```
 LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                      2 ************************************************************************
                                                      3 *                              PFPO.ASM
                                                      4 ************************************************************************
                                                      5 *
                                                      6 *   This test converts the number 6.28318530717958647692528676655900 4
                                                      7 *   from Extended DFP (Decimal Floating-Point) format to a Long HFP
                                                      8 *   (Hexadecimal Floating-Point) format in order to confirm that the
                                                      9 *   bug described in GitHub Issue #407 has indeed been fixed. It does
                                                     10 *   not do anything else. It does NOT test any other function of the
                                                     11 *   PFPO instruction.
                                                     12 *
                                                     13 *   Note that the accompanying .tst runtest script tests two different
                                                     14 *   conversion scenarios: the first confirms that the original bug has
                                                     15 *   been fixed, and the second test confirms conversions of a shorter
                                                     16 *   length values also still works (i.e. that our fixed hasn't broken
                                                     17 *   anything).
                                                     18 *
                                                     19 ************************************************************************




                                                     21 ************************************************************************
                                                     22 *                          Low Core PSWs...
                                                     23 ************************************************************************

                            00000000  0000075F     25 PFPO     START 0
00000000                    00000000               26          USING PFPO,0                Use absolute addressing


00000000                    00000000  000001A0     28          ORG   PFPO+X'1A0'          z/Arch Restart new PSW
000001A0  00000001                                29          DC    XL4'00000001'         z/Arch Restart new PSW
000001A4  80000000                                30          DC    XL4'80000000'         z/Arch Restart new PSW
000001A8  00000000                                31          DC    XL4'00000000'         z/Arch Restart new PSW
000001AC  00000200                                32          DC    A(BEGIN)              z/Arch Restart new PSW


000001B0                    000001B0  000001D0     34          ORG   PFPO+X'1D0'          z/Arch Program new PSW
000001D0  00020001                                35          DC    XL4'00020001'         z/Arch Program new PSW
000001D4  80000000                                36          DC    XL4'80000000'         z/Arch Program new PSW
000001D8  00000000                                37          DC    XL4'00000000'         z/Arch Program new PSW
000001DC  0000DEAD                                38          DC    XL4'0000DEAD'         z/Arch Program new PSW
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2     STMT

                                                      40 ********************************************************************************
                                                      41 *                                BEGIN
                                                      42 ********************************************************************************

000001E0                        000001E0  00000200    44          ORG   PFPO+X'200'            Test code entry point
00000200                                              45 BEGIN    DS    0H

00000200  EB00 0290 002F                  00000290    47          LCTLG CR0,CR0,CTL0   Enable AFP-register-control bit
00000206  B38C 0000                                   48          EFPC  R0             R0 <== FPC
0000020A  5000 02A0                       000002A0    49          ST    R0,SAVEDFPC    Save FPC

                                                      51 *   Load the test values.............

0000020E  E340 0600 0004                  00000600    53          LG    R4,DFPIN_F4    R4 = first 64-bits
00000214  E360 0608 0004                  00000608    54          LG    R6,DFPIN_F6    R6 = second 64-bits

0000021A  B3C1 0044                                   56          LDGR  FR4,R4         Move to floating point register
0000021E  B3C1 0066                                   57          LDGR  FR6,R6         Move to floating point register

                                                      59 *   Do the test............. (i.e. perform the conversion)

00000222  E300 0298 0004                  00000298    61          LG    R0,PFPO_R0     Extended DFP ==> Long HFP
00000228  C019 ABCD ABCD                              62          IILF  R1,X'ABCDABCD' Unlikely Return Code Register value

0000022E  41F0 0003                       00000003    64          LA    R15,3          (set CC3...)
00000232  89F0 001C                       0000001C    65          SLL   R15,32-4       (shift into proper position)
00000236  04F0                                        66          SPM   R15            (set Condition Code 3 in PSW)

00000238  010A                                        68          PFPO  ,              Do it!
