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1  * GENERAL AUTOMATION, INC. ALL RIGHTS RESERVED
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3  *
4  * PROGRAM NAME FPH-05
5  *
6  * MODEL NUMBER 8F005
7  *
8  * PURPOSE FORTRAN PHASE-05
9  *
10 * PROGRAMMER DICK WALLMANN, MODS-MARK ELFIELD
11 *
12 ***** REVISION LIST *****
13 *
14 * RV DATE SCO BY REASON FOR CHANGE
15 * -----
16 *
17 * 01 11/16/70 NONE INITIAL RELEASE
18 *
19 *****
20 *****
21 * GA 18/30 FORTRAN COMPILER 05/01/70
22 * STATUS-VERSION 1, MODIFICATION 0
23 * FUNCTION/OPERATION-
24 * * ANALYZES DIMENSION STMENTS, PLACES DIMENSION
25 * INFORMATION INTO THE SYMBOL TABLE,
26 * * REMOVES DIMENSION STMT FROM THE STMT
27 * STRING
28 * * PLACES VARIABLES AND DIMENSION INFORMATION
29 * FROM REAL, INTEGER, AND EXTERNAL STMENTS INTO
30 * THE SYMBOL TABLE
31 * * INDICATES IN THE SYMBOL TABLE ID WORD THE
32 * MODE (REAL OR INTEGER)
33 * * CHECKS EXTERNAL STMENTS FOR THE NAMES IFIX
34 * AND FLOAT, WHICH ARE NOT ALLOWED.
35 * * THE PROCESSING OF PHASE 5 IS DONE IN TWO
36 * PASSES, THE FIRST PASS ANALYZES DIMENSION
37 * STMENTS, THE SECOND PASS EXAMINES REAL,
38 * INTEGER, AND EXTERNAL STMENTS FOUND IN THE
39 * STMT STRING
40 * ENTRY POINTS-
41 * * TOP-PHASE 5 IS READ INTO CORE BY PHASE 4 VIA
42 * THE ROLRX ROUTINE AND EXECUTION BEGUN
43 * AT LOCATION TOP.
44 * INPUT-
45 * NONE IN THE USUAL SENSE, HOWEVER, THE STMT
46 * STRING SCANNED BY THE COMPILER MAY BE
47 * CONSIDERED INPUT.
48 * OUTPUT-
49 * NONE IN THE USUAL SENSE, HOWEVER, PHASE 5
50 * REMOVES STMENTS FROM THE STMT STRING AND ADDS
51 * ENTRIES TO THE SYMBOL TABLE,
52 * EXTERNAL REFERENCES-
53 * SUBROUTINES-
54 * * ROL
55 * EXITS-
56 * NORMAL-
57 * PHASE EXITS NORMALLY IF NO STMENTS OF THE
58 * TYPE IT PROCESSES ARE ENCOUNTERED OR IF NO
59 * ERRORS ARE FOUND, PHASE 6 IS LOADED AND

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60 * EXECUTED,
61 * ERROR-
62 * THE FLOW OF COMPILER PROCESSING IS NOT
63 * INTERRUPTED WHEN AN ERROR IS ENCOUNTERED
64 * AN ERROR STMT REPLACES THE FAULTY STMT
65 * ON THE STRING AND STMT SCANNING PROCESS
66 * CONTINUES. AN EXCEPTION OCCURS IN THE CASE
67 * OF AN OVERLAP ERROR, COMPILATION IS
68 * ABORTED AND CONTROL IS PASSED FROM PHASE
69 * TO SUCCEEDING PHASE UNTIL AN OUTPUT PHASE
70 * IS REACHED WHICH CAN PRINT AN ERROR MESSAGE
71 * THE ERRORS DETECTED BY PHASE 5 ARE 7, 8,
72 * 16, 17, 18, 19, 20, 21, AND 22,
73 * TABLES/WORK AREAS-
74 * THE STATEMENT STRING, THE SYMBOL TABLE AND
75 * THE FORTRAN COMMUNICATIONS AREA,
76 * ATTRIBUTES-N/A
77 * NOTES-
78 * THE SWITCHES USED IN PHASE 5 FOLLOW, IF NON-
79 * ZERO, THE SWITCH IS TRANSFER=T, IF ZERO, THE
80 * SWITCH IS NORMAL=N,
81 * SW2-OPERATOR SEMICOLON
82 * T=NEXT OPERATOR MUST BE SEMICOLON
83 * SW3-SYMBOL TABLE OPEN
84 * T=SYMBOL TABLE WAS SPREAD THREE WORDS
85 * SW1A-TYPE STATEMENT ENCOUNTERED
86 * T=TYPE STMT HAS BEEN ENCOUNTERED
87 * N=REAL STATEMENT
88 * T=INTEGER STATEMENT
89 * SW3A-SEMICOLON
90 * T=SEMICOLON MUST BE NEXT
91 * SW4-EXTERNAL STATEMENT
92 * T=EXTERNAL STMT ENCOUNTERED
93 * SW5-DIMENSIONED NAME
94 * T=NOT DIMENSIONED NAME
95 * SW6-TEMPORARY EXTERNAL SWITCH
96 * T=TEMPORARY EXTERNAL
97 * ABS REF CORE
98 * SYSTEM AND FORTRAN EQUATES
99 * MEMRY EQU 4*320 MAXIMUM CORE SIZE
100 * MEMRY EQU 4*320 MAXIMUM CORE SIZE
101 * OVERL EQU MEMRY-PHSIZ PHASES 2-29 START
102 * FCOM EQU OVERL-22 FORTRAN COMM. TABLE
103 * PHNTB EQU FCOM-56 PHASE TABLE
104 * RQLRX EQU PHNTB-50 INTERPHASE CALL
105 * FORTRAN COMMUNICATION AREA
106 * FORTRAN COMMUNICATION AREA
107 * ORG FCOM
108 * SOFS BSS 1 START OF STRING
109 * EOFS BSS 1 END OF STRING
110 * SQFST BSS 1 START OF SYMBOL TABLE
111 * SOFNS BSS 1 START OF NON-SUBSC NUMBERS
112 * SOFXT BSS 1 START OF SUBSC TEMPORARIES
113 * SOFGT BSS 1 START OF GENERATED TEMPS
114 * EOFST BSS 1 END OF SYMBOL TABLE
115 * COMON BSS 1 NEXT AVAILABLE COMMON
116 * CSIZE BSS 1 SIZE OF COMMON
117 * ERROR BSS 1 OVERLAP ERROR
118 * FNAME BSS 1 PROGRAM NAME
119 * BSS 1 *

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|-----|-------|-----|----|-------------|-----------------------------------|
| 120 | SORF | BSS | 1 | | SUBR (-) OR FUNCTION (+) |
| 121 | CCWD | BSS | 1 | | CONTROL CARD WORD |
| 122 | * | | | BIT 15 | TRANSFER TRACE |
| 123 | * | | | BIT 14 | ARITHMETIC TRACE |
| 124 | * | | | BIT 13 | EXTENDED PRECISION |
| 125 | * | | | BIT 12 | LIST SYMBOL TABLE |
| 126 | * | | | BIT 11 | LIST SUBPROGRAM NAMES |
| 127 | * | | | BIT 10 | LIST SOURCE PROGRAM |
| 128 | * | | | BIT 9 | ONE WORD INTEGERS |
| 129 | * | | | BIT 8 | PUNCH |
| 130 | * | | | BIT 7 | NONPROCESS PROGRAM |
| 131 | IOCS | BSS | 1 | | IOCS CONTROL CARD WORD |
| 132 | * | | | | SEE PHASE ONE FOR BIT PATTERNS |
| 133 | DFCNT | BSS | 1 | | FILE TABLE WORD COUNT |
| 134 | LDCMN | BSS | 2 | | SIZE OF INSKEL COMMON |
| 135 | ICCR | BSS | 2 | | IOCS CONTROL CARD ERROR |
| 136 | | BSS | 2 | | SYSTEM LOADER USE |
| 137 | * | | | | END OF FORTRAN COMMUNICATION |
| 138 | * | | | | AREA |
| 139 | | ORG | | OVERL | |
| 140 | TOP | LDX | I1 | SOFS | START OF STRING ADDR |
| 141 | | LD | | ERROR | OVERLAP ERROR INDICATOR |
| 142 | | BSC | L | BEGIN,Z | BR TO NEXT PHASE IF OVERLA |
| 143 | TEST | LD | 1 | 0 | FIRST WORD OF STMT |
| 144 | | SRA | | 1 | POSITION TO TEST STMT TYP |
| 145 | | AND | | IDTPE | STATEMENT TYPE (BITS 1-5) |
| 146 | | S | | ENDC | END STATEMENT CONSTANT |
| 147 | | BSC | L | BEGIN,+ | BR TO BEGIN IF END STMT |
| 148 | | S | | DIMC | DIMENSION STMT CONSTANT |
| 149 | | BSC | | + - | SKIP NEXT IF NOT DIMENSION |
| 150 | | MDX | | MIX | BR TO SCAN DIMENSION STMT |
| 151 | MV | LD | 1 | 0 | STMT ID WORD |
| 152 | | SRA | | 2 | |
| 153 | | AND | | IDNRM | EXTRACT STMT WORD COUNT |
| 154 | | STO | | NXID+1 | ST COUNT TO UPDATE POINTER |
| 155 | NXID | MDX | L1 | ** | INCREMENT TO NEXT STMT |
| 156 | | MDX | | TEST | BR TO TEST STMT TYPE |
| 157 | * | | | | CONSTANTS AND WORK AREA |
| 158 | ENDC | DC | | /0800 | END STATEMENT CONSTANT |
| 159 | DIMC | DC | | /2000-/0800 | DIMENSION STMT CONSTAN |
| 160 | SEMIC | DC | | /001E | SEMI-COLON CONSTANT |
| 161 | ERR | DC | | 18 | ERROR 18 CONSTANT |
| 162 | ERR7 | DC | | 7 | ERROR 7 CONSTANT |
| 163 | ERR8 | DC | | 8 | ERROR 8 CONSTANT |
| 164 | ERR16 | DC | | 16 | ERROR 16 CONSTANT |
| 165 | ERR17 | DC | | 17 | ERROR 17 CONSTANT |
| 166 | ERRNO | DC | | 0 | ERROR NUMBER |
| 167 | WD1 | DC | | 0 | STMT NAME (FIRST HALF) |
| 168 | WD2 | DC | | 0 | STMT NAME (SECOND HALF) |
| 169 | SAVE | DC | | 0 | INDEX REGISTER 3 TEMPORARY |
| 170 | IDNRM | DC | | /01FF | STMT WORD COUNT MASK |
| 171 | | DC | | 0 | RESERVED FOR FUTURE USE |
| 172 | SW2 | DC | | 0 | ERROR 16 SWITCH NON-ZERO=0 |
| 173 | DIMSV | DC | | 0 | INDEX REGISTER 1 TEMPORARY |
| 174 | IDTPE | DC | | /7C00 | STATEMENT TYPE MASK |
| 175 | ERRID | DC | | /A008 | ERROR IDENTIFIER CONSTANT |
| 176 | ZERO | DC | | /8000 | SWITCH 2 RESET CONSTANT |
| 177 | * | | | | INITIALIZE TO SCAN DIMENSION STMT |
| 178 | MIX | STX | 1 | DIMSV | SAVE START ADDR OF STMT |
| 179 | | MDX | 1 | 1 | INCREMENT STMT ADDRESS |

