```
 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 ************************************************************************
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                      49          PRINT OFF
                                                    3430          PRINT ON

                                                    3432 ********************************************************************************
                                                    3433 *        SATK prolog stuff...
                                                    3434 ********************************************************************************

                                                    3436          ARCHLVL ZARCH=YES,ARCHIND=YES,MNOTE=NO
                                                    3438+$AL      OPSYN AL
                                                    3439+$ALR     OPSYN ALR
                                                    3440+$B       OPSYN B
                                                    3441+$BAS     OPSYN BAS
                                                    3442+$BASR    OPSYN BASR
                                                    3443+$BC      OPSYN BC
                                                    3444+$BCTR    OPSYN BCTR
                                                    3445+$BE      OPSYN BE
                                                    3446+$BH      OPSYN BH
                                                    3447+$BL      OPSYN BL
                                                    3448+$BM      OPSYN BM
                                                    3449+$BNE     OPSYN BNE
                                                    3450+$BNH     OPSYN BNH
                                                    3451+$BNL     OPSYN BNL
                                                    3452+$BNM     OPSYN BNM
                                                    3453+$BNO     OPSYN BNO
                                                    3454+$BNP     OPSYN BNP
                                                    3455+$BNZ     OPSYN BNZ
                                                    3456+$BO      OPSYN BO
                                                    3457+$BP      OPSYN BP
                                                    3458+$BXLE    OPSYN BXLE
                                                    3459+$BZ      OPSYN BZ
                                                    3460+$CH      OPSYN CH
                                                    3461+$L       OPSYN L
                                                    3462+$LH      OPSYN LH
                                                    3463+$LM      OPSYN LM
                                                    3464+$LPSW    OPSYN LPSW
                                                    3465+$LR      OPSYN LR
                                                    3466+$LTR     OPSYN LTR
                                                    3467+$NR      OPSYN NR
                                                    3468+$SL      OPSYN SL
                                                    3469+$SLR     OPSYN SLR
                                                    3470+$SR      OPSYN SR
                                                    3471+$ST      OPSYN ST
                                                    3472+$STM     OPSYN STM
                                                    3473+$X       OPSYN X
                                                    3474+$AHI     OPSYN AHI
                                                    3475+$B       OPSYN J
                                                    3476+$BC      OPSYN BRC
                                                    3477+$BE      OPSYN JE
                                                    3478+$BH      OPSYN JH
                                                    3479+$BL      OPSYN JL
                                                    3480+$BM      OPSYN JM
                                                    3481+$BNE     OPSYN JNE
                                                    3482+$BNH     OPSYN JNH
                                                    3483+$BNL     OPSYN JNL
                                                    3484+$BNM     OPSYN JNM
                                                    3485+$BNO     OPSYN JNO
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                    3486+$BNP     OPSYN JNP
                                                    3487+$BNZ     OPSYN JNZ
                                                    3488+$BO      OPSYN JO
                                                    3489+$BP      OPSYN JP
                                                    3490+$BXLE    OPSYN JXLE
                                                    3491+$BZ      OPSYN JZ
                                                    3492+$CHI     OPSYN CHI
                                                    3493+$AHI     OPSYN AGHI
                                                    3494+$AL      OPSYN ALG
                                                    3495+$ALR     OPSYN ALGR
                                                    3496+$BCTR    OPSYN BCTGR
                                                    3497+$BXLE    OPSYN JXLEG
                                                    3498+$CH      OPSYN CGH
                                                    3499+$CHI     OPSYN CGHI
                                                    3500+$L       OPSYN LG
                                                    3501+$LH      OPSYN LGH
                                                    3502+$LM      OPSYN LMG
                                                    3503+$LPSW    OPSYN LPSWE
                                                    3504+$LR      OPSYN LGR
                                                    3505+$LTR     OPSYN LTGR
                                                    3506+$NR      OPSYN NGR
                                                    3507+$SL      OPSYN SLG
                                                    3508+$SLR     OPSYN SLGR
                                                    3509+$SR      OPSYN SGR
                                                    3510+$ST      OPSYN STG
                                                    3511+$STM     OPSYN STMG
                                                    3512+$X       OPSYN XG


                                                    3514 ********************************************************************************
                                                    3515 *        Initiate the E7TEST CSECT in the CODE region
                                                    3516 *        with the location counter at 0
                                                    3517 ********************************************************************************

                                                    3519 E7TEST   ASALOAD  REGION=CODE
                                 00000000  00002023 3520+E7TEST   START 0,CODE
00000000  00020000 00000000                         3522+         PSW   0,0,2,0,X'008'      64-bit Restart ISR Trap New PSW
00000010                         00000010  00000058 3523+         ORG   E7TEST+X'058'
00000058  00020000 00000000                         3525+         PSW   0,0,2,0,X'018'      64-bit External ISR Trap New PSW
00000068  00020000 00000000                         3526+         PSW   0,0,2,0,X'020'      64-bit Supervisor Call ISR Trap New PSW
00000078  00020000 00000000                         3527+         PSW   0,0,2,0,X'028'      64-bit Program ISR Trap New PSW
00000088  00020000 00000000                         3528+         PSW   0,0,2,0,X'030'      64-bit Machine Check Trap New PSW
00000098  00020000 00000000                         3529+         PSW   0,0,2,0,X'038'      64-bit Input/Output Trap New PSW
000000A8                         000000A8  000001A0 3530+         ORG   E7TEST+X'1A0'
000001A0  00020000 00000000                         3532+         PSWZ  0,0,2,0,X'120'     Restart ISR Trap New PSW
000001B0  00020000 00000000                         3533+         PSWZ  0,0,2,0,X'130'     External ISR Trap New PSW
000001C0  00020000 00000000                         3534+         PSWZ  0,0,2,0,X'140'     Supervisor Call ISR Trap New PSW
000001D0  00020000 00000000                         3535+         PSWZ  0,0,2,0,X'150'     Program ISR Trap New PSW
000001E0  00020000 00000000                         3536+         PSWZ  0,0,2,0,X'160'     Machine Check Trap New PSW
000001F0  00020000 00000000                         3537+         PSWZ  0,0,2,0,X'170'     Input/Output Trap New PSW
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                    3539 ********************************************************************************
                                                    3540 *                  L O W   C O R E
                                                    3541 ********************************************************************************

00000200                        00000200  000001A0  3543          ORG   E7TEST+X'1A0'                      z/Arch Restart New PSW
000001A0  00000001 80000000                         3544          DC    0D'0',XL8'0000000180000000'
000001A8  00000000 00000200                         3545          DC    AD(BEGIN)

000001B0                        000001B0  000001D0  3547          ORG   E7TEST+X'1D0'                      z/Arch Program New PSW
000001D0  00020001 80000000                         3548          DC    0D'0',XL8'0002000180000000'
000001D8  00000000 0000DEAD                         3549          DC    AD(X'DEAD')




                                                    3551 ********************************************************************************
                                                    3552 *                       ENTRY POINT CODE
                                                    3553 ********************************************************************************
                                                    3554 *   R0       (work)
                                                    3555 *   R1       (work) (also ENADEV macro's I/O device during startup)
                                                    3556 *   R2       (work)
                                                    3557 *   R3       IOCB pointer (set by INIT, needed by ENADEV macro)
                                                    3558 *   R4       SCHIB pointer (tempoarily used at INIT during ENADEV)
                                                    3559 *   R5       SCHSCSW pointer (also temporarily used for CPU register
                                                    3560 *            when signaling architecture change during startup)
                                                    3561 *   R6,R7    (work) (also used as signaling registers when changing
                                                    3562 *            architecture during startup)
                                                    3563 *   R8       ORB pointer (set by INIT, used by EXCP subroutine)
                                                    3564 *   R9-R15   (work)
                                                    3565 ********************************************************************************

000001E0                        00000000            3567          USING E7TEST,R0          Low core addressability
000001E0                        00000000            3568          USING ASA,R0             Low core addressability
000001E0                        00000000            3569          USING IOCB,R3            SATK Device I/O-Control Block
000001E0                        00000000            3570          USING SCHIB,R4           ESA/390 Subchannel Information Block
000001E0                        00000000            3571          USING SCSW,R5            ESA/390 Subchannel Status Word
000001E0                        00000000            3572          USING ORB,R8             ESA/390 Operation-Request Block

000001E0                        000001E0  00000200  3574          ORG   E7TEST+X'200'
                                00000200  00000001  3575 BEGIN     EQU   *
00000200  1F00                                      3576          SLR   R0,R0              Start clean (SIGP status register)
00000202  9200 0200                     00000200   3577          MVI   TESTNUM,0          Initialize Test number
00000206  1F11                                      3578          SLR   R1,R1              Start clean (SIGP parm   register)
00000208  1F22                                      3579          SLR   R2,R2              Start clean
0000020A  1F33                                      3580          SLR   R3,R3              Start clean (SIGP target CPU)

0000020C  4130 0000                     00000000   3582          LA    R3,0               Target CPU = CPU #0
00000210  4110 0001                     00000001   3583          LA    R1,1               Parm register = z/Arch mode
00000214  AE03 0012                     00000012   3584          SIGP  R0,R3,X'12'        Order code    = z/Arch mode
00000218  4780 0232                     00000232   3585          BC    B'1000',ZARCHOK    CC0 = success: continue
0000021C  4740 0228                     00000228   3586          BC    B'0100',CHKZARCH   CC1 = status stored: check further
00000220  4720 02D0                     000002D0   3587          BC    B'0010',FAILCPU0   CC2 = busy: FAIL
00000224  4710 02D0                     000002D0   3588          BC    B'0001',FAILCPU0   CC3 = not operational: FAIL
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                          3590 ********************************************************************
                                          3591 *       Ensure test program executes in z/Architecture mode
                                          3592 ********************************************************************

00000228  4140 0100                       00000100  3594 CHKZARCH LA    R4,X'100'          Status X'100' = Same Architecture!
0000022C  1504                            3595          CLR   R0,R4              Are we already in z/Arch mode?
0000022E  A774 0051                       000002D0  3596          JNE   FAILCPU0           Any other status = FAIL

00000232  4140 0246                       00000246  3598 ZARCHOK  LA    R4,BEGIN0          Point to CPU #0 entry point
00000236  4040 01AE                       000001AE  3599          STH   R4,X'1AE'          Update Restart PSW

0000023A  4130 0000                       00000000  3601          LA    R3,0               Target CPU = CPU #0
0000023E  AE03 0006                       00000006  3602          SIGP  R0,R3,X'6'         Order code = Restart

00000242  B2B2 02D0                       000002D0  3604          LPSWE FAILCPU0           WTF?! How did we get here?!

                                          3606 ********************************************************************
                                          3607 *    THE ACTUAL (very short and simple) E7TEST TEST PROGRAM ITSELF
                                          3608 ********************************************************************

00000246  45E0 0368                       00000368  3610 BEGIN0   BAL   R14,INIT           Initalize Program

0000024A  98AB 0610                       00000610  3612          LM    R10,R11,ATESTTAB   R10 --> table, R11 <== #of entries

0000024E  9500 0FFF                       00000FFF  3614 TESTLOOP CLI   TESTONLY,0         Do only specific test?
00000252  4780 0260                       00000260  3615          BE    TESTTHIS           No, do all tests
00000256  D500 0FFF A003      00000FFF    00000003  3616          CLC   TESTONLY,3(R10)    Is the test they want?
0000025C  4770 0270                       00000270  3617          BNE   TESTNEXT           No, skip this test

00000260  9801 A00C                       0000000C  3619 TESTTHIS LM    R0,R1,(TESTLEN-(2*4))(R10)  R0 <== MSG LEN, R1 --> MSG
00000264  45E0 04A0                       000004A0  3620          BAL   R14,MSG                     Report which test this is

00000268  9802 A000                       00000000  3622          LM    R0,R2,0(R10)       Load test parms from table
0000026C  45E0 027C                       0000027C  3623          BAL   R14,DOTEST          Perform this test...
00000270  41A0 A014                       00000014  3624 TESTNEXT LA    R10,TESTLEN(,R10)  R10 --> next test table entry

00000274  46B0 024E                       0000024E  3626          BCT   R11,TESTLOOP        Loooop... until no more tests

00000278  B2B2 0308                       00000308  3628          LPSWE GOODPSW            E7TEST SUCCESS!
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                  3630 ************************************************************************
                                                  3631 *        Generic TEST subroutine:  R0=test#, R1=chpgm, R2=flag
                                                  3632 ************************************************************************

0000027C  50E0 02CC                     000002CC  3634 DOTEST   ST    R14,TESTR14        Save return address

00000280  4200 0200                     00000200  3636          STC   R0,TESTNUM         Save this test's test number
00000284  1801                                    3637          LR    R0,R1              R0 --> This test's Channel Program

00000286  45F0 03E2                     000003E2  3639          BAL   R15,EXCP           Execute this Channel Program...

0000028A  5810 3000                     00000000  3641          L     R1,IOCBDID         R1 <== Subchannel
0000028E  5840 3028                     00000028  3642          L     R4,IOCBSIB         R4 <== SCHIB address

