Mode: All
Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt

```
*===========================================
» ===========================================
» ===========================
* Title      : Test_002
* Written by : CSS 422 Best Group
*
*   The CSS 422 Best Group is:
*      - Howie Catlin
*      - Kyle Dukart
*      - Colton Sellers
*
*
* Date       : 10-Nov-2019
*
* Description:
*   Test input file used to perform software v
» erification
*   and validation (i.e.: validation that the
» disassembler
*   is capable of converting hexidecimal to En
» glish,
*   verification that the the strings being tr
» anslated are
*   in fact correct).
*
*   First parts of this file attempt to prove
» that each
*   operation code is capable of being transla
» ted. The
*   registers D0, D7, A0, & A7 and hex values
» '0', '1', '5',
*   'A', and 'F' as edge cases most likely to
» uncover early
*   programming errors. This method exercises
» all opcodes,
*   but performs less addressing.
*
*   Later in the file, a brute-force matrix of
»  every-register
*   to-every-register is employed to verify th
» e Effective
*   Addressing code paths. This method uses fe
» wer op codes,
*   but performs more addressing.
*
*   Refer to the Test Plan and test matrix for
»  more
*   information.
*===========================================
» ===========================================
» ===========================
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Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
TESTIO
*----------------------------------------------
» --------------
* BCLR
*----------------------------------------------
» --------------
    BCLR        D0,D7
    BCLR        D7,(A7)
    BCLR        D0,(A0)+
    BCLR        D7,-(A7)
    BCLR        D0,$FFFF
    BCLR        D7,$55555

*----------------------------------------------
» --------------
* ORI
*----------------------------------------------
» --------------
    ORI.W       #$1111,D0
    ORI.W       #$AAAA,(A0)+
    ORI.W       #$0000,-(A0)
    ORI.L       #$FFFFF,D0
    ORI.L       #$55555,(A0)+
    ORI.L       #$AAAAA,-(A0)
*----------------------------------------------
» --------------
* CMPI
*----------------------------------------------
» --------------
    CMPI.W      #$1111,D0
    CMPI.W      #$AAAA,(A0)+
    CMPI.W      #$0000,-(A0)
    CMPI.L      #$FFFFF,D0
    CMPI.L      #$55555,(A0)+
    CMPI.L      #$AAAAA,-(A0)
*----------------------------------------------
» --------------
* MOVE.B
*----------------------------------------------
» --------------
    MOVE.B      #$0F,D0
    MOVE.B      D7,(A7)
    MOVE.B      D7,(A0)+
    MOVE.B      D0,-(A7)
    MOVE.B      $1000,D0
    MOVE.B      $10000,D0

    MOVE.W      #$AA,D0
    MOVE.W      D7,A0
    MOVE.W      D7,(A7)
    MOVE.W      D0,(A0)+
    MOVE.W      D7,-(A7)
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
    MOVE.W      $5555,D0
    MOVE.W      $AAAAA,D0
    MOVE.L      #$AA,D0
    MOVE.L      D0,A0
    MOVE.L      D0,(A0)
    MOVE.L      D0,(A0)+
    MOVE.L      D0,-(A0)
    MOVE.L      $1000,D0
    MOVE.L      $10000,D0


*----------------------------------------------
» --------------
* MOVEA.W
*----------------------------------------------
» --------------

    MOVEA.W     D7,A0
    MOVEA.W     (A0),A7
    MOVEA.W     (A0)+,A7
    MOVEA.W     -(A7),A0
    MOVEA.W     $AAAA,A0
    MOVEA.W     $55555,A0
    MOVEA.L     D0,A0
    MOVEA.L     D7,A0
    MOVEA.L     (A7),A0
    MOVEA.L     (A0)+,A7
    MOVEA.L     -(A7),A0
    MOVEA.L     $FFAA,A7
    MOVEA.L     $FFAA5,A0
*----------------------------------------------
» --------------
* NOP, RTS, ILLEGAL
*----------------------------------------------
» --------------
    NOP

    RTS

    ILLEGAL
*----------------------------------------------
» --------------
* LEA
*----------------------------------------------
» --------------
    LEA         (A7),A0
    LEA         $FFAA,A0
    LEA         $AA551,A7
*----------------------------------------------
» --------------
* NEG
*----------------------------------------------
» --------------
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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Left	Right
`    NEG       D0`	
`    NEG       (A6)`	
`    NEG       (A0)+`	
`    NEG       -(A1)`	
`    NEG       $AAFF`	
`    NEG       $55FAA`	
`*----------------------------------------`	
`» -------------`	
`* JSR`	
`*----------------------------------------`	
`» -------------`	
`    JSR       (A6)`	
`    JSR       $AAFF`	
`    JSR       $55FAA`	
`*----------------------------------------`	
`» -------------`	
`* MOVEM`	
`*----------------------------------------`	
`» -------------`	
`    MOVEM.L    D0-D7/A0-A6,-(A7)`	`111204   MOVEM.L D0-D7/A0-A6, -(A7)`
`    MOVEM.L    D0,-(A7)`	`111208   MOVEM.L D0, -(A7)`
`    MOVEM.L    D1,-(A7)`	`11120C   MOVEM.L D1, -(A7)`
`    MOVEM.L    D2,-(A7)`	`111210   MOVEM.L D2, -(A7)`
`    MOVEM.L    D3,-(A7)`	`111214   MOVEM.L D3, -(A7)`
`    MOVEM.L    D4,-(A7)`	`111218   MOVEM.L D4, -(A7)`
`    MOVEM.L    D5,-(A7)`	`11121C   MOVEM.L D5, -(A7)`
`    MOVEM.L    D6,-(A7)`	`111220   MOVEM.L D6, -(A7)`
`    MOVEM.L    D7,-(A7)`	`111224   MOVEM.L D7, -(A7)`
`    MOVEM.L    A0,-(A7)`	`111228   MOVEM.L A0, -(A7)`
`    MOVEM.L    A1,-(A7)`	`11122C   MOVEM.L A1, -(A7)`
`    MOVEM.L    A2,-(A7)`	`111230   MOVEM.L A2, -(A7)`
