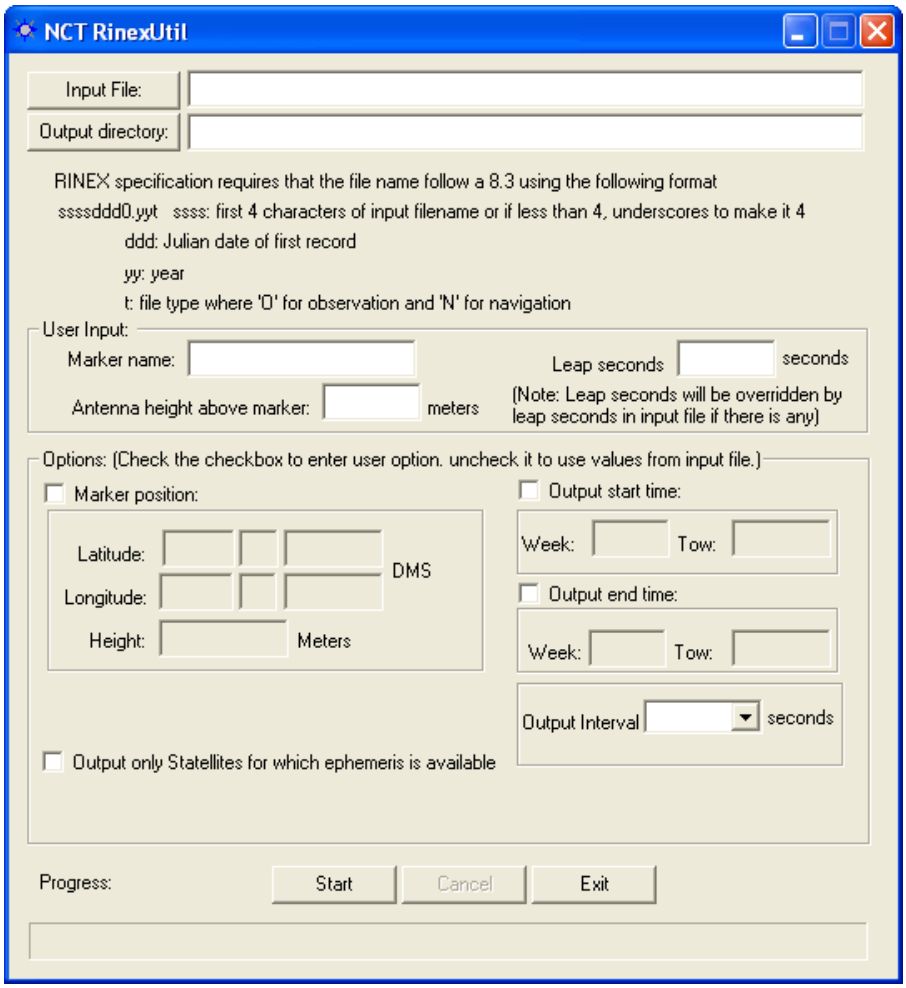
RINEX Utility

NavCom Technology



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Notices

RINEX Utility

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Revision History

Revision A (Jun 2006)	Initial release
Revision B (Dec 2006)	Updated graphics; updated ‘Known Issues’; Format change

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Use of this Document

This User Guide is intended to be used by someone familiar with the concepts of *GPS* and satellite surveying equipment.

Note indicates additional information to make better use of the product.

This symbol means *Reader Be Careful*. Indicates a caution, care, and/or safety situation. The user might do something that could result in equipment damage or loss of data.

This symbol means *Danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical and RF circuitry and be familiar with standard practices for preventing accidents.

Overview of the RINEX Utility

The RINEX Utility converts NCT (NavCom Technology) binary raw data (0xB0, 0xB1, and 0x44 messages) to RINEX v2.1 format. Converting NCT raw data to RINEX provides a means to post-process the raw data where third party software packages do not support the NCT Binary format, but do possess the ability to import RINEX Standard measurement data.

