```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                     2 ************************************************************************
                                                     3 *
                                                     4 *                     ICKDSF related changes #615
                                                     5 *
                                                     6 ************************************************************************
                                                     7 *
                                                     8 *   This program verifies proper handling of various ICKDSF related
                                                     9 *   CCW chains related to home address alternate track handling as
                                                    10 *   documented in SDL-Hyperion GitHub Issue #615. A big thank you to
                                                    11 *   Anders Edlund for the actual tests. All I (Fish) did was to make
                                                    12 *   them into a formal QA (Quality Assurance) 'runtest' test.
                                                    13 *
                                                    14 ************************************************************************
                                                    15 *
                                                    16 *   Example Hercules Testcase:
                                                    17 *
                                                    18 *   NOTE: the 'attach' statements are actually very long, spanning
                                                    19 *   well past column 71, so they have been split into multiple lines
                                                    20 *   in the below example. In the actual test script they should each
                                                    21 *   be one long line.
                                                    22 *
                                                    23 *       *Testcase GH615 ICKDSF related changes
                                                    24 *
                                                    25 *       mainsize    2
                                                    26 *       numcpu      1
                                                    27 *       sysclear
                                                    28 *       archmode    S/370
                                                    29 *
                                                    30 *       attach      0333 3330 "$(testpath)/3330.cckd64" ro ...
                                                    31 *                   ... sf="$(testpath)/3330-shadow_*.cckd64"
                                                    32 *
                                                    33 *       attach      0338 3380 "$(testpath)/3380.cckd64" ro ...
                                                    34 *                   ... sf="$(testpath)/3380-shadow_*.cckd64"
                                                    35 *
                                                    36 *       attach      0339 3390 "$(testpath)/3390.cckd64" ro ...
                                                    37 *                   ... sf="$(testpath)/3390-shadow_*.cckd64"
                                                    38 *
                                                    39 *       sf+333
                                                    40 *       sf+338
                                                    41 *       sf+339
                                                    42 *
                                                    43 *       loadcore    "$(testpath)/GH615.core"
                                                    44 *       runtest     1.0
                                                    45 *
                                                    46 *       sf-333 nomerge
                                                    47 *       sf-338 nomerge
                                                    48 *       sf-339 nomerge
                                                    49 *
                                                    50 *       detach 0333
                                                    51 *       detach 0338
                                                    52 *       detach 0339
                                                    53 *
                                                    54 *       *Done
                                                    55 *
                                                    56 ************************************************************************
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                    58 ********************************************************************************
                                                    59 *                              LOW CORE
                                                    60 ********************************************************************************


                             00000000  000006CC    62 TEST     START 0
00000000                     00000000                63          USING TEST,0          Use absolute addressing


00000000                     00000000  00000000    65          ORG   TEST+X'00'      Restart new PSW
00000000  00080000                                 66          DC    XL4'00080000'
00000004  00000200                                 67          DC    A(BEGIN)          --> Restart routine = program begin


00000008                     00000008  00000044    69          ORG   TEST+X'44'      CSW unit/channel status
00000044  00                                       70 CSWUS    DC    X'00'             unit-status
00000045  00                                       71 CSWCS    DC    X'00'             channel-status


00000046                     00000046  00000048    73          ORG   TEST+X'48'      CAW
00000048  00000000                                 74 CAW      DC    A(0)              --> Channel program


0000004C                     0000004C  00000068    76          ORG   TEST+X'68'      Program new psw
00000068  000A0000                                 77          DC    XL4'000A0000'
0000006C  0000DEAD                                 78          DC    A(X'DEAD')
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                    80 ********************************************************************************
                                                    81 *                    MAIN TESTS EXECUTION LOOP...
                                                    82 ********************************************************************************
00000070                      00000070  00000200    84           ORG   TEST+X'200'


                                                    86 *                      Register Usage...