| | | | | | |
|-----|-------|-----|---|----------|----------------------------|
| 180 | | SLA | | 16 | CLEAR ACCUMULATOR |
| 181 | | STO | | SW2 | TURN OFF SWITCH 2 |
| 182 | | STO | L | SW3 | TURN OFF SWITCH 3 |
| 183 | SIP | LD | | 1 0 | LOAD NEXT STMNT WORD |
| 184 | | S | | SEMIC | SEMI-COLON |
| 185 | | BSC | L | RMOVE,+- | BR IF CHAR IS SEMI-COLON |
| 186 | | LD | | SW2 | ERROR 16 INDICATOR |
| 187 | | BSC | L | ER16,Z | BR IF POSITIVE |
| 188 | | MDX | L | SW2,1 | SET ERROR 16 INDICATOR ON |
| 189 | PADS | LD | | 1 0 | STATEMENT NAME (FIRST HALF |
| 190 | | BSC | | - | BR TO ER7 IF FIRST CHAR IS |
| 191 | | MDX | | ER7 | NOT ALPHABETIC, |
| 192 | | STO | | WD1 | SAVE FIRST HALF OF NAME |
| 193 | | SLA | | 2 | |
| 194 | | BSC | L | ER7,C+Z | BR IF 1ST CHAR NOT ALPHA |
| 195 | | LD | | 1 1 | LAST HALF OF STATEMENT NAM |
| 196 | | BSC | L | MADS,+Z | BR IF NAME LONGER THAN 1 W |
| 197 | | LD | | ZERO | ONE WORD NAME INDICATOR |
| 198 | | STO | | WD2 | LAST HALF OF NAME |
| 199 | | MDX | | ZORRO | BR TO SEARCH SYMBOL TABLE |
| 200 | MADS | STO | | WD2 | LAST HALF OF NAME |
| 201 | | MDX | | 1 1 | INCREMENT STMNT ADDRESS |
| 202 | | LD | | 1 1 | BR TO ER7 IF NAME IS MORE |
| 203 | | BSC | L | ER7,+Z | THAN TWO WORDS LONG, |
| 204 | * | | | LOOK FOR | NAME IN SYMBOL TABLE |
| 205 | ZORRO | LDX | | 13 SOFNS | START OF NON-STMNT NUMBERS |
| 206 | | MDX | | BILL | BR TO CHECK END OF SEARCH |
| 207 | LOOP | LD | | 3 1 | LD NEXT SYMBOL TABLE ENTRY |
| 208 | | S | | WD1 | FIRST HALF OF NAME |
| 209 | | BSC | | Z | SKIP NEXT IF EQUAL NAME |
| 210 | | MDX | | HEAT | BR IF NOT EQUAL NAME |
| 211 | | LD | | 3 2 | LD NEXT SYMBOL TABLE ENTRY |
| 212 | | S | | WD2 | LAST HALF OF NAME |
| 213 | | BSC | L | CHK,+- | BR IF NAME FOUND |
| 214 | HEAT | MDX | | 3 -3 | DECREMENT SYMBOL TABLE ADD |
| 215 | BILL | STX | | 3 SAVE | STORE TO TEMPORARY |
| 216 | | LD | | SAVE | LOAD CURRENT SEARCH ADDRES |
| 217 | | S | L | EOFST | END OF SYMBOL TABLE |
| 218 | | BSC | | Z | SKIP NEXT IF END SEARCH |
| 219 | | MDX | | LOOP | BR TO CONTINUE SEARCH |
| 220 | | MDX | | PLACE | BR TO PUT NAME IN TABLE |
| 221 | CHK | LD | | 3 0 | CHECK FOR SUBPROGRAM NAME |
| 222 | | SLA | | 8 | BR TO SET ERROR 17 IF |
| 223 | | BSC | L | PREV,- | SUBPROGRAM NAME IN STMNT, |
| 224 | * | | | SET UP | ERRORS |
| 225 | ER17 | LD | | ERR17 | ERROR 17 INDICATOR |
| 226 | | STO | | ERRNO | ERROR NUMBER TEMPORARY |
| 227 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 228 | ER8 | LD | | ERR8 | ERROR 08 INDICATOR |
| 229 | | STO | | ERRNO | ERROR NUMBER TEMPORARY |
| 230 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 231 | ER16 | LD | | ERR16 | ERROR 16 INDICATOR |
| 232 | | STO | | ERRNO | ERROR NUMBER TEMPORARY |
| 233 | | MDX | | CLOSE | BR TO CLOSE STPING |
| 234 | ER7 | LD | | ERR7 | ERROR 07 INDICATOR |
| 235 | | STO | | ERRNO | ERROR NUMBER TEMPORARY |
| 236 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 237 | ER | LD | | ERR | ERROR 18 INDICATOR |
| 238 | | STO | | ERRNO | ERROR NUMBER TEMPORARY |
| 239 | * | | | CLOSE UP | STRING |

