```
 LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                        2 ************************************************************************
                                                        3 *
                                                        4 *                              E7Prefix
                                                        5 *
                                                        6 *                          GitHub Issue #572
                                                        7 *
                                                        8 *      "z/VM 7.2 IPL'ing as guest of itself CCW Command Rejects"
                                                        9 *
                                                       10 *       https://github.com/SDL-Hercules-390/hyperion/issues/572
                                                       11 *                #issuecomment-1606223921
                                                       12 *
                                                       13 *   (Thank you to Aaron Finerman for devising these tests for us!)
                                                       14 *
                                                       15 *
                                                       16 *                              OVERVIEW
                                                       17 *
                                                       18 *
                                                       19 *   This test program simply executes a few selected E7 Prefix CCW
                                                       20 *   channel programs to verify Hercules's E7 Prefix CCW support is
                                                       21 *   working properly.
                                                       22 *
                                                       23 *
                                                       24 *   All channel programs (except for one of them) are expected to
                                                       25 *   complete normally without error (SCSW = CE+DE = X'0C00').
                                                       26 *
                                                       27 *   One them however (test #5) is purposely designed to always fail
                                                       28 *   in order to verify Hercules properly rejects the invalid channel
                                                       29 *   program and does not mistakenly accept and process it instead.
                                                       30 *   Test #6 is the corrected form of this same test which should,
                                                       31 *   just like all of the other tests, always succeed.
                                                       32 *
                                                       33 *
                                                       34 *   Except for Test #1, all of the other tests (#2-#6) also specify
                                                       35 *   IDA (Indirect Data Addressing) in some of their CCWs in order
                                                       36 *   to verify proper Hercules handling of that too.
                                                       37 *
                                                       38 *
                                                       39 *   Test #4 is especially important in that it specifies IDA in its
                                                       40 *   E7 Prefix CCW to cause its data to be accessed in TWO chunks
                                                       41 *   (i.e. its IDAL contains TWO entries in it), whereas all other
                                                       42 *   IDA usage is only used in the Read 06 and Read 86 CCWs where
                                                       43 *   the IDAL only has one entry in it so as to simply redirect the
                                                       44 *   read to elsewhere.
                                                       45 *
                                                       46 *
                                                       47 *   The set of tests to be run is controlled by the "TESTTAB". All
                                                       48 *   tests in the table are run one after the other by default. To
                                                       49 *   run just one specific test, set the byte at address X'FFF' to
                                                       50 *   the specific test number you want to run in your .tst script.
                                                       51 *
                                                       52 *
                                                       53 ************************************************************************
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                       55          PRINT OFF
                                                     3436          PRINT ON

                                                     3438 ********************************************************************************
                                                     3439 *        SATK prolog stuff...
                                                     3440 ********************************************************************************

                                                     3442          ARCHLVL ZARCH=YES,ARCHIND=YES,MNOTE=NO
                                                     3444+$AL      OPSYN AL
                                                     3445+$ALR     OPSYN ALR
                                                     3446+$B       OPSYN B
                                                     3447+$BAS     OPSYN BAS
                                                     3448+$BASR    OPSYN BASR
                                                     3449+$BC      OPSYN BC
                                                     3450+$BCTR    OPSYN BCTR
                                                     3451+$BE      OPSYN BE
                                                     3452+$BH      OPSYN BH
                                                     3453+$BL      OPSYN BL
                                                     3454+$BM      OPSYN BM
                                                     3455+$BNE     OPSYN BNE
                                                     3456+$BNH     OPSYN BNH
                                                     3457+$BNL     OPSYN BNL
                                                     3458+$BNM     OPSYN BNM
                                                     3459+$BNO     OPSYN BNO
                                                     3460+$BNP     OPSYN BNP
                                                     3461+$BNZ     OPSYN BNZ
                                                     3462+$BO      OPSYN BO
                                                     3463+$BP      OPSYN BP
                                                     3464+$BXLE    OPSYN BXLE
                                                     3465+$BZ      OPSYN BZ
                                                     3466+$CH      OPSYN CH
                                                     3467+$L       OPSYN L
                                                     3468+$LH      OPSYN LH
                                                     3469+$LM      OPSYN LM
                                                     3470+$LPSW    OPSYN LPSW
                                                     3471+$LR      OPSYN LR
                                                     3472+$LTR     OPSYN LTR
                                                     3473+$NR      OPSYN NR
                                                     3474+$SL      OPSYN SL
                                                     3475+$SLR     OPSYN SLR
                                                     3476+$SR      OPSYN SR
                                                     3477+$ST      OPSYN ST
                                                     3478+$STM     OPSYN STM
                                                     3479+$X       OPSYN X
                                                     3480+$AHI     OPSYN AHI
                                                     3481+$B       OPSYN J
                                                     3482+$BC      OPSYN BRC
                                                     3483+$BE      OPSYN JE
                                                     3484+$BH      OPSYN JH
                                                     3485+$BL      OPSYN JL
                                                     3486+$BM      OPSYN JM
                                                     3487+$BNE     OPSYN JNE
                                                     3488+$BNH     OPSYN JNH
                                                     3489+$BNL     OPSYN JNL
                                                     3490+$BNM     OPSYN JNM
                                                     3491+$BNO     OPSYN JNO
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                    3492+$BNP     OPSYN JNP
                                                    3493+$BNZ     OPSYN JNZ
                                                    3494+$BO      OPSYN JO
                                                    3495+$BP      OPSYN JP
                                                    3496+$BXLE    OPSYN JXLE
                                                    3497+$BZ      OPSYN JZ
                                                    3498+$CHI     OPSYN CHI
                                                    3499+$AHI     OPSYN AGHI
                                                    3500+$AL      OPSYN ALG
                                                    3501+$ALR     OPSYN ALGR
                                                    3502+$BCTR    OPSYN BCTGR
                                                    3503+$BXLE    OPSYN JXLEG
                                                    3504+$CH      OPSYN CGH
                                                    3505+$CHI     OPSYN CGHI
                                                    3506+$L       OPSYN LG
                                                    3507+$LH      OPSYN LGH
                                                    3508+$LM      OPSYN LMG
                                                    3509+$LPSW    OPSYN LPSWE
                                                    3510+$LR      OPSYN LGR
                                                    3511+$LTR     OPSYN LTGR
                                                    3512+$NR      OPSYN NGR
                                                    3513+$SL      OPSYN SLG
                                                    3514+$SLR     OPSYN SLGR
                                                    3515+$SR      OPSYN SGR
                                                    3516+$ST      OPSYN STG
                                                    3517+$STM     OPSYN STMG
                                                    3518+$X       OPSYN XG


                                                    3520 ********************************************************************************
                                                    3521 *        Initiate the E7TEST CSECT in the CODE region
                                                    3522 *        with the location counter at 0
                                                    3523 ********************************************************************************

                                                    3525 E7TEST   ASALOAD  REGION=CODE
                                 00000000  00002023 3526+E7TEST   START 0,CODE
00000000  00020000 00000000                         3528+         PSW   0,0,2,0,X'008'      64-bit Restart ISR Trap New PSW
00000010                         00000010  00000058 3529+         ORG   E7TEST+X'058'
00000058  00020000 00000000                         3531+         PSW   0,0,2,0,X'018'      64-bit External ISR Trap New PSW
00000068  00020000 00000000                         3532+         PSW   0,0,2,0,X'020'      64-bit Supervisor Call ISR Trap New PSW
00000078  00020000 00000000                         3533+         PSW   0,0,2,0,X'028'      64-bit Program ISR Trap New PSW
00000088  00020000 00000000                         3534+         PSW   0,0,2,0,X'030'      64-bit Machine Check Trap New PSW
00000098  00020000 00000000                         3535+         PSW   0,0,2,0,X'038'      64-bit Input/Output Trap New PSW
000000A8                         000000A8  000001A0 3536+         ORG   E7TEST+X'1A0'
000001A0  00020000 00000000                         3538+         PSWZ  0,0,2,0,X'120'     Restart ISR Trap New PSW
000001B0  00020000 00000000                         3539+         PSWZ  0,0,2,0,X'130'     External ISR Trap New PSW
000001C0  00020000 00000000                         3540+         PSWZ  0,0,2,0,X'140'     Supervisor Call ISR Trap New PSW
000001D0  00020000 00000000                         3541+         PSWZ  0,0,2,0,X'150'     Program ISR Trap New PSW
000001E0  00020000 00000000                         3542+         PSWZ  0,0,2,0,X'160'     Machine Check Trap New PSW
000001F0  00020000 00000000                         3543+         PSWZ  0,0,2,0,X'170'     Input/Output Trap New PSW
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT
                                                     3545 ********************************************************************************
                                                     3546 *                  L O W   C O R E
                                                     3547 ********************************************************************************

00000200                        00000200  000001A0   3549          ORG   E7TEST+X'1A0'                      z/Arch Restart New PSW
000001A0  00000001 80000000                          3550          DC    0D'0',XL8'0000000180000000'
000001A8  00000000 00000200                          3551          DC    AD(BEGIN)

000001B0                        000001B0  000001D0   3553          ORG   E7TEST+X'1D0'                      z/Arch Program New PSW
000001D0  00020001 80000000                          3554          DC    0D'0',XL8'0002000180000000'
000001D8  00000000 0000DEAD                          3555          DC    AD(X'DEAD')




                                                     3557 ********************************************************************************
                                                     3558 *                       ENTRY POINT CODE
                                                     3559 ********************************************************************************
                                                     3560 *   R0       (work)
                                                     3561 *   R1       (work) (also ENADEV macro's I/O device during startup)
                                                     3562 *   R2       (work)
                                                     3563 *   R3       IOCB pointer (set by INIT, needed by ENADEV macro)
                                                     3564 *   R4       SCHIB pointer (tempoarily used at INIT during ENADEV)
                                                     3565 *   R5       SCHSCSW pointer (also temporarily used for CPU register
                                                     3566 *            when signaling architecture change during startup)
                                                     3567 *   R6,R7    (work) (also used as signaling registers when changing
                                                     3568 *            architecture during startup)
                                                     3569 *   R8       ORB pointer (set by INIT, used by EXCP subroutine)
                                                     3570 *   R9-R15   (work)
                                                     3571 ********************************************************************************

000001E0                        00000000             3573          USING E7TEST,R0          Low core addressability
000001E0                        00000000             3574          USING ASA,R0             Low core addressability
000001E0                        00000000             3575          USING IOCB,R3            SATK Device I/O-Control Block
