Upgrading SD Radio Firmware

From time to time, GE MDS releases new firmware for its radio products. This firmware can be installed into previously shipped radios to take advantage of engineering improvements or new features.

Several methods are available for loading firmware files into the radio. TFTP is generally the fastest technique, but it requires an Ethernet connection. If an Ethernet connection is not available, a firmware upgrade can be performed using only the radio's serial management port.

This publication describes how to update SD radios using Serial file transfer. For a description of TFTP file downloads, consult publication 05-4890A01 instead.

NOTE: Only firmware specifically designed for this model of radio may be installed in the unit.

Firmware files are available free-of-charge online at:
http://www.gemds.com/app/support/downloads/

Firmware Upgrade via Serial Port (COM1)

To install firmware using the Serial, you will need:

1. A valid firmware file.
   This is a file with a .s28 extension, available from the website mentioned above.

2. A terminal program such as HyperTerminal.
   This program will be used both to configure the radio and to perform an ASCII text file transfer of the .s28 firmware file.

Important Notes about Serial Interface Programming

- Serial downloading requires a terminal program to perform an ASCII text file transfer, using XON/XOFF flow control.
- Serial reprogramming may take **7-8 minutes** at the fastest setting (115200bps). Reprogramming at lower baud rates is allowed, but not recommended.
- Text file transfers must be started quickly after the appropriate radio instructions are entered. Failure to do so will cause the radio interface to timeout and the process will need to be repeated.

Connecting the Transceiver for Firmware Upgrade

Connect the transceiver for firmware upgrade as shown below.

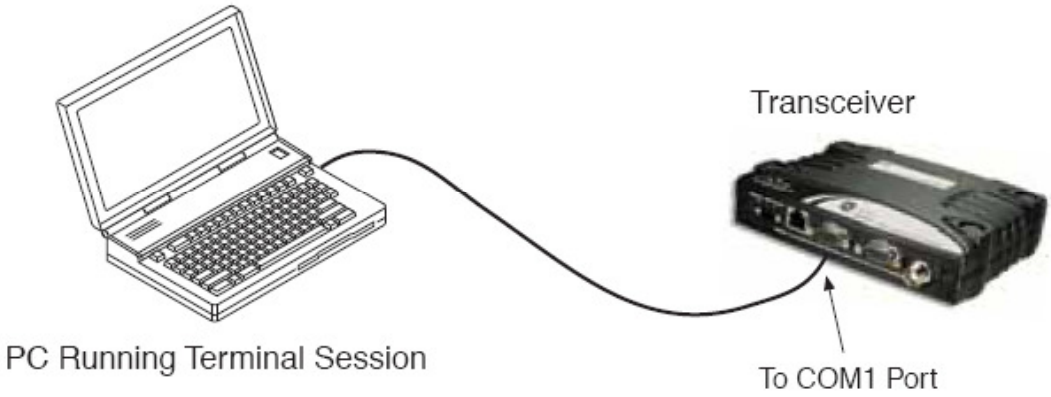

Figure 1. PC Connection to Transceiver

Initial Setup:

1. Connect a straight-through DB-9 cable from the PC to the transceiver's COM1 Port.

2. Launch a Terminal Program such as HyperTerminal with the following communication parameters: Baud 115200, 8 data bits, no parity, one stop bit (8N1), XON/XOFF flow control, VT100 emulation.

3. Remaining steps will vary based on the SD model purchased and the radio's operating mode.
   - For Models "ES" & "SS" the radio is typically configured through the menu interface.
   - For Model "MS" the radio must be configured through the SD command line.
   - Examples of each are shown below.

SD Menu Upgrade Procedure:

To load a new firmware file using the menu interface, use the following procedure.