| | | | | | |
|-----|-------|-----|----|-----------|-----------------------------|
| 240 | CLOSE | LDX | I1 | DIMSV | STRING ADDRESS |
| 241 | | LD | 1 | 0 | FIRST WD OF STMT |
| 242 | | SRA | | 2 | |
| 243 | | AND | | IDNRM | EXTRACT STMT WORD COUNT |
| 244 | | STO | | NRMSV | SAVE IN WD COUNT TEMPORARY |
| 245 | | A | | DIMSV | ADDR FIRST WD OF THIS STMN |
| 246 | | STO | | GET | ADDR FIRST WD NEXT STMT |
| 247 | | LDX | I2 | GET | NEXT STMT ADDR INTO REG |
| 248 | | LD | | ERRID | PUT ERROR IDENTIFIER |
| 249 | | STO | 1 | 0 | ON STRING, |
| 250 | | LD | | ERRNO | ERROR NUMBER |
| 251 | | STO | 1 | 1 | PUT ERROR NUMBER ON STRING |
| 252 | | MDX | 1 | 1 | INCREMENT STRING POINTER |
| 253 | | LD | L | EOFS | END OF STRING ADDRESS |
| 254 | | S | L | DIMSV | ADDR FIRST WD OF THIS STMN |
| 255 | | S | | NRMSV | WORD COUNT THIS STATEMENT |
| 256 | | STO | | RANGE | COMPUTED RANGE OF CLOSURE |
| 257 | | LDX | I3 | RANGE | RANGE |
| 258 | | STX | 1 | SVV | SAVE INDEX REG 1 |
| 259 | | MDX | 3 | 1 | |
| 260 | LOOP1 | LD | 2 | 0 | NEXT WORD OF STRING TO MOV |
| 261 | | STO | 1 | 1 | CLOSE STRING |
| 262 | | MDX | 1 | 1 | INCREMENT STRING POINTER |
| 263 | | MDX | 2 | 1 | INCR ADDR NEXT WD TO MOVE |
| 264 | | MDX | 3 | -1 | DECR RANGE AND SKIP IF ZER |
| 265 | | MDX | | LOOP1 | BR TO MOVE NEXT WORD |
| 266 | | STX | L1 | EOFS | NEW END OF STRING ADDRESS |
| 267 | | LDX | I1 | SVV | RESTORE INDEX REG 1 |
| 268 | | MDX | 1 | 1 | ADDRESS OF NEXT STATEMENT |
| 269 | | BSC | L | TEST | BR TO TEST STATEMENT TYPE |
| 270 | * | | | CONSTANTS | AND WORK AREA |
| 271 | NRMSV | DC | | 0 | STMT WORD COUNT |
| 272 | GET | DC | | 0 | ADDR OF NEXT WD TO MOVE |
| 273 | TWO | DC | | 2 | DECIMAL 2 FOR ADDR INCR |
| 274 | RANGE | DC | | 0 | COMPUTED RANGE OF CLOSURE |
| 275 | SVV | DC | | 0 | INDEX REGISTER 1 TEMPORARY |
| 276 | TENT | DC | | 0 | SYMBOL TABLE ADDRESS |
| 277 | SW3 | DC | | 0 | SYMBOL TABLE OVERLAP INDR |
| 278 | ONEDM | DC | | /0800 | ONE DIMENSION CONSTANT |
| 279 | * | | | | PLACE NAME IN SYMBOL TABLE |
| 280 | PLACE | LD | L | WD2 | LAST HALF OF NAME |
| 281 | | STO | 3 | 2 | NEXT SYMBOL TABLE ENTRY+1 |
| 282 | | LD | L | WD1 | FIRST HALF OF NAME |
| 283 | | STO | 3 | 1 | NEXT SYMBOL TABLE ENTRY |
| 284 | | MDX | L | EOFST,-3 | DECR END SYMBOL TABLE ADDR |
| 285 | | MDX | L | SOFXT,-3 | DECR START OF SUBSC TEMPS |
| 286 | | MDX | L | SQFGT,-3 | DECR START GENERATED TEMPS |
| 287 | * | | | SET TYPE | INDICATOR (REAL OR INTEGER) |
| 288 | | LD | L | WD1 | FIRST HALF OF NAME |
| 289 | | AND | L | PIT1 | EXTRACT FIRST NAME CHAR |
| 290 | | S | L | RGTI | ALPHA CONSTANT |
| 291 | | BSC | | +Z | SKIP IF NOT REAL |
| 292 | | MDX | | REEL | BR TO REEL IF NEG (REAL) |
| 293 | | S | L | RGTN | ALPHA CONSTANT |
| 294 | | BSC | L | REEL,Z- | BR TO REEL IF PLUS |
| 295 | | LD | L | IDCI | INTEGER INDICATOR |
| 296 | | MDX | | VIP | BR TO STORE INDICATOR |
| 297 | REEL | LD | | IDCR | REAL INDICATOR |
| 298 | VIP | STO | 3 | 0 | IDENTIFICATION WORD |
| 299 | | MDX | | LORD | BR TO TEST FOR OVERLAP ERR |

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300 *          TEST FOR NAME PREVIOUSLY DIMENSIONED
301 PREV LD 3 0 IDENTIFICATION WORD
302 SLA 4 SHIFT DIMENSION CHARACTER
303 BSC C INTO THE CARRY AND SIGN
304 MDX ER POSITIONS AND BR TO ER IF
305 BSC L ER,+Z EITHER BIT IS ON,
306 *          CHECK IF SUBPROGRAM OR FUNCTION
307 LD L SORF SUBPROGRAM OR FUNCTION IND
308 BSC L SUBN,+* BR IF EITHER INDICATOR ON
309 LD 3 0 IDENTIFICATION WORD
310 SLA 2 COMMON INDICATOR TO SIGN
311 BSC L SUBN,- BR IF ALREADY IN COMMON
312 MDX L FNAME,1 ADJUST FNAME POINTER
313 *          SPREAD SYMBOL TABLE FOR DIMENSION WD
314 SUBN STX 1 VVV+1 SAVE STATEMENT POINTER
315 STX 3 TENT ADDR OF NAME IN COMMON
316 LD TENT
317 S L EOFST END OF STRING ADDRESS
318 STO TENT NUMBER OF WORDS TO MOVE
319 LDX I2 TENT
320 MDX 2 -3 DECK WORDS TO MOVE COUNT
321 MDX PASS BR TO SLIDE TABLE 1 ENTRY
322 MDX GLINK BR TO CLEAR ENTRY IF ZERO
323 PASS LDX I1 EOFST END OF SYMBOL TABLE ADDRESS
324 LOOP3 LD 1 3 LD WORD TO MOVE
325 STO 1 0 SPREAD TABLE 3 WORDS
326 MDX 1 1 INCREMENT MOVE POINTER
327 MDX 2 -1 DECK CTR, SKIP NEXT IF DONE
328 MDX LOOP3 BR TO CONTINUE
329 GLINK SLA 16 CLEAR ACCUMULATOR
330 STO 3 -1 ZERO WD 3 DIMENSION ENTRY
331 STO 3 -2 ZERO WD 2 DIMENSION ENTRY
332 STO 3 -3 ZERO WD 1 DIMENSION ENTRY
333 LD 3 0 IDENTIFICATION WORD
334 OR ONEDM ONE DIMENSION INDICATOR
335 STO 3 0 REPLACE IN TABLE ENTRY
336 VVV LDX L1 0 RESTORE INDEX REGISTER 1
337 MDX L EOFST,-3 DECK END OF SYMBOL TABLE
338 MDX L SOFXT,-3 DECK START OF SUBSC TEMPS
339 MDX L SOFGT,-3 DECK START GENERATED TEMPS
340 MDX L SW3,1
341 LORD LD L EOFST CHK FOR SYMBOL TBL OVERFLO
342 A TWO
343 S L EOFS END OF STRING
344 BSC L JIMY,+Z BR IF SYMBOL TABLE OVERFLO
345 TARZ MDX 1 1 MOVE STATEMENT POINTER
346 LD 1 0 NEXT CHAR DIMENSION STMT
347 S PARNL LEFT PARENTHESIS
348 BSC L ER8,Z BR IF NO LEFT PARENTHESIS
349 SON1 SLA 16 CLEAR ACCUMULATOR
350 STO CNT RESET DIMENSION COUNTER
351 MDX 1 1 MOVE STMT POINTER
352 LD 1 0 NEXT CHAR OF STMT
353 AND PIT CHECK FOR ALPHA CHARACTER
354 EOR PIT
355 BSC L ER8,Z BR TO ER8 IF NOT NUMERIC
356 *          COLLECT CONSTANT TO BINARY
357 LDS 0 RESET OVERFLOW AND CARRY
358 SLT 32 CLEAR ACCUMULATOR
359 STO SUMM CLEAR CONSTANT SUM

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|-----|-------|-----|-----------|-----------------------------|--------------|
| 360 | LD | 1 | 0 | WORD 1 OF CONSTANT | |
| 361 | STD | | TEM | | |
| 362 | LD | 1 | 1 | WORD 2 OF CONSTANT | |
| 363 | BSC | L | AOT,- | BRANCH ON OPERATOR | |
| 364 | SLA | | 1 | MAKE BITS CONTIGUOUS | |
| 365 | STO | | TEM+1 | | |
| 366 | LD | 1 | 2 | NEXT STATEMENT WORD | |
| 367 | MDX | 1 | 1 | MOVE STATEMENT POINTER | |
| 368 | BSC | L | ER8,+ | BR ON NO OPERATOR | |
| 369 | AOT | | LD | WORD 1 OF CONSTANT | |
| 370 | AOT1 | | AND | AND OUT ALL BUT 1ST 6 BITS | |
| 371 | SLA | | 2 | | |
| 372 | BSC | L | PILL,C | BRANCH IF CARRY ON | |
| 373 | BSC | L | NEX,+ | BR TO CHECK FOR ZERO CON | |
| 374 | BSC | L | ERR8 | BR EMBEDDED ALPHA CHARACTE | |
| 375 | PILL | BSC | L | ER8,- | BR NOT MINUS |
| 376 | AND | | COT2 | EXTRACT DIGIT | |
| 377 | S | | NINT | NINE | |
| 378 | BSC | L | ER8,-Z | BR GREATER THAN NINE | |
| 379 | A | | NINT | | |
| 380 | SRA | | 11 | RIGHT JUSTIFY | |
| 381 | STO | | HELP1 | | |
| 382 | LD | | SUMM | CUMULATIVE SUM | |
| 383 | SLA | | 1 | TIMES 2 | |
| 384 | STO | | GORT | TEMPORARY STORE | |
| 385 | BSC | L | ER8,+Z | BR IF TOO LARGE | |
| 386 | SLA | | 2 | TIMES 8 | |
| 387 | BSC | L | ER8,C+Z | BR IF TOO LARGE | |
| 388 | A | | GORT | TIMES 10 | |
| 389 | A | | HELP1 | UNITS DIGIT | |
| 390 | BSC | L | ER8,0 | BR TOO LARGE | |
| 391 | STO | | SUMM | CUMULATIVE SUM | |
| 392 | LDD | | TEM | DIGIT TEMPORARY | |
| 393 | SLT | | 6 | SHIFT NEXT DIGIT TO HIGH 6 | |
| 394 | STD | | TEM | | |
| 395 | MDX | | AOT1 | BR TO PROCESS NEXT DIGIT | |
| 396 | * | | CONSTANTS | AND WORK AREA | |
| 397 | PIT | DC | /6000 | ALPHABETIC MASK | |
| 398 | PIT1 | DC | /7E00 | FIRST NAME CHARACTER MASK | |
| 399 | RGT1 | DC | /1200 | CHARACTER LIMIT CHECK CON | |
| 400 | RGTN | DC | /1800 | CHARACTER LIMIT CHECK CON | |
| 401 | IDCI | DC | /4000 | INTEGER TYPE CONSTANT INDR | |
| 402 | IDCR | DC | 0 | REAL TYPE CONSTANT INDR | |
| 403 | PARNL | DC | /000D | LEFT PARENTHESIS CONSTANT | |
| 404 | COMAC | DC | /002B | COMMA CONSTANT | |
| 405 | BSS | E | 0 | MAKE ADDRESS EVEN | |
| 406 | TEM | DC | 0 | 2 WORD TEMPORARY FOR | |
| 407 | | DC | 0 | CONSTANT TO BE CONVERTED, | |
| 408 | COT1 | DC | /FE00 | EXTRACT CHARACTER CONSTANT | |
| 409 | COT2 | DC | /7800 | EXTRACT DIGIT CONSTANT | |
| 410 | HELP1 | DC | 0 | UNITS DIGIT TEMPORARY | |
| 411 | NINT | DC | /4800 | DECIMAL NINE CONSTANT | |
| 412 | SUMM | DC | 0 | CUMULATIVE SUM OF CONSTANT | |
| 413 | CNT | DC | 0 | NUMBER OF CONSTANTS COUNTED | |
| 414 | PARNR | DC | /001D | RIGHT PARENTHESIS CONSTANT | |
| 415 | ZTEMP | DC | 0 | STMT WORD COUNT TEMPORARY | |
| 416 | FLOG | DC | 0 | STMT ADDRESS TEMPORARY | |
| 417 | BOUND | DC | 0 | STRING MOVE COUNTER | |
| 418 | GORT | DC | 0 | CONSTANT TIMES 2 TEMPORARY | |
| 419 | 01 | DC | 1 | DECIMAL 1 CONSTANT | |