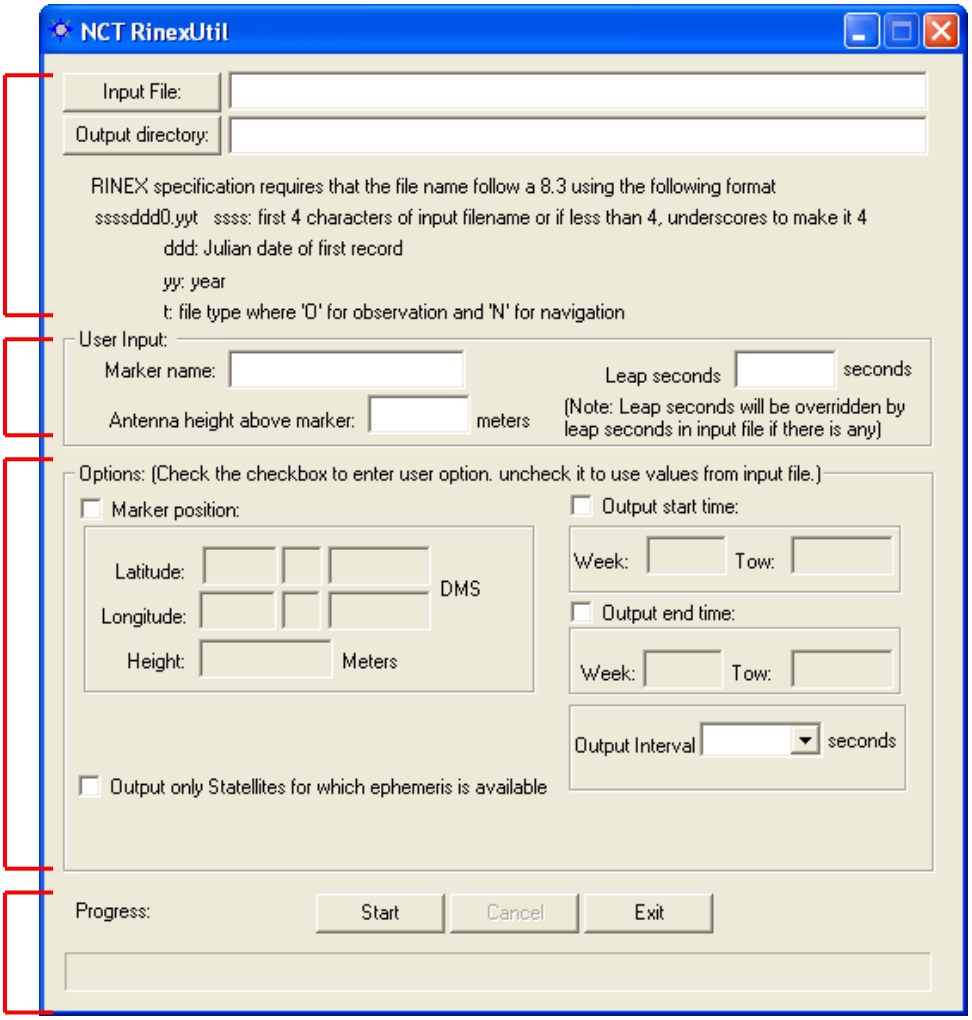

Figure 1: NavCom RINEX Utility

The NCT RINEX converter utility GUI is divided into four major areas:

- File I/O
- User Input
- Options
- Execution and Progress

File I/O

Click the ***Input File*** button to navigate your way to the file path of the source NCT Binary files. A Windows® dialog box, similar to Figure 2, will open. Locate the "*.dat*" extension files in the appropriate source directory. This tells the RINEX utility where to get your data from.