1. Establish communication to the radio by pressing the enter key several times and login. (Additional details are provided in SD Series Reference Manual 05-4846A01)

2. Navigate to the Serial Menu. **Main Menu>>Maintenance/Tools>>Local Reprogram>>Serial Menu** shown in Figure 2.

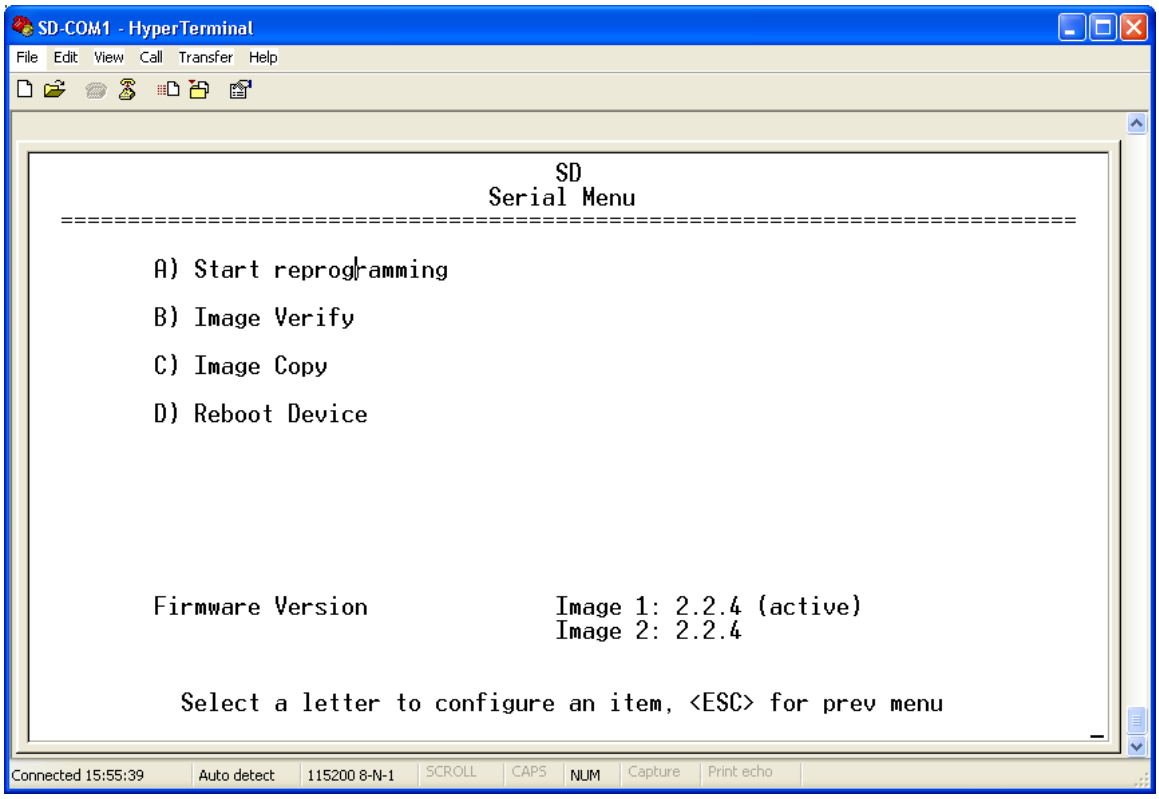

Figure 2. Reprogram Menu

3. Start reprogramming by selecting the **Start reprogramming** option from the menu. At this point, the message **Reprogram Image (1 or 2) via COM1? [y|n]** is displayed as shown in Figure 3.