000001E0                        00000000             3576          USING SCHIB,R4           ESA/390 Subchannel Information Block
000001E0                        00000000             3577          USING SCSW,R5            ESA/390 Subchannel Status Word
000001E0                        00000000             3578          USING ORB,R8             ESA/390 Operation-Request Block

000001E0                        000001E0  00000200   3580          ORG   E7TEST+X'200'
                                00000200  00000001   3581 BEGIN    EQU   *
00000200  1F00                                       3582          SLR   R0,R0              Start clean (SIGP status register)
00000202  9200 0200                      00000200   3583          MVI   TESTNUM,0          Initialize Test number
00000206  1F11                                       3584          SLR   R1,R1              Start clean (SIGP parm   register)
00000208  1F22                                       3585          SLR   R2,R2              Start clean
0000020A  1F33                                       3586          SLR   R3,R3              Start clean (SIGP target CPU)

0000020C  4130 0000                      00000000   3588          LA    R3,0               Target CPU = CPU #0
00000210  4110 0001                      00000001   3589          LA    R1,1               Parm register = z/Arch mode
00000214  AE03 0012                      00000012   3590          SIGP  R0,R3,X'12'        Order code    = z/Arch mode
00000218  4780 0232                      00000232   3591          BC    B'1000',ZARCHOK    CC0 = success: continue
0000021C  4740 0228                      00000228   3592          BC    B'0100',CHKZARCH   CC1 = status stored: check further
00000220  4720 02D0                      000002D0   3593          BC    B'0010',FAILCPU0   CC2 = busy: FAIL
00000224  4710 02D0                      000002D0   3594          BC    B'0001',FAILCPU0   CC3 = not operational: FAIL
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                          3596 ********************************************************************
                                          3597 *       Ensure test program executes in z/Architecture mode
                                          3598 ********************************************************************

00000228  4140 0100                 00000100  3600 CHKZARCH LA    R4,X'100'          Status X'100' = Same Architecture!
0000022C  1504                               3601          CLR   R0,R4              Are we already in z/Arch mode?
0000022E  A774 0051                 000002D0  3602          JNE   FAILCPU0           Any other status = FAIL

00000232  4140 0246                 00000246  3604 ZARCHOK  LA    R4,BEGIN0          Point to CPU #0 entry point
00000236  4040 01AE                 000001AE  3605          STH   R4,X'1AE'          Update Restart PSW

0000023A  4130 0000                 00000000  3607          LA    R3,0               Target CPU = CPU #0
0000023E  AE03 0006                 00000006  3608          SIGP  R0,R3,X'6'         Order code = Restart

00000242  B2B2 02D0                 000002D0  3610          LPSWE FAILCPU0           WTF?! How did we get here?!



                                          3612 ********************************************************************
                                          3613 *    THE ACTUAL (very short and simple) E7TEST TEST PROGRAM ITSELF
                                          3614 ********************************************************************

00000246  45E0 0368                 00000368  3616 BEGIN0   BAL   R14,INIT           Initalize Program


0000024A  98AB 0610                 00000610  3618          LM    R10,R11,ATESTTAB   R10 --> table, R11 <== #of entries

0000024E  9500 0FFF                 00000FFF  3620 TESTLOOP CLI   TESTONLY,0         Do only specific test?
00000252  4780 0260                 00000260  3621          BE    TESTTHIS           No, do all tests
00000256  D500 0FFF A003      00000FFF  00000003  3622          CLC   TESTONLY,3(R10)    Is the test they want?
0000025C  4770 0270                 00000270  3623          BNE   TESTNEXT           No, skip this test

00000260  9801 A00C                 0000000C  3625 TESTTHIS LM    R0,R1,(TESTLEN-(2*4))(R10)  R0 <== MSG LEN, R1 --> MSG
00000264  45E0 04A0                 000004A0  3626          BAL   R14,MSG                    Report which test this is

00000268  9802 A000                 00000000  3628          LM    R0,R2,0(R10)       Load test parms from table
0000026C  45E0 027C                 0000027C  3629          BAL   R14,DOTEST         Perform this test...
00000270  41A0 A014                 00000014  3630 TESTNEXT LA    R10,TESTLEN(,R10)  R10 --> next test table entry

00000274  46B0 024E                 0000024E  3632          BCT   R11,TESTLOOP       Loooop... until no more tests



00000278  B2B2 0308                 00000308  3634          LPSWE GOODPSW            E7TEST SUCCESS!
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                  3636 ************************************************************************
                                                  3637 *        Generic TEST subroutine:  R0=test#, R1=chpgm, R2=flag
                                                  3638 ************************************************************************

0000027C  50E0 02CC                     000002CC  3640 DOTEST   ST    R14,TESTR14        Save return address

00000280  4200 0200                     00000200  3642          STC   R0,TESTNUM         Save this test's test number
00000284  1801                                    3643          LR    R0,R1              R0 --> This test's Channel Program

00000286  45F0 03E2                     000003E2  3645          BAL   R15,EXCP           Execute this Channel Program...

0000028A  5810 3000                     00000000  3647          L     R1,IOCBDID         R1 <== Subchannel
0000028E  5840 3028                     00000028  3648          L     R4,IOCBSIB         R4 <== SCHIB address

00000292  B234 4000                     00000000  3650          STSCH 0(R4)              Store Subchannel for our device
00000296  4770 02D8                     000002D8  3651          BC    B'0111',FAILSCH    FAIL if anything other than CC0

                                                  3653 *        Verify correct/expected I/O completion...

0000029A  4150 401C                     0000001C  3655          LA    R5,SCHSCSW         R5 --> SCSW

0000029E  9500 5009                     00000009  3657          CLI   SCSWCS,0           Clean channel status?
000002A2  4770 02F0                     000002F0  3658          BNE   FAILTEST           No?! ALWAYS FAIL THE TEST!

000002A6  1222                                    3660          LTR   R2,R2              I/O error expected for this test?
000002A8  4770 02B8                     000002B8  3661          BNZ   ERRTEST            Yes, then verify there was an error

000002AC  950C 5008                     00000008  3663          CLI   SCSWUS,SCSWCE+SCSWDE   Check for normal successful I/O
000002B0  4770 02F0                     000002F0  3664          BNE   FAILTEST           No?! FAIL!
000002B4  47F0 02C4                     000002C4  3665          B     TESTOK             Yes, then we're done; return

000002B8  950C 5008                     00000008  3667 ERRTEST  CLI   SCSWUS,SCSWCE+SCSWDE   Check for normal successful I/O
000002BC  4780 02F0                     000002F0  3668          BE    FAILTEST           Yes?! UNEXPECTED! FAIL!
000002C0  45F0 03DE                     000003DE  3669          BAL   R15,DOSENSE        Clear the error

000002C4  58E0 02CC                     000002CC  3671 TESTOK   L     R14,TESTR14        Restore R14 return address
000002C8  07FE                                    3672          BR    R14                Return to caller

000002CC  00000000                                3674 TESTR14  DC    A(0)     Test subroutine saved R14 return address
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                          3676 ********************************************************************************
                                          3677 *                    Disabled Wait PSWs...
                                          3678 ********************************************************************************



                                          3680 *    Test failure routines to load specific failure PSW...

000002D0  4190 0328                       00000328  3682 FAILCPU0 LA    R9,BAD66PSW          SIGP failed
000002D4  47F0 02F8                       000002F8  3683          B     FAIL
000002D8  4190 0338                       00000338  3684 FAILSCH  LA    R9,BAD77PSW          STSCH failed
000002DC  47F0 02F8                       000002F8  3685          B     FAIL
000002E0  4190 0348                       00000348  3686 FAILDEV  LA    R9,BAD88PSW          ENADEV failed
000002E4  47F0 02F8                       000002F8  3687          B     FAIL
000002E8  4190 0358                       00000358  3688 FAILIO   LA    R9,BAD99PSW          RAWIO failed
000002EC  47F0 02F8                       000002F8  3689          B     FAIL
000002F0  4190 0318                       00000318  3690 FAILTEST LA    R9,FAILPSW           One of our overall tests failed
000002F4  47F0 02F8                       000002F8  3691          B     FAIL



000002F8  D200 900F 0200      0000000F    00000200  3693 FAIL     MVC   16-1(1,R9),TESTNUM   Put failing test# into PSW
000002FE  B2B2 9000                       00000000  3694          LPSWE 0(R9)                Load failure PSW



                                          3696 *
                                          3697 **    Overall test SUCCESS / FAILURE disabled wait PSWs...
                                          3698 *

00000308  00020001 80000000               3700 GOODPSW  DC    0D'0',XL8'0002000180000000',AD(X'00000000')
00000318  00020001 80000000               3701 FAILPSW  DC    0D'0',XL8'0002000180000000',AD(X'0BAD0000')



                                          3703 *
                                          3704 **    Specific unexpected failure disabled wait PSWs...
                                          3705 *

00000328  00020001 80000000               3707 BAD66PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD6600')
00000338  00020001 80000000               3708 BAD77PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD7700')
00000348  00020001 80000000               3709 BAD88PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD8800')
00000358  00020001 80000000               3710 BAD99PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD9900')
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2    STMT

                                                   3712 ********************************************************************
                                                   3713 *        Program Initialization
                                                   3714 ********************************************************************

00000368  4130 0574                      00000574  3716 INIT     LA    R3,IOCB_A80        R3 --> IOCB
0000036C  E380 3018 0004                 00000018  3717          LG    R8,IOCBORB         R8 --> ORB
00000372  45F0 037C                      0000037C  3718          BAL   R15,IOINIT         Init CPU for I/O operations
00000376  45F0 038A                      0000038A  3719          BAL   R15,ENADEV         Enable device for I/O
0000037A  07FE                                     3720          BR    R14                Return to caller


                                                   3722 ********************************************************************
                                                   3723 *        Initialize the CPU for I/O operations
                                                   3724 ********************************************************************

                                                   3726 IOINIT   IOINIT ,
0000037C  B766 0384                      00000384  3727+IOINIT   LCTL  6,6,IOMK0007       Enable subchannel subclasses for interruptions
00000380  47F0 0388                      00000388  3728+         B     IOMK0007+4
00000384                                           3729+IOMK0007 DS    0F
00000384  FF000000                                 3730+         DC    XL4'FF000000'         All subchannel subclasses enabled
00000388  07FF                                     3731          BR    R15                Return to caller


                                                   3733 ********************************************************************
                                                   3734 *        Enable the device, making it ready for use
                                                   3735 ********************************************************************

                                                   3737 ENADEV   ENADEV  ENAOKAY,FAILDEV,REG=4
0000038A  5810 03D4                      000003D4  3738+ENADEV   L     1,FIND0008
0000038E  E340 3028 0004                 00000028  3739+         $L    4,IOCBSIB          Locate where the SCHIB is to be stored
00000394                        00000000           3740+         USING SCHIB,4
00000394                                           3741+FINL0008 DS    0H   Retrieve Subchannel Information Block for desired device number
00000394  B234 4000                      00000000  3742+         STSCH 0(4)               Store the SCHIB for first subchannel
00000398  A774 FFA4                      000002E0  3743+         $BC   B'0111',FAILDEV    Subchannel does not exist and device number not found
0000039C  9101 4005                      00000005  3744+         TM    PMCW1_8,PMCWV      Is the subchannel device number valid?
000003A0  A784 0011                      000003C2  3745+         $BZ   FINN0008           ..No, check the next subchannel
000003A4  D501 4006 3004      00000006   00000004  3746+         CLC   PMCWDNUM,IOCBDEV   Is this the device number being sought?
000003AA  A774 000C                      000003C2  3747+         $BNE  FINN0008           ..No, check the next subchannel
                                                   3748+* Subchannel found!
000003AE  5010 3000                      00000000  3749+         ST    1,IOCBDID          Remember the subchannel so I/O can be done to it.
000003B2  9680 4005                      00000005  3750+         OI    PMCW1_8,PMCWE      Make sure it is enabled so I/O requests accepted
000003B6  B232 4000                      00000000  3751+         MSCH  0(4)               Enable the subchannel to the channel sub-system
000003BA  A784 0011                      000003DC  3752+         $BC   B'1000',ENAOKAY    CC0 (SCHIB updated), device is ready.
000003BE  A7F4 FF91                      000002E0  3753+         $B    FAILDEV            CC1,CC2,CC3 (SCHIB update failed), quit
000003C2                                           3754+FINN0008 DS    0H  Advance to next subchannel
000003C2  4110 1001                      00000001  3755+         LA    1,1(0,1)           Advance to next subchannel
000003C6  5510 03D8                      000003D8  3756+         CL    1,FINM0008         Beyond maximum subchannel
000003CA  A7D4 FFE5                      00000394  3757+         $BNH  FINL0008           ..No, examine the next subchannel
000003CE  A724 FF89                      000002E0  3758+         $BH   FAILDEV            ..Yes, failed to enable the device
000003D2                                           3759+         DROP  4                  Forget SCHIB addressing
000003D4  00010000                                 3760+FIND0008 DC    A(X'00010000')     First subchannel subsystem ID
000003D8  0001FFFF                                 3761+FINM0008 DC    A(X'0001FFFF')     Last subchannel subsystem ID

000003DC  07FF                                     3763 ENAOKAY  BR    R15                Return to caller if device enabled OK
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  3765 ********************************************************************************
                                                  3766 *        Execute the channel program pointed to by R0
                                                  3767 ********************************************************************************

000003DE  4100 06A8                    000006A8  3769 DOSENSE  LA    R0,SENSEPGM          R0 -> Read SENSE Channel Program
000003E2  5000 8008                    00000008  3770 EXCP     ST    R0,ORBCCW            Plug Channel Program into IORB
