USER'S GUIDE

MRF NAD

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MRF NAD 3.0 *USER'S GUIDE*

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© MRF Geosystems Corporation
Suite 200, 625 - 14th Street NW
Calgary, Alberta
CANADA T2N 2A1

Tel: (403) 216-5515
Fax: (403) 216-5518
Email: mrfsales@mrf.com
WWW: http://www.mrf.com

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Installation

On DOS and WINDOWS NT

Copy the executable file MRFNAD.MA from the supplied floppy diskette to $(MS)\MDLAPPS where all the MDL applications are stored.

Example: Assume that the floppy disk is on A: drive, your mdlapps directory is C:\USTATION\MDLAPPS, and your current directory is C:\MRFNAD. Use the following commands to install MRF NAD on DOS or WINDOWS NT:

```
COPY A:\MRFNAD.MA C:\USTATION\MDLAPPS
COPY A:\*.* C:\MRFNAD
```

On CLIX

Copy the executable file *mrfnad.ma* from the supplied floppy disk to *$(MS)/MDLAPPS* where all the MDL applications are stored.

Example: Assume your mdlapps directory is */usr/ip32/mstation/mdlapps*, and your current directory is */usr/mrfnad*, and is empty. Use the following steps to install MRF NAD on your CLIX workstation:

```
dtu -p mrfnad.ma /usr/ip32/mstation/mdlapps
dtu *.inf   /usr/mrfnad
dtu *.sh   /usr/mrfnad
dtu -p *.dgn /usr/mrfnad
dtu -p *.gsb /usr/mrfnad
```

The command **dtu** is used because all the files are stored in DOS format on the supplied diskette.

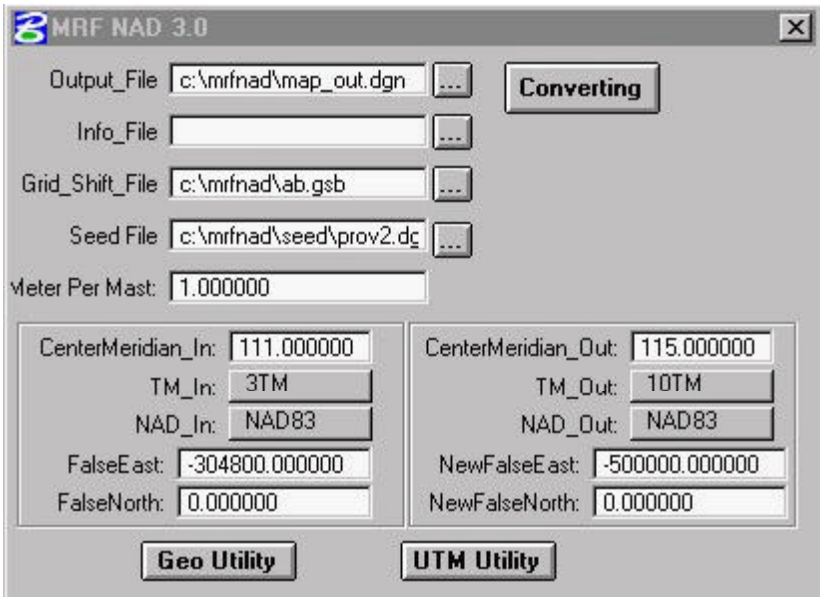
Introduction

Daxxes' MRF NAD is a transformation software for transferring 3TM, 6TM or 10TM coordinates (easting, northing) between the NAD27 and NAD83 reference systems. The transformation algorithm is based on Geodetic Canada's NTv2 software, it utilizes grid shift coordinates derived by Geomatics Canada for precise transformation.

MRF NAD takes a two-dimensional design file as input and processes lines, line strings, multi-lines, shapes, arcs, ellipses, curves, text, text nodes, complex chains, complex shapes, group holes, and unshared cell elements. MRF NAD uses user-specified false easting and false northing values for the input DGN file to calculate the coordinates of elements in the output file. The output file will keep the global origin defined in the input DGN file by default. For interchange between various agencies, where their standard specifies different global origins, the output file can inherit the desired global origin.

MRF NAD Parameters

MRF NAD parameters can be entered through a text file, which is optional for interactive processing, but necessary for batch processing. Parameters may also be entered interactively on the **MRF NAD** form. Interactive and batch processing will be covered later. This section will discuss how each parameter affects MRF NAD processing.



OUTPUT_FILE: (Optional, design file) This file holds the output. By default, the currently active design file is the output design file. As a result, MRF NAD will write the results back to the input file, overwriting the input. You can activate the file picker, the push-button beside the "Output File" field, to key in an output file name.

