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        HDNG    MPX FORTRAN ** LIST STMNT ALLOCATION
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**************************************************
*
*    PROGRAM NAME  FPH-23
*
*    MODEL NUMBER  8F023
*
*    PURPOSE       FORTRAN PHASE-23
*
*    PROGRAMMER    DICK WALLMANN
*
*****************   REVISION LIST   **************
*
*    RV DATE     SCO   BY  REASON FOR CHANGE
*    -- -------- ----- --- ----------------------
*
*    01 11/16/70 NONE  RPH INITIAL RELEASE
*
**************************************************
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**************************************************
*STATUS-VERSION 1, MODIFICATION 0
*
*FUNCTION/OPERATION-
*    * SCANS THE STATEMENT STRING FOR STATEMENT
*      FUNCTION STATEMENTS AND NUMBERED STATEMENTS.
*    * INSERTS THEIR ALLOCATIONS IN THE STATEMENT
*      STRING INTO THE SYMBOL TABLE.
*    * LISTS THE STATEMENT ALLOCATIONS ON THE
*      SYSTEM'S LIST PRINTER IF REQUESTED
*
*ENTRY POINTS-
*    * NEQ - PHASE 23 IS LOADED BY PHASE 22 VIA
*            THE ROLRX ROUTINE.  EXECUTION IS
*            BEGUN AT THE LOCATION LABELED NEQ
*
*INPUT-
*    * THE STATEMENT STRING
*    * THE SYMBOL TABLE
*    * THE FORTRAN COMMUNICATIONS AREA
*
*OUTPUT-
*    * THE STATEMENT STRING
*    * THE SYMBOL TABLE
*    * THE FORTRAN COMMUNICATIONS AREA
*    * STATEMENT ALLOCATIONS LISTED ON LIST PRINTER
*
*EXTERNAL REFERENCES-
*    * SUBROUTINES-
*      ROLRX
*    * OTHER FORTRAN PHASES-
*      PHASE 19 OR 30 OR NEITHER
*
*EXITS-
*    * NORMAL-
*          PHASE 24 IS LOADED VIA ROLRX AND
*          CONTROL IS PASSED TO IT.
*    * ERRORS-
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```
60  *      OVERLAP-
61  *          IF OVERLAP WAS DETECTED PRIOR TO THE
62  *          PHASE ENTRY THEN EXIT FROM PHASE IS
63  *          IMMEDIATE.  NO NEW OVERLAP ERROR CAN BE
64  *          DETECTED IN THE PHASE.
65  *      SYNTAX-
66  *          NO SYNTAX ERRORS ARE DETECTED IN THE
67  *          PHASE.
68  *
69  *TABLES/WORK AREAS-
70  *    * THE STATEMENT STRING
71  *    * THE SYMBOL TABLE
72  *    * THE FORTRAN COMMUNICATIONS AREA
73  *    * BUF+120, A 120 WORD MESSAGE BUILDING AND
74  *    * OUTPUTTING AREA.
75  *
76  *ATTRIBUTES-N/A
77  *
78  *NOTES-NONE
79  ************************************************************
80          ABS  REF  CORE
81  *
82  *      SYSTEM AND FORTRAN EQUATES
83  *
84  MEMRY EQU     ~~77777~~ CORE     MAXIMUM CORE SIZE
85  PHSIZ EQU     4*320              MAXIMUM PHASE SIZE
86  OVERL EQU     MEMRY-PHSIZ        PHASES 2-29 START
87  FCOM  EQU     OVERL-22           FORTRAN COMM. TABLE
88  PHNTB EQU     FCOM-56            PHASE TABLE
89  ROLRX EQU     PHNTB-50           INTERPHASE CALL
90  AREA  EQU     OVERL+3*320+100    PRINT DATA ADDRESS
91  PRINT EQU     AREA+1             PRINT ENTRANCE
92          ORG   FCOM       FORTRAN COMM AREA
93  *
94  *                          FORTRAN COMMUNICATION AREA
95  SOFS  BSS     1                  START OF STRING
96  EOFS  BSS     1                  END OF STRING
97  SOFST BSS     1                  START OF SYMBOL TABLE
98  SOFNS BSS     1                  LENGTH OF PROGRAM
99  SOFXT BSS     1                  SIZE OF WORK AREA (VARIES)