0000023A  A714 0025                       00000284    69          JC    B'0001',BADCC  CC=3?!  Impossible!!  FAIL!!

0000023E  1211                                        71          LTR   R1,R1          Check Return Code Register value
00000240  4770 0288                       00000288    72          BNZ   BADGR1         Not zero? FAIL!

                                                      74 *   Save the results..........

00000244  B3CD 0000                                   76          LGDR  R0,FR0         Save actual results (R0 <== FR0)
00000248  E300 0710 0024                  00000710    77          STG   R0,HFPOUT      Save actual results (R0 --> save)

                                                      79 *   Check the results..........

0000024E  E310 0700 0004                  00000700    81          LG    R1,HFPOUTOK    R1 <== Expected
00000254  B920 0001                                   82          CGR   R0,R1          Actual = Expected?
00000258  4770 0280                       00000280    83          BNE   FAIL          No?! FAIL!
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                    85 ************************************************************************
                                                    86 *      Try invalid conversion with Test bit set  (should get cc=3)
                                                    87 ************************************************************************

0000025C  C009 8109 0900                            89          IILF  R0,X'81090900' Test: Long DFP ==> Long DFP (invalid!)
00000262  C019 ABCD ABCD                            90          IILF  R1,X'ABCDABCD' Unlikely Return Code Register value

00000268  1FFF                                      92          SLR   R15,R15        (set CC0...)
0000026A  89F0 001C                    0000001C     93          SLL   R15,32-4       (shift into proper position)
0000026E  04F0                                      94          SPM   R15            (set Condition Code 0 in PSW)

00000270  010A                                      96          PFPO  ,              Do it!
00000272  A7E4 0009                    00000284     97          JC    B'1110',BADCC  Not CC=3? FAIL!

00000276  1211                                      99          LTR   R1,R1          Check Return Code Register value
00000278  4770 0288                    00000288    100          BNZ   BADGR1         Not zero? FAIL!

0000027C  B2B2 0720                    00000720    102          LPSWE GOODPSW        Load success PSW
00000280  B2B2 0730                    00000730    103 FAIL     LPSWE FAILPSW        Load failure PSW
00000284  B2B2 0750                    00000750    104 BADCC    LPSWE BADCCPSW       Load failure PSW
00000288  B2B2 0740                    00000740    105 BADGR1   LPSWE BADRCPSW       Load failure PSW
```

```
  LOC        OBJECT CODE       ADDR1     ADDR2    STMT
                                                   107 ********************************************************************
                                                   108 *                        Working storage
                                                   109 ********************************************************************

0000028C  07000700                                 111          CNOP  0,16   (alignment solely for storage readability)


00000290  00000000 00040000                        113 CTL0     DC    0D'0',XL8'0000000000040000' CR0 AFP-register-control bit
00000298  00000000 01010A00                        114 PFPO_R0  DC    XL4'00000000',XL4'01010A00'
000002A0  00000000 00000000                        115 SAVEDFPC DC    F'0',F'0',D'0'

000002B0                     000002B0  00000600    117          ORG   PFPO+X'600'      INPUT @ X'600'

00000600  39FFD2B3 2D873E6E                        119 DFPIN_F4 DC    0D'0',XL8'39FFD2B32D873E6E'    (original input)
00000608  A9DAAD5A BE6B6404                        120 DFPIN_F6 DC    0D'0',XL8'A9DAAD5ABE6B6404'    (original input)

00000610                     00000610  00000700    122          ORG   PFPO+X'700'      EXPECTED OUTPUT @ X'700'

00000700  416487ED 5110B461                        124 HFPOUTOK DC    0D'0',XL8'416487ED5110B461'  (expected output)
00000708  00000000 00000000                        125          DC    D'0'

00000710                     00000710  00000710    127          ORG   PFPO+X'710'      ACTUAL OUTPUT @ X'710'

00000710  00000000 00000000                        129 HFPOUT   DC    0D'0',XL8'00'    (actual output)
00000718  00000000 00000000                        130          DC    D'0'