                                                    87 *
                                                    88 *       R0  <==  Constant zero
                                                    89 *       R1  -->  Tests table
                                                    90 *
                                                    91 *       R2  <==  CUU to use for test
                                                    92 *       R3  -->  Test's Channel Program
                                                    93 *       R4  -->  Test's Verification Routine
                                                    94 *       R5  <==  Test's expectation: 0 = normal, 1 = I/O error
                                                    95 *       R6  <==  Test number
                                                    96 *
                                                    97 *       R13 -->  Where the failing test failed
                                                    98 *       R14 -->  Subroutine calling and return

00000200                      00000000             100           USING TESTTAB,R1       TESTS table entry layout

00000200  1F00                                     102 BEGIN     SLR   R0,R0           R0 <== constant zero
00000202  5810 0328                  00000328      103           L     R1,=A(TESTS)     R1 --> Tests Table

00000206  4820 100A                  0000000A      105 TESTLOOP  LH    R2,CUU           R2 <== CUU of device
0000020A  9834 1000                  00000000      106           LM    R3,R4,ACHPROG    R3 --> Channel Program
                                                    107 *                                R4 --> verify Routine
0000020E  4350 1008                  00000008      108           IC    R5,EXPECT        R5 <== Expectation
00000212  4360 1009                  00000009      109           IC    R6,TESTNUM       R6 <== Test number

00000216  D2FF 0490 032E      00000490  0000032E    111           MVC   BUFFER,=256X'FF' (Re-)Initialize generic buffer
0000021C  45E0 0242                  00000242      112           BAL   R14,DOTESTIO     Perform this test's I/O...
00000220  05E4                                     113           BALR  R14,R4           Verify this test's results...

00000222  4110 100C                  0000000C      115           LA    R1,TESTNEXT      R1 --> Next table entry

00000226  5500 1000                  00000000      117           CL    R0,0(,R1)        End of table?
0000022A  4770 0206                  00000206      118           BNE   TESTLOOP          No, looooop...
0000022E  47F0 0232                  00000232      119           B     GOODEOJ          ALL TESTS SUCCEEDED!


00000232  8200 0318                  00000318      121 GOODEOJ   LPSW  GOODPSW          Load successful completion PSW

00000236  4260 0327                  00000327      123 FAILEOJ   STC   R6,FAILTEST      Plug test# into failure PSW
0000023A  4BD0 032C                  0000032C      124           SH    R13,=H'4'        Backup to actual failure location
0000023E  8200 0320                  00000320      125           LPSW  FAILPSW          Load abnormal termination PSW
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                          127 ********************************************************************
                                          128 *            Subroutine to perform an individual test
                                          129 ********************************************************************

00000242  5030 0048                 00000048   131 DOTESTIO ST    R3,CAW           CAW --> channel program

00000246  9C00 2000                 00000000   133 STARTIO  SIO   0(R2)            Start the I/O to the device...
0000024A  4710 026E                 0000026E   134          BC    B'0001',FAILIO   CC3 (not operational)
0000024E  4720 0246                 00000246   135          BC    B'0010',STARTIO  CC2 (busy)
00000252  4740 0276                 00000276   136          BC    B'0100',CHECKIO  CC1 (CSW stored)
00000256  4780 025A                 0000025A   137          BC    B'1000',TESTIO   CC0 (started)

0000025A  9D00 2000                 00000000   139 TESTIO   TIO   0(R2)            Test the I/O's progress...
0000025E  4710 026E                 0000026E   140          BC    B'0001',FAILIO   CC3 (not operational)
00000262  4720 025A                 0000025A   141          BC    B'0010',TESTIO   CC2 (busy)
00000266  4740 0276                 00000276   142          BC    B'0100',CHECKIO  CC1 (CSW stored)
0000026A  4780 026E                 0000026E   143          BC    B'1000',FAILIO   CC0 (available)

0000026E  4360 042E                 0000042E   145 FAILIO   IC    R6,=X'33'        Indicate CUU error
00000272  45D0 0236                 00000236   146          BAL   R13,FAILEOJ      TEST FAILED!



00000276  9102 0044                 00000044   148 CHECKIO  TM    CSWUS,X'02'      Check if this I/O had an error
0000027A  4770 0290                 00000290   149          BNZ   ERRORIO          Go issue sense if it did

0000027E  950E 0326                 00000326   151          CLI   ERRFLAG,X'0E'    Was this the sense I/O?
00000282  9200 0326                 00000326   152          MVI   ERRFLAG,X'00'    Reset error flag
00000286  077E                              153          BNER  R14              No, TEST SUCCESS! Return to caller

00000288  1255                              155          LTR   R5,R5            Was I/O error expected?
0000028A  077E                              156          BNZR  R14              Yes, TEST SUCCESS! Return to caller

0000028C  45D0 0236                 00000236   158          BAL   R13,FAILEOJ      No, TEST FAILED!