100 SOFGT BSS     1                  SIZE OF CONSTANTS AREA
101 EOFST BSS     1                  END OF SYMBOL TABLE
102 COMON BSS     1                  RELATIVE ENTRY POINT
103 CSIZE BSS     1                  SIZE OF COMMON
104 ERROR BSS     1                  ERROR FLAG
105 *                                BIT 15 OVERLAP ERROR
106 *                                BIT 14 OTHER ERROR
107 FNAME BSS     1                  PROGRAM NAME
108         BSS     1                2ND WORD PROG NAME
109 SORF  BSS     1                  SUBR (-) OR FUNC (+)
110 CCWD  BSS     1                  CONTROL CARD WORD
111 *                          BIT 15 TRANSFER TRACE
112 *                          BIT 14 ARITHMETIC TRACE
113 *                          BIT 13 EXTENDED PRECISION
114 *                          BIT 12 LIST SYMBOL TABLE
115 *                          BIT 11 LIST SUBPROGRAM NAMES
116 *                          BIT 10 LIST SOURCE PROGRAM
117 *                          BIT  9 ONE WORD INTEGERS
118 *                          BIT  8 PUNCH
119 *                          BIT  7 NONPROCESS PROGRAM
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120  IOCS   BSS     1          IOCS CONTROL CARD WORD
121  *
122  *         SEE PHASE ONE FOR BIT PATTERNS
123  *
124  DFCNT  BSS     1          DEFINE FILE COUNT
125  *
126  LCOMN  BSS     2  F0      INSKEL COMMON SIZE
127  *
128  ICCER  BSS     2          IOCS CONTROL CARD ERROR
129  *
130         BSS     2          SYSTEM LOADER USE
131  *
132  *                              END OF FORTRAN COMMUNICATION
133  *                              AREA
134  ***************************************************
135  *                   THE SWITCHES USED IN PHASE 23 FOLLOW
136  *                   IF POSITIVE, THE SWITCH IS TRANSFER
137  *                   IF ZERO, THE SWITCH IS NORMAL N
138  *                   SWITCH HTEST
139  *                     N  HEADER NOT PRINTED
140  *                     T  HEADER ALREADY PRINTED
141  *
142  *
143         ORG     OVERL
144  NEO    BSC  L  ENT        BRANCH TO INITIALIZE
145  WDCNT  DC      *-*
146  BUF    DC      /4000      ALL EBC BLANKS
147         DC      /4000      *
148         DC      /4000      *
149         DC      /4000      *
150         DC      /4000      *
151         DC      /4000      *
152         DC      /4000      *
153         DC      /4000      *
154         DC      /4000      *
155         DC      /4000      *
156         DC      /4000      *
157         DC      /4000      *
158         DC      /4000      *
159         DC      /4000      *
160         DC      /4000      *
161         DC      /4000      *
162  TEXTO  DC      /E200      S
163         DC      /E300      T
164         DC      /C100      A
165         DC      /E300      T
166         DC      /C500      E
167         DC      /D400      M
168         DC      /C500      E
169         DC      /D500      N
170         DC      /E300      T
171         DC      /4000      BLANK
172         DC      /C100      A
173         DC      /D300      L
174         DC      /D300      L
175         DC      /D600      O
176         DC      /C300      C
177         DC      /C100      A
178         DC      /E300      T
179         DC      /C900      I
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180          DC      /0600      O