00000720                                           132 GOODPSW  DC    0D'0'          Failure PSW
00000720  00020001                                 133          DC    XL4'00020001'  Failure PSW
00000724  80000000                                 134          DC    XL4'80000000'  Failure PSW
00000728  00000000                                 135          DC    XL4'00000000'  Failure PSW
0000072C  00000000                                 136          DC    XL4'00000000'  Failure PSW

00000730                                           138 FAILPSW  DC    0D'0'          Failure PSW
00000730  00020001                                 139          DC    XL4'00020001'  Failure PSW
00000734  80000000                                 140          DC    XL4'80000000'  Failure PSW
00000738  00000000                                 141          DC    XL4'00000000'  Failure PSW
0000073C  00000BAD                                 142          DC    XL4'00000BAD'  Failure PSW  (general test failure)

00000740                                           144 BADRCPSW DC    0D'0'          Failure PSW
00000740  00020001                                 145          DC    XL4'00020001'  Failure PSW
00000744  80000000                                 146          DC    XL4'80000000'  Failure PSW
00000748  00000000                                 147          DC    XL4'00000000'  Failure PSW
0000074C  0000BAD1                                 148          DC    XL4'0000BAD1'  Failure PSW  (bad GR1 Return Code value)

00000750                                           150 BADCCPSW DC    0D'0'          Failure PSW
00000750  00020001                                 151          DC    XL4'00020001'  Failure PSW
00000754  80000000                                 152          DC    XL4'80000000'  Failure PSW
00000758  00000000                                 153          DC    XL4'00000000'  Failure PSW
0000075C  000BADCC                                 154          DC    XL4'000BADCC'  Failure PSW  (bad Condition Code)
```

```
  LOC         OBJECT CODE       ADDR1     ADDR2    STMT

                              00000000  00000001   156 R0       EQU   0        General Purpose Registers...
                              00000001  00000001   157 R1       EQU   1
                              00000002  00000001   158 R2       EQU   2
                              00000003  00000001   159 R3       EQU   3
                              00000004  00000001   160 R4       EQU   4
                              00000005  00000001   161 R5       EQU   5
                              00000006  00000001   162 R6       EQU   6
                              00000007  00000001   163 R7       EQU   7
                              00000008  00000001   164 R8       EQU   8
                              00000009  00000001   165 R9       EQU   9
                              0000000A  00000001   166 R10      EQU   10
                              0000000B  00000001   167 R11      EQU   11
                              0000000C  00000001   168 R12      EQU   12
                              0000000D  00000001   169 R13      EQU   13
                              0000000E  00000001   170 R14      EQU   14
                              0000000F  00000001   171 R15      EQU   15
                                                   172
                              00000000  00000001   173 FR0      EQU   0        Floating-Point Registers...
                              00000001  00000001   174 FR1      EQU   1
                              00000002  00000001   175 FR2      EQU   2
                              00000003  00000001   176 FR3      EQU   3
                              00000004  00000001   177 FR4      EQU   4
                              00000005  00000001   178 FR5      EQU   5
                              00000006  00000001   179 FR6      EQU   6
                              00000007  00000001   180 FR7      EQU   7
                              00000008  00000001   181 FR8      EQU   8
                              00000009  00000001   182 FR9      EQU   9
                              0000000A  00000001   183 FR10     EQU   10
                              0000000B  00000001   184 FR11     EQU   11
                              0000000C  00000001   185 FR12     EQU   12
                              0000000D  00000001   186 FR13     EQU   13
                              0000000E  00000001   187 FR14     EQU   14
                              0000000F  00000001   188 FR15     EQU   15
                                                   189
                              00000000  00000001   190 CR0      EQU   0        Control Registers...