`    MOVEM.L    A3,-(A7)`	`111234   MOVEM.L A3, -(A7)`
`    MOVEM.L    A4,-(A7)`	`111238   MOVEM.L A4, -(A7)`
`    MOVEM.L    A5,-(A7)`	`11123C   MOVEM.L A5, -(A7)`
`    MOVEM.L    A6,-(A7)`	`111240   MOVEM.L A6, -(A7)`
`    MOVEM.L    A7,-(A7)`	`111244   MOVEM.L A7/A7, -(A7)`
`    MOVEM.L    D0-D7/A0-A6,-(A7)`	`111248   MOVEM.L D0-D7/A0-A6, -(A7)`
`    MOVEM.L    D0-D5/D7/A3-A6,-(A7)`	`11124C   MOVEM.L D0-D5/D7/A3-A6, -(A7)`
`    MOVEM.L    D0/D2/D4/D6/A0/A2/A4/A6,-(A7)`	`111250   MOVEM.L D0/D2/D4/D6-(A0)/A0/A2/A4/A6,`
	`» -(A7)`
`    MOVEM.L    D0-D2/D4/D6-D7/A0-A3/A5/A7,-(A`	`111254   MOVEM.L D0-D2/D4/D6-D7/A0-A3/A5/A7/A7,`
`» 7)`	`»  -(A7)`
`    MOVEM.L    (A7)+,D0`	`111258   MOVEM.W (A7)+, D0`
`    MOVEM.L    (A7)+,D1`	`11125C   MOVEM.W (A7)+, D1`
`    MOVEM.L    (A7)+,D2`	`111260   MOVEM.W (A7)+, D2`
`    MOVEM.L    (A7)+,D3`	`111264   MOVEM.W (A7)+, D3`
`    MOVEM.L    (A7)+,D4`	`111268   MOVEM.W (A7)+, D4`
`    MOVEM.L    (A7)+,D5`	`11126C   MOVEM.W (A7)+, D5`
`    MOVEM.L    (A7)+,D6`	`111270   MOVEM.W (A7)+, D6`
`    MOVEM.L    (A7)+,D7`	`111274   MOVEM.W (A7)+, D7`

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
      MOVEM.L     (A7)+,A0                    111278   MOVEM.W (A7)+, A0
      MOVEM.L     (A7)+,A1                    11127C   MOVEM.W (A7)+, A1
      MOVEM.L     (A7)+,A2                    111280   MOVEM.W (A7)+, A2
      MOVEM.L     (A7)+,A3                    111284   MOVEM.W (A7)+, A3
      MOVEM.L     (A7)+,A4                    111288   MOVEM.W (A7)+, A4
      MOVEM.L     (A7)+,A5                    11128C   MOVEM.W (A7)+, A5
      MOVEM.L     (A7)+,A6                    111290   MOVEM.W (A7)+, A6
      MOVEM.L     (A7)+,A7                    111294   MOVEM.W (A7)+, A7/A7
      MOVEM.L     (A7)+,D0-D7/A0-A6           111298   MOVEM.W (A7)+, D0-D7/A0-A6
      MOVEM.L     (A7)+,D0-D5/D7/A3-A6        11129C   MOVEM.W (A7)+, D0-D5/D7/A3-A6
      MOVEM.L     (A7)+,D0/D2/D4/D6/A0/A2/A4/A6    1112A0   MOVEM.W (A7)+, D0/D2/D4/D6-(A0)/A0/A2/
                                             »  A4/A6
      MOVEM.L     (A7)+,D0-D2/D4/D6-D7/A0-A3/A5/    1112A4   MOVEM.W (A7)+, D0-D2/D4/D6-D7/A0-A3/A5
»  A7                                        »  /A7/A7
*------------------------------------------
»  --------------
*  SUBQ.x
*------------------------------------------
»  --------------
      SUBQ.B      #1,D0                       1112A8   SUBQ.B  #1, D0
      SUBQ.B      #3,(A7)                     1112AA   SUBQ.B  #3, (A7)
      SUBQ.B      #4,(A0)+                    1112AC   SUBQ.B  #4, (A0)+
      SUBQ.B      #5,-(A0)                    1112AE   SUBQ.B  #5, -(A0)
      SUBQ.B      #6,$AAFF                    1112B0   SUBQ.B  #6, $AAFF
      SUBQ.B      #7,$AFAF5                   1112B6   SUBQ.B  #7, $AFAF5

      SUBQ.W      #1,D0                       1112BC   SUBQ.W  #1, D0
      SUBQ.W      #3,(A7)                     1112BE   SUBQ.W  #3, (A7)
      SUBQ.W      #4,(A0)+                    1112C0   SUBQ.W  #4, (A0)+
      SUBQ.W      #5,-(A0)                    1112C2   SUBQ.W  #5, -(A0)
      SUBQ.W      #6,$AAFF                    1112C4   SUBQ.W  #6, $AAFF
      SUBQ.W      #7,$AFAF5                   1112CA   SUBQ.W  #7, $AFAF5
      SUBQ.L      #1,D0                       1112D0   SUBQ.L  #1, D0
      SUBQ.L      #3,(A7)                     1112D2   SUBQ.L  #3, (A7)
      SUBQ.L      #4,(A0)+                    1112D4   SUBQ.L  #4, (A0)+
      SUBQ.L      #5,-(A0)                    1112D6   SUBQ.L  #5, -(A0)
      SUBQ.L      #6,$AAFF                    1112D8   SUBQ.L  #6, $AAFF
      SUBQ.L      #7,$AFAF5                   1112DE   SUBQ.L  #7, $AFAF5
*------------------------------------------
»  --------------
*  DIVS
*------------------------------------------
»  --------------
      DIVS        D0,D1                       1112E4   DIVS    D0, D1
      DIVS        (A1)+,D1                    1112E6   DIVS    (A1)+, D1
      DIVS        -(A2),D2                    1112E8   DIVS    -(A2), D2
      DIVS        #01,D1                      1112EA   DIVS    #$1, D1
      DIVS        $AAFF,D1                    1112EE   DIVS    $AAFF, D1
      DIVS        $FFAA5,D2                   1112F4   DIVS    $FFAA5, D2
*------------------------------------------
»  --------------
*  OR
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
*-----------------------------------------
» --------------
     OR          D0,D1                          1112FA  OR.W     D0, D1
     OR          (A0),D0                        1112FC  OR.W     (A0), D0
     OR          (A0)+,D7                       1112FE  OR.W     (A0)+, D7
     OR          -(A7),D0                       111300  OR.W     -(A7), D0
     OR          #02,D1                         111302  OR.W     #$2, D1
*-----------------------------------------
» --------------
*  SUB
*-----------------------------------------
» --------------
     SUB         D0,D1                          111306  SUB.W    D0, D1
     SUB         A0,D0                          111308  SUB.W    A0, D0
     SUB         (A0),D0                        11130A  SUB.W    (A0), D0
     SUB         (A0)+,D0                       11130C  SUB.W    (A0)+, D0
     SUB         -(A7),D1                       11130E  SUB.W    -(A7), D1
     SUB         #02,D1                         111310  SUBQ.W   #2, D1
     SUB         $AAFF,D0                       111312  SUB.W    $AAFF, D0