00000292  B234 4000                     00000000  3644          STSCH 0(R4)              Store Subchannel for our device
00000296  4770 02D8                     000002D8  3645          BC    B'0111',FAILSCH    FAIL if anything other than CC0

                                                  3647 *        Verify correct/expected I/O completion...

0000029A  4150 401C                     0000001C  3649          LA    R5,SCHSCSW         R5 --> SCSW

0000029E  9500 5009                     00000009  3651          CLI   SCSWCS,0           Clean channel status?
000002A2  4770 02F0                     000002F0  3652          BNE   FAILTEST           No?! ALWAYS FAIL THE TEST!

000002A6  1222                                    3654          LTR   R2,R2              I/O error expected for this test?
000002A8  4770 02B8                     000002B8  3655          BNZ   ERRTEST            Yes, then verify there was an error

000002AC  950C 5008                     00000008  3657          CLI   SCSWUS,SCSWCE+SCSWDE   Check for normal successful I/O
000002B0  4770 02F0                     000002F0  3658          BNE   FAILTEST           No?! FAIL!
000002B4  47F0 02C4                     000002C4  3659          B     TESTOK             Yes, then we're done; return

000002B8  950C 5008                     00000008  3661 ERRTEST  CLI   SCSWUS,SCSWCE+SCSWDE   Check for normal successful I/O
000002BC  4780 02F0                     000002F0  3662          BE    FAILTEST           Yes?! UNEXPECTED! FAIL!
000002C0  45F0 03DE                     000003DE  3663          BAL   R15,DOSENSE        Clear the error

000002C4  58E0 02CC                     000002CC  3665 TESTOK   L     R14,TESTR14        Restore R14 return address
000002C8  07FE                                    3666          BR    R14                Return to caller

000002CC  00000000                                3668 TESTR14  DC    A(0)     Test subroutine saved R14 return address
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                          3670 ********************************************************************************
                                          3671 *                    Disabled Wait PSWs...
                                          3672 ********************************************************************************



                                          3674 *    Test failure routines to load specific failure PSW...

000002D0  4190 0328                       00000328  3676 FAILCPU0 LA    R9,BAD66PSW          SIGP failed
000002D4  47F0 02F8                       000002F8  3677          B     FAIL
000002D8  4190 0338                       00000338  3678 FAILSCH  LA    R9,BAD77PSW          STSCH failed
000002DC  47F0 02F8                       000002F8  3679          B     FAIL
000002E0  4190 0348                       00000348  3680 FAILDEV  LA    R9,BAD88PSW          ENADEV failed
000002E4  47F0 02F8                       000002F8  3681          B     FAIL
000002E8  4190 0358                       00000358  3682 FAILIO   LA    R9,BAD99PSW          RAWIO failed
000002EC  47F0 02F8                       000002F8  3683          B     FAIL
000002F0  4190 0318                       00000318  3684 FAILTEST LA    R9,FAILPSW           One of our overall tests failed
000002F4  47F0 02F8                       000002F8  3685          B     FAIL



000002F8  D200 900F 0200      0000000F    00000200  3687 FAIL     MVC   16-1(1,R9),TESTNUM   Put failing test# into PSW
000002FE  B2B2 9000                       00000000  3688          LPSWE 0(R9)                Load failure PSW



                                          3690 *
                                          3691 **    Overall test SUCCESS / FAILURE disabled wait PSWs...
                                          3692 *

00000308  00020001 80000000               3694 GOODPSW  DC    0D'0',XL8'0002000180000000',AD(X'00000000')
00000318  00020001 80000000               3695 FAILPSW  DC    0D'0',XL8'0002000180000000',AD(X'0BAD0000')



                                          3697 *
                                          3698 **    Specific unexpected failure disabled wait PSWs...
                                          3699 *

00000328  00020001 80000000               3701 BAD66PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD6600')
00000338  00020001 80000000               3702 BAD77PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD7700')
00000348  00020001 80000000               3703 BAD88PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD8800')
00000358  00020001 80000000               3704 BAD99PSW DC    0D'0',XL8'0002000180000000',AD(X'0BAD9900')
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  3706 ********************************************************************
                                                  3707 *        Program Initialization
                                                  3708 ********************************************************************

00000368  4130 0574                     00000574  3710 INIT     LA    R3,IOCB_A80        R3 --> IOCB
0000036C  E380 3018 0004                00000018  3711          LG    R8,IOCBORB         R8 --> ORB
00000372  45F0 037C                     0000037C  3712          BAL   R15,IOINIT         Init CPU for I/O operations
00000376  45F0 038A                     0000038A  3713          BAL   R15,ENADEV         Enable device for I/O
0000037A  07FE                                    3714          BR    R14                Return to caller


                                                  3716 ********************************************************************
                                                  3717 *        Initialize the CPU for I/O operations
                                                  3718 ********************************************************************

                                                  3720 IOINIT   IOINIT ,
0000037C  B766 0384                     00000384  3721+IOINIT   LCTL  6,6,IOMK0007       Enable subchannel subclasses for interruptions
00000380  47F0 0388                     00000388  3722+         B     IOMK0007+4
00000384                                          3723+IOMK0007 DS    0F
00000384  FF000000                                3724+         DC    XL4'FF000000'         All subchannel subclasses enabled
00000388  07FF                                    3725          BR    R15                Return to caller


                                                  3727 ********************************************************************
                                                  3728 *        Enable the device, making it ready for use
                                                  3729 ********************************************************************

                                                  3731 ENADEV   ENADEV  ENAOKAY,FAILDEV,REG=4
0000038A  5810 03D4                     000003D4  3732+ENADEV   L     1,FIND0008
0000038E  E340 3028 0004                00000028  3733+         $L    4,IOCBSIB          Locate where the SCHIB is to be stored
00000394                        00000000          3734+         USING SCHIB,4
00000394                                          3735+FINL0008 DS    0H   Retrieve Subchannel Information Block for desired device number
00000394  B234 4000                     00000000  3736+         STSCH 0(4)               Store the SCHIB for first subchannel
00000398  A774 FFA4                     000002E0  3737+         $BC   B'0111',FAILDEV    Subchannel does not exist and device number not found
0000039C  9101 4005                     00000005  3738+         TM    PMCW1_8,PMCWV      Is the subchannel device number valid?
000003A0  A784 0011                     000003C2  3739+         $BZ   FINN0008           ..No, check the next subchannel
000003A4  D501 4006 3004      00000006  00000004  3740+         CLC   PMCWDNUM,IOCBDEV   Is this the device number being sought?
000003AA  A774 000C                     000003C2  3741+         $BNE  FINN0008           ..No, check the next subchannel
                                                  3742+* Subchannel found!
000003AE  5010 3000                     00000000  3743+         ST    1,IOCBDID          Remember the subchannel so I/O can be done to it.
000003B2  9680 4005                     00000005  3744+         OI    PMCW1_8,PMCWE      Make sure it is enabled so I/O requests accepted
000003B6  B232 4000                     00000000  3745+         MSCH  0(4)               Enable the subchannel to the channel sub-system
000003BA  A784 0011                     000003DC  3746+         $BC   B'1000',ENAOKAY    CC0 (SCHIB updated), device is ready.
000003BE  A7F4 FF91                     000002E0  3747+         $B    FAILDEV            CC1,CC2,CC3 (SCHIB update failed), quit
000003C2                                          3748+FINN0008 DS    0H  Advance to next subchannel
000003C2  4110 1001                     00000001  3749+         LA    1,1(0,1)           Advance to next subchannel
000003C6  5510 03D8                     000003D8  3750+         CL    1,FINM0008         Beyond maximum subchannel
000003CA  A7D4 FFE5                     00000394  3751+         $BNH  FINL0008           ..No, examine the next subchannel
000003CE  A724 FF89                     000002E0  3752+         $BH   FAILDEV            ..Yes, failed to enable the device
000003D2                                          3753+         DROP  4                  Forget SCHIB addressing
000003D4  00010000                                3754+FIND0008 DC    A(X'00010000')     First subchannel subsystem ID
000003D8  0001FFFF                                3755+FINM0008 DC    A(X'0001FFFF')     Last subchannel subsystem ID

000003DC  07FF                                    3757 ENAOKAY  BR    R15                Return to caller if device enabled OK
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  3759 ********************************************************************************
                                                  3760 *        Execute the channel program pointed to by R0
                                                  3761 ********************************************************************************

000003DE  4100 0698                    00000698   3763 DOSENSE  LA    R0,SENSEPGM          R0 -> Read SENSE Channel Program
000003E2  5000 8008                    00000008   3764 EXCP     ST    R0,ORBCCW            Plug Channel Program into IORB
000003E6  B904 0004                               3765          LGR   R0,R4                Save SCHIB pointer
000003EA  9282 8005                    00000005   3766          MVI   ORB1_8,ORBF+ORBH     Format-1 CCWs, Format-2 IDAWs
000003EE  9200 8007                    00000007   3767          MVI   ORRB1_24,0           Set all these ORB flags to zero

                                                  3769          RAWIO 4,FAIL=FAILIO
000003F2  9200 300E                    0000000E   3770+         MVI   IOCBSC,X'00'          Clear SC information
000003F6  D201 300A 3006      0000000A 00000006   3771+         MVC   IOCBST,IOCBZERO       Clear accumulated status
000003FC  5810 3000                    00000000   3772+         L     1,IOCBDID             Remember the device ID with which I am working
                                                  3773+* Initiate Subchannel-based input/output operation
00000400  E340 3018 0004               00000018   3774+         $L    4,IOCBORB             Locate the ORB for the channel subsystem
00000406  B233 4000                    00000000   3775+         SSCH  0(4)                  Initiate the I/O operation
0000040A  A774 FF6F                    000002E8   3776+         $BC   B'0111',FAILIO        ..Start function failed, report/handle the error
0000040E  E340 3020 0004               00000020   3777+         $L    4,IOCBIRB             Locate the IRB storage area
00000414                      00000000            3778+         USING IRB,4                 Make it addressable

                                                  3780+* Wait for I/O operation to present status via an interruption
00000414                                          3781+IOWT0009 DS    0H  Wait for I/O to complete
00000414  D20F 0448 01F0      00000448 000001F0   3783+         MVC   IOS0010(16),496(0)     Save Input/Output new PSW
0000041A  D20F 01F0 0438      000001F0 00000438   3784+         MVC   496(16,0),ION0010     Establish Input/Ouput new PSW
00000420  B2B2 0428                    00000428   3785+         $LPSW WPSW0010              Wait for event
00000428  02020000 00000000                       3786+WPSW0010 PSW   2,0,2,0,0               Wait for event
00000438  00002000 00000000                       3787+ION0010  PSW   0,0,0,32,IRST0010,24        I/O New PSW: cc==2
00000448  00000000 00000000                       3788+IOS0010  DC    XL16'00'
                                                  3789+* Handle input/output interruption
00000458                                          3790+IRST0010 DS    0H
00000458  D20F 01F0 0448      000001F0 00000448   3791+         MVC   496(16,0),IOS0010      Restore input/output new PSW
                                                  3792+* Process the interruption...
                                                  3793+* Validate interruption is for the expected subchannel
0000045E  5510 00B8                    000000B8   3794+         CL    1,IOSSID              Is this the device for which I am waiting?
00000462  A774 FFD9                    00000414   3795+         $BNE  IOWT0009              ..No, continue waiting for it
                                                  3796+* Accumulate interruption information from IRB
00000466  B235 4000                    00000000   3797+         TSCH  0(4)                  Retrive interrupt information
0000046A  A744 FFD5                    00000414   3798+         $BC   B'0100',IOWT0009      CC1 (not status pending), wait for it to arrive
0000046E  A714 FF3D                    000002E8   3799+         $BC   B'0001',FAILIO        CC3 (not operational), an error then
                                                  3800+*                                    CC0 (status was pending), accumulate the status
00000472  D600 300E 4003      0000000E 00000003   3801+         OC    IOCBSC,IRBSCSW+SCSW2  Accumulate status control
00000478  D601 300A 4008      0000000A 00000008   3802+         OC    IOCBST,IRBSCSW+SCSWUS Accumulate device and channel status
0000047E  9104 300E                    0000000E   3803+         TM    IOCBSC,SCSWSPRI       Primary subchannel status?
00000482  A7E4 FFC9                    00000414   3804+         $BNO  IOWT0009              ..No, wait for primary status
00000486  D203 3010 4004      00000010 00000004   3805+         MVC   IOCBSCCW,IRBSCSW+SCSWCCW  CCW address
0000048C  D201 3016 400A      00000016 0000000A   3806+         MVC   IOCBRCNT,IRBSCSW+SCSWCNT  Residual count
                                                  3807+* Test for errors as specified in the IOCB
00000492  910C 300A                    0000000A   3808+         TM    IOCBUS,CSWCE+CSWDE    Channel end and device end both accumulated?
00000496  A7E4 FF29                    000002E8   3809+         $BNO  FAILIO                Hunh? No CE and DE but do have primary status!
                                                  3810+* Input/Output operation successful

0000049A  B904 0040                               3812          LGR   R4,R0                Restore SCHIB pointer
0000049E  07FF                                    3813          BR    R15                 Return to caller
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                          3815 ************************************************************************
                                          3816 *        Issue HERCULES MESSAGE pointed to by R1, length in R0
                                          3817 ************************************************************************

000004A0  4900 0690                       00000690  3819 MSG      CH    R0,=H'0'                Do we even HAVE a message?
000004A4  07DE                                      3820          BNHR  R14                     No, ignore

000004A6  9002 04D8                       000004D8  3822          STM   R0,R2,MSGSAVE           Save registers

000004AA  4900 0692                       00000692  3824          CH    R0,=AL2(L'MSGMSG)       Message length within limits?
000004AE  47D0 04B6                       000004B6  3825          BNH   MSGOK                   Yes, continue
000004B2  4100 0080                       00000080  3826          LA    R0,L'MSGMSG             No, set to maximum

000004B6  1820                                      3828 MSGOK    LR    R2,R0                   Copy length to work register
000004B8  0620                                      3829          BCTR  R2,0                    Minus-1 for execute
000004BA  4420 04E4                       000004E4  3830          EX    R2,MSGMVC               Copy message to O/P buffer

000004BE  4120 200A                       0000000A  3832          LA    R2,1+L'MSGCMD(,R2)      Calculate true command length
000004C2  4110 04EA                       000004EA  3833          LA    R1,MSGCMD               Point to true command

000004C6  83120008                                  3835          DC    X'83',X'12',X'0008'     Issue Hercules Diagnose X'008'
000004CA  4780 04D0                       000004D0  3836          BZ    MSGRET                  Return if successful
000004CE  0000                                      3837          DC    H'0'                    CRASH for debugging purposes

000004D0  9802 04D8                       000004D8  3839 MSGRET   LM    R0,R2,MSGSAVE           Restore registers
000004D4  07FE                                      3840          BR    R14                     Return to caller

000004D8  00000000 00000000                         3842 MSGSAVE  DC    3F'0'                   Registers save area