00000290  920E 0326                 00000326   160 ERRORIO  MVI   ERRFLAG,X'0E'    Set I/O error flag in failure PSW
00000294  4130 0468                 00000468   161          LA    R3,SNSPGM        R3 --> sense channel program
00000298  47F0 0242                 00000242   162          B     DOTESTIO         Go issue sense I/O
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                   164 ********************************************************************
                                                   165 *                  Test 1 verification routine
                                                   166 ********************************************************************

0000029C                                           168 VERIFY1  DS    0H
                                                   169 *
                                                   170 *     The last data area will contain the R0 of the track, i.e:
                                                   171 *
                                                   172 *           04590000 00000008 00000000 00000000
                                                   173 *
                                                   174 *     after the chain is complete.
                                                   175 *


0000029C  D204 05FE 05E8      000005FE  000005E8   177          MVC   RHADATA1,WHADATA1    (copy what test1 wrote)
000002A2  9200 05FE                     000005FE   178          MVI   RHADATA1,X'00'       (but with leading 01 to 00 instead)

000002A6  D504 05FE 0490      000005FE  00000490   180          CLC   RHADATA1,BUFFER
000002AC  4780 02B4                     000002B4   181          BE    VERIFY12

000002B0  45D0 0236                     00000236   183          BAL   R13,FAILEOJ


000002B4  D50F 05ED 04A0      000005ED  000004A0   185 VERIFY12 CLC   WR0DATA1,BUFFER+16
000002BA  078E                                     186          BER   R14

000002BC  45D0 0236                     00000236   188          BAL   R13,FAILEOJ
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                     190 ********************************************************************
                                                     191 *                  Test 2 verification routine
                                                     192 ********************************************************************

000002C0                                             194 VERIFY2  DS    0H
                                                     195 *
                                                     196 *     The data area of X'0A' (DRHA = Diagnostic Read Home Address)
                                                     197 *     should contain the HA of 0004590000 at offset 19 decimal.
                                                     198 *
                                                     199 *     The X'16' command (RR0 = Read Record 0) should read the R0
                                                     200 *     of 04590000 00000008 00000000 00000000.
                                                     201 *


000002C0  D204 0648 05E8      00000648  000005E8     203          MVC   DHA219,WHADATA1    (copy what test1 wrote)
000002C6  9200 0648                     00000648     204          MVI   DHA219,X'00'       (but with leading 01 to 00 instead)

000002CA  D504 0648 04A3      00000648  000004A3     206          CLC   DHA219,BUFFER+19
000002D0  4780 02D8                     000002D8     207          BE    VERIFY22

000002D4  45D0 0236                     00000236     209          BAL   R13,FAILEOJ


000002D8  D50F 05ED 04B0      000005ED  000004B0     211 VERIFY22 CLC   WR0DATA1,BUFFER+32
000002DE  078E                                       212          BER   R14

000002E0  45D0 0236                     00000236     214          BAL   R13,FAILEOJ
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT
                                                      216 ********************************************************************************
                                                      217 *                  Test 3 verification routine
                                                      218 ********************************************************************************

000002E4                                              220 VERIFY3  DS    0H
                                                      221 *
                                                      222 *     Should return a CMDREJ (80) sense with byte 07 set to 01.
                                                      223 *     Without the fix 02 would be returned.
                                                      224 *

000002E4  9501 0477                   00000477    226          CLI   SNSBYTES+7,X'01'   Message code 01?
000002E8  078E                                    227          BER   R14                Yes, all is well

000002EA  45D0 0236                   00000236    229          BAL   R13,FAILEOJ        No?! TEST FAILED!
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                     231 ********************************************************************
                                                     232 *                  Test 4 verification routine
                                                     233 ********************************************************************

000002EE                                             235 VERIFY4  DS    0H
                                                     236 *
                                                     237 *     Well it is really a change for 3340 or 3350 from 5,
                                                     238 *     which is for all older and newer!