> Recommendation: MRF recommends that you always specify an output file to keep the original design file intact.

If you specify an existing design file, an alert dialog box will pop up and ask for permission to overwrite it. In batch mode, for safety purposes MRF NAD will not overwrite an existing file.

INFO_FILE: (Optional, ASCII text file) This text file contains the parameters for running MRF NAD when you want to ensure the same set of

parameters are applied to a set of files, or when MRF NAD is run in batch or command line mode. An option button can have as many values as the number of options: the first option is 1, the second 2, etc. The ordering of the options is the same as displayed in the dialog box.

The INFO file has the following format:

```
GRID_SHIFT_FILE: c:\mrfnad\ab.gsb
METER_PER_MAST: 1.0
SEED_FILE: c:\mrfnad\bow_hyb_seed.dgn
CENTER_MERIDIAN_IN: 111
TM_IN: 1
NAD_IN: 2
FALSE_EASTING: -304800
FALSE_NORTHING: 0
CENTER_MERIDIAN_OUT: 115
TM_OUT: 3;
NAD_OUT: 2;
NEW_FALSE_EASTING: -500000
NEW_FALSE_NORTHING: 0
```

Note that the format of the INFO file is important but the ordering of the parameters is not. All uppercase characters before ":" on each line in the above the INFO file template are considered as key words to MRF NAD. No space should be added before the keywords. Each parameter should occupy one line only. However, you can add comments in the file as shown below:

```
# Ab Env MISAM 3TM CM=111 NAD83 ---> Hyb 10TM CM=115 NAD83
#
GRID_SHIFT_FILE: c:\mrfnad\ab.gsb
METER_PER_MAST: 1.0
SEED_FILE: c:\mrfnad\bow_hyb_seed.dgn
#
# parameters for input
#
CENTER_MERIDIAN_IN: 111;  (3TM 111,114,117; 6TM 111,117; 10TM 115)
TM_IN: 1;                 (3TM 1; 6TM 2; 10TM 3)
NAD_IN: 2;                (NAD27 1; NAD83 2)
FALSE_EASTING: -304800
FALSE_NORTHING: 0
#
# parameters for output
#
CENTER_MERIDIAN_OUT: 115; (3TM 111,114,117; 6TM 111,117; 10TM 115)
TM_OUT: 3;                (3TM 1; 6TM 2; 10TM 3)
NAD_OUT: 2;               (NAD27 1; NAD83 2)
NEW_FALSE_EASTING: -500000
NEW_FALSE_NORTHING: 0
```

In the above example, the bold texts are all comments added to the INFO file. A semi-colon at the end of the command statements must precede comments on the command line. Parameters not specified in the INFO file will be set to defaults by MRF NAD.


Note: You can activate the file picker, the push-button beside the "Info File" field, to select an INFO file.

GRID_SHIFT_FILE: (Optional, binary file) This file contains information on shifts of latitude and longitude at pre-defined grids between the NAD27 and NAD83 reference systems. The grid shift file is licensed from Geodetic Canada and is included with MRF NAD. The file's extension is ".GSB", by default. If the grid shift file is not specified, MRF NAD assumes there are no shifts of latitude and longitude between the NAD27 and NAD83 reference systems.


Note: You can activate the file picker, the push-button beside the "Grid_Shift_File" field, to select a grid shift file.

SEED_FILE: (Optional) If the output file is to be assigned a different global origin then a seed file is used to define this new global origin values. Note the content of the seed file will be merged with the existing elements of the input file, this is useful to visually determine if the output file is correct. However it is not desirable to have a seed file with existing elements if you do not want new elements added to the input file. The simplest method to create an empty seed file is to create a new file and assign it the desired G.O. Alternatively if output file is available then make a copy and remove all elements in the copied file.

METER_PER_MAST: (Default is 1.0) If the master units of the design file are not meters, enter the appropriate multiple. For example, if design file master units are kilometers (km), enter a value of 1000 (i.e., 1000 m in 1 km).

FALSE_EASTING: (Default is 0.0) This field specifies the false easting value for the input DGN file. To find out whether a false easting applies to the input DGN file, you can use MicroStation's snapping tool to read out coordinates of a point or vertex. If the coordinate readout is not the true easting, a value other than 0.0 should be set in the FALSE_EASTING field. MRF NAD assumes the standard UTM false easting values of

500,000 m for 6TM data and 304,800 m for 3TM data. If this is not the case for the input design file, it is necessary to specify a value in the FALSE_EASTING field. The 'True Easting' is calculated as follows:

- Easting_from_DGN + FALSE_EASTING - 500,000 = True Easting for 6TM
- Easting_from_DGN + FALSE_EASTING - 304,800 = True Easting for 3TM

For example, an easting coordinate of 1,310,045 m is displayed in MicroStation. A user-specified FALSE_EASTING of -1,000,000 is entered to provide a valid easting of 310,045 m.