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|-----|-------|-----|---|-----------|--------------------------------------|
| 420 | * | | | | MAKE DIMENSION ENTRY IN SYMBOL TABLE |
| 421 | NEX | MDX | L | CNT,1 | INCR CONSTANT COUNTER |
| 422 | | LD | | SUMM | CHECK FOR ZERO CONSTANT |
| 423 | | BSC | L | ER8,+ | BR IF DIMENSION CON IS ZER |
| 424 | | LD | | CNT | DIMENSION COUNTER |
| 425 | | S | | 01 | ONE |
| 426 | | BSC | | Z | SKIP NEXT IF FIRST CONSTAN |
| 427 | | MDX | | 02 | BR TO COMPUTE 2ND CONSTANT |
| 428 | | LD | | SUMM | DIMENSION CONSTANT |
| 429 | | STO | 3 | -1 | STORE IN ALL 3 DIMENSION |
| 430 | | STO | 3 | -2 | WORDS OF SYMBOL TABLE |
| 431 | | STO | 3 | -3 | ENTRY, |
| 432 | | MDX | | NEXP | BR TO GET NEXT STMNT CHAR |
| 433 | 02 | S | | 01 | ONE |
| 434 | | BSC | | Z | SKIP NEXT IF SECOND CON |
| 435 | | MDX | | 03 | BR TO COMPUTE THIRD CON |
| 436 | | LD | 3 | -1 | FIRST DIMENSION CONSTANT |
| 437 | | M | | SUMM | SECOND DIMENSION CONSTANT |
| 438 | | SLT | | 16 | |
| 439 | | STO | 3 | -2 | STORE IN SECOND AND THIRD |
| 440 | | STO | 3 | -3 | DIMENSION WORDS, |
| 441 | | MDX | | NEXP | BR TO GET NEXT STMNT CHAR |
| 442 | 03 | LD | 3 | -3 | 1ST X 2ND DIMENSION CON |
| 443 | | M | | SUMM | THIRD DIMENSION CONSTANT |
| 444 | | SLT | | 16 | |
| 445 | | STO | 3 | -3 | STORE IN THIRD DIMENSION W |
| 446 | NEXP | MDX | 1 | 1 | INCREMENT STMNT POINTER |
| 447 | | LD | 1 | 0 | NEXT CHARACTER |
| 448 | | S | | COMAC | COMMA |
| 449 | | BSC | L | TCNT,+ | BR TO CHECK DIMENSION COUN |
| 450 | | A | | COMAC | RESTORE CHARACTER |
| 451 | | S | | PARNR | RIGHT PARENTHESIS |
| 452 | | BSC | L | ER8,Z | BR TO ERR IF NO PARENTHESI |
| 453 | | LD | | CNT | DIMENSION COUNT |
| 454 | | SLA | | 11 | SHIFT TO BITS 3 AND 4 |
| 455 | | STO | | TMPDM | TEMPORARY |
| 456 | | LD | 3 | 0 | SYMBOL TABLE ID WORD |
| 457 | | AND | | THRDM | SET BITS 3 AND 4 EQUAL TO |
| 458 | | OR | | TMPDM | THE NUMBER OF DIMENSIONS, |
| 459 | | STO | 3 | 0 | SYMBOL TABLE ID WORD |
| 460 | | LD | L | SW3 | |
| 461 | | BSC | L | YELP1,Z | BR TO CHECK FOR OVERLAP |
| 462 | | MDX | L | EQFST,-3 | DECR END OF SYMBOL TABLE |
| 463 | | MDX | L | SOFXT,-3 | DECR START OF SUBSC TEMPS |
| 464 | | MDX | L | SOFGT,-3 | DECR START GENERATED TEMPS |
| 465 | YELP1 | LD | L | EQFST | CHK FOR SYMBOL TBL OVERLAP |
| 466 | | A | L | TWO | |
| 467 | | S | L | EQFS | END OF STRING |
| 468 | | BSC | L | JIMY,+Z | BR IF SYMBOL TABLE OVERLAP |
| 469 | | SLA | | 16 | CLEAR ACCUMULATOR |
| 470 | | STO | L | SW3 | RESET SWITCH 3 |
| 471 | | MDX | 1 | 1 | MOVE STMNT POINTER |
| 472 | | LD | 1 | 0 | NEXT STMNT CHARACTER |
| 473 | | S | | COMAC | COMMA |
| 474 | | BSC | L | SIP,Z | BR NOT COMMA |
| 475 | | MDX | 1 | 1 | MOVE STMNT POINTER |
| 476 | | BSC | L | PADS | BR TO CHK FOR LEGAL NAME |
| 477 | * | | | CONSTANTS | AND WORK AREA |
| 478 | THRE | DC | 3 | | DECIMAL THREE |
| 479 | THRDM | DC | | /E7FF | MASK TO REMOVE BITS 3 AND |

| | | | | | |
|-----|-------|-----|----|-------------|--------------------------------|
| 480 | TMPDM | DC | | *** | DIMENSION COUNT TEMPORARY |
| 481 | * | | | | CHECK FOR OVERLAP ERROR |
| 482 | JIMY | MDX | L | ERROR,1 | SET OVERLAP ERROR ON |
| 483 | | BSC | L | BEGIN | BR TO REAL AND INTEGER |
| 484 | TCNT | LD | | CNT | CHK FOR COUNT LESS THAN 3 |
| 485 | | S | | THRE | |
| 486 | | BSC | L | ER8,- | BR IF COUNT 3 OR MORE |
| 487 | | BSC | L | SON1+2 | BR TO CONVERT NEXT CONSTAN |
| 488 | * | | | REMOVE | DIMENSION STATEMENT FR STRING |
| 489 | RMOVE | LDX | I1 | DIMSV | ADDRESS FIRST WD OF STMT |
| 490 | | MDX | 1 | -1 | DECR STMT ADDR |
| 491 | | LD | 1 | 1 | ID WD OF DIMENSION STMT |
| 492 | | SRA | | 2 | RIGHT JUSTIFY WD COUNT |
| 493 | | AND | L | IDNRM | EXTRACT STMT WORD COUNT |
| 494 | | STO | | ZTEMP | TEMPORARY |
| 495 | | LD | L | EOFS | ADDR END OF STRING |
| 496 | | S | L | DIMSV | ADDR OF DIMENSION STMT |
| 497 | | S | | ZTEMP | DIMENSION STMT WD COUNT |
| 498 | | STO | | BOUND | NUMBER OF WDS TO MOVE -1 |
| 499 | | LDX | I3 | BOUND | MOVE WORD COUNT -1 |
| 500 | | MDX | 3 | 1 | ADJUST = WDS TO MOVE |
| 501 | | LD | L | DIMSV | ADDR OF DIMENSION STMT |
| 502 | | A | | ZTEMP | DIMENSION STMT WD COUNT |
| 503 | | STO | | ZTEMP | TEMPORARY |
| 504 | | LDX | I2 | ZTEMP | ADDR OF STMT TO MOVE |
| 505 | | STX | 1 | FLOG | SAVE ID WD -1 ADDRESS |
| 506 | LPP | LD | 2 | | NEXT WD TO MOVE |
| 507 | | STO | 1 | 1 | MOVE TO CLOSE UP STRING |
| 508 | | MDX | 1 | 1 | INCR MOVE TO ADDRESS |
| 509 | | MDX | 2 | 1 | INCR MOVE FROM ADDRESS |
| 510 | | MDX | 3 | -1 | DECR AND SKIP IF ZERO |
| 511 | | MDX | | LPP | BR TO CONTINUE CLOSING |
| 512 | | STX | L1 | EOFS | NEW END OF STRING ADDRESS |
| 513 | | LDX | I1 | FLOG | RESTORE REGISTER 1 |
| 514 | | MDX | 1 | 1 | ADDR ID WD OF NEXT STMT |
| 515 | | BSC | L | TEST | BR TO TEST NEXT STMT TYPE |
| 516 | * | | | | CONSTANTS AND WORK AREA |
| 517 | ONE | DC | | 1 | DECIMAL 1 |
| 518 | SW1A | DC | | 0 | MOVE SWITCH |
| 519 | SW2A | DC | | 0 | REAL/INTEGER SWITCH |
| 520 | H0800 | DC | | /0800 | END STMT CONSTANT |
| 521 | INTGR | DC | | /0400 | INTEGER STMT CONSTANT |
| 522 | REALC | DC | | /2400-/0800 | REAL STMT CONSTANT |
| 523 | SEMI | DC | | /1E | SEMICOLON CONSTANT |
| 524 | SW3A | DC | | 0 | SYNTAX ERROR SWITCH |
| 525 | IDTPQ | DC | | /7C00 | STATEMENT TYPE MASK |
| 526 | EXTER | DC | | /3C00 | EXTERNAL STMT CONSTANT |
| 527 | LPARN | DC | | /0000 | LEFT PARENTHESIS CONST |
| 528 | DATAS | DC | | /7C00-/6400 | DATA STMT CONST *V1M3 |
| 529 | DEFIL | DC | | /7800-/7C00 | DEFINE FILE CONST *V1M3 |
| 530 | * | | | | INITIALIZE TYPE STATEMENT PASS |
| 531 | BEGIN | LDX | I1 | SOFS | START OF STRING ADDRESS |
| 532 | | LD | L | ERROR | OVERLAP ERROR INDICATOR |
| 533 | | BSC | L | SOS,Z | BR TO NEXT PHASE IF OVERLA |
| 534 | DAP | SLA | | 16 | |
| 535 | | STO | L | SW4 | RESET EXTERNAL STMT SWITC |
| 536 | | STO | L | SW6 | RESET SWITCH 6 |
| 537 | | LD | 1 | 0 | FIRST WORD OF STMT |
| 538 | | SRA | | 1 | POSITION TO TEST STMT TYP |
| 539 | | AND | | IDTPQ | STMT TYPE (BITS 1-5) |