                              00000001  00000001   191 CR1      EQU   1
                              00000002  00000001   192 CR2      EQU   2
                              00000003  00000001   193 CR3      EQU   3
                              00000004  00000001   194 CR4      EQU   4
                              00000005  00000001   195 CR5      EQU   5
                              00000006  00000001   196 CR6      EQU   6
                              00000007  00000001   197 CR7      EQU   7
                              00000008  00000001   198 CR8      EQU   8
                              00000009  00000001   199 CR9      EQU   9
                              0000000A  00000001   200 CR10     EQU   10
                              0000000B  00000001   201 CR11     EQU   11
                              0000000C  00000001   202 CR12     EQU   12
                              0000000D  00000001   203 CR13     EQU   13
                              0000000E  00000001   204 CR14     EQU   14
                              0000000F  00000001   205 CR15     EQU   15

                                                   207          END
```

SYMBOL	TYPE	VALUE	LENGTH	DEFN	REFERENCES
BADCC	I	000284	4	104	69 97
BADCCPSW	D	000750	8	150	104
BADGR1	I	000288	4	105	72 100
BADRCPSW	D	000740	8	144	105
BEGIN	H	000200	2	45	32
CR0	U	000000	1	190	47
CR1	U	000001	1	191	
CR10	U	00000A	1	200	
CR11	U	00000B	1	201	
CR12	U	00000C	1	202	
CR13	U	00000D	1	203	
CR14	U	00000E	1	204	
CR15	U	00000F	1	205	
CR2	U	000002	1	192	
CR3	U	000003	1	193	
CR4	U	000004	1	194	
CR5	U	000005	1	195	
CR6	U	000006	1	196	
CR7	U	000007	1	197	
CR8	U	000008	1	198	
CR9	U	000009	1	199	
CTL0	D	000290	8	113	47
DFPIN_F4	D	000600	8	119	53
DFPIN_F6	D	000608	8	120	54
FAIL	I	000280	4	103	83
FAILPSW	D	000730	8	138	103
FR0	U	000000	1	173	76
FR1	U	000001	1	174	
FR10	U	00000A	1	183	
FR11	U	00000B	1	184	
FR12	U	00000C	1	185	
FR13	U	00000D	1	186	
FR14	U	00000E	1	187	
FR15	U	00000F	1	188	
FR2	U	000002	1	175	
FR3	U	000003	1	176	
FR4	U	000004	1	177	56
FR5	U	000005	1	178	
FR6	U	000006	1	179	57
FR7	U	000007	1	180	
FR8	U	000008	1	181	
FR9	U	000009	1	182	
GOODPSW	D	000720	8	132	102
HFPOUT	D	000710	8	129	77
HFPOUTOK	D	000700	8	124	81
IMAGE	1	000000	1888	0	
PFPO	J	000000	1888	25	28 34 44 117 122 127 26
PFPO_R0	X	000298	4	114	61
R0	U	000000	1	156	48 49 61 76 77 82 89
R1	U	000001	1	157	62 71 81 82 90 99
R10	U	00000A	1	166	
R11	U	00000B	1	167	
R12	U	00000C	1	168	
R13	U	00000D	1	169	
R14	U	00000E	1	170	
R15	U	00000F	1	171	64 65 66 92 93 94

```
     SYMBOL         TYPE  VALUE    LENGTH  DEFN  REFERENCES

R2                   U    000002        1   158
R3                   U    000003        1   159
R4                   U    000004        1   160   53   56
R5                   U    000005        1   161
R6                   U    000006        1   162   54   57
R7                   U    000007        1   163
R8                   U    000008        1   164
R9                   U    000009        1   165
SAVEDFPC             F    0002A0        4   115   49
```

MACRO DEFN REFERENCES

No defined macros

```
   DESC    SYMBOL   SIZE    POS      ADDR

Entry: 0

Image      IMAGE    1888  000-75F  000-75F
  Region              1888  000-75F  000-75F
    CSECT  PFPO     1888  000-75F  000-75F
```

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

** NO ERRORS FOUND **
```