631                                        OFF    9000
4632         *** OFF **                     OFF    9001
4633         *** OFF **             90000   JMP    1190       0000
4634         *** OFF **             90001   JMP    1519       1230
4635         *** OFF **             90002   JMP    2398       1600
4636         *** OFF **             90003   JMP    B999       B000
4637         *** OFF **             90004   ATL2
4638         *** OFF **                     LDL   LDCN3
4639         *** OFF **                     STL   LDCN4
4640         *** OFF **                     LDL   PRM5
4641         *** OFF **                     STL   5B         4B
4642         *** OFF **             90005   JMP    0000      LDCN4
4643         *** OFF **             90006   JMP    B99A       B00A
4644         *** OFF **             90007   JMP    B99F       B00F
4645         *** OFF **             90008   ATL2
4646         *** OFF **                     HLT    HHHH      *
4647         *** OFF **                     OFF    9002
4648         *** OFF **                     OFF    8002
4649                                        ON     9000
4650                                        ON     9001
4651                                        ON     8001
4652   2201  BBB 0 00  1190  0000   90000   JMP    1190       0000
4653   2202  BBB 0 00  1519  1230   90001   JMP    1519       1230
4654   2203  BBB 0 00  3298  1600   90002   JMP    3298       1600
4655   2204  BBB 0 00  4998  3800   90003   JMP    4998       3800
- 4656 2205  BBB 1 77  2205  3264   90004   ATL2
4657   3264  BBB 0 67  HHHH  3264           HLT    HHHH      *
4658                                        ON     8002
4659                                        ON     9002
```
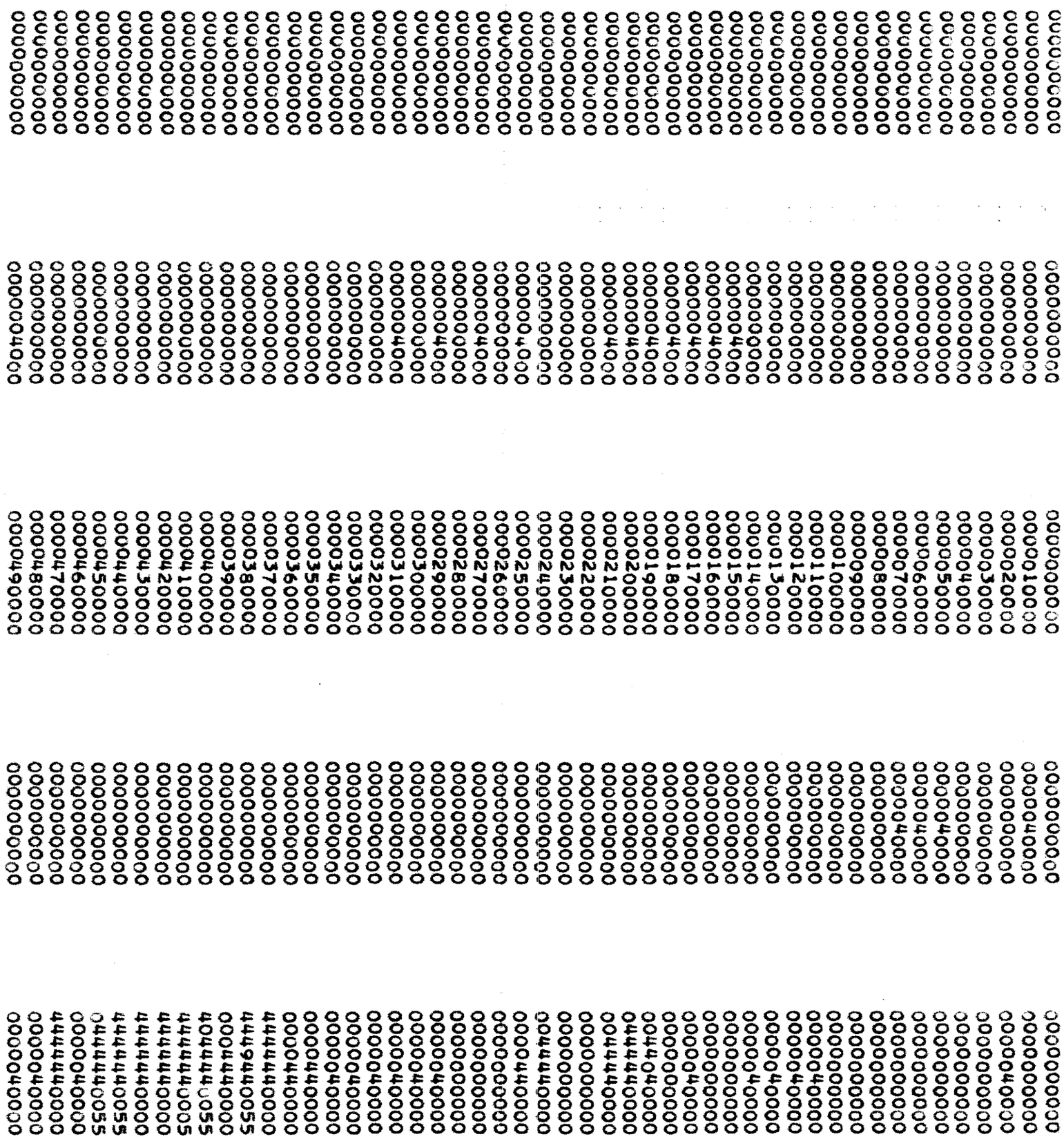

PRINTED IN U. S. A.

Remington Rand Univac
DIVISION OF SPERRY RAND CORPORATION
PHILADELPHIA, PA.