| | | | | | |
|-----|-------|-----|----|----------|---------------------------------|
| 540 | | S | | H0800 | END STATEMENT CONSTANT |
| 541 | | BSC | L | SOS,+- | BR TO READ IN NEXT PHASE |
| 542 | | S | | REALC | REAL STMT CONSTANT |
| 543 | | BSC | L | LAP,+- | BR IF REAL STMT |
| 544 | | S | | INTGR | INTEGER CONSTANT |
| 545 | | BSC | L | LAP1,+- | BR IF INTEGER STMT |
| 546 | | S | | EXTER | EXTERNAL STMT CONSTANT |
| 547 | | BSC | L | EXT,+- | BR IF EXTERNAL *V1M3 |
| 548 | | S | | DATAS | DATA STATEMENT *V1M3 |
| 549 | | BSC | | Z | SKIP IF DS *V1M3 |
| 550 | | S | | DEFIL | DEFINE FILE *V1M3 |
| 551 | | BSC | L | MOVE,+- | NEXT STATEMENT *V1M3 |
| 552 | | BSC | L | TAP | BR TO TEST SW1A *V1M3 |
| 553 | EXT | MDX | L | SW4,1 | EXTERNAL SWITCH ON |
| 554 | | MDX | | LAP4 | BR TO SET MOVE SWITCH ON |
| 555 | LAP1 | STX | 0 | SW2A | SW2A SET NON-ZERO = INTEGE |
| 556 | | MDX | | LAP4 | BR TO SET MOVE SWITCH ON |
| 557 | LAP | SLA | | 16 | SET SW2A TO ZERO TO |
| 558 | | STO | | SW2A | INDICATE REAL STMT, |
| 559 | LAP4 | STX | 0 | SW1A | SET MOVE SWITCH ON |
| 560 | * | | | | INITIALIZE TO SCAN BODY OF STMT |
| 561 | LAP3 | STX | 1 | TYPEV | ADDR FIRST STMT WORD |
| 562 | | MDX | 1 | 1 | INCR STMT ADDR |
| 563 | | SLA | | 16 | CLEAR ACCUMULATOR |
| 564 | | STO | L | SW5 | SYMBOL TABLE ADDR ADJUST S |
| 565 | | STO | | SW3A | RESET SYNTAX ERROR INDR |
| 566 | JAP | LD | 1 | 0 | FIRST STMT WORD |
| 567 | | S | | SEMI | SEMI-COLON |
| 568 | | BSC | L | BOB,+- | BR IF SEMI-COLON TO REMOVE |
| 569 | | LD | | SW3A | SYNTAX ERROR SW |
| 570 | | BSC | L | ER19,Z | BR TO SET ERROR IF SW3 ON |
| 571 | ZAR | LD | 1 | 0 | STMT NAME (FIRST HALF) |
| 572 | | S | | SEMI | SEMICOLON NOW *V1M3 |
| 573 | | BSC | L | ER19,+- | SYNTAX ERROR *V1M3 |
| 574 | | LD | 1 | 0 | LOAD BACK THE WORD *V1M3 |
| 575 | | BSC | | - | BR TO ER7 IF FIRST CHAR IS |
| 576 | | MDX | | ER7R | NOT ALPHABETIC, |
| 577 | | STO | | WORD1 | SAVE FIRST HALF OF NAME |
| 578 | | SLA | | 2 | |
| 579 | | BSC | L | ER7R,C+Z | BR IF 1ST CHAR NOT ALPHA |
| 580 | | LD | 1 | 1 | LAST HALF OF STMT NAME |
| 581 | | BSC | L | HOCK,+Z | BR IF NAME LONGER THAN 1 W |
| 582 | | LD | | Z0 | ONE WORD NAME INDICATOR |
| 583 | | STO | | WORD2 | LAST HALF OF NAME |
| 584 | | MDX | | **2 | SKIP AROUND |
| 585 | HOCK | STO | | WORD2 | LAST HALF OF NAME |
| 586 | | MDX | 1 | 1 | INCR INPT STRING WD POINTE |
| 587 | | LD | L | SW4 | GET SW4 (EXT STMT SW) AND |
| 588 | | BSC | L | **5,+- | BR AROUND IF SW4 IS ON |
| 589 | | LD | 1 | 1 | ELSE PICK UP NEXT I/P WD |
| 590 | | S | L | LPARN | COMPARE TO LEFT PARENTHESI |
| 591 | | BSC | L | ER19,+- | BRANCH IF IT COMPARES |
| 592 | | LD | 1 | 1 | ELSE GET THE WORD BACK |
| 593 | | BSC | L | ER7R,+Z | BR IF NAME IS 3 WDS LONG |
| 594 | * | | | | LOOK FOR NAME IN SYMBOL TABLE |
| 595 | ZOR | LDX | I3 | SOFNS | START OF NON-STMT NUMBERS |
| 596 | | MDX | | HACK | BR TO CHECK END OF SEARCH |
| 597 | LOOPQ | LD | 3 | 1 | LD NEXT SYMBOL TABLE ENTRY |
| 598 | | S | | WORD1 | FIRST HALF OF NAME |
| 599 | | BSC | | Z | SKIP NEXT IF EQUAL NAME |