181          DC      /0500      N
182          DC      /E200      S
183          DC      /4000       BLANK
184   *
185   *                THIS ROUTINE PRINTS THE HEADER
186   *                     STATEMENT ALLOCATIONS
187   *                AND IS THEN WIPED OUT WHEN THE PRIN
188   *                AREA IS CLEARED
189   *
190   PRTHD  LD     3 PAPOR-Z    LD ADDR OF MSG AREA
191          STO  L  AREA        STO ADDR IN AREA
192          LD     3 ONE-Z      LD VALUE ONE IN ACC
193          STO  L  WDCNT       SET WORD COUNT TO ONE
194          BSI  L  PRINT       PRINT BLANK LINE
195          LDX  L3 TEXT0       LD XR3 WITH ADDR OF HEADER
196          STX  L3 AREA        STORE ADDR IN AREA
197          LDX    3 11         LOAD XR3 WITH 11
198          STX  L3 WDCNT       SET WORD COUNT TO 11
199          BSI  L  PRINT       PRINT .STATEMENT ALLOCS.
200          LDX  L3 PTHD 2      LOAD XR3 WITH AN ADDR
201          STX  L3 PTHD 1      PUT ADDR IN BRANCH
202          STX  L3 BLKPA       PUT ADDR HERE TOO
203          LDX  L3 Z           RESTORE XR3 TO POINTER VAL
204          BSC  L  BLKPA 1     BRANCH TO BLANK OUT BUF
205   *
206   ENT    LDX  L3 Z           SET XR3 TO POINTER VALUE
207          LD   L  ERROR       CHECK ERROR
208          BSC  L  NOERR,+-    BR IF NO ERROR              V1M
209          LD   L  STOCH       PUT A ZERO IN ERROR         V1M
210          STO     SOFS        PARAMETER FOR PHASE 28      V1M
211          BSI  L  ROLRX       CALL IN PHASE-28
212          DC      28
213   NOERR  LDX  11 SOFS        PUT STRING ADDR IN XR1      V1M
214          LDX  12 SOFS        PUT STRING ADDR IN XR2
215          STX  L3 NEO         PUT POINTER VAL IN NEO
216          BSC  L  M1000       SKIP AROUND THE ORG
217          ORG     BUF 120     NOT OVERLAYED FROM HERE ON
218   *
219   *                CHECK FOR STATEMENT NUMBER
220   M1000  LD     1 0          LOAD AN ID WORD
221          BSC  L  ALOC,E      BRANCH YES - BIT 15 ON
222   *
223   *                CHECK FOR ARITH STMNT FUNCTN
224          AND    3 HF800-Z    AND FOR STATEMENT ID
225          S      3 HD000-Z    SUB CODE FOR STMNT FUN.
226          BSC  L  ALOC, -     BRANCH IF STMNT FUN.
227          STO    3 IDM-Z      ELSE STORE DIFF.
228   *
229   *                MOVE UNALTERED
230   MOVE   LD     1 0          LD ID WORD AGAIN
231          AND    3 H07FC-Z    GET NORM
232          STO    3 NORM-Z     STORE STATEMENT WD COUNT
233   MOVE1  LD     1 0          LD STRING WORD AND
234          STO    2 0          MOVE IT DOWN 2 WORDS
235          MDX    2 1          MOVE XR2 BY 1
236          MDX    1 1          MOVE XR1 BY 1
237          MDX  L  NORM,-4     DECREMENT WD COUNT
238          MDX     MOVE1       LOOP BACK UNTIL NORM 0
239          LD     3 IDM-Z      LD MODIFIED ID WORD
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240          S     3 ENDID-Z    SUB END CARD CODE
241          BSC  L EXIT,-      BRANCH OUT IF END CARD
242          MDX    M1000       ELSE LOOP BACK TO
243  *                           GET NEXT ID WORD
244  *                FIND SYMBOL TABLE ENTRY
245  ALOC    LD     I 1          GET 1ST WD OF STMNT NUM
246          AND    3 H07FF-Z    MASK OF BITS 0,1,2,3
247          STO    3 STENT-Z    PUT IT AWAY
248          LD   L SOFST        LD ADDR OF SYMBOL TABLE
249          S      3 STENT-Z    SUB SYMBOL TABLE
250          S      3 STENT-Z    ENTRY 3
251          S      3 STENT-Z    TIMES
252          A      3 FOUR-Z     ADJUST FOR REG OF ENTRY
253          STO    3 STENT-Z    STORE ENTRY ADDR HERE
254  *
255  *                CHECK IF LIST DESIRED
256          LD   L CCWD         GET CONTROL CARD WORD
257          SLA    12           PUT BIT 12 IN SIGN
258          BSC  L TKOFF,-      BRANCH TO TAKE NUM OFF
259          LD     I 2          ELSE LD ALLOCATION ADDR
260          STO    3 LOCC2-Z    STORE IT HERE
261  *
262  *                GET NAME FROM SYM. TABLE
263          LD   I STENT        GET C ADDR  IN STENT
264          STO    3 STONA-Z    PUT IT IN STORE NAME
265          MDX  L STENT,1      MOVE POINTER
266          LD   I STENT        GET NEXT HALF OF NAME