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4661   4417  BBB 0 00  4092  0000   RATOR   CON  00409  20000
4662   1420  BBB 0 00  4098  0000   Z0000   CON  00409  80000     G   CON ZERO
4663   1421  BBB 0 00  4096  0000   Z0001   CON  00409  60000     G   CON 1
4664   1422  BBB 0 00  4094  0000   Z0002   CON  00409  40000     G   CON 2
4665   1423  BBB 0 00  0000  0000   Z0003   CON  00000  00000
4666   1424  BBB 0 00  0000  0000   Z0004   CON  00000  00000
4667   1425  BBB 0 00  0000  0000   Z0005   CON  00000  00000
4668   1426  BBB 0 00  0000  0000   Z0006   CON  00000  00000
4669   1427  BBB 0 00  0000  0000   Z0007   CON  00000  00000
4670   1428  BBB 0 00  0000  0000   Z0008   CON  00000  00000
4671   1429  BBB 0 00  4090  0000   Z0009   CON  00409  00000     G   APOSTROPHE
4672   1430  BBB 0 00  0000  0000   Z0010   CON  00000  00000
4673   1431  BBB 0 00  0000  0000   Z0011   CON  00000  00000
4674   1432  BBB 0 00  0000  0000   Z0012   CON  00000  00000
4675   1433  BBB 0 00  0000  0000   Z0013   CON  00000  00000
4676   1434  BBB 0 00  0000  0000   Z0014   CON  00000  00000
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4682   1440  BBB 0 00  0000  0000   Z0020   CON  00000  00000
4683   1441  BBB 0 00  0000  0000   Z0021   CON  00000  00000
4684   1442  BBB 0 00  0000  0000   Z0022   CON  00000  00000
4685   1443  BBB 0 00  0000  0000   Z0023   CON  00000  00000
4686   1444  BBB 0 00  0000  0000   Z0024   CON  00000  00000
4687   1445  BBB 0 00  0000  0000   Z0025   CON  00000  00000
4688   1446  BBB 0 00  0000  0000   Z0026   CON  00000  00000
4689   1447  BBB 0 00  0000  0000   Z0027   CON  00000  00000
4690   1448  BBB 0 00  0000  0000   Z0028   CON  00000  00000
4691   1449  BBB 0 00  0000  0000   Z0029   CON  00000  00000
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4696   1454  BBB 0 00  0000  0000   Z0034   CON  00000  00000
4697   1455  BBB 0 00  0000  0000   Z0035   CON  00000  00000
4698   1456  BBB 0 00  0000  0000   Z0036   CON  00000  00000
4699   1457  BBB 0 00  0000  0000   Z0037   CON  00000  00000
4700   1458  BBB 0 00  0000  0000   Z0038   CON  00000  00000
4701   1459  BBB 0 00  0000  0000   Z0039   CON  00000  00000
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4703   1461  BBB 0 00  0000  0000   Z0041   CON  00000  00000
4704   1462  BBB 0 00  0000  0000   Z0042   CON  00000  00000
4705   1463  BBB 0 00  0000  0000   Z0043   CON  00000  00000
4706   1464  BBB 0 00  0000  0000   Z0044   CON  00000  00000
4707   1465  BBB 0 00  0000  0000   Z0045   CON  00000  00000
4708   1466  BBB 0 00  0000  0000   Z0046   CON  00000  00000
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4711	1469	BBB	0	00	0000	0000	Z0049	CON	00000	00000
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4713	1471	BBB	0	00	0000	0000	Z0051	CON	00000	00000
4714	1472	BBB	0	00	0000	0000	Z0052	CON	00000	00000
4715	1473	BBB	0	00	0000	0000	Z0053	CON	00000	00000
4716	1474	BBB	0	00	0000	0000	Z0054	CON	00000	00000
4717	1475	BBB	0	00	0000	0000	Z0055	CON	00000	00000
4718	1476	BBB	0	00	0000	0000	Z0056	CON	00000	00000
4719	1477	BBB	0	00	0000	0000	Z0057	CON	00000	00000
4720	1478	BBB	0	00	0000	0000	Z0058	CON	00000	00000
4721	1479	BBB	0	00	0000	0000	Z0059	CON	00000	00000
4722	1480	BBB	0	00	0000	0000	Z0060	CON	00000	00000
4723	1481	BBB	0	00	0000	0000	Z0061	CON	00000	00000
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4725	1483	BBB	0	00	0000	0000	Z0063	CON	00000	00000
4726	1484	BBB	0	00	0000	0000	Z0064	CON	00000	00000
4727	1485	BBB	0	00	0000	0000	Z0065	CON	00000	00000
4728	1486	BBB	0	00	0000	0000	Z0066	CON	00000	00000
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4741	1499	BBB	0	00	0000	0000	Z0079	CON	00000	00000
4742	1500	BBB	0	00	0000	0000	Z0080	CON	00000	00000
4743	1501	BBB	0	00	0000	0000	Z0081	CON	00000	00000
4744	1502	BBB	0	00	0000	0000	Z0082	CON	00000	00000
4745	1503	BBB	0	00	0000	0000	Z0083	CON	00000	00000
4746	1504	BBB	0	00	0000	0000	Z0084	CON	00000	00000
4747	1505	BBB	0	00	0000	0000	Z0085	CON	00000	00000
4748	1506	BBB	0	00	0000	0000	Z0086	CON	00000	00000
4749	1507	BBB	0	00	0000	0000	Z0087	CON	00000	00000
4750	1508	BBB	0	00	0000	0000	Z0088	CON	00000	00000
4751	1509	BBB	0	00	0000	0000	Z0089	CON	00000	00000
4752	1510	BBB	0	00	0000	0000	Z0090	CON	00000	00000
4753	1511	BBB	0	00	0000	0000	Z0091	CON	00000	00000
4754	1512	BBB	0	00	0000	0000	Z0092	CON	00000	00000
4755	1513	BBB	0	00	0000	0000	Z0093	CON	00000	00000
4756	1514	BBB	0	00	0000	0000	Z0094	CON	00000	00000
4757	1515	BBB	0	00	0000	0000	Z0095	CON	00000	00000
4758	1516	BBB	0	00	0000	0000	Z0096	CON	00000	00000
4759	1517	BBB	0	00	0000	0000	Z0097	CON	00000	00000

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4760    1518   BBB 0 00   0000  0000      Z0098     CON  00000      00000
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4762    0405   BBB 0 00   0000  0000      P0005     ZON
4763    0486   BBB 0 00   0000  0000      P0086     ZON
4764    0570   BBB 0 00   0000  0000      P0170     ZON
4765    0455   BBB 0 00   0000  0000      P0055     ZON
4766    0539   BBB 0 00   0000  0000      P0139     ZON
4767    0423   BBB 0 00   0000  0000      P0023     ZON
4768    0508   BBB 0 00   0000  0000      P0108     ZON
4769    0446   BBB 0 00   0000  0000      P0046     ZON
4770    0530   BBB 0 00   0000  0000      P0130     ZON
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4772    0499   BBB 0 00   0000  0000      P0099     ZON
4773    0583   BBB 0 00   0000  0000      P0183     ZON
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4775    0339   BBB 0 00   0000  0000      K0139     ZON