000003E6  B904 0004                              3771          LGR   R0,R4                Save SCHIB pointer
000003EA  9282 8005                    00000005  3772          MVI   ORB1_8,ORBF+ORBH     Format-1 CCWs, Format-2 IDAWs
000003EE  9200 8007                    00000007  3773          MVI   ORRB1_24,0           Set all these ORB flags to zero

                                                  3775          RAWIO 4,FAIL=FAILIO
000003F2  9200 300E                    0000000E  3776+         MVI   IOCBSC,X'00'          Clear SC information
000003F6  D201 300A 3006      0000000A 00000006  3777+         MVC   IOCBST,IOCBZERO       Clear accumulated status
000003FC  5810 3000                    00000000  3778+         L     1,IOCBDID             Remember the device ID with which I am working
                                                  3779+* Initiate Subchannel-based input/output operation
00000400  E340 3018 0004               00000018  3780+         $L    4,IOCBORB             Locate the ORB for the channel subsystem
00000406  B233 4000                    00000000  3781+         SSCH  0(4)                  Initiate the I/O operation
0000040A  A774 FF6F                    000002E8  3782+         $BC   B'0111',FAILIO        ..Start function failed, report/handle the error
0000040E  E340 3020 0004               00000020  3783+         $L    4,IOCBIRB             Locate the IRB storage area
00000414                      00000000           3784+         USING IRB,4                 Make it addressable

                                                  3786+* Wait for I/O operation to present status via an interruption
00000414                                          3787+IOWT0009 DS    0H  Wait for I/O to complete
00000414  D20F 0448 01F0      00000448 000001F0   3789+         MVC   IOS0010(16),496(0)     Save Input/Output new PSW
0000041A  D20F 01F0 0438      000001F0 00000438   3790+         MVC   496(16,0),ION0010     Establish Input/Ouput new PSW
00000420  B2B2 0428                    00000428  3791+         $LPSW WPSW0010              Wait for event
00000428  02020000 00000000                       3792+WPSW0010 PSW   2,0,2,0,0               Wait for event
00000438  00002000 00000000                       3793+ION0010  PSW   0,0,0,32,IRST0010,24        I/O New PSW: cc==2
00000448  00000000 00000000                       3794+IOS0010  DC    XL16'00'
                                                  3795+* Handle input/output interruption
00000458                                          3796+IRST0010 DS    0H
00000458  D20F 01F0 0448      000001F0 00000448   3797+         MVC   496(16,0),IOS0010      Restore input/output new PSW
                                                  3798+* Process the interruption...
                                                  3799+* Validate interruption is for the expected subchannel
0000045E  5510 00B8                    000000B8  3800+         CL    1,IOSSID              Is this the device for which I am waiting?
00000462  A774 FFD9                    00000414  3801+         $BNE  IOWT0009              ..No, continue waiting for it
                                                  3802+* Accumulate interruption information from IRB
00000466  B235 4000                    00000000  3803+         TSCH  0(4)                  Retrive interrupt information
0000046A  A744 FFD5                    00000414  3804+         $BC   B'0100',IOWT0009      CC1 (not status pending), wait for it to arrive
0000046E  A714 FF3D                    000002E8  3805+         $BC   B'0001',FAILIO        CC3 (not operational), an error then
                                                  3806+*                                    CC0 (status was pending), accumulate the status
00000472  D600 300E 4003      0000000E 00000003  3807+         OC    IOCBSC,IRBSCSW+SCSW2  Accumulate status control
00000478  D601 300A 4008      0000000A 00000008  3808+         OC    IOCBST,IRBSCSW+SCSWUS Accumulate device and channel status
0000047E  9104 300E                    0000000E  3809+         TM    IOCBSC,SCSWSPRI       Primary subchannel status?
00000482  A7E4 FFC9                    00000414  3810+         $BNO  IOWT0009              ..No, wait for primary status
00000486  D203 3010 4004      00000010 00000004  3811+         MVC   IOCBSCCW,IRBSCSW+SCSWCCW  CCW address
0000048C  D201 3016 400A      00000016 0000000A  3812+         MVC   IOCBRCNT,IRBSCSW+SCSWCNT  Residual count
                                                  3813+* Test for errors as specified in the IOCB
00000492  910C 300A                    0000000A  3814+         TM    IOCBUS,CSWCE+CSWDE    Channel end and device end both accumulated?
00000496  A7E4 FF29                    000002E8  3815+         $BNO  FAILIO                Hunh? No CE and DE but do have primary status!
                                                  3816+* Input/Output operation successful

0000049A  B904 0040                              3818          LGR   R4,R0                 Restore SCHIB pointer
0000049E  07FF                                   3819          BR    R15                   Return to caller
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                         3821 ************************************************************************
                                         3822 *        Issue HERCULES MESSAGE pointed to by R1, length in R0
                                         3823 ************************************************************************

000004A0  4900 06A4                      000006A4  3825 MSG      CH    R0,=H'0'                Do we even HAVE a message?
000004A4  07DE                           000006A6  3826          BNHR  R14                     No, ignore

000004A6  9002 04D8                      000004D8  3828          STM   R0,R2,MSGSAVE           Save registers

000004AA  4900 06A6                      000006A6  3830          CH    R0,=AL2(L'MSGMSG)       Message length within limits?
000004AE  47D0 04B6                      000004B6  3831          BNH   MSGOK                   Yes, continue
000004B2  4100 0080                      00000080  3832          LA    R0,L'MSGMSG             No, set to maximum

000004B6  1820                           000004B8  3834 MSGOK    LR    R2,R0                   Copy length to work register
000004B8  0620                           000004BA  3835          BCTR  R2,0                    Minus-1 for execute
000004BA  4420 04E4                      000004E4  3836          EX    R2,MSGMVC               Copy message to O/P buffer

000004BE  4120 200A                      0000000A  3838          LA    R2,1+L'MSGCMD(,R2)      Calculate true command length
000004C2  4110 04EA                      000004EA  3839          LA    R1,MSGCMD               Point to true command

000004C6  83120008                       000004C8  3841          DC    X'83',X'12',X'0008'     Issue Hercules Diagnose X'008'
000004CA  4780 04D0                      000004D0  3842          BZ    MSGRET                  Return if successful
000004CE  0000                           000004D0  3843          DC    H'0'                    CRASH for debugging purposes

000004D0  9802 04D8                      000004D8  3845 MSGRET   LM    R0,R2,MSGSAVE           Restore registers
000004D4  07FE                           000004DA  3846          BR    R14                     Return to caller

000004D8  00000000 00000000                        3848 MSGSAVE  DC    3F'0'                   Registers save area
000004E4  D200 04F3 1000       000004F3  00000000  3849 MSGMVC   MVC   MSGMSG(0),0(R1)         Executed instruction

000004EA  D4E2C7D5 D6C8405C                        3851 MSGCMD   DC    C'MSGNOH * '            *** HERCULES MESSAGE COMMAND ***
000004F3  40404040 40404040                        3852 MSGMSG   DC    CL128' '                The message text to be displayed
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                    3854 ********************************************************************************
                                                    3855 *                              IOCB
                                                    3856 ********************************************************************************
                                                    3857 *
                                                    3858 *         I/O Control Block -- Structure used by RAWIO macro
                                                    3859 *         identifying the device and operation being performed
                                                    3860 *
                                                    3861 ********************************************************************************


                                                    3863 IOCB_A80 IOCB  X'A80'     I/O Control Block for CCUU device X'A80'
00000574  00000000                                  3864+IOCB_A80 DC    A(0)            +0 Device Identifier (supplied by ENADEV macro)
00000578  0A80                                      3865+         DC    AL2(X'A80')     +4 Device address or device number
0000057A  0000                                      3866+         DC    H'0'            +6 Must be zeros
0000057C  D3                                        3867+         DC    AL1(X'D3')      +8 Default detected unit errors
0000057D  3F                                        3868+         DC    AL1(X'3F')      +9 Default detected channel errors
0000057E  0000                                      3869+         DC    HL2'0'          +10 Accumulated unit and channel errors
00000580  0000                                      3870+         DC    HL2'0'          +12 Tested unit and channel status
00000582  00                                        3871+         DC    XL1'00'         +14 Accumulated subchannel status control from SCSW
00000583  80                                        3872+         DC    XL1'80'         +15 Default unsoliticed wait condition
00000584  00000000                                  3873+         DC    F'0'            +16 I/O status CCW address
00000588  00000000                                  3874+         DC    F'0'            +20 residual count
0000058C  00000000 00000604                         3875+         DC    ADL8(IORB0011)  +24  Address where ORB is located
00000594  00000000 000005A4                         3876+         DC    ADL8(IIRB0011)  +32 Address where IRB stored
0000059C  00000000 000005A4                         3877+         DC    ADL8(IIRB0011)  +40 Address where SCHIB stored
000005A4  00000000 00000000                         3878+IIRB0011 DC    24F'0'              Embedded shared IRB and SCHIB area
00000604                                            3880+IORB0011 DS    0XL12
00000604  00000000                                  3881+         DC    A(0)            Word 0 - Interruption Parameter
00000608  00                                        3882+         DC    AL1((0)*16+B'0000')  Word 1, bits 0-7
00000609  80                                        3883+         DC    BL1'10000000'   Word 1, bits 8-15
0000060A  FF                                        3884+         DC    AL1(255)        Word 1, bits 16-23
0000060B  00                                        3885+         DC    BL1'00000000'    Word 1, bits 24-31
0000060C  00000000                                  3886+         DC    AL4(0)          Word 2 - CCW address
```

```
  LOC         OBJECT CODE        ADDR1     ADDR2     STMT

                                                     3888 ********************************************************************************
                                                     3889 *                          WORKING STORAGE
                                                     3890 ********************************************************************************

                                00000610  00000001   3892 WKSTORG  EQU   *
00000610                        00000610  00000FFF   3893           ORG   E7TEST+X'FFF'
00000FFF  00                                         3894 TESTONLY DC    AL1(0)              Only do this one test if non-zero
00001000                        00001000  00000610   3895           ORG   WKSTORG

                                00000040  00000001   3897 CC       EQU   X'40'               Chain Command
                                00000020  00000001   3898 SLI      EQU   X'20'               Suppress Incorrect Length Indication
                                00000004  00000001   3899 IDA      EQU   X'04'               Indirect Data Addressing

                                00000004  00000001   3901 SNS      EQU   X'04'               Basic Sense CCW opcode
                                00000006  00000001   3902 RD       EQU   X'06'               Read Data CCW opcode
                                0000003E  00000001   3903 RSD      EQU   X'3E'               Read Subsystem Data CCW opcode
                                00000047  00000001   3904 LR       EQU   X'47'               Locate Record CCW opcode
                                00000063  00000001   3905 DX       EQU   X'63'               Define Extent CCW opcode
                                00000086  00000001   3906 RDMT     EQU   X'86'               Read Data Multi-track CCW opcode
                                000000E7  00000001   3907 PFX      EQU   X'E7'               Prefix CCW opcode

                                                     3909 *
                                                     3910 **       TESTS CONTROL TABLE...
                                                     3911 *

00000610  00000618 00000007                          3913 ATESTTAB DC    A(TESTTAB,NUMTESTS)

                                00000200  00000001   3914 TESTNUM  EQU   X'200'                 Current test number
                                                     3915 *                                   (identifies failed test)

00000618                                             3917 TESTTAB  DC    0A(0)
                                                     3918          PRINT DATA
00000618  00000001 000006F0                          3919          DC    A(1,T1_CHPGM,0,T1_MSGLN,T1_DESC)
00000620  00000000 0000003E
00000628  000006B0
0000062C  00000002 00000758                          3920          DC    A(2,T2_CHPGM,0,T2_MSGLN,T2_DESC)
00000634  00000000 00000055
0000063C  00000700
00000640  00000003 000007D8                          3921          DC    A(3,T3_CHPGM,0,T3_MSGLN,T3_DESC)
00000648  00000000 00000056
00000650  00000780
00000654  00000004 00000850                          3922          DC    A(4,T4_CHPGM,0,T4_MSGLN,T4_DESC)
0000065C  00000000 00000056
00000664  000007F8
00000668  00000005 000008E8                          3923          DC    A(5,T5_CHPGM,1,T5_MSGLN,T5_DESC)  (1=Expect I/O ERROR)
00000670  00000001 0000006F
00000678  00000878
0000067C  00000006 00000960                          3924          DC    A(6,T6_CHPGM,0,T6_MSGLN,T6_DESC)
00000684  00000000 00000051
0000068C  00000908
00000690  00000007 000009B0                          3925          DC    A(7,T7_CHPGM,0,T7_MSGLN,T7_DESC)
00000698  00000000 0000002F
000006A0  00000980
                                                     3926          PRINT NODATA
                                00000007  00000001   3927 NUMTESTS EQU     7                   Number of test table entries
                                00000014  00000001   3928 TESTLEN  EQU   (*-TESTTAB)/NUMTESTS   Width of each test table entry
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

000006A4                                          3930          LTORG ,        Literals Pool
000006A4  0000                                    3931                =H'0'
000006A6  0080                                    3932                =AL2(L'MSGMSG)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                   3934 ********************************************************************
                                                   3935 *                    CHANNEL PROGRAMS...
                                                   3936 ********************************************************************


000006A8                                           3938          DC    0D'0'
000006A8  04200020 000009B8                        3939 SENSEPGM DC    AL1(SNS),AL1(SLI),AL2(L'SNSBYTES),AL4(SNSBYTES)




                                                   3941 ********************************************************************


000006B0  E3C5E2E3 407BF17A                        3943 T1_DESC  DC    C'TEST #1: Format 2 PFX to obtain subsystem information (no IDA)'
                           0000003E  00000001      3944 T1_MSGLN EQU   *-T1_DESC
