```
1                                HIGH LEVEL ASSEMBLER OPTION SUMMARY                 (PTF UK37157)   PAGE    1
-                                                                                   HLASM R6.0  2016/08/29 08.42
0  NO OVERRIDING ASMAOPT PARAMETERS
   OVERRIDING PARAMETERS-  OBJECT,ESD,RXREF,RLD,XREF(SHORT,UNREFS),DXREF,LIST,TERM,ASA
   NO PROCESS STATEMENTS


   OPTIONS FOR THIS ASSEMBLY
0  NOADATA
     ALIGN
 3   ASA
     BATCH
     CODEPAGE(047C)
   NOCOMPAT
   NODBCS
   NODECK
 3   DXREF
 3   ESD
   NOEXIT
     FLAG(0,ALIGN,CONT,EXLITW,NOIMPLEN,NOPAGE0,PUSH,RECORD,NOSUBSTR,USINGO)
   NOFOLD
   NOGOFF
   NOINFO
     LANGUAGE(EN)
   NOLIBMAC
     LINECOUNT(60)
 3   LIST(121)
     MACHINE(,NOLIST)
     MXREF(SOURCE)
 3   OBJECT
     OPTABLE(UNI,NOLIST)
   NOPCONTROL
   NOPESTOP
   NOPROFILE
   NORA2
   NORENT
 3   RLD
 3   RXREF
     SECTALGN(8)
     SIZE(MAX)
   NOSUPRWARN
     SYSPARM()
 3   TERM(WIDE)
   NOTEST
     THREAD
   NOTRANSLATE
     TYPECHECK(MAGNITUDE,REGISTER)
     USING(NOLIMIT,MAP,WARN(15))
   NOWORKFILE
 3   XREF(SHORT,UNREFS)

   STANDARD   DD NAMES- SYSLIN   SYSLIB   SYSIN    SYSPRINT SYSPUNCH SYSUT1   SYSTERM  SYSADATA ASMAOPT
   OVERRIDING DD NAMES- SYS00013 SYS00005 SYS00011 SYS00012                   SYS00010
1                                     EXTERNAL SYMBOL DICTIONARY                                  PAGE    2
-SYMBOL   TYPE   ID     ADDRESS  LENGTH   OWNER ID FLAGS ALIAS-OF                        HLASM R6.0  2016/08/29 08.42
OPROGRAM   SD 00000001 00000000 00001770             00
 CARDLDR   SD 00000002 00001770 000000A0             00
 IPLCARD   SD 00000003 00001810 00000050             00
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                              PAGE    3
   ACTIVE USINGS: NONE
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                        HLASM R6.0  2016/08/29 08.42
```

```
0                                              2 ****************************************************************** 00020000
                                               3 *                                                                * 00030000
                                               4 *  ************************************************************  * 00040000
                                               5 *  *                                                          *  * 00050000
                                               6 *  *                    SAMPLE OPERATING SYSTEM               *  * 00060002
                                               7 *  *                          VERSION 2.00                    *  * 00067002
                                               8 *  *                     DEVELOPED AT MIT 1973                *  * 00074002
                                               9 *  *                                                          *  * 00090000
                                              10 *  ************************************************************  * 00100000
                                              11 *                                                                * 00100602
                                              12 *  UPDATE 2015/10/31 JUERGEN WINKELMANN, E-MAIL WINKELMANN@ID.ETHZ.CH * 00101202
                                              13 *                                                                * 00101802
                                              14 *   - CHANGE STORAGE PROTECTION ALIGNMENTS TO 4K  \              * 00102402
                                              15 *   - REPLACE SSK/ISK INSTRUCTIONS WITH SSKE/ISKE  > 4K SUPPORT  * 00103002
                                              16 *   - MINOR CHANGES IN STORAGE PROTECTION LOGIC   /              * 00103602
                                              17 *   - CHANGE NUMBER OF PARALLEL PROCESSING STREAMS TO 4          * 00104202
                                              18 *   - CHANGE CORE SIZE TO 16M                                    * 00104802
                                              19 *   - REPLACE TABLE OF VALID $JOB CARD CORE REQUESTS WITH GENERAL * 00105402
                                              20 *     LOGIC ROUNDING UP ANY NONE FULL PAGE REQUEST ENTERED TO NEXT * 00106002
                                              21 *     FULL PAGE                                                  * 00106602
                                              22 *   - ADD IPL CARD AND TWO CARD LOADER FOR ONE STOP CREATION OF AN * 00107202
                                              23 *     IPLABLE CARD DECK                                          * 00107802
                                              24 *   - IGNORE EXTERNAL INTERRUPTS DURING INITIALIZATION TO AVOID  * 00108402
                                              25 *     IPLRTN GETTING INTERRUPTED BY THE INTERVAL TIMER           * 00109002
                                              26 *                                                                * 00109103
                                              27 *  UPDATE 2015/11/05 JUERGEN WINKELMANN, E-MAIL WINKELMANN@ID.ETHZ.CH * 00109203
                                              28 *                                                                * 00109303
                                              29 *   - ALLOW RELOADING CARD READERS WITHOUT NEEDING TO RE-IPL THE * 00109403
                                              30 *     SYSTEM. THIS FUNCTIONALITY RELIES ON HERCULES' CARD READER * 00109503
                                              31 *     BEHAVIOR WITH THE EOF INITIALIZATION IN PLACE. IT WILL NOT * 00109603
                                              32 *     WORK IN INTR MODE.                                         * 00109703
                                              33 *                                                                * 00109744
                                              34 *  UPDATE 2015/11/13 JUERGEN WINKELMANN, E-MAIL WINKELMANN@ID.ETHZ.CH * 00109784
                                              35 *                                                                * 00109824
                                              36 *   - ADD UCB TO SUPPORT A CONSOLE AT 009 USING THE EXCP DEVICE  * 00109864
                                              37 *     HANDLER.                                                   * 00109904
                                              38 *                                                                * 00110000
                                              39 ****************************************************************** 00120000
-
                                              41          PRINT ON,NODATA,GEN                                        00140000
 000000                00000 01770            42 PROGRAM  CSECT ,                SAMPLE OPERATING SYSTEM STARTS AT ZERO  00150002
 001770                01770 000A0            43 CARDLDR  CSECT ,                TWO CARD LOADER FOLLOWS AT THE END      00150102
                                              44 ***                                                                 00150202
                                              45 *** IPL CARD                                                        00150302
                                              46 ***                                                                 00150402
 001810                01810 00050            47 IPLCARD  CSECT ,                IPLABLE DECK MUST BEGIN WITH THIS CARD  00150502
 001810 0000000000                            48 PSWD     DC    F'0',X'00'       INITIAL PROGRAM STATUS WORD, DISABLED   00150602
 001815 001770                                49          DC    AL3(LOADER)      START EXECUTION AT LOAD ADDRESS         00150702
 001818 02001770                              50 CCW1     DC    X'02',AL3(LOADER) READ 1ST CARD TO LOAD ADDRESS          00150802
 00181C 40000050                              51          DC    XL4'40000050'    CHAIN, READ LENGTH = 80                 00150902
 001820 020017C0                              52 CCW2     DC    X'02',AL3(LOADER+80) READ 2ND CARD TO LOAD ADDR + 80     00151002
 001824 00000050                              53          DC    XL4'00000050'    READ LENGTH = 80                        00151102
 001828 E2819497938540D6                      54          DC    C'SAMPLE OPERATING SYSTEM     VERSION 2.00' EYE CATCHER  00151202
1          SAMPLE OPERATING SYSTEM            VERSION 2.00                                                            PAGE    4
   ACTIVE USINGS: NONE
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                       HLASM R6.0  2016/08/29 08.42
0001850 0000000000000000                      55          DC    16X'00'          PAD TO CARD LENGTH                      00151302
                                              56 ***                                                                 00151402
                                              57 *** LOADER                                                          00151502
                                              58 ***                                                                 00151602
                                              59 *                                                                   00151702
```

```
                                        60 * INITIALIZE                                                      00151802
                                        61 *                                                                 00151902
001770                  01770 000A0     62 CARDLDR  CSECT ,                TWO CARD LOADER MUST FOLLOW IPL CARD  00152002
001770 05C0                             63          BALR  R12,0            ESTABLISH ..                          00152102
001772 4120 0002            00002       64          LA    R2,2                       .. BASE ..                   00152202
001776 1BC2                             65          SR    R12,R2                           .. REGISTER          00152302
                    R:C  01770          66          USING CARDLDR,R12      TELL ASSEMBLER                        00152402
001778 41B0 0000            00000       67          LA    R11,0            ADDRESSABILITY OF ..                  00152502
                    R:B  00000          68          USING PROGRAM,R11        .. SAMPLE OPERATING SYSTEM          00152602
00177C 4120 0000            00000       69          LA    R2,0             I/O ..                                00152702
001780 4130 C06A            017DA       70          LA    R3,IOINTRPT              .. NEW PSWD                  00152802
001784 9023 B078            00078       71          STM   R2,R3,IONEW      STORE I/O NEW PSWD                    00152902
001788 8000 C07E      017EE             72          SSM   ENBLECHO         ENABLE INTERRUPTS FROM CHANNEL 0      00153002
00178C 4150 C0A0            01810       73          LA    R5,CCWCHAIN      ADDRESS OF CARD READER CCW CHAIN      00153102
001790 5050 B048            00048       74          ST    R5,CAW           STORE ADDRESS IN CAW                  00153202
001794 5830 C094            01804       75          L     R3,NUMCARDS      NUMBER OF CARDS TO READ               00153302
001798 5840 C090            01800       76          L     R4,LOADADDR      TARGET ADDRESS OF LOADED CODE         00153402
                                        77 *                                                                 00153502
                                        78 * CREATE CCW CHAIN                                                00153602
                                        79 *                                                                 00153702
00179C 1824                             80 NEXTCARD LR    R2,R4            LOAD NEXT CARD HERE                   00153802
00179E BF28 C080            017F0       81          ICM   R2,B'1000',READ  INSERT WRITE COMMAND                  00153902
0017A2 5020 5000            00000       82          ST    R2,0(,R5)        STORE CCW                             00154002
0017A6 4120 0050            00050       83          LA    R2,80            LENGTH OF CARD                        00154102
0017AA 5020 5004            00004       84          ST    R2,4(,R5)        STORE LENGTH IN CCW, ZERO ALL FLAGS   00154202
0017AE 9640 5004      00004             85          OI    4(R5),X'40'      INDICATE COMMAND CHAINING             00154302
0017B2 4140 4050            00050       86          LA    R4,80(,R4)       INCREMENT TARGET ADDRESS              00154402
0017B6 4150 5008            00008       87          LA    R5,8(,R5)        POINT TO NEXT CCW                     00154502
0017BA 4630 C02C            0179C       88          BCT   R3,NEXTCARD      READ NEXT CARD                        00154602
0017BE 5B50 C098            01808       89          S     R5,EIGHT         POINT TO PREVIOUS CCW                 00154702
0017C2 94BF 5004      00004             90          NI    4(R5),X'BF'      CLEAR COMMAND CHAINING FLAG           00154802
                                        91 *                                                                 00154902
                                        92 * READ CARDS AND WAIT FOR COMPLETION                              00155002
                                        93 *                                                                 00155102
0017C6 9C00 000C      0000C             94          SIO   12(0)            READ CARDS                            00155202
0017CA 4120 C066            017D6       95          LA    R2,*+12          CONTINUE HERE AFTER I/O COMPLETION    00155302
0017CE 5020 C08C            017FC       96          ST    R2,CONTINUE      STORE CONTINUE ADDRESS IN PSWD SKELETON 00155402
0017D2 8200 C088      017F8             97          LPSW  WAITPSWD         WAIT FOR I/O COMPLETION               00155502
                                        98 *                                                                 00155602
                                        99 * "IPL" THE SAMPLE OPERATING SYSTEM                                00155702
                                       100 *                                                                 00155802
0017D6 8200 0000      00000            101          LPSW  0                TRANSFER CONTROL                      00155902
                                       102 *                                                                 00156002
                                       103 * I/O INTERRUPT HANDLER                                           00156102
                                       104 *                                                                 00156202
                        017DA          105 IOINTRPT EQU   *                                                  00156302
0017DA 9104 B044      00044            106          TM    CSW+4,X'04'      DEVICE END RECEIVED?                  00156402
0017DE 47E0 C07A            017EA      107          BNO   IOINTRTN          -> NO,  KEEP WAITING                  00156502
0017E2 94FD B039      00039            108          NI    IOOLD+1,X'FD'    -> YES, TERMINATE WAIT STATE AND ..   00156602
0017E6 947F B038      00038            109          NI    IOOLD,X'7F'            .. AND DISABLE CHANNEL 0 INTERRUPTS 00156702
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                  PAGE    5
   ACTIVE USINGS: PROGRAM,R11  CARDLDR,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
00017EA 8200 B038      00038       110 IOINTRTN LPSW  IOOLD             RETURN TO MAINLINE                    00156802
                                       111          DROP  R11,R12         NO LONGER NEEDED                      00156902
                                       112 *                                                                 00157002
                                       113 * DATA AREA                                                       00157102
                                       114 *                                                                 00157202
0017EE F8F0                            115 ENBLECHO DC    C'80'            MASK TO ENABLE CHANNEL 0 INTERRUPTS   00157302
0017F0 02                              116 READ     DC    X'02'            READ A CARD                           00157402
0017F8                                 117          DS    0D               ALIGN                                 00157502
```

```
      0017F8 80020000                    118 WAITPSWD DC    X'80020000'      WAIT WITH CHANNEL 0 INTERRUPTS ENABLED  00157602
      0017FC                             119 CONTINUE DS    F                CONTINUE HERE AFTER WAIT               00157702
      001800 00000000                    120 LOADADDR DC    F'0'             CODE IS TO BE LOADED HERE              00157802
      001804 0000004B                    121 NUMCARDS DC    F'75'            NUMBER OF CARDS TO READ                00157904
      001808 00000008                    122 EIGHT    DC    F'8'             CCW LENGTH                             00158002
      001810                             123 CCWCHAIN DS    0D               START OF CARD READER CCW CHAIN         00158102
                                         124 ***                                                                    00158202
                                         125 *** SAMPLE OPERATING SYSTEM CODE BEGINS HERE                            00158302
                                         126 ***                                                                    00158402
      000000                 00000 01770 127 PROGRAM  CSECT ,                SAMPLE OS MUST FOLLOW LOADER CARDS     00158502
     0                     000000        129 CORESIZE EQU   16777216         BYTES OF CORE IN OBJECT MACHINE        00170002
     0                  R:0  00000       131          USING *,0 COMMUNICATIONS AREA                                 00190000
     0000000 000000000000103E           133 IPLPSW   DC    B'00000000',B'00000000',X'0000',X'00',AL3(IPLRTN)       00210000
      000008                             134 IPLCCW1  DS    D .              IPL CCW #1                             00220000
      000010                             135 IPLCCW2  DS    D .              IPL CCW #2                             00230000
      000018                             136 EXTOLD   DS    D .              EXTERNAL OLD PSW                       00240000
      000020                             137 SVCOLD   DS    D .              SVC OLD PSW                            00250000
      000028                             138 PGMOLD   DS    D .              PROGRAM INTERRUPT OLD PSW              00260000
      000030                             139 MCHKOLD  DS    D .              MACHINE CHECK OLD PSW                  00270000
      000038                             140 IOOLD    DS    D .              I/O INTERRUPT OLD PSW                  00280000
      000040                             141 CSW      DS    D .              CHANNEL STATUS WORD                    00290000
      000048                             142 CAW      DS    F .              CHANNEL ADDRESS WORD                   00300000
      00004C                             143 UNUSED0  DS    F .                                                     00310000
      000050 FFFFFFFF                    144 TIMER    DC    F'-1' .          TIMER                                  00320000
      000054 00000000                    145 UNUSED1  DC    F'0' .                                                  00330000
      000058 000000000000027A            146 EXTNEW   DC    B'00000000',B'00000000',X'0000',X'00',AL3(EXTHANDL)     00340000
      000060 00000000000002B2            147 SVCNEW   DC    B'00000000',B'00000000',X'0000',X'00',AL3(SVCHANDL)     00350000
      000068 00000000000002B0            148 PGMNEW   DC    B'00000000',B'00000000',X'0000',X'00',AL3(PGMHANDL)     00360000
      000070 0002000000000000            149 MCHKNEW  DC    B'00000000',B'00000010',X'0000',X'00',AL3(0)            00370000
      000078 00000000000017DA            150 IONEW    DC    B'00000000',B'00000000',X'0000',X'00',AL3(IOINTRPT) <-+  00380002
                                         151 ***                                                              |  00382002
                                         152 ***  IOINTRPT WILL BE REPLACED WITH IOHANDL AFTER IPL BY IPLRTN -----+  00384002
                                         153 ***                                                                    00386002
      000080                 00080 00180 154          ORG   *+X'100' SPACE OVER STAND ALONE DUMP AREA              00390000
      000180 00001740                    155 FSBPTR   DC    A(VERYEND) .     FSB POINTER                            00400000
      000184 0000000100000000            156 FSBSEM   DC    F'1,0' .         FSB SEMAPHORE                          00410000
      00018C 0000000000000000            157 MEMORY   DC    F'0,0' .         MEMORY SEMAPHORE                       00420000
      000194 0000000100000000            158 CAWSEM   DC    F'1,0' .         CAW SEMAPHORE                          00430000
     000019C                             160 TRAPSAVE DS    16F .            STORAGE FOR EXTERNAL INTERRUPTS        00450000
      0001DC                             161 IOHSAVE  DS    16F .            STORAGE FOR I/O INTERRUPTS             00460000
     000021C                             163 SYSSEMSA DS    CL84 .           SYSTEM SEMAPHORE SAVE AREA             00480000
     1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE    6
        ACTIVE USINGS: PROGRAM,R0
     0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
     0000270                            165 RUNNING  DS    A .              RUNNING                                00500000
      000274                            166 NEXTTRY  DS    A .              NEXTTRY                                00510000
      000278                            167 NEXTTRYM DS    C,0H .           NEXTTRY MODIFIED                       00520000
     1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE    7
        ACTIVE USINGS: PROGRAM,R0
     0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
     0                                  169 ********************************************************************** 00540000
                                        170 *                                                                    * 00550000
                                        171 *            EXTERNAL, PROGRAM, AND SVC INTERRUPT HANDLERS           * 00560000
                                        172 *                                                                    * 00570000
                                        173 ********************************************************************** 00580000
     0                     0027A        175 EXTHANDL EQU   * .              EXTERNAL INTERRUPT HANDLER             00600000
      00027A 900F 019C           0019C  176          STM   0,15,TRAPSAVE .   SAVE REGISTERS                         00610000
      00027E 0510                       177          BALR  1,0 .             ESTABLISH ADDRESSING                   00620000
                       R:1  00280       178          USING *,1                                                      00630000
      ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
      ** ASMA435I RECORD 178 IN /MBHFS/SOS4K.ASM ON VOLUME:
```

```
 000280 9580 001B      0001B         179           CLI   EXTOLD+3,X'80' .    SEE IF TIMER TRAP                 00640000
 000284 4770 1028            002A8   180           BNE   EXTHRET .           IF NOT, IGNORE                    00650000
 000288 58F0 0270            00270   181           L     15,RUNNING .        SET UP REGISTERS FOR TRAFFIC      00660000
                   R:F  00000        182           USING PCB,15 .             CONTROLLER (XPER)                00670000
 00028C 95FF F019      00019         183           CLI   PCBBLOKT,X'FF' .    IF BLOCKED, NO PROCESS IS         00680000
 000290 4780 1028            002A8   184           BE    EXTHRET .            RUNNABLE, SO RETURN              00690000
 000294 41E0 F04C            0004C   185           LA    14,PCBISA .         GET SAVE AREA                     00700000
                   R:E  00000        186           USING SA,14                                                 00710000
 000298 D207 E000 0018 00000 00018   187           MVC   SAPSW,EXTOLD .      AND STORE OLD STUFF INTO IT       00720000
 00029E D23F E008 019C 00008 0019C   188           MVC   SAREGS,TRAPSAVE                                       00730000
 0002A4 47F0 12EA            0056A   189           B     XPER .              THEN GO TO TRAFFIC SCHEDULER      00740000
                                     190           DROP  14,15                                                 00750000
 0002A8 980F 019C            0019C   191 EXTHRET   LM    0,15,TRAPSAVE .     TO IGNORE AN INTERRUPT, RELOAD    00760000
 0002AC 8200 0018      00018         192           LPSW  EXTOLD .            AND TRANSFER BACK                 00770000
0                      002B0         194 PGMHANDL  EQU   * .                 PROGRAM INTERRUPT HANDLER         00790000
 0002B0 0A6F                         195           SVC   C'?' .              IN ANY CASE, AN ERROR             00800000
1            SAMPLE OPERATING SYSTEM      VERSION 2.00                                                   PAGE    8
    ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'280',R1
0   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                             HLASM R6.0  2016/08/29 08.42
0                                    197 ********************************************************************** 00820000
                                     198 *                                                                    * 00830000
                                     199 *                           SVC INTERRUPT HANDLER                    * 00840000
                                     200 *                                                                    * 00850000
                                     201 *         FOR ALL ROUTINES ENTERED BY SVC INTERRUPT, THE             * 00860000
                                     202 *         FOLLOWING REGISTERS CONTAIN THIS INFORMATION:              * 00870000
                                     203 *                                                                    * 00880000
                                     204 *         REGISTER  1 - BASE REGISTER FOR ROUTINE                    * 00890000
                                     205 *         REGISTER  2 - POINTER TO ARGUMENT LIST (IF ANY)            * 00900000
                                     206 *         REGISTER 14 - POINTER TO SAVEAREA USED FOR THIS SVC        * 00910000
                                     207 *         REGISTER 15 - POINTER TO PCB PRESENTLY RUNNING             * 00920000
                                     208 *                                                                    * 00930000
                                     209 ********************************************************************** 00940000
0                      002B2         211 SVCHANDL  EQU   * .                 SVC HANDLER                       00960000
 0002B2 900F 019C            0019C   212           STM   0,15,TRAPSAVE .     SAVE REGISTERS                    00970000
 0002B6 0590                         213           BALR  9,0 .               ESTABLISH ADDRESSING              00980000
                   R:9  002B8        214           USING *,9                                                   00990000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 178
 ** ASMA435I RECORD 214 IN /MBHFS/SOS4K.ASM ON VOLUME:
 0002B8 98AE 905C            00314   215           LM    10,14,SVCCONST .    INITIALIZE REGISTERS              01000000
 0002BC 43A0 0023            00023   216           IC    10,SVCOLD+3 .       GET SVC CODE                      01010000
 0002C0 43AA 9070            00328   217           IC    10,SVCHTABL(10) .   TRANSLATE INTO TABLE OFFSET       01020000
 0002C4 41AA 9170            00428   218           LA    10,SVCRTN(10) .     REG 10 -> THE CORRECT PSW         01030000
 0002C8 9500 A002      00002         219           CLI   2(10),X'00' .       IS THIS CALL PROTECTED?           01040000
 0002CC 4780 904A            00302   220           BE    SVCHPROT .          THEN SEE IF WE CAN CALL IT        01050000
 0002D0 58F0 0270            00270   221 SVCOK     L     15,RUNNING .        GET PCB POINTER                   01060000
                   R:F  00000        222           USING PCB,15                                                01070000
 0002D4 9500 A003      00003         223           CLI   3(10),X'00' .       IS IT A SYSTEM SAVEAREA?          01080000
 0002D8 4780 9026            002DE   224           BE    SYSSEM .            DON'T USE REG 14 AS PCB POINTER   01090000
 0002DC 18EF                         225           LR    14,15 .             ELSE, SET UP PCB POINTER          01100000
 0002DE 43BA 0003            00003   226 SYSSEM    IC    11,3(10) .          GET POINTER TO SAVE AREA OFFSET   01110000
 0002E2 5AEB 9210            004C8   227           A     14,SVCSAVE(11) .    REG 14 -> SAVE AREA               01120000
 0002E6 954B 0023      00023         228           CLI   SVCOLD+3,C'.' .     ARE WE CALLING XPER?              01130000
 0002EA 4780 9042            002FA   229           BE    SVCXPER .           IF SO, DON'T SAVE RETURN STATUS   01140000
                   R:E  00000        230           USING SA,14                                                 01150000
 0002EE D207 E000 0020 00000 00020   231           MVC   SAPSW,SVCOLD .      SAVE PSW                          01160000
 0002F4 D23F E008 019C 00008 0019C   232           MVC   SAREGS,TRAPSAVE .   SAVE REGISTERS                    01170000
 0002FA 581A 0004            00004   233 SVCXPER   L     1,4(10) .           MAKE ADDRESSING EASY WITHIN       01180000
 0002FE 8200 A000      00000         234           LPSW  0(10) .              ROUTINE, AND GO THERE            01190000
 000302 58C0 0020            00020   235 SVCHPROT  L     12,SVCOLD .         GET PROTECTION KEY                01200000
 000306 14CD                         236           NR    12,13 .             IS IT A USER?                     01210000
```

```
 000308 4780 9018             002D0   237          BZ    SVCOK .             IF NO, THAT'S FINE                    01220000
 00030C 41A0 91F8             004B0   238          LA    10,SVCRTN+136 .     ELSE SET UP CALL TO XQUE              01230000
 000310 47F0 9018             002D0   239          B     SVCOK .                                                   01240000
                                      240          DROP  9                                                         01250000
 000314 0000000000000000              241 SVCCONST DC    3F'0',X'00F00000',F'0'                                    01260000
0000328 8484848484848484              243 SVCHTABL DC    256X'84' .          TABLE OF PSW OFFSETS                  01280000
 000428                 00428 003FF   244          ORG   SVCHTABL+C'P'                                           01290000
 0003FF 00                            245          DC    AL1(0)                                                  01300000
 000400                 00400 0040D   246          ORG   SVCHTABL+C'V'                                           01310000
 00040D 08                            247          DC    AL1(8)                                                  01320000
 00040E                 0040E 00382   248          ORG   SVCHTABL+C'!'                                           01330000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE    9
  ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'280',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0000382 10                           249          DC    AL1(16)                                                 01340000
 000383                 00383 00393   250          ORG   SVCHTABL+C','                                         01350000
 000393 18                            251          DC    AL1(24)                                                 01360000
 000394                 00394 003EA   252          ORG   SVCHTABL+C'B'                                         01370000
 0003EA 20                            253          DC    AL1(32)                                                 01380000
 0003EB                 003EB 003E9   254          ORG   SVCHTABL+C'A'                                         01390000
 0003E9 28                            255          DC    AL1(40)                                                 01400000
 0003EA                 003EA 003EE   256          ORG   SVCHTABL+C'F'                                         01410000
 0003EE 30                            257          DC    AL1(48)                                                 01420000
 0003EF                 003EF 003F1   258          ORG   SVCHTABL+C'I'                                         01430000
 0003F1 38                            259          DC    AL1(56)                                                 01440000
 0003F2                 003F2 003F9   260          ORG   SVCHTABL+C'J'                                         01450000
 0003F9 40                            261          DC    AL1(64)                                                 01460000
 0003FA                 003FA 00373   262          ORG   SVCHTABL+C'.'                                         01470000
 000373 48                            263          DC    AL1(72)                                                 01480000
 000374                 00374 00401   264          ORG   SVCHTABL+C'R'                                         01490000
 000401 50                            265          DC    AL1(80)                                                 01500000
 000402                 00402 0040A   266          ORG   SVCHTABL+C'S'                                         01510000
 00040A 58                            267          DC    AL1(88)                                                 01520000
 00040B                 0040B 003EB   268          ORG   SVCHTABL+C'C'                                         01530000
 0003EB 60                            269          DC    AL1(96)                                                 01540000
 0003EC                 003EC 003FD   270          ORG   SVCHTABL+C'N'                                         01550000
 0003FD 68                            271          DC    AL1(104)                                                01560000
 0003FE                 003FE 00410   272          ORG   SVCHTABL+C'Y'                                         01570000
 000410 70                            273          DC    AL1(112)                                                01580000
 000411                 00411 00411   274          ORG   SVCHTABL+C'Z'                                         01590000
 000411 78                            275          DC    AL1(120)                                                01600000
 000412                 00412 003EC   276          ORG   SVCHTABL+C'D'                                         01610000
 0003EC 80                            277          DC    AL1(128)                                                01620000
 0003ED                 003ED 00397   278          ORG   SVCHTABL+C'?'                                         01630000
 000397 88                            279          DC    AL1(136)                                                01640000
 000398                 00398 003F0   280          ORG   SVCHTABL+C'H'                                         01650000
 0003F0 90                            281          DC    AL1(144)                                                01660000
 0003F1                 003F1 003ED   282          ORG   SVCHTABL+C'E'                                         01670000
 0003ED 98                            283          DC    AL1(152)                                                01680000
 0003EE                 003EE 00428   284          ORG   SVCHTABL+256                                           01690000
0000428                              286 SVCRTN   DS    0D .                THE PSWS                              01710000
                                     287 *                  IN THE FOLLOWING PSWS, THE THIRD BYTE INDICATES    * 01720000
                                     288 *                  WHETHER THE SVC IS RESTRICTED:                     * 01730000
                                     289 *                           X'00' -> OPERATING SYSTEM ONLY            * 01740000
                                     290 *                           X'FF' -> AVAILABLE TO USER ALSO           * 01750000
                                     291 *                                                                     * 01760000
                                     292 *                   THE FOURTH BYTE INDICATES WHICH SAVE AREA TO USE; * 01770000
                                     293 *                   SVCSAVE BELOW SHOWS THE CODE VALUES.              * 01780000
 000428 00000000000004EE             294          DC    B'00000000',B'00000000',X'0000',X'00',AL3(XP)           01790000
 000430 0000000000000534             295          DC    B'00000000',B'00000000',X'0000',X'00',AL3(XV)           01800000
 000438 00000004000005C0             296          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XEXC)         01810000
```

```
 000440 00000004000005D2                297          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XCOM)          01820000
 000448 0000000400000744                298          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XB)            01830000
 000450 FF00000C00000600                299          DC    B'11111111',B'00000000',X'000C',X'00',AL3(XA)            01840000
 000458 FF00000C000006B6                300          DC    B'11111111',B'00000000',X'000C',X'00',AL3(XF)            01850000
 000460 000000040000087A                301          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XI)            01860000
 000468 00000004000008A6                302          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XJ)            01870000
 000470 000000040000056A                303          DC    B'00000000',B'00000000',X'0004',X'00',AL3(XPER)          01880000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                                PAGE   10
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'280',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000478 FF00FF08000008EC                304          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XR)            01890000
 000480 FF00FF0800000978                305          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XS)            01900000
 000488 FF00FF0800000780                306          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XC)            01910000
 000490 0000FF04000008CA                307          DC    B'00000000',B'00000000',X'FF04',X'00',AL3(XN)            01920000
 000498 0000FF0800000A0A                308          DC    B'00000000',B'00000000',X'FF08',X'00',AL3(XY)            01930000
 0004A0 FF00FF0800000A42                309          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XZ)            01940000
 0004A8 FF00FF08000007C6                310          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XD)            01950000
 0004B0 0000FF0400000A8E                311          DC    B'00000000',B'00000000',X'FF04',X'00',AL3(XQUE)          01960000
 0004B8 FF00FF0800000842                312          DC    B'11111111',B'00000000',X'FF08',X'00',AL3(XH)            01970000
 0004C0 FF00000C00000608                313          DC    B'11111111',B'00000000',X'000C',X'00',AL3(XAUTO)          01980000
00004C8                                 315 SVCSAVE  DS    OF .                  THE SAVE AREA OFFSETS               02000000
 0004C8 0000021C                        316          DC    A(SYSSEMSA) .         CODE 00 -> SYSSEMSA                 02010000
 0004CC 0000004C                        317          DC    A(PCBISA-PCB) .       CODE 04 -> INTERRUPT SAVE AREA      02020000
 0004D0 000000A0                        318          DC    A(PCBFSA-PCB) .       CODE 08 -> FAULT SAVE AREA          02030000
 0004D4 000000F4                        319          DC    A(PCBMSA-PCB) .       CODE 0C -> MEMORY SAVE AREA         02040000
-
                                        321 ********************************************************************** 02060000
                                        322 *                                                                    * 02070000
                                        323 * RETURN SEQUENCE FOR REQUEST DRIVEN ROUTINES AND TRAFFIC CONTROLLER  * 02080000
                                        324 *                                                                    * 02090000
                                        325 ********************************************************************** 02100000
00004D8                                 327          DS    0D                                                       02120000
 0004D8 00000000000004E0                328 RETURN   DC    B'00000000',B'00000000',X'0000',X'00',AL3(RETURNR)        02130000
0                     004E0             330 RETURNR  EQU   * .                  RETURN ROUTINE FOR SVC'S AND XPER    02150000
 0004E0 D207 0020 E000 00020 00000      331          MVC   SVCOLD,SAPSW .        SAVE PSW IN A SAFE PLACE           02160000
 0004E6 980F E008            00008      332          LM    0,15,SAREGS .         RELOAD REGISTERS                   02170000
 0004EA 8200 0020            00020      333          LPSW  SVCOLD .              AND RETURN                         02180000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                                PAGE   11
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'280',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                       335 ********************************************************************** 02200000
                                        336 *                                                                    * 02210000
                                        337 *                          REQUEST DRIVEN ROUTINES                   * 02220000
                                        338 *                                                                    * 02230000
                                        339 ********************************************************************** 02240000
-
                                        341 ********************************************************************** 02260000
                                        342 *                                                                    * 02270000
                                        343 *                                  XP ROUTINE                        * 02280000
                                        344 *                                                                    * 02290000
                                        345 *        FUNCTION: TO IMPLEMENT "P" PRIMITIVE FOR SEMAPHORES         * 02300000
                                        346 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS SM        * 02310000
                                        347 *                    SM        DS 0D   SEMAPHORE DEFINITION          * 02320000
                                        348 *                    SMVAL     DS F    VALUE                         * 02330000
                                        349 *                    SMPTR     DS A    POINTER TO FIRST WAITER       * 02340000
                                        350 *   ROUTINES USED: XPER                                              * 02350000
                                        351 *       PROCEDURE: SUBTRACT ONE FROM SMVAL; IF NON-NEGATIVE, RETURN. * 02360000
                                        352 *                  IF NEGATIVE, PLACE RUNNING PROCESS AT END OF LIST * 02370000
                                        353 *                  OF PRECESSES WAITING ON SM. BLOCK CALLING PROCESS; * 02380000
                                        354 *                  ENTER TRAFFIC CONTROLLER.                       * 02390000
                                        355 *    ERROR CHECKS: NONE                                            * 02400000
```

```
                                        356 *      INTERRUPTS: OFF                                                  * 02410000
                                        357 *     USER ACCESS: NO                                                   * 02420000
                                        358 *                                                                       * 02430000
                                        359 ***************************************************************************** 02440000
0                       004EE           361 XP       EQU   * .                  THE XP ROUTINE                       02460000
                    R:1 004EE           362          USING *,1                                                       02470000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 362 IN /MBHFS/SOS4K.ASM ON VOLUME:
                    R:2 00000           363          USING SM,2 .               ARGUMENT IS A SEMAPHORE              02480000
 0004EE 5830 2000           00000       364          L     3,SMVAL  .           GET THE VALUE                        02490000
 0004F2 0630                            365          BCTR  3,0 .                SUBTRACT ONE                         02500000