                                                     239 *

000002EE  D204 06C8 06B3      000006C8  000006B3    241          MVC   RHADATA4,WHADATA4+6  (copy what was written)
000002F4  9200 06C8                     000006C8    242          MVI   RHADATA4,X'00'      (but with leading 01 to 00 instead)

000002F8  D504 06C8 0490      000006C8  00000490    244          CLC   RHADATA4,BUFFER
000002FE  4780 0306                     00000306    245          BE    VERIFY42

00000302  45D0 0236                     00000236    247          BAL   R13,FAILEOJ


00000306  D50F 06B8 04A0      000006B8  000004A0    249 VERIFY42 CLC   WR0DATA4,BUFFER+16
0000030C  078E                                      250          BER   R14

0000030E  45D0 0236                     00000236    252          BAL   R13,FAILEOJ
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                    254 ********************************************************************************
                                                    255 *                          WORKING STORAGE
                                                    256 ********************************************************************************

00000318                                            258 GOODPSW  DC    0D'0'             All tests succeeded PSW
00000318  000A0000                                  259          DC    XL4'000A0000'
0000031C  00000000                                  260          DC    XL4'00000000'


00000320                                            262 FAILPSW  DC    0D'0'             Test failure PSW
00000320  000A0000                                  263          DC    XL4'000A0000'
00000324  00                                        264          DC    XL1'00'
00000325  00                                        265          DC    XL1'00'
00000326  00                                        266 ERRFLAG  DC    XL1'00'           if 0E = I/O error occurred
00000327  FF                                        267 FAILTEST DC    XL1'FF'           Test number or X'33' = CUU error


00000328                                            269          LTORG ,                 literals pool
00000328  00000430                                  270                =A(TESTS)
0000032C  0004                                      271                =H'4'
0000032E  FFFFFFFF FFFFFFFF                         272                =256X'FF'
0000042E  33                                        273                =X'33'
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                   275 ********************************************************************************
                                                   276 *                              EQUATES
                                                   277 ********************************************************************************

                                                   279 *
                                                   280 **                    CCW Flag Equates...
                                                   281 *
                                00000080  00000001 282 CD       EQU   X'80'            Chain data
                                00000040  00000001 283 CC       EQU   X'40'            Chain command
                                00000020  00000001 284 SLI      EQU   X'20'            Suppress length indication


                                                   286 *
                                                   287 **                   CCW Command Equates...
                                                   288 *
                                00000004  00000001 289 SENSE    EQU   X'04'            Basic Sense
                                00000007  00000001 290 SEEK     EQU   X'07'            Seek
                                0000000A  00000001 291 DRHA     EQU   X'0A'            Diagnostic Read Home Address
                                00000015  00000001 292 WR0      EQU   X'15'            Write Record 0
                                00000016  00000001 293 RR0      EQU   X'16'            Read Record 0
                                00000019  00000001 294 WHA      EQU   X'19'            Write Home Address
                                0000001A  00000001 295 RHA      EQU   X'1A'            Read Home Address
                                0000001F  00000001 296 SFM      EQU   X'1F'            Set File Mask
                                00000023  00000001 297 SETSECT  EQU   X'23'            Set Sector
                                00000039  00000001 298 SHAEQ    EQU   X'39'            Search Home Address Equal
                                00000047  00000001 299 LR       EQU   X'47'            Locate Record
                                00000063  00000001 300 DX       EQU   X'63'            Define Extent
                                00000064  00000001 301 RDC      EQU   X'64'            Read Device Characteristics
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT
                                                      303 ********************************************************************************
                                                      304 *                          TESTS TABLE
                                                      305 ********************************************************************************
                                                      307 *             ------------------------------------
                                                      308 *             |  Table of tests to be performed  |
                                                      309 *             ------------------------------------
00000430                                              311 TESTS    DC    0D'0'

00000430  00000590 0000029C                           313          DC    A(TEST1),A(VERIFY1),AL1(0),AL1(1),AL2(X'339')
0000043C  00000608 000002C0                           314          DC    A(TEST2),A(VERIFY2),AL1(0),AL1(2),AL2(X'339')
00000448  00000650 000002E4                           315          DC    A(TEST3),A(VERIFY3),AL1(1),AL1(3),AL2(X'333')  (*)
00000454  00000658 000002EE                           316          DC    A(TEST4),A(VERIFY4),AL1(0),AL1(4),AL2(X'338')

00000460  00000000                                    318          DC    A(0)     ZERO = End of table

                                                      320 *                  (*)     I/O Error expected!