000006F0                                           3945          DC    0D'0'
000006F0  E760004C 000009D8                        3946 T1_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(T1_E7LEN),AL4(T1_E7DAT)
000006F8  3E200100 00000A24                        3947          DC    AL1(RSD),AL1(SLI),AL2(L'T1_3EBUF),AL4(T1_3EBUF)




                                                   3949 ********************************************************************


00000700  E3C5E2E3 407BF27A                        3951 T2_DESC  DC    C'TEST #2: Format 0 PFX with Define Extent Valid bit off (DX CCW chained
                           00000055  00000001      3952 T2_MSGLN EQU   *-T2_DESC
00000758                                           3953          DC    0D'0'
00000758  E7600040 00000B24                        3954 T2_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T2_E7DAT),AL4(T2_E7DAT)
00000760  63600010 00000B64                        3955          DC    AL1(DX),AL1(CC+SLI),AL2(L'T2_63DAT),AL4(T2_63DAT)
00000768  47600010 00000B74                        3956          DC    AL1(LR),AL1(CC+SLI),AL2(L'T2_47DAT),AL4(T2_47DAT)
00000770  0624000A 00000778                        3957          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T2_06BUF),AL4(T2_06IDA)
00000778  00000000 00000B84                        3958 T2_06IDA DC    AD(T2_06BUF)




                                                   3960 ********************************************************************


00000780  E3C5E2E3 407BF37A                        3962 T3_DESC  DC    C'TEST #3: Format 0 PFX with Define Extent Valid bit on (DX CCW imbeded
                           00000056  00000001      3963 T3_MSGLN EQU   *-T3_DESC
000007D8                                           3964          DC    0D'0'
000007D8  E7600040 00000B8E                        3965 T3_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T3_E7DAT),AL4(T3_E7DAT)
000007E0  47600010 00000BCE                        3966          DC    AL1(LR),AL1(CC+SLI),AL2(L'T3_47DAT),AL4(T3_47DAT)
000007E8  0624000A 000007F0                        3967          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T3_06BUF),AL4(T3_06IDA)
000007F0  00000000 00000BDE                        3968 T3_06IDA DC    AD(T3_06BUF)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                   3970 ********************************************************************************
000007F8  E3C5E2E3 407BF47A                        3972 T4_DESC  DC    C'TEST #4: Format 2 PFX to obtain control unit information (PFX E7 2 IDA
                           00000056  00000001      3973 T4_MSGLN EQU   *-T4_DESC
00000850                                           3974          DC    0D'0'
00000850  E764004C 00000860                        3975 T4_CHPGM DC    AL1(PFX),AL1(CC+SLI+IDA),AL2(L'T4_E7DAT),AL4(T4_E7IDA)
00000858  3E240100 00000870                        3976          DC    AL1(RSD),AL1(SLI+IDA),AL2(L'T4_3EBUF),AL4(T4_3EIDA)
00000860  00000000 00001FD8                        3977 T4_E7IDA DC    AD(T4_E7DAT_PART1)
00000868  00000000 00002000                        3978          DC    AD(T4_E7DAT_PART2)
00000870  00000000 00000BE8                        3979 T4_3EIDA DC    AD(T4_3EBUF)



                                                   3981 ********************************************************************************
00000878  E3C5E2E3 407BF57A                        3983 T5_DESC  DC    C'TEST #5: Read 06 CCW should fail since LR operation is Read(16) and Re
                           0000006F  00000001      3984 T5_MSGLN EQU   *-T5_DESC
000008E8                                           3985          DC    0D'0'
000008E8  E7600040 00000CE8                        3986 T5_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T5_E7DAT),AL4(T5_E7DAT)
000008F0  47600010 00000D28                        3987          DC    AL1(LR),AL1(CC+SLI),AL2(L'T5_47DAT),AL4(T5_47DAT)
000008F8  0624000A 00000900                        3988          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T5_06BUF),AL4(T5_06IDA)
00000900  00000000 00000D38                        3989 T5_06IDA DC    AD(T5_06BUF)



                                                   3991 ********************************************************************************
00000908  E3C5E2E3 407BF67A                        3993 T6_DESC  DC    C'TEST #6: Same as Test #5, but properly uses multi-track Read (86) (Rea
                           00000051  00000001      3994 T6_MSGLN EQU   *-T6_DESC
00000960                                           3995          DC    0D'0'
00000960  E7600040 00000D42                        3996 T6_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T6_E7DAT),AL4(T6_E7DAT)
00000968  47600010 00000D82                        3997          DC    AL1(LR),AL1(CC+SLI),AL2(L'T6_47DAT),AL4(T6_47DAT)
00000970  8624000A 00000978                        3998          DC    AL1(RDMT),AL1(SLI+IDA),AL2(L'T6_86BUF),AL4(T6_86IDA)
00000978  00000000 00000D92                        3999 T6_86IDA DC    AD(T6_86BUF)



                                                   4001 ********************************************************************************
00000980  E3C5E2E3 407BF77A                        4003 T7_DESC  DC    C'TEST #7: Peter''s z/VM SSI issue (PFX 01 CMDREJ)'
                           0000002F  00000001      4004 T7_MSGLN EQU   *-T7_DESC
000009B0                                           4005          DC    0D'0'
000009B0  E7200040 00000D9C                        4006 T7_CHPGM DC    AL1(PFX),AL1(SLI),AL2(T7_E7LEN),AL4(T7_E7DAT)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                  4008 ********************************************************************************
                                                  4009 *                I/O DATA AND I/O BUFFERS...
                                                  4010 ********************************************************************************

000009B8                                          4012          DC    0D'0'
000009B8  00000000 00000000                       4013 SNSBYTES DC    XL32'00'     (Generic SENSE buffer)


                                                  4015 ********************************************************************************


000009D8  02000000 00000000                       4017 T1_E7DAT DC    X'02000000 00000000 00000000'           +00  PFX
000009E4  00000000 00000000                       4018          DC    X'00000000 00000000 00000000 00000000'  +12  DEF EXT
000009F4  00000000 00000000                       4019          DC    X'00000000 00000000 00000000 00000000'  +28
00000A04  00000000 00000000                       4020          DC    X'00000000 00000000 00000000 00000000'  +44  LREC EXD
00000A14  0000                                    4021          DC    X'0000'                                 +60
00000A16  18000000 00004100                       4022          DC    X'    1800 00000000 41000000 00000000'  +62  PSF
                            0000004C  00000001    4023 T1_E7LEN EQU   *-T1_E7DAT
00000A24  00000000 00000000                       4024 T1_3EBUF DC    XL256'00'  (the subsystem data that was read)


                                                  4026 ********************************************************************************


00000B24  00000000 00000000                       4028 T2_E7DAT DC    XL64'00'
00000B64  40C00000 00000000                       4029 T2_63DAT DC    XL16'40C00000 00000000 00000000 00000000'
00000B74  06000001 00000000                       4030 T2_47DAT DC    XL16'06000001 00000000 00000000 03000000'
00000B84  00000000 00000000                       4031 T2_06BUF DC    XL10'00'


                                                  4033 ********************************************************************************


00000B8E                                          4035 T3_E7DAT DS   0XL64
00000B8E  00800000 00000000                       4036          DC    XL16'00800000 00000000 00000000 40C00000'
00000B9E  00000000 00000000                       4037          DC    XL16'00000000 00000000 00000000 00000000'
00000BAE  00000000 00000000                       4038          DC    XL16'00000000 00000000 00000000 00000000'
00000BBE  00000000 00000000                       4039          DC    XL16'00000000 00000000 00000000 00000000'
00000BCE  06000001 00000000                       4040 T3_47DAT DC    XL16'06000001 00000000 00000000 03000000'
00000BDE  00000000 00000000                       4041 T3_06BUF DC    XL10'00'
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                  4044 ************************************************************************
00000BE8  00000000 00000000                       4046 T4_3EBUF            DC    XL256'00'
                                                  4047                     PRINT DATA
                            00000CE8  00000001    4048 T4_ORG              EQU   *
                            0000004C  00000001    4049 T4_E7DAT_TOTAL_LEN  EQU   76
                            00000028  00000001    4050 T4_E7DAT_PART1_LEN  EQU   40
                            00000024  00000001    4051 T4_E7DAT_PART2_LEN  EQU   (T4_E7DAT_TOTAL_LEN-T4_E7DAT_PART1_LEN)
00000CE8                    00000CE8  00001FD8    4052                     ORG   E7TEST+X'2000'-T4_E7DAT_PART1_LEN
00001FD8                                          4053 T4_E7DAT            DS   0XL(T4_E7DAT_TOTAL_LEN)
00001FD8                                          4054 T4_E7DAT_PART1      DS   0XL(T4_E7DAT_PART1_LEN)
00001FD8  02000000 00000000                       4055                     DC    XL16'02000000 00000000 00000000 00000000'
00001FE0  00000000 00000000
00001FE8  00000000 00000000                       4056                     DC    XL16'00000000 00000000 00000000 00000000'
00001FF0  00000000 00000000
00001FF8  00000000 00000000                       4057                     DC    XL8' 00000000 00000000'
00002000                                          4058 T4_E7DAT_PART2      DS   0XL(T4_E7DAT_PART2_LEN)
00002000  00000000 00000000                       4059                     DC    XL8'                    00000000 00000000'
00002008  00000000 00000000                       4060                     DC    XL16'00000000 00000000 00000000 00001800'
00002010  00000000 00001800
00002018  00000000 41000000                       4061                     DC    XL12'00000000 41000000 00000000'
00002020  00000000
00002024                    00002024  00000CE8    4062                     ORG   T4_ORG
                                                  4063                     PRINT NODATA
                                                  4065 ************************************************************************

00000CE8                                          4067 T5_E7DAT DS   0XL64
00000CE8  00800000 00000000                       4068          DC    XL16'00800000 00000000 00000000 40C00000'
00000CF8  00000000 00000000                       4069          DC    XL16'00000000 00000000 00000000 00000000'
00000D08  00000000 00000000                       4070          DC    XL16'00000000 00000000 00000000 00000000'
00000D18  00000000 00000000                       4071          DC    XL16'00000000 00000000 00000000 00000000'
00000D28  16000001 00000000                       4072 T5_47DAT DC    XL16'16000001 00000000 00000000 03000000'
00000D38  00000000 00000000                       4073 T5_06BUF DC    XL10'00'

                                                  4075 ************************************************************************

00000D42                                          4077 T6_E7DAT DS   0XL64
00000D42  00800000 00000000                       4078          DC    XL16'00800000 00000000 00000000 40C00000'
00000D52  00000000 00000000                       4079          DC    XL16'00000000 00000000 00000000 00000000'
00000D62  00000000 00000000                       4080          DC    XL16'00000000 00000000 00000000 00000000'
00000D72  00000000 00000000                       4081          DC    XL16'00000000 00000000 00000000 00000000'
00000D82  16000001 00000000                       4082 T6_47DAT DC    XL16'16000001 00000000 00000000 03000000'
00000D92  00000000 00000000                       4083 T6_86BUF DC    XL10'00'
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                    4086 ************************************************************************
00000D9C  01800000 00000000                         4088 T7_E7DAT DC    X'01800000 00000000 00000000'           +00  PFX
00000DA8  40C01000 00000042                         4089          DC    X'40C01000 00000042 00020000 00020000'  +12  DEF EXT
00000DB8  00000000 00000000                         4090          DC    X'00000000 00000000 00000000 00000000'  +28
00000DC8  06000001 00020000                         4091          DC    X'06000001 00020000 00020000 01290000'  +44  LREC EXD
00000DD8  00000000                                  4092          DC    X'00000000'                             +60
                            00000040  00000001      4093 T7_E7LEN EQU   *-T7_E7DAT
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                    4095 ********************************************************************************
                                                    4096 *        IOCB DSECT
                                                    4097 ********************************************************************************

                                                    4099          DSECTS NAME=IOCB
                                                    4101+IOCB     DSECT
                                                    4102+*     Field usage by: CH SC Description (R->program read-only, X->program read/write)
00000000                                            4103+IOCBDID  DS    0F  +0     R  Device Identifier - Subsystem ID for channel subsystem
00000000  0000                                      4104+         DS    H   +0  R      reserved - must be zeros
00000002  0000                                      4105+IOCBDV   DS    H   +2  R      Channel Unit Device address of I/O operation
00000004  0000                                      4106+IOCBDEV  DS    H   +4  X  X  Device address or device number (R after ENADEV)
00000006  0000                                      4107+IOCBZERO DS    H   +6  R  R  Must be zeros
00000008  00                                        4108+IOCBUM   DS    X   +8  X  X  Unit status test mask
00000009  00                                        4109+IOCBCM   DS    X   +9  X  X  Channel status test mask
0000000A                                            4110+IOCBST   DS    0H  +10 X  X  Input/Output unit and channel status accumulation
0000000A  00                                        4111+IOCBUS   DS    X   +10 R  R  Accumulated unit status
0000000B  00                                        4112+IOCBCS   DS    X   +11 R  R  Accumulated channel status
0000000C  00                                        4113+IOCBUT   DS    X   +14 R  R  Used to test unit status
0000000D  00                                        4114+IOCBCT   DS    X   +13 R  R  Used to test channel status
0000000E  00                                        4115+IOCBSC   DS    X   +14    R  Accumulted subchanel status control
0000000F  00                                        4116+IOCBWAIT DS    X   +15 X  X  Recognized unsolicited interruption unit status events
00000010  00000000                                  4117+IOCBSCCW DS    A   +16 R  R  I/O status CCW address
00000014                                            4118+IOCBSCNT DS    0F  +20 R  R  I/O status residual count as a positive full word
00000014  0000                                      4119+         DS    H   +20 R     reserved must be zeros
00000016  0000                                      4120+IOCBRCNT DS    H   +22 R     I/O status residual count as an unsigned halfword
00000018                                            4121+IOCBCAW  DS    0A  +24 X     Channel Address word
00000018  00000000 00000000                         4122+IOCBORB  DS    AD  +24    X  Address of the ORB for channel subsystem I/O
00000020  00000000 00000000                         4123+IOCBIRB  DS    AD  +32    X  Channel subsystem IRB address
00000028  00000000 00000000                         4124+IOCBSIB  DS    AD  +40    X  Channel subsystem SCHIB address
                            00000030  00000001      4125+IOCBL    EQU   *-IOCB  Length of IOCB control block (48) without embedded structures
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4127 ********************************************************************************