 0004F4 5030 2000           00000       366          ST    3,SMVAL .            AND STORE IT BACK                    02510000
 0004F8 1233                            367          LTR   3,3 .                SET CONDITION CODE                   02520000
 0004FA 4740 1014           00502       368          BM    XPWAIT .             IF IT'S NEGATIVE, MUST WAIT          02530000
 0004FE 8200 04D8      004D8            369          LPSW  RETURN .             ELSE RETURN NOW                      02540000
 000502 4140 2004           00004       370 XPWAIT   LA    4,SMPTR .            START GOING DOWN                     02550000
 000506 5850 2004           00004       371          L     5,SMPTR .             CHAIN OF POINTERS                   02560000
                                        372          DROP  15                                                        02570000
                    R:5 00000           373          USING PCB,5                                                     02580000
 00050A 1255                            374 XPLOOP   LTR   5,5 .                IF REACHED END                       02590000
 00050C 4780 102E           0051C       375          BZ    XPTHEN .             ADD OUR PCB ON. ELSE,                02600000
 000510 4140 5030           00030       376          LA    4,PCBNSW .           INCREMENT POINTERS                   02610000
 000514 5850 5030           00030       377          L     5,PCBNSW                                                  02620000
 000518 47F0 101C           0050A       378          B     XPLOOP .             AND TRY AGAIN                        02630000
                                        379          DROP  5                                                         02640000
                    R:F 00000           380          USING PCB,15                                                    02650000
 00051C D203 4000 0270 00000 00270      381 XPTHEN   MVC   0(4,4),RUNNING .     WE'RE AT THE END                     02660000
 000522 5050 F030           00030       382          ST    5,PCBNSW .           STORE NULL POINTER                   02670000
 000526 92FF F019      00019            383          MVI   PCBBLOKT,X'FF' .     AND WE'RE BLOCKED                    02680000
 00052A D253 F04C 021C 0004C 0021C      384          MVC   PCBISA,SYSSEMSA .    SWITCH SAVE AREAS                    02690000
 000530 47F0 107C           0056A       385          B     XPER .               SO RUN SOMEONE ELSE                  02700000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE   12
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'4EE',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                       386          DROP  2                                                         02710000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE   13
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'4EE',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                       388 ***************************************************************************** 02730000
                                        389 *                                                                       * 02740000
                                        390 *                                  XV ROUTINE                           * 02750000
                                        391 *                                                                       * 02760000
                                        392 *        FUNCTION: TO IMPLEMENT "V" PRIMITIVE FOR SEMAPHORES            * 02770000
                                        393 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS SM           * 02780000
                                        394 *                    SM        DS OD   SEMAPHORE DEFINITION           * 02790000
                                        395 *                    SMVAL     DS F    VALUE                          * 02800000
                                        396 *                    SMPTR     DS A    POINTER TO FIRST WAITER        * 02810000
                                        397 *   ROUTINES USED: NONE                                                 * 02820000
                                        398 *       PROCEDURE: ADD ONE TO SMVAL; IF > ZERO, RETURN. IF ZERO OR      * 02830000
                                        399 *                  LESS, REMOVE FIRST PROCESS FROM WAITER CHAIN;      * 02840000
                                        400 *                  UNBLOCK IT; IF NEXTTRYM NOT SET, SET IT AND SET    * 02850000
                                        401 *                  NEXTTRY TO THAT PROCESS; RETURN; IF NEXTTRYM SET,  * 02860000
                                        402 *                  RETURN.                                            * 02870000
                                        403 *    ERROR CHECKS: NONE                                                 * 02880000
                                        404 *      INTERRUPTS: OFF                                                  * 02890000
                                        405 *     USER ACCESS: NO                                                   * 02900000
                                        406 *                                                                       * 02910000
                                        407 ***************************************************************************** 02920000
0                       00534           409 XV       EQU   * .                  THE XV ROUTINE                       02940000
                    R:1 00534           410          USING *,1                                                       02950000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
```

```
** ASMA435I RECORD 410 IN /MBHFS/SOS4K.ASM ON VOLUME:
                     R:2  00000          411           USING SM,2 .              ARGUMENT IS A SEMAPHORE                02960000
000534 5830 2000             00000    412           L     3,SMVAL .           GET THE VALUE                          02970000
000538 5A30 1924             00E58    413           A     3,=F'1' .           ADD ONE                                02980000
00053C 5030 2000             00000    414           ST    3,SMVAL .           AND STORE IT BACK                      02990000
000540 47D0 1014             00548    415           BNP   XVWAKEUP .          IF <=0, SOMEONE'S WAITING              03000000
000544 8200 04D8       004D8          416           LPSW  RETURN .            ELSE RETURN                            03010000
000548 5840 2004             00004    417 XVWAKEUP  L     4,SMPTR .           GET THE FIRST OF THE GUYS              03020000
                                      418           DROP  15                                                         03030000
                     R:4  00000          419           USING PCB,4                                                    03040000
00054C D203 2004 4030 00004 00030    420           MVC   SMPTR,PCBNSW .      REMEMBER THE REST                      03050000
000552 9200 4019       00019          421           MVI   PCBBLOKT,X'00' .    WE'RE NO LONGER BLOCKING HIM           03060000
000556 95FF 0278       00278          422           CLI   NEXTTRYM,X'FF' .    IS NEXT TRY MODIFIED?                  03070000
00055A 4780 1032             00566    423           BE    XVRET .             IF SO, WELL OK                         03080000
00055E 5040 0274             00274    424           ST    4,NEXTTRY           ELSE MODIFY NEXTTRY                    03090000
000562 92FF 0278       00278          425           MVI   NEXTTRYM,X'FF' .    AND SAY SO                             03100000
000566 8200 04D8       004D8          426 XVRET     LPSW  RETURN .            GET BACK                               03110000
                                      427           DROP  2,4                                                        03120000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                                 PAGE   14
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'534',R1  SA,R14
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                    429 ********************************************************************** 03140000
                                     430 *                                                                      * 03150000
                                     431 *                          XPER ROUTINE (TRAFFIC CONTROLLER)           * 03160000
                                     432 *                                                                      * 03170000
                                     433 *        FUNCTION: TO IMPLEMENT MULTIPROGRAMMING                       * 03180000
                                     434 *       DATABASES: NONE                                                * 03190000
                                     435 *   ROUTINES USED: NONE                                                * 03200000
                                     436 *       PROCEDURE: STARTING WITH NEXTTRY, SEARCH FOR PROCESS ON ALL    * 03210000
                                     437 *                  PCB CHAIN NOT BLOCKED OR STOPPED; IF FOUND, USE AS  * 03220000
                                     438 *                  NEW RUNNING, FOR 50 MS OF TIME AND RETURN. ELSE,    * 03230000
                                     439 *                  ENTER WAIT STATE WITH INTERRUPTS ON, AND TRY TO     * 03240000
                                     440 *                  SCHEDULE AGAIN AFTER INTERRUPT; RETURN.             * 03250000
                                     441 *    ERROR CHECKS: NONE                                                * 03260000
                                     442 *      INTERRUPTS: OFF                                                 * 03270000
                                     443 *     USER ACCESS: NO                                                  * 03280000
                                     444 *                                                                      * 03290000
                                     445 ********************************************************************** 03300000
0                        0056A       447 XPER      EQU   * .                 ROUTINE XPER: TRAFFIC SCHEDULER        03320000
 00056A 8000 0078        00078       448           SSM   IONEW .             MASK OFF INTERRUPTS                    03330000
 00056E 0510                         449           BALR  1,0                                                        03340000
                     R:1  00570          450           USING *,1                                                      03350000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 450 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000570 58A0 0274             00274    451           L     10,NEXTTRY .        START LOOKING AT NEXTTRY               03360000
 000574 18BA                         452           LR    11,10 .             REMEMBER WHICH THAT WAS                03370000
                     R:A  00000          453           USING PCB,10                                                   03380000
 000576 95FF A019        00019       454 GWLOOP    CLI   PCBBLOKT,X'FF' .    IF IT'S BLOCKED                        03390000
 00057A 4780 1016             00586    455           BE    GWINC .             IGNORE                                 03400000
 00057E 95FF A018        00018       456           CLI   PCBSTOPT,X'FF' .    ELSE, IF IT'S NOT STOPPED              03410000
 000582 4770 1030             005A0    457           BNE   GWRUN .            WE CAN RUN IT                          03420000
 000586 58A0 A010             00010    458 GWINC     L     10,PCBNPALL .       ELSE, GO TO THE NEXT                   03430000
 00058A 19AB                         459           CR    10,11 .             IF WE'VE SEEN ALL, QUIT                03440000
 00058C 4770 1006             00576    460           BNE   GWLOOP .            ELSE TRY AGAIN                         03450000
 000590 8200 1028        00598       461           LPSW  IDLE .              SIT AND WAIT                           03460000
 000598                              462           DS    0D                                                       03470000
 000598 FE0200000000056A             463 IDLE      DC    B'11111110',B'00000010',X'0000',X'00',AL3(XPER)           03480000
00005A0 D203 0274 A010 00274 00010   465 GWRUN     MVC   NEXTTRY,PCBNPALL .  GET A NEW NEXTTRY                     03500000
 0005A6 9200 0278        00278       466           MVI   NEXTTRYM,X'00' .    NOT MODIFIED                           03510000
 0005AA 50A0 0270             00270    467           ST    10,RUNNING .        GET A NEW RUNNING                      03520000
 0005AE 41E0 A04C             0004C    468           LA    14,PCBISA                                                  03530000
```

```
0005B2 D203 0050 104C 00050 005BC   469          MVC   TIMER,QUANTUM .     INTERRUPT AFTER 50 MS                03540000
0005B8 8200 04D8      004D8         470          LPSW  RETURN .            AND GO TO RETURNR                    03550000
0005BC 00000F00                     471 QUANTUM  DC    X'00000F00' .       QUANTUM OF TIME                      03560000
                                    472          DROP  10                                                       03570000
                    R:F  00000      473          USING PCB,15                                                   03580000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                            PAGE   15
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'570',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0                                   475 ********************************************************************** 03600000
                                    476 *                                                                    * 03610000
                                    477 *                          XEXC ROUTINE                              * 03620000
                                    478 *                                                                    * 03630000
                                    479 *        FUNCTION: TO ENTER SMC SECTION                              * 03640000
                                    480 *       DATABASES: NONE                                              * 03650000
                                    481 *   ROUTINES USED: NONE                                              * 03660000
                                    482 *       PROCEDURE: INCREMENT SMC BYTE IN PCB BY ONE; RETURN.         * 03670000
                                    483 *    ERROR CHECKS: NONE                                              * 03680000
                                    484 *      INTERRUPTS: OFF                                               * 03690000
                                    485 *     USER ACCESS: NO                                                * 03700000
                                    486 *                                                                    * 03710000
                                    487 ********************************************************************** 03720000
0                   005C0           489 XEXC     EQU   * .                ROUTINE XEXC: ENTER SMC SECTION      03740000
                    R:1  005C0      490          USING *,1                                                      03750000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 490 IN /MBHFS/SOS4K.ASM ON VOLUME:
 0005C0 1B88                        491          SR    8,8                                                      03760000
 0005C2 4380 F01A            0001A  492          IC    8,PCBINSMC                                               03770000
 0005C6 4188 0001            00001  493          LA    8,1(8) .           ADD ONE TO SMC BYTE                   03780000
 0005CA 4280 F01A            0001A  494          STC   8,PCBINSMC                                               03790000
 0005CE 8200 04D8      004D8        495          LPSW  RETURN .           AND LEAVE                             03800000
0                                   497 ********************************************************************** 03820000
                                    498 *                                                                    * 03830000
                                    499 *                          XCOM ROUTINE                              * 03840000
                                    500 *                                                                    * 03850000
                                    501 *        FUNCTION: TO LEAVE SMC SECTION                              * 03860000
                                    502 *       DATABASES: NONE                                              * 03870000
                                    503 *   ROUTINES USED: XP, XV                                            * 03880000
                                    504 *       PROCEDURE: DECREMENT SMC BYTE IN PCB BY ONE; IF NOT ZERO,    * 03890000
                                    505 *                  RETURN. ELSE, CHECK FOR STOP WAITING; IF STOP     * 03900000
                                    506 *                  WAITING, ALLOW STOP AND BLOCK SELF; RETURN. IF NO * 03910000
                                    507 *                  STOP WAITING, RETURN.                             * 03920000
                                    508 *    ERROR CHECKS: NONE                                              * 03930000
                                    509 *      INTERRUPTS: OFF                                               * 03940000
                                    510 *     USER ACCESS: NO                                                * 03950000
                                    511 *                                                                    * 03960000
                                    512 ********************************************************************** 03970000
0                   005D2           514 XCOM     EQU   * .                ROUTINE XCOM: LEAVE SMC              03990000
                    R:1  005D2      515          USING *,1                                                      04000000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 515 IN /MBHFS/SOS4K.ASM ON VOLUME:
 0005D2 1B88                        516          SR    8,8                                                      04010000
 0005D4 4380 F01A            0001A  517          IC    8,PCBINSMC                                               04020000
 0005D8 0680                        518          BCTR  8,0 .              SUBTRACT ONE FROM IN SMC BYTE         04030000
 0005DA 4280 F01A            0001A  519          STC   8,PCBINSMC                                               04040000
 0005DE 1288                        520          LTR   8,8 .              IS IT ZERO?                           04050000
 0005E0 4770 102A            005FC  521          BNZ   XCOMRET .          NO, THEN GET BACK, OTHERWISE          04060000
 0005E4 9500 F01B      0001B        522          CLI   PCBSW,X'00' .      IS STOP WAITING?                      04070000
 0005E8 4780 102A            005FC  523          BE    XCOMRET .          IF NOT, RETURN                        04080000
 0005EC 9200 F01B      0001B        524          MVI   PCBSW,X'00' .      STOPS NOT WAITING AFTER THIS          04090000
 0005F0 4120 F034            00034  525          LA    2,PCBSRS .         WE'LL "V" THE STOPPER,                04100000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                            PAGE   16
```

```
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'5D2',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    HLASM R6.0  2016/08/29 08.42
00005F4 0AE5                        526          SVC   C'V'                                                    04110000
 0005F6 4120 F03C            0003C  527          LA    2,PCBSES .          AND "P" THE STOPPEE.                04120000
 0005FA 0AD7                        528          SVC   C'P'                                                    04130000
 0005FC 8200 04D8      004D8        529 XCOMRET  LPSW  RETURN .           AND HERE (IF EVER) WE RETURN          04140000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                           PAGE   17
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'5D2',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    HLASM R6.0  2016/08/29 08.42
0                                   531 ********************************************************************************* 04160000
                                    532 *                                                                               * 04170000
                                    533 *                              XA ROUTINE                                       * 04180000
                                    534 *                            XAUTO ROUTINE                                      * 04190000
                                    535 *                                                                               * 04200000
                                    536 *       FUNCTION: TO ALLOCATE MEMORY                                            * 04210000
                                    537 *      DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XAX:                  * 04220000
                                    538 *                   XAX       DS 0D                                             * 04230000
                                    539 *                   XAXSIZE   DS F     SIZE OF BLOCK TO BE ALLOCATED          * 04240000
                                    540 *                   XAXADDR   DS A     ADDRESS OF FIRST BYTE OF BLOCK         * 04250000
                                    541 *                   XAXALGN   DS F     ALIGNMENT OF BLOCK                     * 04260000
                                    542 *  ROUTINES USED: XEXC, XCOM, XP, XV, XB                                        * 04270000
                                    543 *      PROCEDURE: LOCK FSB SEMAPHORE; SEARCH FREE STORAGE FOR LARGE             * 04280000
                                    544 *                 ENOUGH MEMORY BLOCK; ALIGN BOUNDARY; USE XB TO                * 04290000
                                    545 *                 CHAIN ANY LEFTOVER BLOCKS TO FREE STORAGE LIST;               * 04300000
                                    546 *                 PLACE ADDRESS OF ALLOCATED BLOCK IN XAXADDR; UNLOCK           * 04310000
                                    547 *                 FSB SEMAPHORE; RETURN. IF CAN'T SATISFY REQUEST,              * 04320000
                                    548 *                 UNLOCK FSB SEMAPHORE, APPLY XP ROUTINE TO MEMORY              * 04330000
                                    549 *                 SEMAPHORE, BLOCKING PROCESS RUNNING UNTIL MEMORY              * 04340000
                                    550 *                 FREED; THEN UNBLOCK; TRY TO SATISFY REQUEST AGAIN.            * 04350000
                                    551 *    ERROR CHECKS: NONE                                                         * 04360000
                                    552 *      INTERRUPTS: ON                                                           * 04370000
                                    553 *     USER ACCESS: NO                                                           * 04380000
                                    554 *                                                                               * 04390000
                                    555 ********************************************************************************* 04400000
0                       00600       557 XA       EQU   * .                THE XA ROUTINE, TO ALLOCATE                 04420000
                  R:1   00600       558          USING *,1                                                            04430000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 558 IN /MBHFS/SOS4K.ASM ON VOLUME:
000600 4100 0001            00001   559          LA    0,1 .              SET REGISTER ZERO TO ONE TO                 04440000
000604 47F0 100E            0060E   560          B     XACOM .             INDICATE C'A' CALL                         04450000
                        00608       561 XAUTO    EQU   * .                AUTO STORAGE ENTRY POINT                    04460000
                  R:1   00608       562          USING *,1                                                            04470000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 562 IN /MBHFS/SOS4K.ASM ON VOLUME:
000608 1B00                         563          SR    0,0 .              REG0=0 INDICATES C'E' CALL                 04480000
00060A 5810 1854            00E5C   564          L     1,=A(XA) .         RESET BASE REGISTER PROPERLY               04490000
                  R:1   00600       565          USING XA,1                                                           04500000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 565 IN /MBHFS/SOS4K.ASM ON VOLUME:
00060E 0A5A                         566 XACOM    SVC   C'!' .             ENTER SMC                                  04510000
000610 1872                         567          LR    7,2                                                            04520000
                  R:7   00000       568          USING XAX,7 .            ARGUMENT LIST                              04530000
000612 5860 7000            00000   569          L     6,XAXSIZE .        GET THE SIZE REQUESTED                     04540000
000616 4120 0184            00184   570 XATOP    LA    2,FSBSEM .         LOCK THE FSB SEMAPHORE                     04550000
00061A 0AD7                         571          SVC   C'P' .                                                        04560000
00061C 4150 0180            00180   572          LA    5,FSBPTR .         START LOOKING DOWN                         04570000
000620 5840 0180            00180   573          L     4,FSBPTR .          THE FREE STORAGE LIST                     04580000
000624 5880 7008            00008   574          L     8,XAXALGN .        WE WOULD HAVE TO START AT WITH             04590000
000628 0680                         575          BCTR  8,0 .               THIS CONSTANT TO FIND ALIGNMENT           04600000
                  R:4   00000       576          USING FSB,4                                                          04610000
00062A 1244                         577 XALOOP   LTR   4,4 .               IF AT THE END                              04620000
```

```
         00062C 4780 1056            00656   578            BZ    XAWAIT .          WAIT UNTIL A "FREE" OP             04630000
         000630 18D4                         579            LR    13,4 .           FIND THE LOCATION                   04640000
        1          SAMPLE OPERATING SYSTEM      VERSION 2.00                                                          PAGE   18
           ACTIVE USINGS: PROGRAM,R0  XA,R1  FSB,R4  XAX,R7  SA,R14  PCB,R15
        0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                             HLASM R6.0  2016/08/29 08.42
        0000632 06D0                         580            BCTR  13,0 .            IN THIS BLOCK WITH THIS            04650000
         000634 16D8                         581            OR    13,8 .           ALIGNMENT                           04660000
         000636 41DD 0001            00001   582            LA    13,1(13) .       THAT'S IT                           04670000
         00063A 189D                         583            LR    9,13 .           AND NOW GET IN REG 9                04680000
         00063C 1B94                         584            SR    9,4 .             WHAT IS WASTED AT THE FRONT        04690000
         00063E 5830 4004            00004   585            L     3,FSBSIZE .      GET SIZE MINUS WASTE AT             04700000
         000642 1B39                         586            SR    3,9 .             FRONT, LEAVING EFFECTIVE SIZE      04710000
         000644 1963                         587            CR    6,3 .            IS IT ENOUGH?                       04720000
         000646 47D0 1062            00662   588            BNP   XAFOUND .        EUREKA!                             04730000
         00064A 4150 4000            00000   589            LA    5,FSBNEXT .      OH WELL, GET THE NEXT FREE          04740000
         00064E 5840 4000            00000   590            L     4,FSBNEXT .       STORAGE BLOCK ON THE CHAIN         04750000
         000652 47F0 102A            0062A   591            B     XALOOP .         BETTER LUCK NEXT TIME               04760000
         000656 0AE5                         592 XAWAIT     SVC   C'V' .           NEED TO WAIT                        04770000
         000658 4120 018C            0018C   593            LA    2,MEMORY .       SO WE LET OTHER PEOPLE GET IN       04780000
         00065C 0AD7                         594            SVC   C'P' .           SO THEY'LL WAKE US UP               04790000
         00065E 47F0 1016            00616   595            B     XATOP .          AND THEN WE'LL TRY AGAIN            04800000
         000662 50D0 7004            00004   596 XAFOUND    ST    13,XAXADDR .     WE'VE NOW GOT THE ADDRESS           04810000
         000666 D203 5000 4000 00000 00000   597            MVC   0(4,5),FSBNEXT . UNLINK THE BLOCK OUT                04820000
         00066C 58C0 4004            00004   598            L     12,FSBSIZE .     GET THE WHOLE BLOCK SIZE            04830000
         000670 4120 E048            00048   599            LA    2,SATEMP .       START MAKING UP ARG LISTS           04840000
                             R:2  00000      600            USING XBX,2 .          FOR THE XB ROUTINE                  04850000
         000674 18AD                         601            LR    10,13 .          THE STARTING LOCATION               04860000
         000676 1BA4                         602            SR    10,4 .           MINUS THE START OF THE BLOCK        04870000
         000678 4780 1086            00686   603            BZ    XANF .           IF NONE WASTED AT THE FRONT, SKIP   04880000
         00067C 5040 2004            00004   604            ST    4,XBXADDR .      ELSE FREE, STARTING THERE           04890000
         000680 50A0 2000            00000   605            ST    10,XBXSIZE .      UP TO THE BEGINNING OF THE         04900000
         000684 0AC2                         606            SVC   C'B' .            ALLOCATION; INSERT IT IN THE CHAIN 04910000
         000686 18BD                         607 XANF       LR    11,13 .          THE STARTING ADDR PLUS THE SIZE     04920000
         000688 1AB6                         608            AR    11,6 .            GIVES THE FIRST UNUSED ADDR        04930000
         00068A 1BCA                         609            SR    12,10 .          MINUS THE WASTE AT FRONT,           04940000
         00068C 1BC6                         610            SR    12,6 .           MINUS THE PART ALLOCATED. IF        04950000
         00068E 4780 109C            0069C   611            BZ    XARETURN .       NONE LEFT OVER, GOOD                04960000
         000692 50B0 2004            00004   612            ST    11,XBXADDR .     ELSE STORE ADDRESS AND              04970000
         000696 50C0 2000            00000   613            ST    12,XBXSIZE .     SIZE, AND LINK ONTO                 04980000
         00069A 0AC2                         614            SVC   C'B' .           FREE STORAGE LIST                   04990000
                                             615            DROP  2                                                    05000000
         00069C 4120 0184            00184   616 XARETURN   LA    2,FSBSEM .       WE ARE DONE, SO NOW SOMEONE         05010000
         0006A0 0AE5                         617            SVC   C'V' .            ELSE CAN COME IN                   05020000
         0006A2 1200                         618            LTR   0,0 .            IS THIS FOR AUTOMATIC STORAGE?      05030000
         0006A4 4770 10B0            006B0   619            BNZ   XABACK .         IF NOT, RETURN NOW                  05040000
         0006A8 5060 F044            00044   620            ST    6,PCBASIZE .     OTHERWISE STORE SIZE AND            05050000
         0006AC 50D0 F048            00048   621            ST    13,PCBAADDR .     ADDRESS OF AUTOMATIC STORAGE       05060000
         0006B0 0A6B                         622 XABACK     SVC   C',' .           LEAVE SMC SECTION                   05070000
         0006B2 8200 04D8      004D8         623            LPSW  RETURN .         GET BACK JOJO                       05080000
                                             624            DROP  4,7                                                  05090000
        1          SAMPLE OPERATING SYSTEM      VERSION 2.00                                                          PAGE   19
           ACTIVE USINGS: PROGRAM,R0  XA,R1  SA,R14  PCB,R15
        0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                             HLASM R6.0  2016/08/29 08.42
        0                                    626 *********************************************************************** 05110000
                                             627 *                                                                     * 05120000
                                             628 *                              XF ROUTINE                             * 05130000
                                             629 *                                                                     * 05140000
                                             630 *          FUNCTION: TO FREE MEMORY                                   * 05150000
                                             631 *         DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XFX:     * 05160000
                                             632 *                     XFX        DS 0D                                * 05170000
                                             633 *                     XFXSIZE    DS F      SIZE OF BLOCK TO BE FREED  * 05180000
```

```
                                        634 *                    XFXADDR   DS A     ADDRESS OF FIRST BYTE OF BLOCK* 05190000
                                        635 *   ROUTINES USED: XEXC, XP, XV, XB, XCOM                               * 05200000
                                        636 *       PROCEDURE: LOCK FSB SEMAPHORE; SEARCH FREE STORAGE LIST TO      * 05210000
                                        637 *                  FIND IF ANY FREE BLOCK CONTIGUOUSLY FOLLOWS OR       * 05220000
                                        638 *                  PRECEDES BLOCK TO BE FREED; IF THERE IS ANY,         * 05230000
                                        639 *                  COMPACT THEM INTO A SINGLE BLOCK OF COMBINED SIZE;   * 05240000
                                        640 *                  USE XB TO CHAIN COMPACTED BLOCK ONTO FREE STORAGE    * 05250000
                                        641 *                  LIST; WAKEUP ALL PROCESSES WAITING ON MEMORY         * 05260000
                                        642 *                  SEMAPHORE; UNLOCK FSB SEMAPHORE; RETURN              * 05270000
                                        643 *    ERROR CHECKS: NONE                                                 * 05280000
                                        644 *      INTERRUPTS: ON                                                   * 05290000
                                        645 *     USER ACCESS: NO                                                   * 05300000
                                        646 *                                                                       * 05310000
                                        647 ***************************************************************************** 05320000
0                          006B6        649 XF       EQU   * .                THE XF ROUTINE, TO FREE STORAGE      05340000
                       R:1 006B6        650          USING *,1                                                     05350000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 650 IN /MBHFS/SOS4K.ASM ON VOLUME:
0006B6 0A5A                             651          SVC   C'!' .             ENTER SMC SECTION                   05360000
0006B8 1872                             652          LR    7,2                                                   05370000
                       R:7 00000        653          USING XFX,7 .            THE ARGUMENT LIST                   05380000
0006BA 5830 7000              00000     654          L     3,XFXSIZE .        GET THE SIZE                        05390000
0006BE 5840 7004              00004     655          L     4,XFXADDR .        AND THE ADDRESS                     05400000
0006C2 1853                             656          LR    5,3 .              GET THE ADDRESS OF THE END OF THE    05410000
0006C4 1A54                             657          AR    5,4 .               BLOCK TO BE FREED                  05420000
0006C6 4120 0184              00184     658          LA    2,FSBSEM .         LOCK FSBSEM                         05430000
0006CA 0AD7                             659          SVC   C'P'                                                  05440000
0006CC 4180 0180              00180     660          LA    8,FSBPTR .         START LOOKING DOWN THE FREE         05450000
0006D0 5860 0180              00180     661          L     6,FSBPTR .          STORAGE LIST, FOR COMPACTION       05460000
                       R:6 00000        662          USING FSB,6                                                 05470000
0006D4 1266                             663 XFLOOP   LTR   6,6 .              ARE WE THROUGH?                     05480000
0006D6 4780 105E              00714     664          BZ    XFLINK .           IF SO, JUST ADD IT ON               05490000
0006DA 5890 6000              00000     665          L     9,FSBNEXT .        IF NOT. GET THE NEXT PTR            05500000
0006DE 1965                             666          CR    6,5 .              IS THIS BLOCK RIGHT AFTER OURS?     05510000
0006E0 4770 103A              006F0     667          BNE   XFTHEN .           IF NOT, OK. BUT IF IT IS,           05520000
0006E4 5098 0000              00000     668          ST    9,0(8) .           WE CAN COMPACT, SO UNCHAIN IT       05530000
0006E8 5A30 6004              00004     669          A     3,FSBSIZE .        AND REMEMBER THE NEW SIZE           05540000
0006EC 47F0 1050              00706     670          B     XFBACKUP .         AND ON TO THE NEXT                  05550000
0006F0 18A6                             671 XFTHEN   LR    10,6 .             MAYBE IT'S RIGHT BEFORE OURS        05560000
0006F2 5AA0 6004              00004     672          A     10,FSBSIZE .       GET ENDING ADDRESS OF FREE BLOCK    05570000
0006F6 19A4                             673          CR    10,4 .             IS IT RIGHT BEFORE OURS?            05580000
0006F8 4770 1052              00708     674          BNE   XFINC .           OH FUDGE! NO!                       05590000
0006FC 5098 0000              00000     675          ST    9,0(8) .           IF SO, UNLINK IT                    05600000
000700 1846                             676          LR    4,6 .              GET THE NEW BEGINNING LOCATION      05610000
000702 5A30 6004              00004     677          A     3,FSBSIZE .        AND NEW SIZE OF FREE BLOCK          05620000
000706 1868                             678 XFBACKUP LR    6,8 .              BACK UP ONE FSB                     05630000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   20
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'6B6',R1  FSB,R6  XFX,R7  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000708 4180 6000             00000     679 XFINC    LA    8,FSBNEXT .        ON TO THE NEXT FSB                  05640000
00070C 5860 6000              00000     680          L     6,FSBNEXT                                             05650000
000710 47F0 101E              006D4     681          B     XFLOOP .           TRY, TRY AGAIN                      05660000
000714 4120 E048              00048     682 XFLINK   LA    2,SATEMP .         START TO CALL XB                    05670000
                       R:2 00000        683          USING XBX,2                                                 05680000
000718 5030 2000              00000     684          ST    3,XBXSIZE .        STORE SIZE                          05690000
00071C 5040 2004              00004     685          ST    4,XBXADDR .        AND ADDRESS                         05700000
000720 0AC2                             686          SVC   C'B' .             LINK IT ONTO THE FSB CHAIN          05710000
                       R:2 00000        687          USING SM,2                                                  05720000
000722 4120 018C              0018C     688          LA    2,MEMORY .         GET VALUE OF MEMORY SEMAPHORE       05730000
000726 41B0 0001              00001     689          LA    11,1(0,0) .        SUBTRACT FROM ONE, IT'S A HANDLE    05740000
00072A 5BB0 2000              00000     690          S     11,SMVAL .         ON THE # OF PEOPLE WAITING          05750000
```

```
                                     691          DROP  2                                                        05760000
 00072E 46B0 1088            0073E   692 XFVLOOP  BCT   11,XFVDO .          LOOP IF ANYONE ELSE IS WAITING       05770000
 000732 4120 0184            00184   693          LA    2,FSBSEM .          WE'RE THROUGH, SO                    05780000
 000736 0AE5                         694          SVC   C'V' .              UNBLOCK FSBSEM                       05790000
 000738 0A6B                         695          SVC   C',' .              LEAVE SMC                            05800000
 00073A 8200 04D8      004D8         696          LPSW  RETURN .            RETURN                               05810000
 00073E 0AE5                         697 XFVDO    SVC   C'V' .              WAKE SOMEONE UP                      05820000
 000740 47F0 1078            0072E   698          B     XFVLOOP .           TRY AGAIN FOR ANOTHER                05830000
                                     699          DROP  6,7                                                      05840000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   21
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'6B6',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                    701 *********************************************************************** 05860000
                                     702 *                                                                     * 05870000
                                     703 *                            XB ROUTINE                               * 05880000
                                     704 *                                                                     * 05890000
                                     705 *        FUNCTION: TO CHAIN A STORAGE BLOCK ONTO FREE STORAGE LIST    * 05900000
                                     706 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XBX:       * 05910000
                                     707 *                    XBX       DS 0D                                  * 05920000
                                     708 *                    XBXSIZE   DS F     SIZE OF BLOCK                 * 05930000
                                     709 *                    XBXADDR   DS A     ADDRESS OF FIRST BYTE OF BLOCK* 05940000
                                     710 *   ROUTINES USED: NONE                                               * 05950000
                                     711 *       PROCEDURE: SEARCH FREE STORAGE LIST TO FIND WHERE TO INSERT   * 05960000
                                     712 *                  FREE BLOCK IN ORDER OF INCREASING SIZE; FORMAT     * 05970000
                                     713 *                  BLOCK LIKE AN FSB; INSERT; RETURN.                 * 05980000
                                     714 *    ERROR CHECKS: NONE                                               * 05990000
                                     715 *      INTERRUPTS: OFF                                                * 06000000
                                     716 *     USER ACCESS: NO                                                 * 06010000
                                     717 *        COMMENTS: SINCE XB ROUTINE ONLY CALLED BY XA AND XF, FSB     * 06020000
                                     718 *                  SEMAPHORE IS ALREADY LOCKED.                       * 06030000
                                     719 *                                                                     * 06040000
                                     720 *********************************************************************** 06050000
0                      00744         722 XB       EQU   *                                                        06070000
                  R:1  00744         723          USING *,1                                                      06080000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 723 IN /MBHFS/SOS4K.ASM ON VOLUME:
                  R:2  00000         724          USING XBX,2 .             ARGUMENT LIST                        06090000