267          STO    3 STONA-Z 1  PUT IT IN STORE NAME  1
268          MDX  L STENT,-1     MOVE POINTER BACK
269  *
270  *
271  *                LIST ALLOCATED STATEMENT NUMBER
272  *
273  *
274  *                TEST IF GENERATED STATEMENT NUMBER
275  *                 GENER STMT NUMBER HAS NAME   0
276  *                IF GENERATED STMT NUMBER, DO NOT
277  *                PRINT
278  *
279          LD     3 STONA-Z    LD 1ST HALF OF NAME
280          BSC  L TKOFF, -     GO REMOVE IT IF NAME 0
281  *
282  *                TEST IF HEADER PRINTED
283  PTHD    BSC  L PRTHD        THIS ADDR IS REPLACED
284  *                           WITH 7AEA
285          LD     3 H4000-Z    BLANK TO PRINT AREA
286          BSI    TOPAU        GO PUT CHAR IN O/P AREA
287          LD     3 STONA-Z    STORED NAME
288          BSI    TOPA         FIRST CHAR TO PRINT AREA
289          LD     3 STONA-Z    LD STORED NAME AGAIN
290          SLA    6            SHIFT OUT FIRST CHARACTER
291          BSI    TOPA         SSECOND CHAR TO PRINT AREA
292          LDD    3 STONA-Z    LD ALL OF STORED NAME
293          SLT    12           SHIFT OUT 1ST AND 2ND CHAR
294          BSI    TOPA         TTHIRD CHAR TO PRINT AREA
295          LD     3 STONA 1-Z  LD 2ND WD OF NAME
296          SLA    2            GET FOURTH CHAR
297          BSI    TOPA         FFOURTH CHAR TO PRINT AREA
298          LD     3 STONA 1-Z  LD 2ND WD OF NAME
299          SLA    8            GET 5TH CHAR
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300          BSI      TOPA      FFIFTH CHAR TO PRINT AREA
301          LD       H7E00     INSERT EQUALSIGN
302          BSI      TOPAU     TO PRINT AREA UNCHANGED
303   *
304   *                         CONVERSION OF ADDRESS BEGINS
305          LD     3 LOCC2-Z   STORED ALLOCATION
306          SRA      12         SAVE BITS 0 THRU 3
307          BSI      TOPAH     FIRST CHAR TO PRINT AREA
308          LD     3 LOCC2-Z   LD ALLOCATION AGAIN
309          SRA      8          SHIFT OUT 3RD   4TH HEX DI
310          BSI      TOPAH     SSECOND CHAR TO PRINT AREA
311          LD     3 LOCC2-Z   RELOAD ALLOCATION
312          SRA      4          SHIFT OUT 4TH HEX DIGIT
313          BSI      TOPAH     TTHIRD CHAR TO PRINT AREA
314          LD     3 LOCC2-Z   RELOAD ALLOCATION
315          BSI      TOPAH     FFOURTH CHAR TO PRINT AREA
316          LD     3 H4000-Z   LD AN EBC BLANK
317          BSI      TOPAU     GO PRINT IT
318   *
319   *                         TEST IF PRINT AREA FULL
320   *                         IF FULL, PRINT A LINE
321   *
322          LD     3 PAP-Z     LOAD PRINT AREA POINTER
323          S        LNEND     END OF LINE ADDR.
324          BSC  L   TKOFF, Z  RETURN IF LINE NOT FILLED
325   *
326   *                         LINE FULL, PRINT IT
327          LD       PAPOR     LD ADDR OF OUTPUT MESSAGE
328          STO  L   PAP       PUT IT IN PRINT AREA POINT
329          STO  L   AREA      ALSO IN AREA
330          LD       D60       LD CONSTANT
331          STO  L   WDCNT     SET WORD COUNT TO 60
332          BSI  L   PRINT     GO PRINT MESSAGE
333          BSI      BLKPA     BGO BLANK PRINT AREA.
334   *
335   *                         TEST IF END OF PAGE
336   TKOFF  LD     I 2         LOAD SYMBOL TABLE ENTRY
337          STO  I   STENT     PUT IT IN STENT
338          LD     I 0         LOAD ID WORD
339          S      3 EIGHT-Z   REDUCE NORM BY 2 WORDS
340          MDX    1 2         MOVE
341          STO    I 0         STORE ID WORD 2 WD HIGHER
342          MDX      MOVE      GO MOVE STRING
343   *
344   *                         CONSTANTS, TEMP STORAGE
345          BSS  E   0         MAKE I COUNTER EVEN
346   Z      EQU      *
347   STONA  DC       *-*       STORED NAME  WORD ONE
348          DC       *-*                    WORD TWO
349   ENDID  DC       /1000-/D000    END STMNT ID
350   PAPOR  DC       BUF       MSG BUFFER ADDR
351   PAP    DC       BUF       PRINT AREA POINTER
352   LNEND  DC       BUF+60    TEST VALUE FOR END OF LINE
353   STOCH  DC       0         STORED CHARACTER
354   HC000  DC       /C000     FOR TURNING BITS 0,1 ON