000004E4  D200 04F3 1000      000004F3  00000000    3843 MSGMVC   MVC   MSGMSG(0),0(R1)         Executed instruction

000004EA  D4E2C7D5 D6C8405C                         3845 MSGCMD   DC    C'MSGNOH * '            *** HERCULES MESSAGE COMMAND ***
000004F3  40404040 40404040                         3846 MSGMSG   DC    CL128' '                The message text to be displayed
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  3848 ********************************************************************************
                                                  3849 *                              IOCB
                                                  3850 ********************************************************************************
                                                  3851 *
                                                  3852 *         I/O Control Block -- Structure used by RAWIO macro
                                                  3853 *         identifying the device and operation being performed
                                                  3854 *
                                                  3855 ********************************************************************************


                                                  3857 IOCB_A80 IOCB  X'A80'     I/O Control Block for CCUU device X'A80'
00000574  00000000                                3858+IOCB_A80 DC    A(0)            +0 Device Identifier (supplied by ENADEV macro)
00000578  0A80                                    3859+         DC    AL2(X'A80')     +4 Device address or device number
0000057A  0000                                    3860+         DC    H'0'            +6 Must be zeros
0000057C  D3                                      3861+         DC    AL1(X'D3')      +8 Default detected unit errors
0000057D  3F                                      3862+         DC    AL1(X'3F')      +9 Default detected channel errors
0000057E  0000                                    3863+         DC    HL2'0'          +10 Accumulated unit and channel errors
00000580  0000                                    3864+         DC    HL2'0'          +12 Tested unit and channel status
00000582  00                                      3865+         DC    XL1'00'         +14 Accumulated subchannel status control from SCSW
00000583  80                                      3866+         DC    XL1'80'         +15 Default unsoliticed wait condition
00000584  00000000                                3867+         DC    F'0'            +16 I/O status CCW address
00000588  00000000                                3868+         DC    F'0'            +20 residual count
0000058C  00000000 00000604                       3869+         DC    ADL8(IORB0011)  +24  Address where ORB is located
00000594  00000000 000005A4                       3870+         DC    ADL8(IIRB0011)  +32 Address where IRB stored
0000059C  00000000 000005A4                       3871+         DC    ADL8(IIRB0011)  +40 Address where SCHIB stored
000005A4  00000000 00000000                       3872+IIRB0011 DC    24F'0'              Embedded shared IRB and SCHIB area
00000604                                          3874+IORB0011 DS    0XL12
00000604  00000000                                3875+         DC    A(0)            Word 0 - Interruption Parameter
00000608  00                                      3876+         DC    AL1((0)*16+B'0000')  Word 1, bits 0-7
00000609  80                                      3877+         DC    BL1'10000000'   Word 1, bits 8-15
0000060A  FF                                      3878+         DC    AL1(255)        Word 1, bits 16-23
0000060B  00                                      3879+         DC    BL1'00000000'    Word 1, bits 24-31
0000060C  00000000                                3880+         DC    AL4(0)          Word 2 - CCW address
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                     3882 ********************************************************************************
                                                     3883 *                          WORKING STORAGE
                                                     3884 ********************************************************************************

                                00000610  00000001   3886 WKSTORG  EQU   *
00000610                        00000610  00000FFF   3887           ORG   E7TEST+X'FFF'
00000FFF  00                                         3888 TESTONLY DC    AL1(0)              Only do this one test if non-zero
00001000                        00001000  00000610   3889           ORG   WKSTORG

                                00000040  00000001   3891 CC       EQU   X'40'               Chain Command
                                00000020  00000001   3892 SLI      EQU   X'20'               Suppress Incorrect Length Indication
                                00000004  00000001   3893 IDA      EQU   X'04'               Indirect Data Addressing

                                00000004  00000001   3895 SNS      EQU   X'04'               Basic Sense CCW opcode
                                00000006  00000001   3896 RD       EQU   X'06'               Read Data CCW opcode
                                0000003E  00000001   3897 RSD      EQU   X'3E'               Read Subsystem Data CCW opcode
                                00000047  00000001   3898 LR       EQU   X'47'               Locate Record CCW opcode
                                00000063  00000001   3899 DX       EQU   X'63'               Define Extent CCW opcode
                                00000086  00000001   3900 RDMT     EQU   X'86'               Read Data Multi-track CCW opcode
                                000000E7  00000001   3901 PFX      EQU   X'E7'               Prefix CCW opcode

                                                     3903 *
                                                     3904 **       TESTS CONTROL TABLE...
                                                     3905 *

00000610  00000618 00000006                          3907 ATESTTAB DC    A(TESTTAB,NUMTESTS)

                                00000200  00000001   3908 TESTNUM  EQU   X'200'                Current test number
                                                     3909 *                                   (identifies failed test)

00000618                                             3911 TESTTAB  DC    0A(0)
                                                     3912          PRINT DATA
00000618  00000001 000006E0                          3913          DC    A(1,T1_CHPGM,0,T1_MSGLN,T1_DESC)
00000620  00000000 0000003E
00000628  000006A0
0000062C  00000002 00000748                          3914          DC    A(2,T2_CHPGM,0,T2_MSGLN,T2_DESC)
00000634  00000000 00000055
0000063C  000006F0
00000640  00000003 000007C8                          3915          DC    A(3,T3_CHPGM,0,T3_MSGLN,T3_DESC)
00000648  00000000 00000056
00000650  00000770
00000654  00000004 00000840                          3916          DC    A(4,T4_CHPGM,0,T4_MSGLN,T4_DESC)
0000065C  00000000 00000056
00000664  000007E8
00000668  00000005 000008D8                          3917          DC    A(5,T5_CHPGM,1,T5_MSGLN,T5_DESC)  (1=Expect I/O ERROR)
00000670  00000001 0000006F
00000678  00000868
0000067C  00000006 00000950                          3918          DC    A(6,T6_CHPGM,0,T6_MSGLN,T6_DESC)
00000684  00000000 00000051
0000068C  000008F8
                                                     3919          PRINT NODATA
                                00000006  00000001   3920 NUMTESTS EQU   6                     Number of test table entries
                                00000014  00000001   3921 TESTLEN  EQU   (*-TESTTAB)/NUMTESTS  Width of each test table entry

00000690                                             3923          LTORG ,        Literals Pool
00000690  0000                                       3924                =H'0'
00000692  0080                                       3925                =AL2(L'MSGMSG)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                    3927 ********************************************************************
                                                    3928 *                   TEST CHANNEL PROGRAMS...
                                                    3929 ********************************************************************

00000698                                            3931          DC    0D'0'
00000698  04200020 00000970                         3932 SENSEPGM DC    AL1(SNS),AL1(SLI),AL2(L'SNSBYTES),AL4(SNSBYTES)




                                                    3934 ********************************************************************

000006A0  E3C5E2E3 407BF17A                         3936 T1_DESC  DC    C'TEST #1: Format 2 PFX to obtain subsystem information (no IDA)'
                           0000003E  00000001       3937 T1_MSGLN EQU   *-T1_DESC
000006E0                                            3938          DC    0D'0'
000006E0  E760004C 00000990                         3939 T1_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(T1_E7LEN),AL4(T1_E7DAT)
000006E8  3E200100 000009DC                         3940          DC    AL1(RSD),AL1(SLI),AL2(L'T1_3EBUF),AL4(T1_3EBUF)




                                                    3942 ********************************************************************

000006F0  E3C5E2E3 407BF27A                         3944 T2_DESC  DC    C'TEST #2: Format 0 PFX with Define Extent Valid bit off (DX CCW chained
                           00000055  00000001       3945 T2_MSGLN EQU   *-T2_DESC
00000748                                            3946          DC    0D'0'
00000748  E7600040 00000ADC                         3947 T2_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T2_E7DAT),AL4(T2_E7DAT)
00000750  63600010 00000B1C                         3948          DC    AL1(DX),AL1(CC+SLI),AL2(L'T2_63DAT),AL4(T2_63DAT)
00000758  47600010 00000B2C                         3949          DC    AL1(LR),AL1(CC+SLI),AL2(L'T2_47DAT),AL4(T2_47DAT)
00000760  0624000A 00000768                         3950          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T2_06BUF),AL4(T2_06IDA)
00000768  00000000 00000B3C                         3951 T2_06IDA DC    AD(T2_06BUF)




                                                    3953 ********************************************************************

00000770  E3C5E2E3 407BF37A                         3955 T3_DESC  DC    C'TEST #3: Format 0 PFX with Define Extent Valid bit on (DX CCW imbeded
                           00000056  00000001       3956 T3_MSGLN EQU   *-T3_DESC
000007C8                                            3957          DC    0D'0'
000007C8  E7600040 00000B46                         3958 T3_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T3_E7DAT),AL4(T3_E7DAT)
000007D0  47600010 00000B86                         3959          DC    AL1(LR),AL1(CC+SLI),AL2(L'T3_47DAT),AL4(T3_47DAT)
000007D8  0624000A 000007E0                         3960          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T3_06BUF),AL4(T3_06IDA)
000007E0  00000000 00000B96                         3961 T3_06IDA DC    AD(T3_06BUF)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                    3963 ********************************************************************************
000007E8  E3C5E2E3 407BF47A                         3965 T4_DESC  DC    C'TEST #4: Format 2 PFX to obtain control unit information (PFX E7 2 IDA
                           00000056  00000001     3966 T4_MSGLN EQU   *-T4_DESC
00000840                                            3967          DC    0D'0'
00000840  E764004C 00000850                         3968 T4_CHPGM DC    AL1(PFX),AL1(CC+SLI+IDA),AL2(L'T4_E7DAT),AL4(T4_E7IDA)
00000848  3E240100 00000860                         3969          DC    AL1(RSD),AL1(SLI+IDA),AL2(L'T4_3EBUF),AL4(T4_3EIDA)
00000850  00000000 00001FD8                         3970 T4_E7IDA DC    AD(T4_E7DAT_PART1)
00000858  00000000 00002000                         3971          DC    AD(T4_E7DAT_PART2)
00000860  00000000 00000BA0                         3972 T4_3EIDA DC    AD(T4_3EBUF)



                                                    3974 ********************************************************************************
00000868  E3C5E2E3 407BF57A                         3976 T5_DESC  DC    C'TEST #5: Read 06 CCW should fail since LR operation is Read(16) and Re
                           0000006F  00000001     3977 T5_MSGLN EQU   *-T5_DESC
000008D8                                            3978          DC    0D'0'
000008D8  E7600040 00000CA0                         3979 T5_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T5_E7DAT),AL4(T5_E7DAT)
000008E0  47600010 00000CE0                         3980          DC    AL1(LR),AL1(CC+SLI),AL2(L'T5_47DAT),AL4(T5_47DAT)
000008E8  0624000A 000008F0                         3981          DC    AL1(RD),AL1(SLI+IDA),AL2(L'T5_06BUF),AL4(T5_06IDA)
000008F0  00000000 00000CF0                         3982 T5_06IDA DC    AD(T5_06BUF)



                                                    3984 ********************************************************************************
000008F8  E3C5E2E3 407BF67A                         3986 T6_DESC  DC    C'TEST #6: Same as Test #5, but properly uses multi-track Read (86) (Rea
                           00000051  00000001     3987 T6_MSGLN EQU   *-T6_DESC
00000950                                            3988          DC    0D'0'
00000950  E7600040 00000CFA                         3989 T6_CHPGM DC    AL1(PFX),AL1(CC+SLI),AL2(L'T6_E7DAT),AL4(T6_E7DAT)
00000958  47600010 00000D3A                         3990          DC    AL1(LR),AL1(CC+SLI),AL2(L'T6_47DAT),AL4(T6_47DAT)
00000960  8624000A 00000968                         3991          DC    AL1(RDMT),AL1(SLI+IDA),AL2(L'T6_86BUF),AL4(T6_86IDA)
00000968  00000000 00000D4A                         3992 T6_86IDA DC    AD(T6_86BUF)
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                    3994 ********************************************************************************
                                                    3995 *        TEST CHANNEL PROGRAM I/O DATA AND I/O BUFFERS...
                                                    3996 ********************************************************************************

00000970                                            3998          DC    0D'0'
00000970  00000000 00000000                         3999 SNSBYTES DC    XL32'00'     (Generic SENSE buffer)



                                                    4001 ********************************************************************************


00000990  02000000 00000000                         4003 T1_E7DAT DC    X'02000000 00000000 00000000'           +00  PFX
0000099C  00000000 00000000                         4004          DC    X'00000000 00000000 00000000 00000000'  +12  DEF EXT
000009AC  00000000 00000000                         4005          DC    X'00000000 00000000 00000000 00000000'  +28
000009BC  00000000 00000000                         4006          DC    X'00000000 00000000 00000000 00000000'  +44  LREC EXD
000009CC  0000                                      4007          DC    X'0000'                                 +60
000009CE  18000000 00004100                         4008          DC    X'    1800 00000000 41000000 00000000'  +62  PSF
                            0000004C  00000001      4009 T1_E7LEN EQU   *-T1_E7DAT
000009DC  00000000 00000000                         4010 T1_3EBUF DC    XL256'00'  (the subsystem data that was read)



                                                    4012 ********************************************************************************


00000ADC  00000000 00000000                         4014 T2_E7DAT DC    XL64'00'
00000B1C  40C00000 00000000                         4015 T2_63DAT DC    XL16'40C00000 00000000 00000000 00000000'
00000B2C  06000001 00000000                         4016 T2_47DAT DC    XL16'06000001 00000000 00000000 03000000'
00000B3C  00000000 00000000                         4017 T2_06BUF DC    XL10'00'



                                                    4019 ********************************************************************************


00000B46                                            4021 T3_E7DAT DS   0XL64
00000B46  00800000 00000000                         4022          DC    XL16'00800000 00000000 00000000 40C00000'
00000B56  00000000 00000000                         4023          DC    XL16'00000000 00000000 00000000 00000000'
00000B66  00000000 00000000                         4024          DC    XL16'00000000 00000000 00000000 00000000'
00000B76  00000000 00000000                         4025          DC    XL16'00000000 00000000 00000000 00000000'
00000B86  06000001 00000000                         4026 T3_47DAT DC    XL16'06000001 00000000 00000000 03000000'
00000B96  00000000 00000000                         4027 T3_06BUF DC    XL10'00'
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                    4030 ************************************************************************

00000BA0  00000000 00000000                         4032 T4_3EBUF            DC    XL256'00'
                                                    4033                     PRINT DATA
                            00000CA0  00000001      4034 T4_ORG              EQU   *
                            0000004C  00000001      4035 T4_E7DAT_TOTAL_LEN  EQU   76
                            00000028  00000001      4036 T4_E7DAT_PART1_LEN  EQU   40
                            00000024  00000001      4037 T4_E7DAT_PART2_LEN  EQU   (T4_E7DAT_TOTAL_LEN-T4_E7DAT_PART1_LEN)
00000CA0                    00000CA0  00001FD8      4038                     ORG   E7TEST+X'2000'-T4_E7DAT_PART1_LEN
00001FD8                                            4039 T4_E7DAT            DS   0XL(T4_E7DAT_TOTAL_LEN)