 000744 5830 2000            00000   725          L     3,XBXSIZE .         GET THE SIZE                         06100000
 000748 5840 2004            00004   726          L     4,XBXADDR .         AND THE ADDRESS                      06110000
 00074C 4180 0180            00180   727          LA    8,FSBPTR .          START LOOKING DOWN THE CHAIN         06120000
 000750 5860 0180            00180   728          L     6,FSBPTR                                                 06130000
 000754 1266                         729          LTR   6,6 .               IF ZERO POINTER, WE ARE AT           06140000
 000756 4780 102C            00770   730          BZ    XBINSERT .          END OF CHAIN ALREADY                 06150000
                  R:6  00000         731          USING FSB,6                                                    06160000
 00075A 5930 6004            00004   732 XBLOOP   C     3,FSBSIZE .         IF THE SIZE OF OURS IS LESS,         06170000
 00075E 47D0 102C            00770   733          BNP   XBINSERT .           TIME TO INSERT                      06180000
 000762 4180 6000            00000   734          LA    8,FSBNEXT .         ELSE GO ON TO THE NEXT               06190000
 000766 5860 6000            00000   735          L     6,FSBNEXT                                                06200000
 00076A 1266                         736          LTR   6,6 .               IF NOT ALREADY THROUGH               06210000
 00076C 4770 1016            0075A   737          BNZ   XBLOOP .            BRANCH BACK                          06220000
 000770 5048 0000            00000   738 XBINSERT ST    4,0(8) .            NOW, LINK OURS ON                    06230000
                                     739          DROP  6                                                        06240000
                  R:4  00000         740          USING FSB,4                                                    06250000
 000774 5060 4000            00000   741          ST    6,FSBNEXT .         MAKE OURS POINT TO THE NEXT          06260000
 000778 5030 4004            00004   742          ST    3,FSBSIZE .         WITH THE RIGHT SIZE                  06270000
 00077C 8200 04D8      004D8         743          LPSW  RETURN .            AND RETURN                           06280000
                                     744          DROP  2,4                                                      06290000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   22
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'744',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                    746 *********************************************************************** 06310000
```

```
                                        747 *                                                                       * 06320000
                                        748 *                              XC ROUTINE                               * 06330000
                                        749 *                                                                       * 06340000
                                        750 *        FUNCTION: TO CREATE A PROCESS                                  * 06350000
                                        751 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XCX:         * 06360000
                                        752 *                    XCX       DS OD                                    * 06370000
                                        753 *                    XCXNAME   DS CL8   NAME OF PROCESS TO BE CREATED   * 06380000
                                        754 *   ROUTINES USED: XEXC, XCOM, XN, XA, XI, XQUE                         * 06390000
                                        755 *       PROCEDURE: USE XA TO ALLOCATE NEW PCB; PLACE XCXNAME IN PCB;    * 06400000
                                        756 *                  INITIALIZE SEMAPHORES; STOP; BLOCK; OUT OF SMC;      * 06410000
                                        757 *                  CALL XI TO LINK PCB ONTO PCB CHAINS; RETURN.         * 06420000
                                        758 *    ERROR CHECKS: IF NAME ALREADY USED IN THIS GROUP, XQUE ENTERED.    * 06430000
                                        759 *      INTERRUPTS: ON                                                   * 06440000
                                        760 *     USER ACCESS: YES                                                  * 06450000
                                        761 *                                                                       * 06460000
                                        762 ********************************************************************** 06470000
0                       00780           764 XC       EQU   * .                THE XC ROUTINE: CREATE A PROCESS     06490000
                  R:1   00780           765          USING *,1                                                     06500000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 765 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000780 1872                            766          LR    7,2                                                     06510000
                  R:7   00000           767          USING XCX,7 .            ARGUMENT LIST                        06520000
 000782 4120 E048             00048     768          LA    2,SATEMP .         READY TO MAKE CALLS OUT              06530000
                  R:2   00000           769          USING XNX,2 .            A XN-LIKE ARGUMENT LIST              06540000
 000786 D207 2000 7000 00000 00000      770          MVC   XNXNAME,XCXNAME .  GET THE NAME                         06550000
 00078C 0AD5                            771          SVC   C'N' .             AND CALL TO FIND THE PCB             06560000
 00078E D503 2008 16E0 00008 00E60      772          CLC   XNXADDR,=A(0) .    SEE IF THERE                         06570000
 000794 4770 1044             007C4     773          BNE   XCERR .            IF ALREADY EXISTS, BAD               06580000
 000798 0A5A                            774          SVC   C'!' .             ENTER SMC SECTION                    06590000
                                        775          DROP  2                                                       06600000
                  R:2   00000           776          USING XAX,2 .            READY TO CALL XA                     06610000
 00079A D203 2000 16E4 00000 00E64      777          MVC   XAXSIZE,=A(LENPCB) . WE KNOW THE SIZE                   06620000
 0007A0 D203 2008 16E8 00008 00E68      778          MVC   XAXALGN,=F'8' .    AND THE ALIGNMENT                    06630000
 0007A6 0AC1                            779          SVC   C'A' .             SO CALL                              06640000
 0007A8 5820 2004             00004     780          L     2,XAXADDR .        FIND THE ADDRESS                     06650000
                                        781          DROP  2,15                                                    06660000
                  R:2   00000           782          USING PCB,2 .            FILL IN THE PCB                      06670000
 0007AC D207 2000 7000 00000 00000      783          MVC   PCBNAME,XCXNAME .  GIVE IT A NAME                       06680000
 0007B2 92FF 2018             00018     784          MVI   PCBSTOPT,X'FF' .   IT'S STOPPED                        06690000
 0007B6 D232 2019 1B01 00019 01281      785          MVC   PCBBLOKT(PCBISA-PCBBLOKT),TEMPLATE+1 INITIALIZE PCB     06700000
 0007BC 0AC9                            786          SVC   C'I' .             THREAD IT ON                         06710000
 0007BE 0A6B                            787          SVC   C',' .             LEAVE SMC SECTION                    06720000
 0007C0 8200 04D8             004D8     788          LPSW  RETURN .           AND RETURN                           06730000
 0007C4 0A6F                            789 XCERR    SVC   C'?' .             IF ALREADY EXISTS,KERROR             06740000
                                        790          DROP  2,7                                                     06750000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   23
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'780',R1  SA,R14
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0                                       792 ********************************************************************** 06770000
                                        793 *                                                                       * 06780000
                                        794 *                              XD ROUTINE                               * 06790000
                                        795 *                                                                       * 06800000
                                        796 *        FUNCTION: TO DESTROY A PROCESS                                 * 06810000
                                        797 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XDX:         * 06820000
                                        798 *                    XDX       DS OD                                    * 06830000
                                        799 *                    XDXNAME   DS CL8  NAME OF PROCESS TO BE DESTROYED* 06840000
                                        800 *   ROUTINES USED: XEXC, XJ, XS, XN, XF, XCOM, XQUE                     * 06850000
                                        801 *       PROCEDURE: USE XN TO FIND PCB FOR PROCESS TO BE DESTROYED;      * 06860000
                                        802 *                  USE XJ TO UNLOCK PCB FROM PROCESS CHAINS; IF ANY     * 06870000
                                        803 *                  MESSAGES FOR THIS PROCESS, FREE STORAGE FOR THEM;    * 06880000
                                        804 *                  IF THERE IS ANY AUTOMATIC STORAGE, FREE IT;          * 06890000
```

```
                                        805 *                 FREE STORAGE FOR PCB; RETURN.                         * 06900000
                                        806 *    ERROR CHECKS: IF NAME DOESN'T EXIST OR PROCESS NOT STOPPED,       * 06910000
                                        807 *                  XQUE ENTERED.                                       * 06920000
                                        808 *      INTERRUPTS: ON                                                  * 06930000
                                        809 *     USER ACCESS: YES                                                 * 06940000
                                        810 *                                                                      * 06950000
                                        811 ************************************************************************ 06960000
0                       007C6           813 XD       EQU   * .                  XD ROUTINE: DESTROY A PROCESS        06980000
                    R:1 007C6           814          USING *,1                                                       06990000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 814 IN /MBHFS/SOS4K.ASM ON VOLUME:
 0007C6 1872                            815          LR    7,2                                                     07000000
                    R:7  00000          816          USING XDX,7 .              ARG LIST                             07010000
 0007C8 4120 E048             00048     817          LA    2,SATEMP .           READY TO CALL OUT                    07020000
                    R:2  00000          818          USING XNX,2 .              WILL CALL XN                         07030000
 0007CC D207 2000 7000 00000 00000      819          MVC   XNXNAME,XDXNAME .    GET NAME                             07040000
 0007D2 0AD5                            820          SVC   C'N' .               AND CALL                             07050000
 0007D4 5820 2008             00008     821          L     2,XNXADDR .          GET ADDRESS                          07060000
                                        822          DROP  2                                                         07070000
 0007D8 1222                            823          LTR   2,2 .                IF ADDRESS IS NULL,                  07080000
 0007DA 4780 107A             00840     824          BZ    XDERR .              IT'S AN ERROR                        07090000
                    R:2  00000          825          USING PCB,2                                                     07100000
 0007DE 95FF 2018      00018            826          CLI   PCBSTOPT,X'FF' .     IF NOT STOPPED                       07110000
 0007E2 4770 107A             00840     827          BNE   XDERR .              IT'S AN ERROR                        07120000
 0007E6 0A5A                            828          SVC   C'!' .               ENTER SMC SECTION                    07130000
                                        829          DROP  2                                                         07140000
                    R:F  00000          830          USING PCB,15                                                    07150000
 0007E8 0AD1                            831          SVC   C'J' .               ELSE UNTHREAD THE ENTRY              07160000
 0007EA 1882                            832          LR    8,2 .                REMEMBER THE PCB POINTER             07170000
 0007EC 4120 E048             00048     833          LA    2,SATEMP .           READY TO CALL OUT AGAIN              07180000
                R:8  00000              834          USING PCB,8                                                     07190000
 ** ASMA300W USING OVERRIDDEN BY A PRIOR ACTIVE USING ON STATEMENT NUMBER 830
 ** ASMA435I RECORD 834 IN /MBHFS/SOS4K.ASM ON VOLUME:
                                        835          DROP  15                                                        07200000
 0007F0 5890 802C             0002C     836          L     9,PCBFM .            GET FIRST MESSAGE                    07210000
 0007F4 1299                            837 XDLOOP   LTR   9,9 .                ANY MORE MESSAGES?                   07220000
 0007F6 4780 1054             0081A     838          BZ    XDCHECK .            IF NOT, FINISH UP                    07230000
                    R:9  00000          839          USING MSG,9                                                     07240000
 0007FA 58A0 9004             00004     840          L     10,MSGNEXT .         ELSE REMEMBER NEXT                   07250000
 0007FE 58B0 9008             00008     841          L     11,MSGSIZE .         GET THE SIZE                         07260000
 000802 41BB 000F             0000F     842          LA    11,15(11) .           AND MAKE IT SOME NUMBER             07270000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                                  PAGE   24
  ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'7C6',R1  XDX,R7  PCB,R8  MSG,R9  SA,R14
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000806 54B0 16A6             00E6C     843          N     11,=F'-8' .           OF DOUBLEWORDS                       07280000
                    R:2  00000          844          USING XFX,2                                                     07290000
 00080A 5090 2004             00004     845          ST    9,XFXADDR .          FREE THE LOCATION                    07300000
 00080E 50B0 2000             00000     846          ST    11,XFXSIZE .          THE NUMBER OF WORDS                 07310000
 000812 0AC6                            847          SVC   C'F' .               DO IT                                07320000
 000814 189A                            848          LR    9,10 .               ON TO THE NEXT                       07330000
 000816 47F0 102E             007F4     849          B     XDLOOP .             GET THE NEXT MESSAGE                 07340000
 00081A D503 8048 169A 00048 00E60      850 XDCHECK  CLC   PCBAADDR(4),=A(0) .  HAS AUTOMATIC STORAGE BEEN           07350000
 000820 4780 1068             0082E     851          BE    XDTHEN .              ALLOCATED? IF NOT, GO FINISH UP     07360000
 000824 4120 8044             00044     852          LA    2,PCBASIZE .         SET UP THE ARGUMENT LIST             07370000
 000828 0AC6                            853          SVC   C'F' .               FREE IT                              07380000
 00082A 4120 E048             00048     854          LA    2,SATEMP .           RESET REGISTER 2                     07390000
 00082E 5080 2004             00004     855 XDTHEN   ST    8,XFXADDR .          READY TO FREE THE PCB                07400000
 000832 D203 2000 169E 00000 00E64      856          MVC   XFXSIZE,=A(LENPCB) . THE SIZE                           07410000
 000838 0AC6                            857          SVC   C'F' .               FREE IT                              07420000
 00083A 0A6B                            858          SVC   C',' .               LEAVE SMC                            07430000
 00083C 8200 04D8      004D8            859          LPSW  RETURN .             AND RETURN                           07440000
```

```
  000840 0A6F                         860 XDERR    SVC   C'?' .              IF PROCESS DOES NOT EXIST          07450000
                                      861          DROP  2,7,8,9                                                07460000
                   R:F  00000         862          USING PCB,15                                                 07470000
 -
                                      864 *********************************************************************** 07490000
                                      865 *                                                                   * 07500000
                                      866 *                            XH ROUTINE                             * 07510000
                                      867 *                                                                   * 07520000
                                      868 *        FUNCTION: TO HALT A JOB                                    * 07530000
                                      869 *       DATABASES: NONE                                             * 07540000
                                      870 *   ROUTINES USED: XS, XR                                           * 07550000
                                      871 *       PROCEDURE: SEND MESSAGE TO SUPERVISOR PROCESS FOR THIS JOB  * 07560000
                                      872 *                  INDICATING NORMAL TERMINATION; TRIES TO READ     * 07570000
                                      873 *                  MESSAGES FOREVER LOOPING; BLOCKS ITSELF, THEREBY * 07580000
                                      874 *                  NEVER RETURNING.                                 * 07590000
                                      875 *    ERROR CHECKS: NONE                                             * 07600000
                                      876 *      INTERRUPTS: ON                                               * 07610000
                                      877 *     USER ACCESS: YES                                              * 07620000
                                      878 *        COMMENTS: USER NORMALLY USES THIS ROUTINE TO END A JOB.    * 07630000
                                      879 *                                                                   * 07640000
                                      880 *********************************************************************** 07650000
 0                        00842       882 XH       EQU   * .                 THE XH ROUTINE: HALT A JOB         07670000
                   R:1  00842         883          USING *,1                                                    07680000
  ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
  ** ASMA435I RECORD 883 IN /MBHFS/SOS4K.ASM ON VOLUME:
  000842 4120 1012            00854   884          LA    2,XHMSG1 .          SEND A MESSAGE TO *IBSUP           07690000
  000846 0AE2                         885          SVC   C'S' .              SEND IT                            07700000
  000848 4120 102A            0086C   886 XHLOOP   LA    2,XHMSG2 .          READY TO READ A REPLY              07710000
  00084C 0AD9                         887          SVC   C'R' .               WHICH NEVER COMES                 07720000
  00084E 47F0 1006            00848   888          B     XHLOOP .            BUT IF IT DOES WERE READY          07730000
  000854                              889          DS    0F                                                     07740000
  000854 5CC9C2E2E4D74040             890 XHMSG1   DC    CL8'*IBSUP' .       SAY TO *IBSUP                      07750000
  00085C 0000000C                     891          DC    F'12' .             TWELVE CHARACTERS                  07760000
  000860 D7D9D6C7D9C1D440             892          DC    C'PROGRAM HALT' .   SAYING WERE OK                     07770000
  00086C                              893 XHMSG2   DS    CL8 .               WHO SENDS US A MESSAGE             07780000
 1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                     PAGE   25
    ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'842',R1  SA,R14  PCB,R15
 0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                           HLASM R6.0  2016/08/29 08.42
 0000874 00000001                     894          DC    F'1' .              ONE CHARACTER                      07790000
  000878                              895          DS    CL1,0H .            WHICH GOES HERE                    07800000
 1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                     PAGE   26
    ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'842',R1  SA,R14  PCB,R15
 0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                           HLASM R6.0  2016/08/29 08.42
 0                                    897 *********************************************************************** 07820000
                                      898 *                                                                   * 07830000
                                      899 *                            XI ROUTINE                             * 07840000
                                      900 *                                                                   * 07850000
                                      901 *        FUNCTION: TO CHAIN A PCB ONTO PROCESS CHAINS               * 07860000
                                      902 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS OF A PCB * 07870000
                                      903 *   ROUTINES USED: NONE                                             * 07880000
                                      904 *       PROCEDURE: POINTER USED TO CHAIN PCB INTO ALL PCB CHAIN AND * 07890000
                                      905 *                  THIS GROUP CHAIN RIGHT AFTER RUNNING PCB; RETURN. * 07900000
                                      906 *    ERROR CHECKS: NONE                                             * 07910000
                                      907 *      INTERRUPTS: OFF                                              * 07920000
                                      908 *     USER ACCESS: NO                                               * 07930000
                                      909 *                                                                   * 07940000
                                      910 *********************************************************************** 07950000
 0                        0087A       912 XI       EQU   * .                 THE XI ROUTINE: THREAD IN A PCB    07970000
                   R:1  0087A         913          USING *,1                                                    07980000
  ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
  ** ASMA435I RECORD 913 IN /MBHFS/SOS4K.ASM ON VOLUME:
```

```
00087A 58A0 F010             00010   914          L     10,PCBNPALL .       GET THE NEXT 'ALL' PCB                07990000
00087E 5020 F010             00010   915          ST    2,PCBNPALL .        STORE THIS PCB RIGNT AFTER MINE       08000000
                                     916          DROP  15                                                        08010000
                   R:A  00000        917          USING PCB,10                                                    08020000
000882 5020 A014             00014   918          ST    2,PCBLPALL .        THE NEXT ONE DOWN POINTS BACK         08030000
                                     919          DROP  10                                                        08040000
                   R:2  00000        920          USING PCB,2                                                     08050000
000886 50F0 2014             00014   921          ST    15,PCBLPALL .       THIS PCB POINTS BACK                  08060000
00088A 50A0 2010             00010   922          ST    10,PCBNPALL .        AND FORWARD                      08070000
                                     923          DROP  2                                                         08080000
                   R:F  00000        924          USING PCB,15                                                    08090000
00088E 58A0 F008             00008   925          L     10,PCBNPTG .        GET NEXT "THIS GROUP" PCB             08100000
000892 5020 F008             00008   926          ST    2,PCBNPTG .         RUNNING PCB POINTS TO NEW MEMBER      08110000
                                     927          DROP  15 .                 OF PROCESS GROUP                     08120000
                   R:A  00000        928          USING PCB,10                                                    08130000
000896 5020 A00C             0000C   929          ST    2,PCBLPTG .         NEXT PCB DOWN POINTS BACK             08140000
                                     930          DROP  10                                                        08150000
                   R:2  00000        931          USING PCB,2                                                     08160000
00089A 50F0 200C             0000C   932          ST    15,PCBLPTG .        AND WE POINT BACKWARD                 08170000
00089E 50A0 2008             00008   933          ST    10,PCBNPTG .        AND FORWARD                           08180000
                                     934          DROP  2                                                         08190000
0008A2 8200 04D8             004D8   935          LPSW  RETURN .            RETURN                                08200000
                   R:F  00000        936          USING PCB,15                                                    08210000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                             PAGE   27
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'87A',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                    938 ********************************************************************************* 08230000
                                     939 *                                                                           * 08240000
                                     940 *                          XJ ROUTINE                                       * 08250000
                                     941 *                                                                           * 08260000
                                     942 *        FUNCTION: TO UNCHAIN A PCB FROM PROCESS CHAINS                     * 08270000
                                     943 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS OF A PCB         * 08280000
                                     944 *   ROUTINES USED: NONE                                                     * 08290000
                                     945 *       PROCEDURE: POINTERS TO PCB IN ALL PCB CHAIN AND THIS GROUP          * 08300000
                                     946 *                  CHAIN MODIFIED WITHOUT FREEING STORAGE; RETURN.       * 08310000
                                     947 *    ERROR CHECKS: NONE                                                     * 08320000
                                     948 *      INTERRUPTS: OFF                                                      * 08330000
                                     949 *     USER ACCESS: NO                                                       * 08340000
                                     950 *                                                                           * 08350000
                                     951 ********************************************************************************* 08360000
0                         008A6      953 XJ       EQU   * .                  THE XJ ROUTINE: UNTHREAD A PCB        08380000
                   R:1  008A6        954          USING *,1                                                       08390000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 954 IN /MBHFS/SOS4K.ASM ON VOLUME:
                                     955          DROP  15                                                        08400000
                   R:2  00000        956          USING PCB,2                                                     08410000
0008A6 58B0 2014             00014   957          L     11,PCBLPALL .       GET PRECEDING PCB                     08420000
0008AA 58A0 2010             00010   958          L     10,PCBNPALL .        AND FOLLOWING ONE IN "ALL"           08430000
                                     959          DROP  2 .                  CHAIN                                08440000
                   R:B  00000        960          USING PCB,11                                                    08450000
0008AE 50A0 B010             00010   961          ST    10,PCBNPALL .       LAST POINTS TO NEXT                   08460000
                                     962          DROP  11                                                        08470000
                   R:A  00000        963          USING PCB,10                                                    08480000
0008B2 50B0 A014             00014   964          ST    11,PCBLPALL .       NEXT POINTS TO LAST                   08490000
                                     965          DROP  10                                                        08500000
                   R:2  00000        966          USING PCB,2                                                     08510000
0008B6 58B0 200C             0000C   967          L     11,PCBLPTG .        REDO FOR THIS GROUP PCB CHAIN         08520000
0008BA 58A0 2008             00008   968          L     10,PCBNPTG                                                08530000
                                     969          DROP  2                                                         08540000
                   R:B  00000        970          USING PCB,11                                                    08550000
0008BE 50A0 B008             00008   971          ST    10,PCBNPTG .        LAST POINTS TO NEXT                   08560000
```

```
                                          972          DROP  11                                                    08570000
                      R:A  00000          973          USING PCB,10                                                08580000
  0008C2 50B0 A00C              0000C     974          ST    11,PCBLPTG .         NEXT POINTS TO LAST              08590000
                                          975          DROP  10                                                    08600000
  0008C6 8200 04D8         004D8          976          LPSW  RETURN .             AND RETURN                       08610000
                      R:F  00000          977          USING PCB,15                                                08620000
1          SAMPLE OPERATING SYSTEM      VERSION 2.00                                                              PAGE   28
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'8A6',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                      HLASM R6.0  2016/08/29 08.42
0                                         979 *********************************************************************** 08640000
                                          980 *                                                                     * 08650000
                                          981 *                           XN ROUTINE                                * 08660000
                                          982 *                                                                     * 08670000
                                          983 *        FUNCTION: TO FIND THE PCB FOR A PROCESS GIVEN ITS NAME ONLY  * 08680000
                                          984 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XNX        * 08690000
                                          985 *                             XNX        DS OD                        * 08700000
                                          986 *                             XNXNAME    DS CL8   NAME OF PROCESS     * 08710000
                                          987 *                             XNXADDR    DS A     ADDRESS OF PCB      * 08720000
                                          988 *   ROUTINES USED: NONE                                               * 08730000
                                          989 *       PROCEDURE: SEARCH THIS GROUP PCB CHAIN FOR NAME; IF FOUND,    * 08740000
                                          990 *                  STORE POINTER IN XNXADDR. IF NOT FOUND, STORE      * 08750000
                                          991 *                  ZERO IN XNXADDR; RETURN.                           * 08760000
                                          992 *    ERROR CHECKS: NONE                                               * 08770000
                                          993 *      INTERRUPTS: OFF                                                * 08780000
                                          994 *     USER ACCESS: YES                                                * 08790000
                                          995 *                                                                     * 08800000
                                          996 *********************************************************************** 08810000
0                          008CA          998 XN       EQU   * .                  THE XN ROUTINE: FIND A NAMED PCB   08830000
                      R:1  008CA          999          USING *,1                                                   08840000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 999 IN /MBHFS/SOS4K.ASM ON VOLUME:
                      R:2  00000         1000          USING XNX,2 .              THE ARG LIST                     08850000
  0008CA 18AF                            1001          LR    10,15 .              FIRST PCB TO LOOK AT IS OURS     08860000
                                         1002          DROP  15                                                    08870000
                      R:A  00000         1003          USING PCB,10                                                08880000
  0008CC 58A0 A008              00008    1004 XNXLOOP  L     10,PCBNPTG .         LOOK AT NEXT PCB                 08890000
  0008D0 D507 A000 2000 00000 00000      1005          CLC   PCBNAME,XNXNAME .    HAS IT THE RIGHT NAME?           08900000
  0008D6 4780 101A              008E4    1006          BE    XNXFOUND .           IF YES, OH JOY.                  08910000
  0008DA 19AF                            1007          CR    10,15 .              IF NOT, ARE WE THROUGH?          08920000
  0008DC 4770 1002              008CC    1008          BNE   XNXLOOP .            IF NOT, TRY THE NEXT PCB         08930000
  0008E0 41A0 0000              00000    1009          LA    10,0 .               ELSE, IT'S NOT HERE              08940000
  0008E4 50A0 2008              00008    1010 XNXFOUND ST    10,XNXADDR .         FOUND IT. SAY WHERE.             08950000
  0008E8 8200 04D8         004D8         1011          LPSW  RETURN .             AND RETURN                       08960000
                                         1012          DROP  2,10                                                  08970000
                      R:F  00000         1013          USING PCB,15                                                08980000
1          SAMPLE OPERATING SYSTEM      VERSION 2.00                                                              PAGE   29
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'8CA',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                      HLASM R6.0  2016/08/29 08.42
0                                        1015 *********************************************************************** 09000000
                                         1016 *                                                                     * 09010000
                                         1017 *                           XR ROUTINE                                * 09020000
                                         1018 *                                                                     * 09030000
                                         1019 *        FUNCTION: TO READ A MESSAGE                                  * 09040000
                                         1020 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XRX        * 09050000
                                         1021 *                             XRX        DS OD                        * 09060000
                                         1022 *                             XRXNAME    DS CL8   NAME OF SENDER PROCESS * 09070000
                                         1023 *                             XRXSIZE    DS F     SIZE OF MESSAGE TEXT  * 09080000
                                         1024 *                             XRXTEXT    DS C     TEXT OF MESSAGE       * 09090000
                                         1025 *   ROUTINES USED: XP, XEXC, XN, XCOM, XF                             * 09100000
                                         1026 *       PROCEDURE: USE XP ON MESSAGE SEMAPHORE RECEIVER TO SEE IF ANY * 09110000
                                         1027 *                  MESSAGES WAITING; IF NONE, PROCESS BLOCKED UNTIL   * 09120000
```

```
                                        1028 *                  THERE IS ONE; LOCK MESSAGE CHAIN; REMOVE A MESSAGE * 09130000
                                        1029 *                  FROM CHAIN AND UNLOCK IT; MOVE TEXT OF MESSAGE,    * 09140000
                                        1030 *                  PADDING WITH BLANKS OR TRUNCATING AS NECESSARY;    * 09150000
                                        1031 *                  INDICATE CORRECT MESSAGE LENGTH AND NAME OF        * 09160000
                                        1032 *                  MESSAGE SENDER; FREE STORAGE USED TO HOLD MESSAGE, * 09170000
                                        1033 *                  AND RETURN.                                        * 09180000
                                        1034 *    ERROR CHECKS: NONE                                               * 09190000
                                        1035 *      INTERRUPTS: ON                                                 * 09200000
                                        1036 *     USER ACCESS: YES                                                * 09210000
                                        1037 *                                                                     * 09220000
                                        1038 ***************************************************************************** 09230000
0                        008EC          1040 XR       EQU   * .                 THE XR ROUTINE: READ A MESSAGE       09250000
                   R:1   008EC          1041          USING *,1                                                      09260000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
** ASMA435I RECORD 1041 IN /MBHFS/SOS4K.ASM ON VOLUME:
0008EC 1872                             1042          LR    7,2                                                      09270000
                   R:7   00000          1043          USING XRX,7 .             ARG LIST                             09280000
0008EE 4120 F024             00024      1044          LA    2,PCBMSR .          SEE IF MESSAGES WAITING              09290000
0008F2 0AD7                             1045          SVC   C'P'                                                     09300000
0008F4 0A5A                             1046          SVC   C'!' .              ENTER SMC SECTION                    09310000
0008F6 4120 F01C             0001C      1047          LA    2,PCBMSC .          THEN LOCK THE MESSAGE CHAIN          09320000
0008FA 0AD7                             1048          SVC   C'P'                                                     09330000
0008FC 5850 F02C             0002C      1049          L     5,PCBFM .           GET THE FIRST MESSAGE                09340000
                   R:5   00000          1050          USING MSG,5                                                    09350000
000900 D203 F02C 5004 0002C 00004       1051          MVC   PCBFM,MSGNEXT .     REMEMBER THE NEXT                    09360000
000906 0AE5                             1052          SVC   C'V' .              UNLOCK THE MESSAGE CHAIN             09370000
000908 5860 7008             00008      1053          L     6,XRXSIZE .         GET THE BUFFER CAPACITY              09380000
00090C 5B60 1584             00E70      1054          S     6,=F'2' .           MINUS 1, MINUS 1                     09390000
000910 9240 700C       0000C            1055          MVI   XRXTEXT,C' ' .      MOVE IN A BLANK                      09400000
000914 4740 1030             0091C      1056          BM    XRNOB                                                    09410000
000918 4460 1080             0096C      1057          EX    6,XRFILL .          THEN FILL THE REST WITH BLANKS       09420000
00091C 4166 0001             00001      1058 XRNOB    LA    6,1(6) .            THEN GET PROPER BUFFER COUNT         09430000
000920 5960 5008             00008      1059          C     6,MSGSIZE .         COMPARE WITH MESSAGE LENGTH          09440000
000924 4740 1042             0092E      1060          BL    XRTHEN .            IF LESS, HANDLE ACCORDINGLY          09450000
000928 5860 5008             00008      1061          L     6,MSGSIZE .         ELSE COUNT FOR MVC IS MESSAGE        09460000
00092C 0660                             1062          BCTR  6,0 .                SIZE MINUS ONE                    09470000
00092E 1266                             1063 XRTHEN   LTR   6,6 .               ANY CHARACTERS TO MOVE?              09480000
000930 4740 104C             00938      1064          BM    XRAFT .             IF NOT, DON'T                        09490000
000934 4460 1086             00972      1065          EX    6,XRMOVE .          ELSE MOVE THEM                       09500000
000938 4166 0001             00001      1066 XRAFT    LA    6,1(6) .            THEN GET LENGTH                      09510000
00093C 5060 7008             00008      1067          ST    6,XRXSIZE .         STORE IT                             09520000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE   30
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'8EC',R1  MSG,R5  XRX,R7  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000940 58A0 5000            00000      1068          L     10,MSGSENDR .       GET SENDER'S PCB                     09530000
                                        1069          DROP  15                                                       09540000
                   R:A   00000          1070          USING PCB,10                                                   09550000
000944 D207 7000 A000 00000 00000       1071          MVC   XRXNAME,PCBNAME .   AND STORE SENDER'S NAME             09560000
00094A 5860 5008             00008      1072          L     6,MSGSIZE .         GET SIZE OF MESSAGE TEXT             09570000
00094E 4166 000C             0000C      1073          LA    6,LENMSG(6) .        ADD SIZE OF MESSAGE BLOCK           09580000
000952 4166 0007             00007      1074          LA    6,7(6) .            AND TRUNCATE                         09590000
000956 5460 1580             00E6C      1075          N     6,=F'-8' .          UP                                   09600000
00095A 1825                             1076          LR    2,5 .               SET UP POINTER TO XFX                09610000
                   R:2   00000          1077          USING XFX,2                                                    09620000
00095C 5050 2004             00004      1078          ST    5,XFXADDR .         STORE ADDRESS                        09630000
000960 5060 2000             00000      1079          ST    6,XFXSIZE .         STORE SIZE                           09640000
000964 0AC6                             1080          SVC   C'F' .              AND FREE THE MESSAGE BLOCK           09650000
000966 0A6B                             1081          SVC   C',' .              LEAVE SMC                            09660000
000968 8200 04D8       004D8            1082          LPSW  RETURN .            AND RETURN                           09670000
00096C D200 700D 700C 0000D 0000C       1083 XRFILL   MVC   XRXTEXT+1,XRXTEXT . FILL WITH BLANKS                   09680000
000972 D200 700C 500C 0000C 0000C       1084 XRMOVE   MVC   XRXTEXT,MSGTEXT .   MOVE TEXT                          09690000
```

```