4776    0223   BBB 0 00   0000  0000      K0023     ZON
4777    0308   BBB 0 00   0000  0000      K0108     ZON
4778    0246   BBB 0 00   0000  0000      K0046     ZON
4779    0330   BBB 0 00   0000  0000      K0130     ZON
4780    0214   BBB 0 00   0000  0000      K0014     ZON
4781    0299   BBB 0 00   0000  0000      K0099     ZON
4782    0383   BBB 0 00   0000  0000      K0183     ZON
4783    0267   BBB 0 00   0000  0000      K0067     ZON
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4787          *** OFF **                   P0050     NUM
4788          *** OFF **                   P0018     NUM
4789          *** OFF **                   P0103     NUM
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4792          *** OFF **                   P0009     NUM
4793          *** OFF **                   P0094     NUM
4794          *** OFF **                   P0178     NUM
4795          *** OFF **                   P0062     NUM
4796          *** OFF **                   K0000     NUM  USS F       ORTRA
4797          *** OFF **                   K0005     ZON  USS F       ORTRA
4798          *** OFF **                   K0081     NUM  N II         ***
4799          *** OFF **                   K0086     ZON  N II         ***
4800          *** OFF **                   K0165     NUM   VERS       ION #
4801          *** OFF **                   K0170     ZON   VERS       ION #
4802          *** OFF **                             OFF   8001
4803          *** OFF **                             OFF   9001
4804          *** OFF **                             OFF   9002
4805          *** OFF **                   K0050     NUM  8002-       08-62      G   VERSION TYPE, MONTH, AND YEAR
4806          *** OFF **                             OFF   8002
4807                                                 ON    8001
4808          *** OFF **                   K0050     NUM  8001-       08-62      G   VERSION TYPE, MONTH, AND YEAR
4809          *** OFF **                             OFF   8001
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4810                                                    ON    9001
4811          *** OFF **                K0050         NUM   9001-      08-62      G   VERSION TYPE, MONTH, AND YEAR
4812          *** OFF **                              OFF   9001
4813                                                  ON    9002
4814          *** OFF **                K0050         NUM   9002-      08-62      G   VERSION TYPE, MONTH, AND YEAR
4815                                                  ON    9001
4816                                                  ON    8001
4817                                                  ON    8002
4818          *** OFF **                K0055         CON   00000     00000
4819          *** OFF **                K0134         NUM
4820          *** OFF **                K0018         NUM
4821          *** OFF **                K0103         NUM
4822          *** OFF **                K0041         NUM
4823          *** OFF **                K0125         NUM
4824          *** OFF **                K0009         NUM
4825          *** OFF **                K0094         NUM
4826          *** OFF **                K0178         NUM
4827          *** OFF **                K0062         NUM
4828                                                  ON    9000
4829                                                  OFF   9001
4830                                                  OFF   9002
4831                                                  OFF   8001
4832                                                  OFF   8002
4833    0400  BBB 0 00  0000  0000      P0000         ZON
4834    0481  BBB 0 00  0000  0000      P0081         ZON
4835    0450  BBB 0 00  0000  0000      P0050         ZON
4836    0418  BBB 0 00  0000  0000      P0018         ZON
4837    0503  BBB 0 00  0000  0000      P0103         ZON
4838    0441  BBB 0 00  0000  0000      P0041         ZON
4839    0525  BBB 0 00  0000  0000      P0125         ZON
4840    0409  BBB 0 00  0000  0000      P0009         ZON
4841    0494  BBB 0 00  0000  0000      P0094         ZON
4842    0578  BBB 0 00  0000  0000      P0178         ZON
4843    0462  BBB 0 00  0000  0000      P0062         ZON
4844    0200  BBB 0 67  702B  2427      K0000         CON   67702     B2427      G   USS FORTRA
4845    0205  BBB 0 11  1030  1312      K0005         CON   11103     01312
4846    0281  BBB 0 60  9900  3330      K0081         CON   60990     03330      G   N II  ***
4847    0286  BBB 0 20  0000  0000      K0086         CON   20000     00000
4848    0365  BBB 0 0A  A279  B608      K0165         CON   0AA27     9B608      G    VERSION #
4849    0370  BBB 0 02  0110  0201      K0170         CON   02011     00201
4850    0250  BBB 0 01  11F1  0F52      K0050         CON   0111F     10F52      G   9000-MONTH-YEAR
4851    0255  BBB 0 20  0010  3122      K0055         CON   20001     03122
4852    0334  BBB 0 00  0000  0000      K0134         ZON
4853    0218  BBB 0 00  0000  0000      K0018         ZON
4854    0303  BBB 0 00  0000  0000      K0103         ZON
4855    0241  BBB 0 00  0000  0000      K0041         ZON
4856    0325  BBB 0 00  0000  0000      K0125         ZON
4857    0209  BBB 0 00  0000  0000      K0009         ZON
4858    0294  BBB 0 00  0000  0000      K0094         ZON
4859    0378  BBB 0 00  0000  0000      K0178         ZON
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4860  0262  BBB 0 00  0000  0000   K0062   ZON