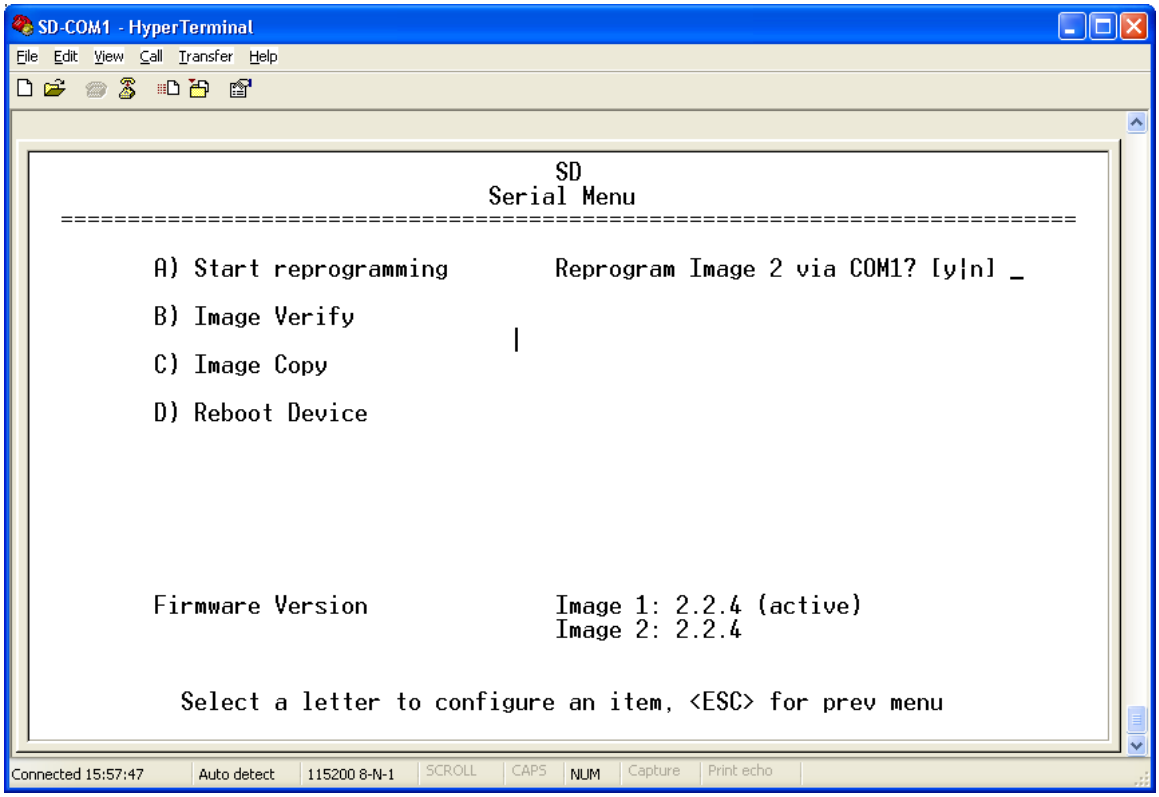

Figure 3. Reprogram Menu

4. Selecting "y" will initiate the serial file transfer. The message **Send S-record file now** is displayed as shown in Figure 4.