                                                  4128 *        ORB DSECT
                                                  4129 ********************************************************************************

                                                  4131          DSECTS NAME=ORB
                                                  4133+ORB      DSECT
00000000  00000000                                4134+ORBPARM  DC    F'0'     Word 0, bits 0-31

00000004  00                                      4136+ORB1_0   DC    X'00'    Word 1, bits 0-7
                               000000F0  00000001 4137+ORBKEYM  EQU   X'F0'    Word 1, bits 0-3   - Storage Key Mask
                               00000008  00000001 4138+ORBS     EQU   X'08'    Word 1, bit 4      - Suspend Control
                               00000004  00000001 4139+ORBC     EQU   X'04'    Word 1, bit 5      - Streaming Mode Control
                               00000002  00000001 4140+ORBM     EQU   X'02'    Word 1, bit 6      - Modification Control
                               00000001  00000001 4141+ORBY     EQU   X'01'    Word 1, bit 7      - Synchronization Control

00000005  00                                      4143+ORB1_8   DC    X'00'    Word 1, bits 8-15
                               00000080  00000001 4144+ORBF     EQU   X'80'    Word 1, bit 8      - CCW Format-Control
                               00000040  00000001 4145+ORBP     EQU   X'40'    Word 1, bit 9      - Pre-fetch control
                               00000020  00000001 4146+ORBI     EQU   X'20'    Word 1, bit 10     - Initial-status Interruption Control
                               00000010  00000001 4147+ORBA     EQU   X'10'    Word 1, bit 11     - Address Limit Checking Control
                               00000008  00000001 4148+ORBU     EQU   X'08'    Word 1, bit 12     - Suppress-suspended-interruption control
                               00000004  00000001 4149+ORBB     EQU   X'04'    Word 1, bit 13     - Channel-Program-Type Control
                               00000002  00000001 4150+ORBH     EQU   X'02'    Word 1, bit 14     - Format 2-IDAW Control
                               00000001  00000001 4151+ORBT     EQU   X'01'    Word 1, bit 15     - 2K-IDAW control
00000006  00                                      4152+ORBLPM   DC    X'00'    Word 1, bits 16-23 - Logical Path Mask
00000007  00                                      4153+ORRB1_24 DC    X'00'    Word 1, bits 24-31
                               00000080  00000001 4154+ORBL     EQU   X'80'    Word 1, bit 24     - Incorrect Length Suppression Mode
                               0000007F  00000001 4155+ORBRSV3  EQU   X'7F'    Word 1, bits 25-31 - reserved must be zeros
                               00000040  00000001 4156+ORBD     EQU   X'40'    Word 1, bit 25     - MIDAW Addressing Control
                               0000003E  00000001 4157+ORBRSV26 EQU   X'3E'    Word 1, bits 26-30 - reserved must be zeros
                               0000007E  00000001 4158+ORBRSV25 EQU   X'7E'    Word 1, bits 25-30 - reserved must be zeros
                               00000001  00000001 4159+ORBX     EQU   X'01'    Word 1, bit 31     - ORB-extension control

00000008  00000000                                4161+ORBCCW   DC    A(0)     Word 2, bits 1-31  - Channel Program Address
                               00000080  00000001 4162+ORBRSV4  EQU   X'80'    Word 2, bit 0      - reserved must be zero
                               0000000C  00000001 4163+ORBLEN   EQU   *-ORB Length of standard ORB
                                                  4164+* Extended ORB fields
0000000C  00                                      4165+ORBCSS   DC    X'00'    Word 3, bits 0-7   - Channel Subsystem Priority
0000000D  00                                      4166+ORBRSV5  DC    X'00'    Word 3, bits 8-15  - reserved must be zeros
0000000E                                          4167+ORBPGM   DC    0X'00'   Word 3, bits 16-23 - Transport mode reserves for program us
0000000E  00                                      4168+ORBCU    DC    X'00'    Word 3, bits 16-23 - Control Unit Priority
0000000F  00                                      4169+ORBRSV6  DC    X'00'    Word 3, bits 24-31 - reserved must be zeros
00000010  00000000 00000000                       4170+ORBRSV7  DC    XL16'00' Words 4-7          - reserved must be zeros
                               00000020  00000001 4171+ORBXLEN  EQU   *-ORB Length of extended ORB
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4174 ********************************************************************************
                                                  4175 *        IRB DSECT
                                                  4176 ********************************************************************************

                                                  4178          DSECTS NAME=IRB
                                                  4180+IRB      DSECT Interruption          Response Block
00000000  00000000 00000000                       4181+IRBSCSW  DC    XL12'00' Words 0-2 - Subchannel Status Word (Defined by DSECT SCSW)
0000000C  00000000 00000000                       4182+IRBESW   DC    XL20'00' Words 3-7 - Extended Status Word
00000020  00000000 00000000                       4183+IRBECW   DC    XL32'00' Words 8-15 - Extended Control Word
                             00000040  00000001   4184+IRBL     EQU   *-IRB    IRB Length
00000040  00000000 00000000                       4185+IRBEMW   DC    XL32'00' Words 16-23 - Extended Measurement Word
                             00000060  00000001   4186+IRBXL    EQU   *-IRB    Extended IRB Length
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4189 ********************************************************************************
                                                  4190 *        SCHIB DSECT
                                                  4191 ********************************************************************************

                                                  4193          DSECTS NAME=SCHIB
                                                  4195+SCHIB    DSECT Subchannel          Information Block
                                                  4196+* Fields marked RW may be changed by MSCH.  IN indicates installed value supplied
00000000                                          4197+SCHPMCW  DC    0XL28'00'  Words 0-6 - Path-Management-Control Word
00000000  00000000                                4198+PMCWIP   DC    F'0'   RW  Word 0, bits 0-31 - Interruption Parameter
00000004  00                                      4199+PMCW1_0  DC    X'00'      Word 1, bits 0-7
                          00000038  00000001    4200+PMCWISCM EQU   X'38'  RW  Interruption Subclass Code Mask

00000005  00                                      4202+PMCW1_8  DC    X'00'      Word 1, bits 8-15
                          00000080  00000001    4203+PMCWE    EQU   X'80'  RW  Word 1, bit 8 - Subchannel Enabled
                          00000060  00000001    4204+PMCWLM   EQU   X'60'  RW  Word 1, bits 9,10 - Limit-Mode Mask
                          00000020  00000001    4205+PMCWLMG  EQU   X'20'  RW  Word 1, bit 9 - Address must be GE to limit
                          00000040  00000001    4206+PMCWLML  EQU   X'40'  RW  Word 1, bit 10 - Address must be less than the limit
                          00000018  00000001    4207+PMCWMM   EQU   X'18'  RW  Word 1, bits 11,12 - Measurement Mode Mask
                          00000010  00000001    4208+PMCWMME  EQU   X'10'  RW  Word 1, bit 11 - Measurement Block Update Enabled
                          00000008  00000001    4209+PMCWMMC  EQU   X'08'  RW  Word 1, bit 12 - Device Connect Time Measurement Enabled
                          00000004  00000001    4210+PMCWM    EQU   X'04'  RW  Word 1, bit 13 - Multipath Mode Enabled
                          00000002  00000001    4211+PMCWT    EQU   X'02'  IN  Word 1, bit 14 - Timing facility availability
                          00000001  00000001    4212+PMCWV    EQU   X'01'  IN  Word 1, bit 15 - Device number valid

00000006  0000                                    4214+PMCWDNUM DC    H'0'   IN  Word 1, bits 16-31 - Device Number

00000008  00                                      4216+PMCWLPM  DC    X'00'  RW  Word 2, bits 0-7   - Logical Path Mask
00000009  00                                      4217+PMCWPNOM DC    X'00'  RW  Word 2, bits 8-15  - Logical Path Not Operational Mask
0000000A  00                                      4218+PMCWLPUM DC    X'00'  IN  Word 2, bits 16-23 - Logical Path Used Mask
0000000B  00                                      4219+PMCWPIM  DC    X'00'  IN  Word 2, bits 24-31 - Path-Installed Mask
0000000C  0000                                    4220+PMCWMBI  DC    H'0'   RW  Word 3, bits 0-15  - Measurement Block Index
0000000E  00                                      4221+PMCWPOM  DC    X'00'  RW  Word 3, bits 16-23 - Path-Operational Mask
0000000F  00                                      4222+PMCWPAM  DC    X'00'  IN  Word 3, bits 24-31 - Path-Available Mask
00000010  00                                      4223+PMCWCHP0 DC    X'00'  IN  Word 3, bits 0-7   - Channel Path Identifier 0
00000011  00                                      4224+PMCWCHP1 DC    X'00'  IN  Word 3, bits 8-15  - Channel Path Identifier 1
00000012  00                                      4225+PMCWCHP2 DC    X'00'  IN  Word 3, bits 16-23 - Channel Path Identifier 2
00000013  00                                      4226+PMCWCHP3 DC    X'00'  IN  Word 3, bits 24-31 - Channel Path Identifier 3
00000014  00                                      4227+PMCWCHP4 DC    X'00'  IN  Word 4, bits 0-7   - Channel Path Identifier 4
00000015  00                                      4228+PMCWCHP5 DC    X'00'  IN  Word 4, bits 8-15  - Channel Path Identifier 5
00000016  00                                      4229+PMCWCHP6 DC    X'00'  IN  Word 4, bits 16-23 - Channel Path Identifier 6
00000017  00                                      4230+PMCWCHP7 DC    X'00'  IN  Word 4, bits 24-31 - Channel Path Identifier 7
00000018                                          4231+PMCWRES1 DC    0XL4'00'   Word 6, bits 0-31  - reserved or pre-z systems
00000018  000000                                  4232+PMCWRES2 DC    XL3'00'    Word 6, bits 0-23  - reserved on z systems
0000001B  00                                      4233+PMCWEXC  DC    X'00'      Word 6, bits 24-28 - reserved
                          00000004  00000001    4234+PMCWB    EQU   X'04'  RW  Word 6, bit 29     - Measurement Block Format Control
                          00000002  00000001    4235+PMCWX    EQU   X'02'  RW  Word 6, bit 30     - Extended Measurement Word Mode Enabl
                          00000001  00000001    4236+PMCWS    EQU   X'01'  RW  Word 6, bit 31     - Concurrent Sense Enable

0000001C  00000000 00000000                       4238+SCHSCSW  DC    XL12'00'   Words 7-9 - Subchannel Status Word (See DSECT SCSW)
00000028                                          4239+SCHMDA3  DC    0XL12'00'  Words 10-12 - Model Dependent Area on pre-z systems
00000028  00000000 00000000                       4240+SCHMBA   DC    AD(0)  RW  Words 10,11 - Measurement Block Address
00000030  00000000                                4241+SCHMDA1  DC    XL4'00'    Word 12 - Model Dependent Area on z systems
                          00000034  00000001    4242+SCHIBL   EQU   *-SCHIB Length of SCHIB
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4245 ********************************************************************************
                                                  4246 *        SCSW DSECT
                                                  4247 ********************************************************************************

                                                  4249          DSECTS NAME=SCSW
                                                  4251+SCSW     DSECT Subchannel          Status Word
00000000  00                                      4252+SCSWFLAG DC    X'00'    Flags
                          000000F0  00000001      4253+SCSWKEYM EQU   X'F0'    Storage Key Mask of subchannel storage key
                          00000008  00000001      4254+SCSWSUSC EQU   X'08'    Suspend Control
                          00000004  00000001      4255+SCSWESWF EQU   X'04'    Extended Status Word Format
                          00000003  00000001      4256+SCSWDCCM EQU   X'03'    Deferred condiont code mask
                          00000000  00000001      4257+SCSWDCC0 EQU   X'00'    Normal I/O interruption
                          00000001  00000001      4258+SCSWDCC1 EQU   X'01'    Deferred condition code is 1
                          00000003  00000001      4259+SCSWDCC3 EQU   X'03'    Deferred condition code is 3

00000001  00                                      4261+SCSWCTLS DC    X'00'    General Controls
                          00000080  00000001      4262+SCSWCCWF EQU   X'80'    CCW Format control when ...
                          00000040  00000001      4263+SCSWCCWP EQU   X'40'    CCW Prefetch Control
                          00000020  00000001      4264+SCSWISIC EQU   X'20'    Initial-Status-Interruption Control
                          00000010  00000001      4265+SCSWALKC EQU   X'10'    Address-Limit-Checking Control
                          00000008  00000001      4266+SCSWSSIC EQU   X'08'    Suppress suspended interruption
                          00000004  00000001      4267+SCSW0CC  EQU   X'04'    Zero-Condition Code
                          00000002  00000001      4268+SCSWECWC EQU   X'02'    Extended Control Word control
                          00000001  00000001      4269+SCSWPNOP EQU   X'01'    Path Not Operational

00000002  00                                      4271+SCSW1    DC    X'00'    Control Byte 1
                          00000070  00000001      4272+SCSWFM   EQU   X'70'    Functional Control Mask
                          00000040  00000001      4273+SCSWFS   EQU   X'40'    Function Control - Start Function
                          00000020  00000001      4274+SCSWFH   EQU   X'20'    Function Control - Halt Function
                          00000010  00000001      4275+SCSWFC   EQU   X'10'    Function Control - Clear Function
                          00000008  00000001      4276+SCSWARP  EQU   X'08'    Activity Control - Resume pending
                          00000004  00000001      4277+SCSWASP  EQU   X'04'    Activity Control - Start pending
                          00000002  00000001      4278+SCSWAHP  EQU   X'02'    Activity Control - Halt pending
                          00000001  00000001      4279+SCSWACP  EQU   X'01'    Activity Control - Clear pending
00000003  00                                      4280+SCSW2    DC    X'00'    Control Byte 2
                          00000080  00000001      4281+SCSWASA  EQU   X'80'    Activity Control - Subchannel Active
                          00000040  00000001      4282+SCSWADA  EQU   X'40'    Activity Control - Device Active
                          00000020  00000001      4283+SCSWASUS EQU   X'20'    Activity Control - Suspended
                          00000010  00000001      4284+SCSWSAS  EQU   X'10'    Status Control   - Alert Status
                          00000008  00000001      4285+SCSWSINT EQU   X'08'    Status Control   - Intermediate Status
                          00000004  00000001      4286+SCSWSPRI EQU   X'04'    Status Control   - Primary Status
                          00000002  00000001      4287+SCSWSSEC EQU   X'02'    Status Control   - Secondary Status
                          00000001  00000001      4288+SCSWSPEN EQU   X'01'    Status Control   - Status Pending

00000004  00000000                                4290+SCSWCCW  DC    A(0)     CCW Address

00000008  00                                      4292+SCSWUS   DC    X'00'    Unit Status
                          00000080  00000001      4293+SCSWATTN EQU   X'80'    Attention
                          00000040  00000001      4294+SCSWSM   EQU   X'40'    Status modifier
                          00000020  00000001      4295+SCSWCUE  EQU   X'20'    Control-unit end
                          00000010  00000001      4296+SCSWBUSY EQU   X'10'    Busy
                          00000008  00000001      4297+SCSWCE   EQU   X'08'    Channel end
                          00000004  00000001      4298+SCSWDE   EQU   X'04'    Device end
                          00000002  00000001      4299+SCSWUC   EQU   X'02'    Unit check
                          00000001  00000001      4300+SCSWUX   EQU   X'01'    Unit exception
```