| | | | | | |
|-----|-------|-----|----|-----------------|-----------------------------|
| 600 | | MDX | | EAT | BR IF NOT EQUAL NAME |
| 601 | | LD | 3 | 2 | LD NEXT SYMBOL TABLE ENTRY |
| 602 | | S | | WORD2 | LAST HALF OF NAME |
| 603 | | BSC | L | FUN,+- | BR IF NAME FOUND |
| 604 | EAT | MDX | 3 | -3 | DECK SYMBOL TABLE ADDRESS |
| 605 | HACK | STX | 3 | SAVEQ | STORE TO TEMPORARY |
| 606 | | LD | | SAVEQ | LOAD CURRENT SEARCH ADDRESS |
| 607 | | S | L | EQFST | END OF SYMBOL TABLE |
| 608 | | BSC | | Z | SKIP NEXT IF END SEARCH |
| 609 | | MDX | | LOOPQ | BR TO CONTINUE SEARCH |
| 610 | | MDX | | PLACQ | BR TO PUT NAME IN TABLE |
| 611 | * | | | CONSTANTS | AND WORK AREA |
| 612 | ZO | DC | | /3000 | SWITCH 2 RESET CONSTANT |
| 613 | SAVEQ | DC | | 0 | INDEX REGISTER 3 TEMPORARY |
| 614 | WORD1 | DC | | 0 | STMT NAME (FIRST HALF) |
| 615 | WORD2 | DC | | 0 | STMT NAME (SECOND HALF) |
| 616 | TYPEV | DC | | 0 | ADDR FIRST WD OF STATEMENT |
| 617 | ERNO | DC | | 0 | ERROR NUMBER |
| 618 | ERR18 | DC | | 18 | ERROR 18 CONSTANT |
| 619 | ERR19 | DC | | 19 | ERROR 19 CONSTANT |
| 620 | ERR20 | DC | | 20 | ERROR 20 CONSTANT |
| 621 | ERR8S | DC | | 8 | ERROR 08 CONSTANT |
| 622 | ERID | DC | | /A008 | ERROR IDENTIFIER CONSTANT |
| 623 | ERR7S | DC | | 7 | ERROR 07 CONSTANT |
| 624 | ERR21 | DC | | 21 | ERROR 21 CONSTANT |
| 625 | * | | | SET UP ERRORS | |
| 626 | ER19 | LD | | ERR19 | ERROR 19 INDICATOR |
| 627 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 628 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 629 | ER20 | LD | | ERR20 | ERROR 20 INDICATOR |
| 630 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 631 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 632 | ER8R | LD | | ERR8S | ERROR 08 INDICATOR |
| 633 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 634 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 635 | ER18 | LD | | ERR18 | ERROR 18 INDICATOR |
| 636 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 637 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 638 | ER21 | LD | | ERR21 | ERROR 21 INDICATOR |
| 639 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 640 | | MDX | | CLOSE | BR TO CLOSE STRING |
| 641 | ER7R | LD | | ERR7S | ERROR 07 INDICATOR |
| 642 | | STO | | ERNO | ERROR NUMBER TEMPORARY |
| 643 | * | | | CLOSE UP STRING | |
| 644 | CLOSE | LXD | I1 | TYPEV | STRING ADDRESS |
| 645 | | LD | 1 | 0 | FIRST WD OF STMT |
| 646 | | SRA | | 2 | |
| 647 | | AND | | IDNVM | EXTRACT STMT WORD COUNT |
| 648 | | STO | | NRMSQ | SAVE IN WD COUNT TEMPORARY |
| 649 | | A | | TYPEV | ADDR FIRST WD OF THIS STMT |
| 650 | | STO | | **+1 | ADDR FIRST WD OF NEXT STMT |
| 651 | | LXD | L2 | ** | NEXT STMT ADDR INTO REG 2 |
| 652 | | LD | | ERID | PUT ERROR IDENTIFIER |
| 653 | | STO | 1 | 0 | ON STRING, |
| 654 | | LD | | ERNO | ERROR NUMBER |
| 655 | | STO | 1 | 1 | PUT ERROR NUMBER ON STRING |
| 656 | | MDX | 1 | 1 | INCREMENT STRING POINTER |
| 657 | | LD | L | EQFS | END OF STRING ADDRESS |
| 658 | | S | | TYPEV | ADDR FIRST WD OF THIS STMT |
| 659 | | S | | NRMSQ | WORD COUNT THIS STMT |

| | | | | |
|-----|-------|-----|------------|----------------------------|
| 660 | STO | | **+1 | COMPUTED RANGE OF CLOSURE |
| 661 | LDX | L3 | **-- | RANGE |
| 662 | MDX | | 3 1 | |
| 663 | LOOPZ | LD | 2 0 | NEXT WD OF STRING TO MOVE |
| 664 | | STO | 1 1 | CLOSE STRING |
| 665 | | MDX | 1 1 | INCR STRING POINTER |
| 666 | | MDX | 2 1 | INCR ADDR NEXT WD TO MOVE |
| 667 | | MDX | 3 -1 | DECK RANGE AND SKIP IF ZER |
| 668 | | MDX | LOOPZ | BR TO MOVE NEXT WORD |
| 669 | | STX | L1 EOF5 | NEW END OF STRING ADDRESS |
| 670 | | LDX | I1 TYPEV | ADDR FIRST WD NEXT STMT |
| 671 | MOVE | LD | 1 0 | STMT IDENTIFICATION WORD |
| 672 | | SRA | | 2 |
| 673 | | AND | IDNVM | EXTRACT STMT WORD COUNT |
| 674 | | STO | **+1 | ST COUNT TO UPDATE POINTER |
| 675 | | MDX | L1 **-- | INCR TO NEXT STMT |
| 676 | | BSC | L DAP | BR TO TEST STMT TYPE |
| 677 | * | | | CONSTANTS AND WORK AREA |
| 678 | IDNVM | DC | /01FF | STMT WORD COUNT MASK |
| 679 | NRMSQ | DC | 0 | STMT WORD COUNT |
| 680 | RLIND | DC | /BFFF | REAL INDICATOR |
| 681 | ININD | DC | /4000 | INTEGER INDICATOR |
| 682 | COMA | DC | /2B | COMMA CONSTANT |
| 683 | LPAR | DC | /0D-/2B | LEFT PARENTHESIS CONSTANT |
| 684 | TENTS | DC | 0 | SYMBOL TABLE ADDRESS |
| 685 | RPAR | DC | /1D-/2B | RIGHT PARENTHESIS CONSTANT |
| 686 | MART | DC | /3800 | EXTERNAL STMT MASK |
| 687 | MART1 | DC | /0090 | EXTERNAL INDICATORS |
| 688 | SW5 | DC | 0 | SYMBOL TABLE ADDR ADJUST S |
| 689 | SW4 | DC | 0 | EXTERNAL STMT SWITCH |
| 690 | ER22 | DC | 22 | ERROR 22 CONSTANT |
| 691 | IFIXC | DC | /9231 | IFIX EBCDIC CON (FIRST WD) |
| 692 | | DC | /99C0 | IFIX EBCDIC CON (LAST WD) |
| 693 | FLT | DC | /8C9A | FLT EBCDIC CON (FIRST WD) |
| 694 | | DC | /E063 | FLT EBCDIC CON (LAST WD) |
| 695 | H7E00 | DC | /7E00 | FIRST NAME CHAR MASK |
| 696 | H1200 | DC | /1200 | NAME ALPHA CONSTANT |
| 697 | H1800 | DC | /1800 | NAME ALPHA CONSTANT |
| 698 | SW6 | DC | **-- | DIMENSION ERROR SWITCH |
| 699 | * | | | PLACE NAME IN SYMBOL TABLE |
| 700 | PLACQ | LD | WORD2 | LAST HALF OF NAME |
| 701 | | STO | 3 2 | NEXT SYMBOL TABLE ENTRY+1 |
| 702 | | LD | WORD1 | FIRST HALF OF NAME |
| 703 | | STO | 3 1 | NEXT SYMBOL TABLE ENTRY |
| 704 | | SLA | | 16 |
| 705 | | STO | 3 0 | CLEAR SYMBOL TABLE ID WORD |
| 706 | | MDX | L EOFST,-3 | DECK END SYMBOL TABLE ADDR |
| 707 | | MDX | L SOFXT,-3 | DECK START OF SUBSC TEMPS |
| 708 | | MDX | L SOFGT,-3 | DECK START GENERATED TEMPS |
| 709 | | LD | SW4 | EXTERNAL STMT SWITCH |
| 710 | | BSC | L TICK,+-- | BR IF NOT EXTERNAL STMT |
| 711 | MLTN | LD | 3 0 | SYMBOL TABLE ID WORD |
| 712 | | AND | MART | BR TO ER21 IF EXTERNAL NAM |
| 713 | | BSC | L ER21,Z | IS IN COMMON OR DIMENSION, |
| 714 | | LD | 3 0 | SYMBOL TABLE ID WORD |
| 715 | | OR | MART1 | SET EXTERNAL STMT INDR |
| 716 | | STO | 3 0 | RESTORE ID WD |
| 717 | | LD | 3 1 | FIRST HALF OF NAME |
| 718 | | S | IFIXC | FIRST HALF OF IFIX NAME CO |
| 719 | | BSC | L TICKK,Z | BR IF NAME NOT EQUAL IFIX |