FALSE_NORTHING: (Default is 0.0) This field specifies the false northing value for the input DGN file. To find out whether you have a false northing for your DGN file, you can use MicroStation's snapping tool to read out coordinates of a point or vertex. If the coordinate readout is not the true northing, then you should set a value other than 0.0 in the "False Northing" field. MRF NAD assumes no false northing value for 6TM or 3TM data. If this is not the case for the input design file, it is necessary to specify a value in the FALSE_NORTHING field. The 'True Northing' is calculated for both 6TM and 3TM data as follows:

- Northing_from_DGN + FALSE_NORTHING = True Northing

For example, a northing coordinate of 1,110,045 m is displayed in MicroStation. A user-specified FALSE_NORTHING of 5,000,000 m is entered to provide a valid northing of 6,110,045 m.

CENTER_MERIDIAN_IN: (Default is 117 degrees for zone 11) This field specifies the center meridian, in degrees, for the region covered by your input DGN file. In Alberta the central meridian for 3TM is 111, 114, 117, 120; 6TM is 111, 117; 10TM is 115.

TM_IN: (Default is "6TM") This field specifies which Transverse Mercator (TM) projection is used for the input DGN file. Two options are implemented in the current version of MRF NAD:

Option 1: "3TM" - TM zone covers an area three degrees wide in longitude.
Option 2: "6TM" - TM zone covers an area six degrees wide in longitude.
Option 3: "10TM" - TM zone covers an area ten degrees wide in longitude.

NAD_IN: (Default is "NAD27") This field specifies which North American Datum (NAD) was used for input DGN file. Two options are available:

Option 1: "NAD27"
Option 2: "NAD83"

CENTER_MERIDIAN_OUT: (Default is 117 degrees for zone 11). This field specifies the center meridian, in degrees, for the region covered by your output DGN file. In Alberta the central meridian for 3TM is 111, 114, 117, 120; 6TM is 111, 117; 10TM is 115.

TM_OUT: (Default is "6TM") This field specifies which Transverse Mercator (TM) projection will be used for the output DGN file. Two options are implemented in the current version of MRF NAD:

Option 1: "3TM" - TM zone covers three degrees wide in longitude.
Option 2: "6TM" - TM zone covers six degrees wide in longitude.
Option 3: "10TM" - TM zone covers an area ten degrees wide in longitude.

NAD_OUT: (Default is "NAD27") This field specifies which North American Datum (NAD) will be used for the output DGN file. Two options are available:

Option 1: "NAD27"
Option 2: "NAD83"

GEO UTILITY: When this push-button is activated, a dialog box will pop up to let you perform a single point transformation. The input and output variables are all geographic coordinates (i.e. latitude, longitude) in degrees.

UTM UTILITY: When this push-button is activated, a dialog box will pop up to let you perform a single point transformation. The input and output variables are all TM coordinates (i.e. easting, northing) in meters. The UTM utility is based on mathematical routines that does not use the false easting/northing or the seed file's global origin. Only valid coordinates will be converted, anything outside the extent of the grid shift file is ignored.

CONVERTING: When this push-button is activated, MRF NAD will start processing. The status bar shows the percentage of completion for this conversion. If you want to abort MRF NAD while it is processing, enter CTRL+C ("^C"). When aborting MRF NAD under WINDOWS NT or WINDOWS 95, an "Alert" window will open. Click the "OK" button, and a "MicroStation" text window will open. If you do not want to exit MicroStation, do not close this text window.