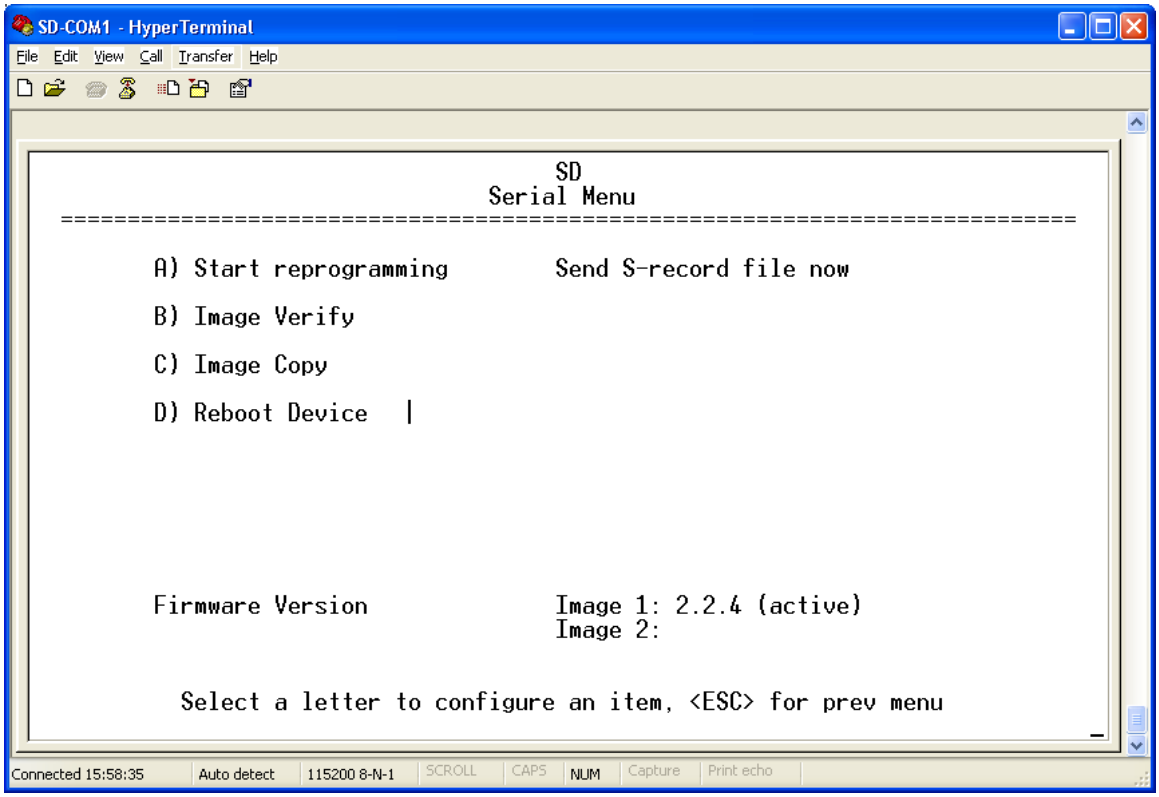

Figure 4. Reprogram Menu

5. From the terminal program quickly select **Transfer->Send Text File** and choose the correct file/file folder on the PC where the text file SDx-2_2_4.s28 is located. **NOTE**: When using HyperTerminal to perform serial reprogramming no status indication is available. The COM1 LED light on the transceiver will be continuously lit until file transfer is complete.