     SUB         $AFAF5,D1                      111318  SUB.W    $AFAF5, D1
*-----------------------------------------
» --------------
*  CMP
*-----------------------------------------
» --------------
     CMP         D0,D1                          11131E  CMP.W    D0, D1
     CMP         A0,D0                          111320  CMP.W    A0, D0
     CMP         (A0),D0                        111322  CMP.W    (A0), D0
     CMP         (A0)+,D0                       111324  CMP.W    (A0)+, D0
     CMP         -(A7),D1                       111326  CMP.W    -(A7), D1
     CMP         #02,D1                         111328  CMP.W    #$2, D1
     CMP         $AAFF,D0                       11132C  CMP.W    $AAFF, D0
     CMP         $AFAF5,D1                      111332  CMP.W    $AFAF5, D1
*-----------------------------------------
» --------------
*  EOR
*-----------------------------------------
» --------------
     EOR         D0,D1                          111338  EOR.W    D0, D1
     EOR         D0,(A0)                        11133A  EOR.W    D0, (A0)
     EOR         D0,(A0)+                       11133C  EOR.W    D0, (A0)+
     EOR         D0,-(A7)                       11133E  EOR.W    D0, -(A7)
     EOR.W       #$AAFF,D0                      111340  EORI.W   #$AAFF, D0
     EOR.L       #$AFAF5,D1                     111344  BCLR     #$A, D1
                                                111348  DATA     FAF5
*-----------------------------------------
» --------------
*  MULS
*-----------------------------------------
» --------------
     MULS        D0,D1                          11134A  MULS     D0, D1
     MULS        (A0),D0                        11134C  MULS     (A0), D0
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
      MULS        (A0)+,D0              11134E  MULS     (A0)+, D0
      MULS        -(A7),D1             111350  MULS     -(A7), D1
      MULS        #02,D1               111352  MULS     #$2, D1
      MULS        $AAFF,D0             111356  MULS     $AAFF, D0
      MULS        $AFAF5,D1            11135C  MULS     $AFAF5, D1
*-------------------------------------
» -------------
*  ADD
*-------------------------------------
» -------------
      ADD         D0,D1                111362  ADD.W            D0, D1
      ADD         D0,A0                111364  ADDA.W   D0, A0
      ADD         (A0),D0              111366  ADD.W            (A0), D0
      ADD         (A0)+,D0             111368  ADD.W            (A0)+, D0
      ADD         -(A7),D1             11136A  ADD.W            -(A7), D1
      ADD         #02,D1               11136C  ADDQ.W   #2, D1
      ADD         $AAFF,D0             11136E  ADD.W            $AAFF, D0
      ADD         $AFAF5,D1            111374  ADD.W            $AFAF5, D1
*-------------------------------------
» -------------
*  ADDA
*-------------------------------------
» -------------
      ADDA        D0,A0                11137A  ADDA.W   D0, A0
      ADDA        D0,A0                11137C  ADDA.W   D0, A0
      ADDA        (A0),A0              11137E  ADDA.W   (A0), A0
      ADDA        (A0)+,A0             111380  ADDA.W   (A0)+, A0
      ADDA        -(A7),A1             111382  ADDA.W   -(A7), A1
      ADDA        #02,A1               111384  ADDQ.W   #2, A1
      ADDA        $AAFF,A0             111386  ADDA.W   $AAFF, A0
      ADDA        $AFAF5,A7            11138C  ADDA.W   $AFAF5, A7
*-------------------------------------
» -------------
*  ASR
*-------------------------------------
» -------------
      ASR         (A0)                 111392  ASR      (A0)
      ASR         (A7)+                111394  ASR      (A7)+
      ASR         -(A0)                111396  ASR      -(A0)
      ASR         $AFAF                111398  ASR      $AFAF
      ASR         $FFAA550             11139E  ASR      $FFAA550
*-------------------------------------
» -------------
*  ASL
*-------------------------------------
» -------------
      ASL         (A0)                 1113A4  ASL      (A0)
      ASL         (A7)+                1113A6  ASL      (A7)+
      ASL         -(A0)                1113A8  ASL      -(A0)
      ASL         $AFAF                1113AA  ASL      $AFAF
      ASL         $FFAA550             1113B0  ASL      $FFAA550
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Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
*---------------------------------------------
» --------------
* LSR
*---------------------------------------------
» --------------
    LSR         (A0)                        1113B6  LSR         (A0)
    LSR         (A7)+                       1113B8  LSR         (A7)+
    LSR         -(A0)                       1113BA  LSR         -(A0)
    LSR         $AFAF                       1113BC  LSR         $AFAF
    LSR         $FFAA550                    1113C2  LSR         $FFAA550
*---------------------------------------------
» --------------
* LSL
*---------------------------------------------
» --------------
    LSL         (A0)                        1113C8  LSL         (A0)
    LSL         (A7)+                       1113CA  LSL         (A7)+
    LSL         -(A0)                       1113CC  LSL         -(A0)
    LSL         $AFAF                       1113CE  LSL         $AFAF
    LSL         $FFAA550                    1113D4  LSL         $FFAA550