Running MRF NAD Interactively

Follow these steps to load and run MRF NAD interactively:

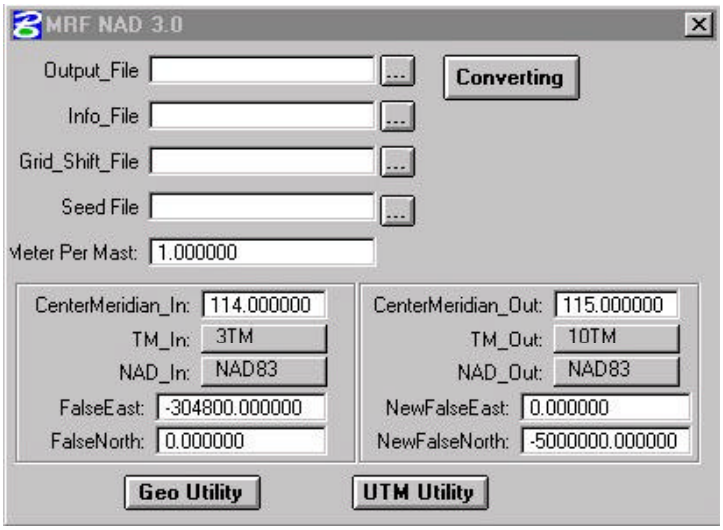
(1) Start MicroStation and open the design file to be processed.

(2) Choose "MDL Applications" from the "User" pull-down menu.

(3) Click "mrfnad.ma".

(4) Click push-button "Load".

MRF NAD is now loaded. A dialog box will pop up:



⇒ Tip: Steps (2) - (4) can be replaced by issuing one command: **mdl load mrfnad** under MicroStation's command window.

(5) Specify the full path for the OUTPUT design file in the "Output File" text field. If the specified OUTPUT file is an existing file, MRF NAD will give a warning, and ask you for permission to overwrite. If this field is not specified, the results will be written to the current design file. If you do not specify the full path, MRF NAD will create the OUTPUT file in the current directory. Alternatively, you can activate the file picker beside the "Output File" field to key in an OUTPUT design file in a specific directory.

(6) Optional: Specify the INFO file which contains the parameters for running MRF NAD. Alternatively, you can activate the file picker beside the "Info File" field to select an INFO file. If you have such a file, you may go directly to Step 11 to run MRF NAD, or to the next step to modify the parameters read from the INFO file. If you do not have an INFO file, go directly to Step 7.

(7) (Optional) Specify the SEED_FILE for your input value to inherit that file's global origin values. Normally the seed file does not contain elements, otherwise will be merged to the output file.

(8) Specify the CENTER_MERIDIAN_IN, TM_IN, NAD_IN for your input DGN file.

If the design file master units are not meters, enter a value in METER_PER_MAST.

Specify the FALSE_EASTING and FALSE_NORTHING.

Specify the CENTER_MERIDIAN_OUT, TM_OUT, NAD_OUT for your input design file.

Specify the NEW_FALSE_EASTING and NEW_FALSE_NORTHING.

(9) (Optional) Click push-button "Geo Utility". A dialog box will pop up to let you perform a single point geographic coordinate transformation.

Key in latitude and longitude (in degrees) in the input fields, and click the "Perform Geo Cal" push-button to start converting. The result will be shown in the output fields.

(10) (Optional) Click push-button "UTM Utility". A dialog box will pop up to let you perform a single point TM transformation.

Key in easting and northing values (in meters) in the input fields, and click the "Perform UTM Cal" push-button to start converting. The result will be shown in the output fields.

(11) Click push-button "Converting" to start the conversion. You can close any opened sub-dialog box before clicking the push-button.

If some input parameters are incorrect, MRF NAD will stop processing and display an error message in the "Error" field of the MicroStation Command Window.

Note: If you wish to stop MRF NAD press CTRL+C.

Upon completion, the output design file is automatically reloaded for you to see the result.

For more information about batch file processing, please refer to your **Microsoft operating system** documentation.

Batch Processing MRF NAD in DOS and WINDOWS NT

Using MS-DOS batch command processing can provide additional efficiency by processing large numbers of files without constant attention, or by increasing equipment usage by processing on evenings and weekends. MS-DOS batch commands can also be used to automate recurrent tasks. MRF NAD provides batch processing on all supported operating systems.

Under the DOS command prompt (open an MS-DOS Command window on Windows products), key in the following to start the MRF NAD process:

msbatch mrfnad.ma infofile.inf input.dgn output.dgn<CR>

The INPUT.DGN will be converted using the parameters specified in INFOFILE.INF and the OUTPUT.DGN will hold the results.

Note: OUTPUT.DGN should not be an existing design file. If OUTPUT.DGN is not specified, the result will be written back to INPUT.DGN.

File MSBATCH.BAT is in your MicroStation directory. You must have the MicroStation directory on your path (in the command window enter "set <CR>" to display the currently set system variables including the PATH variable). File MRFNAD.MA should be in your MDLAPPS directory. Files INFOFILE.INF and INPUT.DGN should be in your current directory, otherwise specify the directory location. File OUTPUT.DGN will be created in your current directory. If any of these files are not in the above-mentioned directories, you will need to specify the full directory path of the file.