4861                                 ON    9002
4862                                 ON    9001
4863  0988  BBB 0 00  0000  0000   R0188   CON   00000   00000
4864  0993  BBB 0 00  0000  0000   R0193   CON   00000   00000
4865  0998  BBB 0 00  0000  0000   R0198   CON   00000   00000
4866  0903  BBB 0 00  0000  0000   R0103   CON   00000   00000
4867  0983  BBB 0 00  0000  0000   R0183   CON   00000   00000
4868                                 OFF   9000
4869        *** OFF **               OFF   9001
4870        *** OFF **               OFF   9002
4871                                 ON    8001
4872                                 ON    8002
4873        *** OFF **       R0191   ZON
4874                                 ON    9000
4875                                 ON    9001
4876                                 ON    9002
4877                                                 G   INTERPRETIVE CODES FOR BINARY OPERATION
4878                                                 G   V1 OP V2  OR  V2 PO V1.
4879                                                 G   KEY: S#SIMPLE VARIABLE,CONSTANT,OR TEMP STORE
4880                                                 G   A#REGISTER A    I # INDEX REGISTER 1
4881                                                 G   D#SUBSCRIPTED VARIABLE
4882  1700  BBB 0 05  0199  0800   J0000   CON   05019   90800   G   SS CLACC CHG1 LDA1 OP2
4883  1701  BBB 0 06  0900  0000   J0001   CON   06090   00000   G   SA UZACC PO1
4884  1702  BBB 0 05  8809  0000   J0002   CON   05880   90000   G   SI CLACC IIR10 PO1
4885  1703  BBB 0 02  9699  1000   J0003   CON   02969   91000   G   SD CHG2 LDL2 LDA1 OPRL
4886  1704  BBB 0 06  0800  0000   J0004   CON   06080   00000   G   AS UZACC OP2
4887                                                 G   AA IMPOSIBLE CASE
4888  1706  BBB 0 06  1588  1100   J0006   CON   06158   81100   G   AI UZACC ATL IIR10 PORL
4889  1707  BBB 0 06  1598  1100   J0007   CON   06159   81100   G   AD UZACC ATL LDA2 PORL
4890  1708  BBB 0 05  8808  0000   J0008   CON   05880   80000   G   IS CLACC IIR10 OP2
4891  1709  BBB 0 06  1588  1000   J0009   CON   06158   81000   G   IA UZACC ATL IIR10 OPRL
4892  1710  BBB 0 05  8815  1000   J0010   CON   05881   51000   G   II CLACC IIR10 ATL OPRL
4893  1711  BBB 0 96  8810  0000   J0011   CON   96881   00000   G   ID LDL2 IIR10 OPRL
4894  1712  BBB 0 03  9908  0000   J0012   CON   03990   80000   G   DS CHG3 LDA1 OP2
4895  1713  BBB 0 06  1599  1000   J0013   CON   06159   91000   G   DA UZACC ATL LDA1 OPRL
4896  1714  BBB 0 97  8811  0000   J0014   CON   97881   10000   G   DI LDL1 IIR10 PORL
4897  1715  BBB 0 04  9699  1000   J0015   CON   04969   91000   G   DD CHG4 LDL2 LDA1
4898                                                 G   INTERPRETIVE CODES FOR VARIOUS UNARY OPS
4899  1716  BBB 0 05  9687  1600   J0016   CON   05968   71600   G   MUL  S CLACC LDL2 MUL1 SHL
4900  1717  BBB 0 06  1587  1600   J0017   CON   06158   71600   G   MUL  A UZACC ATL MUL1 SHL
4901  1718  BBB 0 05  8815  8716   J0018   CON   05881   58716   G   MUL  I CLACC IIR10 ATL MUL1 SHL
4902  1719  BBB 0 96  8716  0000   J0019   CON   96871   60000   G   MUL  D LDL2 MUL1 SHL
4903  1720  BBB 0 05  9817  0000   J0020   CON   05981   70000   G   MULL S CLACC LDA2 ADSHL
4904  1721  BBB 0 06  1700  0000   J0021   CON   06170   00000   G   MULL A UZACC ADSHL
4905  1722  BBB 0 05  8817  0000   J0022   CON   05881   70000   G   MULL I CLACC IIR10 ADSHL
4906  1723  BBB 0 98  1700  0000   J0023   CON   98170   00000   G   MULL D LDA2 ADSHL
4907  1724  BBB 0 05  9918  0000   J0024   CON   05991   80000   G   GET+ S CLACC LDA1 UNARY
4908  1725  BBB 0 06  1800  0000   J0025   CON   06180   00000   G   GET+ A UZACC UNARY
4909  1726  BBB 0 05  8818  0000   J0026   CON   05881   80000   G   GET+ I CLACC IIR10 UNARY
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4910  1727  BBB 0 99  1800  0000  J0027  CON  99180  00000  G  GET+ D LDA1 UNARY
4911  1728  BBB 0 05  8685  0000  J0028  CON  05868  50000  G  GET- S CLACC CLA SUB1
4912  1729  BBB 0 06  1586  8400  J0029  CON  06158  68400  G  GET- A UZACC ATL CLA SUBRL
4913  1730  BBB 0 05  8815  8684  J0030  CON  05881  58684  G  GET- I CLACC IIR10 ATL CLA SUBRL
4914  1731  BBB 0 97  8684  0000  J0031  CON  97868  40000  G  GET- D LDL1 CLA SUBRL
4915  1732  BBB 0 97  0000  0000  J0032  CON  97000  00000  G  LDL  S LDL1       NOTE:CLACC NOT USED HERE.