*---------------------------------------------
» --------------
* ROL
*---------------------------------------------
» --------------
    ROL         (A0)                        1113DA  ROL         (A0)
    ROL         (A7)+                       1113DC  ROL         (A7)+
    ROL         -(A0)                       1113DE  ROL         -(A0)
    ROL         $AFAF                       1113E0  ROL         $AFAF
    ROL         $FFAA550                    1113E6  ROL         $FFAA550
*---------------------------------------------
» --------------
* ROR
*---------------------------------------------
» --------------
    ROR         (A0)                        1113EC  ROR         (A0)
    ROR         (A7)+                       1113EE  ROR         (A7)+
    ROR         -(A0)                       1113F0  ROR         -(A0)
    ROR         $AFAF                       1113F2  ROR         $AFAF
    ROR         $FFAA550                    1113F8  ROR         $FFAA550
*---------------------------------------------
» --------------
* BRUTE-FORCE VERIFICATION
*---------------------------------------------
» --------------
        ; D0 to all other data registers
    ADD         D0,D0                       1113FE  ADD.W           D0, D0
    ADD         D0,D1                       111400  ADD.W           D0, D1
    ADD         D0,D2                       111402  ADD.W           D0, D2
    ADD         D0,D3                       111404  ADD.W           D0, D3
    ADD         D0,D4                       111406  ADD.W           D0, D4
    ADD         D0,D5                       111408  ADD.W           D0, D5
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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ADD	D0,D6		11140A	ADD.W	D0, D6
ADD	D0,D7		11140C	ADD.W	D0, D7
; D1 to all other data registers					
ADD	D1,D0		11140E	ADD.W	D1, D0
ADD	D1,D1		111410	ADD.W	D1, D1
ADD	D1,D2		111412	ADD.W	D1, D2
ADD	D1,D3		111414	ADD.W	D1, D3
ADD	D1,D4		111416	ADD.W	D1, D4
ADD	D1,D5		111418	ADD.W	D1, D5
ADD	D1,D6		11141A	ADD.W	D1, D6
ADD	D1,D7		11141C	ADD.W	D1, D7
; D2 to all other data registers					
ADD	D2,D0		11141E	ADD.W	D2, D0
ADD	D2,D1		111420	ADD.W	D2, D1
ADD	D2,D2		111422	ADD.W	D2, D2
ADD	D2,D3		111424	ADD.W	D2, D3
ADD	D2,D4		111426	ADD.W	D2, D4
ADD	D2,D5		111428	ADD.W	D2, D5
ADD	D2,D6		11142A	ADD.W	D2, D6
ADD	D2,D7		11142C	ADD.W	D2, D7
; D3 to all other data registers					
ADD	D3,D0		11142E	ADD.W	D3, D0
ADD	D3,D1		111430	ADD.W	D3, D1
ADD	D3,D2		111432	ADD.W	D3, D2
ADD	D3,D3		111434	ADD.W	D3, D3
ADD	D3,D4		111436	ADD.W	D3, D4
ADD	D3,D5		111438	ADD.W	D3, D5
ADD	D3,D6		11143A	ADD.W	D3, D6
ADD	D3,D7		11143C	ADD.W	D3, D7
; D4 to all other data registers					
ADD	D4,D0		11143E	ADD.W	D4, D0
ADD	D4,D1		111440	ADD.W	D4, D1
ADD	D4,D2		111442	ADD.W	D4, D2
ADD	D4,D3		111444	ADD.W	D4, D3
ADD	D4,D4		111446	ADD.W	D4, D4
ADD	D4,D5		111448	ADD.W	D4, D5
ADD	D4,D6		11144A	ADD.W	D4, D6
ADD	D4,D7		11144C	ADD.W	D4, D7
; D5 to all other data registers					
ADD	D5,D0		11144E	ADD.W	D5, D0
ADD	D5,D1		111450	ADD.W	D5, D1
ADD	D5,D2		111452	ADD.W	D5, D2
ADD	D5,D3		111454	ADD.W	D5, D3
ADD	D5,D4		111456	ADD.W	D5, D4
ADD	D5,D5		111458	ADD.W	D5, D5
ADD	D5,D6		11145A	ADD.W	D5, D6
ADD	D5,D7		11145C	ADD.W	D5, D7
; D6 to all other data registers					
ADD	D6,D0		11145E	ADD.W	D6, D0
ADD	D6,D1		111460	ADD.W	D6, D1
ADD	D6,D2		111462	ADD.W	D6, D2
ADD	D6,D3		111464	ADD.W	D6, D3

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
        ADD         D6,D4                 111466   ADD.W          D6, D4
        ADD         D6,D5                 111468   ADD.W          D6, D5
        ADD         D6,D6                 11146A   ADD.W          D6, D6
        ADD         D6,D7                 11146C   ADD.W          D6, D7
        ; D7 to all other data registers
        ADD         D7,D0                 11146E   ADD.W          D7, D0
        ADD         D7,D1                 111470   ADD.W          D7, D1
        ADD         D7,D2                 111472   ADD.W          D7, D2
        ADD         D7,D3                 111474   ADD.W          D7, D3
        ADD         D7,D4                 111476   ADD.W          D7, D4
        ADD         D7,D5                 111478   ADD.W          D7, D5
        ADD         D7,D6                 11147A   ADD.W          D7, D6
        ADD         D7,D7                 11147C   ADD.W          D7, D7
        ; D0 to all other address registers
        ADD         D0,A0                 11147E   ADDA.W   D0, A0
        ADD         D0,A1                 111480   ADDA.W   D0, A1
        ADD         D0,A2                 111482   ADDA.W   D0, A2
        ADD         D0,A3                 111484   ADDA.W   D0, A3
        ADD         D0,A4                 111486   ADDA.W   D0, A4
        ADD         D0,A5                 111488   ADDA.W   D0, A5
        ADD         D0,A6                 11148A   ADDA.W   D0, A6
        ADD         D0,A7                 11148C   ADDA.W   D0, A7

        ; D1 to all other address registers
        ADD         D1,A0                 11148E   ADDA.W   D1, A0
        ADD         D1,A1                 111490   ADDA.W   D1, A1
        ADD         D1,A2                 111492   ADDA.W   D1, A2
        ADD         D1,A3                 111494   ADDA.W   D1, A3
        ADD         D1,A4                 111496   ADDA.W   D1, A4
        ADD         D1,A5                 111498   ADDA.W   D1, A5