00001FD8                                            4040 T4_E7DAT_PART1      DS   0XL(T4_E7DAT_PART1_LEN)
00001FD8  02000000 00000000                         4041                     DC    XL16'02000000 00000000 00000000 00000000'
00001FE0  00000000 00000000
00001FE8  00000000 00000000                         4042                     DC    XL16'00000000 00000000 00000000 00000000'
00001FF0  00000000 00000000
00001FF8  00000000 00000000                         4043                     DC    XL8' 00000000 00000000'
00002000                                            4044 T4_E7DAT_PART2      DS   0XL(T4_E7DAT_PART2_LEN)
00002000  00000000 00000000                         4045                     DC    XL8'                    00000000 00000000'
00002008  00000000 00000000                         4046                     DC    XL16'00000000 00000000 00000000 00001800'
00002010  00000000 00001800
00002018  00000000 41000000                         4047                     DC    XL12'00000000 41000000 00000000'
00002020  00000000
00002024                    00002024  00000CA0      4048                     ORG   T4_ORG
                                                    4049                     PRINT NODATA

                                                    4051 ************************************************************************

00000CA0                                            4053 T5_E7DAT DS   0XL64
00000CA0  00800000 00000000                         4054          DC    XL16'00800000 00000000 00000000 40C00000'
00000CB0  00000000 00000000                         4055          DC    XL16'00000000 00000000 00000000 00000000'
00000CC0  00000000 00000000                         4056          DC    XL16'00000000 00000000 00000000 00000000'
00000CD0  00000000 00000000                         4057          DC    XL16'00000000 00000000 00000000 00000000'
00000CE0  16000001 00000000                         4058 T5_47DAT DC    XL16'16000001 00000000 00000000 03000000'
00000CF0  00000000 00000000                         4059 T5_06BUF DC    XL10'00'

                                                    4061 ************************************************************************

00000CFA                                            4063 T6_E7DAT DS   0XL64
00000CFA  00800000 00000000                         4064          DC    XL16'00800000 00000000 00000000 40C00000'
00000D0A  00000000 00000000                         4065          DC    XL16'00000000 00000000 00000000 00000000'
00000D1A  00000000 00000000                         4066          DC    XL16'00000000 00000000 00000000 00000000'
00000D2A  00000000 00000000                         4067          DC    XL16'00000000 00000000 00000000 00000000'
00000D3A  16000001 00000000                         4068 T6_47DAT DC    XL16'16000001 00000000 00000000 03000000'
00000D4A  00000000 00000000                         4069 T6_86BUF DC    XL10'00'
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4071 ********************************************************************************
                                                  4072 *        IOCB DSECT
                                                  4073 ********************************************************************************

                                                  4075          DSECTS NAME=IOCB
                                                  4077+IOCB     DSECT
                                                  4078+*     Field usage by: CH SC Description (R->program read-only, X->program read/write)
00000000                                          4079+IOCBDID  DS    0F  +0     R  Device Identifier - Subsystem ID for channel subsystem
00000000  0000                                    4080+         DS    H   +0  R      reserved - must be zeros
00000002  0000                                    4081+IOCBDV   DS    H   +2  R      Channel Unit Device address of I/O operation
00000004  0000                                    4082+IOCBDEV  DS    H   +4  X  X   Device address or device number (R after ENADEV)
00000006  0000                                    4083+IOCBZERO DS    H   +6  R  R   Must be zeros
00000008  00                                      4084+IOCBUM   DS    X   +8  X  X   Unit status test mask
00000009  00                                      4085+IOCBCM   DS    X   +9  X  X   Channel status test mask
0000000A                                          4086+IOCBST   DS    0H  +10 X  X   Input/Output unit and channel status accumulation
0000000A  00                                      4087+IOCBUS   DS    X   +10 R  R   Accumulated unit status
0000000B  00                                      4088+IOCBCS   DS    X   +11 R  R   Accumulated channel status
0000000C  00                                      4089+IOCBUT   DS    X   +14 R  R   Used to test unit status
0000000D  00                                      4090+IOCBCT   DS    X   +13 R  R   Used to test channel status
0000000E  00                                      4091+IOCBSC   DS    X   +14    R   Accumulted subchanel status control
0000000F  00                                      4092+IOCBWAIT DS    X   +15 X  X   Recognized unsolicited interruption unit status events
00000010  00000000                                4093+IOCBSCCW DS    A   +16 R  R   I/O status CCW address
00000014                                          4094+IOCBSCNT DS    0F  +20 R  R   I/O status residual count as a positive full word
00000014  0000                                    4095+         DS    H   +20 R     reserved must be zeros
00000016  0000                                    4096+IOCBRCNT DS    H   +22 R     I/O status residual count as an unsigned halfword
00000018                                          4097+IOCBCAW  DS    0A  +24 X     Channel Address word
00000018  00000000 00000000                       4098+IOCBORB  DS    AD  +24    X  Address of the ORB for channel subsystem I/O
00000020  00000000 00000000                       4099+IOCBIRB  DS    AD  +32    X  Channel subsystem IRB address
00000028  00000000 00000000                       4100+IOCBSIB  DS    AD  +40    X  Channel subsystem SCHIB address
                            00000030  00000001    4101+IOCBL    EQU   *-IOCB  Length of IOCB control block (48) without embedded structures
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                  4103 ********************************************************************************
                                                  4104 *        ORB DSECT
                                                  4105 ********************************************************************************

                                                  4107          DSECTS NAME=ORB
                                                  4109+ORB      DSECT
00000000  00000000                                4110+ORBPARM  DC    F'0'     Word 0, bits 0-31

00000004  00                                      4112+ORB1_0   DC    X'00'    Word 1, bits 0-7
                            000000F0  00000001    4113+ORBKEYM  EQU   X'F0'    Word 1, bits 0-3   - Storage Key Mask
                            00000008  00000001    4114+ORBS     EQU   X'08'    Word 1, bit 4      - Suspend Control
                            00000004  00000001    4115+ORBC     EQU   X'04'    Word 1, bit 5      - Streaming Mode Control
                            00000002  00000001    4116+ORBM     EQU   X'02'    Word 1, bit 6      - Modification Control
                            00000001  00000001    4117+ORBY     EQU   X'01'    Word 1, bit 7      - Synchronization Control

00000005  00                                      4119+ORB1_8   DC    X'00'    Word 1, bits 8-15
                            00000080  00000001    4120+ORBF     EQU   X'80'    Word 1, bit 8      - CCW Format-Control
                            00000040  00000001    4121+ORBP     EQU   X'40'    Word 1, bit 9      - Pre-fetch control
                            00000020  00000001    4122+ORBI     EQU   X'20'    Word 1, bit 10     - Initial-status Interruption Control
                            00000010  00000001    4123+ORBA     EQU   X'10'    Word 1, bit 11     - Address Limit Checking Control
                            00000008  00000001    4124+ORBU     EQU   X'08'    Word 1, bit 12     - Suppress-suspended-interruption control
                            00000004  00000001    4125+ORBB     EQU   X'04'    Word 1, bit 13     - Channel-Program-Type Control
                            00000002  00000001    4126+ORBH     EQU   X'02'    Word 1, bit 14     - Format 2-IDAW Control
                            00000001  00000001    4127+ORBT     EQU   X'01'    Word 1, bit 15     - 2K-IDAW control
00000006  00                                      4128+ORBLPM   DC    X'00'    Word 1, bits 16-23 - Logical Path Mask
00000007  00                                      4129+ORRB1_24 DC    X'00'    Word 1, bits 24-31
                            00000080  00000001    4130+ORBL     EQU   X'80'    Word 1, bit 24     - Incorrect Length Suppression Mode
                            0000007F  00000001    4131+ORBRSV3  EQU   X'7F'    Word 1, bits 25-31 - reserved must be zeros
                            00000040  00000001    4132+ORBD     EQU   X'40'    Word 1, bit 25     - MIDAW Addressing Control
                            0000003E  00000001    4133+ORBRSV26 EQU   X'3E'    Word 1, bits 26-30 - reserved must be zeros
                            0000007E  00000001    4134+ORBRSV25 EQU   X'7E'    Word 1, bits 25-30 - reserved must be zeros
                            00000001  00000001    4135+ORBX     EQU   X'01'    Word 1, bit 31     - ORB-extension control

00000008  00000000                                4137+ORBCCW   DC    A(0)     Word 2, bits 1-31  - Channel Program Address
                            00000080  00000001    4138+ORBRSV4  EQU   X'80'    Word 2, bit 0      - reserved must be zero
                            0000000C  00000001    4139+ORBLEN   EQU   *-ORB Length of standard ORB
                                                  4140+* Extended ORB fields
0000000C  00                                      4141+ORBCSS   DC    X'00'    Word 3, bits 0-7   - Channel Subsystem Priority
0000000D  00                                      4142+ORBRSV5  DC    X'00'    Word 3, bits 8-15  - reserved must be zeros
0000000E                                          4143+ORBPGM   DC    0X'00'   Word 3, bits 16-23 - Transport mode reserves for program us
0000000E  00                                      4144+ORBCU    DC    X'00'    Word 3, bits 16-23 - Control Unit Priority
0000000F  00                                      4145+ORBRSV6  DC    X'00'    Word 3, bits 24-31 - reserved must be zeros
00000010  00000000 00000000                       4146+ORBRSV7  DC    XL16'00' Words 4-7          - reserved must be zeros
                            00000020  00000001    4147+ORBXLEN  EQU   *-ORB Length of extended ORB
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4150 ********************************************************************************
                                                  4151 *        IRB DSECT
                                                  4152 ********************************************************************************

                                                  4154          DSECTS NAME=IRB
                                                  4156+IRB      DSECT Interruption          Response Block
00000000  00000000 00000000                       4157+IRBSCSW  DC    XL12'00' Words 0-2 - Subchannel Status Word (Defined by DSECT SCSW)
0000000C  00000000 00000000                       4158+IRBESW   DC    XL20'00' Words 3-7 - Extended Status Word
00000020  00000000 00000000                       4159+IRBECW   DC    XL32'00' Words 8-15 - Extended Control Word
                             00000040  00000001   4160+IRBL     EQU   *-IRB    IRB Length
00000040  00000000 00000000                       4161+IRBEMW   DC    XL32'00' Words 16-23 - Extended Measurement Word
                             00000060  00000001   4162+IRBXL    EQU   *-IRB    Extended IRB Length
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4165 ********************************************************************************
                                                  4166 *        SCHIB DSECT
                                                  4167 ********************************************************************************

                                                  4169          DSECTS NAME=SCHIB
                                                  4171+SCHIB    DSECT Subchannel          Information Block
                                                  4172+* Fields marked RW may be changed by MSCH.  IN indicates installed value supplied
00000000                                          4173+SCHPMCW  DC    0XL28'00'  Words 0-6 - Path-Management-Control Word
00000000  00000000                                4174+PMCWIP   DC    F'0'   RW  Word 0, bits 0-31 - Interruption Parameter
00000004  00                                      4175+PMCW1_0  DC    X'00'      Word 1, bits 0-7
                          00000038  00000001    4176+PMCWISCM EQU   X'38'  RW  Interruption Subclass Code Mask

00000005  00                                      4178+PMCW1_8  DC    X'00'      Word 1, bits 8-15
                          00000080  00000001    4179+PMCWE    EQU   X'80'  RW  Word 1, bit 8 - Subchannel Enabled
                          00000060  00000001    4180+PMCWLM   EQU   X'60'  RW  Word 1, bits 9,10 - Limit-Mode Mask
                          00000020  00000001    4181+PMCWLMG  EQU   X'20'  RW  Word 1, bit 9 - Address must be GE to limit
                          00000040  00000001    4182+PMCWLML  EQU   X'40'  RW  Word 1, bit 10 - Address must be less than the limit
                          00000018  00000001    4183+PMCWMM   EQU   X'18'  RW  Word 1, bits 11,12 - Measurement Mode Mask
                          00000010  00000001    4184+PMCWMME  EQU   X'10'  RW  Word 1, bit 11 - Measurement Block Update Enabled
                          00000008  00000001    4185+PMCWMMC  EQU   X'08'  RW  Word 1, bit 12 - Device Connect Time Measurement Enabled
                          00000004  00000001    4186+PMCWM    EQU   X'04'  RW  Word 1, bit 13 - Multipath Mode Enabled
                          00000002  00000001    4187+PMCWT    EQU   X'02'  IN  Word 1, bit 14 - Timing facility availability
                          00000001  00000001    4188+PMCWV    EQU   X'01'  IN  Word 1, bit 15 - Device number valid

00000006  0000                                    4190+PMCWDNUM DC    H'0'   IN  Word 1, bits 16-31 - Device Number

00000008  00                                      4192+PMCWLPM  DC    X'00'  RW  Word 2, bits 0-7   - Logical Path Mask
00000009  00                                      4193+PMCWPNOM DC    X'00'  RW  Word 2, bits 8-15  - Logical Path Not Operational Mask
0000000A  00                                      4194+PMCWLPUM DC    X'00'  IN  Word 2, bits 16-23 - Logical Path Used Mask
0000000B  00                                      4195+PMCWPIM  DC    X'00'  IN  Word 2, bits 24-31 - Path-Installed Mask
0000000C  0000                                    4196+PMCWMBI  DC    H'0'   RW  Word 3, bits 0-15  - Measurement Block Index
0000000E  00                                      4197+PMCWPOM  DC    X'00'  RW  Word 3, bits 16-23 - Path-Operational Mask
0000000F  00                                      4198+PMCWPAM  DC    X'00'  IN  Word 3, bits 24-31 - Path-Available Mask
00000010  00                                      4199+PMCWCHP0 DC    X'00'  IN  Word 3, bits 0-7   - Channel Path Identifier 0
00000011  00                                      4200+PMCWCHP1 DC    X'00'  IN  Word 3, bits 8-15  - Channel Path Identifier 1
00000012  00                                      4201+PMCWCHP2 DC    X'00'  IN  Word 3, bits 16-23 - Channel Path Identifier 2
00000013  00                                      4202+PMCWCHP3 DC    X'00'  IN  Word 3, bits 24-31 - Channel Path Identifier 3
00000014  00                                      4203+PMCWCHP4 DC    X'00'  IN  Word 4, bits 0-7   - Channel Path Identifier 4
00000015  00                                      4204+PMCWCHP5 DC    X'00'  IN  Word 4, bits 8-15  - Channel Path Identifier 5
00000016  00                                      4205+PMCWCHP6 DC    X'00'  IN  Word 4, bits 16-23 - Channel Path Identifier 6
00000017  00                                      4206+PMCWCHP7 DC    X'00'  IN  Word 4, bits 24-31 - Channel Path Identifier 7
00000018                                          4207+PMCWRES1 DC    0XL4'00'   Word 6, bits 0-31  - reserved or pre-z systems
00000018  000000                                  4208+PMCWRES2 DC    XL3'00'    Word 6, bits 0-23  - reserved on z systems
0000001B  00                                      4209+PMCWEXC  DC    X'00'      Word 6, bits 24-28 - reserved
                          00000004  00000001    4210+PMCWB    EQU   X'04'  RW  Word 6, bit 29     - Measurement Block Format Control
                          00000002  00000001    4211+PMCWX    EQU   X'02'  RW  Word 6, bit 30     - Extended Measurement Word Mode Enabl
                          00000001  00000001    4212+PMCWS    EQU   X'01'  RW  Word 6, bit 31     - Concurrent Sense Enable

0000001C  00000000 00000000                       4214+SCHSCSW  DC    XL12'00'   Words 7-9 - Subchannel Status Word (See DSECT SCSW)
00000028                                          4215+SCHMDA3  DC    0XL12'00'  Words 10-12 - Model Dependent Area on pre-z systems
00000028  00000000 00000000                       4216+SCHMBA   DC    AD(0)  RW  Words 10,11 - Measurement Block Address
00000030  00000000                                4217+SCHMDA1  DC    XL4'00'    Word 12 - Model Dependent Area on z systems
                          00000034  00000001    4218+SCHIBL   EQU   *-SCHIB Length of SCHIB
```