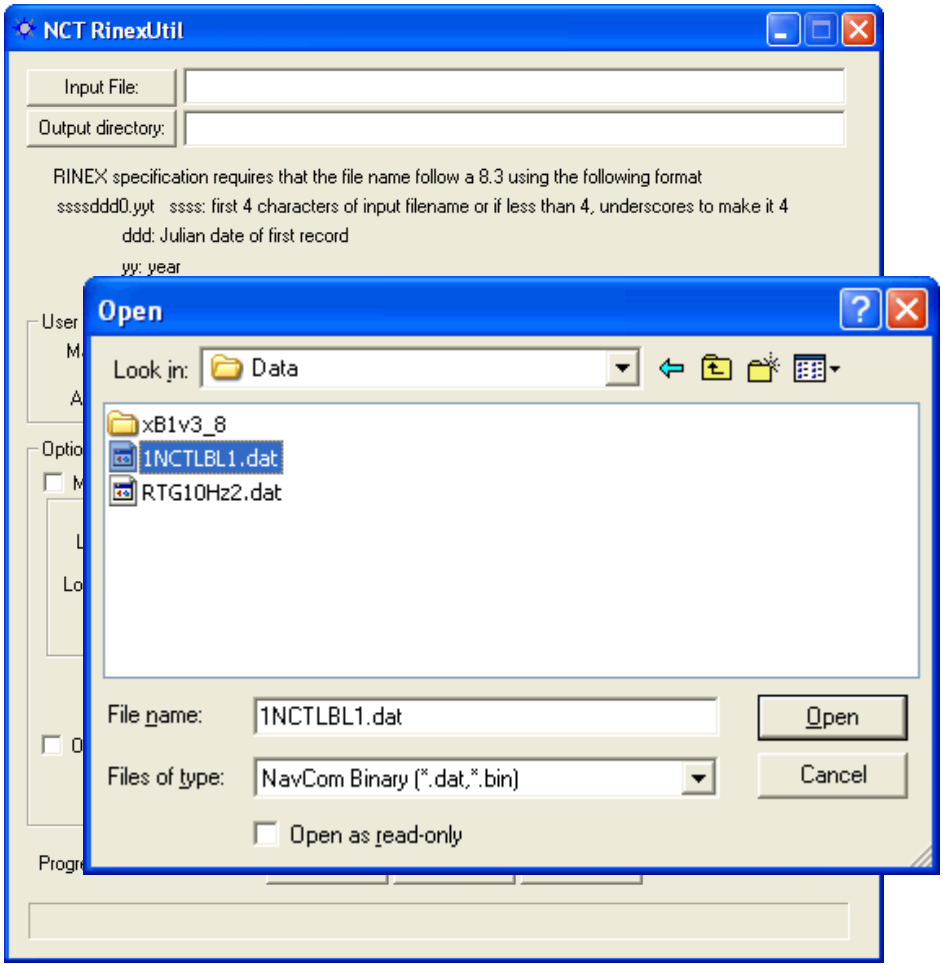

Figure 2: Input File Dialog

After selecting the file to convert, click the **Open** *button.*

RINEX requires the file naming convention to follow a specific format. The easiest way to relate files is to use the same name convention for all related files in a given directory and to use separate directors for files recorded on the same date. The file naming convention is as follows:

- ✓ File names are limited to 8 characters followed by a 3 character extension (MS-DOS compatible; ssssddd0.yyt)
- ✓ ssss = a unique file identifier. All four characters must be used. If less than 4 characters are used, enter "_" (underscore) to fill the space. Any alpha-numeric character is acceptable (A-Z and 0 -9)
- ✓ ddd = the julian date of the year; i.e. March 23, 2007 = julian date 082
- ✓ 0 = required fill character
- ✓ yy = last two digits of the calendar year
- ✓ t = file type; the output files will be tagged as either O for observation or N for navigation

In a similar fashion, the ***Output Directory*** button tells the RINEX Utility where to place the converted files when the process is complete. Most users create a sub-directory in their data folder, so that related data sets stay together. Set the path to the folder where the converted files are to be placed. Figure 3 depicts a typical window display.