4916  1733  BBB 0 06  1500  0000  J0033  CON  06150  00000  G  LDL  A UZACC ATL
4917  1734  BBB 0 05  8815  0000  J0034  CON  05881  50000  G  LDL  I CLACC IIR10 ATL
4918  1735  BBB 0 97  0000  0000  J0035  CON  97000  00000  G  LDL  D LDL1
4919  1736  BBB 0 05  8681  2400  J0036  CON  05868  12400  G  ABS  S CLACC CLA BUF1 XIT
4920  1737  BBB 0 06  1586  8024  J0037  CON  06158  68024  G  ABS  A UZACC ATL CLA BUFRL XIT
4921  1738  BBB 0 05  8824  0000  J0038  CON  05882  40000  G  ABS  I CLACC IIR10 XIT
4922  1739  BBB 0 97  8680  2400  J0039  CON  97868  02400  G  ABS  D LDL1 CLA BUFRL XIT
4923  1636  BBB 0 94  0713  0000  CTRC   CON  94071  30000  G  STL1 TRACE LIR3
4924  0801  BBB 0 13  0001  3000  CSUB   CON  13000  13000  G  LIR3 - LIR3  LEFT SIDE IS OP,RIGHT SIDE IS PO
4925  3014  BBB 0 93  9109  2900  C345   CON  93910  92900  G  TGR5 TEQ43 - TGR 3 TEQ45
4926  0115  BBB 0 93  9108  2000  C4#5   CON  93910  82000  G  TGR5 TEQ43 - TGR34
4927  1615  BBB 0 83  0009  2900  C3#4   CON  83000  92900  G  TGR54 - TGR3 TEQ45
4928  1613  BBB 0 91  0009  1000  C3#5   CON  91000  91000  G  TEQ43 - TEQ43
4929  1908  BBB 0 12  0001  2000  COP    CON  12000  12000  G  OPRLX - OPRLX
4930                                                         G  SUBROUTINE ENTRANCES,LEFT:OP  RIGHT:PO
4931  1000  BBB 0 01  0600  1060  Q0000  CON  01060  01060  G  &&  FAD   FAD
4932  1001  BBB 0 01  0700  1080  Q0001  CON  01070  01080  G  -&  RFSUB FSUB
4933  1002  BBB 0 01  0800  1070  Q0002  CON  01080  01070  G  &-  FSUB  RFSUB
4934  1003  BBB 0 01  0650  1065  Q0003  CON  01065  01065  G  --  FAD-  FAD-
4935  1004  BBB 0 01  0900  1090  Q0004  CON  01090  01090  G  &&  FMUL  FMUL
4936  1005  BBB 0 01  1000  1100  Q0005  CON  01100  01100  G  -&  NFMUL NFMUL
4937  1006  BBB 0 01  1000  1100  Q0006  CON  01100  01100  G  &-  NFMUL NFMUL
4938  1007  BBB 0 01  0900  1090  Q0007  CON  01090  01090  G  --  FMUL  FMUL
4939  1008  BBB 0 01  1100  1130  Q0008  CON  01110  01130  G  &&  FDIV  RFDIV
4940  1009  BBB 0 01  1200  1140  Q0009  CON  01120  01140  G  -&  NFDIV NRFDV
4941  1010  BBB 0 01  1200  1140  Q0010  CON  01120  01140  G  &-  NFDIV NRFDV
4942  1011  BBB 0 01  1100  1130  Q0011  CON  01110  01130  G  --  FDIV  RFDIV
4943  1012  BBB 0 01  0200  1040  Q0012  CON  01020  01040  G  &&  DIV   RDIV
4944  1013  BBB 0 01  0300  1050  Q0013  CON  01030  01050  G  -&  NDIV  NRDIV
4945  1014  BBB 0 01  0300  1050  Q0014  CON  01030  01050  G  &-  NDIV  NRDIV
4946  1015  BBB 0 01  0200  1040  Q0015  CON  01020  01040  G  --  DIV   RDIV
4947  1016  BBB 0 02  0600  2100  Q0016  CON  02060  02100  G  &&  PLL   RPLL
4948  1017  BBB 0 02  0700  2120  Q0017  CON  02070  02120  G  -&  PLL2  PLL7
4949  1018  BBB 0 02  0800  2110  Q0018  CON  02080  02110  G  &-  PLL3  PLL6
4950  1019  BBB 0 02  0900  2130  Q0019  CON  02090  02130  G  --  PLL4  PLL8
4951  1020  BBB 0 02  1400  2180  Q0020  CON  02140  02180  G  &&  PLX   RPLX
4952  1021  BBB 0 02  1500  2200  Q0021  CON  02150  02200  G  -&  PLX2  PLX7
4953  1022  BBB 0 02  1600  2190  Q0022  CON  02160  02190  G  &-  PLX3  PLX6
4954  1023  BBB 0 02  1700  2210  Q0023  CON  02170  02210  G  --  PLX4  PLX8
4955  1024  BBB 0 01  2500  1250  Q0024  CON  01250  01250  G      FLSQ  FLSQ
4956  1025  BBB 0 02  2200  2260  Q0025  CON  02220  02260  G  &&  PXX   RPXX
4957  1026  BBB 0 02  2300  2280  Q0026  CON  02230  02280  G  -&  PXX2  PXX7
4958  1027  BBB 0 02  2400  2270  Q0027  CON  02240  02270  G  &-  PXX3  PXX6
4959  1028  BBB 0 02  2500  2290  Q0028  CON  02250  02290  G  --  PXX4  PXX8
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4960  1029  BBB 0 01  2400  1240  Q0029  CON  01240  01240  G       FXSQ   FXSQ
4961  1030  BBB 0 70  0007  0000  Q0030  CON  70000  70000  G  &&   ADD    ADD
4962  1031  BBB 0 75  0057  5000  Q0031  CON  75005  75000  G  -&   SUB-   SUB
4963  1032  BBB 0 75  0007  5005  Q0032  CON  75000  75005  G  &-   SUB    SUB-
4964  1033  BBB 0 70  0057  0005  Q0033  CON  70005  70005  G  --   ADD-   ADD-