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  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

                                                  4221 ********************************************************************************
                                                  4222 *        SCSW DSECT
                                                  4223 ********************************************************************************

                                                  4225          DSECTS NAME=SCSW
                                                  4227+SCSW     DSECT Subchannel          Status Word
00000000  00                                      4228+SCSWFLAG DC    X'00'    Flags
                          000000F0  00000001      4229+SCSWKEYM EQU   X'F0'    Storage Key Mask of subchannel storage key
                          00000008  00000001      4230+SCSWSUSC EQU   X'08'    Suspend Control
                          00000004  00000001      4231+SCSWESWF EQU   X'04'    Extended Status Word Format
                          00000003  00000001      4232+SCSWDCCM EQU   X'03'    Deferred condiont code mask
                          00000000  00000001      4233+SCSWDCC0 EQU   X'00'    Normal I/O interruption
                          00000001  00000001      4234+SCSWDCC1 EQU   X'01'    Deferred condition code is 1
                          00000003  00000001      4235+SCSWDCC3 EQU   X'03'    Deferred condition code is 3

00000001  00                                      4237+SCSWCTLS DC    X'00'    General Controls
                          00000080  00000001      4238+SCSWCCWF EQU   X'80'    CCW Format control when ...
                          00000040  00000001      4239+SCSWCCWP EQU   X'40'    CCW Prefetch Control
                          00000020  00000001      4240+SCSWISIC EQU   X'20'    Initial-Status-Interruption Control
                          00000010  00000001      4241+SCSWALKC EQU   X'10'    Address-Limit-Checking Control
                          00000008  00000001      4242+SCSWSSIC EQU   X'08'    Suppress suspended interruption
                          00000004  00000001      4243+SCSW0CC  EQU   X'04'    Zero-Condition Code
                          00000002  00000001      4244+SCSWECWC EQU   X'02'    Extended Control Word control
                          00000001  00000001      4245+SCSWPNOP EQU   X'01'    Path Not Operational