                                     1085          DROP  2,5,7,10                                                  09700000
                R:F  00000           1086          USING PCB,15                                                    09710000
 -
                                     1088 ********************************************************************** 09730000
                                     1089 *                                                                     * 09740000
                                     1090 *                            XS ROUTINE                               * 09750000
                                     1091 *                                                                     * 09760000
                                     1092 *        FUNCTION: TO SEND A MESSAGE                                  * 09770000
                                     1093 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XSX        * 09780000
                                     1094 *                    XSX        DS OD                                 * 09790000
                                     1095 *                    XSXNAME    DS CL8   NAME OF TARGET PROCESS       * 09800000
                                     1096 *                    XSXSIZE    DS F     SIZE OF TEXT                 * 09810000
                                     1097 *                    XSXTEXT    DS C     TEXT OF MESSAGE              * 09820000
                                     1098 *   ROUTINES USED: XP, XV, XEXC, XCOM, XA, XQUE                       * 09830000
                                     1099 *       PROCEDURE: USE XN TO GET POINTER TO PCB OF TARGET PROCESS;    * 09840000
                                     1100 *                  USE LENGTH OF MESSAGE AND XA TO ALLOCATE BLOCK FOR * 09850000
                                     1101 *                  MESSAGE; LOCK MESSAGE CHAIN OF TARGET PROCESS;     * 09860000
                                     1102 *                  PUT MESSAGE BLOCK AT END OF CHAIN; STORE SENDER    * 09870000
                                     1103 *                  NAME, SIZE, AND TEXT OF MESSAGE; UNLOCK CHAIN;     * 09880000
                                     1104 *                  INDICATE MESSAGE CHAIN IS ONE LONGER; RETURN.      * 09890000
                                     1105 *    ERROR CHECKS: IF NO PROCESS BY GIVEN NAME, ENTER XQUE.           * 09900000
                                     1106 *      INTERRUPTS: ON                                                 * 09910000
                                     1107 *     USER ACCESS: YES                                                * 09920000
                                     1108 *                                                                     * 09930000
                                     1109 ********************************************************************** 09940000
0                    00978           1111 XS       EQU   * .                     THE XS ROUTINE: SEND MESSAGES     09960000
                R:1  00978           1112          USING *,1                                                       09970000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1112 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000978 1872                         1113          LR    7,2                                                       09980000
                R:7  00000           1114          USING XSX,7 .                 ARG LIST                          09990000
 00097A 4120 E048           00048    1115          LA    2,SATEMP .              READY TO CALL OUT                 10000000
                R:2  00000           1116          USING XNX,2 .                 ABOUT TO CALL XN                  10010000
 00097E D207 2000 7000 00000 00000   1117          MVC   XNXNAME,XSXNAME .       GIVE NAME OF TARGET PROCESS       10020000
 000984 0AD5                         1118          SVC   C'N' .                  SEE WHERE IT IS                   10030000
1         SAMPLE OPERATING SYSTEM      VERSION 2.00                                                            PAGE   31
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'978',R1  XNX,R2  XSX,R7  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                 HLASM R6.0  2016/08/29 08.42
0000986 5840 2008           00008    1119          L     4,XNXADDR .             GET THE POINTER                   10040000
 00098A 1244                         1120          LTR   4,4 .                   IS THERE INDEED ONE?              10050000
 00098C 4780 108A           00A02    1121          BZ    XSERR .                 IF NOT, ERROR                     10060000
                R:4  00000           1122          USING PCB,4                                                     10070000
 ** ASMA300W USING OVERRIDDEN BY A PRIOR ACTIVE USING ON STATEMENT NUMBER 1086
 ** ASMA435I RECORD 1122 IN /MBHFS/SOS4K.ASM ON VOLUME:
                                     1123          DROP  2,15                                                      10080000
                R:2  00000           1124          USING XAX,2 .                 READY TO CALL XA                  10090000
 000990 0A5A                         1125          SVC   C'!' .                  ENTERING SMC SECTION              10100000
 000992 5830 7008           00008    1126          L     3,XSXSIZE .             GET THE STATED SIZE               10110000
 000996 4133 000C           0000C    1127          LA    3,LENMSG(3) .           PLUS THE AMOUNT OF OVERHEAD       10120000
 00099A 4133 0007           00007    1128          LA    3,7(3) .                AND TRUNCATE                      10130000
 00099E 5430 14F4           00E6C    1129          N     3,=F'-8' .              UP                                10140000
 0009A2 5030 2000           00000    1130          ST    3,XAXSIZE .             THAT'S THE SIZE OF THE REGION TO  10150000
 0009A6 D203 2008 14F0 00008 00E68   1131          MVC   XAXALGN,=F'8' .         ALLOCATE, ON A DOUBLEWORD BOUND   10160000
 0009AC 0AC1                         1132          SVC   C'A' .                  SO ALLOCATE ALREADY               10170000
 0009AE 5850 2004           00004    1133          L     5,XAXADDR .             GET THE ADDRESS                   10180000
                                     1134          DROP  2                                                         10190000
 0009B2 4120 401C           0001C    1135          LA    2,PCBMSC .              GET THE MESSAGE CHAIN SEMAPHORE   10200000
 0009B6 0AD7                         1136          SVC   C'P' .                   AND LOCK IT                      10210000
 0009B8 4180 402C           0002C    1137          LA    8,PCBFM .               THEN START DOWN THE MESSAGE       10220000
 0009BC 5890 402C           0002C    1138          L     9,PCBFM .                CHAIN                            10230000
                R:9  00000           1139          USING MSG,9                                                     10240000
```

```
 0009C0 1299                        1140 XSLOOP   LTR   9,9 .               ARE WE THROUGH?                      10250000
 0009C2 4780 105A            009D2  1141          BZ    XSADD .             IF SO ADD IT ON                      10260000
 0009C6 4180 9004            00004  1142          LA    8,MSGNEXT .         IF NOT, ON TO THE NEXT               10270000
 0009CA 5890 9004            00004  1143          L     9,MSGNEXT                                                10280000
 0009CE 47F0 1048            009C0  1144          B     XSLOOP .            AND TRY AGAIN                        10290000
 0009D2 5058 0000            00000  1145 XSADD    ST    5,0(8) .            CHAIN OURS ON THE END                10300000
                                    1146          DROP  9                                                        10310000
                  R:5  00000        1147          USING MSG,5                                                    10320000
 0009D6 D203 5004 14E8 00004 00E60  1148          MVC   MSGNEXT,=A(0) .     SET NEXT POINTER NULL                10330000
 0009DC 50F0 5000            00000  1149          ST    15,MSGSENDR .       STORE THE SENDER                     10340000
 0009E0 5860 7008            00008  1150          L     6,XSXSIZE .         GET THE TEXT LENGTH                  10350000
 0009E4 5060 5008            00008  1151          ST    6,MSGSIZE .         AND STORE IT                         10360000
 0009E8 0660                        1152          BCTR  6,0 .               ONE LESS                             10370000
 0009EA 1266                        1153          LTR   6,6 .               TEST LENGTH                          10380000
 0009EC 4740 107C            009F4  1154          BM    XSAFT .             IF ZERO, NOTHING TO MOVE             10390000
 0009F0 4460 108C            00A04  1155          EX    6,XSMOVE .          ELSE, MOVE IT                        10400000
 0009F4 0AE5                        1156 XSAFT    SVC   C'V' .              UNLOCK THE MESSAGE CHAIN             10410000
 0009F6 4120 4024            00024  1157          LA    2,PCBMSR .          THEN SAY THERE'S                     10420000
 0009FA 0AE5                        1158          SVC   C'V' .               ONE MORE MESSAGE                    10430000
 0009FC 0A6B                        1159          SVC   C',' .              LEAVE SMC SECTION                    10440000
 0009FE 8200 04D8      004D8        1160          LPSW  RETURN .            AND RETURN                           10450000
 000A02 0A6F                        1161 XSERR    SVC   C'?'                                                     10460000
 000A04 D200 500C 700C 0000C 0000C  1162 XSMOVE   MVC   MSGTEXT,XSXTEXT .   THE MOVE FOR THE TEXT                10470000
                                    1163          DROP  4,5,7                                                    10480000
                  R:F  00000        1164          USING PCB,15                                                   10490000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   32
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'978',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                   1166 *********************************************************************** 10510000
                                    1167 *                                                                     * 10520000
                                    1168 *                            XY ROUTINE                               * 10530000
                                    1169 *                                                                     * 10540000
                                    1170 *        FUNCTION: TO START A PROCESS                                 * 10550000
                                    1171 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XYX        * 10560000
                                    1172 *                    XYX       DS OD                                  * 10570000
                                    1173 *                    XYXNAME   DS CL8   NAME OF PROCESS TO BE STARTED * 10580000
                                    1174 *                    XYXADDR   DS A     STARTING ADDRESS OF PROCESS   * 10590000
                                    1175 *   ROUTINES USED: XN, XEXC, XCOM, XQUE                               * 10600000
                                    1176 *       PROCEDURE: USE XN TO GET POINTER TO THE PCB OF PROCESS TO BE  * 10610000
                                    1177 *                  STARTED; STORE IN PCB INTERRUPT SAVE AREA REGISTERS* 10620000
                                    1178 *                  AND PSW WITH STARTING ADDRESS AS SENT FROM STARTING* 10630000
                                    1179 *                  PROCESS; STOPPED BIT TURNED OFF; RETURN.           * 10640000
                                    1180 *    ERROR CHECKS: IF NO PROCESS BY GIVEN NAME, XQUE ENTERED.         * 10650000
                                    1181 *      INTERRUPTS: OFF                                                * 10660000
                                    1182 *     USER ACCESS: YES                                                * 10670000
                                    1183 *                                                                     * 10680000
                                    1184 *********************************************************************** 10690000
0                      00A0A        1186 XY       EQU   * .                 THE XY ROUTINE: START A PROCESS      10710000
                  R:1  00A0A        1187          USING *,1                                                      10720000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1187 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000A0A 1872                        1188          LR    7,2                                                      10730000
                  R:7  00000        1189          USING XYX,7 .             THE ARG LIST                         10740000
 000A0C 4120 E048            00048  1190          LA    2,SATEMP .          READY TO CALL OUT                    10750000
                  R:2  00000        1191          USING XNX,2                                                    10760000
 000A10 D207 2000 7000 00000 00000  1192          MVC   XNXNAME,XYXNAME .   GIVE XN A NAME                       10770000
 000A16 0AD5                        1193          SVC   C'N' .              CALL XN                              10780000
 000A18 58A0 2008            00008  1194          L     10,XNXADDR .        WHERE IS THE PCB?                    10790000
 000A1C 12AA                        1195          LTR   10,10 .              OR IS THERE ONE?                    10800000
 000A1E 4780 1036            00A40  1196          BZ    XYERR .             IF NOT, OH HISS BOO                  10810000
                                    1197          DROP  2,14,15                                                  10820000
```

```
                  R:A  00000        1198          USING PCB,10                                                   10830000
 000A22 41D0 A04C            0004C  1199          LA    13,PCBISA .         GET INTO THAT PCB'S ISA              10840000
                  R:D  00000        1200          USING SA,13                                                    10850000
 000A26 D207 D000 E000 00000 00000  1201          MVC   SAPSW,(SAPSW-SA)(14) . GIVE IT THE CALLER'S PSW          10860000
 000A2C D202 D005 7009 00005 00009  1202          MVC   SAPSW+5(3),XYXADDR+1 . BUT AT THE REQUESTED ADDRESS      10870000
 000A32 D23F D008 E008 00008 00008  1203          MVC   SAREGS,(SAREGS-SA)(14) .GIVE IT HIS REGISTERS            10880000
 000A38 9200 A018      00018        1204          MVI   PCBSTOPT,X'00' .    IT'S NO LONGER STOPPED               10890000
 000A3C 8200 04D8      004D8        1205          LPSW  RETURN .            AND RETURN                           10900000
 000A40 0A6F                        1206 XYERR    SVC   C'?' .              WE DONE BAD                          10910000
                                    1207          DROP  7,10,13                                                  10920000
                  R:E  00000        1208          USING SA,14                                                    10930000
                  R:F  00000        1209          USING PCB,15                                                   10940000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   33
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'A0A',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                   1211 *********************************************************************** 10960000
                                    1212 *                                                                     * 10970000
                                    1213 *                            XZ ROUTINE                               * 10980000
                                    1214 *                                                                     * 10990000
                                    1215 *        FUNCTION: TO STOP A PROCESS                                  * 11000000
                                    1216 *       DATABASES: UPON ENTRY, REGISTER 2 CONTAINS ADDRESS XZX        * 11010000
                                    1217 *                    XZX       DS OD                                  * 11020000
                                    1218 *                    XZXNAME   DS CL8   NAME OF PROCESS TO BE STOPPED * 11030000
                                    1219 *   ROUTINES USED: XN, XEXC, XCOM, XQUE, XP                           * 11040000
                                    1220 *       PROCEDURE: CHECK THAT USER PROCESS CAN'T STOP SYSTEM          * 11050000
                                    1221 *                  PROCESS; USE XN TO GET PCB POINTER; IF IN SMC, SET * 11060000
                                    1222 *                  STOP WAITING BIT AND BLOCK SELF UNTIL STOP         * 11070000
                                    1223 *                  PERFORMED; ELSE SET STOPPED BIT, AND RETURN.       * 11080000
                                    1224 *    ERROR CHECKS: IF NO PROCESS BY GIVEN NAME OR USER TRIES TO       * 11090000
                                    1225 *                  STOP A SYSTEM PROCESS, XQUE ENTERED.               * 11100000
                                    1226 *      INTERRUPTS: ON                                                 * 11110000
                                    1227 *     USER ACCESS: YES                                                * 11120000
                                    1228 *                                                                     * 11130000
                                    1229 *********************************************************************** 11140000
0                      00A42        1231 XZ       EQU   * .                 THE XZ ROUTINE: STOP A PROCESS       11160000
                  R:1  00A42        1232          USING *,1                                                      11170000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1232 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000A42 1872                        1233          LR    7,2                                                      11180000
                  R:7  00000        1234          USING XZX,7 .             ARG LIST                             11190000
 000A44 955C F000      00000        1235          CLI   PCBNAME,C'*' .      IS STOPPER A * PROCESS               11200000
 000A48 4780 1012            00A54  1236          BE    XZFINE .            THAT'S OK                            11210000
 000A4C 955C 7000      00000        1237          CLI   XZXNAME,C'*' .       IF NOT, IS STOPPEE A * ?            11220000
 000A50 4780 104A            00A8C  1238          BE    XZERR .             CAN'T DO THAT                        11230000
 000A54 4120 E048            00048  1239 XZFINE   LA    2,SATEMP .          READY TO CALL OUT                    11240000
                  R:2  00000        1240          USING XNX,2 .             WILL CALL XN                         11250000
 000A58 D207 2000 7000 00000 00000  1241          MVC   XNXNAME,XZXNAME .   GIVE IT THE NAME                     11260000
 000A5E 0AD5                        1242          SVC   C'N' .              AND DO THE CALL                      11270000
 000A60 58A0 2008            00008  1243          L     10,XNXADDR .        GET THE PCB'S ADDRESS                11280000
 000A64 12AA                        1244          LTR   10,10 .             SEE IF NULL                          11290000
 000A66 4780 104A            00A8C  1245          BZ    XZERR .             IF SO, ERROR                         11300000
 000A6A 0A5A                        1246          SVC   C'!' .              ENTER SMC                            11310000
                                    1247          DROP  2,15                                                     11320000
                  R:A  00000        1248          USING PCB,10                                                   11330000
 000A6C 9500 A01A      0001A        1249 XZSTOP   CLI   PCBINSMC,X'00' .    SEE IF IN SMC                        11340000
 000A70 4770 103C            00A7E  1250          BNE   XZINSMC .           IF SO, BAD                           11350000
 000A74 92FF A018      00018        1251          MVI   PCBSTOPT,X'FF' .    ELSE JUST STOP IT                    11360000
 000A78 0A6B                        1252          SVC   C',' .              LEAVE SMC                            11370000
 000A7A 8200 04D8      004D8        1253          LPSW  RETURN .            AND RETURN                           11380000
 000A7E 92FF A01B      0001B        1254 XZINSMC  MVI   PCBSW,X'FF' .       IF IN SMC, SAY STOP WAITING          11390000
 000A82 4120 A034            00034  1255          LA    2,PCBSRS .          AND STOP OURSELVES AGAINST           11400000
```

```
 000A86 0AD7                        1256          SVC   C'P' .               A SEMAPHORE                        11410000
 000A88 47F0 102A             00A6C 1257          B     XZSTOP .            THEN WE CAN REALLY STOP IT          11420000
 000A8C 0A6F                        1258 XZERR    SVC   C'?' .              AN ERROR                            11430000
                                    1259          DROP  10,7                                                    11440000
                 R:F  00000         1260          USING PCB,15                                                  11450000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                             PAGE   34
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'A42',R1  SA,R14  PCB,R15
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                   1262 *********************************************************************** 11470000
                                    1263 *                                                                     * 11480000
                                    1264 *                            XQUE ROUTINE                             * 11490000
                                    1265 *                                                                     * 11500000
                                    1266 *        FUNCTION: TO SIGNAL ERROR CONDITION                          * 11510000
                                    1267 *       DATABASES: NONE                                               * 11520000
                                    1268 *   ROUTINES USED: XR, XS                                             * 11530000
                                    1269 *       PROCEDURE: SEND MESSAGE TO SUPERVISOR PROCESS FOR THIS JOB    * 11540000
                                    1270 *                  INDICATING ABNORMAL TERMINATION; TRY TO READ       * 11550000
                                    1271 *                  MESSAGES, FOREVER LOOPING; BLOCK ITSELF, THEREBY   * 11560000
                                    1272 *                  NEVER RETURNING.                                   * 11570000
                                    1273 *    ERROR CHECKS: NONE                                               * 11580000
                                    1274 *      INTERRUPTS: OFF                                                * 11590000
                                    1275 *     USER ACCESS: YES                                                * 11600000
                                    1276 *                                                                     * 11610000
                                    1277 *********************************************************************** 11620000
0                     00A8E         1279 XQUE     EQU   * .                 THE XQUE ROUTINE: ERROR!            11640000
                 R:1  00A8E         1280          USING *,1                                                     11650000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1280 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000A8E 4120 1012             00AA0 1281          LA    2,XQUEM1 .          SEND AN ERROR MESSAGE TO *IBSUP     11660000
 000A92 0AE2                        1282          SVC   C'S'                                                    11670000
 000A94 4120 102A             00AB8 1283 XQUELOOP LA    2,XQUEM2 .          WAIT FOR REPLY                      11680000
 000A98 0AD9                        1284          SVC   C'R'                                                    11690000
 000A9A 47F0 1006             00A94 1285          B     XQUELOOP .          BUT IGNORE IT                       11700000
 000AA0                             1286          DS    0F                                                      11710000
 000AA0 5CC9C2E2E4D74040            1287 XQUEM1   DC    CL8'*IBSUP'                                             11720000
 000AA8 0000000C                    1288          DC    F'12'                                                   11730000
 000AAC D7D9D6C7D9C1D440            1289          DC    CL12'PROGRAM FLOP'                                      11740000
 000AB8                             1290 XQUEM2   DS    CL8                                                     11750000
 000AC0 00000001                    1291          DC    F'1'                                                    11760000
 000AC4                             1292          DS    CL1,0H                                                  11770000
                                    1293          DROP  14,15                                                   11780000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                             PAGE   35
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'A8E',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                   1295 *********************************************************************** 11800000
                                    1296 *                                                                     * 11810000
                                    1297 *                           INPUT/OUTPUT ROUTINES                     * 11820000
                                    1298 *                                                                     * 11830000
                                    1299 *********************************************************************** 11840000
0                                   1301 *********************************************************************** 11860000
                                    1302 *                                                                     * 11870000
                                    1303 *             SYSTEM SUPPLIED DEVICE HANDLER FOR READERS              * 11880000
                                    1304 *                                                                     * 11890000
                                    1305 *********************************************************************** 11900000
0                     00AC6         1307 RDRHANDL EQU   * .                 THE READER HANDLER                  11920000
                 R:3  00000         1308          USING UCB,3 .             STARTED WITH REG3 -> UCB            11930000
 000AC6 0510                        1309          BALR  1,0                                                     11940000
                 R:1  00AC8         1310          USING *,1 .               ESTABLISH ADDRESSING                11950000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1310 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000AC8 4120 1160             00C28 1311          LA    2,RDRHSEM .         LOCK OURSELVES UNTIL WE SET UP      11960000
```

```
000ACC 0AD7                          1312          SVC   C'P' .               AN AUTOMATIC STORAGE AREA          11970000
000ACE 4120 1174             00C3C   1313          LA    2,RDRHAAS .          READY TO ALLOCATE                  11980000
                   R:2  00000        1314          USING XAX,2                                                   11990000
000AD2 0AC5                          1315          SVC   C'E' .               ALLOCATE                           12000000
000AD4 58C0 2004             00004   1316          L     12,XAXADDR .         GET A PTR                          12010000
                                     1317          DROP  2                                                       12020000
000AD8 4120 1160             00C28   1318          LA    2,RDRHSEM .          AND UNBLOCK OURSELVES              12030000
000ADC 0AE5                          1319          SVC   C'V'                                                    12040000
000ADE 8840 0010             00010   1320          SRL   4,16 .               SHIFT KEY                          12050000
000AE2 1BAA                          1321          SR    10,10 .              CLEAR REG 10                       12060000
                   R:C  00000        1322          USING RDRHAS,12 .          AUTOMATIC AREA                     12070000
000AE4 9200 C07A       0007A         1323          MVI   JOBBIT,X'00' .       INITIALIZE                         12080000
000AE8 4160 C000             00000   1324          LA    6,RDRHCCB .          GET PTR TO CCB                     12090000
000AEC 4120 C008             00008   1325 RDRHLOOP LA    2,RDRHMSG .          TRY TO READ A MESSAGE              12100000
                   R:2  00000        1326          USING XRX,2                                                   12110000
000AF0 D203 2008 13A0 00008  00E68   1327          MVC   XRXSIZE,=F'8' .      WE CAN TAKE 8 CHARS                12120000
000AF6 0AD9                          1328          SVC   C'R' .               READ IT                            12130000
000AF8 D503 13AC 200C 00E74  0000C   1329          CLC   =C'READ',XRXTEXT .   IF FIRST WORD IS READ, OK          12140000
000AFE 4770 1024             00AEC   1330          BNE   RDRHLOOP .           ELSE IGNORE                        12150000
000B02 5850 2010             00010   1331          L     5,XRXTEXT+4 .        GET 2ND WORD OF TEXT               12160000
                                     1332          DROP  2                                                       12170000
000B06 4120 3004             00004   1333          LA    2,UCBUS .            LOCK THE UCB AND IT'S UNIT         12180000
000B0A 0AD7                          1334          SVC   C'P'                                                    12190000
000B0C 4120 C008             00008   1335          LA    2,RDRHMSG .          RESET ADDRESSING POINTER           12200000
                   R:2  00000        1336          USING XRX,2                                                   12210000
000B10 95FF C07A       0007A         1337          CLI   JOBBIT,X'FF' .       HAVE WE JUST READ $JOB CARD?       12220000
000B14 4770 1066             00B2E   1338          BNE   RDRHMORE .           IF NO, GO CHECK PROTECTION, ELSE   12230000
000B18 955C 2000       00000         1339          CLI   XRXNAME,C'*' .       IS JSP CALLING US?                 12240000
000B1C 4770 10F8             00BC0   1340          BNE   RDRHNO .             IF NOT, TELL HIM NO.               12250000
000B20 D24F 5000 C01C 00000  0001C   1341          MVC   0(80,5),RDRHTEMP .   IF IT IS, GIVE JSP THE $JOB CARD   12260000
000B26 9200 C07A       0007A         1342          MVI   JOBBIT,X'00' .       SAY WE DON'T HAVE $JOB WAITING     12270000
000B2A 47F0 1114             00BDC   1343          B     RDRHSOK .             AND SEND MESSAGE BACK              12280000
                                     1344          DROP  2                                                       12290000
000B2E 955C C008       00008         1345 RDRHMORE CLI   RDRHMSG,C'*' .       IS SYSTEM CALLING?                 12300000
000B32 4780 1098             00B60   1346          BE    RDRHPOK .            THEN PROTECTION OK, ELSE           12310000
000B36 18B5                          1347          LR    11,5 .               GET ADDRESS THAT'S TO HOLD CARD,   12320000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                        PAGE   36
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'AC8',R1  UCB,R3  RDRHAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000B38 54B0 116C            00C34   1348          N     11,PROTCON1 .        GET THE PAGE BOUNDARY              12330002
                                     1349 *        ISKE  10,11 .              FIND STORAGE KEY                   12334002
000B3C B22900AB                      1350          DC    X'B22900AB'          ASSEMBLER (XF) DOESN'T SUPPORT ISKE 12338002
000B40 54A0 1170             00C38   1351          N     10,PROTCON2 .        IGNORE LOW ORDER BITS              12342002
000B44 19A4                          1352          CR    10,4 .               DOES IT MATCH OURS?                12350000
000B46 4770 10F8             00BC0   1353          BNE   RDRHNO .             IF NOT, TELL HIM NO                12360000
000B4A 41B5 004F             0004F   1354          LA    11,79(5) .           CHECK LAST BYTE ADDR OF CARD       12370000
000B4E 54B0 116C             00C34   1355          N     11,PROTCON1 .        GET THE PAGE BOUNDARY              12380002
                                     1356 *        ISKE  10,11 .              FIND STORAGE KEY                   12384002
000B52 B22900AB                      1357          DC    X'B22900AB'          ASSEMBLER (XF) DOESN'T SUPPORT ISKE 12388002
000B56 54A0 1170             00C38   1358          N     10,PROTCON2 .        IGNORE LOW ORDER BITS              12392002
000B5A 19A4                          1359          CR    10,4 .               DOES IT MATCH OURS?                12400000
000B5C 4770 10F8             00BC0   1360          BNE   RDRHNO .             IF NOT, TELL HIM NO                12410000
000B60 5450 1168             00C30   1361 RDRHPOK  N     5,CCBCON1 .          MAKE ADDRESS INTO                  12420000
000B64 5050 C000             00000   1362          ST    5,RDRHCCB .          A CCW (OR CCB)                     12430000
000B68 9602 C000       00000         1363          OI    RDRHCCB,X'02'                                           12440000
000B6C D203 C004 13B0 00004  00E78   1364          MVC   RDRHCCB+4,=F'80' .   WE'LL READ EIGHTY CHARACTERS       12450000
000B72 D203 3014 1398 00014  00E60   1365          MVC   UCBCSW(4),=A(0) .    CLEAR THE LAST CSW THERE           12460000
000B78 D203 3018 1398 00018  00E60   1366          MVC   UCBCSW+4(4),=A(0)                                       12470000
000B7E 4120 0194             00194   1367          LA    2,CAWSEM .           LOCK THE CAW                       12480000
000B82 0AD7                          1368          SVC   C'P'                                                    12490000
000B84 5060 0048             00048   1369          ST    6,CAW .              THAT'S THE CAW                     12500000
```

```
000B88 5870 3000            00000  1370          L     7,UCBADDR .          GET THE UNIT ADDRESS                  12510000
000B8C 9C00 7000      00000        1371          SIO   0(7) .               START THE I/O                         12520000
000B90 4770 1154            00C1C  1372          BNZ   RDSTATUS .           BRANCH IF SIO UNSUCCESSFUL            12530000
000B94 0AE5                        1373          SVC   C'V' .               THEN UNLOCK THE CAW                   12540000
000B96 4120 300C            0000C  1374 RDRHWAIT LA    2,UCBWS .            NOW WAIT FOR AN INTERRUPT             12550000
000B9A 0AD7                        1375          SVC   C'P'                                                     12560000
000B9C 9185 3018      00018        1376          TM    UCBCSW+4,X'85' .     CHECK THE STATUS                      12570003
000BA0 4780 10CE            00B96  1377          BZ    RDRHWAIT .           IF NOT FINISHED, WAIT                 12580000
000BA4 9101 3018      00018        1378          TM    UCBCSW+4,X'01' .     CHECK FOR EXCEPTION                   12590000
000BA8 4710 10F0            00BB8  1379          BO    RDRHEXC .            IF YES, IGNORE THIS INTERRUPT         12600003
000BAC 9180 3018      00018        1380          TM    UCBCSW+4,X'80' .     IF NO, CHECK FOR ATTENTION            12602003
000BB0 4710 1098            00B60  1381          BO    RDRHPOK .            IF YES, TRY TO RESTART THE I/O        12604003
000BB4 47F0 1102            00BCA  1382          B     RDRHOK .             ELSE, ALL IS GROOVY                   12606003
000BB8 94FE 3018      00018        1383 RDRHEXC  NI    UCBCSW+4,X'FE' .     CLEAR EXCEPTION ..                    12608003
000BBC 47F0 10CE            00B96  1384          B     RDRHWAIT .            .. AND CONTINUE WAITING              12610003
000BC0 D201 C078 13CC 00078 00E94  1385 RDRHNO   MVC   RDRHM+12(2),=C'NO' . MESSAGE BACK IS NO                  12612003
000BC6 47F0 111A            00BE2  1386          B     RDRHSEND .           GET READY TO SEND                     12620000
000BCA 955C C008      00008        1387 RDRHOK   CLI   RDRHMSG,C'*' .       IS THE SYSTEM CALLING?                12630000
000BCE 4780 1114            00BDC  1388          BE    RDRHSOK .            THAT'S FINE. OTHERWISE,               12640000
000BD2 D504 13D0 5000 00E98 00000  1389          CLC   =C'$JOB,',0(5) .     WAS IT A $JOB CARD?                   12650000
000BD8 4780 1136            00BFE  1390          BE    ENDADATA .           OOPS! WE HIT END OF DATA STREAM        12660000
000BDC D201 C078 13CE 00078 00E96  1391 RDRHSOK  MVC   RDRHM+12(2),=C'OK' .GROOVINESS MESSAGE                   12670000
000BE2 D203 C074 13A8 00074 00E70  1392 RDRHSEND MVC   RDRHM+8(4),=F'2' .   SAY THERE ARE 2 CHARACTERS           12680000
000BE8 D207 C06C C008 0006C 00008  1393          MVC   RDRHM+0(8),RDRHMSG+0 . SEND BACK TO SAME GUY            12690000
000BEE 4120 3004            00004  1394          LA    2,UCBUS .            NOW UNLOCK UCB AND UNIT               12700000
000BF2 0AE5                        1395          SVC   C'V'                                                     12710000
000BF4 4120 C06C            0006C  1396          LA    2,RDRHM .            SET UP MESSAGE                        12720000
000BF8 0AE2                        1397          SVC   C'S' .                AND SEND IT                           12730000
000BFA 47F0 1024            00AEC  1398          B     RDRHLOOP                                                   12740000
000BFE D201 C078 13CC 00078 00E94  1399 ENDADATA MVC   RDRHM+12(2),=C'NO' . TELL USER NO MORE CARDS              12750000
000C04 D24F C01C 5000 0001C 00000  1400          MVC   RDRHTEMP(80),0(5) . SAVE THE $JOB CARD                   12760000
000C0A 9240 5000      00000        1401          MVI   0(5),C' ' .          BLANK OUT THE USER'S COPY             12770000
000C0E D24E 5001 5000 00001 00000  1402          MVC   1(79,5),0(5)                                             12780000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                       PAGE   37
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'AC8',R1  UCB,R3  RDRHAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0000C14 92FF C07A      0007A        1403          MVI   JOBBIT,X'FF' .      INDICATE WE HAVE A NEW $JOB CARD      12790000
000C18 47F0 111A            00BE2  1404          B     RDRHSEND .           AND SEND THE MESSAGE BACK             12800000
000C1C 0AE5                        1405 RDSTATUS SVC   C'V' .               UNLOCK THE CAW                        12810000
000C1E 4120 300C            0000C  1406          LA    2,UCBWS .            AND WAIT FOR AN INTERRUPT             12820000
000C22 0AD7                        1407          SVC   C'P'                                                     12830000
000C24 47F0 1098            00B60  1408          B     RDRHPOK .            AND TRY TO RESTART THE I/O            12840000
                                   1409          DROP  3,12                                                     12850000
0000C28 0000000100000000           1411 RDRHSEM  DC    F'1,0'                                                   12870000
000C30 00FFFFFF                    1412 CCBCON1  DC    X'00FFFFFF' MASK                                         12880000
000C34 00FFF000                    1413 PROTCON1 DC    X'00FFF000'          PAGE ALIGNMENT                    12890002
000C38 FFFFFFF0                    1414 PROTCON2 DC    X'FFFFFFF0'          IGNORE LOW ORDER BITS             12893002
000C3C 00000080                    1415 RDRHAAS  DC    A(LENRDRHA) ALLOCATE ARGLIST FOR STORAGE               12900000
000C40 00000000                    1416          DC    F'0'                                                     12910000
000C44 00000008                    1417          DC    F'8'                                                     12920000
-
                                   1419 ************************************************************************ 12940000
                                   1420 *                                                                      * 12950000
                                   1421 *            SYSTEM SUPPLIED DEVICE HANDLER FOR PRINTERS               * 12960000
                                   1422 *                                                                      * 12970000
                                   1423 ************************************************************************ 12980000
0                     00C48        1425 PRTHANDL EQU   * .                  THE PRINTER HANDLER                   13000000
                    R:3  00000     1426          USING UCB,3 .              ENTERED WITH REG3 -> THE UCB          13010000
000C48 0510                        1427          BALR  1,0                                                      13020000
                    R:1  00C4A     1428          USING *,1 .                ESTABLISH ADDRESSING                  13030000
** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
```

```
** ASMA435I RECORD 1428 IN /MBHFS/SOS4K.ASM ON VOLUME:
000C4A 4120 1116            00D60  1429          LA    2,PRTHSEM .          LOCK UNTIL ALLOCATE STORAGE          13040000
000C4E 0AD7                        1430          SVC   C'P' .                                                    13050000
000C50 4120 111E            00D68  1431          LA    2,PRTHAAS .          READY TO ALLOCATE                    13060000
                    R:2  00000     1432          USING XAX,2                                                     13070000
000C54 0AC5                        1433          SVC   C'E' .               ALLOCATE                             13080000
000C56 58C0 2004            00004  1434          L     12,XAXADDR .         GET THE ADDRESS                      13090000
                                   1435          DROP  2                                                         13100000
000C5A 4120 1116            00D60  1436          LA    2,PRTHSEM .                                               13110000
000C5E 0AE5                        1437          SVC   C'V'                 UNLOCK TO ROUTINE                    13120000
000C60 8840 0010            00010  1438          SRL   4,16 .               SHIFT KEY                            13130000
000C64 1BAA                        1439          SR    10,10 .              CLEAR REG 10                         13140000
                    R:C  00000     1440          USING PRTHAS,12 .          ADDRESSING IN THE AUTO AREA          13150000
000C66 4160 C000            00000  1441          LA    6,PRTHCCB .          MAKE A CAW                           13160000
000C6A 4120 C008            00008  1442 PRTHLOOP LA    2,PRTHMSG .          READY TO READ A MESSAGE              13170000
                    R:2  00000     1443          USING XRX,2                                                     13180000
000C6E D203 2008 121E 00008 00E68  1444          MVC   XRXSIZE,=F'8' .      WE CAN TAKE 8 CHARACTERS             13190000
000C74 0AD9                        1445          SVC   C'R' .               READ IT                              13200000
000C76 5850 2010            00010  1446          L     5,XRXTEXT+4 .        LOAD THE ADDRESS                     13210000
000C7A D503 1232 200C 00E7C 0000C  1447          CLC   =C'PRIN',XRXTEXT .   IS IT A PRIN REQUEST?                13220000
000C80 4780 1048            00C92  1448          BE    PRTHPRIN                                                  13230000
000C84 D503 1236 200C 00E80 0000C  1449          CLC   =C'STC1',XRXTEXT .   OR A SKIP REQUEST?                   13240000
000C8A 4780 1096            00CE0  1450          BE    PRTHSTC1                                                  13250000
000C8E 47F0 1020            00C6A  1451          B     PRTHLOOP .           IF NEITHER, IGNORE                   13260000
                                   1452          DROP  2                                                         13270000
 000C92 4120 3004           00004  1453 PRTHPRIN LA    2,UCBUS                                                   13280000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   38
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'C4A',R1  UCB,R3  PRTHAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0000C96 0AD7                       1454          SVC   C'P' .               LOCK THE UCB AND UNIT                13290000
 000C98 955C C008      00008       1455          CLI   PRTHMSG,C'*' .       IS SYSTEM CALLING?                   13300000
 000C9C 4780 1080            00CCA  1456          BE    PRTHPOK .            THEN PROTECTION OK. ELSE             13310000
