



*Now, what's tomorrow's challenge?*

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## **TECHNICAL BULLETIN**

### **Loading GPS Software to the GPS Receiver**

#### **Introduction**

This bulletin describes the procedure for updating the resident software on the NovAtel 12 channel OEM and PC GPS cards. Note that 10 channel OEM cards must be returned to the NovAtel factory for software updates and model upgrades. The VERSION command will identify the current model number and software version of any GPS card as shown:

```
Console> version  
GPSCard-2 RT20-PC CGP96120019 HW 2 SW 3.35 Oct 08/97
```

This example response to the VERSION command indicates type of GPS card, model number, serial number, hardware version, software version, and date of software build.

The memory on the PC GPS cards is volatile and is therefore wiped out every time the card is powered down (i.e. whenever the host computer is turned off). As a result, the GPS software is resident on the host computer's disk drive in the form of a BTL file (a file with the extension BTL). The PC card is booted by loading the contents of the BTL file into the on-board memory of the card. As a result, it is only the BTL file that needs to be changed in order to update the software of a PC card.

Conversely, the GPS software for an OEM card remains in the on-board memory of the card. In order to modify this software, it is necessary to communicate directly with the card via a program called LOADER. This program will erase the memory of the OEM card and program it with the new software load that comes in the form of a binary file (usually with the extension BIN).

Both of these procedures are described in detail below. All released loads of GPS software for both OEM and PC cards are available on the NovAtel FTP site: <ftp://ftp.novatel.ca>, or on the dial-up bulletin board at (403) 295-4902. The software loads usually come packaged with the appropriate loading software in a self-extracting archive file. Most of NovAtel's archives are password encrypted. Please contact NovAtel Customer Service for more information.

Both software updates and model upgrades require an authorization code to be obtained from NovAtel Customer Service. Model upgrades usually involve a fee equal to the cost difference between the desired model list price and original model list price. All software updates,

however, are free of charge. The procedures described below apply to both model upgrades and software updates. Appropriate authorization codes can be obtained by contacting Novatel.

## PCCard

The BTL file that is loaded into the PC card memory every time the card is booted defines the GPS software load. In order to update the version of software and/or upgrade the model, the old BTL file needs to be replaced with a new one. By default the BTL file is found in the \GPS directory on the host computer and is named MAIN.BTL. To operate correctly, the BTL file needs to be stamped with an authorization code that is specific to the receiver in which it will be loaded. As a result, every BTL file becomes unique to a particular PC card, and cannot be interchanged with other files unless they are re-stamped with appropriate authorization codes.

The BTL files are easily stamped with the proper authorization code using a small DOS utility called GPSAUTH.EXE. To authorize a file, the following is typed at the DOS command line:

**c: gpsauth /fFILE /aAUTHCODE /sSERIAL [/cCARD] [/oOLDFILE]**

Option	Description
FILE	BTL file name.
AUTHCODE	Authorization code (all characters are hexadecimal: 0-9, A-F). Typical format: aaaa,bbbb,cccc,dddd,eeee,xxxxR
SERIAL	GPS card serial number (found on the label attached to the card).
[CARD] (optional)	Type of GPS card: PC
[OLDFILE] (optional)	Hardware serial number of the GPSCard can be extracted from a previous BTL file as entered here and inserted automatically. This option may be used instead of the SERIAL option.

## OEMCard

The GPS software for OEM cards is resident in the on-board flash memory and is changed using the utility LOADER.EXE. The program is usually packaged with software files but can also be obtained separately from the NovAtel Internet page, FTP site or dial-up BBS.

### Loader

The program, LOADER, is run from a DOS prompt by typing LOADER. Upon running the program, the main menu will appear. Four options will be available:

- Program card starts the loading procedure,
- Setup sets the communication parameters,
- Terminal provides a simple interface to communicate with the card.
- Quit terminates the program.



Selecting the SETUP menu item will cause the program to prompt the user for the following parameters:

First, the COM port selection option will appear. Select the COM port on your PC to which the GPS receiver is connected. Use the mouse or the arrow keys to select the appropriate option followed by the ENTER key.

```
Com Port:  COM1
           COM2
           COM3
           COM4
```

The next option is the baud rate at which the card will be programmed. Normally the highest rate of 115200 is selected. If communication errors occur or a modem is being used to load the card, then a slower rate should be selected. LOADER will temporarily configure the COM ports on the GPS receiver to match whatever setting is specified here.

```
Com Port: COM2

BAUD RATES
Programming: 9600
              19200
              38400
              57600
              115200
```

The TERMINAL baud rate will control the communication rate used if the TERMINAL function is employed. This is normally set to match the configured baud rate of the GPS receiver COM ports (the default is 9600).

```
Com Port: COM2

BAUD RATES
Programming: 115200
Terminal:    9600
              19200
              38400
              57600
              115200
```

The settings are saved by pressing the ENTER key. This will bring up the main menu again. Select PROGRAM CARD to begin uploading the new software.

The LOADER software requires the location of the software file to be loaded (BIN file). The utility will query the user for the drive letter on which the file is saved and then open up a browse window, as shown here, to conveniently locate the file. Either the mouse or the arrow keys can be used to move the selection bar around the screen followed by the ENTER key to choose the file. After selecting the software file, LOADER will request the authorization code.

```
C:\OEMLOADS\*.BIN
.. \
335B1.BIN    4437.BIN    NEWLOADS\
341-334.BIN
```

```
File selected:
C:\OEMLOADS\334.BIN

Authorization Code:
120A,26DC,AE75,A344,9859,3011R
```

Again, only hexadecimal characters will be accepted (1-9, A-F) and all lower case letters will be converted to upper case. The commas are inserted automatically after every four characters. Once the code has been entered, LOADER will prompt the user to turn the receiver off and then press the ENTER key. After pressing ENTER, the program will require the GPS card to be turned on again within 10 seconds.

```
SerialLoad U1.31 COM1
Initializing Loader
OEMCard Smart Loader U1.07 Card Address: 1 COM: 1
Erasing card: 1 \
```

```
SerialLoad U1.31 COM1
Initializing Loader
OEMCard Smart Loader U1.07 Card Address: 1 COM: 1
Programming card: 1 with C:\OEMLOADS\4437.BIN \
```

The original software load is erased before the new one is injected. Once the load is complete, the card is reset and the total download time is displayed.

### **\$AUTH Command**

If it is desired to change the model of the GPS card without changing the software version, an authorization code can be issued to the card without using the LOADER program. The command is \$AUTH and can be issued from the WinSat or GPSolution command line or through any dumb terminal program. The syntax is simply:

```
$auth aaaa,bbbb,cccc,dddd,eeee,xxxxR
```

This command will insert the new authorization code into the OEM card and change the model appropriately.

It is often necessary to issue temporary authorization codes to provide a trial period for a particular model of GPS card. Temporary codes have the same format as described above except that an expiry date is added to the end of the code. How the receiver functions after the expiry date passes is a function of how the new authorization code is loaded. If the \$AUTH command is used, the card will revert back to its original model when the expiry date passes. If LOADER is used, however, the card will become inoperative until another valid code is inserted. As a result, unless it's necessary to change the software load, it's usually best to insert temporary authorization codes using the \$AUTH command.

Please contact NovAtel Customer Service with any questions or concerns regarding this procedure:

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