00000002  00                                      4247+SCSW1    DC    X'00'    Control Byte 1
                          00000070  00000001      4248+SCSWFM   EQU   X'70'    Functional Control Mask
                          00000040  00000001      4249+SCSWFS   EQU   X'40'    Function Control - Start Function
                          00000020  00000001      4250+SCSWFH   EQU   X'20'    Function Control - Halt Function
                          00000010  00000001      4251+SCSWFC   EQU   X'10'    Function Control - Clear Function
                          00000008  00000001      4252+SCSWARP  EQU   X'08'    Activity Control - Resume pending
                          00000004  00000001      4253+SCSWASP  EQU   X'04'    Activity Control - Start pending
                          00000002  00000001      4254+SCSWAHP  EQU   X'02'    Activity Control - Halt pending
                          00000001  00000001      4255+SCSWACP  EQU   X'01'    Activity Control - Clear pending
00000003  00                                      4256+SCSW2    DC    X'00'    Control Byte 2
                          00000080  00000001      4257+SCSWASA  EQU   X'80'    Activity Control - Subchannel Active
                          00000040  00000001      4258+SCSWADA  EQU   X'40'    Activity Control - Device Active
                          00000020  00000001      4259+SCSWASUS EQU   X'20'    Activity Control - Suspended
                          00000010  00000001      4260+SCSWSAS  EQU   X'10'    Status Control   - Alert Status
                          00000008  00000001      4261+SCSWSINT EQU   X'08'    Status Control   - Intermediate Status
                          00000004  00000001      4262+SCSWSPRI EQU   X'04'    Status Control   - Primary Status
                          00000002  00000001      4263+SCSWSSEC EQU   X'02'    Status Control   - Secondary Status
                          00000001  00000001      4264+SCSWSPEN EQU   X'01'    Status Control   - Status Pending

00000004  00000000                                4266+SCSWCCW  DC    A(0)     CCW Address

00000008  00                                      4268+SCSWUS   DC    X'00'    Unit Status
                          00000080  00000001      4269+SCSWATTN EQU   X'80'    Attention
                          00000040  00000001      4270+SCSWSM   EQU   X'40'    Status modifier
                          00000020  00000001      4271+SCSWCUE  EQU   X'20'    Control-unit end
                          00000010  00000001      4272+SCSWBUSY EQU   X'10'    Busy
                          00000008  00000001      4273+SCSWCE   EQU   X'08'    Channel end
                          00000004  00000001      4274+SCSWDE   EQU   X'04'    Device end
                          00000002  00000001      4275+SCSWUC   EQU   X'02'    Unit check
                          00000001  00000001      4276+SCSWUX   EQU   X'01'    Unit exception
```

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  LOC        OBJECT CODE       ADDR1     ADDR2    STMT

00000009  00                                      4278+SCSWCS   DC    X'00'    Channel Status
                            00000080  00000001  4279+SCSWPCI  EQU   X'80'    Program-controlled interruption
                            00000040  00000001  4280+SCSWIL   EQU   X'40'    Incorrect length
                            00000020  00000001  4281+SCSWPRGM EQU   X'20'    Program check
                            00000010  00000001  4282+SCSWPROT EQU   X'10'    Protection Check
                            00000008  00000001  4283+SCSWCDAT EQU   X'08'    Channel-data check
                            00000004  00000001  4284+SCSWCCTL EQU   X'04'    Channel-control check
                            00000002  00000001  4285+SCSWICTL EQU   X'02'    Interface-control check
                            00000001  00000001  4286+SCSWCHNG EQU   X'01'    Chaining check

0000000A  0000                                    4288+SCSWCNT  DC    H'0'     Residual CCW count
                            0000000C  00000001  4289+SCSWL    EQU   *-SCSW
```

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 LOC         OBJECT CODE        ADDR1     ADDR2     STMT

                                                    4292 ********************************************************************************
                                                    4293 *        (other DSECTS needed by SATK)
                                                    4294 ********************************************************************************

                                                    4296          DSECTS PRINT=OFF,NAME=(ASA,CCW0,CCW1,CSW)
                                                    4522          PRINT ON









                                                    4524 ********************************************************************************
                                                    4525 *        Register equates
                                                    4526 ********************************************************************************

                                00000000  00000001  4528 R0        EQU   0
                                00000001  00000001  4529 R1        EQU   1
                                00000002  00000001  4530 R2        EQU   2
                                00000003  00000001  4531 R3        EQU   3
                                00000004  00000001  4532 R4        EQU   4
                                00000005  00000001  4533 R5        EQU   5
                                00000006  00000001  4534 R6        EQU   6
                                00000007  00000001  4535 R7        EQU   7
                                00000008  00000001  4536 R8        EQU   8
                                00000009  00000001  4537 R9        EQU   9
                                0000000A  00000001  4538 R10       EQU   10
                                0000000B  00000001  4539 R11       EQU   11
                                0000000C  00000001  4540 R12       EQU   12
                                0000000D  00000001  4541 R13       EQU   13
                                0000000E  00000001  4542 R14       EQU   14
                                0000000F  00000001  4543 R15       EQU   15


                                                    4545          END
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
ASA	4	000000	512	4300	3568
ASBEGIN	U	000000	1	4301	4306 4348 4384 4393 4411 4418 4424 4428 4432 4438 4455
ASEND	U	000200	1	4454	4455
ASLENGTH	U	000200	1	4455	
ATESTTAB	A	000610	4	3907	3612
BAD66PSW	D	000328	8	3701	3676
BAD77PSW	D	000338	8	3702	3678
BAD88PSW	D	000348	8	3703	3680
BAD99PSW	D	000358	8	3704	3682
BCEXTCOD	H	00001A	2	4318	
BCIOCOD	H	00003A	2	4326	
BCMCKCOD	H	000032	2	4324	
BCPGMCOD	H	00002A	2	4322	
BCSVCCOD	H	000022	2	4320	
BEGIN	U	000200	1	3575	3545
BEGIN0	I	000246	4	3610	3598
CAW	F	000048	4	4330	
CAWADDR	R	000049	3	4333	
CAWKEY	X	000048	1	4331	
CAWSUSP	U	000008	1	4332	
CC	U	000040	1	3891	3939 3947 3948 3949 3958 3959 3968 3979 3980 3989 3990
CCW0	4	000000	8	4459	4465
CCW0ADDR	R	000001	3	4461	
CCW0CNT	H	000006	2	4464	
CCW0CODE	X	000000	1	4460	
CCW0FLGS	X	000004	1	4462	
CCW0L	U	000008	1	4465	
CCW1	4	000000	8	4477	4482
CCW1ADDR	A	000004	4	4481	
CCW1CNT	H	000002	2	4480	
CCW1CODE	X	000000	1	4478	
CCW1FLGS	X	000001	1	4479	
CCW1L	U	000008	1	4482	
CCWCC	U	000040	1	4469	
CCWCD	U	000080	1	4468	
CCWIDA	U	000004	1	4473	
CCWPCI	U	000008	1	4472	
CCWSKIP	U	000010	1	4471	
CCWSLI	U	000020	1	4470	
CCWSUSP	U	000002	1	4474	
CHANID	F	0000A8	4	4385	
CHKZARCH	I	000228	4	3594	3586
CODE	2	000000	8228	3520	
CPUID	U	00031B	1	4457	
CSW	F	000040	8	4329	
CSWATTN	U	000080	1	4499	
CSWBUSY	U	000010	1	4502	
CSWCCTL	U	000004	1	4514	
CSWCCW	R	000001	3	4496	
CSWCDAT	U	000008	1	4513	
CSWCE	U	000008	1	4503	3808
CSWCHNG	U	000001	1	4516	
CSWCNT	H	000006	2	4518	
CSWCS	X	000005	1	4508	
CSWCUE	U	000020	1	4501	
CSWDCC0	U	000000	1	4492	