 000CA0 18B5                        1457          LR    11,5 .               GET ADDRESS THAT'S TO HOLD MSG,      13320000
 000CA2 54B0 0C34            00C34  1458          N     11,PROTCON1 .        GET THE PAGE BOUNDARY                13330002
                                   1459 *        ISKE  10,11 .              FIND STORAGE KEY                     13334002
 000CA6 B22900AB                   1460          DC    X'B22900AB'          ASSEMBLER (XF) DOESN'T SUPPORT ISKE  13338002
 000CAA 54A0 0C38            00C38  1461          N     10,PROTCON2 .        IGNORE LOW ORDER BITS                13342002
 000CAE 19A4                        1462          CR    10,4 .               DOES IT MATCH OURS?                  13350000
 000CB0 4770 10DC            00D26  1463          BNE   PRTHNO .             IF NOT, TELL HIM NO                  13360000
 000CB4 41B5 0083            00083  1464          LA    11,131(5) .          CHECK LAST BYTE ADDRESS OF LINE      13370000
 000CB8 54B0 0C34            00C34  1465          N     11,PROTCON1 .        GET THE PAGE BOUNDARY                13380002
                                   1466 *        ISKE  10,11 .              FIND STORAGE KEY                     13384002
 000CBC B22900AB                   1467          DC    X'B22900AB'          ASSEMBLER (XF) DOESN'T SUPPORT ISKE  13388002
 000CC0 54A0 0C38            00C38  1468          N     10,PROTCON2 .        IGNORE LOW ORDER BITS                13392002
 000CC4 19A4                        1469          CR    10,4 .               DOES IT MATCH OURS?                  13400000
 000CC6 4770 10DC            00D26  1470          BNE   PRTHNO .             IF NOT, TELL HIM NO                  13410000
 000CCA 5450 0C30            00C30  1471 PRTHPOK  N     5,CCBCON1 .          MAKE A WRITE REQUEST                 13420000
 000CCE 5050 C000            00000  1472          ST    5,PRTHCCB .          FOR THE CCB                          13430000
 000CD2 9609 C000      00000       1473          OI    PRTHCCB,X'09' .      PRINT COMMAND CODE                   13440000
 000CD6 D203 C004 123A 00004 00E84  1474          MVC   PRTHCCB+4,=F'132' . WE'LL PRINT 132 CHARACTERS           13450000
 000CDC 47F0 10A2            00CEC  1475          B     PRTHCOMM .           BRANCH TO COMMON SECTION             13460000
 000CE0 D207 C000 1206 00000 00E50  1476 PRTHSTC1 MVC   PRTHCCB(8),=X'8900000020000001' SKIP TO TOP OF PAGE      13470000
 000CE6 4120 3004            00004  1477          LA    2,UCBUS                                                   13480000
 000CEA 0AD7                        1478          SVC   C'P' .               LOCK THE UCB AND UNIT                13490000
 000CEC 4120 0194            00194  1479 PRTHCOMM LA    2,CAWSEM .           LOCK THE CAW                         13500000
 000CF0 0AD7                        1480          SVC   C'P'                                                      13510000
 000CF2 5060 0048            00048  1481          ST    6,CAW .              STORE OUR CAW                        13520000
 000CF6 D203 3014 1216 00014 00E60  1482          MVC   UCBCSW(4),=A(0) .    CLEAR THE LAST CSW THERE             13530000
 000CFC D203 3018 1216 00018 00E60  1483          MVC   UCBCSW+4(4),=A(0)                                         13540000
 000D02 5870 3000            00000  1484          L     7,UCBADDR .          GET THE ADDRESS                      13550000
 000D06 9C00 7000      00000       1485          SIO   0(7) .               START THE I/O                        13560000
```

```
000D0A 4770 1108              00D52  1486           BNZ   PTSTATUS .          BRANCH IF SIO UNSUCCESSFUL          13570000
000D0E 0AE5                          1487           SVC   C'V' .              AND UNLOCK THE CAW                  13580000
000D10 4120 300C              0000C  1488 PRTHWAIT  LA    2,UCBWS .           START TO WAIT                       13590000
000D14 0AD7                          1489           SVC   C'P'                                                    13600000
000D16 9105 3018      00018          1490           TM    UCBCSW+4,X'05' .    IS THE UNIT READY?                  13610000
000D1A 4780 10C6              00D10  1491           BZ    PRTHWAIT .          IF NOT, ITS STILL ON. WAIT          13620000
000D1E 9101 3018      00018          1492           TM    UCBCSW+4,X'01' .    WAS THERE AN EXCEPTION?             13630000
000D22 4780 10E6              00D30  1493           BZ    PRTHOK .            IF NOT, GOOD                        13640000
000D26 D201 C028 124A 00028 00E94    1494 PRTHNO    MVC   PRTHM+12(2),=C'NO' .THERE WAS, SO SAY SO              13650000
000D2C 47F0 10EC              00D36  1495           B     PRTHSEND                                                13660000
000D30 D201 C028 124C 00028 00E96    1496 PRTHOK    MVC   PRTHM+12(2),=C'OK' .NO ERRORS                         13670000
000D36 D203 C024 1226 00024 00E70    1497 PRTHSEND  MVC   PRTHM+8(4),=F'2' .  SENDING 2 CHARACTERS             13680000
000D3C D207 C01C C008 0001C 00008    1498           MVC   PRTHM+0(8),PRTHMSG+0 . SEND TO OUR SENDER             13690000
000D42 4120 3004              00004  1499           LA    2,UCBUS                                                 13700000
000D46 0AE5                          1500           SVC   C'V' .              UNLOCK THE UCB                      13710000
000D48 4120 C01C              0001C  1501           LA    2,PRTHM                                                 13720000
000D4C 0AE2                          1502           SVC   C'S' .              SEND IT                             13730000
000D4E 47F0 1020              00C6A  1503           B     PRTHLOOP .          AND READ ANOTHER MESSAGE            13740000
000D52 0AE5                          1504 PTSTATUS  SVC   C'V' .              UNLOCK THE CAW                      13750000
000D54 4120 300C              0000C  1505           LA    2,UCBWS .           AND WAIT FOR THE INTERRUPT          13760000
000D58 0AD7                          1506           SVC   C'P'                                                    13770000
000D5A 47F0 10A2              00CEC  1507           B     PRTHCOMM .          AND TRY TO RESTART THE I/O          13780000
                                     1508           DROP  3,12                                                    13790000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   39
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'C4A',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0000D5E 0000
 000D60 0000000100000000             1510 PRTHSEM  DC    F'1,0' LOCK                                             13810000
 000D68 00000030                     1511 PRTHAAS  DC    A(LENPRTHA) XA ARG LIST FOR AUTO STORAGE                13820000
 000D6C 00000000                     1512           DC    F'0'                                                    13830000
 000D70 00000008                     1513           DC    F'8'                                                    13840000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   40
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'C4A',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0                                    1515 ********************************************************************** 13860000
                                     1516 *                                                                    * 13870000
                                     1517 *            SYSTEM ROUTINE FOR USER SUPPLIED DEVICE HANDLER         * 13880000
                                     1518 *                                                                    * 13890000
                                     1519 ********************************************************************** 13900000
0                     00D74          1521 EXCPHNDL EQU   * .                 EXCP DEVICE HANDLER                 13920000
                  R:3 00000          1522           USING UCB,3 .            WILL HAVE REG3 -> UCB               13930000
 000D74 0510                         1523           BALR  1,0                                                    13940000
                  R:1 00D76          1524           USING *,1 .              ESTABLISH ADDRESSING                13950000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1524 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000D76 4120 10C6              00E3C  1525           LA    2,EXCPHSEM .       LOCK OURSELVES UNTIL WE HAVE        13960000
 000D7A 0AD7                          1526           SVC   C'P' .             SET UP AUTOMATIC STORAGE            13970000
 000D7C 4120 10CE              00E44  1527           LA    2,EXCPHAAS .       READY TO ALLOCATE                   13980000
                  R:2 00000          1528           USING XAX,2                                                  13990000
 000D80 0AC5                         1529           SVC   C'E' .             ALLOCATE                            14000000
 000D82 58C0 2004              00004  1530           L     12,XAXADDR .       GET POINTER TO AUTO STORAGE         14010000
                                     1531           DROP  2                                                      14020000
 000D86 4120 10C6              00E3C  1532           LA    2,EXCPHSEM .       AND UNLOCK OURSELVES                14030000
 000D8A 0AE5                         1533           SVC   C'V'               UNLOCK TO ROUTINE                   14040000
 000D8C 184B                         1534           LR    4,11                                                   14050000
 000D8E 8940 0008              00008  1535           SLL   4,8 .              SHIFT KEY FOR CAW                   14060000
                  R:C 00000          1536           USING EXCPHAS,12 .       FOR ADDRESSING AUTO AREA            14070000
 000D92 4120 C000              00000  1537 EXCPLOOP  LA    2,EXCPHMSG .       TRY TO READ A MESSAGE               14080000
                  R:2 00000          1538           USING XRX,2                                                  14090000
 000D96 D203 2008 1112 00008 00E88    1539           MVC   XRXSIZE,=F'12' .   WE'LL TAKE 12 CHARACTERS            14100000
 000D9C 0AD9                         1540           SVC   C'R'                                                   14110000
```

```
000D9E D503 1116 200C 00E8C 0000C  1541           CLC   =C'EXCP',XRXTEXT .  IS IT AN EXCP MESSAGE?              14120000
000DA4 4770 101C             00D92  1542           BNE   EXCPLOOP .          IF NOT, IGNORE IT                  14130000
000DA8 5850 2010             00010  1543           L     5,XRXTEXT+4 .       REG 5 CONTAINS CHAN AND DEV        14140000
000DAC 5860 2014             00014  1544           L     6,XRXTEXT+8 .       REG 6 CONTAINS ADDR OF CCWS        14150000
                                    1545           DROP  2                                                      14160000
000DB0 4170 112E             00EA4  1546           LA    7,UCBTABLE .        GET PTR TO UCB TABLE               14170000
000DB4 5957 0000             00000  1547 EXCPCOMP C     5,0(7) .            COMPARE UNIT ADDRESS               14180000
000DB8 4780 1054             00DCA  1548           BE    EXCPFIND .          THAT'S THE UCB WE WANT             14190000
000DBC 4177 0020             00020  1549           LA    7,UCBLENG(7) .      GET PTR TO NEXT UCB                14200000
000DC0 5970 111A             00E90  1550           C     7,=A(UCBTBEND) .    ARE WE THROUGH WITH TABLE?         14210000
000DC4 4770 103E             00DB4  1551           BNE   EXCPCOMP .          IF NOT, LOOK SOME MORE             14220000
000DC8 0A6F                         1552           SVC   C'?' .              ELSE ERROR                         14230000
000DCA 1837                         1553 EXCPFIND LR    3,7 .               SET REG 3 TO UCB PTR               14240000
000DCC 4120 3004             00004  1554           LA    2,UCBUS                                              14250000
000DD0 0AD7                         1555           SVC   C'P' .              LOCK THE UCB                       14260000
000DD2 1664                         1556           OR    6,4 .               OR IN THE USER'S KEY               14270000
000DD4 D203 3014 10EA 00014 00E60  1557           MVC   UCBCSW(4),=A(0) .   CLEAR THE LAST CSW THERE           14280000
000DDA D203 3018 10EA 00018 00E60  1558           MVC   UCBCSW+4(4),=A(0)                                      14290000
000DE0 4120 0194             00194  1559           LA    2,CAWSEM                                             14300000
000DE4 0AD7                         1560           SVC   C'P' .              LOCK CAW                           14310000
000DE6 5060 0048             00048  1561           ST    6,CAW .             STORE OUR CAW                      14320000
000DEA 9C00 5000      00000         1562           SIO   0(5) .              START THE I/O                      14330000
000DEE 0AE5                         1563           SVC   C'V' .              UNLOCK THE CAW                     14340000
000DF0 4120 300C             0000C  1564 EXCPWAIT LA    2,UCBWS .           NOW WAIT FOR AN INTERRUPT          14350000
000DF4 0AD7                         1565           SVC   C'P'                                                   14360000
000DF6 D207 C024 3014 00024 00014  1566           MVC   EXCPHM+12(8),UCBCSW . GIVE USER HIS CSW                14370000
000DFC D203 C020 1112 00020 00E88  1567           MVC   EXCPHM+8(4),=F'12'                                     14380000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                  PAGE   41
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'D76',R1  UCB,R3  EXCPHAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                 HLASM R6.0  2016/08/29 08.42
0000E02 D207 C018 C000 00018 00000  1568           MVC   EXCPHM(8),EXCPHMSG                                    14390000
 000E08 4120 C018             00018  1569           LA    2,EXCPHM                                             14400000
 000E0C 0AE2                         1570           SVC   C'S' .              AND SENT THE MESSAGE               14410000
 000E0E 4120 C000             00000  1571           LA    2,EXCPHMSG .        AND WAIT FOR A REPLY               14420000
                   R:2  00000        1572           USING XRX,2                                                  14430000
 000E12 D203 2008 10F2 00008 00E68  1573           MVC   XRXSIZE(4),=F'8' .  FROM THE USER                      14440000
 000E18 0AD9                         1574           SVC   C'R'                                                   14450000
 000E1A D501 1120 200C 00E96 0000C  1575           CLC   =C'OK',XRXTEXT .    AM I DONE?                         14460000
 000E20 4780 10BA             00E30  1576           BE    EXCPDONE                                             14470000
 000E24 D504 1127 200C 00E9D 0000C  1577           CLC   =C'AGAIN',XRXTEXT . DOES HE WANT ANOTHER CSW?          14480000
 000E2A 4780 107A             00DF0  1578           BE    EXCPWAIT                                             14490000
 000E2E 0A6F                         1579           SVC   C'?' .              WRONG MESSAGE                      14500000
                                     1580           DROP  2                                                      14510000
 000E30 4120 3004             00004  1581 EXCPDONE LA    2,UCBUS .           UNLOCK UNIT                        14520000
 000E34 0AE5                         1582           SVC   C'V'                                                   14530000
 000E36 47F0 101C             00D92  1583           B     EXCPLOOP .          AND GET ANOTHER MESSAGE            14540000
                                     1584           DROP  3,12                                                   14550000
 000E3A 0000
 000E3C 0000000100000000             1585 EXCPHSEM DC    F'1,0'                                               14560000
 000E44 00000030                     1586 EXCPHAAS DC    A(LENEXCPA) .       ALLOCATION OF AUTO STORAGE         14570000
 000E48 00000000                     1587           DC    F'0'                                                 14580000
 000E4C 00000008                     1588           DC    F'8'                                                 14590000
-
 000E50                              1590           LTORG                                                      14610000
 000E50 8900000020000001             1591                 =X'8900000020000001'
 000E58 00000001                     1592                 =F'1'
 000E5C 00000600                     1593                 =A(XA)
 000E60 00000000                     1594                 =A(0)
 000E64 00000148                     1595                 =A(LENPCB)
 000E68 00000008                     1596                 =F'8'
 000E6C FFFFFFF8                     1597                 =F'-8'
```

```
000E70 00000002                  1598                =F'2'
000E74 D9C5C1C4                  1599                =C'READ'
000E78 00000050                  1600                =F'80'
000E7C D7D9C9D5                  1601                =C'PRIN'
000E80 E2E3C3F1                  1602                =C'STC1'
000E84 00000084                  1603                =F'132'
000E88 0000000C                  1604                =F'12'
000E8C C5E7C3D7                  1605                =C'EXCP'
000E90 00000FC4                  1606                =A(UCBTBEND)
000E94 D5D6                      1607                =C'NO'
000E96 D6D2                      1608                =C'OK'
000E98 5BD1D6C26B                1609                =C'$JOB,'
000E9D C1C7C1C9D5                1610                =C'AGAIN'
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   42
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'D76',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0                                 1612 ********************************************************************** 14630000
                                  1613 *                                                                    * 14640000
                                  1614 *             UNIT CONTROL BLOCKS                                    * 14650000
                                  1615 *                                                                    * 14660000
                                  1616 ********************************************************************** 14670000
0000EA4                           1618 UCBTABLE DS    0F .                TABLE OF UNIT CONTROL BLOCKS       14690000
                                  1619 *                            UCB FOR READER 1                        14700000
000EA4 00000012                   1620 UCBRDR1  DC    X'00000012' .       DEVICE ADDRESS,                     14710000
000EA8 0000000100000000           1621          DC    F'1,0' .            USER SEMAPHORE,                     14720000
000EB0 0000000000000000           1622          DC    F'0,0' .            WAIT SEMAPHORE,                     14730000
000EB8 0000000000000000           1623          DC    F'0,0' .            CHANNEL STATUS WORD                 14740000
000EC0 00                         1624          DC    X'00'                                                   14750000
000EC4                            1625          DS    0F                                                      14760000
                                  1626 *                            UCB FOR PRINTER 1                       14770000
000EC4 00000010                   1627 UCBPRT1  DC    X'00000010' .       DEVICE ADDRESS,                     14780000
000EC8 0000000100000000           1628          DC    F'1,0' .            USER SEMAPHORE,                     14790000
000ED0 0000000000000000           1629          DC    F'0,0' .            WAIT SEMAPHORE,                     14800000
000ED8 0000000000000000           1630          DC    F'0,0' .            CHANNEL STATUS WORD                 14810000
000EE0 00                         1631          DC    X'00'                                                   14820000
000EE4                            1632          DS    0F                                                      14830000
                                  1633 *                            UCB FOR READER 2                        14840000
000EE4 0000000C                   1634 UCBRDR2  DC    X'0000000C' .       DEVICE ADDRESS,                     14850000
000EE8 0000000100000000           1635          DC    F'1,0' .            USER SEMAPHORE,                     14860000
000EF0 0000000000000000           1636          DC    F'0,0' .            WAIT SEMAPHORE,                     14870000
000EF8 0000000000000000           1637          DC    F'0,0' .            CHANNEL STATUS WORD                 14880000
000F00 00                         1638          DC    X'00'                                                   14890000
000F04                            1639          DS    0F                                                      14900000
                                  1640 *                            UCB FOR PRINTER 2                       14910000
000F04 0000000E                   1641 UCBPRT2  DC    X'0000000E' .       DEVICE ADDRESS,                     14920000
000F08 0000000100000000           1642          DC    F'1,0' .            USER SEMAPHORE,                     14930000
000F10 0000000000000000           1643          DC    F'0,0' .            WAIT SEMAPHORE,                     14940000
000F18 0000000000000000           1644          DC    F'0,0' .            CHANNEL STATUS WORD                 14950000
000F20 00                         1645          DC    X'00'                                                   14960000
000F24                            1646          DS    0F                                                      14970000
                                  1647 *                            UCB FOR READER 3                        14970302
000F24 00000112                   1648 UCBRDR3  DC    X'00000112' .       DEVICE ADDRESS,                     14970602
000F28 0000000100000000           1649          DC    F'1,0' .            USER SEMAPHORE,                     14970902
000F30 0000000000000000           1650          DC    F'0,0' .            WAIT SEMAPHORE,                     14971202
000F38 0000000000000000           1651          DC    F'0,0' .            CHANNEL STATUS WORD                 14971502
000F40 00                         1652          DC    X'00'                                                   14971802
000F44                            1653          DS    0F                                                      14972102
                                  1654 *                            UCB FOR PRINTER 3                       14972402
000F44 00000110                   1655 UCBPRT3  DC    X'00000110' .       DEVICE ADDRESS,                     14972702
000F48 0000000100000000           1656          DC    F'1,0' .            USER SEMAPHORE,                     14973002
000F50 0000000000000000           1657          DC    F'0,0' .            WAIT SEMAPHORE,                     14973302
```

```
000F58 0000000000000000           1658          DC    F'0,0' .            CHANNEL STATUS WORD                    14973602
000F60 00                         1659          DC    X'00'                                                      14973902
000F64                            1660          DS    0F                                                         14974202
                                  1661 *                          UCB FOR READER 4                           14974502
000F64 0000010C                   1662 UCBRDR4  DC    X'0000010C' .       DEVICE ADDRESS,                    14974802
000F68 0000000100000000           1663          DC    F'1,0' .            USER SEMAPHORE,                    14975102
000F70 0000000000000000           1664          DC    F'0,0' .            WAIT SEMAPHORE,                    14975402
000F78 0000000000000000           1665          DC    F'0,0' .            CHANNEL STATUS WORD                14975702
000F80 00                         1666          DC    X'00'                                                      14976002
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                            PAGE   43
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'D76',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0000F84                           1667          DS    0F                                                         14976302
                                  1668 *                          UCB FOR PRINTER 4                          14976602
000F84 0000010E                   1669 UCBPRT4  DC    X'0000010E' .       DEVICE ADDRESS,                    14976902
000F88 0000000100000000           1670          DC    F'1,0' .            USER SEMAPHORE,                    14977202
000F90 0000000000000000           1671          DC    F'0,0' .            WAIT SEMAPHORE,                    14977502
000F98 0000000000000000           1672          DC    F'0,0' .            CHANNEL STATUS WORD                14977802
000FA0 00                         1673          DC    X'00'                                                      14978102
000FA4                            1674          DS    0F                                                         14978402
                                  1675 *                          UCB FOR CONSOLE 1                          14978504
000FA4 00000009                   1676 UCBCONS1 DC    X'00000009' .       DEVICE ADDRESS,                    14978604
000FA8 0000000100000000           1677          DC    F'1,0' .            USER SEMAPHORE,                    14978704
000FB0 0000000000000000           1678          DC    F'0,0' .            WAIT SEMAPHORE,                    14978804
000FB8 0000000000000000           1679          DC    F'0,0' .            CHANNEL STATUS WORD                14978904
000FC0 00                         1680          DC    X'00'                                                      14979004
000FC4                            1681          DS    0F                                                         14979104
                     00FC4        1682 UCBTBEND EQU   *                                                        14980000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                            PAGE   44
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'D76',R1
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                HLASM R6.0  2016/08/29 08.42
0                                 1684 ********************************************************************** 15000000
                                  1685 *                                                                      * 15010000
                                  1686 *             I/O INTERRUPT HANDLER                                    * 15020000
                                  1687 *                                                                      * 15030000
                                  1688 ********************************************************************** 15040000
0                    00FC4        1690 IOHANDL  EQU   * .                   THE I/O INTERRUPT HANDLER          15060000
 000FC4 900F 01DC          001DC  1691          STM   0,15,IOHSAVE .        SAVE REGISTERS                     15070000
 000FC8 0510                      1692          BALR  1,0                                                      15080000
                R:1  00FCA        1693          USING *,1 .                 ESTABLISH ADRESSING                15090000
 ** ASMA303W MULTIPLE ADDRESS RESOLUTIONS MAY RESULT FROM THIS USING AND THE USING ON STATEMENT NUMBER 131
 ** ASMA435I RECORD 1673 IN /MBHFS/SOS4K.ASM ON VOLUME:
 000FCA 94FD 0039      00039       1694          NI    IOOLD+1,X'FD' .     TURN OFF WAIT BIT                  15100000
 000FCE 5860 172E          016F8  1695          L     6,=A(UCBTABLE) .    GET POINTER TO UCB TABLE           15110000
 000FD2 D501 6002 003A 00002 0003A 1696 IOCOMP   CLC   2(2,6),IOOLD+2 .   COMPARE DEVICE AND CHANNEL          15120000
 000FD8 4780 1022          00FEC  1697          BE    IODEVFND .          IF EQUAL, REG 6 INDICATES PTR      15130000
 000FDC 4166 0020          00020  1698          LA    6,UCBLENG(6) .      INCREMENT TO NEXT ENTRY            15140000
 000FE0 5960 1732          016FC  1699          C     6,=A(UCBTBEND) .    ARE WE AT END OF TABLE?            15150000
 000FE4 4770 1008          00FD2  1700          BNE   IOCOMP .            IF NOT DONE, TRY NEXT UCB          15160000
 000FE8 47F0 106C          01036  1701          B     IOBACK .            ELSE, IGNORE IT                    15170000
                R:6  00000        1702          USING UCB,6 .             IT'S A UCB PTR                     15180000
 000FEC D203 6014 0040 00014 00040 1703 IODEVFND MVC   UCBCSW(4),CSW .     MOVE IN THE NEW CSW                15190000
 000FF2 5870 0044          00044  1704          L     7,CSW+4 .           GET STATUS BYTE                    15200000
 000FF6 5670 6018          00018  1705          O     7,UCBCSW+4 .        OR IN NEW STATUS INFORMATION       15210000
 000FFA 5070 6018          00018  1706          ST    7,UCBCSW+4 .         AND STORE IT BACK                 15220000
 000FFE D201 601A 0046 0001A 00046 1707          MVC   UCBCSW+6(2),CSW+6 . MOVE IN BYTE COUNT                 15230000
 001004 4120 600C          0000C  1708          LA    2,UCBWS                                                  15240000
 001008 9500 601C      0001C       1709          CLI   UCBFPR,X'00' .      IS FAST PROCESSING                 15250000
 00100C 4780 106A          01034  1710          BE    IONOFPR .            REQUIRED? IF NOT, RETURN          15260000
 001010 58F0 0270          00270  1711          L     15,RUNNING .        IF SO, STOP GUY NOW RUNNING        15270000
                R:F  00000        1712          USING PCB,15                                                   15280000
```

```
001014 95FF F019      00019         1713          CLI   PCBBLOKT,X'FF' .    IS ANYONE REALLY RUNNING?            15290000
001018 4780 1062            0102C   1714          BE    IOWAIT .            IF NOT, START UP SLEEPER             15300000
00101C 41D0 F04C            0004C   1715          LA    13,PCBISA .         IF SO, STOP RUNNING PROCESS          15310000
                   R:D  00000         1716          USING SA,13                                                15320000
001020 D207 D000 0038 00000 00038   1717          MVC   SAPSW,IOOLD .       SAVE PROCESS WHICH WAS               15330000
001026 D23F D008 01DC 00008 001DC   1718          MVC   SAREGS,IOHSAVE .     INTERRUPTED                     15340000
                                    1719          DROP  13,15                                                15350000
00102C 9200 0278      00278         1720 IOWAIT   MVI   NEXTTRYM,X'00' .    MAKE NEXTTRY NOT MODIFIED            15360000
001030 0AE5                         1721          SVC   C'V' .              SO CAN FAST PROCESS SLEEPER          15370000
001032 0A4B                         1722          SVC   C'.' .              GO PROCESS IT RIGHT AWAY             15380000
001034 0AE5                         1723 IONOFPR  SVC   C'V' .              AND WAKE UP THE SLEEPER              15390000
001036 980F 01DC            001DC   1724 IOBACK   LM    0,15,IOHSAVE .      RELOAD OUR REGISTERS                 15400000
00103A 8200 0038      00038         1725          LPSW  IOOLD .             AND STEALTHILY RETURN                15410000
                                    1726          DROP  1,6                                                  15420000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                       PAGE   45
   ACTIVE USINGS: PROGRAM,R0
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0                                   1728 ********************************************************************** 15440000
                                    1729 *                                                                    * 15450000
                                    1730 *            IPL ENTERED ROUTINE                                     * 15460000
                                    1731 *                                                                    * 15470000
                                    1732 *        FUNCTION: TO INITIALIZE SYSTEM PARAMETERS, SET STORAGE KEYS, * 15480000
                                    1733 *                  AND CREATE MULTIPLE JOB STREAMS.                  * 15490000
                                    1734 *                                                                    * 15500000
                                    1735 ********************************************************************** 15510000
0                     0103E         1737 IPLRTN   EQU   * .                 THE IPL-ENTERED ROUTINE              15530000
 00103E 0510                        1738          BALR  1,0                                                  15540000
                   R:1  01040       1739          USING *,1 .               ESTABLISH ADDRESSING                 15550000
 001040 D202 007D 1281 0007D 012C1  1740          MVC   IONEW+5(3),SOSIONEW ACTIVATE IO HANDLER                15553002
001046 D202 005D 1289 0005D 012C9   1741          MVC   EXTNEW+5(3),IPLEXNEW IGNORE EXTERNAL INTERRUPTS FOR NOW 15556002
00104C 41F0 10D0            01110   1742          LA    15,IPLPCB .         I'M RUNNING                          15560000
001050 50F0 0270            00270   1743          ST    15,RUNNING .        INITIALIZE 'RUNNING'                 15570000
001054 50F0 0274            00274   1744          ST    15,NEXTTRY .        INITIALIZE 'NEXTTRY'                 15580000
001058 D207 1700 1690 01740 016D0   1745          MVC   VERYEND,=A(0,CORESIZE-(VERYEND-PROGRAM)) FREE CORE     15590000
00105E 4130 0008            00008   1746          LA    3,8 .               SET ZERO KEY AND FETCH PROTECT       15600000
001062 5820 1224            01264   1747          L     2,CORESIZ .         START PAST THE LAST BLOCK            15610000
001066 5B20 161C            0165C   1748 IPLCL    S     2,PAGESIZE .        GET THE PREVIOUS BLOCK, PAGE ALIGNED 15620002
00106A 4740 1036            01076   1749          BM    IPLTH .             IF NEGATIVE, WE'RE THROUGH HERE      15630000
                                    1750 *        SSKE  3,2 .               ELSE SET THE STORAGE KEY TO          15640002
00106E B22B0032                     1751          DC    X'B22B0032'         ASSEMBLER (XF) DOESN'T SUPPORT SSKE  15643002
001072 47F0 1026            01066   1752          B     IPLCL .              ZERO, AND WORK BACKWARDS            15650000
001076 1B44                         1753 IPLTH    SR    4,4 .               INDEX IN TABLES FOR INPUT STREAM     15660000
001078 5850 1088            010C8   1754          L     5,STREAMS .         HOW MANY STREAMS?                    15670000
00107C 4120 1218            01258   1755 IPLLOOP  LA    2,IPLAPCBS .        READY TO ALLOCATE A PCB              15680000
                   R:2  00000       1756          USING XAX,2                                                15690000
001080 0AC1                         1757          SVC   C'A' .              ALLOCATE                             15700000
001082 5820 2004            00004   1758          L     2,XAXADDR .         GET THE ADDRESS                      15710000
001086 D253 2000 1228 00000 01268   1759          MVC   0(TYPLEN,2),TYPPCB .MAKE IT LOOK LIKE A PCB            15720000
00108C 0AC9                         1760          SVC   C'I' .              CHAIN IT ON                          15730000
                   R:2  00000       1761          USING PCB,2                                                15740000
00108E 5020 2008            00008   1762          ST    2,PCBNPTG .         BUT PUT IT IN A GROUP BY ITSELF      15750000
001092 5020 200C            0000C   1763          ST    2,PCBLPTG                                            15760000
                                    1764          DROP  2                                                    15770000
                   R:F  00000       1765          USING PCB,15                                               15780000
001096 50F0 F00C            0000C   1766          ST    15,PCBLPTG .        LIKEWISE FOR THE IPL PCB             15790000
00109A 50F0 F008            00008   1767          ST    15,PCBNPTG                                           15800000
                                    1768          DROP  15                                                   15810000
                   R:2  00000       1769          USING PCB,2                                                15820000
00109E 4180 204C            0004C   1770          LA    8,PCBISA .          GET THE NEW PCB'S ISA                15830000
                   R:8  00000       1771          USING SA,8                                                 15840000
0010A2 4190 8008            00008   1772          LA    9,SAREGS .          ABOUT TO FIX INIT REGS               15850000
```

```
                         R:9  00000         1773          USING REGS,9                                                  15860000
         0010A6 41A0 108C            010CC  1774          LA    10,UCBTAB                                               15870000
         0010AA 1AA4                        1775          AR    10,4                                                    15880000
         0010AC D203 900C A000 0000C 00000  1776          MVC   REG3,0(10) .          REG3 -> (RDRUCB,PRTUCB)           15890000
         0010B2 D203 9010 A010 00010 00010  1777          MVC   REG4,KEYTAB-UCBTAB(10) . REG4 = KEY                     15900000
                                            1778          DROP  9                                                       15910000
         0010B8 4144 0004            00004  1779          LA    4,4(4) .              GO TO NEXT JOB STREAM             15920000
         0010BC 4650 103C            0107C  1780          BCT   5,IPLLOOP .           DO FOR EACH STREAM                15930000
         0010C0 D202 005D 1285 0005D 012C5  1781          MVC   EXTNEW+5(3),SOSEXNEW REACTIVATE EXT INTERRUPT HANDLER   15935002
         0010C6 0A4B                        1782          SVC   C'.' .                THEN ENTER TRAFFIC CONTROLLER     15940000
```



```
        00010C8 00000004                    1784 STREAMS  DC    F'4' .                NUMBER OF STREAMS                 15960002
        0                      010CC        1786 UCBTAB   EQU   * .                   TABLE OF PTRS TO UCB BLOCKS       15980000
         0010CC 000010EC                    1787          DC    A(UCBLP1)                                               15990000
         0010D0 000010F4                    1788          DC    A(UCBLP2)                                               16000000
         0010D4 000010FC                    1789          DC    A(UCBLP3)                                               16003002
         0010D8 00001104                    1790          DC    A(UCBLP4)                                               16006002
        0                      010DC        1792 KEYTAB   EQU   * .                   TABLE OF PROTECTION KEYS          16020000
         0010DC 00100000                    1793          DC    X'00100000'           STORAGE KEY FOR STREAM 1 REGION   16030002
         0010E0 00200000                    1794          DC    X'00200000'           STORAGE KEY FOR STREAM 2 REGION   16034002
         0010E4 00300000                    1795          DC    X'00300000'           STORAGE KEY FOR STREAM 3 REGION   16038002
         0010E8 00400000                    1796          DC    X'00400000'           STORAGE KEY FOR STREAM 4 REGION   16042002
        00010EC 00000EA400000EC4            1798 UCBLP1   DC    A(UCBRDR1,UCBPRT1)                                      16060000
         0010F4 00000EE400000F04            1799 UCBLP2   DC    A(UCBRDR2,UCBPRT2)                                      16070000
         0010FC 00000F2400000F44            1800 UCBLP3   DC    A(UCBRDR3,UCBPRT3)                                      16073002
         001104 00000F6400000F84            1801 UCBLP4   DC    A(UCBRDR4,UCBPRT4)                                      16076002
        0001110                             1803          DS    0D                                                      16090000
         001110 4040404040404040            1804 IPLPCB   DC    CL8' ' .              IPL ROUTINE PCB                   16100000
         001118 0000111000001110            1805          DC    4A(IPLPCB)                                              16110000
         001128 FF000000                    1806          DC    X'FF000000' .         INITIALIZED FLAGS                 16120000
         00112C 0000000100000000            1807          DC    F'1,0'                                                  16130000
         001134 0000000000000000            1808          DC    5F'0,0'                                                 16140000
         00115C 0002000000000000            1809          DC    X'0002000000000000'                                     16150000
         001164                             1810          DS    CL76                                                    16160000
         0011B0                             1811          DS    CL84                                                    16170000
         001204                             1812          DS    CL84                                                    16180000
        0001258 00000148                    1814 IPLAPCBS DC    A(LENPCB) .           ALLOC LIST FOR PCB'S              16200000
         00125C 00000000                    1815          DC    A(0)                                                    16210000
         001260 00000008                    1816          DC    F'8'                                                    16220000
         001264 01000000                    1817 CORESIZ  DC    A(CORESIZE) .         BYTES OF CORE IN OBJECT MACHINE   16230000
        0001268                             1819          DS    0D                                                      16250000
         001268 5CC9C2E2E4D74040            1820 TYPPCB   DC    CL8'*IBSUP' .         A TEMPLATE *IBSUP PCB             16260000
         001270 0000000000000000            1821          DC    4A(0)                                                   16270000
         001280 00000000                    1822 TEMPLATE DC    X'00000000' .         INITIALIZED FLAGS                 16280000
         001284 0000000100000000            1823          DC    F'1,0'                                                  16290000
         00128C 0000000000000000            1824          DC    5F'0,0'                                                 16300000
         0012B4 FF00000000012CC             1825          DC    X'FF00000000',AL3(JSP)                                  16310000
                               00054        1826 TYPLEN   EQU   *-TYPPCB                                                16320000
         0012BC 8200 0018      00018        1827 EXINTRPT LPSW  EXTOLD             IGNORE EXTERNAL INTERRUPTS           16321002
         0012C0                             1828          DS    0F                 ALIGN                                16322002
         0012C0 00                          1829          DC    X'00'              FILLER                               16323002
         0012C1 000FC4                      1830 SOSIONEW DC    AL3(IOHANDL)       SAMPLE OS IO NEW PSW INSTRUCTION ADDR  16324002
         0012C4 00                          1831          DC    X'00'              FILLER                               16325002
         0012C5 00027A                      1832 SOSEXNEW DC    AL3(EXTHANDL)      SAMPLE OS EXT NEW PSW INSTRUCTION ADDR 16326002
         0012C8 00                          1833          DC    X'00'              FILLER                               16327002
         0012C9 0012BC                      1834 IPLEXNEW DC    AL3(EXINTRPT)      IPLRTN EXT NEW PSW INSTRUCTION ADDR  16328002
```

```
0                                       1836 ********************************************************************************* 16340000
                                        1837 *                                                                               * 16350000
                                        1838 *             JOB STREAM PROCESSOR                                              * 16360000
                                        1839 *                                                                               * 16370000
                                        1840 ********************************************************************************* 16380000
0                       012CC           1842 JSP      EQU   * .                  THE JOB STREAM PROCESSOR                     16400000
 0012CC 0510                            1843          BALR  1,0 .                 (PROCESS *IBSUP)                            16410000
                    R:1  012CE          1844          USING *,1 .                ESTABLISH ADDRESSING                         16420000
 0012CE 4120 1392              01660    1845          LA    2,JSPSUSEM .         LOCK OURSELVES UNTIL                         16430000
 0012D2 0AD7                            1846          SVC   C'P' .                WE CAN ALLOCATE STORAGE                     16440000
 0012D4 4120 139A              01668    1847          LA    2,JSPAAS .           READY TO ALLOCATE                            16450000