4965  1034  BBB 0 01  0000  1000  Q0034  CON  01000  01000  G  &&   MUL    MUL
4966  1035  BBB 0 01  0100  1010  Q0035  CON  01010  01010  G  -&   NMUL   NMUL
4967  1036  BBB 0 01  0100  1010  Q0036  CON  01010  01010  G  &-   NMUL   NMUL
4968  1037  BBB 0 01  0000  1000  Q0037  CON  01000  01000  G  --   MUL    MUL
4969  1038  BBB 0 35  0003  5000  Q0038  CON  35000  35000  G       ERS    ERS
4970  1039  BBB 0 35  0003  5000  Q0039  CON  35000  35000  G       ERS    ERS
4971  1040  BBB 0 35  0003  5000  Q0040  CON  35000  35000  G       ERS    ERS
4972  1041  BBB 0 35  0003  5000  Q0041  CON  35000  35000  G       ERS    ERS
4973  1042  BBB 0 20  0002  0000  Q0042  CON  20000  20000  G       BUF    BUF
4974  1043  BBB 0 20  0002  0000  Q0043  CON  20000  20000  G       BUF    BUF
4975  1044  BBB 0 20  0002  0000  Q0044  CON  20000  20000  G       BUF    BUF
4976  1045  BBB 0 20  0002  0000  Q0045  CON  20000  20000  G       BUF    BUF
4977  1127  BBB 0 02  0300  2020  EXP    CON  02030  02020  G       EXP    NEXP   LEFT SIDE IS F(X)
4978  0726  BBB 0 02  0500  2040  LN     CON  02050  02040  G       LN     NLN    RIGHT SIDE IS F(-X)
4979  1925  BBB 0 03  0300  3035  ATAN   CON  03030  03035  G       ATAN   ATAN-
4980  0924  BBB 0 03  0200  3025  TAN    CON  03020  03025  G       TAN    TAN-
4981  2721  BBB 0 02  0000  2010  SQRT   CON  02000  02010  G       SQRT   NSQRT
4982  0723  BBB 0 03  0100  3010  COS    CON  03010  03010  G       COS    COS
4983  2322  BBB 0 03  0000  3005  SIN    CON  03000  03005  G       SIN    SIN-
4984  2919  BBB 0 01  1600  1170  FLOTA  CON  01160  01170  G       FLT    NFLT
4985  1920  BBB 0 01  2000  1210  FIXA   CON  01200  01210  G       FIX    NFIX
4986  0563  BBB 0 01  1500  1150  COMPL  CON  01150  01150  G       COMP   COMP
4987  1232  BBB 0 04  1200  4120  TRACE  CON  04120  04120  G     TRACE  TRACE
4988  0343  BBB 0 01  2700  1270  PAUSF  CON  01270  01270  G   PAUSE    PAUSE
4989  0744  BBB 0 01  2800  1280  STOPF  CON  01280  01280  G   STOP     STOP
4990  1750  BBB 0 31  2203  547B  W0000  ALF  TEMP
4991  1751  BBB 0 12  2226  372B  W0001  ALF  FLPK*                    G   NAMES OF LIBRARY PCKAGES
4992  1752  BBB 0 13  2225  772B  W0002  ALF  EXPK*
4993  1753  BBB 0 32  1123  997B  W0003  ALF  TRIG*
4994  1754  BBB 0 11  2225  472B  W0004  ALF  EDPK*
4995  3009  BBB 0 01  4094  5000  CON2   CON  01409  45000
4996  1363  BBB 0 00  0050  0000  HEAD   CON  00005  00000
4997  0773  BBB 0 FF  FFFF  FFFF  WARN   CON  FFFFF  FFFFF
4998  1050  BBB 0 99  4110  0000  T0000  CON  99411  00000  G   99 TARA*
4999  1051  BBB 0 02  4098  5000  T0001  CON  02409  85000  G   CON ZERO
5000  1052  BBB 0 82  4106  0000  T0002  CON  82410  60000  G   82 BIN&
5001  1053  BBB 0 00  0000  0000  T0003  CON  00000  00000  G   SENTINEL
5002  1054  BBB 0 84  4112  0000  T0004  CON  84411  20000  G   84 BIN*
5003  1055  BBB 0 00  0000  0000  T0005  CON  00000  00000  G   SENTINEL
5004  1057  BBB 0 82  4106  0000  T0007  CON  82410  60000  G   82 BIN&
5005  1058  BBB 0 02  4098  5000  T0008  CON  02409  85000  G   FILLED IN
5006  1059  BBB 0 99  4109  0000  T0009  CON  99410  90000  G   99 TARA*
5007  1060  BBB 0 02  4098  5000  T0010  CON  02409  85000  G   CON ZERO
5008  1061  BBB 0 82  4106  0000  T0011  CON  82410  60000  G   82 BIN&
5009  1062  BBB 0 00  0000  0000  T0012  CON  00000  00000  G   SENTINEL
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5010  1063  BBB 0 70  0000  0000  T0013  CON  70000  00000  G  RIGHT PAREN
5011  1064  BBB 0 73  4114  0000  T0014  CON  73411  40000  G  73 SIGN$
5012  1065  BBB 0 00  0000  0000  T001*  CON  00000  00000  G  SENTINEL
5013  1066  BBB 0 99  4101  0000  T0016  CON  99410  10000  G  99 SIGN&
5014  1067  BBB 0 00  0000  0000  T0017  CON  00000  00000  G  SENTINEL
5015  1068  BBB 0 99  4110  0000  T0018  CON  99411  00000  G  99 TARA%
5016  1069  BBB 0 02  4098  5000  T0019  CON  02409  85000  G  CON ZERO
5017  1070  BBB 0 82  4106  0000  T0020  CON  82410  60000  G  82 BIN&
5018  1071  BBB 0 01  4096  5000  T0021  CON  01409  65000  G  CON 1