        ADD         D1,A6                 11149A   ADDA.W   D1, A6
        ADD         D1,A7                 11149C   ADDA.W   D1, A7
        ; D2 to all other address registers
»
        ADD         D2,A0                 11149E   ADDA.W   D2, A0
        ADD         D2,A1                 1114A0   ADDA.W   D2, A1
        ADD         D2,A2                 1114A2   ADDA.W   D2, A2
        ADD         D2,A3                 1114A4   ADDA.W   D2, A3
        ADD         D2,A4                 1114A6   ADDA.W   D2, A4
        ADD         D2,A5                 1114A8   ADDA.W   D2, A5
        ADD         D2,A6                 1114AA   ADDA.W   D2, A6
        ADD         D2,A7                 1114AC   ADDA.W   D2, A7
        ; D3 to all other address registers
        ADD         D3,A0                 1114AE   ADDA.W   D3, A0
        ADD         D3,A1                 1114B0   ADDA.W   D3, A1
        ADD         D3,A2                 1114B2   ADDA.W   D3, A2
        ADD         D3,A3                 1114B4   ADDA.W   D3, A3
        ADD         D3,A4                 1114B6   ADDA.W   D3, A4
        ADD         D3,A5                 1114B8   ADDA.W   D3, A5
        ADD         D3,A6                 1114BA   ADDA.W   D3, A6
        ADD         D3,A7                 1114BC   ADDA.W   D3, A7
        ; D4 to all other address registers
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
        ADD        D4,A0                    1114BE  ADDA.W   D4, A0
        ADD        D4,A1                    1114C0  ADDA.W   D4, A1
        ADD        D4,A2                    1114C2  ADDA.W   D4, A2
        ADD        D4,A3                    1114C4  ADDA.W   D4, A3
        ADD        D4,A4                    1114C6  ADDA.W   D4, A4
        ADD        D4,A5                    1114C8  ADDA.W   D4, A5
        ADD        D4,A6                    1114CA  ADDA.W   D4, A6
        ADD        D4,A7                    1114CC  ADDA.W   D4, A7
        ; D5 to all other address registers
        ADD        D5,A0                    1114CE  ADDA.W   D5, A0
        ADD        D5,A1                    1114D0  ADDA.W   D5, A1
        ADD        D5,A2                    1114D2  ADDA.W   D5, A2
        ADD        D5,A3                    1114D4  ADDA.W   D5, A3
        ADD        D5,A4                    1114D6  ADDA.W   D5, A4
        ADD        D5,A5                    1114D8  ADDA.W   D5, A5
        ADD        D5,A6                    1114DA  ADDA.W   D5, A6
        ADD        D5,A7                    1114DC  ADDA.W   D5, A7
        ; D6 to all other address registers
        ADD        D6,A0                    1114DE  ADDA.W   D6, A0
        ADD        D6,A1                    1114E0  ADDA.W   D6, A1
        ADD        D6,A2                    1114E2  ADDA.W   D6, A2
        ADD        D6,A3                    1114E4  ADDA.W   D6, A3
        ADD        D6,A4                    1114E6  ADDA.W   D6, A4
        ADD        D6,A5                    1114E8  ADDA.W   D6, A5
        ADD        D6,A6                    1114EA  ADDA.W   D6, A6
        ADD        D6,A7                    1114EC  ADDA.W   D6, A7
        ; D7 to all other address registers
        ADD        D7,A0                    1114EE  ADDA.W   D7, A0
        ADD        D7,A1                    1114F0  ADDA.W   D7, A1
        ADD        D7,A2                    1114F2  ADDA.W   D7, A2
        ADD        D7,A3                    1114F4  ADDA.W   D7, A3
        ADD        D7,A4                    1114F6  ADDA.W   D7, A4
        ADD        D7,A5                    1114F8  ADDA.W   D7, A5
        ADD        D7,A6                    1114FA  ADDA.W   D7, A6
        ADD        D7,A7                    1114FC  ADDA.W   D7, A7

        ; values from all address registers to
»   A0
        ADD        (A0),A0                  1114FE  ADDA.W   (A0), A0
        ADD        (A1),A0                  111500  ADDA.W   (A1), A0
        ADD        (A2),A0                  111502  ADDA.W   (A2), A0
        ADD        (A3),A0                  111504  ADDA.W   (A3), A0
        ADD        (A4),A0                  111506  ADDA.W   (A4), A0
        ADD        (A5),A0                  111508  ADDA.W   (A5), A0
        ADD        (A6),A0                  11150A  ADDA.W   (A6), A0
        ADD        (A7),A0                  11150C  ADDA.W   (A7), A0
        ; values from all address registers to
»   A1
        ADD        (A0),A1                  11150E  ADDA.W   (A0), A1
        ADD        (A1),A1                  111510  ADDA.W   (A1), A1
        ADD        (A2),A1                  111512  ADDA.W   (A2), A1
        ADD        (A3),A1                  111514  ADDA.W   (A3), A1
```

12/4/2019 10:51:46 PM   Text Compare   Page 12
Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
        ADD         (A4),A1                      111516  ADDA.W  (A4), A1
        ADD         (A5),A1                      111518  ADDA.W  (A5), A1
        ADD         (A6),A1                      11151A  ADDA.W  (A6), A1
        ADD         (A7),A1                      11151C  ADDA.W  (A7), A1

            ; values from all address registers to
»   A2
        ADD         (A0),A2                      11151E  ADDA.W  (A0), A2
        ADD         (A1),A2                      111520  ADDA.W  (A1), A2
        ADD         (A2),A2                      111522  ADDA.W  (A2), A2
        ADD         (A3),A2                      111524  ADDA.W  (A3), A2
