

Quentin Sager Consulting, Inc.

[V&H COORDINATE CONVERSION UTILITY]

NALENND™ V&H coordinate batch conversion utility reference manual

This document contains the user reference specifications for the NALENND™ V&H coordinate batch conversion utility. These specifications are subject to change without notice.

NALENND™ V&H Coordinate Batch Conversion Utility Reference Manual
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The NALENND™ V&H Coordinate Batch Conversion Utility is a text mode, command line utility application for use on Microsoft® Windows® 95/98/ME/NT/2000/XP or newer operating systems. It consists of the single executable file *vhbatch.exe*. Installation of the utility is simply a matter of unzipping the file *clvhbatch.zip* to any folder or location on your computer.

COMMAND LINE OPTIONS

The action performed by the utility is determined by the options passed to it on the command line. The options must be preceded with either a hyphen '-' or a forward slash '/' with no space between it and the option character. Options may be specified in either upper or lower case with at least one space between each option.

Example: `vhbatch /M:V /S:datafile.csv`

Option	General Description
/M:mode	specifies conversion mode <ul style="list-style-type: none"> • V – source coordinates are V&H convert to Latitude and Longitude • L – source coordinates are Latitude and Longitude convert to V&H • A – calculated Airline Mileage from V&H coordinates • G – calculate Great Circle Distance from Latitude and Longitude
/T:output filename	Target file name for the converted data. You can either specify a filename to have the utility write directly to the file or redirect the utility's output to a specific file name from the command line. The default behavior is output to the console (screen).
/S:input filename	Source file name containing the data. This is the name of the CSV data file you wish to convert from.
/A	Data is converted and the converted values are appended to the end of record.
/R	Data is converted in replace mode. In this mode the original coordinate data is replaced with the converted values.
/D:delimiter	The delimiter used to separate field values in the source data file. The default value is a comma. If the data file uses a different delimiter, such as a colon or semicolon you will need to specify its literal value via this parameter. If the data file uses a tab or space character as a delimiter you can only specify it via the keyword TAB or SPACE.
/V:label	Specifies the field or column name from the header row in the data file of either the Vertical Coordinate or Latitude (depending on the conversion).
/V1:label	This option is interchangeable with the /V: option. It is used to specify the first vertical coordinate label when performing distance calculations
/V2:label	Specifies the second field or column name from the header row in the data file of either the Vertical Coordinate or Latitude when performing distance calculations.
/H:label	Specifies the field or column name from the header row in the data file of either the Horizontal Coordinate or Longitude (depending on the conversion).
/H1:label	This option is interchangeable with the /H: option. It is used to specify the first horizontal coordinate label when performing distance calculations
/H2:label	Specifies the second field or column name from the header row in the data file of either the Horizontal Coordinate or Longitude when performing distance calculations.
/Q	Round converted coordinate values. When converting from Latitude/Longitude rounds fractional V&H coordinates to the next whole value. When converting from V&H rounds Latitude/Longitude to 4 decimal places (default is 12 decimal places).
/C:vertical, horizontal	This option allows you to perform a single conversion of a single input coordinate pair. This option is ignored in batch mode.

INPUT DATA FILE REQUIREMENTS

The utility can perform batch conversions from any ASCII text delimited source file. The only requirements for the file are (1) it is ASCII text with each field or column separated by a single delimiting character and (2) the first row or line of the data file contains the delimited field or column names to identify your data (3) the maximum length for any line (including delimiters) cannot be greater than 4,092 characters.

The specific information required to perform a batch conversion are: the name of the source data file, the single character delimiter used to separate its field values, and the Vertical and Horizontal Coordinate (or Latitude and Longitude Coordinate) field names.

Command Line Examples:

We want to convert fields from the following CSV data file named `npanxxdata.csv`:

```
NPA,NXX,LATITUDE, LONGITUDE, RCSHORT, RV, RH
201,200,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,202,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,204,40.7148,-74.0371,JERSEYCITY,5006.00,1409.00
201,206,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,207,40.7394,-74.1714,NEWARK,5015.00,1430.00
201,208,40.7357,-74.1750,JERSEYCITY,5006.00,1409.00
201,209,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,210,40.7357,-74.1750,UNION CITY,4995.00,1415.00
```

The input file name is `npanxxdata.csv`, the name of the vertical coordinate column is **RV**, the name of the horizontal coordinate is **RH**, we are converting from V&H to Latitude and Longitude, and the file uses a comma delimiter.