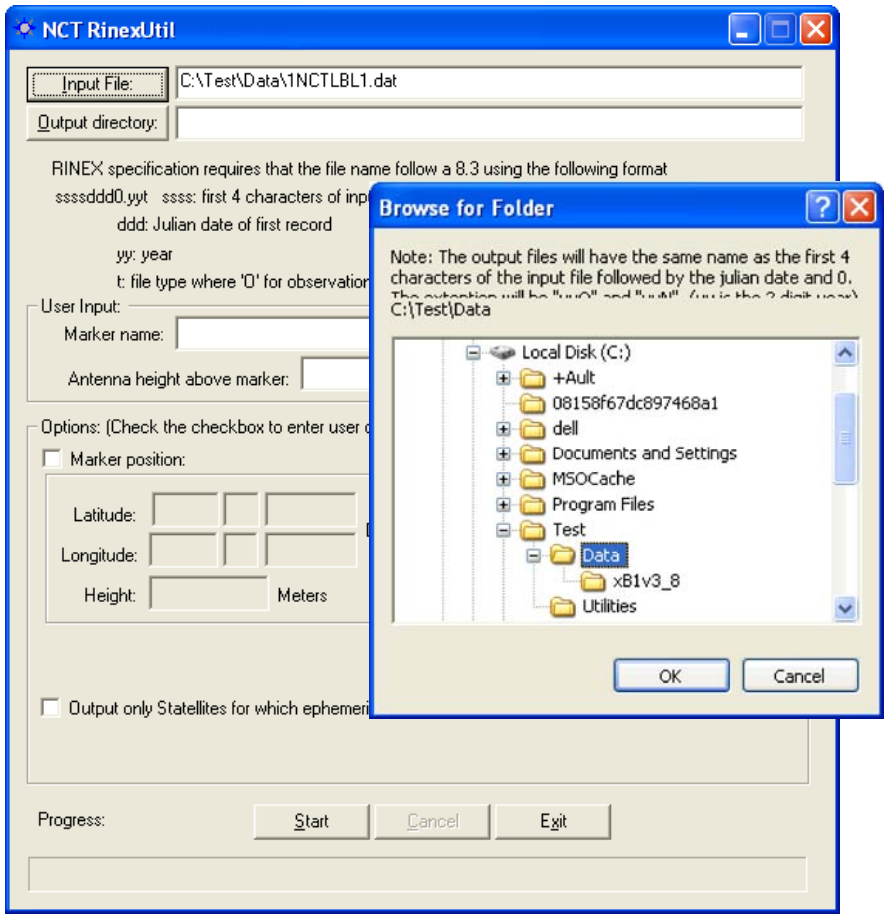

Figure 3: Output File Dialog

After selecting a location to save the RINEX files, click OK.

Options are not always necessary to complete the conversion. Entering User Input or Option data updates the RINEX header with user specific information. To skip the Options menu, simply click the **START** button and the RINEX files will be generated without any USER INPUT data or OPTIONS being entered, however the RINEX observations file header will only show the default information shown in Table 1.

User Input

Figure 3 depicts the User Input area of the RINEX Utility. Completing these fields is optional. Entries in these fields will be included in the RINEX observations or ephemeris file header.

Marker name: This field allows up to 60 characters to identify the site where the data was collected.

Leap seconds: This field allows the user to insert the current GPS Leap Second value, if known. If left blank no leap second value will be reported in the RINEX ephemeris (navigation) file header, or the RINEX Utility will use the leap second time reported in the raw data file (if one exists). If the raw data file has a larger leap second value reported than the user entered value, the raw data file value will be used instead.

Antenna height above marker: This field allows the user to insert antenna base height above the survey point. This adjustment can often be made in the Post Processing Software package as well.

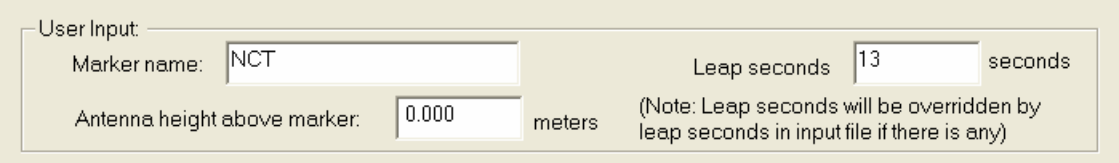

Figure 4: RINEX Converter User Input Area

Options

Figure 5 depicts the Options area of the RINEX Utility. To modify an option, the box above and/or to the left must be "checked" (✓).