| | | | | | |
|-----|-------|-----|---|-----------|----------------------------|
| 720 | | LD | 3 | 2 | LAST HALF OF NAME |
| 721 | | S | | IFIXC+1 | LAST HALF OF IFIX NAME CON |
| 722 | | BSC | L | TICKK,Z | BR IF NAME NOT EQUAL IFIX |
| 723 | EROR | LD | | ER22 | SET UP ERROR 22 = IFIX |
| 724 | | STO | | ERNO | |
| 725 | | BSC | L | CLOSE | BR TO CLOSE UP STRING |
| 726 | TICKK | LD | 3 | 1 | FIRST HALF OF NAME |
| 727 | | S | | FLT | FIRST HALF OF FLT NAME CON |
| 728 | | BSC | L | TICKP,Z | BR NAME NOT EQUAL FLT |
| 729 | | LD | 3 | 2 | LAST HALF OF NAME |
| 730 | | S | | FLT+1 | LAST HALF OF FLT NAME CON |
| 731 | | BSC | L | EROR,+- | BR IF NAME EQUAL FLT |
| 732 | TICKP | LD | | SW6 | |
| 733 | | BSC | L | TICKQ,+- | BR IF SW6 IS OFF |
| 734 | | SLA | | 16 | |
| 735 | | STO | | SW6 | CLEAR SW6 |
| 736 | | MDX | | MOTQS | BR TO MOVE STMT POINTER |
| 737 | TICKQ | LD | 3 | 1 | FIRST NAME WORD |
| 738 | | AND | | H7E00 | EXTRACT FIRST CHARACTER |
| 739 | | S | | H1200 | |
| 740 | | BSC | L | LAP5,+Z | BR IF MINUS TO SET REAL |
| 741 | | S | | H1800 | |
| 742 | | BSC | L | LAP5,-Z | BR IF PUS TO SET REAL |
| 743 | | MDX | | MA | BR TO SET INTEGER INDR |
| 744 | FUN | LD | 3 | 0 | SYMBOL TBL ID WORD |
| 745 | | SLA | | 8 | |
| 746 | | BSC | L | ER20,+Z | BR IF SUBPROGRAM NAME |
| 747 | * | | | CHECK FOR | NAME PREVIOUSLY DIMENSIONE |
| 748 | | LD | 3 | 0 | SYMBOL TBL ID WORD |
| 749 | | SLA | | 3 | |
| 750 | | BSC | L | ER18,+Z | BR IF MULTIPLE DIMENSION |
| 751 | | SLA | | 1 | |
| 752 | | BSC | L | ER18,+Z | BR IF MULTIPLE DIMENSION |
| 753 | | LD | | SW4 | EXTERNAL SWITCH |
| 754 | | BSC | L | TICK,+- | BR IF NOT EXTERNAL STMT |
| 755 | | STX | 0 | SW6 | TURN ON SWITCH 6 |
| 756 | | MDX | | MLTN | BR TO CHK EXTERNAL ERROR |
| 757 | TICK | LD | L | SW2A | REAL/INTEGER SWITCH |
| 758 | | BSC | L | MA,Z | BR TO SET INTEGER INDICATO |
| 759 | LAP5 | LD | 3 | 0 | SYMBOL TABLE ID WORD |
| 760 | | AND | | RLIND | SET INDICATOR REAL |
| 761 | | MDX | | ZZ | BR TO RESTORE ID WORD |
| 762 | MA | LD | 3 | 0 | ID WORD |
| 763 | | OR | | ININD | SET INDICATOR INTEGER |
| 764 | ZZ | STO | 3 | 0 | RESTORE ID WORD |
| 765 | MOTQS | MDX | 1 | 1 | INCR STMT POINTER |
| 766 | | LD | 1 | 0 | NEXT STMT WORD |
| 767 | | S | | COMA | COMMA CONSTANT |
| 768 | | BSC | L | BR0T,+- | BR IF COMMA |
| 769 | | S | | LPAR | LEFT PARENTHESIS CONSTANT |
| 770 | | BSC | L | SIS,Z | BR NOT LEFT PARENTHESIS |
| 771 | | SLA | | 16 | |
| 772 | | STO | | CNTQ | RESET DIMENSION COUNTER |
| 773 | * | | | CHECK FOR | SUBPROGRAM OR FUNCTION |
| 774 | | LD | L | SORF | SUBPROGRAM OR FUNCTION IND |
| 775 | | BSC | L | SUBQ,+- | BR IF SUBPROG OR FUNCTION |
| 776 | | LD | 3 | 0 | SYMBOL TBL ID WORD |
| 777 | | SLA | | 2 | |
| 778 | | BSC | L | SUBQ,- | BR IF ALREADY IN COMMON |
| 779 | | MDX | L | FNAME,1 | ADJUST FNAME POINTER |

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|-----|-------|-----|----|----------|--------------------------------------|
| 780 | * | | | | SPREAD SYMBOL TABLE FOR DIMENSION WD |
| 781 | SUBQ | STX | 1 | SAVIT+1 | SAVE STMT POINTER |
| 782 | | STX | 3 | TENTS | ADDR OF NAME IN COMMON |
| 783 | | LD | | TENTS | |
| 784 | | S | L | EOFST | END OF STRING ADDRESS |
| 785 | | STO | | TENTS | NUMBER OF WORDS TO MOVE |
| 786 | | LDX | I2 | TENTS | |
| 787 | | MDX | 2 | -3 | DECK WDS TO MOVE COUNT |
| 788 | | MDX | | PASSS | BR TO SLIDE TABLE 1 ENTRY |
| 789 | | MDX | | GLINE | BR TO CLEAR ENTRY IF ZERO |
| 790 | PASSS | LDX | I1 | EOFST | END OF SYMBOL TABLE ADDRESS |
| 791 | LOOP8 | LD | 1 | 3 | LD WORD TO MOVE |
| 792 | | STO | 1 | 0 | SPREAD TABLE THREE WORDS |
| 793 | | MDX | 1 | 1 | INCR MOVE POINTER |
| 794 | | MDX | 2 | -1 | DECK CTR, SKIP NEXT IF DON |
| 795 | | MDX | | LOOP8 | BR TO CONTINUE |
| 796 | GLINE | SLA | | 16 | |
| 797 | | STO | 3 | -1 | ZERO WD 3 DIMENSION ENTRY |
| 798 | | STO | 3 | -2 | ZERO WD 2 DIMENSION ENTRY |
| 799 | | STO | 3 | -3 | ZERO WD 1 DIMENSION ENTRY |
| 800 | | LD | 3 | 0 | ID WORD |
| 801 | | OR | | MUM1 | ONE DIMENSION INDICATOR |
| 802 | | STO | 3 | 0 | REPLACE IN TABLE ENTRY |
| 803 | | MDX | L | EOFST,-3 | DECK END OF SYMBOL TABLE |
| 804 | | MDX | L | SOFXT,-3 | DECK START OF SUBSC TEMPS |
| 805 | | MDX | L | SOFGT,-3 | DECK START GENERATED TEMPS |
| 806 | SAVIT | LDX | L1 | ** | RESTORE INDEX REGISTER 1 |
| 807 | | MDX | L | SW5,1 | |
| 808 | | LD | L | EOFST | CHK FOR SYMBOL TBL OVERLAP |
| 809 | | A | | TKOS | |
| 810 | | S | L | EOFS | END OF STRING |
| 811 | | BSC | L | JIMMY,+Z | BR IF SYMBOL TABLE OVERLAP |
| 812 | PHIL | MDX | 1 | 1 | MOVE STATEMENT POINTER |
| 813 | | LD | 1 | 0 | NEXT CHARACTER OF STATEMEN |
| 814 | | AND | | H6000 | CHECK FOR ALPHA CHARACTER |
| 815 | | EOR | | H6000 | |
| 816 | | BSC | L | ER8R,Z | BR TO ER8 IF NOT NUMERIC |
| 817 | * | | | COLLECT | CONSTANT TO BINARY |
| 818 | | LDS | | 0 | RESET OVERFLOW AND CARRY |
| 819 | | SLT | | 32 | |
| 820 | | STO | | SJMMS | CLEAR CONSTANT SUM |
| 821 | | LD | 1 | 0 | WORD ONE OF CONSTANT |
| 822 | | STD | | TEMP | |
| 823 | | LD | 1 | 1 | WORD TWO OF CONSTANT |
| 824 | | BSC | L | BOT,- | BR ON OPERATOR |
| 825 | | SLA | | 1 | MAKE BITS CONTIGUOUS |
| 826 | | STO | | TEMP+1 | |
| 827 | | LD | 1 | 2 | NEXT STATEMENT WORD |
| 828 | | MDX | 1 | 1 | MOVE STMT POINTER |
| 829 | | BSC | L | ER8R,+ | BR ON NO OPERATOR |
| 830 | BOT | LD | | TEMP | WD 1 OF CONSTANT |
| 831 | BOT1 | AND | | COT10 | AND OUT ALL BUT 1ST 6 BITS |
| 832 | | SLA | | 2 | |
| 833 | | BSC | L | PILLS,C | BRANCH IF CARRY ON |
| 834 | | BSC | L | NEXT,+ | BR TO CHK FOR ZERO CONSTAN |
| 835 | | BSC | L | ER8R | BR IMBEDDED ALPHA CHARACTE |
| 836 | PILLS | BSC | L | ER8R,- | BR NOT MINUS |
| 837 | | AND | | COT20 | EXTRACT DIGIT |
| 838 | | S | | NINTS | NINE |
| 839 | | BSC | L | ER8R,-Z | BR GREATER THAN NINE |