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  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

00000009  00                                      4302+SCSWCS   DC    X'00'    Channel Status
                            00000080  00000001  4303+SCSWPCI  EQU   X'80'    Program-controlled interruption
                            00000040  00000001  4304+SCSWIL   EQU   X'40'    Incorrect length
                            00000020  00000001  4305+SCSWPRGM EQU   X'20'    Program check
                            00000010  00000001  4306+SCSWPROT EQU   X'10'    Protection Check
                            00000008  00000001  4307+SCSWCDAT EQU   X'08'    Channel-data check
                            00000004  00000001  4308+SCSWCCTL EQU   X'04'    Channel-control check
                            00000002  00000001  4309+SCSWICTL EQU   X'02'    Interface-control check
                            00000001  00000001  4310+SCSWCHNG EQU   X'01'    Chaining check

0000000A  0000                                    4312+SCSWCNT  DC    H'0'     Residual CCW count
                            0000000C  00000001  4313+SCSWL    EQU   *-SCSW
```

```
 LOC         OBJECT CODE        ADDR1     ADDR2     STMT

                                                    4316 ********************************************************************************
                                                    4317 *        (other DSECTS needed by SATK)
                                                    4318 ********************************************************************************

                                                    4320          DSECTS PRINT=OFF,NAME=(ASA,CCW0,CCW1,CSW)
                                                    4546          PRINT ON









                                                    4548 ********************************************************************************
                                                    4549 *        Register equates
                                                    4550 ********************************************************************************


                                00000000  00000001  4552 R0       EQU   0
                                00000001  00000001  4553 R1       EQU   1
                                00000002  00000001  4554 R2       EQU   2
                                00000003  00000001  4555 R3       EQU   3
                                00000004  00000001  4556 R4       EQU   4
                                00000005  00000001  4557 R5       EQU   5
                                00000006  00000001  4558 R6       EQU   6
                                00000007  00000001  4559 R7       EQU   7
                                00000008  00000001  4560 R8       EQU   8
                                00000009  00000001  4561 R9       EQU   9
                                0000000A  00000001  4562 R10      EQU   10
                                0000000B  00000001  4563 R11      EQU   11
                                0000000C  00000001  4564 R12      EQU   12
                                0000000D  00000001  4565 R13      EQU   13
                                0000000E  00000001  4566 R14      EQU   14
                                0000000F  00000001  4567 R15      EQU   15


                                                    4569          END
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
ASA	4	000000	512	4324	3574
ASBEGIN	U	000000	1	4325	4330 4372 4408 4417 4435 4442 4448 4452 4456 4462 4479
ASEND	U	000200	1	4478	4479
ASLENGTH	U	000200	1	4479	
ATESTTAB	A	000610	4	3913	3618
BAD66PSW	D	000328	8	3707	3682
BAD77PSW	D	000338	8	3708	3684
BAD88PSW	D	000348	8	3709	3686
BAD99PSW	D	000358	8	3710	3688
BCEXTCOD	H	00001A	2	4342	
BCIOCOD	H	00003A	2	4350	
BCMCKCOD	H	000032	2	4348	
BCPGMCOD	H	00002A	2	4346	
BCSVCCOD	H	000022	2	4344	
BEGIN	U	000200	1	3581	3551
BEGIN0	I	000246	4	3616	3604
CAW	F	000048	4	4354	
CAWADDR	R	000049	3	4357	
CAWKEY	X	000048	1	4355	
CAWSUSP	U	000008	1	4356	
CC	U	000040	1	3897	3946 3954 3955 3956 3965 3966 3975 3986 3987 3996 3997
CCW0	4	000000	8	4483	4489
CCW0ADDR	R	000001	3	4485	
CCW0CNT	H	000006	2	4488	
CCW0CODE	X	000000	1	4484	
CCW0FLGS	X	000004	1	4486	
CCW0L	U	000008	1	4489	
CCW1	4	000000	8	4501	4506
CCW1ADDR	A	000004	4	4505	
CCW1CNT	H	000002	2	4504	
CCW1CODE	X	000000	1	4502	
CCW1FLGS	X	000001	1	4503	
CCW1L	U	000008	1	4506	
CCWCC	U	000040	1	4493	
CCWCD	U	000080	1	4492	
CCWIDA	U	000004	1	4497	
CCWPCI	U	000008	1	4496	
CCWSKIP	U	000010	1	4495	
CCWSLI	U	000020	1	4494	
CCWSUSP	U	000002	1	4498	
CHANID	F	0000A8	4	4409	
CHKZARCH	I	000228	4	3600	3592
CODE	2	000000	8228	3526	
CPUID	U	00031B	1	4481	
CSW	F	000040	8	4353	
CSWATTN	U	000080	1	4523	
CSWBUSY	U	000010	1	4526	
CSWCCTL	U	000004	1	4538	
CSWCCW	R	000001	3	4520	
CSWCDAT	U	000008	1	4537	
CSWCE	U	000008	1	4527	3814
CSWCHNG	U	000001	1	4540	
CSWCNT	H	000006	2	4542	
CSWCS	X	000005	1	4532	
CSWCUE	U	000020	1	4525	
CSWDCC0	U	000000	1	4516	

