

# Uploading Almanac and Ephemerides Data to Micro Transcoder™

JLT provides the `simnav` command line utility that installs with the SimCon program files folder that allows uploading of RINEX ephemeris data to the unit. This command line utility converts the RINEX ephemeris data to the format required in the `SIMulation:LNAV...` commands described below.

The following command is used to provide ephemeris data:

```
SIMulation:LNAV:EPHemeris <prn> <subframe> <word> <data>
```

for up to 32 satellite PRN numbers.

Similarly, ionospheric correction data is provided with the following command:

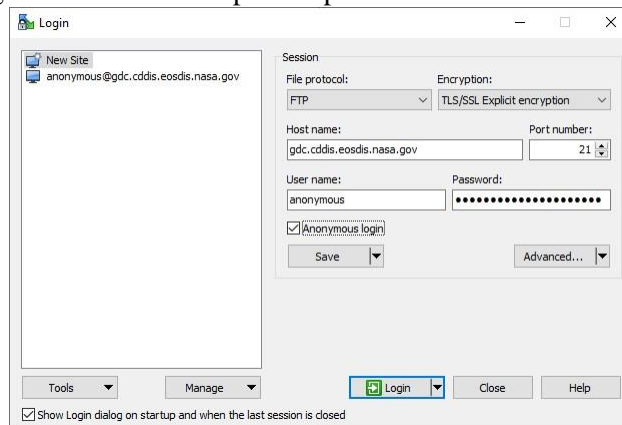
```
SIMulation:LNAV:IONosphere <subframe> <word> <data>
```

All of the required words in a subframe must be received together since the entire subframe is assembled in volatile memory. To store the completed subframe in non-volatile memory for use in the simulation enter the `SIM:LNAV:WRITE` command.

To use the `simnav` command line utility, first download a RINEX navigation file. NASA currently maintains an archive of RINEX navigation files including recent files that are available on their FTP site here:

<ftp://gdc.cddis.eosdis.nasa.gov/>

To access this archive, users will need to use a client that supports TLS such as WinSCP which supports anonymous login. See Figure below for example setup.



Navigate to `gnss/data/daily/yyyy/brdc/` where `yyyy` is the 4-digit year.

The RINEX file is available in that folder in the following format:

```
brdcddd0.yyn.gz
```

where

`ddd` is the current day of the year, and

`yy` is the 2-digit year.

The Micro Transcoder™ can extrapolate the provided ephemeris set to create a valid ephemeris set for the simulation epoch, but to duplicate the constellation as accurately as possible, it is best to use a RINEX navigation file with the same day as being simulated. The RINEX navigation file is in a `.gz` compressed format that can be extracted in Windows with WinZip, WinRAR or other compression programs. The file locations and availability of the NASA RINEX archive are current as the release of this manual, but are subject to change.

Next, copy the extracted brdcDDD0.YYn file to the SimCon installation folder (C:\Program Files\Jackson Labs\SimCon by default). Open a Command Prompt window and change directory to the SimCon installation folder. At the command prompt, enter “simnav” without any command line options to see a full list of available options.

Make sure that SimCon and other programs are disconnected to the Micro Transcoder’s SCPI serial port. To upload the RINEX file that was downloaded, enter the following:

```
simnav /port:COMx /eph:brdcddd0.yyn /epoch:eph
```

where x is the COM port number, and ddd and yy are defined above. The simnav utility will display the commands being sent and provide status of the transfer. When the transfer is complete, connect to the Micro Transcoder™ in SimCon and send the “SIM:LNAV:SEL USER” command to select the ephemeris data that was just uploaded and stored. The ephemeris data is stored in non-volatile memory and will still be available after a reset or power cycle.

Please note that any running simulation should be restarted for change in constellation data to take effect immediately. Also the target receiver may require a power cycle or cold start reset when the simulated constellation is changed.