                    R:2  00000          1848          USING XAX,2                                                             16460000
 0012D8 0AC5                            1849          SVC   C'E' .               ALLOCATE                                     16470000
 0012DA 58C0 2004              00004    1850          L     12,XAXADDR .         PTR TO AUTO AREA                             16480000
                                        1851          DROP  2                                                                 16490000
                    R:C  00000          1852          USING JSPAS,12 .           USE FOR ADDRESSING                           16500000
 0012DE 4120 1392              01660    1853          LA    2,JSPSUSEM .         UNLOCK OURSELVES                             16510000
 0012E2 0AE5                            1854          SVC   C'V'                                                              16520000
 0012E4 D207 C164 140A 00164 016D8      1855          MVC   TREAD+0(8),=CL8'*IN' . INITIALIZE VALUES IN AUTOMATIC           16530000
 0012EA D203 C16C 1432 0016C 01700      1856          MVC   TREAD+8(4),=F'8' .    STORAGE                                   16540000
 0012F0 D203 C170 1436 00170 01704      1857          MVC   TREAD+12(4),=C'READ'                                            16550000
 0012F6 4120 C084              00084    1858          LA    2,CARD                                                            16560000
 0012FA 5020 C174              00174    1859          ST    2,ACARD                                                           16570000
 0012FE D207 C190 1412 00190 016E0      1860          MVC   USERL+0(8),=CL8'USERPROG'                                       16580000
 001304 D20B C178 1352 00178 01620      1861          MVC   WRITE(12),SKIP                                                  16590000
 00130A D203 C184 143A 00184 01708      1862          MVC   WRITE+12(4),=C'PRIN'                                            16600000
 001310 4150 C000              00000    1863          LA    5,LINE                                                            16610000
 001314 5050 C188              00188    1864          ST    5,WRITE+16                                                        16620000
 001318 D203 C1B0 138E 001B0 0165C      1865          MVC   CORE+8(4),PAGESIZE  ALIGN TO PAGE BOUNDARY                      16630002
 00131E D207 C1B8 1412 001B8 016E0      1866          MVC   TALK+0(8),=CL8'USERPROG'                                        16640000
 001324 D203 C1C0 143E 001C0 0170C      1867          MVC   TALK+8(4),=F'12'                                                16650000
 00132A D203 C1D8 1442 001D8 01710      1868          MVC   ANYBACK+8(4),=F'1'                                              16660000
 001330 D203 C1B4 1446 001B4 01714      1869          MVC   RLDTEMP,=A(0)                                                   16670000
 001336 5040 C18C              0018C    1870          ST    4,KEY .              STORE KEY                                    16680000
 00133A 1853                            1871          LR    5,3 .                GET PTR TO UCB PTR BLOCK                     16690000
 00133C 5835 0000              00000    1872          L     3,0(5) .             GET READER POINTER                           16700000
 001340 4120 1362              01630    1873          LA    2,INSEQ .            READY TO CREATE & START *IN                  16710000
 001344 0AC3                            1874          SVC   C'C' .               CREATE                                       16720000
 001346 0AE8                            1875          SVC   C'Y' .               START                                        16730000
 001348 5835 0004              00004    1876          L     3,4(5) .             GET PTR TO PRINTER UCB                       16740000
 00134C 4120 136E              0163C    1877          LA    2,OUTSEQ .           READY TO CREATE & START *OUT                 16750000
 001350 0AC3                            1878          SVC   C'C' .               CREATE                                       16760000
 001352 0AE8                            1879          SVC   C'Y' .               START                                        16770000
0001354 4120 C164              00164    1881 LOOP     LA    2,TREAD .            READT TO READ A CARD                         16790000
 001358 0AE2                            1882          SVC   C'S' .               START TO READ                                16800000
 00135A D203 C0DC 144A 000DC 01718      1883          MVC   RREPLY1,=F'132' .    132 CHARS FOR REPLY                          16810000
 001360 4120 C0D4              000D4    1884          LA    2,RREPLY                                                          16820000
 001364 0AD9                            1885          SVC   C'R' .               LISTEN FOR REPLY                             16830000
 001366 D501 C0E0 145A 000E0 01728      1886          CLC   REPLY(2),=C'OK' .    IS REPLY 'OK'?                               16840000
 00136C 4770 10B0              0137E    1887          BNE   STOP .               IF NOT, STOP                                 16850000
 001370 D504 145C C084 0172A 00084      1888          CLC   =C'$JOB,',CARD .     HAVE WE A JOB CARD?                          16860000
 001376 4780 10B6              01384    1889          BE    JOB .                GOOD!                                        16870000
 00137A 47F0 1086              01354    1890          B     LOOP .               ELSE LOOP                                    16880000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                                    PAGE   48
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'12CE',R1  SA,R8  JSPAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        HLASM R6.0  2016/08/29 08.42
000137E 4120 134A              01618  1891 STOP     LA    2,JSPNEVER .         WAIT FOR A "V" OPERATION                     16890000
 001382 0AD7                           1892          SVC   C'P' .               THAT NEVER COMES                             16900000
0001384 9200 C1DD      001DD          1894 JOB      MVI   LOADED,X'00' .       REMEMBER NOT LOADED                          16920000
 001388 D283 C000 141A 00000 016E8     1895          MVC   LINE,=CL8' ' .       CLEAR A LINE, PUT IN                         16930000
 00138E D27B C008 C007 00008 00007     1896          MVC   LINE+8(124),LINE+7 .ALL BLANKS                                    16940000
```

```
001394 D24F C000 C084 00000 00084  1897           MVC   LINE(80),CARD .     GET READY TO SEND $JOB CARD          16950000
00139A 4120 C178             00178  1898           LA    2,WRITE .           TO PRINTER                           16960000
00139E 0AE2                         1899           SVC   C'S' .              SEND IT                              16970000
0013A0 4120 C0D4             00D4   1900           LA    2,RREPLY                                                 16980000
0013A4 0AD9                         1901           SVC   C'R' .              AND WAIT FOR REPLY                   16990000
0013A6 4120 C190             00190  1902           LA    2,USERL .           CREATE USERPROG                      17000000
0013AA 0AC3                         1903           SVC   C'C'                                                     17010000
0013AC 4140 C088             00088  1904           LA    4,CARD+4 .          START TO SCAN CARD                   17020000
0013B0 4530 131C             015EA  1905           BAL   3,SCAN .            GET NEXT TOKEN                       17030000
0013B4 0650                         1906           BCTR  5,0 .               LESS ONE TO REMOVE K                 17040002
0013B6 5650 138A             01658  1907           O     5,COREPKLN .        LENGTH OF PACKED SIZE FOR EXECUTE    17049002
0013BA 4450 137A             01648  1908           EX    5,COREPACK .        PACK CORE DIGITS                     17058002
0013BE 4F80 1382             01650  1909           CVB   8,COREPCKD .        CONVERT CORE REQUESTED TO BINARY     17067002
0013C2 1B99                         1910           SR    9,9 .               IS CORE ..                           17076002
0013C4 8C80 0002             00002  1911           SRDL  8,2 .                .. MODULO FOUR ..                   17085002
0013C8 1299                         1912           LTR   9,9 .                .. EQUAL ZERO?                      17094002
0013CA 4780 1104             013D2  1913           BZ    COREOK .             -> YES, USE IT                      17103002
0013CE 4180 8001             00001  1914           LA    8,1(,8) .            -> NO, UP ONE PAGE                  17112002
0013D2 8980 000C             0000C  1915 COREOK     SLL   8,12 .              CORE BYTES, ROUNDED UP TO FULL PAGES 17121002
0013D6 5080 C1A8             001A8  1916           ST    8,CORE .            REMEMBER CORE REQUIREMENT            17130002
0013DA 4530 131C             015EA  1917 ASGNUNIT   BAL   3,SCAN .            GET NEXT TOKEN                       17150000
0013DE 957E 4000       00000        1918           CLI   0(4),C'=' .         IS IT AN '='?                        17160000
0013E2 4770 1194             01462  1919           BNE   LOAD .              IF NOT, LOAD IN THE OBJECT DECK      17170000
0013E6 955C 9000       00000        1920           CLI   0(9),C'*' .         HAS USER NAMED IT STARTING           17180000
0013EA 4780 12C8             01596  1921           BE    EXPUNGE .            WITH '*'? IF SO, THROW HIM OUT      17190000
0013EE 4120 C19C             0019C  1922           LA    2,SEQ .             ELSE CREATE A PROCESS                17200000
0013F2 D207 C19C 141A 0019C 016E8  1923           MVC   SEQ,=CL8' ' .       BLANK OUT THE NAME                   17210000
0013F8 4450 1154             01422  1924           EX    5,UNAMMOV .         THEN MOVE THE RELEVANT               17220000
0013FC 0AC3                         1925           SVC   C'C' .               CHARACTERS AND CREATE               17230000
0013FE 4120 C19C             0019C  1926           LA    2,SEQ .             WE'LL START IT IN A MOMENT           17240000
001402 4530 131C             015EA  1927           BAL   3,SCAN .            SCAN AGAIN                           17250000
001406 4450 115A             01428  1928           EX    5,CMPIN .           IS IT 'IN'?                          17260000
00140A 4780 116C             0143A  1929           BE    ASIN .              IF SO, ASSIGN IT AS IN               17270000
00140E 4450 1160             0142E  1930           EX    5,CMPOUT .          IF IT'S 'OUT'                        17280000
001412 4780 117C             0144A  1931           BE    ASOUT .              ASSIGN IT AS OUT                    17290000
001416 4450 1166             01434  1932           EX    5,CMPEXCP .         IS IT 'EXCP'?                        17300000
00141A 4780 1184             01452  1933           BE    ASEXCP .             IF SO, ASSIGN IT AS EXCP            17310000
00141E 47F0 12C8             01596  1934           B     EXPUNGE .            ERROR: GO ON TO NEXT JOB            17320000
001422 D200 C19C 9000 0019C 00000  1935 UNAMMOV   MVC   SEQ(0),0(9) .        MOVE THE UNIT'S PROCESS NAME         17330000
001428 D500 9000 1461 00000 0172F  1936 CMPIN     CLC   0(0,9),=C'IN ' .    DOES IT SAY 'IN'?                    17340000
00142E D500 9000 144E 00000 0171C  1937 CMPOUT    CLC   0(0,9),=C'OUT ' .   DOES IT SAY 'OUT'?                   17350000
001434 D500 9000 1464 00000 01732  1938 CMPEXCP   CLC   0(0,9),=C'EXCP ' .  DOES IT SAY 'EXCP'?                  17360000
00143A 41B0 140A             016D8  1940 ASIN     LA    11,=CL8'*IN' .      POINT TO NAME OF READER HANDLER      17380000
00143E D203 C1A4 1452 001A4 01720  1941 SETDIM    MVC   UNITRTN,=A(DIM) .   USE DIM AS THE INTERFACE             17390000
001444 0AE8                         1942           SVC   C'Y'                                                     17400000
001446 47F0 110C             013DA  1943           B     ASGNUNIT                                                 17410000
00144A 41B0 1422             016F0  1944 ASOUT     LA    11,=CL8'*OUT' .     POINT TO NAME OF PRINTER HANDLER     17420000
00144E 47F0 1170             0143E  1945           B     SETDIM                                                   17430000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                    PAGE   49
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'12CE',R1  SA,R8  JSPAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0001452 D203 C1A4 1456 001A4 01724  1946 ASEXCP   MVC   UNITRTN,=A(EXCPHNDL) . USE FOR USER SUPPLIED             17440000
001458 58B0 C18C             0018C  1947           L     11,KEY                                                   17450000
00145C 0AE8                         1948           SVC   C'Y' .              I/O ROUTINE                          17460000
00145E 47F0 110C             013DA  1949           B     ASGNUNIT                                                 17470000
0001462 4120 C1A8             001A8  1951 LOAD     LA    2,CORE .            READY TO ALLOCATE THE REGION         17490000
001466 0AC1                         1952           SVC   C'A' .              AND ALLOCATE IT                      17500000
001468 92FF C1DD       001DD        1953           MVI   LOADED,X'FF' .      REMEMBER THAT WE'RE LOADED           17510000
00146C 5890 C1AC             001AC  1954           L     9,CORE+4 .          GET THE FIRST ADDRESS                17520000
001470 5840 C18C             0018C  1955           L     4,KEY .             GET THE KEY                          17530000
001474 8840 0010             00010  1956           SRL   4,16                                                     17540000
```

```
 001478 5640 13A2            01670  1957          O     4,FETCHPRT          FETCH PROTECTED                        17545002
 00147C 1839                        1958          LR    3,9 .               GET THE BLOCK FOLLOWING OURS           17550000
 00147E 1A38                        1959          AR    3,8                                                        17560000
 001480 5B30 138E            0165C  1960 LOADSK   S     3,PAGESIZE .        GET THE PREVIOUS BLOCK, PAGE ALIGNED   17570002
 001484 1939                        1961          CR    3,9 .               HAVE WE PASSED THE START?              17580000
 001486 4740 11C4            01492  1962          BL    LOADLOOP .          IF SO, START LOADING                   17590000
                                    1963 *        SSKE  4,3 .               ELSE SET THIS BLOCK TO THE KEY         17600002
 00148A B22B0043                    1964          DC    X'B22B0043'         ASSEMBLER (XF) DOESN'T SUPPORT SSKE    17603002
 00148E 47F0 11B2            01480  1965          B     LOADSK .            AND BRANCH BACK                        17610000
 001492 4120 C164            00164  1966 LOADLOOP LA    2,TREAD .           READ IN OBJECT DECK                    17620000
 001496 0AE2                        1967          SVC   C'S' .              GET A CARD A'READING                   17630000
 001498 D203 C0DC 144A 00DC  01718  1968          MVC   RREPLY1,=F'132'                                            17640000
 00149E 4120 C0D4            00D4   1969          LA    2,RREPLY                                                   17650000
 0014A2 0AD9                        1970          SVC   C'R' .              WAIT FOR ANSWER                        17660000
 0014A4 D502 C085 1469 0085  01737  1971          CLC   CARD+1(3),=C'TXT' . IS IT A TXT CARD?                      17670000
 0014AA 4780 11F8            014C6  1972          BE    TXTCARD                                                    17680000
 0014AE D502 C085 146C 0085  0173A  1973          CLC   CARD+1(3),=C'RLD' . IS IT A RLD CARD?                      17690000
 0014B4 4780 1212            014E0  1974          BE    RLDCARD                                                    17700000
 0014B8 D502 C085 146F 0085  0173D  1975          CLC   CARD+1(3),=C'END' . IS IT AN END CARD?                     17710000
 0014BE 4780 1270            0153E  1976          BE    ENDCARD                                                    17720000
 0014C2 47F0 11C4            01492  1977          B     LOADLOOP .          IF NONE, IGNORE.                       17730000
00014C6 58A0 C088            00088  1979 TXTCARD  L     10,CARD+4 .         GET THE RELATIVE ADDRESS               17750000
 0014CA 1AA9                        1980          AR    10,9 .              PLUS THE ABSOLUTE ADDRESS              17760000
 0014CC 48B0 C08E            0008E  1981          LH    11,CARD+10 .        GET THE COUNT,                         17770000
 0014D0 06B0                        1982          BCTR  11,0 .               DECREMENTED                           17780000
 0014D2 44B0 120C            014DA  1983          EX    11,TXTMOV .         AND MOVE THE TEXT                      17790000
 0014D6 47F0 11C4            01492  1984          B     LOADLOOP .          AND READ ANOTHER CARD! OH WOW!         17800000
 0014DA D200 A000 C094 00000 00094  1985 TXTMOV   MVC   0(0,10),CARD+16                                           17810000
00014E0 48B0 C08E            0008E  1987 RLDCARD  LH    11,CARD+10 .        GET THE BYTE COUNT                     17830000
 0014E4 41D0 C098            00098  1988          LA    13,CARD+20 .        AND AN INDEX INTO THE CARD             17840000
 0014E8 58AD 0000            00000  1989 RLDLOOP  L     10,0(13) .          GET THE LOCATION TO BE RLD'D           17850000
 0014EC 1AA9                        1990          AR    10,9 .              GET THE ABSOLUTE ADDRESS               17860000
 0014EE 9103 D003      00003        1991          TM    3(13),X'03' .       IS IT A FULLWORD?                      17870000
 0014F2 4770 1252            01520  1992          BNZ   NOTALGND .          IF NO, HANDLE AS THREE BYTES           17880000
 0014F6 587A 0000            00000  1993          L     7,0(10) .           GET THAT WORD (HAD BETTER BE            17890000
 0014FA 1A79                        1994          AR    7,9 .                ONE); ADD THE RELOCATION              17900000
 0014FC 507A 0000            00000  1995          ST    7,0(10) .            ADDRESS, AND STORE IT BACK            17910000
 001500 9101 D000      00000        1996 RLDCONT  TM    0(13),X'01' .       CHECK IF LONG OR SHORT FIELD           17920000
 001504 4770 1242            01510  1997          BNZ   SHORT .             AND BRANCH ACCORDINGLY                 17930000
 001508 4140 0008            00008  1998          LA    4,8 .               SKIP EIGHT BYTES                       17940000
 00150C 47F0 1246            01514  1999          B     RLDFINI                                                    17950000
 001510 4140 0004            00004  2000 SHORT    LA    4,4 .               SKIP FOUR BYTES                        17960000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                              PAGE   50
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'12CE',R1  SA,R8  JSPAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
0001514 1AD4                       2001 RLDFINI  AR    13,4 .              INCREMENT THE CARD INDEX               17970000
 001516 1BB4                       2002          SR    11,4 .              DECREMENT THE BYTE COUNT               17980000
 001518 4720 121A            014E8  2003          BP    RLDLOOP .           AND TRY AGAIN                          17990000
 00151C 47F0 11C4            01492  2004          B     LOADLOOP .          OR READ ANOTHER CARD                   18000000
 001520 D202 C1B5 A000 001B5 00000  2005 NOTALGND MVC   RLDTEMP+1(3),0(10) . PUT ADDRESS HERE                      18010000
 001526 5870 C1B4            001B4  2006          L     7,RLDTEMP .         RELOCATE IT                            18020000
 00152A 1A79                        2007          AR    7,9                                                        18030000
 00152C 5070 C1B4            001B4  2008          ST    7,RLDTEMP .         AND PUT IT BACK TO                     18040000
 001530 D202 A000 C1B5 00000 001B5  2009          MVC   0(3,10),RLDTEMP+1 .  WHERE IT BELONGS                    18050000
 001536 9400 C1B4      001B4        2010          NI    RLDTEMP,X'00' .     CLEAR OUT TEMPORARY                    18060000
 00153A 47F0 1232            01500  2011          B     RLDCONT .           AND LOOP BACK                          18070000
000153E 4120 C190            00190  2013 ENDCARD  LA    2,USERL .           FIND THE PCB FOR USERPROG              18090000
 001542 0AD5                        2014          SVC   C'N'                                                       18100000
 001544 5840 C198            00198  2015          L     4,USERL+8 .         GET THE ADDRESS                        18110000
                R:4  00000          2016          USING PCB,4                                                      18120000
 001548 92FF 4019      00019        2017          MVI   PCBBLOKT,X'FF' .    TEMPORARILY BLOCK IT                   18130000
```

```
 00154C 5090 C198            00198  2018          ST    9,USERL+8 .         STORE THE BEGINNING ADDRESS         18140000
 001550 0AE8                        2019          SVC   C'Y' .              THEN START IT                       18150000
 001552 5850 C18C            0018C  2020          L     5,KEY .             GET THE KEY                         18160000
 001556 5650 404C            0004C  2021          O     5,PCBISA+0 .        THEN OR THIS INTO THE               18170000
 00155A 5050 404C            0004C  2022          ST    5,PCBISA+0 .         FIRST WORD OF THE PCB              18180000
 00155E 9601 404D      0004D        2023          OI    PCBISA+1,X'01' .    OR IN A 'PROGRAM STATE' BIT         18190000
 001562 9200 4019      00019        2024          MVI   PCBBLOKT,X'00' .    AND THEN UNBLOCK IT                 18200000
                                    2025          DROP  4                                                       18210000
 001566 4120 C1B8            001B8  2026          LA    2,TALK .            LISTEN TO WHAT IT SAYS              18220000
 00156A 0AD9                        2027          SVC   C'R'                                                    18230000
000156C D207 C000 141A 00000 016E8  2029          MVC   LINE(8),=CL8' ' .   IF JOB FINISHED, CLEAR A LINE       18250000
 001572 D27B C008 C007 00008 00007  2030          MVC   LINE+8(124),LINE+7                                      18260000
 001578 D20B C000 C1C4 00000 001C4  2031          MVC   LINE(12),TALK+12 .  MOVE THE MESSAGE ONTO THE LINE      18270000
 00157E 4120 C178            00178  2032          LA    2,WRITE .           AND SAY TO WRITE IT                 18280000
 001582 0AE2                        2033          SVC   C'S'                                                    18290000
 001584 4120 C1D0            001D0  2034          LA    2,ANYBACK                                               18300000
 001588 0AD9                        2035          SVC   C'R'                                                    18310000
 00158A 4120 1352            01620  2036          LA    2,SKIP .            SKIP TO THE TOP OF THE NEXT PAGE    18320000
 00158E 0AE2                        2037          SVC   C'S'                                                    18330000
 001590 4120 C1D0            001D0  2038          LA    2,ANYBACK                                               18340000
 001594 0AD9                        2039          SVC   C'R'                                                    18350000
0001596 5850 0270            00270  2041 EXPUNGE  L     5,RUNNING .         EXPUNGE A JOB: LOOK AT ALL PCBS     18370000
 00159A 4120 C19C            0019C  2042          LA    2,SEQ                                                   18380000
                   R:5  00000       2043          USING PCB,5                                                   18390000
 00159E D207 C19C 5000 0019C 00000  2044 EXPLOOP  MVC   SEQ(8),PCBNAME .    GET THE PROCESS NAME                18400000
 0015A4 5840 5008            00008  2045          L     4,PCBNPTG .         GET THE NEXT PTR                    18410000
 0015A8 955C C19C      0019C        2046          CLI   SEQ+0,C'*' .        IS IT A '*' PROCESS?                18420000
 0015AC 4780 12E6            015B4  2047          BE    EXPNXT .            IF SO, SKIP OVER                    18430000
 0015B0 0AE9                        2048          SVC   C'Z' .              ELSE STOP IT                        18440000
 0015B2 0AC4                        2049          SVC   C'D' .              AND DESTROY IT                      18450000
 0015B4 1854                        2050 EXPNXT   LR    5,4 .               GO TO THE NEXT PCB                  18460000
 0015B6 5950 0270            00270  2051          C     5,RUNNING .         ARE WE THROUGH?                     18470000
 0015BA 4770 12D0            0159E  2052          BNE   EXPLOOP .           IF NOT, LOOP AGAIN                  18480000
 0015BE 9500 C1DD      001DD        2053          CLI   LOADED,X'00' .      WAS CORE ALLOCATED?                 18490000
 0015C2 4780 1086            01354  2054          BE    LOOP .              IF NOT, GO READ THE NEXT $JOB CARD  18500000
 0015C6 4140 0008            00008  2055          LA    4,8 .               SET ZERO KEY AND FETCH PROTECT      18510002
1         SAMPLE OPERATING SYSTEM      VERSION 2.00                                                       PAGE   51
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'12CE',R1  PCB,R5  SA,R8  JSPAS,R12
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                            HLASM R6.0  2016/08/29 08.42
00015CA 1839                        2056          LR    3,9 .               AND A POINTER TO THE NEXT           18520000
 0015CC 1A38                        2057          AR    3,8 .                BLOCK AFTER OURS                   18530000
 0015CE 5B30 138E            0165C  2058 LOADCL   S     3,PAGESIZE .        GET THE PREVIOUS BLOCK, PAGE ALIGNED 18540002
 0015D2 1939                        2059          CR    3,9 .               ARE WE THROUGH?                     18550000
 0015D4 4740 1312            015E0  2060          BL    LOADD .             IF SO, GO FREE CORE                 18560000
                                    2061 *        SSKE  4,3 .               ELSE CLEAR STORAGE KEY              18570002
 0015D8 B22B0043                    2062          DC    X'B22B0043'         ASSEMBLER (XF) DOESN'T SUPPORT SSKE  18573002
 0015DC 47F0 1300            015CE  2063          B     LOADCL .            AND LOOP BACK                       18580000
 0015E0 4120 C1A8            001A8  2064 LOADD    LA    2,CORE                                                  18590000
 0015E4 0AC6                        2065          SVC   C'F' .              FREE THE STORAGE                    18600000
 0015E6 47F0 1086            01354  2066          B     LOOP .              READ ANOTHER $JOB CARD              18610000
00015EA 1B55                        2068 SCAN     SR    5,5 .               START THE TOKEN COUNT AT ZERO       18630000
 0015EC 4144 0001            00001  2069 SCANLOOP LA    4,1(4) .            GO TO NEXT CHARACTER                18640000
 0015F0 956B 4000      00000        2070          CLI   0(4),C',' .         DO WE HAVE A DELIMITER? IF SO,      18650000
 0015F4 4780 1342            01610  2071          BE    TOKSTART                                                18660000
 0015F8 957E 4000      00000        2072          CLI   0(4),C'=' .         DITTO                               18670000
 0015FC 4780 1342            01610  2073          BE    TOKSTART                                                18680000
 001600 9540 4000      00000        2074          CLI   0(4),C' ' .         DITTO                               18690000
 001604 4780 1342            01610  2075          BE    TOKSTART                                                18700000
 001608 4155 0001            00001  2076          LA    5,1(5) .            AND UP COUNT                        18710000
 00160C 47F0 131E            015EC  2077          B     SCANLOOP .          AND LOOP                            18720000
 001610 1894                        2078 TOKSTART LR    9,4 .               SET REG9 TO START                   18730000
```

```
        001612 1B95                    2079          SR    9,5 .                 OF THIS TOKEN                       18740000
        001614 0650                    2080          BCTR  5,0 .                 LESS ONE FOR EXECUTE INSTRUCTION    18750000
        001616 07F3                    2081          BR    3                                                         18760000
       -001618 0000000000000000        2083 JSPNEVER DC    F'0,0' .              A GOOD WAY TO DIE: P(JSPNEVER)      18780000
        001620 5CD6E4E340404040        2084 SKIP     DC    CL8'*OUT' .           MESSAGE BLOCK FOR A NEW PAGE        18790000
        001628 00000008                2085          DC    F'8'                                                      18800000
        00162C E2E3C3F1                2086          DC    CL4'STC1'                                                 18810000
        001630 5CC9D54040404040        2087 INSEQ    DC    CL8'*IN' .            SEQ TO CREATE & START *IN           18820000
        001638 00000AC6                2088          DC    A(RDRHANDL)                                               18830000
        00163C 5CD6E4E340404040        2089 OUTSEQ   DC    CL8'*OUT' .           SEQ TO CREATE & START *OUT          18840000
        001644 00000C48                2090          DC    A(PRTHANDL)                                               18850000
        001648 F200 1382 9000 01650 00000  2091 COREPACK PACK  COREPCKD(1),0(1,9) . EXECUTED TO PACK CORE SIZE REQ'D 18860002
        001650                         2092 COREPCKD DS    D .                   PACKED CORE REQUIREMENT GOES HERE   18880002
        001658 00000070                2093 COREPKLN DC    X'00000070' .         LENGTH OF PACKED SIZE FOR EXECUTE   18900002
        00165C 00001000                2094 PAGESIZE DC    F'4096' .             PAGE SIZE FOR CORE COMPUTATION      18920002
        001660 0000000100000000        2095 JSPSUSEM DC    F'1,0' .              SEMAPHORE TO LOCK ROUTINE           18990000
        001668 000001E0                2096 JSPAAS   DC    A(LENJSPAS) .         ALLOCATE LIST FOR AUTO STORAGE      19000000
        00166C                         2097          DS    A                                                         19010000
        001670 00000008                2098 FETCHPRT DC    F'8'                  REUSED TO OR IN FETCH PROTECTION    19020002
     1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                         PAGE   52
          ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'12CE',R1  PCB,R5  SA,R8  JSPAS,R12
       0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
       0                                   2100 ********************************************************************* 19040000
                                           2101 *                                                                   * 19050000
                                           2102 *                              DEVICE INTERFACE MODULE              * 19060000
                                           2103 *                                                                   * 19070000
                                           2104 *        FUNCTION: TO INTERFACE BETWEEN USERPROG AND DEVICE HANDLER  * 19080000
                                           2105 *       DATABASES: NONE                                             * 19090000
                                           2106 *   ROUTINES USED: XA, XP, XV, XR, XS                               * 19100000
                                           2107 *       PROCEDURE: ALLOCATE AUTOMATIC STORAGE; START TO READ MESSAGE * 19110000
                                           2108 *                  FROM USER; SEND MESSAGE TO DEVICE HANDLER;       * 19120000
                                           2109 *                  CONTINUE LOOPING, SENDING MESSAGES FROM USER TO  * 19130000
                                           2110 *                  DEVICE HANDLER AND BACK.                         * 19140000
                                           2111 *    ERROR CHECKS: NONE                                             * 19150000
                                           2112 *      INTERRUPTS: ON                                               * 19160000
                                           2113 *     USER ACCESS: YES                                              * 19170000
                                           2114 *                                                                   * 19180000
                                           2115 ********************************************************************* 19190000
       0                      01674        2117 DIM      EQU   * .                   THE DEVICE INTERFACE MODULE         19210000
        001674 0510                        2118          BALR  1,0                                                       19220000
                         R:1  01676        2119          USING *,1 .                 ESTABLISH ADDRESSING                19230000
        001676 4120 1042            016B8  2120          LA    2,DIMSEM .            LOCK UNTIL GET STORAGE              19240000
        00167A 0AD7                        2121          SVC   C'P'                                                      19250000
        00167C 4120 104A            016C0  2122          LA    2,DIMAAS .            READY TO ALLOCATE STORAGE           19260000
                         R:2  00000        2123          USING XAX,2                                                     19270000
        001680 0AC5                        2124          SVC   C'E' .                DO IT                               19280000
        001682 58C0 2004            00004  2125          L     12,XAXADDR .          GET THE ADDRESS                     19290000
                                           2126          DROP  2                                                         19300000
        001686 4120 1042            016B8  2127          LA    2,DIMSEM .            UNLOCK OURSELVES                    19310000
        00168A 0AE5                        2128          SVC   C'V'                                                      19320000
                         R:C  00000        2129          USING DIMAS,12 .            USE 12 FOR AUTO STORAGE             19330000
        00168C D207 C090 B000 00090 00000  2130          MVC   DIMLMS,0(11) .        MOVE NAME OF RECIEVER               19340000
        001692 4180 0084            00084  2131          LA    8,132 .               REG 8 = SIZE OF MESSAGE             19350000
        001696 5080 C008            00008  2132 DIMLOOP  ST    8,DIMMSG+8 .          GET READY TO READ A MESSAGE         19360000
        00169A 4120 C000            00000  2133          LA    2,DIMMSG                                                  19370000
        00169E 0AD9                        2134          SVC   C'R' .                READ                                19380000
        0016A0 D207 C098 C000 00098 00000  2135          MVC   DIMTEMP,DIMMSG .      SAVE SENDER NAME                    19390000
        0016A6 D207 C000 C090 00000 00090  2136          MVC   DIMMSG,DIMLMS .       SEND IT BACK TO THE LAST GUY        19400000
        0016AC 0AE2                        2137          SVC   C'S' .                SEND IT                             19410000
        0016AE D207 C090 C098 00090 00098  2138          MVC   DIMLMS,DIMTEMP .      AND REMEMBER WHO TO SEND TO NEXT    19420000
        0016B4 47F0 1020            01696  2139          B     DIMLOOP .             RELOOP                              19430000
```

```
 0016B8 0000000100000000           2140 DIMSEM   DC    F'1,0' .           SEMAPHORE FOR ENTRY                  19440000
 0016C0 000000A0                   2141 DIMAAS   DC    A(DIMLEN) .        ALLOCATE SEQ FOR AUTO STORAGE        19450000
 0016C4 00000000                   2142          DC    A(0)                                                    19460000
 0016C8 00000008                   2143          DC    F'8'                                                    19470000
                                   2144          DROP  12                                                      19480000
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                          PAGE   53
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'1676',R1  PCB,R5  SA,R8
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                 HLASM R6.0  2016/08/29 08.42
00016D0                            2146          LTORG                                                         19500000
 0016D0 0000000000FFE8C0           2147                =A(0,CORESIZE-(VERYEND-PROGRAM))
 0016D8 5CC9D54040404040           2148                =CL8'*IN'
 0016E0 E4E2C5D9D7D9D6C7           2149                =CL8'USERPROG'
 0016E8 4040404040404040           2150                =CL8' '
 0016F0 5CD6E4E340404040           2151                =CL8'*OUT'
 0016F8 00000EA4                   2152                =A(UCBTABLE)
 0016FC 00000FC4                   2153                =A(UCBTBEND)
 001700 00000008                   2154                =F'8'
 001704 D9C5C1C4                   2155                =C'READ'
 001708 D7D9C9D5                   2156                =C'PRIN'
 00170C 0000000C                   2157                =F'12'
 001710 00000001                   2158                =F'1'
 001714 00000000                   2159                =A(0)
 001718 00000084                   2160                =F'132'
 00171C D6E4E340                   2161                =C'OUT '
 001720 00001674                   2162                =A(DIM)
 001724 00000D74                   2163                =A(EXCPHNDL)
 001728 D6D2                       2164                =C'OK'
 00172A 5BD1D6C26B                 2165                =C'$JOB,'
 00172F C9D540                     2166                =C'IN '
 001732 C5E7C3D740                 2167                =C'EXCP '
 001737 E3E7E3                     2168                =C'TXT'
 00173A D9D3C4                     2169                =C'RLD'
 00173D C5D5C4                     2170                =C'END'
 001740                            2171 VERYEND  DS    6D .               BEGINNING OF FREE STORAGE            19510004
 001770                            2172 LOADER   DS    0D                 IPL LOADER GOES HERE                 19521002
1         SAMPLE OPERATING SYSTEM     VERSION 2.00                                                          PAGE   54
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'1676',R1  PCB,R5  SA,R8
0  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                 HLASM R6.0  2016/08/29 08.42
0                          00000    2174 R0       EQU   0                                                     19521502
                           00001    2175 R1       EQU   1                                                     19522002
                           00002    2176 R2       EQU   2                                                     19522502
                           00003    2177 R3       EQU   3                                                     19523002
                           00004    2178 R4       EQU   4                                                     19523502
                           00005    2179 R5       EQU   5                                                     19524002
                           00006    2180 R6       EQU   6                                                     19524502
                           00007    2181 R7       EQU   7                                                     19525002
                           00008    2182 R8       EQU   8                                                     19525502
                           00009    2183 R9       EQU   9                                                     19526002
                           0000A    2184 R10      EQU   10                                                    19526502
                           0000B    2185 R11      EQU   11                                                    19527002
                           0000C    2186 R12      EQU   12                                                    19527502
                           0000D    2187 R13      EQU   13                                                    19528002
                           0000E    2188 R14      EQU   14                                                    19528502
                           0000F    2189 R15      EQU   15                                                    19529002
                                    2190 ********************************************************************** 19530000
                                    2191 *                                                                    * 19540000
                                    2192 *                        DATABASE DEFINITIONS                        * 19550000
                                    2193 *                                                                    * 19560000
                                    2194 ********************************************************************** 19570000
0000000                    00000 00148  2196 PCB      DSECT .                  PROCESS CONTROL BLOCK DEFINITION  19590000
 000000                            2197 PCBNAME  DS    CL8 .                  NAME                              19600000
```

```
000008                          2198 PCBNPTG  DS    F .              NEXT POINTER THIS GROUP                19610000
00000C                          2199 PCBLPTG  DS    F .              LAST POINTER THIS GROUP                19620000
000010                          2200 PCBNPALL DS    F .              NEXT POINTER ALL                       19630000
000014                          2201 PCBLPALL DS    F .              LAST POINTER ALL                       19640000
000018                          2202 PCBSTOPT DS    C .              STOPPED                                19650000
000019                          2203 PCBBLOKT DS    C .              BLOCKED                                19660000
00001A                          2204 PCBINSMC DS    C .               IN SMC                                19670000
00001B                          2205 PCBSW    DS    C .              STOP WAITING                           19680000
00001C                          2206 PCBMSC   DS    CL8 .            MESSAGE SEMAPHORE COMMON               19690000
000024                          2207 PCBMSR   DS    CL8 .            MESSAGE SEMAPHORE RECEIVER             19700000
00002C                          2208 PCBFM    DS    F .              FIRST MESSAGE                          19710000
000030                          2209 PCBNSW   DS    F .              NEXT SEMAPHORE WAITER                  19720000
000034                          2210 PCBSRS   DS    CL8 .            STOPPER SEMAPHORE                      19730000
00003C                          2211 PCBSES   DS    CL8 .            STOPPEE SEMAPHORE                      19740000
000044                          2212 PCBASIZE DS    F .              AUTOMATIC STORAGE SIZE                 19750000
000048                          2213 PCBAADDR DS    A .              AUTOMATIC STORAGE ADDRESS              19760000
00004C                          2214 PCBISA   DS    CL84 .           INTERRUPT SAVE AREA                    19770000
0000A0                          2215 PCBFSA   DS    CL84 .           FAULT SAVE AREA                        19780000
0000F4                          2216 PCBMSA   DS    CL84 .           MEMORY SAVE AREA                       19790000
000148                          2217          DS    0D .             (ALIGN)                                19800000
                     00148      2218 LENPCB   EQU   *-PCB .          (LENGTH)                               19810000
0000000              00000 00054 2220 SA       DSECT .              SAVE AREA DEFINITION                   19830000
000000                          2221 SAPSW    DS    D .              PROGRAM STATUS WORD                    19840000
000008                          2222 SAREGS   DS    CL64 .           REGISTERS                              19850000
000048                          2223 SATEMP   DS    CL12 .           TEMPORARIES                            19860000
0000000              00000 00040 2225 REGS     DSECT .              REGISTER DEFINITION                    19880000
000000                          2226 REG0     DS    F .              REGISTER 0                             19890000
000004                          2227 REG1     DS    F .              REGISTER 1                             19900000
000008                          2228 REG2     DS    F .              REGISTER 2                             19910000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                       PAGE   55
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'1676',R1  PCB,R5  SA,R8
OD-LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
00000C                          2229 REG3     DS    F .              REGISTER 3                             19920000
000010                          2230 REG4     DS    F .              REGISTER 4                             19930000