        ADD         (A4),A2                      111526  ADDA.W  (A4), A2
        ADD         (A5),A2                      111528  ADDA.W  (A5), A2
        ADD         (A6),A2                      11152A  ADDA.W  (A6), A2
        ADD         (A7),A2                      11152C  ADDA.W  (A7), A2
            ; values from all address registers to
»   A3
        ADD         (A0),A3                      11152E  ADDA.W  (A0), A3
        ADD         (A1),A3                      111530  ADDA.W  (A1), A3
        ADD         (A2),A3                      111532  ADDA.W  (A2), A3
        ADD         (A3),A3                      111534  ADDA.W  (A3), A3
        ADD         (A4),A3                      111536  ADDA.W  (A4), A3
        ADD         (A5),A3                      111538  ADDA.W  (A5), A3
        ADD         (A6),A3                      11153A  ADDA.W  (A6), A3
        ADD         (A7),A3                      11153C  ADDA.W  (A7), A3

            ; values from all address registers
»   to A4
        ADD         (A0),A4                      11153E  ADDA.W  (A0), A4
        ADD         (A1),A4                      111540  ADDA.W  (A1), A4
        ADD         (A2),A4                      111542  ADDA.W  (A2), A4
        ADD         (A3),A4                      111544  ADDA.W  (A3), A4
        ADD         (A4),A4                      111546  ADDA.W  (A4), A4
        ADD         (A5),A4                      111548  ADDA.W  (A5), A4
        ADD         (A6),A4                      11154A  ADDA.W  (A6), A4
        ADD         (A7),A4                      11154C  ADDA.W  (A7), A4

            ; values from all address registers to
»   A5
        ADD         (A0),A5                      11154E  ADDA.W  (A0), A5
        ADD         (A1),A5                      111550  ADDA.W  (A1), A5
        ADD         (A2),A5                      111552  ADDA.W  (A2), A5
        ADD         (A3),A5                      111554  ADDA.W  (A3), A5
        ADD         (A4),A5                      111556  ADDA.W  (A4), A5
        ADD         (A5),A5                      111558  ADDA.W  (A5), A5
        ADD         (A6),A5                      11155A  ADDA.W  (A6), A5
        ADD         (A7),A5                      11155C  ADDA.W  (A7), A5

            ; values from all address registers to
»   A6
        ADD         (A0),A6                      11155E  ADDA.W  (A0), A6
        ADD         (A1),A6                      111560  ADDA.W  (A1), A6
```

12/4/2019 10:51:46 PM   Text Compare   Page 13
Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
        ADD           (A2),A6                 111562  ADDA.W  (A2), A6
        ADD           (A3),A6                 111564  ADDA.W  (A3), A6
        ADD           (A4),A6                 111566  ADDA.W  (A4), A6
        ADD           (A5),A6                 111568  ADDA.W  (A5), A6
        ADD           (A6),A6                 11156A  ADDA.W  (A6), A6
        ADD           (A7),A6                 11156C  ADDA.W  (A7), A6

        ; values from all address registers to
»  A7
        ADD           (A0),A7                 11156E  ADDA.W  (A0), A7
        ADD           (A1),A7                 111570  ADDA.W  (A1), A7
        ADD           (A2),A7                 111572  ADDA.W  (A2), A7
        ADD           (A3),A7                 111574  ADDA.W  (A3), A7
        ADD           (A4),A7                 111576  ADDA.W  (A4), A7
        ADD           (A5),A7                 111578  ADDA.W  (A5), A7
        ADD           (A6),A7                 11157A  ADDA.W  (A6), A7
        ADD           (A7),A7                 11157C  ADDA.W  (A7), A7

        ; post-increment from all address regi
» sters to A0
        ADD           (A0)+,A0                11157E  ADDA.W  (A0)+, A0
        ADD           (A1)+,A0                111580  ADDA.W  (A1)+, A0
        ADD           (A2)+,A0                111582  ADDA.W  (A2)+, A0
        ADD           (A3)+,A0                111584  ADDA.W  (A3)+, A0
        ADD           (A4)+,A0                111586  ADDA.W  (A4)+, A0
        ADD           (A5)+,A0                111588  ADDA.W  (A5)+, A0
        ADD           (A6)+,A0                11158A  ADDA.W  (A6)+, A0
        ADD           (A7)+,A0                11158C  ADDA.W  (A7)+, A0

        ; post-increment from all address regi
» sters to A1
        ADD           (A0)+,A1                11158E  ADDA.W  (A0)+, A1
        ADD           (A1)+,A1                111590  ADDA.W  (A1)+, A1
        ADD           (A2)+,A1                111592  ADDA.W  (A2)+, A1
        ADD           (A3)+,A1                111594  ADDA.W  (A3)+, A1
        ADD           (A4)+,A1                111596  ADDA.W  (A4)+, A1
        ADD           (A5)+,A1                111598  ADDA.W  (A5)+, A1
        ADD           (A6)+,A1                11159A  ADDA.W  (A6)+, A1
        ADD           (A7)+,A1                11159C  ADDA.W  (A7)+, A1

        ; post-increment from all address regi
» sters to A2
        ADD           (A0)+,A2                11159E  ADDA.W  (A0)+, A2
        ADD           (A1)+,A2                1115A0  ADDA.W  (A1)+, A2
        ADD           (A2)+,A2                1115A2  ADDA.W  (A2)+, A2
        ADD           (A3)+,A2                1115A4  ADDA.W  (A3)+, A2
        ADD           (A4)+,A2                1115A6  ADDA.W  (A4)+, A2
        ADD           (A5)+,A2                1115A8  ADDA.W  (A5)+, A2