355   H7E00  DC       /7E00     AN EBC EQUAL SIGN
356   H000A  DC       /000A     A HEX TEN FOR EBCING
357   H0039  DC       /0039     A HEX 39 FOR EBCING
358   IDM    DC       *-*       PARTIAL ID WORD
359   NORM   DC       *-*       STATEMENT WORD COUNT
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360  STENT DC       *-*        SYMBOL TABLE ENTRY
361  LOCC2 DC       *-*        ALLOCATION ADDR
362  EIGHT DC       8          CONSTANT
363  ONE   DC       1          CONSTANT
364  HF800 DC       /F800      FOR GETTING
365  HD000 DC       /D000      ID CODE FOR SIMNT FUN
366  H07FC DC       /07FC      ALL BITS ON FROM 5 TO 13
367  H07FF DC       /07FF      USED TO MASK BITS 0,1,2,3
368  FOUR  DC       4          CONSTANT
369  H4000 DC       /4000      EBCDIC BLANK CODE
370  H3F00 DC       /3F00      USED TO SAVE BITS 2_THRU 7
371  H000F DC       /000F      TO SAVE BITS 12,13,14,15
372  D60   DC       60         CONSTANT
373  *
374  *              SUBROUTINE
375  *              CHAR IN A-REG TO PRINT AREA UNCHANGE
376  *
377  TOPAU DC       *-*        LINK ADDR WORD
378        STO      STOCH      PUT MSG CHARACTER HERE
379  TOPAX LD       STOCH      RELOAD THE CHARACTER
380        STO   I  PAP        PUT IT IN ADDR AT PAP
381        MDX   L  PAP,1      MOVE PRINT AREA POINTER
382        BSC   I  TOPAU      RRETURN TO CALLING POINT
383  *
384  *              SUBROUTINE
385  *              CONVERT CHAR IN A-REG INTO
386  *              EBC-CODE, THEN MOVE TO PRINT AREA
387  *
388  TOPA  DC       *-*        LINK ADDR WORD
389        AND    3 H3F00-Z    KEEPS BITS 2,3,4,5,6,7
390        BSC   L  TOPA2, -   BBR IF ACC HELD EBC BLANK
391  *
392  *              NOTE
393  *              IF OTHER SPECIAL CHARACTERS THAN
394  *              BLANK ARE EXPECTED, TESTING SHOULD
395  *              BE HERE
396        OR       HC000      TURN BITS 0 AND 1 ON
397  TOPA1 STO      STOCH      PUT EBC CHARACTER AWAY
398        LD       TOPA       MMOVE LINK ADDR WORD
399        STO      TOPAU      PUT ADDR IN HERE
400        MDX      TOPAX      GO PUT MSG CHAR IN MSG.
401  TOPA2 LD     3 H4000-Z    LD AN EBC BLANK
402        MDX      TOPA1      GO PUT BLANK IN MSG.
403  *                          AND RETURN TO CALLING PT.
404  *
405  *              SUBROUTINE
406  *              MOVE HEXADEC CHAR TO PRINT AREA
407  *
408  TOPAH DC       *-*        LINK ADDR WORD
409        AND   L  H000F      KEEP ONLY BITS 12 THRU 15
410        S        H000A      SUBTRACT 10
411        BSC      Z          SSKIP IF .GT. NINE
412        A        H0039      TURN ON BITS10,11 AND ADD
413        A      3 ONE-Z      ADD ONE
414        SLA      8          SHIFT OUT BITS 0 THRU 7
415        BSI      TOPA       CONVERT AND MOVE
416        BSC   I  TOPAH      RRETURN TO CALLING PT.
417  *
418  *
419  *              SUBROUTINE
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420  *                BLANK TO PRINT AREA
421  *
422  BLKPA DC         *-*          LINK ADDR WORD
423        LD     3   H4000-Z      LD AN EBC BLANK
424        LDX    3   -120         SET XR3 TO CHARACTER COUNT
425  BLKP1 STO    L3  BUF+120      STORE BLANK
426        MDX    3   1            MOVE CHARACTER COUNTER
427        MDX        BLKP1        LOOP BACK TO BLANK AGAIN
428        LDX    L3  Z            RESTORE XR3 TO POINTER VAL
429        BSC    I   BLKPA     RRETURN THRU LINK WORD
430  *
431  *
432  EXIT  STX    L2  EOFS         STORE END OF STRING
433        LD     3   PAP-Z        LD CURRENT BUF WD ADDR
434        S      3   PAPOR-Z     SUB END OF BUF ADDR
435        BSC    L   EXIT1, -     GO TO EXIT1 IF SAME
436        LD     3   PAPOR-Z      ELSE PUT BUF ADDR
437        STO    L   AREA         IN AREA
438        LD     3   D60-Z        LD CONSTANT OF 60
439        STO    L   WDCNT        SET WORD COUNT TO 60
440        BSI    L   PRINT        GO PRINT A BLANK LINE
441  EXIT1 BSI    L   ROLRX        CALL DOWN PHASE 24
442        DC         24                NEXT PHASE NUMBER
443        BSS        OVERL-*+320*2  PHASE-23 PATCH AREA
444        END        NEQ
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