000014                          2231 REG5     DS    F .              REGISTER 5                             19940000
000018                          2232 REG6     DS    F .              REGISTER 6                             19950000
00001C                          2233 REG7     DS    F .              REGISTER 7                             19960000
000020                          2234 REG8     DS    F .              REGISTER 8                             19970000
000024                          2235 REG9     DS    F .              REGISTER 9                             19980000
000028                          2236 REG10    DS    F .              REGISTER 10                            19990000
00002C                          2237 REG11    DS    F .              REGISTER 11                            20000000
000030                          2238 REG12    DS    F .              REGISTER 12                            20010000
000034                          2239 REG13    DS    F .              REGISTER 13                            20020000
000038                          2240 REG14    DS    F .              REGISTER 14                            20030000
00003C                          2241 REG15    DS    F .              REGISTER 15                            20040000
0000000              00000 00008 2243 FSB      DSECT .              FREE STORAGE BLOCK DEFINITIONS         20060000
000000                          2244 FSBNEXT  DS    A .              NEXT                                   20070000
000004                          2245 FSBSIZE  DS    F .              SIZE                                   20080000
0000000              00000 00008 2247 SM       DSECT .              SEMAPHORE DEFINITION                   20100000
000000                          2248 SMVAL    DS    F .              VALUE                                  20110000
000004                          2249 SMPTR    DS    F .              PTR                                    20120000
0000000              00000 0000C 2251 MSG      DSECT .              MESSAGE DEFINITION                     20140000
000000                          2252 MSGSENDR DS    A .              POINTER TO SENDER'S PCB                20150000
000004                          2253 MSGNEXT  DS    A .              NEXT                                   20160000
000008                          2254 MSGSIZE  DS    F .              SIZE                                   20170000
00000C                          2255 MSGTEXT  DS    0C .             TEXT                                   20180000
                     0000C      2256 LENMSG   EQU   *-MSG .          (LENGTH)                               20190000
0000000              00000 0000C 2258 XAX      DSECT .              XA ARGUMENT LIST                       20210000
000000                          2259 XAXSIZE  DS    F .              SIZE                                   20220000
000004                          2260 XAXADDR  DS    F .              ADDRESS                                20230000
000008                          2261 XAXALGN  DS    F .              ALIGNMENT                              20240000
```

```
0000000                 00000 00008  2263 XFX      DSECT .                 XF ARGUMENT LIST                        20260000
 000000                              2264 XFXSIZE  DS    F .               SIZE                                    20270000
 000004                              2265 XFXADDR  DS    F .               ADDRESS                                 20280000
0000000                 00000 00008  2267 XBX      DSECT .                 XB ARGUMENT LIST                        20300000
 000000                              2268 XBXSIZE  DS    F .               SIZE                                    20310000
 000004                              2269 XBXADDR  DS    F .               ADDRESS                                 20320000
0000000                 00000 00008  2271 XCX      DSECT .                 XC ARGUMENT LIST                        20340000
 000000                              2272 XCXNAME  DS    CL8 .             NAME                                    20350000
0000000                 00000 00008  2274 XDX      DSECT .                 AD ARGUMENT LIST                        20370000
 000000                              2275 XDXNAME  DS    CL8 .             NAME                                    20380000
0000000                 00000 0000C  2277 XNX      DSECT .                 XN ARGUMENT LIST                        20400000
 000000                              2278 XNXNAME  DS    CL8 .             NAME                                    20410000
 000008                              2279 XNXADDR  DS    A .               ADDRESS                                 20420000
0000000                 00000 0000C  2281 XRX      DSECT .                 XR ARGUMENT LIST                        20440000
 000000                              2282 XRXNAME  DS    CL8 .             NAME                                    20450000
 000008                              2283 XRXSIZE  DS    F .               SIZE                                    20460000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                      PAGE   56
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'1676',R1  PCB,R5  SA,R8
OD-LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  HLASM R6.0  2016/08/29 08.42
000000C                             2284 XRXTEXT  DS    0C .              TEXT                                    20470000
0000000                 00000 0000C  2286 XSX      DSECT .                 XS ARGUMENT LIST                        20490000
 000000                              2287 XSXNAME  DS    CL8 .             NAME                                    20500000
 000008                              2288 XSXSIZE  DS    F .               SIZE                                    20510000
 00000C                              2289 XSXTEXT  DS    0C .              TEXT                                    20520000
0000000                 00000 0000C  2291 XYX      DSECT .                 XY ARGUMENT LIST                        20540000
 000000                              2292 XYXNAME  DS    CL8 .             NAME                                    20550000
 000008                              2293 XYXADDR  DS    A .               ADDR                                    20560000
0000000                 00000 00008  2295 XZX      DSECT .                 XZ ARGUMENT LIST                        20580000
 000000                              2296 XZXNAME  DS    CL8 .             NAME                                    20590000
0000000                 00000 00080  2298 RDRHAS   DSECT .                 READER HANDLER AUTOMATIC STORAGE        20610000
 000000                              2299 RDRHCCB  DS    2F .              CCB                                     20620000
 000008                              2300 RDRHMSG  DS    CL8 .             MESSAGE BLOCK FOR REQUESTS              20630000
 000010                              2301          DS    F'8'                                                      20640000
 000014                              2302          DS    CL8                                                       20650000
 00001C                              2303 RDRHTEMP DS    CL80 .            AREA FOR $JOB IN DATA STREAM            20660000
 00006C                              2304 RDRHM    DS    CL8 .             MESSAGE BLOCK FOR REPLY                 20670000
 000074                              2305          DS    F'2'                                                      20680000
 000078                              2306          DS    CL2                                                       20690000
 00007A                              2307 JOBBIT   DS    1C                                                        20700000
 000080                              2308          DS    0D                                                        20710000
                         00080       2309 LENRDRHA EQU   *-RDRHAS .        (LENGTH)                                20720000
0000000                 00000 00030  2311 PRTHAS   DSECT .                 PRINTER HANDLER AUTOMATIC STORAGE       20740000
 000000                              2312 PRTHCCB  DS    2F .              CCB                                     20750000
 000008                              2313 PRTHMSG  DS    CL8 .             MESSAGE BLOCK FOR REQUESTS              20760000
 000010                              2314          DS    F'2'                                                      20770000
 000014                              2315          DS    CL8                                                       20780000
 00001C                              2316 PRTHM    DS    CL8 .             MESSAGE BLOCK FOR REPLY                 20790000
 000024                              2317          DS    F'2'                                                      20800000
 000028                              2318          DS    CL2                                                       20810000
 000030                              2319          DS    0D                                                        20820000
                         00030       2320 LENPRTHA EQU   *-PRTHAS .        (LENGTH)                                20830000
0000000                 00000 00030  2322 EXCPHAS  DSECT .                 EXCP HANDLER AUTOMATIC STORAGE          20850000
 000000                              2323 EXCPHMSG DS    CL8 .             MESSAGE BLOCK FOR REQUESTS              20860000
 000008                              2324          DS    F'12'                                                     20870000
 00000C                              2325          DS    CL12                                                      20880000
 000018                              2326 EXCPHM   DS    CL8 .             MESSAGE BLOCK FOR REPLY                 20890000
 000020                              2327          DS    F'12'                                                     20900000
 000024                              2328          DS    CL12                                                      20910000
 000030                              2329          DS    0D                                                        20920000
                         00030       2330 LENEXCPA EQU   *-EXCPHAS .         (LENGTH)                               20930000
0000000                 00000 00020  2332 UCB      DSECT .                 UNIT CONTROL BLOCK DEFINITION           20950000
```

```
 000000                       2333 UCBADDR  DS    F .                      ADDRESS                        20960000
 000004                       2334 UCBUS    DS    FL8 .                    USER SEMAPHORE                 20970000
 00000C                       2335 UCBWS    DS    FL8 .                    WAITER SEMAPHORE               20980000
 000014                       2336 UCBCSW   DS    FL8 .                    CHANNEL STATUS WORD            20990000
 00001C                       2337 UCBFPR   DS    CL1 .                    FAST PROCESSING REQUIRED       21000000
 000020                       2338          DS    0F                                                      21010000
1          SAMPLE OPERATING SYSTEM     VERSION 2.00                                                  PAGE   57
   ACTIVE USINGS: PROGRAM,R0  PROGRAM+X'1676',R1  PCB,R5  SA,R8
OD-LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                             HLASM R6.0  2016/08/29 08.42
0                      00020        2339 UCBLENG  EQU   *-UCB                                               21020000
0000000                00000 001E0  2341 JSPAS    DSECT .                  JSP AUTOMATIC STORAGE          21040000
 000000                       2342 LINE     DS    CL132 .                  PRINTED LINE                   21050000
 000084                       2343          DS    0F                                                      21060000
 000084                       2344 CARD     DS    CL80 .                   CARD READ                      21070000
 0000D4                       2345          DS    0F                                                      21080000
 0000D4                       2346 RREPLY   DS    CL8 .                    MESSAGE BLOCK FOR REPLIES      21090000
 0000DC                       2347 RREPLY1  DS    F                                                       21100000
 0000E0                       2348 REPLY    DS    CL132                                                   21110000
 000164                       2349 TREAD    DS    0F .                     MESSAGE BLOCK FOR READING      21120000
 000164                       2350          DS    CL8'*IN'                                                21130000
 00016C                       2351          DS    F'8'                                                    21140000
 000170                       2352          DS    CL4'READ'                                               21150000
 000174                       2353 ACARD    DS    A(0)                                                    21160000
 000178                       2354 WRITE    DS    CL8'*OUT' .              MESSAGE BLOCK TO PRINT A LINE  21170000
 000180                       2355          DS    F'8'                                                    21180000
 000184                       2356          DS    CL4'PRIN'                                               21190000
 000188                       2357          DS    A(LINE)                                                 21200000
 00018C                       2358 KEY      DS    F                                                       21210000
 000190                       2359 USERL    DS    CL8'USERPROG' .          LIST FOR MANIPULATING USERPROG 21220000
 000198                       2360          DS    F                                                       21230000
 00019C                       2361 SEQ      DS    CL8' ' .                 COMMON ARG LIST FOR I/O PROCESS 21240000
 0001A4                       2362 UNITRTN  DS    A                                                       21250000
 0001A8                       2363 CORE     DS    F .                      MEMORY ALLOCATED AND FREE      21260000
 0001AC                       2364          DS    F .                      SEQUENCE                       21270000
 0001B0                       2365          DS    F'4096'                  ALIGN TO PAGE BOUNDARY         21280002
 0001B4                       2366 RLDTEMP  DS    F                                                       21290000
 0001B8                       2367 TALK     DS    CL8'USERPROG' .          MESSAGE BLOCK FOR MESSAGE FROM 21300000
 0001C0                       2368          DS    F'12' .                   USERPROG                      21310000
 0001C4                       2369          DS    CL12                                                    21320000
 0001D0                       2370 ANYBACK  DS    CL8 .                    MESSAGE BLOCK FOR IGNORING MESS 21330000
 0001D8                       2371          DS    F'1'                                                    21340000
 0001DC                       2372          DS    CL1                                                     21350000
 0001DD                       2373 LOADED   DS    C .                      IS CORE ALLOCATED              21360000
 0001E0                       2374          DS    0D                                                      21370000
                       001E0        2375 LENJSPAS EQU   *-JSPAS .                (LENGTH)                       21380000
0000000                00000 000A0  2377 DIMAS    DSECT .                  DEVICE INTERFACE MODULE STORAGE 21400000
 000000                       2378 DIMMSG   DS    CL8 .                    MESSAGE BLOCK                  21410000
 000008                       2379          DS    F'132'                                                  21420000
 00000C                       2380          DS    CL132                                                   21430000
 000090                       2381 DIMLMS   DS    CL8 .                    LAST MESSAGE SENDER            21440000
 000098                       2382 DIMTEMP  DS    CL8 .                    TEMPORARY                      21450000
 0000A0                       2383          DS    0D                                                      21460000
                       000A0        2384 DIMLEN   EQU   *-DIMAS .                (LENGTH)                       21470000
                                    2385          END                                                     21480000
1                                                 RELOCATION DICTIONARY                              PAGE   58
-    POS.ID   REL.ID   ADDRESS   TYPE  ACTION                                   HLASM R6.0  2016/08/29 08.42
0  00000001 00000001 00000005   A 3      +
   00000001 00000001 0000005D   A 3      +
   00000001 00000001 00000065   A 3      +
   00000001 00000001 0000006D   A 3      +
   00000001 00000001 00000180   A 4      +
```

```
         00000001 00000001 0000042D   A 3      +
         00000001 00000001 00000435   A 3      +
         00000001 00000001 0000043D   A 3      +
         00000001 00000001 00000445   A 3      +
         00000001 00000001 0000044D   A 3      +
         00000001 00000001 00000455   A 3      +
         00000001 00000001 0000045D   A 3      +
         00000001 00000001 00000465   A 3      +
         00000001 00000001 0000046D   A 3      +
         00000001 00000001 00000475   A 3      +
         00000001 00000001 0000047D   A 3      +
         00000001 00000001 00000485   A 3      +
         00000001 00000001 0000048D   A 3      +
         00000001 00000001 00000495   A 3      +
         00000001 00000001 0000049D   A 3      +
         00000001 00000001 000004A5   A 3      +
         00000001 00000001 000004AD   A 3      +
         00000001 00000001 000004B5   A 3      +
         00000001 00000001 000004BD   A 3      +
         00000001 00000001 000004C5   A 3      +
         00000001 00000001 000004C8   A 4      +
         00000001 00000001 000004DD   A 3      +
         00000001 00000001 0000059D   A 3      +
         00000001 00000001 00000E5C   A 4      +
         00000001 00000001 00000E90   A 4      +
         00000001 00000001 000010CC   A 4      +
         00000001 00000001 000010D0   A 4      +
         00000001 00000001 000010D4   A 4      +
         00000001 00000001 000010D8   A 4      +
         00000001 00000001 000010EC   A 4      +
         00000001 00000001 000010F0   A 4      +
         00000001 00000001 000010F4   A 4      +
         00000001 00000001 000010F8   A 4      +
         00000001 00000001 000010FC   A 4      +
         00000001 00000001 00001100   A 4      +
         00000001 00000001 00001104   A 4      +
         00000001 00000001 00001108   A 4      +
         00000001 00000001 00001118   A 4      +
         00000001 00000001 0000111C   A 4      +
         00000001 00000001 00001120   A 4      +
         00000001 00000001 00001124   A 4      +
         00000001 00000001 000012B9   A 3      +
         00000001 00000001 000012C1   A 3      +
         00000001 00000001 000012C5   A 3      +
         00000001 00000001 000012C9   A 3      +
         00000001 00000001 00001638   A 4      +
         00000001 00000001 00001644   A 4      +
         00000001 00000001 000016F8   A 4      +
         00000001 00000001 000016FC   A 4      +
         00000001 00000001 00001720   A 4      +
1                                                      RELOCATION DICTIONARY                                       PAGE   59
-   POS.ID   REL.ID   ADDRESS  TYPE  ACTION                                                            HLASM R6.0  2016/08/29 08.42
0   00000001 00000001 00001724   A 4      +
    00000001 00000002 0000007D   A 3      +
    00000003 00000001 00001815   A 3      +
    00000003 00000001 00001819   A 3      +
    00000003 00000001 00001821   A 3      +
1                               ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   60
-SYMBOL   LENGTH   VALUE     ID     R TYPE ASM  PROGRAM   DEFN REFERENCES                                 HLASM R6.0  2016/08/29 08.42
OACARD         4 00000174 FFFFFFEB     A  A               2353 1859M
 ANYBACK       8 000001D0 FFFFFFEB     C  C               2370 1868M 2034  2038
```

```
ASEXCP          6 00001452 00000001     I                1946 1933B
ASGNUNIT        4 000013DA 00000001     I                1917 1943B 1949B
ASIN            4 0000143A 00000001     I                1940 1929B
ASOUT           4 0000144A 00000001     I                1944 1931B
CARD           80 00000084 FFFFFFEB     C  C             2344 1858  1888  1897  1904  1971  1973  1975  1979  1981  1985
                                                             1987  1988
CARDLDR         1 00001770 00000002     J                  43   62    66U
CAW             4 00000048 00000001     F  F               142   74M 1369M 1481M 1561M
CAWSEM          4 00000194 00000001     F  F               158 1367  1479  1559
CCBCON1         4 00000C30 00000001     X  X              1412 1361  1471
CCWCHAIN        8 00001810 00000002     D  D               123   73
CMPEXCP         6 00001434 00000001     I                 1938 1932X
CMPIN           6 00001428 00000001     I                 1936 1928X
CMPOUT          6 0000142E 00000001     I                 1937 1930X
CONTINUE        4 000017FC 00000002     F  F               119   96M
CORE            4 000001A8 FFFFFFEB     F  F              2363 1865M 1916M 1951  1954  2064
COREOK          4 000013D2 00000001     I                 1915 1913B
COREPACK        6 00001648 00000001     I                 2091 1908X
COREPCKD        8 00001650 00000001     D  D              2092 1909  2091M
COREPKLN        4 00001658 00000001     X  X              2093 1907
CORESIZ         4 00001264 00000001     A  A              1817 1747
CORESIZE        1 01000000 00000001 A   U                  129 1817  2147
CSW             8 00000040 00000001     D  D               141  106  1703  1704  1707
DIM             1 00001674 00000001     U                 2117 2162
DIMAAS          4 000016C0 00000001     A  A              2141 2122
DIMAS           1 00000000 FFFFFFEA     J                 2377 2129U 2384
DIMLEN          1 000000A0 FFFFFFEA A   U                 2384 2141
DIMLMS          8 00000090 FFFFFFEA     C  C              2381 2130M 2136  2138M
DIMLOOP         4 00001696 00000001     I                 2132 2139B
DIMMSG          8 00000000 FFFFFFEA     C  C              2378 2132M 2133  2135  2136M
DIMSEM          4 000016B8 00000001     F  F              2140 2120  2127
DIMTEMP         8 00000098 FFFFFFEA     C  C              2382 2135M 2138
EIGHT           4 00001808 00000002     F  F               122   89
ENBLECHO        2 000017EE 00000002     C  C               115   72
ENDADATA        6 00000BFE 00000001     I                 1399 1390B
ENDCARD         4 0000153E 00000001     I                 2013 1976B
EXCPCOMP        4 00000DB4 00000001     I                 1547 1551B
EXCPDONE        4 00000E30 00000001     I                 1581 1576B
EXCPFIND        2 00000DCA 00000001     I                 1553 1548B
EXCPHAAS        4 00000E44 00000001     A  A              1586 1527
EXCPHAS         1 00000000 FFFFFFED     J                 2322 1536U 2330
EXCPHM          8 00000018 FFFFFFED     C  C              2326 1566M 1567M 1568M 1569
EXCPHMSG        8 00000000 FFFFFFED     C  C              2323 1537  1568  1571
EXCPHNDL        1 00000D74 00000001     U                 1521 2163
EXCPHSEM        4 00000E3C 00000001     F  F              1585 1525  1532
EXCPLOOP        4 00000D92 00000001     I                 1537 1542B 1583B
EXCPWAIT        4 00000DF0 00000001     I                 1564 1578B
EXINTRPT        4 000012BC 00000001     I                 1827 1834
EXPLOOP         6 0000159E 00000001     I                 2044 2052B
EXPNXT          2 000015B4 00000001     I                 2050 2047B
EXPUNGE         4 00001596 00000001     I                 2041 1921B 1934B
EXTHANDL        1 0000027A 00000001     U                  175  146  1832
EXTHRET         4 000002A8 00000001     I                  191  180B  184B
1                          ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   61
-SYMBOL   LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                  HLASM R6.0  2016/08/29 08.42
OEXTNEW         1 00000058 00000001     B  B                146 1741M 1781M
 EXTOLD         8 00000018 00000001     D  D               136  179   187   192  1827
 FETCHPRT       4 00001670 00000001     F  F              2098 1957
 FSB            1 00000000 FFFFFFFC     J                 2243  576U  662U  731U  740U
 FSBNEXT        4 00000000 FFFFFFFC     A  A              2244  589   590   597   665   679   680   734   735   741M
 FSBPTR         4 00000180 00000001     A  A               155  572   573   660   661   727   728
```

```
FSBSEM          4 00000184 00000001     F  F                156  570   616   658   693
FSBSIZE         4 00000004 FFFFFFFC     F  F               2245  585   598   669   672   677   732   742M
GWINC           4 00000586 00000001     I                   458  455B
GWLOOP          4 00000576 00000001     I                   454  460B
GWRUN           6 000005A0 00000001     I                   465  457B
IDLE            1 00000598 00000001     B  B                463  461
INSEQ           8 00001630 00000001     C  C               2087 1873
IOBACK          4 00001036 00000001     I                  1724 1701B
IOCOMP          6 00000FD2 00000001     I                  1696 1700B
IODEVFND        6 00000FEC 00000001     I                  1703 1697B
IOHANDL         1 00000FC4 00000001     U                  1690 1830
IOHSAVE         4 000001DC 00000001     F  F                161 1691M 1718  1724
IOINTRPT        1 000017DA 00000002     U                   105   70   150
IOINTRTN        4 000017EA 00000002     I                   110  107B
IONEW           1 00000078 00000001     B  B                150   71M  448  1740M
IONOFPR         2 00001034 00000001     I                  1723 1710B
IOOLD           8 00000038 00000001     D  D                140  108M  109M  110  1694M 1696  1717  1725
IOWAIT          4 0000102C 00000001     I                  1720 1714B
IPLAPCBS        4 00001258 00000001     A  A               1814 1755
IPLCL           4 00001066 00000001     I                  1748 1752B
IPLEXNEW        3 000012C9 00000001     R  A               1834 1741
IPLLOOP         4 0000107C 00000001     I                  1755 1780B
IPLPCB          8 00001110 00000001     C  C               1804 1742  1805
IPLRTN          1 0000103E 00000001     U                  1737  133
IPLTH           2 00001076 00000001     I                  1753 1749B
JOB             4 00001384 00000001     I                  1894 1889B
JOBBIT          1 0000007A FFFFFFEF     C  C               2307 1323M 1337  1342M 1403M
JSP             1 000012CC 00000001     U                  1842 1825
JSPAAS          4 00001668 00000001     A  A               2096 1847
JSPAS           1 00000000 FFFFFFEB     J                  2341 1852U 2375
JSPNEVER        4 00001618 00000001     F  F               2083 1891
JSPSUSEM        4 00001660 00000001     F  F               2095 1845  1853
KEY             4 0000018C FFFFFFEB     F  F               2358 1870M 1947  1955  2020
KEYTAB          1 000010DC 00000001     U                  1792 1777
LENEXCPA        1 00000030 FFFFFFED A   U                  2330 1586
LENJSPAS        1 000001E0 FFFFFFEB A   U                  2375 2096
LENMSG          1 0000000C FFFFFFFA A   U                  2256 1073  1127
LENPCB          1 00000148 FFFFFFFF A   U                  2218 1595  1814
LENPRTHA        1 00000030 FFFFFFEE A   U                  2320 1511
LENRDRHA        1 00000080 FFFFFFEF A   U                  2309 1415
LINE          132 00000000 FFFFFFEB     C  C               2342 1863  1895M 1896M 1896  1897M 2029M 2030M 2030  2031M 2357
LOAD            4 00001462 00000001     I                  1951 1919B
LOADADDR        4 00001800 00000002     F  F                120   76
LOADCL          4 000015CE 00000001     I                  2058 2063B
LOADD           4 000015E0 00000001     I                  2064 2060B
LOADED          1 000001DD FFFFFFEB     C  C               2373 1894M 1953M 2053
LOADER          8 00001770 00000001     D  D               2172   49    50    52
LOADLOOP        4 00001492 00000001     I                  1966 1962B 1977B 1984B 2004B
LOADSK          4 00001480 00000001     I                  1960 1965B
1                              ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   62
-SYMBOL    LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                  HLASM R6.0  2016/08/29 08.42
OLOOP           4 00001354 00000001     I                  1881 1890B 2054B 2066B
MEMORY          4 0000018C 00000001     F  F                157  593   688
MSG             1 00000000 FFFFFFFA     J                  2251  839U 1050U 1139U 1147U 2256
MSGNEXT         4 00000004 FFFFFFFA     A  A               2253  840  1051  1142  1143  1148M
MSGSENDR        4 00000000 FFFFFFFA     A  A               2252 1068  1149M
MSGSIZE         4 00000008 FFFFFFFA     F  F               2254  841  1059  1061  1072  1151M
MSGTEXT         1 0000000C FFFFFFFA     C  C               2255 1084  1162M
NEXTCARD        2 0000179C 00000002     I                   80   88B
NEXTTRY         4 00000274 00000001     A  A                166  424M  451   465M 1744M
NEXTTRYM        1 00000278 00000001     C  C                167  422   425M  466M 1720M
```

```
NOTALGND       6 00001520 00000001     I                2005 1992B
NUMCARDS       4 00001804 00000002     F  F              121   75
OUTSEQ         8 0000163C 00000001     C  C             2089 1877
PAGESIZE       4 0000165C 00000001     F  F             2094 1748  1865  1960  2058
PCB            1 00000000 FFFFFFFF     J                2196  182U  222U  317   318   319   373U  380U  419U  453U  473U
                                                              782U  825U  830U  834U  862U  917U  920U  924U  928U  931U
                                                              936U  956U  960U  963U  966U  970U  973U  977U 1003U 1013U
                                                             1070U 1086U 1122U 1164U 1198U 1209U 1248U 1260U 1712U 1761U
                                                             1765U 1769U 2016U 2043U 2218
PCBAADDR       4 00000048 FFFFFFFF     A  A             2213  621M  850
PCBASIZE       4 00000044 FFFFFFFF     F  F             2212  620M  852
PCBBLOKT       1 00000019 FFFFFFFF     C  C             2203  183   383M  421M  454   785   785M 1713  2017M 2024M
PCBFM          4 0000002C FFFFFFFF     F  F             2208  836  1049  1051M 1137  1138
PCBFSA        84 000000A0 FFFFFFFF     C  C             2215  318
PCBINSMC       1 0000001A FFFFFFFF     C  C             2204  492   494M  517   519M 1249
PCBISA        84 0000004C FFFFFFFF     C  C             2214  185   317   384M  468   785  1199  1715  1770  2021  2022M
                                                             2023M
PCBLPALL       4 00000014 FFFFFFFF     F  F             2201  918M  921M  957   964M
PCBLPTG        4 0000000C FFFFFFFF     F  F             2199  929M  932M  967   974M 1763M 1766M
PCBMSA        84 000000F4 FFFFFFFF     C  C             2216  319
PCBMSC         8 0000001C FFFFFFFF     C  C             2206 1047  1135
PCBMSR         8 00000024 FFFFFFFF     C  C             2207 1044  1157
PCBNAME        8 00000000 FFFFFFFF     C  C             2197  783M 1005  1071  1235  2044
PCBNPALL       4 00000010 FFFFFFFF     F  F             2200  458   465   914   915M  922M  958   961M
PCBNPTG        4 00000008 FFFFFFFF     F  F             2198  925   926M  933M  968   971M 1004  1762M 1767M 2045
PCBNSW         4 00000030 FFFFFFFF     F  F             2209  376   377   382M  420
PCBSES         8 0000003C FFFFFFFF     C  C             2211  527
PCBSRS         8 00000034 FFFFFFFF     C  C             2210  525  1255
PCBSTOPT       1 00000018 FFFFFFFF     C  C             2202  456   784M  826  1204M 1251M
PCBSW          1 0000001B FFFFFFFF     C  C             2205  522   524M 1254M
PGMHANDL       1 000002B0 00000001     U                 194  148
PROGRAM        1 00000000 00000001     J                  42   68U  127  2147
PROTCON1       4 00000C34 00000001     X  X             1413 1348  1355  1458  1465
PROTCON2       4 00000C38 00000001     X  X             1414 1351  1358  1461  1468
PRTHAAS        4 00000D68 00000001     A  A             1511 1431
PRTHANDL       1 00000C48 00000001     U                1425 2090
PRTHAS         1 00000000 FFFFFFEE     J                2311 1440U 2320
PRTHCCB        4 00000000 FFFFFFEE     F  F             2312 1441  1472M 1473M 1474M 1476M
PRTHCOMM       4 00000CEC 00000001     I                1479 1475B 1507B
PRTHLOOP       4 00000C6A 00000001     I                1442 1451B 1503B
PRTHM          8 0000001C FFFFFFEE     C  C             2316 1494M 1496M 1497M 1498M 1501
PRTHMSG        8 00000008 FFFFFFEE     C  C             2313 1442  1455  1498
PRTHNO         6 00000D26 00000001     I                1494 1463B 1470B
PRTHOK         6 00000D30 00000001     I                1496 1493B
PRTHPOK        4 00000CCA 00000001     I                1471 1456B
1                              ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   63
-SYMBOL   LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                    HLASM R6.0  2016/08/29 08.42
OPRTHPRIN      4 00000C92 00000001     I                1453 1448B
PRTHSEM        4 00000D60 00000001     F  F             1510 1429  1436
PRTHSEND       6 00000D36 00000001     I                1497 1495B
PRTHSTC1       6 00000CE0 00000001     I                1476 1450B
PRTHWAIT       4 00000D10 00000001     I                1488 1491B
PTSTATUS       2 00000D52 00000001     I                1504 1486B
QUANTUM        4 000005BC 00000001     X  X              471  469
RDRHAAS        4 00000C3C 00000001     A  A             1415 1313
RDRHANDL       1 00000AC6 00000001     U                1307 2088
RDRHAS         1 00000000 FFFFFFEF     J                2298 1322U 2309
RDRHCCB        4 00000000 FFFFFFEF     F  F             2299 1324  1362M 1363M 1364M
RDRHEXC        4 00000BB8 00000001     I                1383 1379B
RDRHLOOP       4 00000AEC 00000001     I                1325 1330B 1398B
RDRHM          8 0000006C FFFFFFEF     C  C             2304 1385M 1391M 1392M 1393M 1396  1399M
```

```
RDRHMORE       4 00000B2E 00000001     I                 1345 1338B
RDRHMSG        8 00000008 FFFFFFEF     C  C              2300 1325  1335  1345  1387  1393
RDRHNO         6 00000BC0 00000001     I                 1385 1340B 1353B 1360B
RDRHOK         4 00000BCA 00000001     I                 1387 1382B
RDRHPOK        4 00000B60 00000001     I                 1361 1346B 1381B 1408B
RDRHSEM        4 00000C28 00000001     F  F              1411 1311  1318
RDRHSEND       6 00000BE2 00000001     I                 1392 1386B 1404B
RDRHSOK        6 00000BDC 00000001     I                 1391 1343B 1388B
RDRHTEMP      80 0000001C FFFFFFEF     C  C              2303 1341  1400M
RDRHWAIT       4 00000B96 00000001     I                 1374 1377B 1384B
RDSTATUS       2 00000C1C 00000001     I                 1405 1372B
READ           1 000017F0 00000002     X  X               116   81
REGS           1 00000000 FFFFFFFD     J                 2225 1773U
REG3           4 0000000C FFFFFFFD     F  F              2229 1776M
REG4           4 00000010 FFFFFFFD     F  F              2230 1777M
REPLY        132 000000E0 FFFFFFEB     C  C              2348 1886
RETURN         1 000004D8 00000001     B  B               328  369   416   426   470   495   529   623   696   743   788
                                                                 859   935   976  1011  1082  1160  1205  1253
RETURNR        1 000004E0 00000001     U                  330  328
RLDCARD        4 000014E0 00000001     I                 1987 1974B
RLDCONT        4 00001500 00000001     I                 1996 2011B
RLDFINI        2 00001514 00000001     I                 2001 1999B
RLDLOOP        4 000014E8 00000001     I                 1989 2003B
RLDTEMP        4 000001B4 FFFFFFEB     F  F              2366 1869M 2005M 2006  2008M 2009  2010M
RREPLY         8 000000D4 FFFFFFEB     C  C              2346 1884  1900  1969
RREPLY1        4 000000DC FFFFFFEB     F  F              2347 1883M 1968M
RUNNING        4 00000270 00000001     A  A               165  181   221   381   467M 1711  1743M 2041  2051
R11            1 0000000B 00000001 A   U                 2185   67M   68U  111D
R12            1 0000000C 00000001 A   U                 2186   63M   65M   66U  111D
R2             1 00000002 00000001 A   U                 2176   64M   65    69M   71    80M   81M   82    83M   84    95M
                                                                 96
R3             1 00000003 00000001 A   U                 2177   70M   71    75M   88M
R4             1 00000004 00000001 A   U                 2178   76M   80    86M   86
R5             1 00000005 00000001 A   U                 2179   73M   74    82    84    85    87M   87    89M   90
SA             1 00000000 FFFFFFFE     J                 2220  186U  230U 1200U 1201  1203  1208U 1716U 1771U
SAPSW          8 00000000 FFFFFFFE     D  D              2221  187M  231M  331  1201M 1201  1202M 1717M
SAREGS        64 00000008 FFFFFFFE     C  C              2222  188M  232M  332  1203M 1203  1718M 1772
SATEMP        12 00000048 FFFFFFFE     C  C              2223  599   682   768   817   833   854  1115  1190  1239
SCAN           2 000015EA 00000001     I                 2068 1905B 1917B 1927B
SCANLOOP       4 000015EC 00000001     I                 2069 2077B
SEQ            8 0000019C FFFFFFEB     C  C              2361 1922  1923M 1926  1935M 2042  2044M 2046
1                          ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   64
-SYMBOL    LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                  HLASM R6.0  2016/08/29 08.42
OSETDIM        6 0000143E 00000001     I                 1941 1945B
SHORT          4 00001510 00000001     I                 2000 1997B
SKIP           8 00001620 00000001     C  C              2084 1861  2036
SM             1 00000000 FFFFFFFB     J                 2247  363U  411U  687U
SMPTR          4 00000004 FFFFFFFB     F  F              2249  370   371   417   420M
SMVAL          4 00000000 FFFFFFFB     F  F              2248  364   366M  412   414M  690
SOSEXNEW       3 000012C5 00000001     R  A              1832 1781
SOSIONEW       3 000012C1 00000001     R  A              1830 1740
STOP           4 0000137E 00000001     I                 1891 1887B
STREAMS        4 000010C8 00000001     F  F              1784 1754
SVCCONST       4 00000314 00000001     F  F               241  215
SVCHANDL       1 000002B2 00000001     U                  211  147
SVCHPROT       4 00000302 00000001     I                  235  220B
SVCHTABL       1 00000328 00000001     X  X               243  217   244   246   248   250   252   254   256   258   260
                                                                262   264   266   268   270   272   274   276   278   280
                                                                282   284
SVCOK          4 000002D0 00000001     I                  221  237B  239B
SVCOLD         8 00000020 00000001     D  D               137  216   228   231   235   331M  333
```

```
SVCRTN          8 00000428 00000001     D  D                286  218   238
SVCSAVE         4 000004C8 00000001     F  F                315  227
SVCXPER         4 000002FA 00000001     I                   233  229B
SYSSEM          4 000002DE 00000001     I                   226  224B
SYSSEMSA       84 0000021C 00000001     C  C                163  316   384
TALK            8 000001B8 FFFFFFEB     C  C               2367 1866M 1867M 2026  2031
TEMPLATE        4 00001280 00000001     X  X               1822  785
TIMER           4 00000050 00000001     F  F                144  469M
TOKSTART        2 00001610 00000001     I                  2078 2071B 2073B 2075B
TRAPSAVE        4 0000019C 00000001     F  F                160  176M  188   191   212M  232
TREAD           4 00000164 FFFFFFEB     F  F               2349 1855M 1856M 1857M 1881  1966
TXTCARD         4 000014C6 00000001     I                  1979 1972B
TXTMOV          6 000014DA 00000001     I                  1985 1983X
TYPLEN          1 00000054 00000001 A   U                  1826 1759
TYPPCB          8 00001268 00000001     C  C               1820 1759  1826
UCB             1 00000000 FFFFFFEC     J                  2332 1308U 1426U 1522U 1702U 2339
UCBADDR         4 00000000 FFFFFFEC     F  F               2333 1370  1484
UCBCSW          8 00000014 FFFFFFEC     G  F               2336 1365M 1366M 1376  1378  1380  1383M 1482M 1483M 1490  1492
                                                                1557M 1558M 1566  1703M 1705  1706M 1707M
UCBFPR          1 0000001C FFFFFFEC     C  C               2337 1709
UCBLENG         1 00000020 FFFFFFEC A   U                  2339 1549  1698
UCBLP1          4 000010EC 00000001     A  A               1798 1787
UCBLP2          4 000010F4 00000001     A  A               1799 1788
UCBLP3          4 000010FC 00000001     A  A               1800 1789
UCBLP4          4 00001104 00000001     A  A               1801 1790
UCBPRT1         4 00000EC4 00000001     X  X               1627 1798
UCBPRT2         4 00000F04 00000001     X  X               1641 1799
UCBPRT3         4 00000F44 00000001     X  X               1655 1800
UCBPRT4         4 00000F84 00000001     X  X               1669 1801
UCBRDR1         4 00000EA4 00000001     X  X               1620 1798
UCBRDR2         4 00000EE4 00000001     X  X               1634 1799
UCBRDR3         4 00000F24 00000001     X  X               1648 1800
UCBRDR4         4 00000F64 00000001     X  X               1662 1801
UCBTAB          1 000010CC 00000001     U                  1786 1774  1777
UCBTABLE        4 00000EA4 00000001     F  F               1618 1546  2152
UCBTBEND        1 00000FC4 00000001     U                  1682 1606  2153
UCBUS           8 00000004 FFFFFFEC     G  F               2334 1333  1394  1453  1477  1499  1554  1581
1                              ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   65
-SYMBOL    LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                  HLASM R6.0  2016/08/29 08.42
OUCBWS          8 0000000C FFFFFFEC     G  F               2335 1374  1406  1488  1505  1564  1708
UNAMMOV         6 00001422 00000001     I                  1935 1924X
UNITRTN         4 000001A4 FFFFFFEB     A  A               2362 1941M 1946M
USERL           8 00000190 FFFFFFEB     C  C               2359 1860M 1902  2013  2015  2018M
VERYEND         8 00001740 00000001     D  D               2171  155  1745M 2147
WAITPSWD        4 000017F8 00000002     X  X                118   97
WRITE           8 00000178 FFFFFFEB     C  C               2354 1861M 1862M 1864M 1898  2032
XA              1 00000600 00000001     U                   557  299   565U 1593
XABACK          2 000006B0 00000001     I                   622  619B
XACOM           2 0000060E 00000001     I                   566  560B
XAFOUND         4 00000662 00000001     I                   596  588B
XALOOP          2 0000062A 00000001     I                   577  591B
XANF            2 00000686 00000001     I                   607  603B
XARETURN        4 0000069C 00000001     I                   616  611B
XATOP           4 00000616 00000001     I                   570  595B
XAUTO           1 00000608 00000001     U                   561  313
XAWAIT          2 00000656 00000001     I                   592  578B
XAX             1 00000000 FFFFFFF9     J                  2258  568U  776U 1124U 1314U 1432U 1528U 1756U 1848U 2123U
XAXADDR         4 00000004 FFFFFFF9     F  F               2260  596M  780  1133  1316  1434  1530  1758  1850  2125
XAXALGN         4 00000008 FFFFFFF9     F  F               2261  574   778M 1131M
XAXSIZE         4 00000000 FFFFFFF9     F  F               2259  569   777M 1130M
XB              1 00000744 00000001     U                   722  298
```

```
        XBINSERT      4 00000770 00000001      I                   738   730B  733B
        XBLOOP        4 0000075A 00000001      I                   732   737B
        XBX           1 00000000 FFFFFFF7      J                  2267   600U  683U  724U
        XBXADDR       4 00000004 FFFFFFF7      F  F               2269   604M  612M  685M  726
        XBXSIZE       4 00000000 FFFFFFF7      F  F               2268   605M  613M  684M  725
        XC            1 00000780 00000001      U                   764   306
        XCERR         2 000007C4 00000001      I                   789   773B
        XCOM          1 000005D2 00000001      U                   514   297
        XCOMRET       4 000005FC 00000001      I                   529   521B  523B
        XCX           1 00000000 FFFFFFF6      J                  2271   767U
        XCXNAME       8 00000000 FFFFFFF6      C  C               2272   770   783
        XD            1 000007C6 00000001      U                   813   310
        XDCHECK       6 0000081A 00000001      I                   850   838B
        XDERR         2 00000840 00000001      I                   860   824B  827B
        XDLOOP        2 000007F4 00000001      I                   837   849B
        XDTHEN        4 0000082E 00000001      I                   855   851B
        XDX           1 00000000 FFFFFFF5      J                  2274   816U