6. As soon as reprogramming is complete, the screen shown in Figure 5 is displayed.

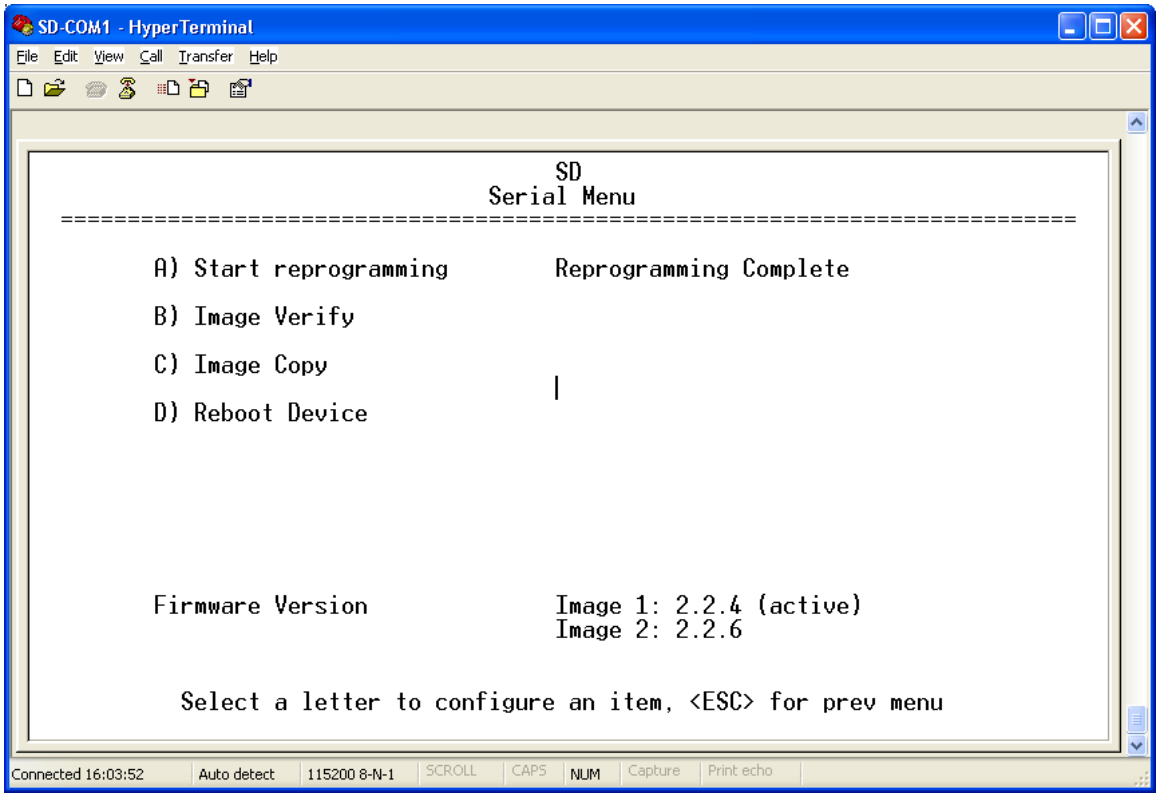

Figure 5. Reprogram Menu

7. To verify the image downloaded into flash use the **Image Verify** option. Make sure to select the *inactive* image when the choice is presented.

8. After verification is successfully completed, reboot to the inactive image using the **Reboot Device** option.

9. After reboot, verify the radio is running the new application by logging in and viewing the Firmware Version shown on the Starting Information Screen.

Error Messages during File Transfers

It is possible to encounter errors during a file transfer. In most cases errors can be quickly corrected by referring to Table 1.

Error Message	Likely Cause/Corrective Action
Invalid file type	Indicates that the file is not a valid firmware file. Locate proper file and reload.
File not found	Invalid or non-existent filename on Host PC
Invalid file path	Invalid or non-existent file path on Host PC
Bad CRC	Cyclic Redundancy Check reporting a corrupted file. Attempt to re-load or use a different file.
Version string mismatch	Invalid file detected. Attempted to re-load, or use a different file.
No S-Record Sent	Send File rather than Send Text File may have been used to initiate file transfer. Attempt to re-send and ensure Send Text File is selected.

Table 1. Common Errors during File Transfer

SD Command Line Upgrade Procedure:

To load a new firmware file using the X710 compatible command line interface, use the following procedure.

1. Establish communication to the radio by pressing the enter key several times until the "**>**" prompt appears.

2. Use the **program** command to initiate serial reprogramming. To confirm initiation of serial reprogramming enter **yes** at the **ARE YOU SURE?** prompt.

```
>program
ARE YOU SURE?>yes
```

3. The "**LOADER>**" prompt is then displayed. Enter the **erase** command.

```
ARE YOU SURE?>yes
LOADER>erase
ERASED OK
```

4. Start reprogramming by entering the **program** command.

```
LOADER>program
```

5. From the terminal program quickly select **Transfer->Send Text File** and choose the correct file/file folder on the PC where the file SDx-2_2_4.s28 is located.

   NOTE: This process initiates the file transfer and causes the radio to reprogram the *inactive* image. When using HyperTerminal to perform serial reprogramming no status indication is available.

6. The message **PROGRAMMED OK** indicates reprogramming was successful. If this message is not seen, reprogramming did **NOT** complete successfully and must be reattempted.

```
LOADER>program
PROGRAMMED OK
```

7. If reprogramming completes successfully, reboot to the inactive image using the **exit** command.

```
PROGRAMMED OK
LOADER> exit
```

8. After reboot, hit enter several times to establish baud. Verify the radio is running the new application by entering the **srev** command.

```
>srev
06-3251A02
2.2.4  15Jan2009
>
```

NOTE: If a firmware installation fails, the radio is left with the original active image intact, the inactive image will not properly verify and is unusable. Reprogramming should be attempted again.