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
CSWDCC1	U	000001	1	4493	
CSWDCC3	U	000003	1	4494	
CSWDCCM	U	000003	1	4491	
CSWDE	U	000004	1	4504	3808
CSWFLAG	X	000000	1	4486	
CSWFMT	4	000000	8	4485	4519
CSWFMTL	U	000008	1	4519	
CSWICTL	U	000002	1	4515	
CSWIL	U	000040	1	4510	
CSWKEYM	U	0000F0	1	4487	
CSWLOG	U	000004	1	4490	
CSWPCI	U	000080	1	4509	
CSWPRGM	U	000020	1	4511	
CSWPROT	U	000010	1	4512	
CSWSM	U	000040	1	4500	
CSWSUSP	U	000008	1	4489	
CSWUC	U	000002	1	4505	
CSWUS	X	000004	1	4498	
CSWUX	U	000001	1	4506	
DOSENSE	I	0003DE	4	3763	3663
DOTEST	I	00027C	4	3634	3623
DX	U	000063	1	3899	3948
E7TEST	J	000000	8228	3520	3523 3530 3543 3547 3574 3887 4038 3567
ENADEV	I	00038A	4	3732	3713
ENAOKAY	I	0003DC	2	3757	3746
ERRTEST	I	0002B8	4	3661	3655
EXCP	I	0003E2	4	3764	3639
EXTCPUAD	H	000084	2	4350	
EXTICODE	H	000086	2	4351	
EXTIPARM	F	000080	4	4349	
EXTNPSW	F	000058	8	4339	
EXTOPSW	F	000018	8	4311	4317
FAIL	I	0002F8	6	3687	3677 3679 3681 3683 3685
FAILCPU0	I	0002D0	4	3676	3587 3588 3596 3604
FAILDEV	I	0002E0	4	3680	3737 3747 3752
FAILIO	I	0002E8	4	3682	3776 3799 3809
FAILPSW	D	000318	8	3695	3684
FAILSCH	I	0002D8	4	3678	3645
FAILTEST	I	0002F0	4	3684	3652 3658 3662
FIND0008	A	0003D4	4	3754	3732
FINL0008	H	000394	2	3735	3751
FINM0008	A	0003D8	4	3755	3750
FINN0008	H	0003C2	2	3748	3739 3741
GOODPSW	D	000308	8	3694	3628
IDA	U	000004	1	3893	3950 3960 3968 3969 3981 3991
IIRB0011	F	0005A4	4	3872	3870 3871
IMAGE	1	000000	8228	0	
INIT	I	000368	4	3710	3610
IOCB	4	000000	48	4077	4101 3569
IOCBCAW	A	000018	4	4097	
IOCBCM	X	000009	1	4085	
IOCBCS	X	00000B	1	4088	
IOCBCT	X	00000D	1	4090	
IOCBDEV	H	000004	2	4082	3740
IOCBDID	F	000000	4	4079	3641 3743 3772
IOCBDV	H	000002	2	4081	

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES			
IOCBIRB	A	000020	8	4099	3777			
IOCBL	U	000030	1	4101				
IOCBORB	A	000018	8	4098	3711	3774		
IOCBRCNT	H	000016	2	4096	3806			
IOCBSC	X	00000E	1	4091	3770	3801	3803	
IOCBSCCW	A	000010	4	4093	3805			
IOCBSCNT	F	000014	4	4094				
IOCBSIB	A	000028	8	4100	3642	3733		
IOCBST	H	00000A	2	4086	3771	3802		
IOCBUM	X	000008	1	4084				
IOCBUS	X	00000A	1	4087	3808			
IOCBUT	X	00000C	1	4089				
IOCBWAIT	X	00000F	1	4092				
IOCBZERO	H	000006	2	4083	3771			
IOCB_A80	A	000574	4	3858	3710			
IOELADDR	F	0000AC	4	4386				
IOICODE	H	0000BA	2	4391				
IOIID	F	0000C0	4	4396				
IOINIT	I	00037C	4	3721	3712			
IOIPARM	F	0000BC	4	4395				
IOMK0007	F	000384	4	3723	3721	3722		
ION0010	3	000438	16	3787	3784			
IONPSW	F	000078	8	4343				
IOOPSW	F	000038	8	4315	4325			
IORB0011	X	000604	12	3874	3869			
IOS0010	X	000448	16	3788	3783	3791		
IOSSID	F	0000B8	4	4394	3794			
IOWT0009	H	000414	2	3781	3795	3798	3804	
IPLCCW1	F	000008	8	4303				
IPLCCW2	F	000010	8	4304				
IPLPSW	F	000000	8	4302				
IRB	4	000000	96	4156	4160	4162	3778	
IRBECW	X	000020	32	4159				
IRBEMW	X	000040	32	4161				
IRBESW	X	00000C	20	4158				
IRBL	U	000040	1	4160				
IRBSCSW	X	000000	12	4157	3801	3802	3805	3806
IRBXL	U	000060	1	4162				
IRST0010	H	000458	2	3790	3787			
LCHANLOG	F	0000B0	4	4387				
LR	U	000047	1	3898	3949	3959	3980	3990
MCKLOG	F	000100	4	4419				
MCKNPSW	F	000070	8	4342				
MCKOPSW	F	000030	8	4314	4323			
MEASUREB	X	0000B9	1	4390				
MKARCHMD	X	0000A3	1	4378				
MKARS	F	000120	4	4417				
MKCLKCMP	F	0000E0	8	4403				
MKCPUTIM	F	0000D8	8	4402				
MKCRS	F	0001C0	4	4422				
MKDMGCOD	F	0000F4	4	4406				
MKFAILA	F	0000F8	4	4408				
MKFPRS	D	000160	8	4420				
MKICODE	F	0000E8	4	4404				
MKLOGOUT	F	000100	4	4410				
MKMODEL	F	0000FC	4	4409				

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     SYMBOL         TYPE  VALUE   LENGTH  DEFN  REFERENCES

MKXSAA               F    0000D4       4  4401
MONCLS               H    000094       2  4366
MONCODE              F    00009C       4  4373
MONNUMBR             X    000095       1  4368
MPGACCID             X    0000A2       1  4376
MSG                  I    0004A0       4  3819  3620
MSGCMD               C    0004EA       9  3845  3832  3833
MSGMSG               C    0004F3     128  3846  3826  3843  3824
MSGMVC               I    0004E4       6  3843  3830
MSGOK                I    0004B6       2  3828  3825
MSGRET               I    0004D0       4  3839  3836
MSGSAVE              F    0004D8       4  3842  3822  3839
NKGRS                F    000180       4  4421
NUMTESTS             U    000006       1  3920  3921  3907
ORB                  4    000000      32  4109  4139  4147  3572
ORB1_0               X    000004       1  4112
ORB1_8               X    000005       1  4119  3766
ORBA                 U    000010       1  4123
ORBB                 U    000004       1  4125
ORBC                 U    000004       1  4115
ORBCCW               A    000008       4  4137  3764
ORBCSS               X    00000C       1  4141
ORBCU                X    00000E       1  4144
ORBD                 U    000040       1  4132
ORBF                 U    000080       1  4120  3766
ORBH                 U    000002       1  4126  3766
ORBI                 U    000020       1  4122
ORBKEYM              U    0000F0       1  4113
ORBL                 U    000080       1  4130
ORBLEN               U    00000C       1  4139
ORBLPM               X    000006       1  4128
ORBM                 U    000002       1  4116
ORBP                 U    000040       1  4121
ORBPARM              F    000000       4  4110
ORBPGM               X    00000E       1  4143
ORBRSV25             U    00007E       1  4134
ORBRSV26             U    00003E       1  4133
ORBRSV3              U    00007F       1  4131
ORBRSV4              U    000080       1  4138
ORBRSV5              X    00000D       1  4142
ORBRSV6              X    00000F       1  4145
ORBRSV7              X    000010      16  4146
ORBS                 U    000008       1  4114
ORBT                 U    000001       1  4127
ORBU                 U    000008       1  4124
ORBX                 U    000001       1  4135
ORBXLEN              U    000020       1  4147
ORBY                 U    000001       1  4117
ORRB1_24             X    000007       1  4129  3767
PCFETO               A    0000C4       4  4397
PERACCID             X    0000A1       1  4375
PERADDR              F    000098       4  4372
PERCODE              X    000096       1  4369
PERCODMK             U    0000F0       1  4370
PFX                  U    0000E7       1  3901  3939  3947  3958  3968  3979  3989
PGMACCID             X    0000A0       1  4374
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
PGMDXC	F	000090	4	4364	
PGMICODE	H	00008E	2	4363	
PGMIID	F	00008C	4	4359	
PGMIILC	X	00008D	1	4361	
PGMIILCM	U	00000C	1	4362	
PGMNPSW	F	000068	8	4341	
PGMOPSW	F	000028	8	4313	4321
PGMTRX	F	000090	4	4365	
PMCW1_0	X	000004	1	4175	
PMCW1_8	X	000005	1	4178	3738 3744
PMCWB	U	000004	1	4210	
PMCWCHP0	X	000010	1	4199	
PMCWCHP1	X	000011	1	4200	
PMCWCHP2	X	000012	1	4201	
PMCWCHP3	X	000013	1	4202	
PMCWCHP4	X	000014	1	4203	
PMCWCHP5	X	000015	1	4204	
PMCWCHP6	X	000016	1	4205	
PMCWCHP7	X	000017	1	4206	
PMCWDNUM	H	000006	2	4190	3740
PMCWE	U	000080	1	4179	3744
PMCWEXC	X	00001B	1	4209	
PMCWIP	F	000000	4	4174	
PMCWISCM	U	000038	1	4176	
PMCWLM	U	000060	1	4180	
PMCWLMG	U	000020	1	4181	
PMCWLML	U	000040	1	4182	
PMCWLPM	X	000008	1	4192	
PMCWLPUM	X	00000A	1	4194	
PMCWM	U	000004	1	4186	
PMCWMBI	H	00000C	2	4196	
PMCWMM	U	000018	1	4183	
PMCWMMC	U	000008	1	4185	
PMCWMME	U	000010	1	4184	
PMCWPAM	X	00000F	1	4198	
PMCWPIM	X	00000B	1	4195	
PMCWPNOM	X	000009	1	4193	
PMCWPOM	X	00000E	1	4197	
PMCWRES1	X	000018	4	4207	
PMCWRES2	X	000018	3	4208	
PMCWS	U	000001	1	4212	
PMCWT	U	000002	1	4187	
PMCWV	U	000001	1	4188	3738
PMCWX	U	000002	1	4211	
R0	U	000000	1	4528	3567 3568 3576 3584 3595 3602 3619 3622 3636 3637 3763 3764 3765 3812 3819 3822 3824 3826 3828 3839
R1	U	000001	1	4529	3578 3583 3619 3637 3641 3833 3843
R10	U	00000A	1	4538	3612 3616 3619 3622 3624
R11	U	00000B	1	4539	3612 3626
R12	U	00000C	1	4540	
R13	U	00000D	1	4541	
R14	U	00000E	1	4542	3610 3620 3623 3634 3665 3666 3714 3820 3840
R15	U	00000F	1	4543	3639 3663 3712 3713 3725 3757 3813
R2	U	000002	1	4530	3579 3622 3654 3822 3828 3829 3830 3832 3839
R3	U	000003	1	4531	3569 3580 3582 3584 3601 3602 3710
R4	U	000004	1	4532	3570 3594 3595 3598 3599 3642 3644 3765 3812