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     SYMBOL         TYPE  VALUE   LENGTH  DEFN  REFERENCES

CSWDCC1              U    000001       1  4517
CSWDCC3              U    000003       1  4518
CSWDCCM              U    000003       1  4515
CSWDE                U    000004       1  4528  3814
CSWFLAG              X    000000       1  4510
CSWFMT               4    000000       8  4509  4543
CSWFMTL              U    000008       1  4543
CSWICTL              U    000002       1  4539
CSWIL                U    000040       1  4534
CSWKEYM              U    0000F0       1  4511
CSWLOG               U    000004       1  4514
CSWPCI               U    000080       1  4533
CSWPRGM              U    000020       1  4535
CSWPROT              U    000010       1  4536
CSWSM                U    000040       1  4524
CSWSUSP              U    000008       1  4513
CSWUC                U    000002       1  4529
CSWUS                X    000004       1  4522
CSWUX                U    000001       1  4530
DOSENSE              I    0003DE       4  3769  3669
DOTEST               I    00027C       4  3640  3629
DX                   U    000063       1  3905  3955
E7TEST               J    000000    8228  3526  3529  3536  3549  3553  3580  3893  4052  3573
ENADEV               I    00038A       4  3738  3719
ENAOKAY              I    0003DC       2  3763  3752
ERRTEST              I    0002B8       4  3667  3661
EXCP                 I    0003E2       4  3770  3645
EXTCPUAD             H    000084       2  4374
EXTICODE             H    000086       2  4375
EXTIPARM             F    000080       4  4373
EXTNPSW              F    000058       8  4363
EXTOPSW              F    000018       8  4335  4341
FAIL                 I    0002F8       6  3693  3683  3685  3687  3689  3691
FAILCPU0             I    0002D0       4  3682  3593  3594  3602  3610
FAILDEV              I    0002E0       4  3686  3743  3753  3758
FAILIO               I    0002E8       4  3688  3782  3805  3815
FAILPSW              D    000318       8  3701  3690
FAILSCH              I    0002D8       4  3684  3651
FAILTEST             I    0002F0       4  3690  3658  3664  3668
FIND0008             A    0003D4       4  3760  3738
FINL0008             H    000394       2  3741  3757
FINM0008             A    0003D8       4  3761  3756
FINN0008             H    0003C2       2  3754  3745  3747
GOODPSW              D    000308       8  3700  3634
IDA                  U    000004       1  3899  3957  3967  3975  3976  3988  3998
IIRB0011             F    0005A4       4  3878  3876  3877
IMAGE                1    000000    8228     0
INIT                 I    000368       4  3716  3616
IOCB                 4    000000      48  4101  4125  3575
IOCBCAW              A    000018       4  4121
IOCBCM               X    000009       1  4109
IOCBCS               X    00000B       1  4112
IOCBCT               X    00000D       1  4114
IOCBDEV              H    000004       2  4106  3746
IOCBDID              F    000000       4  4103  3647  3749  3778
IOCBDV               H    000002       2  4105
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES			
IOCBIRB	A	000020	8	4123	3783			
IOCBL	U	000030	1	4125				
IOCBORB	A	000018	8	4122	3717	3780		
IOCBRCNT	H	000016	2	4120	3812			
IOCBSC	X	00000E	1	4115	3776	3807	3809	
IOCBSCCW	A	000010	4	4117	3811			
IOCBSCNT	F	000014	4	4118				
IOCBSIB	A	000028	8	4124	3648	3739		
IOCBST	H	00000A	2	4110	3777	3808		
IOCBUM	X	000008	1	4108				
IOCBUS	X	00000A	1	4111	3814			
IOCBUT	X	00000C	1	4113				
IOCBWAIT	X	00000F	1	4116				
IOCBZERO	H	000006	2	4107	3777			
IOCB_A80	A	000574	4	3864	3716			
IOELADDR	F	0000AC	4	4410				
IOICODE	H	0000BA	2	4415				
IOIID	F	0000C0	4	4420				
IOINIT	I	00037C	4	3727	3718			
IOIPARM	F	0000BC	4	4419				
IOMK0007	F	000384	4	3729	3727	3728		
ION0010	3	000438	16	3793	3790			
IONPSW	F	000078	8	4367				
IOOPSW	F	000038	8	4339	4349			
IORB0011	X	000604	12	3880	3875			
IOS0010	X	000448	16	3794	3789	3797		
IOSSID	F	0000B8	4	4418	3800			
IOWT0009	H	000414	2	3787	3801	3804	3810	
IPLCCW1	F	000008	8	4327				
IPLCCW2	F	000010	8	4328				
IPLPSW	F	000000	8	4326				
IRB	4	000000	96	4180	4184	4186	3784	
IRBECW	X	000020	32	4183				
IRBEMW	X	000040	32	4185				
IRBESW	X	00000C	20	4182				
IRBL	U	000040	1	4184				
IRBSCSW	X	000000	12	4181	3807	3808	3811	3812
IRBXL	U	000060	1	4186				
IRST0010	H	000458	2	3796	3793			
LCHANLOG	F	0000B0	4	4411				
LR	U	000047	1	3904	3956	3966	3987	3997
MCKLOG	F	000100	4	4443				
MCKNPSW	F	000070	8	4366				
MCKOPSW	F	000030	8	4338	4347			
MEASUREB	X	0000B9	1	4414				
MKARCHMD	X	0000A3	1	4402				
MKARS	F	000120	4	4441				
MKCLKCMP	F	0000E0	8	4427				
MKCPUTIM	F	0000D8	8	4426				
MKCRS	F	0001C0	4	4446				
MKDMGCOD	F	0000F4	4	4430				
MKFAILA	F	0000F8	4	4432				
MKFPRS	D	000160	8	4444				
MKICODE	F	0000E8	4	4428				
MKLOGOUT	F	000100	4	4434				
MKMODEL	F	0000FC	4	4433				

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     SYMBOL         TYPE  VALUE   LENGTH  DEFN  REFERENCES

MKXSAA               F    0000D4       4  4425
MONCLS               H    000094       2  4390
MONCODE              F    00009C       4  4397
MONNUMBR             X    000095       1  4392
MPGACCID             X    0000A2       1  4400
MSG                  I    0004A0       4  3825  3626
MSGCMD               C    0004EA       9  3851  3838  3839
MSGMSG               C    0004F3     128  3852  3832  3849  3830
MSGMVC               I    0004E4       6  3849  3836
MSGOK                I    0004B6       2  3834  3831
MSGRET               I    0004D0       4  3845  3842
MSGSAVE              F    0004D8       4  3848  3828  3845
NKGRS                F    000180       4  4445
NUMTESTS             U    000007       1  3927  3928  3913
ORB                  4    000000      32  4133  4163  4171  3578
ORB1_0               X    000004       1  4136
ORB1_8               X    000005       1  4143  3772
ORBA                 U    000010       1  4147
ORBB                 U    000004       1  4149
ORBC                 U    000004       1  4139
ORBCCW               A    000008       4  4161  3770
ORBCSS               X    00000C       1  4165
ORBCU                X    00000E       1  4168
ORBD                 U    000040       1  4156
ORBF                 U    000080       1  4144  3772
ORBH                 U    000002       1  4150  3772
ORBI                 U    000020       1  4146
ORBKEYM              U    0000F0       1  4137
ORBL                 U    000080       1  4154
ORBLEN               U    00000C       1  4163
ORBLPM               X    000006       1  4152
ORBM                 U    000002       1  4140
ORBP                 U    000040       1  4145
ORBPARM              F    000000       4  4134
ORBPGM               X    00000E       1  4167
ORBRSV25             U    00007E       1  4158
ORBRSV26             U    00003E       1  4157
ORBRSV3              U    00007F       1  4155
ORBRSV4              U    000080       1  4162
ORBRSV5              X    00000D       1  4166
ORBRSV6              X    00000F       1  4169
ORBRSV7              X    000010      16  4170
ORBS                 U    000008       1  4138
ORBT                 U    000001       1  4151
ORBU                 U    000008       1  4148
ORBX                 U    000001       1  4159
ORBXLEN              U    000020       1  4171
ORBY                 U    000001       1  4141
ORRB1_24             X    000007       1  4153  3773
PCFETO               A    0000C4       4  4421
PERACCID             X    0000A1       1  4399
PERADDR              F    000098       4  4396
PERCODE              X    000096       1  4393
PERCODMK             U    0000F0       1  4394
PFX                  U    0000E7       1  3907  3946  3954  3965  3975  3986  3996  4006
PGMACCID             X    0000A0       1  4398
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
PGMDXC	F	000090	4	4388	
PGMICODE	H	00008E	2	4387	
PGMIID	F	00008C	4	4383	
PGMIILC	X	00008D	1	4385	
PGMIILCM	U	00000C	1	4386	
PGMNPSW	F	000068	8	4365	
PGMOPSW	F	000028	8	4337	4345
PGMTRX	F	000090	4	4389	
PMCW1_0	X	000004	1	4199	
PMCW1_8	X	000005	1	4202	3744 3750
PMCWB	U	000004	1	4234	
PMCWCHP0	X	000010	1	4223	
PMCWCHP1	X	000011	1	4224	
PMCWCHP2	X	000012	1	4225	
PMCWCHP3	X	000013	1	4226	
PMCWCHP4	X	000014	1	4227	
PMCWCHP5	X	000015	1	4228	
PMCWCHP6	X	000016	1	4229	
PMCWCHP7	X	000017	1	4230	
PMCWDNUM	H	000006	2	4214	3746
PMCWE	U	000080	1	4203	3750
PMCWEXC	X	00001B	1	4233	
PMCWIP	F	000000	4	4198	
PMCWISCM	U	000038	1	4200	
PMCWLM	U	000060	1	4204	
PMCWLMG	U	000020	1	4205	
PMCWLML	U	000040	1	4206	
PMCWLPM	X	000008	1	4216	
PMCWLPUM	X	00000A	1	4218	
PMCWM	U	000004	1	4210	
PMCWMBI	H	00000C	2	4220	
PMCWMM	U	000018	1	4207	
PMCWMMC	U	000008	1	4209	
PMCWMME	U	000010	1	4208	
PMCWPAM	X	00000F	1	4222	
PMCWPIM	X	00000B	1	4219	
PMCWPNOM	X	000009	1	4217	
PMCWPOM	X	00000E	1	4221	
PMCWRES1	X	000018	4	4231	
PMCWRES2	X	000018	3	4232	
PMCWS	U	000001	1	4236	
PMCWT	U	000002	1	4211	
PMCWV	U	000001	1	4212	3744
PMCWX	U	000002	1	4235	
R0	U	000000	1	4552	3573 3574 3582 3590 3601 3608 3625 3628 3642 3643 3769 3770 3771 3818 3825 3828 3830 3832 3834 3845
R1	U	000001	1	4553	3584 3589 3625 3643 3647 3839 3849
R10	U	00000A	1	4562	3618 3622 3625 3628 3630
R11	U	00000B	1	4563	3618 3632
R12	U	00000C	1	4564	
R13	U	00000D	1	4565	
R14	U	00000E	1	4566	3616 3626 3629 3640 3671 3672 3720 3826 3846
R15	U	00000F	1	4567	3645 3669 3718 3719 3731 3763 3819
R2	U	000002	1	4554	3585 3628 3660 3828 3834 3835 3836 3838 3845
R3	U	000003	1	4555	3575 3586 3588 3590 3607 3608 3716
R4	U	000004	1	4556	3576 3600 3601 3604 3605 3648 3650 3771 3818

```
     SYMBOL         TYPE   VALUE    LENGTH  DEFN  REFERENCES

R5                   U    000005        1  4557  3577  3655
R6                   U    000006        1  4558
R7                   U    000007        1  4559
R8                   U    000008        1  4560  3578  3717
R9                   U    000009        1  4561  3682  3684  3686  3688  3690  3693  3694
RD                   U    000006        1  3902  3957  3967  3988
RDMT                 U    000086        1  3906  3998
RSD                  U    00003E        1  3903  3947  3976
RSTNPSW              F    000000        8  4331
RSTOPSW              F    000008        8  4332
SCANOUT              X    000080        1  4369  4370
SCANOUTL             U    000000        1  4370
SCHIB                4    000000       52  4195  4242  3576  3740
SCHIBL               U    000034        1  4242
SCHMBA               A    000028        8  4240
SCHMDA1              X    000030        4  4241
SCHMDA3              X    000028       12  4239
SCHPMCW              X    000000       28  4197
SCHSCSW              X    00001C       12  4238  3655
SCSW                 4    000000       12  4251  4313  3577
SCSW0CC              U    000004        1  4267
SCSW1                X    000002        1  4271
SCSW2                X    000003        1  4280  3807
SCSWACP              U    000001        1  4279
SCSWADA              U    000040        1  4282
SCSWAHP              U    000002        1  4278
SCSWALKC             U    000010        1  4265
SCSWARP              U    000008        1  4276
SCSWASA              U    000080        1  4281
SCSWASP              U    000004        1  4277
SCSWASUS             U    000020        1  4283
SCSWATTN             U    000080        1  4293
SCSWBUSY             U    000010        1  4296
SCSWCCTL             U    000004        1  4308
SCSWCCW              A    000004        4  4290  3811
SCSWCCWF             U    000080        1  4262
SCSWCCWP             U    000040        1  4263
SCSWCDAT             U    000008        1  4307
SCSWCE               U    000008        1  4297  3663  3667
SCSWCHNG             U    000001        1  4310
SCSWCNT              H    00000A        2  4312  3812
SCSWCS               X    000009        1  4302  3657
SCSWCTLS             X    000001        1  4261
SCSWCUE              U    000020        1  4295
SCSWDCC0             U    000000        1  4257
SCSWDCC1             U    000001        1  4258
SCSWDCC3             U    000003        1  4259
SCSWDCCM             U    000003        1  4256
SCSWDE               U    000004        1  4298  3663  3667
SCSWECWC             U    000002        1  4268
SCSWESWF             U    000004        1  4255
SCSWFC               U    000010        1  4275
SCSWFH               U    000020        1  4274
SCSWFLAG             X    000000        1  4252
SCSWFM               U    000070        1  4272
SCSWFS               U    000040        1  4273
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
SCSWICTL	U	000002	1	4309	
SCSWIL	U	000040	1	4304	
SCSWISIC	U	000020	1	4264	
SCSWKEYM	U	0000F0	1	4253	
SCSWL	U	00000C	1	4313	
SCSWPCI	U	000080	1	4303	
SCSWPNOP	U	000001	1	4269	
SCSWPRGM	U	000020	1	4305	
SCSWPROT	U	000010	1	4306	
SCSWSAS	U	000010	1	4284	
SCSWSINT	U	000008	1	4285	
SCSWSM	U	000040	1	4294	
SCSWSPEN	U	000001	1	4288	
SCSWSPRI	U	000004	1	4286	3809
SCSWSSEC	U	000002	1	4287	
SCSWSSIC	U	000008	1	4266	
SCSWSUSC	U	000008	1	4254	
SCSWUC	U	000002	1	4299	
SCSWUS	X	000008	1	4292	3663 3667 3808
SCSWUX	U	000001	1	4300	
SENSEPGM	R	0006A8	1	3939	3769
SLI	U	000020	1	3898	3939 3946 3947 3954 3955 3956 3957 3965 3966 3967 3975 3976 3986 3987 3988 3996 3997 3998 4006
SNS	U	000004	1	3901	3939
SNSBYTES	X	0009B8	32	4013	3939
SSARCHMD	X	0000A3	1	4401	
SSARS	F	000120	4	4457	
SSCLKCMP	F	0000E0	8	4451	
SSCPUTIM	F	0000D8	8	4450	
SSCRS	F	0001C0	4	4460	
SSFPRS	D	000160	8	4458	
SSGRS	F	000180	4	4459	
SSMODEL	F	00010C	4	4455	
SSPREFIX	F	000108	4	4454	
SSPSW	F	000100	8	4453	
SSXSAA	A	0000D4	4	4449	
STFLDATA	F	0000C8	4	4422	
SVCICODE	H	00008A	2	4381	
SVCIID	F	000088	4	4377	
SVCIILC	X	000089	1	4379	
SVCIILCM	U	00000C	1	4380	
SVCNPSW	F	000060	8	4364	
SVCOPSW	F	000020	8	4336	4343
T1_3EBUF	X	000A24	256	4024	3947
T1_CHPGM	R	0006F0	1	3946	3919
T1_DESC	C	0006B0	62	3943	3944 3919
T1_E7DAT	X	0009D8	12	4017	4023 3946
T1_E7LEN	U	00004C	1	4023	3946
T1_MSGLN	U	00003E	1	3944	3919
T2_06BUF	X	000B84	10	4031	3957 3958
T2_06IDA	A	000778	8	3958	3957
T2_47DAT	X	000B74	16	4030	3956
T2_63DAT	X	000B64	16	4029	3955
T2_CHPGM	R	000758	1	3954	3920
T2_DESC	C	000700	85	3951	3952 3920
T2_E7DAT	X	000B24	64	4028	3954