        ADD           (A6)+,A2                1115AA  ADDA.W  (A6)+, A2
        ADD           (A7)+,A2                1115AC  ADDA.W  (A7)+, A2

        ; post-increment from all address regi
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
» sters to A3
     ADD          (A0)+,A3                      1115AE  ADDA.W   (A0)+, A3
     ADD          (A1)+,A3                      1115B0  ADDA.W   (A1)+, A3
     ADD          (A2)+,A3                      1115B2  ADDA.W   (A2)+, A3
     ADD          (A3)+,A3                      1115B4  ADDA.W   (A3)+, A3
     ADD          (A4)+,A3                      1115B6  ADDA.W   (A4)+, A3
     ADD          (A5)+,A3                      1115B8  ADDA.W   (A5)+, A3
     ADD          (A6)+,A3                      1115BA  ADDA.W   (A6)+, A3
     ADD          (A7)+,A3                      1115BC  ADDA.W   (A7)+, A3

         ; post-increment from all address regi
» sters to A4
     ADD          (A0)+,A4                      1115BE  ADDA.W   (A0)+, A4
     ADD          (A1)+,A4                      1115C0  ADDA.W   (A1)+, A4
     ADD          (A2)+,A4                      1115C2  ADDA.W   (A2)+, A4
     ADD          (A3)+,A4                      1115C4  ADDA.W   (A3)+, A4
     ADD          (A4)+,A4                      1115C6  ADDA.W   (A4)+, A4
     ADD          (A5)+,A4                      1115C8  ADDA.W   (A5)+, A4
     ADD          (A6)+,A4                      1115CA  ADDA.W   (A6)+, A4
     ADD          (A7)+,A4                      1115CC  ADDA.W   (A7)+, A4

         ; post-increment from all address regi
» sters to A5
     ADD          (A0)+,A5                      1115CE  ADDA.W   (A0)+, A5
     ADD          (A1)+,A5                      1115D0  ADDA.W   (A1)+, A5
     ADD          (A2)+,A5                      1115D2  ADDA.W   (A2)+, A5
     ADD          (A3)+,A5                      1115D4  ADDA.W   (A3)+, A5
     ADD          (A4)+,A5                      1115D6  ADDA.W   (A4)+, A5
     ADD          (A5)+,A5                      1115D8  ADDA.W   (A5)+, A5
     ADD          (A6)+,A5                      1115DA  ADDA.W   (A6)+, A5
     ADD          (A7)+,A5                      1115DC  ADDA.W   (A7)+, A5

         ; post-increment from all address regi
» sters to A6
     ADD          (A0)+,A6                      1115DE  ADDA.W   (A0)+, A6
     ADD          (A1)+,A6                      1115E0  ADDA.W   (A1)+, A6
     ADD          (A2)+,A6                      1115E2  ADDA.W   (A2)+, A6
     ADD          (A3)+,A6                      1115E4  ADDA.W   (A3)+, A6
     ADD          (A4)+,A6                      1115E6  ADDA.W   (A4)+, A6
     ADD          (A5)+,A6                      1115E8  ADDA.W   (A5)+, A6
     ADD          (A6)+,A6                      1115EA  ADDA.W   (A6)+, A6
     ADD          (A7)+,A6                      1115EC  ADDA.W   (A7)+, A6

         ; post-increment from all address reg
» isters to A7
     ADD          (A0)+,A7                      1115EE  ADDA.W   (A0)+, A7
     ADD          (A1)+,A7                      1115F0  ADDA.W   (A1)+, A7
     ADD          (A2)+,A7                      1115F2  ADDA.W   (A2)+, A7
     ADD          (A3)+,A7                      1115F4  ADDA.W   (A3)+, A7
     ADD          (A4)+,A7                      1115F6  ADDA.W   (A4)+, A7
     ADD          (A5)+,A7                      1115F8  ADDA.W   (A5)+, A7
     ADD          (A6)+,A7                      1115FA  ADDA.W   (A6)+, A7
```

(continued)

```
      ADD            (A7)+,A7                      1115FC  ADDA.W  (A7)+, A7


      ; pre-decrement from all address regis
» ters to A0
      ADD            -(A0),A0                      1115FE  ADDA.W  -(A0), A0
      ADD            -(A1),A0                      111600  ADDA.W  -(A1), A0
      ADD            -(A2),A0                      111602  ADDA.W  -(A2), A0
      ADD            -(A3),A0                      111604  ADDA.W  -(A3), A0
      ADD            -(A4),A0                      111606  ADDA.W  -(A4), A0
      ADD            -(A5),A0                      111608  ADDA.W  -(A5), A0
      ADD            -(A6),A0                      11160A  ADDA.W  -(A6), A0
      ADD            -(A7),A0                      11160C  ADDA.W  -(A7), A0


      ; pre-decrement from all address regis
» ters to A1
      ADD            -(A0),A1                      11160E  ADDA.W  -(A0), A1
      ADD            -(A1),A1                      111610  ADDA.W  -(A1), A1
      ADD            -(A2),A1                      111612  ADDA.W  -(A2), A1
      ADD            -(A3),A1                      111614  ADDA.W  -(A3), A1
      ADD            -(A4),A1                      111616  ADDA.W  -(A4), A1
      ADD            -(A5),A1                      111618  ADDA.W  -(A5), A1
      ADD            -(A6),A1                      11161A  ADDA.W  -(A6), A1
      ADD            -(A7),A1                      11161C  ADDA.W  -(A7), A1


      ; pre-decrement from all address regis
» ters to A2
      ADD            -(A0),A2                      11161E  ADDA.W  -(A0), A2
      ADD            -(A1),A2                      111620  ADDA.W  -(A1), A2
      ADD            -(A2),A2                      111622  ADDA.W  -(A2), A2
      ADD            -(A3),A2                      111624  ADDA.W  -(A3), A2
      ADD            -(A4),A2                      111626  ADDA.W  -(A4), A2
      ADD            -(A5),A2                      111628  ADDA.W  -(A5), A2