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
R5	U	000005	1	4533	3571 3649
R6	U	000006	1	4534	
R7	U	000007	1	4535	
R8	U	000008	1	4536	3572 3711
R9	U	000009	1	4537	3676 3678 3680 3682 3684 3687 3688
RD	U	000006	1	3896	3950 3960 3981
RDMT	U	000086	1	3900	3991
RSD	U	00003E	1	3897	3940 3969
RSTNPSW	F	000000	8	4307	
RSTOPSW	F	000008	8	4308	
SCANOUT	X	000080	1	4345	4346
SCANOUTL	U	000000	1	4346	
SCHIB	4	000000	52	4171	4218 3570 3734
SCHIBL	U	000034	1	4218	
SCHMBA	A	000028	8	4216	
SCHMDA1	X	000030	4	4217	
SCHMDA3	X	000028	12	4215	
SCHPMCW	X	000000	28	4173	
SCHSCSW	X	00001C	12	4214	3649
SCSW	4	000000	12	4227	4289 3571
SCSW0CC	U	000004	1	4243	
SCSW1	X	000002	1	4247	
SCSW2	X	000003	1	4256	3801
SCSWACP	U	000001	1	4255	
SCSWADA	U	000040	1	4258	
SCSWAHP	U	000002	1	4254	
SCSWALKC	U	000010	1	4241	
SCSWARP	U	000008	1	4252	
SCSWASA	U	000080	1	4257	
SCSWASP	U	000004	1	4253	
SCSWASUS	U	000020	1	4259	
SCSWATTN	U	000080	1	4269	
SCSWBUSY	U	000010	1	4272	
SCSWCCTL	U	000004	1	4284	
SCSWCCW	A	000004	4	4266	3805
SCSWCCWF	U	000080	1	4238	
SCSWCCWP	U	000040	1	4239	
SCSWCDAT	U	000008	1	4283	
SCSWCE	U	000008	1	4273	3657 3661
SCSWCHNG	U	000001	1	4286	
SCSWCNT	H	00000A	2	4288	3806
SCSWCS	X	000009	1	4278	3651
SCSWCTLS	X	000001	1	4237	
SCSWCUE	U	000020	1	4271	
SCSWDCC0	U	000000	1	4233	
SCSWDCC1	U	000001	1	4234	
SCSWDCC3	U	000003	1	4235	
SCSWDCCM	U	000003	1	4232	
SCSWDE	U	000004	1	4274	3657 3661
SCSWECWC	U	000002	1	4244	
SCSWESWF	U	000004	1	4231	
SCSWFC	U	000010	1	4251	
SCSWFH	U	000020	1	4250	
SCSWFLAG	X	000000	1	4228	
SCSWFM	U	000070	1	4248	
SCSWFS	U	000040	1	4249	

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
SCSWICTL	U	000002	1	4285	
SCSWIL	U	000040	1	4280	
SCSWISIC	U	000020	1	4240	
SCSWKEYM	U	0000F0	1	4229	
SCSWL	U	00000C	1	4289	
SCSWPCI	U	000080	1	4279	
SCSWPNOP	U	000001	1	4245	
SCSWPRGM	U	000020	1	4281	
SCSWPROT	U	000010	1	4282	
SCSWSAS	U	000010	1	4260	
SCSWSINT	U	000008	1	4261	
SCSWSM	U	000040	1	4270	
SCSWSPEN	U	000001	1	4264	
SCSWSPRI	U	000004	1	4262	3803
SCSWSSEC	U	000002	1	4263	
SCSWSSIC	U	000008	1	4242	
SCSWSUSC	U	000008	1	4230	
SCSWUC	U	000002	1	4275	
SCSWUS	X	000008	1	4268	3657 3661 3802
SCSWUX	U	000001	1	4276	
SENSEPGM	R	000698	1	3932	3763
SLI	U	000020	1	3892	3932 3939 3940 3947 3948 3949 3950 3958 3959 3960 3968 3969 3979 3980 3981 3989 3990 3991
SNS	U	000004	1	3895	3932
SNSBYTES	X	000970	32	3999	3932
SSARCHMD	X	0000A3	1	4377	
SSARS	F	000120	4	4433	
SSCLKCMP	F	0000E0	8	4427	
SSCPUTIM	F	0000D8	8	4426	
SSCRS	F	0001C0	4	4436	
SSFPRS	D	000160	8	4434	
SSGRS	F	000180	4	4435	
SSMODEL	F	00010C	4	4431	
SSPREFIX	F	000108	4	4430	
SSPSW	F	000100	8	4429	
SSXSAA	A	0000D4	4	4425	
STFLDATA	F	0000C8	4	4398	
SVCICODE	H	00008A	2	4357	
SVCIID	F	000088	4	4353	
SVCIILC	X	000089	1	4355	
SVCIILCM	U	00000C	1	4356	
SVCNPSW	F	000060	8	4340	
SVCOPSW	F	000020	8	4312	4319
T1_3EBUF	X	0009DC	256	4010	3940
T1_CHPGM	R	0006E0	1	3939	3913
T1_DESC	C	0006A0	62	3936	3937 3913
T1_E7DAT	X	000990	12	4003	4009 3939
T1_E7LEN	U	00004C	1	4009	3939
T1_MSGLN	U	00003E	1	3937	3913
T2_06BUF	X	000B3C	10	4017	3950 3951
T2_06IDA	A	000768	8	3951	3950
T2_47DAT	X	000B2C	16	4016	3949
T2_63DAT	X	000B1C	16	4015	3948
T2_CHPGM	R	000748	1	3947	3914
T2_DESC	C	0006F0	85	3944	3945 3914
T2_E7DAT	X	000ADC	64	4014	3947

```
     SYMBOL         TYPE   VALUE    LENGTH  DEFN  REFERENCES

T2_MSGLN             U    000055        1  3945  3914
T3_06BUF             X    000B96       10  4027  3960  3961
T3_06IDA             A    0007E0        8  3961  3960
T3_47DAT             X    000B86       16  4026  3959
T3_CHPGM             R    0007C8        1  3958  3915
T3_DESC              C    000770       86  3955  3956  3915
T3_E7DAT             X    000B46       64  4021  3958
T3_MSGLN             U    000056        1  3956  3915
T4_3EBUF             X    000BA0      256  4032  3969  3972
T4_3EIDA             A    000860        8  3972  3969
T4_CHPGM             R    000840        1  3968  3916
T4_DESC              C    0007E8       86  3965  3966  3916
T4_E7DAT             X    001FD8       76  4039  3968
T4_E7DAT_PART1       X    001FD8       40  4040  3970
T4_E7DAT_PART1_LEN
                     U    000028        1  4036  4037  4038  4040
T4_E7DAT_PART2       X    002000       36  4044  3971
T4_E7DAT_PART2_LEN
                     U    000024        1  4037  4044
T4_E7DAT_TOTAL_LEN
                     U    00004C        1  4035  4037  4039
T4_E7IDA             A    000850        8  3970  3968
T4_MSGLN             U    000056        1  3966  3916
T4_ORG               U    000CA0        1  4034  4048
T5_06BUF             X    000CF0       10  4059  3981  3982
T5_06IDA             A    0008F0        8  3982  3981
T5_47DAT             X    000CE0       16  4058  3980
T5_CHPGM             R    0008D8        1  3979  3917
T5_DESC              C    000868      111  3976  3977  3917
T5_E7DAT             X    000CA0       64  4053  3979
T5_MSGLN             U    00006F        1  3977  3917
T6_47DAT             X    000D3A       16  4068  3990
T6_86BUF             X    000D4A       10  4069  3991  3992
T6_86IDA             A    000968        8  3992  3991
T6_CHPGM             R    000950        1  3989  3918
T6_DESC              C    0008F8       81  3986  3987  3918
T6_E7DAT             X    000CFA       64  4063  3989
T6_MSGLN             U    000051        1  3987  3918
TESTLEN              U    000014        1  3921  3619  3624
TESTLOOP             I    00024E        4  3614  3626
TESTNEXT             I    000270        4  3624  3617
TESTNUM              U    000200        1  3908  3577  3636  3687
TESTOK               I    0002C4        4  3665  3659
TESTONLY             R    000FFF        1  3888  3614  3616
TESTR14              A    0002CC        4  3668  3634  3665
TESTTAB              A    000618        4  3911  3921  3907
TESTTHIS             I    000260        4  3619  3615
TIMER                F    000050        4  4336
TTDES                F    000054        4  4337
UA0                  F    000010        8  4309
UA1                  F    00004C        4  4334
UA2                  F    0000A4        4  4379
UA3                  F    0000B4        4  4388
UA4                  X    0000B8        1  4389
UA5                  X    0000CC        8  4399
UA6                  X    0000EC        8  4405
```

```
     SYMBOL         TYPE  VALUE   LENGTH  DEFN  REFERENCES

UA7                  F    000118       8  4416
UA8                  X    000180      32  4445
WKSTORG              U    000610       1  3886  3889
WPSW0010             3    000428      16  3786  3785
ZARCHOK              I    000232       4  3598  3585
ZBRKADDR             A    000110       8  4415
ZEMONCNT             F    00010C       4  4414
ZEMONCTR             A    000100       8  4412
ZEMONSIZ             F    000108       4  4413
ZEXTNPSW             X    0001B0      16  4448
ZEXTOPSW             X    000130      16  4440
ZIONPSW              X    0001F0      16  4452
ZIOOPSW              X    000170      16  4444
ZMCKNPSW             X    0001E0      16  4451
ZMCKOPSW             X    000160      16  4443
ZMKFAILA             F    0000F8       8  4407
ZMONCODE             F    0000B0       8  4382
ZPGMNPSW             X    0001D0      16  4450
ZPGMOPSW             X    000150      16  4442
ZPGMTRX              F    0000A8       8  4381
ZRSTNPSW             X    0001A0      16  4447
ZRSTOPSW             X    000120      16  4439
ZSASDISP             U    0011C0       1  4453
ZSVCNPSW             X    0001C0      16  4449
ZSVCOPSW             X    000140      16  4441
=AL2(L'MSGMSG)       R    000692       2  3925  3824
=H'0'                H    000690       2  3924  3819
```

```
 MACRO    DEFN  REFERENCES

ANTR       115
APROB      247
ARCHIND    407   3437
ARCHLVL    548   3436
ASAIPL     674
ASALOAD    754   3519
ASAREA     809   4299
ASAZAREA   994
CPUWAIT   1077   3782
DSECTS    1403   4075   4107   4154   4169   4225   4296
DWAIT     1606
DWAITEND  1663
ENADEV    1671   3731
ESA390    1771
IOCB      1782   3857
IOCBDS    1958   4076
IOFMT     1992   4108   4155   4170   4226   4458   4476   4484
IOINIT    2330   3720
IOTRFR    2371
ORB       2419   3873
POINTER   2608
PSWFMT    2636
RAWAIT    2770
RAWIO     2866   3769
SIGCPU    3024
SMMGR     3082
SMMGRB    3182
TRAP128   3231   3531
TRAP64    3208   3521   3524
TRAPS     3244
ZARCH     3318
ZEROH     3330
ZEROL     3358
ZEROLH    3386
ZEROLL    3409
```

```
   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 **
```