                                                      322 *        Basic Sense channel program in case of I/O error

00000468                                              324          DC    0D'0'                    (alignment)
00000468  04000470 20000020                           325 SNSPGM   DC    AL1(SENSE),AL3(SNSBYTES),AL1(SLI),AL1(0),AL2(L'SNSBYTES)
00000470  FFFFFFFF FFFFFFFF                           326 SNSBYTES DC    0XL32'FF',32X'FF'

00000490                                              328          DC    0D'0'                    (alignment)
00000490  FFFFFFFF FFFFFFFF                           329 BUFFER   DC    0XL256'FF',256X'FF'    Generic 256-byte data buffer
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                     331 ************************************************************************
                                                     332 *              TEST 1: Write HA in a ECKD chain (X'19')
                                                     333 ************************************************************************

00000590                                             335 TEST1    DC    0D'0'
00000590  630005C8 40000010                          336          DC    AL1(DX),AL3(DXDATA1),AL1(CC),AL1(0),AL2(L'DXDATA1)
00000598  470005D8 40000010                          337          DC    AL1(LR),AL3(LRDATA1),AL1(CC),AL1(0),AL2(L'LRDATA1)
000005A0  190005E8 40000005                          338          DC    AL1(WHA),AL3(WHADATA1),AL1(CC),AL1(0),AL2(L'WHADATA1)
000005A8  150005ED 40000010                          339          DC    AL1(WR0),AL3(WR0DATA1),AL1(CC),AL1(0),AL2(L'WR0DATA1)
000005B0  230005FD 40000001                          340          DC    AL1(SETSECT),AL3(SECT1),AL1(CC),AL1(0),AL2(L'SECT1)
000005B8  1A000490 40000005                          341          DC    AL1(RHA),AL3(BUFFER),AL1(CC),AL1(0),AL2(5)
000005C0  160004A0 00000010                          342          DC    AL1(RR0),AL3(BUFFER+16),AL1(0),AL1(0),AL2(16)



000005C8                                             344 TEST1DAT DC    0D'0'
000005C8  C2C40000 00000000                          345 DXDATA1  DC    XL16'C2C4000000000000459000000459000E'
000005D8  43000002 04590000                          346 LRDATA1  DC    XL16'4300000204590000045900000000000'
000005E8  01045900 00                                347 WHADATA1 DC    XL5'0104590000'
000005ED  04590000 00000008                          348 WR0DATA1 DC    XL16'045900000000000800000000000000'
000005FD  00                                         349 SECT1    DC    XL1'00'
000005FE  00045900 00                                350 RHADATA1 DC    XL5'0004590000'
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                     352 ************************************************************************
                                                     353 *              TEST 2: Diagnostic read HA (X'0A')
                                                     354 ************************************************************************

00000608                                             356 TEST2    DC    0D'0'
00000608  63000628 40000010                          357          DC    AL1(DX),AL3(DXDATA2),AL1(CC),AL1(0),AL2(L'DXDATA2)
00000610  47000638 40000010                          358          DC    AL1(LR),AL3(LRDATA2),AL1(CC),AL1(0),AL2(L'LRDATA2)
00000618  0A000490 4000001C                          359          DC    AL1(DRHA),AL3(BUFFER),AL1(CC),AL1(0),AL2(28)
00000620  160004B0 00000010                          360          DC    AL1(RR0),AL3(BUFFER+32),AL1(0),AL1(0),AL2(16)


00000628                                             362 TEST2DAT DC    0D'0'
00000628  06C40000 00000000                          363 DXDATA2  DC    XL16'06C4000000000000459000000459000E'
00000638  D6000002 04590000                          364 LRDATA2  DC    XL16'D6000002045900000459000000000000'
00000648  00045900 00                                365 DHA219   DC    XL5'0004590000' (same as WHADATA1 but with 00 not 01)
```

```
 LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                   367 ********************************************************************************
                                                   368 *        TEST 3: Read Device Characteristic on pre-3380
                                                   369 ********************************************************************************

00000650                                           371 TEST3    DC    0D'0'
00000650  64000490 00000040                        372          DC    AL1(RDC),AL3(BUFFER),AL1(0),AL1(0),AL2(64)
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT

