AmigaFlight Binary Coded Decimal Instructions

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	TITLE : AmigaFlight Binary Coded Decimal Instructions	

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Chapter 1

AmigaFlight Binary Coded Decimal Instructions

1.1 AmigaFlight® Help: Binary Coded Decimal Instructions

```
Binary Coded Decimal Instructions
=================================

There are  three operations on numbers in BCD, each of which  operates on a
byte only (two decimal digits) and incorporate the extend flag:


  ABCD              Add Decimal with Extend
  NBCD              Negate Decimal with Extend
  SBCD              Subtract Decimal with Extend
```

1.2 AmigaFlight® Help: Add Decimal with Extend

```
ABCD  Add Decimal with Extend
=============================

  Add  the  source  operand to the  destination operand using Binary
  Coded   Decimal   (BCD)   arithmetic.  Store  the  result  in  the
  destination operand.

  Destn + Source + X  -> Destn


Assembler Syntax
----------------
  ABCD  Dy,Dx
  ABCD  -(Ay),-(Ax)


Data Size
---------
  Byte


Status Flags
```

```
------------
  N  Undefined
  Z  Clear if result non-zero else unchanged
  V  Undefined
  C  Set if carry (decimal) else clear
  X  Set same as carry


Instruction Size and Cycles to Execute
--------------------------------------
      # p
  Dy,Dx   2 6
  -(Ay),-(Ax) 2 18

  # = no. of program bytes
  p = no. of instruction clock periods
```

1.3 AmigaFlight® Help: Negate Decimal with Extend

```
NBCD  Negate Decimal with Extend
================================

  Subtract the destination operand and the  source  operand  and the
  extend bit from zero, and store the result back in the destination
  location. This produces a tens complement if  the extend bit is 0,
  a nines complement if it is set. This is a byte operation only.

  0 - Destn - X -> Destn


Assembler Syntax
----------------
  NBCD  <ea>

  <ea> - data alterable


Addressing Modes
----------------
  Mode             Source  Destination

  Data Register Direct      - *
  Address Register Direct     - -
  Address Register Indirect   - *
  Postincrement Register Indirect   - *
  Predecrement Register Indirect    - *
  Register Indirect with Offset   - *
  Register Indirect with Index    - *
  Absolute Short        - *
  Absolute Long       - *
  P.C. Relative with Offset   - -
  P.C. Relative with Index    - -
  Immediate       - -
```

```
Data Size
---------
  Byte


Status Flags
------------
  N  Undefined
  Z  Cleared if result non-zero, else unchanged
  V  Undefined
  C  Set if borrow (decimal), else cleared
  X  Set same as carry bit


Instruction Size and Cycles to Execute
--------------------------------------
  <ea>     # p
  Dn     2 6
  (An)     2 12
  (An)+    2 12
  -(An)    2 14
  d16(An)    4 16
  d8(An,Ri)  4 18
  Abs short  4 16
  Abs long   6 20

  # = no. of program bytes
  p = no. of instruction clock periods
```

1.4 AmigaFlight® Help: Subtract Decimal with Extend

```
SBCD  Subtract Decimal with Extend
==================================

  Subtract the  source  operand  from the destination  operand using
  binary  coded  decimal  (BCD) arithmetic. Store the  result in the
  destination operand.

  Destn - Source - X  -> Destn


Assembler Syntax
----------------
  SBCD  Dy,Dx
  SBCD  -(Ay),-(Ax)


Data Size
---------
  Byte


Status Flags
------------
  N  Undefined
```

```
  Z  Clear if result <> 0 else unchanged
  V  Undefined
  C  Set if borrow (decimal) else clear
  X  Set same as carry


Instruction Size and Cycles to Execute
--------------------------------------
       # p
  Dy,Dx   2 6
  -(Ay),-(Ax) 2 18

  # = no. of program bytes
  p = no. of instruction clock periods
```