      ADD            -(A6),A2                      11162A  ADDA.W  -(A6), A2
      ADD            -(A7),A2                      11162C  ADDA.W  -(A7), A2


      ; pre-decrement from all address regis
» ters to A3
      ADD            -(A0),A3                      11162E  ADDA.W  -(A0), A3
      ADD            -(A1),A3                      111630  ADDA.W  -(A1), A3
      ADD            -(A2),A3                      111632  ADDA.W  -(A2), A3
      ADD            -(A3),A3                      111634  ADDA.W  -(A3), A3
      ADD            -(A4),A3                      111636  ADDA.W  -(A4), A3
      ADD            -(A5),A3                      111638  ADDA.W  -(A5), A3
      ADD            -(A6),A3                      11163A  ADDA.W  -(A6), A3
      ADD            -(A7),A3                      11163C  ADDA.W  -(A7), A3


      ; pre-decrement from all address regis
» ters to A4
      ADD            -(A0),A4                      11163E  ADDA.W  -(A0), A4
      ADD            -(A1),A4                      111640  ADDA.W  -(A1), A4
      ADD            -(A2),A4                      111642  ADDA.W  -(A2), A4
      ADD            -(A3),A4                      111644  ADDA.W  -(A3), A4
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Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
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```
        ADD        -(A4),A4              111646   ADDA.W   -(A4), A4
        ADD        -(A5),A4              111648   ADDA.W   -(A5), A4
        ADD        -(A6),A4              11164A   ADDA.W   -(A6), A4
        ADD        -(A7),A4              11164C   ADDA.W   -(A7), A4

        ; pre-decrement from all address regis
»  ters to A5
        ADD        -(A0),A5              11164E   ADDA.W   -(A0), A5
        ADD        -(A1),A5              111650   ADDA.W   -(A1), A5
        ADD        -(A2),A5              111652   ADDA.W   -(A2), A5
        ADD        -(A3),A5              111654   ADDA.W   -(A3), A5
        ADD        -(A4),A5              111656   ADDA.W   -(A4), A5
        ADD        -(A5),A5              111658   ADDA.W   -(A5), A5
        ADD        -(A6),A5              11165A   ADDA.W   -(A6), A5
        ADD        -(A7),A5              11165C   ADDA.W   -(A7), A5

        ; pre-decrement from all address regis
»  ters to A6
        ADD        -(A0),A6              11165E   ADDA.W   -(A0), A6
        ADD        -(A1),A6              111660   ADDA.W   -(A1), A6
        ADD        -(A2),A6              111662   ADDA.W   -(A2), A6
        ADD        -(A3),A6              111664   ADDA.W   -(A3), A6
        ADD        -(A4),A6              111666   ADDA.W   -(A4), A6
        ADD        -(A5),A6              111668   ADDA.W   -(A5), A6
        ADD        -(A6),A6              11166A   ADDA.W   -(A6), A6
        ADD        -(A7),A6              11166C   ADDA.W   -(A7), A6

        ; pre-decrement from all address regis
»  ters to A7
        ADD        -(A0),A7              11166E   ADDA.W   -(A0), A7
        ADD        -(A1),A7              111670   ADDA.W   -(A1), A7
        ADD        -(A2),A7
        ADD        -(A3),A7
        ADD        -(A4),A7
        ADD        -(A5),A7
        ADD        -(A6),A7
        ADD        -(A7),A7

        ; immediate to all data registers
        ADD        #01,D0
        ADD        #01,D1
        ADD        #01,D2
        ADD        #01,D3
        ADD        #01,D4
        ADD        #01,D5
        ADD        #01,D6
        ADD        #01,D7
        ; immediate to all address register
        ADD        #01,A0
        ADD        #01,A1
        ADD        #01,A2
        ADD        #01,A3
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
    ADD          #01,A4
    ADD          #01,A5
    ADD          #01,A6
    ADD          #01,A7
        ; immediate to all address register va
»  lues
    ADD          #01,(A0)
    ADD          #01,(A1)
    ADD          #01,(A2)
    ADD          #01,(A3)
    ADD          #01,(A4)
    ADD          #01,(A5)
    ADD          #01,(A6)
    ADD          #01,(A7)
        ; immediate to all address register wi
»  th post increment
    ADD          #01,(A0)+
    ADD          #01,(A1)+
    ADD          #01,(A2)+
    ADD          #01,(A3)+
    ADD          #01,(A4)+
    ADD          #01,(A5)+
    ADD          #01,(A6)+
    ADD          #01,(A7)+
        ; immediate to all address register wi
»  th pre-decrement
    ADD          #01,-(A0)
    ADD          #01,-(A1)
    ADD          #01,-(A2)
    ADD          #01,-(A3)
    ADD          #01,-(A4)
    ADD          #01,-(A5)
    ADD          #01,-(A6)
    ADD          #01,-(A7)
        ; absolute short to all data registers
    ADD          $01,D0
    ADD          $01,D1
    ADD          $01,D2
    ADD          $01,D3
    ADD          $01,D4
    ADD          $01,D5
    ADD          $01,D6
    ADD          $01,D7
        ; absolute long to all data registers
    ADD          $0A05,A0
    ADD          $0A05,A1
    ADD          $0A05,A2
    ADD          $0A05,A3
    ADD          $0A05,A4
    ADD          $0A05,A5
    ADD          $0A05,A6
    ADD          $0A05,A7
```

Left file: D:\Source\github\CSS422_Hardware\Disassembler\UnitTests\Test_002.X68
Right file: D:\Source\github\CSS422_Hardware\Disassembler\Output.txt
(continued)

```
*~Font name~Courier New~
*~Font size~10~
*~Tab type~1~
*~Tab size~4~
```