To process two or more files in batch, you can create a batch file like the following:

```
-----------------------------------------------------
rem my_batch.bat
rem will process  input1.dgn and input2.dgn
rem
call msbatch mrfnad.ma infofile.inf input1.dgn output1.dgn
call msbatch mrfnad.ma c:\mrfnad\infofile.inf c:\project\input2.dgn
c:\project\output\input2.dgn
rem
echo MRF NAD Finished
-----------------------------------------------------
```

Note: The DOS batch command "call" must proceed the msbatch statement or msbatch will exit the batch file when it completes execution. Thus, all commands following msbatch will not be executed.

To execute the batch file from the DOS command prompt key in:

my_batch.bat <CR>

Batch Processing MRF NAD in CLIX

Using CLIX command line or shell batch processing can provide efficiency by processing large numbers of files without requiring constant attention, or by increasing equipment usage by processing on evenings and weekends. Batch files or shell scripts can also be used to automate recurrent tasks. MRF NAD provides batch processing on all supported operating systems.

For more information about batch file processing, please refer to your **CLIX operating system** documentation.

Under operating system prompt, key in:

msbatch.sh mrfnad.ma infofile.inf input.dgn output.dgn

The *input.dgn* will be converted using parameters specified in *infofile.inf* and the *output.dgn* will hold the result.

Note: *output.dgn* should not be an existing design file. If *output.dgn* is not specified, the result will be written back to *input.dgn*.

Shell script *msbatch.sh* is in your MicroStation directory. Its contents should be:

```
#!/bin/sh
#  $1    should be the name of the application (ex. msbatch.sh cnvdgn)
#  $2-$9 are other parameters to be passed through to the application
#

/usr/ip32/mstation/ustation32 -wa$1 -i$2 -i$3 -i$4 -i$5 -i$6 -i$7 -i$8 -i$9
```

It is assumed that your MicroStation directory is on your path. File *mrfnad.ma* should be in your MDLAPPS directory. Files *infofile.inf* and *input.dgn* should be in your current directory. File *output.dgn* will be created in your current directory. If these files are not in the above-mentioned directories, you will need to specify the full path of the files.

To process two or more files in batch, you can create a shell script (*my_script*) with the following contents:

```
msbatch.sh mrfnad.ma infofile.inf input1.dgn output1.dgn
msbatch.sh mrfnad.ma infofile.inf input2.dgn output2.dgn
                .....
```

And run the shell script under operating system prompt: **my_script**

Learning MRF NAD with Example Design Files

You are encouraged to use the supplied example design files to see how MRF NAD works. The MicroStation tool "Analyze" can be used to verify the output elements. Remember to check the coordinate values in MicroStation to understand how False Easting and False Northing values are used. See pages 7 and 8 for more details.

Example 1

input design file:	example1.dgn
info file:	example1.inf
false_easting:	0.0
false_northing:	0.0

Example 2

input design file:	example2.dgn
info file:	example2.inf
false_easting:	1000000
false_northing:	-5000000

Upgrade and Technical Support

If you purchased Daxxes' MRF NAD from an authorized Daxxes dealer, you can receive free technical support from your dealer for thirty (30) days from the date of purchase. Daxxes GSG has an optional maintenance plan that covers technical support and upgrades. Please contact Daxxes for more details.

How to Contact MRF Geosystems

If you have suggestions that will make MRF NAD a better product, or need further information about MRF NAD and related products, please contact:

MRF Geosystems Corporation
Suite 200, 625 - 14 Street NW
Calgary, Alberta
Canada T2N 2A1

Tel: (403) 216-5515
Fax: (403) 216-5518
E-mail: mrfsales@mrf.com

Thank you for choosing MRF NAD!

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Suite 200, 625- 14th Street NW
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Phone: (403) 216-5515 **Fax: (403) 216-5518**

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YEAR MONTH DAY

SERIAL NUMBER:

PREVIOUS VERSION SERIAL NUMBER: (required for upgrades)

LAST NAME:

FIRST NAME:

INITIAL:

TITLE:

COMPANY:

STREET:

CITY:

STATE/PROVINCE:

ZIP/POSTAL CODE:

COUNTRY:

TELEPHONE NUMBER :

FAX NUMBER:

Upgrading to a subsequent version of this Daxxes MRF product requires product registration.

By signing and returning this End User Registration Card, you confirm that you have read the License Agreement included with this MRF product, and that you agree to be bound by its terms and conditions.

END USER SIGNATURE

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