                                                     374 ********************************************************************************
                                                     375 *         TEST 4: Actual byte count for Write HA on 3380
                                                     376 ********************************************************************************

00000658                                             378 TEST4    DC    0D'0'
00000658  070006A0 40000006                          379          DC    AL1(SEEK),AL3(SEEKADR4),AL1(CC),AL1(0),AL2(L'SEEKADR4)
00000660  1F0006A6 40000001                          380          DC    AL1(SFM),AL3(FMASK4),AL1(CC),AL1(0),AL2(L'FMASK4)
00000668  230006A7 40000001                          381          DC    AL1(SETSECT),AL3(SECT41),AL1(CC),AL1(0),AL2(L'SECT41)
00000670  390006A9 40000004                          382          DC    AL1(SHAEQ),AL3(SRCHHA4),AL1(CC),AL1(0),AL2(L'SRCHHA4)
00000678  190006AD 4000000B                          383          DC    AL1(WHA),AL3(WHADATA4),AL1(CC),AL1(0),AL2(L'WHADATA4)
00000680  150006B8 40000010                          384          DC    AL1(WR0),AL3(WR0DATA4),AL1(CC),AL1(0),AL2(L'WR0DATA4)
00000688  230006A8 40000001                          385          DC    AL1(SETSECT),AL3(SECT42),AL1(CC),AL1(0),AL2(L'SECT42)
00000690  1A000490 40000005                          386          DC    AL1(RHA),AL3(BUFFER),AL1(CC),AL1(0),AL2(5)
00000698  160004A0 00000010                          387          DC    AL1(RR0),AL3(BUFFER+16),AL1(0),AL1(0),AL2(16)



000006A0                                             389 TEST4DAT DC    0D'0'
000006A0  00000375 0000                              390 SEEKADR4 DC    XL6'000003750000'
000006A6  C0                                         391 FMASK4   DC    XL1'C0'
000006A7  00                                         392 SECT41   DC    XL1'00'
000006A8  00                                         393 SECT42   DC    XL1'00'
000006A9  03750000                                   394 SRCHHA4  DC    XL4'03750000'
000006AD  00000000 00000103                          395 WHADATA4 DC    XL11'00000000000000103750000'
000006B8  03750000 00000008                          396 WR0DATA4 DC    XL16'03750000000000080000000000000000'
000006C8  00037500 00                                397 RHADATA4 DC    XL5'0003750000'
                                                     398
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2     STMT
                                                     400 ***********************************************************************
                                                     401 *                      Tests Table DSECT
                                                     402 ***********************************************************************

                                                     404 TESTTAB  DSECT

00000000  00000000                                   406 ACHPROG  DS    A        Address of channel program
00000004  00000000                                   407 AVERIFY  DS    A        Address of verification routine
00000008  00                                         408 EXPECT   DS    X        0 = normal completion, 1 = I/O error expected
00000009  00                                         409 TESTNUM  DS    X        Test number
0000000A  0000                                       410 CUU      DS    H        CUU to be used for this test

                            0000000C  00000001   412 TESTNEXT EQU   *        Next table entry...

                            00000000  00000001   415 R0       EQU   0                Register 0
                            00000001  00000001   416 R1       EQU   1                Register 1
                            00000002  00000001   417 R2       EQU   2                Register 2
                            00000003  00000001   418 R3       EQU   3                Register 3
                            00000004  00000001   419 R4       EQU   4                Register 4
                            00000005  00000001   420 R5       EQU   5                Register 5
                            00000006  00000001   421 R6       EQU   6                Register 6
                            00000007  00000001   422 R7       EQU   7                Register 7
                            00000008  00000001   423 R8       EQU   8                Register 8
                            00000009  00000001   424 R9       EQU   9                Register 9
                            0000000A  00000001   425 R10      EQU   10               Register 10
                            0000000B  00000001   426 R11      EQU   11               Register 11
                            0000000C  00000001   427 R12      EQU   12               Register 12