Marker Position: When enabled, allows the user to input the Latitude, Longitude, and Height of the surveyed position in Degrees Minutes and Seconds. These coordinates are converted to Cartesian ECEF format and inserted into the "Approximate Position XYZ" area of the RINEX observation file. If left disabled, the RINEX Utility will average the position based on the range measurements received from the total number of epochs in the data collection period.

RINEX Utility conforms to RINEX Standard 2.10, which states that the Cartesian ECEF position in the observation file header is WGS84. This means that the height entered in the RINEX Utility must be WGS84. The RINEX Utility makes no attempt to convert other datum heights to WGS84. Using height data from a datum other than WGS84 will result in errors in the Z-axis.

Output start time / Output end time: When enabled, the Output Start and Output End times allow the user to parse a large raw data file into a smaller snap shot of the overall data collection period.

Caveats are that the GPS week number (0 – 1023), and the GPS Time Of Week (TOW in seconds 0 – 604800) be entered. If disabled, the RINEX Utility will process the entire data collection period.

Ephemeris Output: When enabled, outputs the ephemeris (navigation) file, but only ephemeris data for those satellites that have been tracked over the data collection period. If disabled the ephemeris file will contain data on all satellites.

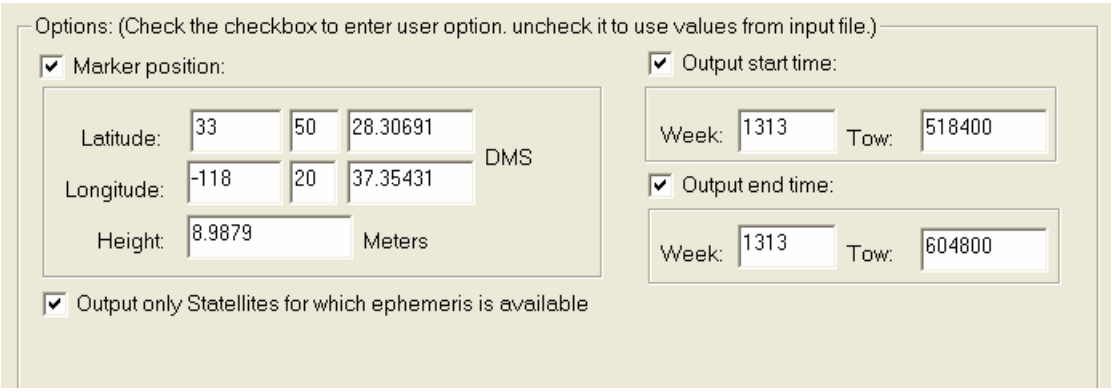

Figure 5: RINEX Converter Options Area

Leap Seconds	0 or Last Entered
Marker Name	None or Last Entered
Antenna Height	0.0 or Last Entered
Marker Position	Disabled
Output Times (Start and End)	Disabled
Sat Ephemeris when Available	Disabled

Table 1: RINEX Utility Defaults

Execution and Progress

The ***Start*** button engages the conversion process, which can be stopped at any time by clicking the ***Cancel*** button. The ***Exit*** button will close the utility at any time including during program execution, thereby canceling the process.

The Progress Bar provides graphical reassurance of utility progress, once the conversion begins.

Figure 6: RINEX Converter Execute & Progress

Known Issues

RINEX will not process output files consecutively

When RINEX has finished processing a data file, the user cannot click start again to begin processing the same or a different data set. Halfway through the process the utility will display an error box “No Valid Observation Available”.

Resolution: *Close the session of RINEX after processing each data set.*

Position Is Incorrect When Entering a Marker Position

When the user manually enters a Marker Position into RINEX, the resulting OBS file’s XYZ Positions are incorrect.

Resolution: *Uncheck the Marker Position and allow the program to be run at default. Fixed in next release.*