5019  1072  BBB 0 70  0000  0000  T0022  CON  70000  00000  G  RIGHT PARENTHESIS
5020  1073  BBB 0 00  0000  0000  T0023  CON  00000  00000  G  SENTINEL
5021  1074  BBB 0 78  4113  0000  T0024  CON  78411  30000  G  78 SIGN,
5022  1075  BBB 0 01  4096  5000  T0025  CON  01409  65000  G  CONSTANT 1
5023  1076  BBB 0 99  4164  0000  T0026  CON  99416  40000  G  99 OO$1
5024  1077  BBB 0 00  0000  0000  T0027  CON  00000  00000  G  SENTINEL
5025  1078  BBB 0 82  4106  0000  T0028  CON  82410  60000  G  82 BIN&
5026  1079  BBB 0 31  2005  1988  T0029  ALF  VAR              G  FILLED IN
5027  1080  BBB 0 73  4157  0000  T0030  CON  73415  70000  G  73 DONT1
5028  1081  BBB 0 00  0000  0000  T0031  CON  00000  00000  G  SENTINEL
5029  1082  BBB 0 99  4165  0000  T0032  CON  99416  50000  G  99 I02,1
5030  1083  BBB 0 99  4110  0000  T0033  CON  99411  00000  G  99 TARA%
5031  1084  BBB 0 02  4098  5000  T0034  CON  02409  85000  G  CON ZERO
5032  1085  BBB 0 82  4106  0000  T0035  CON  82410  60000  G  82 BIN&
5033  1086  BBB 0 01  4088  0000  T0036  CON  01408  80000  G     *I*
5034  1087  BBB 0 70  0000  0000  T0037  CON  70000  00000  G  RIGHT PAREN
5035  1088  BBB 0 78  4113  0000  T0038  CON  78411  30000  G  78 SIGN,
5036  1089  BBB 0 01  4088  0000  T0039  CON  01408  80000  G    *I*
5037  1090  BBB 0 99  4117  0000  T0040  CON  99411  70000  G  99 SIGN#
5038  1091  BBB 0 01  4096  5000  T0041  CON  01409  65000  G  CONSTANT 1
5039  1092  BBB 0 78  4113  0000  T0042  CON  78411  30000  G  78 SIGN,
5040  1093  BBB 0 21  2313  5538  T0043  ALF  LENTH              G  FILLED IN
5041  1094  BBB 0 78  4113  0000  T0044  CON  78411  30000  G  78 SIGN,
5042  1095  BBB 0 01  4096  5000  T0045  CON  01409  65000  G  CON 1
5043  1096  BBB 0 70  0000  0000  T0046  CON  70000  00000  G  RIGHT PAREN
5044  4241  BBB 0 99  4101  0000  LPREN  CON  99410  10000  G  99 SIGN%
5045  4370  BBB 0 99  4129  0000  LABEL  CON  99412  90000  G  99 LABL
5046  0316  BBB 0 82  4103  0000  0BIN-  CON  82410  30000  G  82 BIN-
5047  0972  BBB 0 75  4118  0000  0BIN#  CON  75411  80000  G  75 BIN:#
5048  0922  BBB 0 87  4116  0000  0BN**  CON  87411  60000  G  87 BIN**
5049  2641  BBB 0 70  4139  0000  0DIM%  CON  70413  90000  G  70 DIM%
5050  2909  BBB 0 70  4156  0000  0EQU%  CON  70415  60000  G  70 EQU%
5051  1406  BBB 0 70  4108  0000  0IF%   CON  70410  80000  G  70 IF%
5052  1743  BBB 0 99  4151  0000  0WDIM  CON  99415  10000  G  99 WDDIM
5053  1915  BBB 0 99  4111  0000  0*     CON  99411  10000  G  99 SIGN*
5054  4093  BBB 0 70  4127  0000  00P0   CON  70412  70000  G  70 0P0
5055  2317  BBB 0 84  4102  0000  0UN-   CON  84410  20000  G  84 UN-
5056  2241  BBB 0 70  4128  0000  0GO%   CON  70412  80000  G  70 GO%
5057  0864  BBB 0 70  4158  0000  0FC%   CON  70415  80000  G  70 FC%
5058  2103  BBB 0 70  4140  0000  0LPRN  ADD  NORMX   0000
5059  1816  BBB 0 70  0538  0000  0ARA*  ADD  ARA*    0000
```

```
5060  2009  BBB 0 70  1139  0000   OARA%   ADD  ARA%      0000
5061  4109  BBB 0 05  1816  4428   TARA*   LDX  OARA*     -OP3
5062  1773  BBB 0 70  3075  0000   OIO%    ADD  IO%       0000
5063  2615  BBB 0 00  2307  1629   ARAMD   JMP  ARA,      ARA$
5064  0840  BBB 0 00  2508  2508   COMMD   JMP  COM,      COM$
5065  1353  BBB 0 00  2837  2822   D1MMD   JMP  D1M,      D1M$
5066  2437  BBB 0 00  0471  1629   DIMMD   JMP  DIM,      DIM$
5067  0671  BBB 0 00  0168  1370   DOMD    JMP  DO,       DO$
5068  2355  BBB 0 00  2908  0469   EQ1MD   JMP  EQ1,      EQ1$
5069  2400  BBB 0 00  2904  1629   EQUMD   JMP  EQU,      EQU$
5070  1600  BBB 0 00  3062  1629   FCMD    JMP  FC,       FC$
5071  2237  BBB 0 00  2833  1834   GOMD    JMP  GO,       GO$
5072  2224  BBB 0 00  0589  0195   IFMD    JMP  IF,       IF$
5073  1520  BBB 0 00  2016  0543   MODE    JMP  NO,       NO$
5074  0351  BBB 0 00  2016  1130   POZMD   JMP  POZ,      POZ$
5075  3087  BBB 0 00  2136  2539   PARMD   JMP  PAR,      PAR$
5076  0762  BBB 0 00  2016  2320   CALMD   JMP  CAL,      CAL$