                            0000000D  00000001   428 R13      EQU   13               Register 13
                            0000000E  00000001   429 R14      EQU   14               Register 14
                            0000000F  00000001   430 R15      EQU   15               Register 15

                                      00000000   432          END   TEST
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
ACHPROG	A	000000	4	406	106
AVERIFY	A	000004	4	407	
BEGIN	I	000200	2	102	67
BUFFER	X	000490	256	329	111 180 185 206 211 244 249 341 342 359 360 372 386 387
CAW	A	000048	4	74	131
CC	U	000040	1	283	336 337 338 339 340 341 357 358 359 379 380 381 382 383 384 385 386
CD	U	000080	1	282	
CHECKIO	I	000276	4	148	136 142
CSWCS	X	000045	1	71	
CSWUS	X	000044	1	70	148
CUU	H	00000A	2	410	105
DHA219	X	000648	5	365	203 204 206
DOTESTIO	I	000242	4	131	112 162
DRHA	U	00000A	1	291	359
DX	U	000063	1	300	336 357
DXDATA1	X	0005C8	16	345	336
DXDATA2	X	000628	16	363	357
ERRFLAG	X	000326	1	266	151 152 160
ERRORIO	I	000290	4	160	149
EXPECT	X	000008	1	408	108
FAILEOJ	I	000236	4	123	146 158 183 188 209 214 229 247 252
FAILIO	I	00026E	4	145	134 140 143
FAILPSW	D	000320	8	262	125
FAILTEST	X	000327	1	267	123
FMASK4	X	0006A6	1	391	380
GOODEOJ	I	000232	4	121	119
GOODPSW	D	000318	8	258	121
IMAGE	1	000000	1741	0	
LR	U	000047	1	299	337 358
LRDATA1	X	0005D8	16	346	337
LRDATA2	X	000638	16	364	358
R0	U	000000	1	415	102 117
R1	U	000001	1	416	100 103 115 117
R10	U	00000A	1	425	
R11	U	00000B	1	426	
R12	U	00000C	1	427	
R13	U	00000D	1	428	124 146 158 183 188 209 214 229 247 252
R14	U	00000E	1	429	112 113 153 156 186 212 227 250
R15	U	00000F	1	430	
R2	U	000002	1	417	105 133 139
R3	U	000003	1	418	106 131 161
R4	U	000004	1	419	106 113
R5	U	000005	1	420	108 155
R6	U	000006	1	421	109 123 145
R7	U	000007	1	422	
R8	U	000008	1	423	
R9	U	000009	1	424	
RDC	U	000064	1	301	372
RHA	U	00001A	1	295	341 386
RHADATA1	X	0005FE	5	350	177 178 180
RHADATA4	X	0006C8	5	397	241 242 244
RR0	U	000016	1	293	342 360 387
SECT1	X	0005FD	1	349	340
SECT41	X	0006A7	1	392	381
SECT42	X	0006A8	1	393	385
SEEK	U	000007	1	290	379

```
     SYMBOL         TYPE  VALUE    LENGTH  DEFN  REFERENCES

SEEKADR4             X    0006A0       6   390  379
SENSE                U    000004       1   289  325
SETSECT              U    000023       1   297  340  381  385
SFM                  U    00001F       1   296  380
SHAEQ                U    000039       1   298  382
SLI                  U    000020       1   284  325
SNSBYTES             X    000470      32   326  226  325
SNSPGM               R    000468       1   325  161
SRCHHA4              X    0006A9       4   394  382
STARTIO              I    000246       4   133  135
TEST                 J    000000    1741    62   65   69   73   76   84   63  432
TEST1                D    000590       8   335  313
TEST1DAT             D    0005C8       8   344
TEST2                D    000608       8   356  314
TEST2DAT             D    000628       8   362
TEST3                D    000650       8   371  315
TEST4                D    000658       8   378  316
TEST4DAT             D    0006A0       8   389
TESTIO               I    00025A       4   139  137  141
TESTLOOP             I    000206       4   105  118
TESTNEXT             U    00000C       1   412  115
TESTNUM              X    000009       1   409  109
TESTS                D    000430       8   311  103
TESTTAB              4    000000      12   404  100
VERIFY1              H    00029C       2   168  313
VERIFY12             I    0002B4       6   185  181
VERIFY2              H    0002C0       2   194  314
VERIFY22             I    0002D8       6   211  207
VERIFY3              H    0002E4       2   220  315
VERIFY4              H    0002EE       2   235  316
VERIFY42             I    000306       6   249  245
WHA                  U    000019       1   294  338  383
WHADATA1             X    0005E8       5   347  177  203  338
WHADATA4             X    0006AD      11   395  241  383
WR0                  U    000015       1   292  339  384
WR0DATA1             X    0005ED      16   348  185  211  339
WR0DATA4             X    0006B8      16   396  249  384
=256X'FF'            X    00032E       1   272  111
=A(TESTS)            A    000328       4   270  103
=H'4'                H    00032C       2   271  124
=X'33'               X    00042E       1   273  145
```

MACRO DEFN REFERENCES

No defined macros

```
   DESC    SYMBOL   SIZE    POS      ADDR

Entry: 0

Image      IMAGE    1741  000-6CC  000-6CC
  Region             1741  000-6CC  000-6CC
    CSECT  TEST     1741  000-6CC  000-6CC
```

```
   STMT                                    FILE NAME
1     C:\Users\Fish\Documents\Visual Studio 2008\Projects\MyProjects\ASMA-0\GH615\GH615.asm

** NO ERRORS FOUND **
```