| | | | | | |
|-----|-------|-----|-------------|-----------------------------|----------------------------|
| 840 | A | | NINTS | RESTORE DIGIT | |
| 841 | SRA | | 11 | RIGHT JUSTIFY | |
| 842 | STO | | HP1 | | |
| 843 | LD | | SJMMS | CUMULATIVE SUM | |
| 844 | SLA | | 1 | TIMES 2 | |
| 845 | STO | | TENZ | TEMPORARY STORE | |
| 846 | BSC | L | ER8R,+Z | BR IF TOO LARGE | |
| 847 | SLA | | 2 | TIMES 8 | |
| 848 | BSC | L | ER8R,C+Z | BR IF TOO LARGE | |
| 849 | A | | TENZ | TIMES 10 | |
| 850 | A | | HP1 | UNITS DIGIT | |
| 851 | BSC | L | ER8R,0 | BR TOO LARGE | |
| 852 | STO | | SJMMS | CUMULATIVE SUM | |
| 853 | LDD | | TEMP | DIGIT TEMPORARY | |
| 854 | SLT | | 6 | SHIFT NEXT DIGIT TO HIGH 6 | |
| 855 | STD | | TEMP | | |
| 856 | MDX | | ROT1 | BR TO PROCESS NEXT DIGIT | |
| 857 | * | | CONSTANTS | AND WORK AREA | |
| 858 | TENZ | DC | 0 | CONSTANT TIMES 2 TEMPORARY | |
| 859 | H6000 | DC | /6000 | ALPHABETIC MASK | |
| 860 | SJMMS | DC | 0 | CUMULATIVE SUM OF CONSTANT | |
| 861 | | BSS | E | 0 | MAKE ADDRESS EVEN |
| 862 | TEMP | DC | 0 | 2 WORD TEMPORARY FOR | |
| 863 | | DC | 0 | CONSTANT TO BE CONVERTED. | |
| 864 | COT10 | DC | /7E00 | FIRST NAME CHAR MASK | |
| 865 | COT20 | DC | /7800 | EXTRACT DIGIT CONSTANT | |
| 866 | HP1 | DC | 0 | UNITS DIGIT TEMPORARY | |
| 867 | CNTQ | DC | 0 | NUMBER OF CONSTANTS COUNTED | |
| 868 | NINTS | DC | /4800 | DECIMAL NINE CONSTANT | |
| 869 | TWOS | DC | 2 | DECIMAL TWO CONSTANT | |
| 870 | THREE | DC | 3 | DECIMAL THREE CONSTANT | |
| 871 | MUM1 | DC | /0800 | ONE DIMENSION INDICATOR | |
| 872 | DIMCL | DC | /E7FF | MASK TO REMOVE BITS 3 AND | |
| 873 | * | | COMPUTE AND | STORE DIMENSION CONSTANT | |
| 874 | NEXT | MDX | L | CNTQ,1 | INCR CONSTANT COUNTER |
| 875 | | LD | | SJMMS | CHECK FOR ZERO CONSTANT |
| 876 | | BSC | L | ER8R,+Z | BR IF DIMENSION CON IS ZER |
| 877 | | LD | | CNTQ | DIMENSION COUNTER |
| 878 | | S | L | ONE | |
| 879 | | BSC | | Z | SKIP NEXT IF FIRST CONSTAN |
| 880 | | MDX | | OZ2 | BR TO COMPUTE 2ND CONSTANT |
| 881 | | LD | | SJMMS | DIMENSION CONSTANT |
| 882 | | STO | 3 | -1 | STORE FIRST DIMENSION |
| 883 | | STO | 3 | -2 | CONSTANT IN ALL 3 WORDS OF |
| 884 | | STO | 3 | -3 | SYMBOL TABLE ENTRY. |
| 885 | | MDX | | NEXTS | BR TO GET NEXT STMT CHAR |
| 886 | OZ2 | S | L | ONE | |
| 887 | | BSC | | Z | SKIP NEXT IF 2ND CONSTANT |
| 888 | | MDX | | OZ3 | BR TO COMPUTE 3RD CONSTANT |
| 889 | | LD | 3 | -1 | FIRST DIMENSION CONSTANT |
| 890 | | M | | SJMMS | SECOND DIMENSION CONSTANT |
| 891 | | SLT | | 16 | |
| 892 | | STO | 3 | -2 | STORE IN SECOND AND THIRD |
| 893 | | STO | 3 | -3 | DIMENSION WORDS. |
| 894 | | MDX | | NEXTS | BR TO GET NEXT STMT CHAR |
| 895 | OZ3 | LD | 3 | -3 | 1ST X 2ND DIMENSION CON |
| 896 | | M | | SJMMS | THIRD DIMENSION CONSTANT |
| 897 | | SLT | | 16 | |
| 898 | | STO | 3 | -3 | STORE IN THIRD DIMENSION W |
| 899 | NEXTS | MDX | 1 | 1 | INCR STMT POINTER |

| | | | | | |
|-----|-------|-----|----|----------|-------------------------------------|
| 900 | | LD | 1 | 0 | NEXT CHARACTER |
| 901 | | S | L | COMA | COMMA |
| 902 | | BSC | L | COZ,Z | BR CHK RIGHT PARENTHESIS |
| 903 | | LD | | CNTQ | CHK FOR COUNT LESS THAN 3 |
| 904 | | S | | THREE | |
| 905 | | BSC | L | ER8R,- | BR IF COUNT THREE OR MORE |
| 906 | | MDX | | PHIL | BR TO CONVERT NEXT CONSTAN |
| 907 | COZ | S | L | RPAR | RIGHT PARENTHESIS |
| 908 | | BSC | L | ER8R,Z | BR TO ERR IF NO PARENTHESI |
| 909 | | LD | | CNTQ | DIMENSION COUNT |
| 910 | | SLA | | 11 | SHIFT TO BITS 3 AND 4 |
| 911 | | STO | | TEMP | TEMPORARY |
| 912 | | LD | 3 | 0 | SYMBOL TABLE ID WORD |
| 913 | | AND | | DIMCL | SET BITS 3 AND 4 EQUAL TO |
| 914 | | OR | | TEMP | THE NUMBER OF DIMENSIONS, |
| 915 | | STO | 3 | 0 | SYMBOL TABLE ID WORD |
| 916 | | LD | L | SW5 | |
| 917 | | BSC | L | YELP,Z | BR TO CHECK FOR OVERLAP |
| 918 | | MDX | L | EOFST,-3 | DECK END OF SYMBOL TABLE |
| 919 | | MDX | L | SOFXT,-3 | DECK START OF SUBSC TEMPS |
| 920 | | MDX | L | SOFGT,-3 | DECK START GENERATED TEMPS |
| 921 | YELP | LD | L | EOFST | CHK FOR SYMBOL TBL OVERLAP |
| 922 | | A | | TWOS | |
| 923 | | S | L | EOFS | END OF STRING |
| 924 | | BSC | L | JIMMY,+Z | BR IF SYMBOL TABLE OVERLAP |
| 925 | | SLA | | 16 | CLEAR ACCUMULATOR |
| 926 | | STO | L | SW5 | RESET SWITCH 5 |
| 927 | | MDX | 1 | 1 | MOVE STMT POINTER |
| 928 | | LD | 1 | 0 | NEXT STMT CHARACTER |
| 929 | | S | L | COMA | COMMA |
| 930 | | BSC | L | SIS,Z | BR NOT COMMA |
| 931 | | MDX | 1 | 1 | MOVE STMT POINTER |
| 932 | | BSC | L | ZAR | BR TO CHK FOR LEGAL NAME |
| 933 | BROT | MDX | 1 | 1 | MOVE STMT POINTER |
| 934 | | BSC | L | ZAR | BR TO CHK FOR LEGAL NAME |
| 935 | * | | | | READ AND GO TO NEXT PHASE |
| 936 | SOS | BSI | L | ROLRX | CALL DOWN PHASE 6 |
| 937 | | DC | | 06 | NEXT PHASE NUMBER |
| 938 | * | | | | CHECK CONTINUE SCAN OR READ NEXT PH |
| 939 | TAP | LD | L | SW1A | |
| 940 | | BSC | L | SOS,Z | BR TO READ NEXT PHASE |
| 941 | | BSC | L | MOVE | BR TO SCAN NEXT STMT |
| 942 | SIS | STX | L0 | SW3A | SET SYMBOL TBL OPEN SWITCH |
| 943 | | BSC | L | JAP | BR TO TEST FOR SEMI-COLON |
| 944 | JIMMY | MDX | L | ERROR,1 | SET OVERLAP ERROR ON |
| 945 | | MDX | | SOS | BR TO READ NEXT PHASE |
| 946 | * | | | | REMOVE STATEMENT FROM STRING |
| 947 | BOB | LDX | 11 | TYPEV | ADDRESS FIRST WD OF STMT |
| 948 | | MDX | 1 | -1 | DECR STMT ADDR |
| 949 | | LD | 1 | 1 | ID WD OF STMT |
| 950 | | SRA | | 2 | RIGHT JUSTIFY WD COUNT |
| 951 | | AND | L | IDNVM | EXTRACT STMT WD COUNT |
| 952 | | STO | | ZTEL | TEMPORARY |
| 953 | | LD | L | EOFS | ADDR END OF STRING |
| 954 | | S | L | TYPEV | ADDR OF STATEMENT |
| 955 | | S | | ZTEL | STATEMENT WORD COUNT |
| 956 | | STO | | HAND+1 | |
| 957 | HAND | LDX | L3 | 0 | MOVE WORD COUNT-1 |
| 958 | | MDX | 3 | 1 | ADJUST = WORDS TO MOVE |
| 959 | | LD | L | TYPEV | ADDR OF STMT |

| | | | | | |
|-----|------|-----|----|----------------|----------------------------|
| 960 | | A | | ZTEL | STMNT WORD COUNT |
| 961 | | STO | | ZTEN+1 | |
| 962 | ZTEN | LDX | L2 | 0 | ADDR OF STMNT TO MOVE |
| 963 | | STX | 1 | ZTEL | SAVE ID WD -1 ADDRESS |
| 964 | LPPP | LD | 2 | 0 | NEXT WORD TO MOVE |
| 965 | | STO | 1 | 1 | MOVE TO CLOSE UP STRING |
| 966 | | MDX | 1 | 1 | INCR MOVE TO ADDR |
| 967 | | MDX | 2 | 1 | INCR MOVE FROM ADDR |
| 968 | | MDX | 3 | -1 | DECK AND SKIP IF ZERO |
| 969 | | MDX | | LPPP | BR TO CONTINUE CLOSING |
| 970 | | STX | L1 | EOFS | NEW END OF STRING ADDRESS |
| 971 | | LDX | I1 | ZTEL | RESTORE INDEX REGISTER 1 |
| 972 | | MDX | 1 | 1 | ADDR ID WD OF NEXT STMNT |
| 973 | | BSC | L | DAP | BR TO TEST NEXT STMNT TYPE |
| 974 | ZTEL | DC | | 0 | INDEX REGISTER 1 TEMPORARY |
| 975 | | BSS | | OVERL-***320*4 | PHASE-05 PATCH AREA |
| 976 | | END | | TOP | |