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v
```

We want to convert fields from the following data file named `npanxxdata.csv`:

```
NPA~NXX~LATITUDE~LONGITUDE~RCSHORT~RV~RH
201~200~40.7175~-74.0722~JERSEYCITY~5006.00~1409.00
201~202~40.8870~-74.0391~HACKENSACK~4976.00~1432.00
201~204~40.7148~-74.0371~JERSEYCITY~5006.00~1409.00
201~206~40.8870~-74.0391~HACKENSACK~4976.00~1432.00
201~207~40.7394~-74.1714~NEWARK~5015.00~1430.00
201~208~40.7357~-74.1750~JERSEYCITY~5006.00~1409.00
201~209~40.7175~-74.0722~JERSEYCITY~5006.00~1409.00
201~210~40.7357~-74.1750~UNION CITY~4995.00~1415.00
```

The input file name is `npanxxdata.csv`, the name of the vertical coordinate column is **LATITUDE**, the name of the horizontal coordinate is **LONGITUDE**, we are converting from Latitude and Longitude to V&H, and the file is tilde delimited.

```
vhbatch /s:npanxxdata.txt /v:latitude /h:longitude /m:L /d:~
```

CONVERSION OUTPUT

The first issue to consider when using the program is where will the output go. By default all output is sent to the display. The output can be written or sent to a file by specifying a target filename on the command line or simply redirecting the program's output.

Examples:

We want to convert fields from the following CSV data file named `npanxxdata.csv`:

```
NPA,NXX,LATITUDE, LONGITUDE, RCSHORT, RV, RH
201,200,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,202,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,204,40.7148,-74.0371,JERSEYCITY,5006.00,1409.00
201,206,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,207,40.7394,-74.1714,NEWARK,5015.00,1430.00
201,208,40.7357,-74.1750,JERSEYCITY,5006.00,1409.00
201,209,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,210,40.7357,-74.1750,UNION CITY,4995.00,1415.00
```

The input file name is `npanxxdata.csv`, the name of the vertical coordinate column is **RV**, the name of the horizontal coordinate is **RH**, we are converting from V&H to Latitude and Longitude, and the file uses a comma delimiter. Output is written to the file `convertdata.csv`.

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v /t:convertdata.csv
```

The same results could be achieved by redirecting or *piping* the program output.

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v > convertdata.csv
```

Which method you use to specify how output is handled depends upon your particular requirements.

OUTPUT FORMAT

The program supports three output format modes. Append the converted values to the end of the record, replace the coordinate pair field data with the converted values, and finally, create a separate output that contains the original values followed by the converted values (the default mode).

Examples:

Given the following CSV data file named npanxxdata.csv as input:

```
NPA,NXX,LATITUDE,LONGITUDE,RCSHORT,RV,RH
201,200,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,202,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,204,40.7148,-74.0371,JERSEYCITY,5006.00,1409.00
201,206,40.8870,-74.0391,HACKENSACK,4976.00,1432.00
201,207,40.7394,-74.1714,NEWARK,5015.00,1430.00
201,208,40.7357,-74.1750,JERSEYCITY,5006.00,1409.00
201,209,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00
201,210,40.7357,-74.1750,UNION CITY,4995.00,1415.00
```

The default behavior is to create a separate output that contains the original values followed by the converted values. **The command line:**

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v /t:convertdata.csv
```

Produces:

```
Vertical,Horizontal,Latitude,Longitude
4976.00,1432.00,40.8869,-74.0402
5006.00,1409.00,40.7148,-74.0383
4976.00,1432.00,40.8869,-74.0402
5015.00,1430.00,40.7394,-74.1725
5006.00,1409.00,40.7148,-74.0383
5006.00,1409.00,40.7148,-74.0383
4995.00,1415.00,40.7712,-74.0272
```

To replace the original values with the converted values use the command line option **/R**. **The command line:**

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v /r /t:convertdata.csv
```

Produces:

```
NPA,NXX,LATITUDE,LONGITUDE,RCSHORT,RV,RH
201,200,40.7175,-74.0722,JERSEYCITY,40.7148,-74.0383
201,202,40.8870,-74.0391,HACKENSACK,40.8869,-74.0402
201,204,40.7148,-74.0371,JERSEYCITY,40.7148,-74.0383
201,206,40.8870,-74.0391,HACKENSACK,40.8869,-74.0402
201,207,40.7394,-74.1714,NEWARK,40.7394,-74.1725
201,208,40.7357,-74.1750,JERSEYCITY,40.7148,-74.0383
201,209,40.7175,-74.0722,JERSEYCITY,40.7148,-74.0383
201,210,40.7357,-74.1750,UNION CITY,40.7712,-74.0272
```

In append mode the converted values are appended to the end of the current record. If converting from V&H to Latitude and Longitude the new column names are CVTLAT and CVTLON. If converting from Latitude and Longitude to V&H the new column names are CVTV and CVTH. To use this option mode you must specify the command line option **/A**. **The command line:**

```
vhbatch /s:npanxxdata.csv /v:RV /h:RH /m:v /a /t:convertdata.csv
```

Produces:

```
NPA,NXX,LATITUDE, LONGITUDE, RCSHORT, RV, RH, CVTLAT, CVTLON
201,200,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00,40.7148,-74.0383
201,202,40.8870,-74.0391,HACKENSACK,4976.00,1432.00,40.8869,-74.0402
201,204,40.7148,-74.0371,JERSEYCITY,5006.00,1409.00,40.7148,-74.0383
201,206,40.8870,-74.0391,HACKENSACK,4976.00,1432.00,40.8869,-74.0402
201,207,40.7394,-74.1714,NEWARK,5015.00,1430.00,40.7394,-74.1725
201,208,40.7357,-74.1750,JERSEYCITY,5006.00,1409.00,40.7148,-74.0383
201,209,40.7175,-74.0722,JERSEYCITY,5006.00,1409.00,40.7148,-74.0383
201,210,40.7357,-74.1750,UNION CITY,4995.00,1415.00,40.7712,-74.0272
```

DISTANCE CALCULATIONS

The utility can be used to calculate *Airline Mileage Distance* from V&H coordinate pairs and *Great Circle Distance* from Latitude and Longitude coordinate pairs. The distance calculations do not perform coordinate conversion meaning both coordinates must be either V&H or Latitude and Longitude coordinate pairs. Airline Mileage is only calculated from V&H coordinates and Great Circle Distance is only calculated from Latitude and Longitude.

Command line parameters are similar to the conversion parameters however you must specify the column labels for both sets of coordinate pairs and the type of distance calculation to perform. Output may be written to the console or file using the same parameters as coordinate conversions.

The following two command line examples perform identically. The input file name is **npanxx.csv**, The first set of coordinates are in columns **RV** and **RH** and the second set of coordinates are in columns **RV2** and **RH2**. The coordinates are V&H and we are calculating the Airline Mileage between the as specified via the **/m:a** option. Output is being written to the file named **test.csv**.

```
vhbatch /s:npanxx.csv /v:RV /h:RH /v2:RV2 /h2:RH2 /m:a /t:test.csv  
vhbatch /s:npanxx.csv /v1:RV /h1:RH /v2:RV2 /h2:RH2 /m:a /t:test.csv
```

DISTANCE CALCULATIONS OUTPUT

Output from the distance calculations are in ASCII text comma-separated-value CSV format only. The output contains a header row followed by the data rows. The record layout/data includes the original coordinate pairs, the actual calculated distance, and the rounded calculated distance. The column labels for the coordinate pair are named the same as the source data file. The calculated distance column is name **Distance**, and the rounded distance column is named **Rounded**.

V&H coordinate distance calculations are performed using the Airline Mileage Calculation algorithm as specified in NECA FCC Tariff No. 4. Distances calculated using decimal degree formates latitude and longitude are calculated using the Great Circle Distance algorithm.

ERROR REPORTING AND PROGRAM EXIT CODE

The utility reports errors through simple text messages and through the *Program Exit Code*. The program exit code can be tested programmatically through Windows® system API calls and by testing the batch file environment variable ERRORLEVEL. The utility *Program Exit Codes* are:

Result Code	Description
0	The program successfully completed the operation.
1	The input file specified by the /S: command line option could not be opened.
2	The conversion mode specified by the /M: command line option is invalid.
3	The vertical coordinate label specified by the /V: command line option was not found in the data file's header row.
4	The horizontal coordinate label specified by the /H: command line option was not found in the data file's header row.
5	The vertical and horizontal column labels specify the same column.
6	A vertical coordinate label was not specified by the /V: command line option.
7	A horizontal coordinate label was not specified by the /V: command line option.
8	The output target file specified by the /T: command line option is the same as the input file.
9	An input data file name is required and was not specified by the /S: command line option or is invalid.