```
     SYMBOL         TYPE   VALUE    LENGTH  DEFN  REFERENCES

T2_MSGLN             U    000055        1  3952  3920
T3_06BUF             X    000BDE       10  4041  3967  3968
T3_06IDA             A    0007F0        8  3968  3967
T3_47DAT             X    000BCE       16  4040  3966
T3_CHPGM             R    0007D8        1  3965  3921
T3_DESC              C    000780       86  3962  3963  3921
T3_E7DAT             X    000B8E       64  4035  3965
T3_MSGLN             U    000056        1  3963  3921
T4_3EBUF             X    000BE8      256  4046  3976  3979
T4_3EIDA             A    000870        8  3979  3976
T4_CHPGM             R    000850        1  3975  3922
T4_DESC              C    0007F8       86  3972  3973  3922
T4_E7DAT             X    001FD8       76  4053  3975
T4_E7DAT_PART1       X    001FD8       40  4054  3977
T4_E7DAT_PART1_LEN
                     U    000028        1  4050  4051  4052  4054
T4_E7DAT_PART2       X    002000       36  4058  3978
T4_E7DAT_PART2_LEN
                     U    000024        1  4051  4058
T4_E7DAT_TOTAL_LEN
                     U    00004C        1  4049  4051  4053
T4_E7IDA             A    000860        8  3977  3975
T4_MSGLN             U    000056        1  3973  3922
T4_ORG               U    000CE8        1  4048  4062
T5_06BUF             X    000D38       10  4073  3988  3989
T5_06IDA             A    000900        8  3989  3988
T5_47DAT             X    000D28       16  4072  3987
T5_CHPGM             R    0008E8        1  3986  3923
T5_DESC              C    000878      111  3983  3984  3923
T5_E7DAT             X    000CE8       64  4067  3986
T5_MSGLN             U    00006F        1  3984  3923
T6_47DAT             X    000D82       16  4082  3997
T6_86BUF             X    000D92       10  4083  3998  3999
T6_86IDA             A    000978        8  3999  3998
T6_CHPGM             R    000960        1  3996  3924
T6_DESC              C    000908       81  3993  3994  3924
T6_E7DAT             X    000D42       64  4077  3996
T6_MSGLN             U    000051        1  3994  3924
T7_CHPGM             R    0009B0        1  4006  3925
T7_DESC              C    000980       47  4003  4004  3925
T7_E7DAT             X    000D9C       12  4088  4093  4006
T7_E7LEN             U    000040        1  4093  4006
T7_MSGLN             U    00002F        1  4004  3925
TESTLEN              U    000014        1  3928  3625  3630
TESTLOOP             I    00024E        4  3620  3632
TESTNEXT             I    000270        4  3630  3623
TESTNUM              U    000200        1  3914  3583  3642  3693
TESTOK               I    0002C4        4  3671  3665
TESTONLY             R    000FFF        1  3894  3620  3622
TESTR14              A    0002CC        4  3674  3640  3671
TESTTAB              A    000618        4  3917  3928  3913
TESTTHIS             I    000260        4  3625  3621
TIMER                F    000050        4  4360
TTDES                F    000054        4  4361
UA0                  F    000010        8  4333
UA1                  F    00004C        4  4358
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
UA2	F	0000A4	4	4403	
UA3	F	0000B4	4	4412	
UA4	X	0000B8	1	4413	
UA5	X	0000CC	8	4423	
UA6	X	0000EC	8	4429	
UA7	F	000118	8	4440	
UA8	X	000180	32	4469	
WKSTORG	U	000610	1	3892	3895
WPSW0010	3	000428	16	3792	3791
ZARCHOK	I	000232	4	3604	3591
ZBRKADDR	A	000110	8	4439	
ZEMONCNT	F	00010C	4	4438	
ZEMONCTR	A	000100	8	4436	
ZEMONSIZ	F	000108	4	4437	
ZEXTNPSW	X	0001B0	16	4472	
ZEXTOPSW	X	000130	16	4464	
ZIONPSW	X	0001F0	16	4476	
ZIOOPSW	X	000170	16	4468	
ZMCKNPSW	X	0001E0	16	4475	
ZMCKOPSW	X	000160	16	4467	
ZMKFAILA	F	0000F8	8	4431	
ZMONCODE	F	0000B0	8	4406	
ZPGMNPSW	X	0001D0	16	4474	
ZPGMOPSW	X	000150	16	4466	
ZPGMTRX	F	0000A8	8	4405	
ZRSTNPSW	X	0001A0	16	4471	
ZRSTOPSW	X	000120	16	4463	
ZSASDISP	U	0011C0	1	4477	
ZSVCNPSW	X	0001C0	16	4473	
ZSVCOPSW	X	000140	16	4465	
=AL2(L'MSGMSG)	R	0006A6	2	3932	3830
=H'0'	H	0006A4	2	3931	3825

```
 MACRO    DEFN  REFERENCES

ANTR       121
APROB      253
ARCHIND    413   3443
ARCHLVL    554   3442
ASAIPL     680
ASALOAD    760   3525
ASAREA     815   4323
ASAZAREA  1000
CPUWAIT   1083   3788
DSECTS    1409   4099   4131   4178   4193   4249   4320
DWAIT     1612
DWAITEND  1669
ENADEV    1677   3737
ESA390    1777
IOCB      1788   3863
IOCBDS    1964   4100
IOFMT     1998   4132   4179   4194   4250   4482   4500   4508
IOINIT    2336   3726
IOTRFR    2377
ORB       2425   3879
POINTER   2614
PSWFMT    2642
RAWAIT    2776
RAWIO     2872   3775
SIGCPU    3030
SMMGR     3088
SMMGRB    3188
TRAP128   3237   3537
TRAP64    3214   3527   3530
TRAPS     3250
ZARCH     3324
ZEROH     3336
ZEROL     3364
ZEROLH    3392
ZEROLL    3415
```

```
   DESC    SYMBOL  SIZE     POS         ADDR

Entry: 0

Image      IMAGE   8228  0000-2023  0000-2023
  Region   CODE    8228  0000-2023  0000-2023
    CSECT  E7TEST  8228  0000-2023  0000-2023
```

```
   STMT                                          FILE NAME

1     C:\Users\Fish\Documents\Visual Studio 2008\Projects\MyProjects\ASMA-0\E7Prefix\E7Prefix.asm
2     C:\Users\Fish\Documents\Visual Studio 2008\Projects\Hercules\_Git\_Harold\SATK-0\srcasm\satk.mac


** NO ERRORS FOUND **
```