        XDXNAME       8 00000000 FFFFFFF5      C  C               2275   819
        XEXC          1 000005C0 00000001      U                   489   296
        XF            1 000006B6 00000001      U                   649   300
        XFBACKUP      2 00000706 00000001      I                   678   670B
        XFINC         4 00000708 00000001      I                   679   674B
        XFLINK        4 00000714 00000001      I                   682   664B
        XFLOOP        2 000006D4 00000001      I                   663   681B
        XFTHEN        2 000006F0 00000001      I                   671   667B
        XFVDO         2 0000073E 00000001      I                   697   692B
        XFVLOOP       4 0000072E 00000001      I                   692   698B
        XFX           1 00000000 FFFFFFF8      J                  2263   653U  844U 1077U
        XFXADDR       4 00000004 FFFFFFF8      F  F               2265   655   845M  855M 1078M
        XFXSIZE       4 00000000 FFFFFFF8      F  F               2264   654   846M  856M 1079M
        XH            1 00000842 00000001      U                   882   312
        XHLOOP        4 00000848 00000001      I                   886   888B
        XHMSG1        8 00000854 00000001      C  C                890   884
       1                               ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                    PAGE   66
       -SYMBOL   LENGTH   VALUE      ID     R TYPE ASM  PROGRAM   DEFN REFERENCES                   HLASM R6.0  2016/08/29 08.42
       0XHMSG2        8 0000086C 00000001      C  C                893   886
        XI            1 0000087A 00000001      U                   912   301
        XJ            1 000008A6 00000001      U                   953   302
        XN            1 000008CA 00000001      U                   998   307
        XNX           1 00000000 FFFFFFF4      J                  2277   769U  818U 1000U 1116U 1191U 1240U
        XNXADDR       4 00000008 FFFFFFF4      A  A               2279   772   821  1010M 1119  1194  1243
        XNXFOUND      4 000008E4 00000001      I                  1010 1006B
        XNXLOOP       4 000008CC 00000001      I                  1004 1008B
        XNXNAME       8 00000000 FFFFFFF4      C  C               2278   770M  819M 1005  1117M 1192M 1241M
        XP            1 000004EE 00000001      U                   361   294
        XPER          1 0000056A 00000001      U                   447   189B  303   385B  463
        XPLOOP        2 0000050A 00000001      I                   374   378B
        XPTHEN        6 0000051C 00000001      I                   381   375B
        XPWAIT        4 00000502 00000001      I                   370   368B
        XQUE          1 00000A8E 00000001      U                  1279   311
        XQUELOOP      4 00000A94 00000001      I                  1283 1285B
        XQUEM1        8 00000AA0 00000001      C  C               1287 1281
        XQUEM2        8 00000AB8 00000001      C  C               1290 1283
        XR            1 000008EC 00000001      U                  1040   304
        XRAFT         4 00000938 00000001      I                  1066 1064B
        XRFILL        6 0000096C 00000001      I                  1083 1057X
        XRMOVE        6 00000972 00000001      I                  1084 1065X
        XRNOB         4 0000091C 00000001      I                  1058 1056B
        XRTHEN        2 0000092E 00000001      I                  1063 1060B
        XRX           1 00000000 FFFFFFF3      J                  2281 1043U 1326U 1336U 1443U 1538U 1572U
        XRXNAME       8 00000000 FFFFFFF3      C  C               2282 1071M 1339
```

```
         XRXSIZE       4 00000008 FFFFFFF3     F  F               2283 1053  1067M 1327M 1444M 1539M 1573M
         XRXTEXT       1 0000000C FFFFFFF3     C  C               2284 1055M 1083M 1083  1084M 1329  1331  1446  1447  1449  1541
                                                                       1543  1544  1575  1577
         XS            1 00000978 00000001     U                  1111  305
         XSADD         4 000009D2 00000001     I                  1145 1141B
         XSAFT         2 000009F4 00000001     I                  1156 1154B
         XSERR         2 00000A02 00000001     I                  1161 1121B
         XSLOOP        2 000009C0 00000001     I                  1140 1144B
         XSMOVE        6 00000A04 00000001     I                  1162 1155X
         XSX           1 00000000 FFFFFFF2     J                  2286 1114U
         XSXNAME       8 00000000 FFFFFFF2     C  C               2287 1117
         XSXSIZE       4 00000008 FFFFFFF2     F  F               2288 1126  1150
         XSXTEXT       1 0000000C FFFFFFF2     C  C               2289 1162
         XV            1 00000534 00000001     U                   409  295
         XVRET         4 00000566 00000001     I                   426  423B
         XVWAKEUP      4 00000548 00000001     I                   417  415B
         XY            1 00000A0A 00000001     U                  1186  308
         XYERR         2 00000A40 00000001     I                  1206 1196B
         XYX           1 00000000 FFFFFFF1     J                  2291 1189U
         XYXADDR       4 00000008 FFFFFFF1     A  A               2293 1202
         XYXNAME       8 00000000 FFFFFFF1     C  C               2292 1192
         XZ            1 00000A42 00000001     U                  1231  309
         XZERR         2 00000A8C 00000001     I                  1258 1238B 1245B
         XZFINE        4 00000A54 00000001     I                  1239 1236B
         XZINSMC       4 00000A7E 00000001     I                  1254 1250B
         XZSTOP        4 00000A6C 00000001     I                  1249 1257B
         XZX           1 00000000 FFFFFFF0     J                  2295 1234U
         XZXNAME       8 00000000 FFFFFFF0     C  C               2296 1237  1241
         =A(DIM)       4 00001720 00000001     A                  2162 1941
1                                 ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                    PAGE   67
-SYMBOL   LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                        HLASM R6.0  2016/08/29 08.42
0=A(EXCPHNDL)
                  4 00001724 00000001     A                  2163 1946
         =A(LENPCB)
                  4 00000E64 00000001     A                  1595  777   856
         =A(UCBTABLE)
                  4 000016F8 00000001     A                  2152 1695
         =A(UCBTBEND)
                  4 00000E90 00000001     A                  1606 1550
         =A(UCBTBEND)
                  4 000016FC 00000001     A                  2153 1699
         =A(XA)        4 00000E5C 00000001     A                  1593  564
         =A(0)         4 00000E60 00000001     A                  1594  772   850  1148  1365  1366  1482  1483  1557  1558
         =A(0)         4 00001714 00000001     A                  2159 1869
         =A(0,CORESIZE-(VERYEND-PROGRAM))
                  4 000016D0 00000001     A                  2147 1745
         =C'$JOB,'
                  5 00000E98 00000001     C                  1609 1389
         =C'$JOB,'
                  5 0000172A 00000001     C                  2165 1888
         =C'AGAIN'
                  5 00000E9D 00000001     C                  1610 1577
         =C'END'       3 0000173D 00000001     C                  2170 1975
         =C'EXCP '
                  5 00001732 00000001     C                  2167 1938
         =C'EXCP'      4 00000E8C 00000001     C                  1605 1541
         =C'IN '       3 0000172F 00000001     C                  2166 1936
         =C'NO'        2 00000E94 00000001     C                  1607 1385  1399  1494
         =C'OK'        2 00000E96 00000001     C                  1608 1391  1496  1575
         =C'OK'        2 00001728 00000001     C                  2164 1886
         =C'OUT '      4 0000171C 00000001     C                  2161 1937
```

```
=C'PRIN'      4 00000E7C 00000001     C                 1601 1447
=C'PRIN'      4 00001708 00000001     C                 2156 1862
=C'READ'      4 00000E74 00000001     C                 1599 1329
=C'READ'      4 00001704 00000001     C                 2155 1857
=C'RLD'       3 0000173A 00000001     C                 2169 1973
=C'STC1'      4 00000E80 00000001     C                 1602 1449
=C'TXT'       3 00001737 00000001     C                 2168 1971
=CL8' '       8 000016E8 00000001     C                 2150 1895  1923  2029
=CL8'*IN'
              8 000016D8 00000001     C                 2148 1855  1940
=CL8'*OUT'
              8 000016F0 00000001     C                 2151 1944
=CL8'USERPROG'
              8 000016E0 00000001     C                 2149 1860  1866
=F'-8'        4 00000E6C 00000001     F                 1597  843  1075  1129
=F'1'         4 00000E58 00000001     F                 1592  413
=F'1'         4 00001710 00000001     F                 2158 1868
=F'12'        4 00000E88 00000001     F                 1604 1539  1567
=F'12'        4 0000170C 00000001     F                 2157 1867
=F'132'       4 00000E84 00000001     F                 1603 1474
=F'132'       4 00001718 00000001     F                 2160 1883  1968
=F'2'         4 00000E70 00000001     F                 1598 1054  1392  1497
=F'8'         4 00000E68 00000001     F                 1596  778  1131  1327  1444  1573
=F'8'         4 00001700 00000001     F                 2154 1856
=F'80'        4 00000E78 00000001     F                 1600 1364
1                              ORDINARY SYMBOL AND LITERAL CROSS REFERENCE                                PAGE   68
-SYMBOL   LENGTH   VALUE     ID    R TYPE ASM  PROGRAM   DEFN REFERENCES                  HLASM R6.0  2016/08/29 08.42
0=X'8900000020000001'
              8 00000E50 00000001     X                 1591 1476
1                                UNREFERENCED SYMBOLS DEFINED IN CSECTS                                   PAGE   69
-  DEFN  SYMBOL                                                                          HLASM R6.0  2016/08/29 08.42
0    50  CCW1
      52  CCW2
      47  IPLCARD
     134  IPLCCW1
     135  IPLCCW2
     133  IPLPSW
     149  MCHKNEW
     139  MCHKOLD
     148  PGMNEW
     138  PGMOLD
      48  PSWD
    2174  R0
    2175  R1
    2184  R10
    2187  R13
    2188  R14
    2189  R15
    2180  R6
    2181  R7
    2182  R8
    2183  R9
     147  SVCNEW
    1676  UCBCONS1
     143  UNUSED0
     145  UNUSED1
1                                        DSECT CROSS REFERENCE                                          PAGE   70
-DSECT     LENGTH      ID       DEFN                                                  HLASM R6.0  2016/08/29 08.42
0DIMAS    000000A0  FFFFFFEA    2377
 EXCPHAS  00000030  FFFFFFED    2322
 FSB      00000008  FFFFFFFC    2243
```

```
        JSPAS    000001E0  FFFFFFEB    2341
        MSG      0000000C  FFFFFFFA    2251
        PCB      00000148  FFFFFFFF    2196
        PRTHAS   00000030  FFFFFFEE    2311
        RDRHAS   00000080  FFFFFFEF    2298
        REGS     00000040  FFFFFFFD    2225
        SA       00000054  FFFFFFFE    2220
        SM       00000008  FFFFFFFB    2247
        UCB      00000020  FFFFFFEC    2332
        XAX      0000000C  FFFFFFF9    2258
        XBX      00000008  FFFFFFF7    2267
        XCX      00000008  FFFFFFF6    2271
        XDX      00000008  FFFFFFF5    2274
        XFX      00000008  FFFFFFF8    2263
        XNX      0000000C  FFFFFFF4    2277
        XRX      0000000C  FFFFFFF3    2281
        XSX      0000000C  FFFFFFF2    2286
        XYX      0000000C  FFFFFFF1    2291
        XZX      00000008  FFFFFFF0    2295
       1                                                      USING MAP                                             PAGE   71
       -                                                                                                   HLASM R6.0  2016/08/29 08.42
          STMT  -----LOCATION----- ACTION ----------------USING----------------- REG MAX     LAST LABEL AND USING TEXT
                  COUNT      ID           TYPE         VALUE    RANGE      ID        DISP    STMT
       0    66  00001778  00000002 USING  ORDINARY    00001770 00001000 00000002  12 000A0    107 CARDLDR,R12
            68  0000177C  00000002 USING  ORDINARY    00000000 00001000 00000001  11 00078    110 PROGRAM,R11
           111  000017EE  00000002 DROP                                           11               R11
           111  000017EE  00000002 DROP                                           12               R12
           131  00000000  00000001 USING  ORDINARY    00000000 00001000 00000001   0 00C38   2051 *,0
           178  00000280  00000001 USING  ORDINARY    00000280 00001000 00000001   1 002EA    189 *,1
           182  0000028C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 0004C    185 PCB,15
           186  00000298  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE  14 00008    188 SA,14
           190  000002A8  00000001 DROP                                           14               14
           190  000002A8  00000001 DROP                                           15               15
           214  000002B8  00000001 USING  ORDINARY    000002B8 00001000 00000001   9 00210    239 *,9
           222  000002D4  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000        PCB,15
           230  000002EE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE  14 00048   1190 SA,14
           240  00000314  00000001 DROP                                            9               9
           362  000004EE  00000001 USING  ORDINARY    000004EE 00001000 00000001   1 0007C    385 *,1
           363  000004EE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFB   2 00004    371 SM,2
           372  0000050A  00000001 DROP                                           15               15
           373  0000050A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   5 00030    377 PCB,5
           379  0000051C  00000001 DROP                                            5               5
           380  0000051C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 0004C    384 PCB,15
           386  00000534  00000001 DROP                                            2               2
           410  00000534  00000001 USING  ORDINARY    00000534 00001000 00000001   1 00924    423 *,1
           411  00000534  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFB   2 00004    420 SM,2
           418  0000054C  00000001 DROP                                           15               15
           419  0000054C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   4 00030    421 PCB,4
           427  0000056A  00000001 DROP                                            2               2
           427  0000056A  00000001 DROP                                            4               4
           450  00000570  00000001 USING  ORDINARY    00000570 00001000 00000001   1 0004C    469 *,1
           453  00000576  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 0004C    468 PCB,10
           472  000005C0  00000001 DROP                                           10               10
           473  000005C0  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00048    621 PCB,15
           490  000005C0  00000001 USING  ORDINARY    000005C0 00001000 00000001   1 00000        *,1
           515  000005D2  00000001 USING  ORDINARY    000005D2 00001000 00000001   1 0002A    523 *,1
           558  00000600  00000001 USING  ORDINARY    00000600 00001000 00000001   1 0000E    560 *,1
           562  00000608  00000001 USING  ORDINARY    00000608 00001000 00000001   1 00854    564 *,1
           565  0000060E  00000001 USING  ORDINARY    00000600 00001000 00000001   1 000B0    619 XA,1
           568  00000612  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   7 00008    596 XAX,7
           576  0000062A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFC   4 00004    598 FSB,4
```

```
       600  00000674  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF7   2 00004     613 XBX,2
       615  0000069C  00000001 DROP                                            2               2
       624  000006B6  00000001 DROP                                            4               4
       624  000006B6  00000001 DROP                                            7               7
       650  000006B6  00000001 USING  ORDINARY    000006B6 00001000 00000001   1 00088     698 *,1
       653  000006BA  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF8   7 00004     655 XFX,7
       662  000006D4  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFC   6 00004     680 FSB,6
       683  00000718  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF7   2 00004     685 XBX,2
       687  00000722  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFB   2 00000     690 SM,2
       691  0000072E  00000001 DROP                                            2               2
       699  00000744  00000001 DROP                                            6               6
       699  00000744  00000001 DROP                                            7               7
       723  00000744  00000001 USING  ORDINARY    00000744 00001000 00000001   1 0002C     737 *,1
       724  00000744  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF7   2 00004     726 XBX,2
       731  0000075A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFC   6 00004     735 FSB,6
  1                                                 USING MAP                                                PAGE   72
  -                                                                                     HLASM R6.0  2016/08/29 08.42
      STMT  -----LOCATION----- ACTION ----------------USING----------------- REG MAX     LAST LABEL AND USING TEXT
              COUNT       ID          TYPE            VALUE    RANGE      ID        DISP    STMT
  0    739  00000774  00000001 DROP                                            6               6
       740  00000774  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFC   4 00004     742 FSB,4
       744  00000780  00000001 DROP                                            2               2
       744  00000780  00000001 DROP                                            4               4
       765  00000780  00000001 USING  ORDINARY    00000780 00001000 00000001   1 00B01     785 *,1
       767  00000782  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF6   7 00000     783 XCX,7
       769  00000786  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008     772 XNX,2
       775  0000079A  00000001 DROP                                            2               2
       776  0000079A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00008     780 XAX,2
       781  000007AC  00000001 DROP                                            2               2
       781  000007AC  00000001 DROP                                           15               15
       782  000007AC  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 00019     785 PCB,2
       790  000007C6  00000001 DROP                                            2               2
       790  000007C6  00000001 DROP                                            7               7
       814  000007C6  00000001 USING  ORDINARY    000007C6 00001000 00000001   1 006A6     856 *,1
       816  000007C8  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF5   7 00000     819 XDX,7
       818  000007CC  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008     821 XNX,2
       822  000007D8  00000001 DROP                                            2               2
       825  000007DE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 00018     826 PCB,2
       829  000007E8  00000001 DROP                                            2               2
       830  000007E8  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000         PCB,15
       834  000007F0  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   8 00048     852 PCB,8
       835  000007F0  00000001 DROP                                           15               15
       839  000007FA  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFA   9 00008     841 MSG,9
       844  0000080A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF8   2 00004     856 XFX,2
       861  00000842  00000001 DROP                                            2               2
       861  00000842  00000001 DROP                                            7               7
       861  00000842  00000001 DROP                                            8               8
       861  00000842  00000001 DROP                                            9               9
       862  00000842  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00010     915 PCB,15
       883  00000842  00000001 USING  ORDINARY    00000842 00001000 00000001   1 0002A     888 *,1
       913  0000087A  00000001 USING  ORDINARY    0000087A 00001000 00000001   1 00000         *,1
       916  00000882  00000001 DROP                                           15               15
       917  00000882  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 00014     918 PCB,10
       919  00000886  00000001 DROP                                           10               10
       920  00000886  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 00014     922 PCB,2
       923  0000088E  00000001 DROP                                            2               2
       924  0000088E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00008     926 PCB,15
       927  00000896  00000001 DROP                                           15               15
       928  00000896  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 0000C     929 PCB,10
       930  0000089A  00000001 DROP                                           10               10
       931  0000089A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 0000C     933 PCB,2
```

```
          934  000008A2  00000001 DROP                                               2                 2
          936  000008A6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000         PCB,15
          954  000008A6  00000001 USING  ORDINARY    000008A6 00001000 00000001   1 00000         *,1
          955  000008A6  00000001 DROP                                              15                 15
          956  000008A6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 00014     958 PCB,2
          959  000008AE  00000001 DROP                                               2                 2
          960  000008AE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  11 00010     961 PCB,11
          962  000008B2  00000001 DROP                                              11                 11
          963  000008B2  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 00014     964 PCB,10
          965  000008B6  00000001 DROP                                              10                 10
          966  000008B6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 0000C     968 PCB,2
     1                                         USING MAP                                                     PAGE   73
     -                                                                                           HLASM R6.0  2016/08/29 08.42
        STMT  -----LOCATION----- ACTION ----------------USING----------------- REG MAX     LAST LABEL AND USING TEXT
                COUNT      ID           TYPE          VALUE    RANGE     ID          DISP    STMT
     0    969  000008BE  00000001 DROP                                               2                 2
          970  000008BE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  11 00008     971 PCB,11
          972  000008C2  00000001 DROP                                              11                 11
          973  000008C2  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 0000C     974 PCB,10
          975  000008C6  00000001 DROP                                              10                 10
          977  000008CA  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000         PCB,15
          999  000008CA  00000001 USING  ORDINARY    000008CA 00001000 00000001   1 0001A    1008 *,1
         1000  000008CA  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008    1010 XNX,2
         1002  000008CC  00000001 DROP                                              15                 15
         1003  000008CC  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 00008    1005 PCB,10
         1012  000008EC  00000001 DROP                                               2                 2
         1012  000008EC  00000001 DROP                                              10                 10
         1013  000008EC  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 0002C    1051 PCB,15
         1041  000008EC  00000001 USING  ORDINARY    000008EC 00001000 00000001   1 00584    1075 *,1
         1043  000008EE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   7 0000D    1084 XRX,7
         1050  00000900  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFA   5 0000C    1084 MSG,5
         1069  00000944  00000001 DROP                                              15                 15
         1070  00000944  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 00000    1071 PCB,10
         1077  0000095C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF8   2 00004    1079 XFX,2
         1085  00000978  00000001 DROP                                               2                 2
         1085  00000978  00000001 DROP                                               5                 5
         1085  00000978  00000001 DROP                                               7                 7
         1085  00000978  00000001 DROP                                              10                 10
         1086  00000978  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000         PCB,15
         1112  00000978  00000001 USING  ORDINARY    00000978 00001000 00000001   1 004F4    1155 *,1
         1114  0000097A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF2   7 0000C    1162 XSX,7
         1116  0000097E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008    1119 XNX,2
         1122  00000990  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   4 0002C    1157 PCB,4
         1123  00000990  00000001 DROP                                               2                 2
         1123  00000990  00000001 DROP                                              15                 15
         1124  00000990  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00008    1133 XAX,2
         1134  000009B2  00000001 DROP                                               2                 2
         1139  000009C0  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFA   9 00004    1143 MSG,9
         1146  000009D6  00000001 DROP                                               9                 9
         1147  000009D6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFA   5 0000C    1162 MSG,5
         1163  00000A0A  00000001 DROP                                               4                 4
         1163  00000A0A  00000001 DROP                                               5                 5
         1163  00000A0A  00000001 DROP                                               7                 7
         1164  00000A0A  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000         PCB,15
         1187  00000A0A  00000001 USING  ORDINARY    00000A0A 00001000 00000001   1 00036    1196 *,1
         1189  00000A0C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF1   7 00009    1202 XYX,7
         1191  00000A10  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008    1194 XNX,2
         1197  00000A22  00000001 DROP                                               2                 2
         1197  00000A22  00000001 DROP                                              14                 14
         1197  00000A22  00000001 DROP                                              15                 15
         1198  00000A22  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 0004C    1204 PCB,10
```

```
      1200  00000A26  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE  13 00008   1203 SA,13
      1207  00000A42  00000001 DROP                                            7              7
      1207  00000A42  00000001 DROP                                           10             10
      1207  00000A42  00000001 DROP                                           13             13
      1208  00000A42  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE  14 00048   1239 SA,14
      1209  00000A42  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000   1235 PCB,15
      1232  00000A42  00000001 USING  ORDINARY    00000A42 00001000 00000001   1 0004A   1257 *,1
 1                                                  USING MAP                                               PAGE   74
 -                                                                                         HLASM R6.0  2016/08/29 08.42
      STMT  -----LOCATION----- ACTION ----------------USING----------------- REG MAX      LAST LABEL AND USING TEXT
              COUNT       ID          TYPE           VALUE    RANGE      ID          DISP     STMT
 0    1234  00000A44  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF0   7 00000   1241 XZX,7
      1240  00000A58  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF4   2 00008   1243 XNX,2
      1247  00000A6C  00000001 DROP                                            2              2
      1247  00000A6C  00000001 DROP                                           15             15
      1248  00000A6C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  10 00034   1255 PCB,10
      1259  00000A8E  00000001 DROP                                           10             10
      1259  00000A8E  00000001 DROP                                            7              7
      1260  00000A8E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 00000        PCB,15
      1280  00000A8E  00000001 USING  ORDINARY    00000A8E 00001000 00000001   1 0002A   1285 *,1
      1293  00000AC6  00000001 DROP                                           14             14
      1293  00000AC6  00000001 DROP                                           15             15
      1308  00000AC6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEC   3 00018   1406 UCB,3
      1310  00000AC8  00000001 USING  ORDINARY    00000AC8 00001000 00000001   1 003D0   1408 *,1
      1314  00000AD2  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   1316 XAX,2
      1317  00000AD8  00000001 DROP                                            2              2
      1322  00000AE4  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEF  12 0007A   1403 RDRHAS,12
      1326  00000AF0  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   2 00010   1331 XRX,2
      1332  00000B06  00000001 DROP                                            2              2
      1336  00000B10  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   2 00000   1339 XRX,2
      1344  00000B2E  00000001 DROP                                            2              2
      1409  00000C28  00000001 DROP                                            3              3
      1409  00000C28  00000001 DROP                                           12             12
      1426  00000C48  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEC   3 00018   1505 UCB,3
      1428  00000C4A  00000001 USING  ORDINARY    00000C4A 00001000 00000001   1 0024C   1507 *,1
      1432  00000C54  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   1434 XAX,2
      1435  00000C5A  00000001 DROP                                            2              2
      1440  00000C66  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEE  12 00028   1501 PRTHAS,12
      1443  00000C6E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   2 00010   1449 XRX,2
      1452  00000C92  00000001 DROP                                            2              2
      1508  00000D5E  00000001 DROP                                            3              3
      1508  00000D5E  00000001 DROP                                           12             12
      1522  00000D74  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEC   3 00018   1581 UCB,3
      1524  00000D76  00000001 USING  ORDINARY    00000D76 00001000 00000001   1 0012E   1583 *,1
      1528  00000D80  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   1530 XAX,2
      1531  00000D86  00000001 DROP                                            2              2
      1536  00000D92  00000001 USING  ORDINARY    00000000 00001000 FFFFFFED  12 00024   1571 EXCPHAS,12
      1538  00000D96  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   2 00014   1544 XRX,2
      1545  00000DB0  00000001 DROP                                            2              2
      1572  00000E12  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF3   2 0000C   1577 XRX,2
      1580  00000E30  00000001 DROP                                            2              2
      1584  00000E3A  00000001 DROP                                            3              3
      1584  00000E3A  00000001 DROP                                           12             12
      1693  00000FCA  00000001 USING  ORDINARY    00000FCA 00001000 00000001   1 00732   1714 *,1
      1702  00000FEC  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEC   6 0001C   1709 UCB,6
      1712  00001014  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 0004C   1715 PCB,15
      1716  00001020  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE  13 00008   1718 SA,13
      1719  0000102C  00000001 DROP                                           13             13
      1719  0000102C  00000001 DROP                                           15             15
      1726  0000103E  00000001 DROP                                            1              1
      1726  0000103E  00000001 DROP                                            6              6
```

```
      1739  00001040  00000001 USING  ORDINARY    00001040 00001000 00000001   1 00700   1781 *,1
      1756  00001080  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   1758 XAX,2
      1761  0000108E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 0000C   1763 PCB,2
1     USING MAP                                                                      PAGE   75
-                                                                                     HLASM R6.0  2016/08/29 08.42
      STMT  -----LOCATION-----  ACTION ----------------USING-----------------  REG MAX     LAST  LABEL AND USING TEXT
              COUNT      ID             TYPE           VALUE    RANGE     ID       DISP    STMT
0     1764  00001096  00000001 DROP                                            2              2
      1765  00001096  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF  15 0000C   1767 PCB,15
      1768  0000109E  00000001 DROP                                           15              15
      1769  0000109E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   2 0004C   1770 PCB,2
      1771  000010A2  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFE   8 00008   1772 SA,8
      1773  000010A6  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFD   9 00010   1777 REGS,9
      1778  000010B8  00000001 DROP                                            9              9
      1844  000012CE  00000001 USING  ORDINARY    000012CE 00001000 00000001   1 0046F   2091 *,1
      1848  000012D8  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   1850 XAX,2
      1851  000012DE  00000001 DROP                                            2              2
      1852  000012DE  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEB  12 001DD   2064 JSPAS,12
      2016  00001548  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   4 0004D   2024 PCB,4
      2025  00001566  00000001 DROP                                            4              4
      2043  0000159E  00000001 USING  ORDINARY    00000000 00001000 FFFFFFFF   5 00008   2045 PCB,5
      2119  00001676  00000001 USING  ORDINARY    00001676 00001000 00000001   1 0004A   2139 *,1
      2123  00001680  00000001 USING  ORDINARY    00000000 00001000 FFFFFFF9   2 00004   2125 XAX,2
      2126  00001686  00000001 DROP                                            2              2
      2129  0000168C  00000001 USING  ORDINARY    00000000 00001000 FFFFFFEA  12 00098   2138 DIMAS,12
      2144  000016CC  00000001 DROP                                           12              12
1     GENERAL PURPOSE REGISTER CROSS REFERENCE                                       PAGE   76
- REGISTER  REFERENCES (M=MODIFIED, B=BRANCH, U=USING, D=DROP, N=INDEX)               HLASM R6.0  2016/08/29 08.42
0     0(0)     131U  176   191M  212   332M  559M  563M  563   618M  618   1691  1724M
      1(1)     176   177M  178U  191M  212   233M  332M  362U  410U  449M  450U  490U  515U  558U  562U  564M  565U  650U
               723U  765U  814U  883U  913U  954U  999U 1041U 1112U 1187U 1232U 1280U 1309M 1310U 1427M 1428U 1523M 1524U
              1691  1692M 1693U 1724M 1726D 1738M 1739U 1843M 1844U 2118M 2119U
      2(2)     64M   65    69M   71    80M   81M   82    83M   84    95M   96    176   191M  212   332M  363U  386D  411U
               427D  525M  527M  567   570M  593M  599M  600U  615D  616M  652   658M  682M  683U  687U  688M  691D  693M
               724U  744D  766   768M  769U  775D  776U  780M  781D  782U  790D  815   817M  818U  821M  822D  823M  823
               825U  829D  832   833M  844U  852M  854M  861D  884M  886M  915   918   920U  923D  926   929   931U  934D
               956U  959D  966U  969D 1000U 1012D 1042  1044M 1047M 1076M 1077U 1085D 1113  1115M 1116U 1123D 1124U 1134D
              1135M 1157M 1188  1190M 1191U 1197D 1233  1239M 1240U 1247D 1255M 1281M 1283M 1311M 1313M 1314U 1317D 1318M
              1325M 1326U 1332D 1333M 1335M 1336U 1344D 1367M 1374M 1394M 1396M 1406M 1429M 1431M 1432U 1435D 1436M 1442M
              1443U 1452D 1453M 1477M 1479M 1488M 1499M 1501M 1505M 1525M 1527M 1528U 1531D 1532M 1537M 1538U 1545D 1554M
              1559M 1564M 1569M 1571M 1572U 1580D 1581M 1691  1708M 1724M 1747M 1748M 1755M 1756U 1758M 1759  1761U 1762
              1763  1764D 1769U 1845M 1847M 1848U 1851D 1853M 1858M 1859  1873M 1877M 1881M 1884M 1891M 1898M 1900M 1902M
              1922M 1926M 1951M 1966M 1969M 2013M 2026M 2032M 2034M 2036M 2038M 2042M 2064M 2120M 2122M 2123U 2126D 2127M
              2133M
      3(3)     70M   71    75M   88M   176   191M  212   332M  364M  365M  366   367M  367   412M  413M  414   585M  586M
               587   654M  656   669M  677M  684   725M  732   742   1126M 1127M 1127N 1128M 1128N 1129M 1130  1308U 1409D
              1426U 1508D 1522U 1553M 1584D 1691  1724M 1746M 1871  1872M 1876M 1905M 1917M 1927M 1958M 1959M 1960M 1961
              2056M 2057M 2058M 2059  2081B
      4(4)     76M   80    86M   86    176   191M  212   332M  370M  376M  381   417M  419U  424   427D  573M  576U  577M
               577   579   584   590M  602   604   624D  655M  657   673   676M  685   726M  738   740U  744D 1119M 1120M
              1120  1122U 1163D 1320M 1352  1359  1438M 1462  1469  1534M 1535M 1556  1691  1724M 1753M 1753  1775  1779M
              1779N 1870  1904M 1918  1955M 1956M 1957M 1998M 2000M 2001  2002  2015M 2016U 2025D 2045M 2050  2055M 2069M
              2069N 2070  2072  2074  2078
      5(5)     73M   74    82    84    85    87M   87    89M   90    176   191M  212   332M  371M  373U  374M  374   377M
               379D  382   572M  589M  597   656M  657M  666   1049M 1050U 1076  1078  1085D 1133M 1145  1147U 1163D 1331M
              1341  1347  1354N 1361M 1362  1389  1400  1401  1402  1402  1446M 1457  1464N 1471M 1472  1543M 1547  1562
              1691  1724M 1754M 1780M 1863M 1864  1871M 1872N 1876N 1906M 1907M 1908  1924  1928  1930  1932  2020M 2021M
              2022  2041M 2043U 2050M 2051  2068M 2068  2076M 2076N 2079  2080M
      6(6)     176   191M  212   332M  569M  587   608   610   620   661M  662U  663M  663   666   671   676   678M  680M
               699D  728M  729M  729   731U  735M  736M  736   739D  741   1053M 1054M 1057  1058M 1058N 1059  1061M 1062M
              1063M 1063  1065  1066M 1066N 1067  1072M 1073M 1073N 1074M 1074N 1075M 1079  1150M 1151  1152M 1153M 1153
```

```
                  1155  1324M 1369  1441M 1481  1544M 1556M 1561  1691  1695M 1696  1698M 1698N 1699  1702U 1724M 1726D
        7(7)       176   191M  212   332M  567M  568U  624D  652M  653U  699D  766M  767U  790D  815M  816U  861D 1042M 1043U
                  1085D 1113M 1114U 1163D 1188M 1189U 1207D 1233M 1234U 1259D 1370M 1371  1484M 1485  1546M 1547N 1549M 1549N
                  1550  1553  1691  1704M 1705M 1706  1724M 1993M 1994M 1995  2006M 2007M 2008
        8(8)       176   191M  212   332M  491M  491   492M  493M  493N  494   516M  516   517M  518M  519   520M  520   574M
                   575M  581   660M  668N  675N  678   679M  727M  734M  738N  832M  834U  855   861D 1137M 1142M 1145N 1691
                  1724M 1770M 1771U 1909M 1911M 1914M 1914  1915M 1916  1959  2057  2131M 2132
        9(9)       176   191M  212   213M  214U  240D  332M  583M  584M  586   665M  668   675   836M  837M  837   839U  845
                   848M  861D 1138M 1139U 1140M 1140  1143M 1146D 1691  1724M 1772M 1773U 1778D 1910M 1910  1911M 1912M 1912
                  1920  1935  1936  1937  1938  1954M 1958  1961  1980  1990  1994  2007  2018  2056  2059  2078M 2079M 2091
        10(A)      176   191M  212   215M  216M  217M  217N  218M  218N  219   223   226N  233N  234   238M  332M  451M  452
                   453U  458M  459   467   472D  601M  602M  605   609   671M  672M  673   840M  848   914M  917U  919D  922
                   925M  928U  930D  933   958M  961   963U  965D  968M  971   973U  975D 1001M 1003U 1004M 1007  1009M 1010
                  1012D 1068M 1070U 1085D 1194M 1195M 1195  1198U 1207D 1243M 1244M 1244  1248U 1259D 1321M 1321  1351M 1352
                  1358M 1359  1439M 1439  1461M 1462  1468M 1469  1691  1724M 1774M 1775M 1776  1777  1979M 1980M 1985  1989M
                  1990M 1993N 1995N 2005  2009
        11(B)       67M   68U  111D  176   191M  212   215M  226M  227N  332M  452M  459   607M  608M  612   689M  690M  692M
                   841M  842M  842N  843M  846   957M  960U  962D  964   967M  970U  972D  974  1347M 1348M 1354M 1355M 1457M
                  1458M 1464M 1465M 1534  1691  1724M 1940M 1944M 1947M 1981M 1982M 1983  1987M 2002M 2130
        12(C)       63M   65M   66U  111D  176   191M  212   215M  235M  236M  332M  598M  609M  610M  613  1316M 1322U 1409D
                  1434M 1440U 1508D 1530M 1536U 1584D 1691  1724M 1850M 1852U 2125M 2129U 2144D
        13(D)      176   191M  212   215M  236   332M  579M  580M  581M  582M  582N  583   596   601   607   621  1199M 1200U
1                                  GENERAL PURPOSE REGISTER CROSS REFERENCE                                      PAGE   77
- REGISTER  REFERENCES (M=MODIFIED, B=BRANCH, U=USING, D=DROP, N=INDEX)                          HLASM R6.0  2016/08/29 08.42
0                 1207D 1691  1715M 1716U 1719D 1724M 1988M 1989N 1991  1996  2001M
        14(E)      176   185M  186U  190D  191M  212   215M  225M  227M  230U  332M  468M 1197D 1201  1203  1208U 1293D 1691
                  1724M
        15(F)      176   181M  182U  190D  191M  212   221M  222U  225   332M  372D  380U  418D  473U  781D  830U  835D  862U
                   916D  921   924U  927D  932   936U  955D  977U 1001  1002D 1007  1013U 1069D 1086U 1123D 1149  1164U 1197D
                  1209U 1247D 1260U 1293D 1691  1711M 1712U 1719D 1724M 1742M 1743  1744  1765U 1766  1767  1768D
1                                  DIAGNOSTIC CROSS REFERENCE AND ASSEMBLER SUMMARY                              PAGE   78
-                                                                                                HLASM R6.0  2016/08/29 08.42
0STATEMENTS FLAGGED
0    178(P1,178), 214(P1,214), 362(P1,362), 410(P1,410), 450(P1,450), 490(P1,490), 515(P1,515), 558(P1,558),
     562(P1,562), 565(P1,565), 650(P1,650), 723(P1,723), 765(P1,765), 814(P1,814), 834(P1,834), 883(P1,883), 913(P1,913),
     954(P1,954), 999(P1,999), 1041(P1,1041), 1112(P1,1112), 1122(P1,1122), 1187(P1,1187), 1232(P1,1232), 1280(P1,1280),
     1310(P1,1310), 1428(P1,1428), 1524(P1,1524), 1693(P1,1673)

      29 STATEMENTS FLAGGED IN THIS ASSEMBLY        4 WAS HIGHEST SEVERITY CODE
0HIGH LEVEL ASSEMBLER, 5696-234, RELEASE 6.0, PTF UK37157
0SYSTEM: Z/OS 01.10.00             JOBNAME: IBMUSER7    STEPNAME: *OMVSEX    PROCSTEP: (NOPROC)
0DATA SETS ALLOCATED FOR THIS ASSEMBLY
  CON DDNAME   DATA SET NAME                                VOLUME  MEMBER
   P1 SYSIN    /MBHFS/SOS4K.ASM
   L1 SYSLIB   CEE.SCEEMAC                                  ZAPRD2
   L2          SYS1.MACLIB                                  ZARES1
   L3          SYS1.MODGEN                                  ZARES1
      SYSLIN   /MBHFS/SOS4K.O
      SYSPRINT /DEV/FD1
      SYSTERM  /DEV/FD2

 1028584K ALLOCATED TO BUFFER POOL       STORAGE REQUIRED     360K
    2341 PRIMARY INPUT RECORDS READ            0 LIBRARY RECORDS READ                 0 WORK FILE READS
       0 ASMAOPT RECORDS READ                3473 PRIMARY PRINT RECORDS WRITTEN       0 WORK FILE WRITES
     137 OBJECT RECORDS WRITTEN                 0 ADATA RECORDS WRITTEN
0ASSEMBLY START TIME: 08.42.21 STOP TIME: 08.42.22 PROCESSOR TIME: 00.00.00.3254
 RETURN CODE 004
```