5077                             NO1     NEW  01000     00000
5078  2275  BBB 0 01  0393  0792   IO1MD   NO1  IO1,      IO1$
5079  2475  BBB 0 00  3073  0394   IO2MD   JMP  IO2,      IO2$
5080  2183  BBB 0 00  3073  0543   IO3MD   JMP  IO3,      IO3$
5081  4408  BBB 0 01  0000  0000   BIG01   CON  01000     00000
5082  4756  BBB 0 02  0000  0000   BIG02   CON  02000     00000
5083  2150  BBB 0 03  0000  0000   BIG03   CON  03000     00000
5084  0054  BBB 0 04  0000  0000   BIG04   CON  04000     00000
5085  4623  BBB 0 05  0000  0000   BIG05   CON  05000     00000
5086  0805  BBB 0 07  0000  0000   BIG07   CON  07000     00000
5087  2041  BBB 0 09  0000  0000   BIG09   CON  09000     00000
5088  2289  BBB 0 0G  0000  0000   BIG0G   CON  0G000     00000
5089  4974  BBB 0 10  0000  0000   BIG10   CON  10000     00000
5090  1896  BBB 0 13  0000  0000   BIG13   CON  13000     00000
5091  1178  BBB 0 20  0000  0000   BIG20   CON  20000     00000
5092  4431  BBB 0 21  0000  0000   BIG21   CON  21000     00000
5093  1298  BBB 0 24  0000  0000   BIG24   CON  24000     00000
5094  4604  BBB 0 25  0000  0000   BIG25   CON  25000     00000
5095  0550  BBB 0 29  0000  0000   BIG29   CON  29000     00000
5096  4247  BBB 0 30  0000  0000   BIG30   CON  30000     00000
5097  2784  BBB 0 37  0000  0000   BIG37   CON  37000     00000
5098  2212  BBB 0 40  0000  0000   BIG40   CON  40000     00000
5099  4277  BBB 0 50  0000  0000   BIG50   CON  50000     00000
5100  4603  BBB 0 60  0000  0000   BIG60   CON  60000     00000
5101  0461  BBB 0 69  0000  0000   BIG69   CON  69000     00000
5102  4392  BBB 0 70  0000  0000   BIG70   CON  70000     00000
5103  4203  BBB 0 71  0000  0000   BIG71   CON  71000     00000
5104  0121  BBB 0 77  0000  0000   BIG77   CON  77000     00000
5105  0355  BBB 0 87  0000  0000   BIG87   CON  87000     00000
5106  4301  BBB 0 90  0000  0000   BIG90   CON  90000     00000
5107  4225  BBB 0 99  0000  0000   BIG99   CON  99000     00000
5108  4617  BBB 0 HH  0000  0000   XO      CON  HH000     00000
5109  0043  BBB 0 00  HHHH  0000   YM      CON  00HHH     H0000
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5110	4724	BBB	0	00	0000	HHHH	XC	CON	00000	0HHHH
5111	3023	BBB	0	00	HHHH	HHHH	XMC	CON	00HHH	HHHHH
5112	4201	BBB	0	HH	HHHH	0000	XOM	CON	HHHHH	H0000
5113	4667	BBB	0	HH	0000	HHHH	XOC	CON	HH000	0HHHH
5114	4267	BBB	0	01	HHHH	0000	XM1	CON	01HHH	H0000
5115	4741	BBB	0	0H	HHHH	0000	XMH	CON	0HHHH	H0000
5116	0435	BBB	0	H0	0000	HHHH	XC0	CON	H0000	0HHHH
5117	4740	BBB	0	0H	0000	0000	X1	CON	0H000	00000
5118	3082	BBB	0	00	0H00	0000	X3	CON	000H0	00000
5119	0022	BBB	0	00	0000	000H	X9	CON	00000	0000H
5120	0037	BBB	0	H0	000H	0000	X05	CON	H0000	H0000
5121	1237	BBB	0	00	00H0	000H	X49	CON	0000H	0000H
5122	0012	BBB	0	00	000H	0000	X5	CON	00000	H0000
5123	0406	BBB	0	00	00HH	0000	X45	CON	0000H	H0000
5124	1273	BBB	0	00	0000	00HH	X89	CON	00000	000HH
5125	0645	BBB	0	H0	0000	0000	H1	CON	H0000	00000
5126	0009	BBB	0	HH	HHH0	0000	H5	CON	HHHHH	00000
5127	0015	BBB	0	HH	HHHH	HHHH	H10	CON	HHHHH	HHHHH
5128	4733	BBB	0	BB	BBB0	0000	B5	CON	BBBBB	00000
5129	4405	BBB	0	00	000B	BBBB	B05	CON	00000	BBBBB
5130	4577	BBB	0	BB	BBBB	BBBB	B10	CON	BBBBB	BBBBB
5131	1419	BBB	0	01	0001	0000	ONE15	CON	01000	10000
5132	4628	BBB	1	00	0000	0000	MZERO	CON1	00000	00000
5133	4723	BBB	0	00	0000	5000	KON.5	CON	00000	05000
5134	4097	BBB	0	00	0001	0000	KON1	CON	00000	10000
5135	4095	BBB	0	00	0002	0000	KON2	CON	00000	20000
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5137	4298	BBB	0	00	0030	0000	KON30	CON	00003	00000
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5141	4424	BBB	0	00	0000	0005	LIT5	CON	00000	00005
5142	4413	BBB	0	00	0000	0008	LIT8	CON	00000	00008
5143	0633	BBB	0	00	0000	0010	LIT10	CON	00000	00010
5144	0063	BBB	0	00	0000	0011	LIT11	CON	00000	00011
5145	0366	BBB	0	00	0000	0099	LIT99	CON	00000	00099
5146	4305	BBB	0	00	0000	000A	LITA	CON	00000	0000A
5147	4362	BBB	0	00	0000	000B	LITB	CON	00000	0000B
5148	1907	BBB	0	29	9999	0000	TWO9S	CON	29999	90000
5149	1815	BBB	0	04	9999	0000	FOR9S	CON	04999	90000
- 5150								END	PRIME	