Setting up (and Troubleshooting) MobileMapper CE for MobileMapper Beacon Corrections

28 February 2007

A. Setting Up Bluetooth Communications

1. Create a shortcut on your desktop to the Bluetooth Manager. This will allow you to more quickly connect the MobileMapper CE (MMCE) and the MobileMapper Beacon the next time you record data
   a. Double-tap **My Computer** on the MMCE desktop
   b. Navigate to the **Windows** folder and scroll down to the **Bluetooth Manager** icon
   c. Tap and hold down the stylus on the icon for a second until you see a pop-up menu. (This action is called a "Tap/Hold.")
   d. Tap the **Copy** option
   e. Tap the **X** at the upper right of the **My Computer** screen to return to the desktop.
   f. Tap/hold the MMCE's screen anywhere on the desktop and select the **Paste Shortcut** option.

2. Create a shortcut on your desktop to the **DGPS Configuration** utility
   a. Double-tap **My Computer** on the MMCE desktop
   b. Navigate to the **Windows** folder and locate the **DGPS Configuration** icon.
   c. Tap/hold on the icon
   d. Tap the **Copy** option
   e. Tap the **X** at the upper right of the **My Computer** screen to return to the desktop.
   f. Tap/hold the MMCE's screen anywhere on the desktop and select the **Paste Shortcut** option.

3. Turn on the Bluetooth Manager by tapping the shortcut icon on the desktop.

4. Turn on the MobileMapper Beacon and place it between 60 cm (two feet) and ten meters (thirty-five feet) away from the MobileMapper CE. You should not stand squarely between the two, though you may place the Beacon on your belt.

5. Tap the flashlight icon on the Bluetooth Manager's task bar to search for all Bluetooth-enabled devices that are within range. It may take 30 seconds or so to scan for all available devices. The Bluetooth Manager will say "Ready" in the lower left when the scan is done.

How do I know which device on the list is my MobileMapper Beacon?

Your Beacon will be called "MMBeaconXX…" where "XX…" represent the last five digits of your Beacon's MAC number – a number unique to each Bluetooth-enabled device. Unfortunately, the icon size is such that you can only read the first and second of the last five digits. If you need to see the entire MAC number, tap/hold on the icon and select the Properties option. Individual MAC numbers are printed on the back of every MobileMapper Beacon. If your Beacon is in its belt-mounting carrying case, you can easily lift up the back portion of the case and see the MAC number.

I don't see my MobileMapper Beacon listed on the Bluetooth Manager screen. What should I do?

If your Beacon is turned on and between 60 cm and 3 unobstructed meters of the MobileMapper CE, turn the Beacon off and install fresh batteries. It is possible that the batteries have enough charge left to power red LED but not the Bluetooth transceiver. If you have to turn on your MobileMapper Beacon or install fresh batteries, you may tap the

Refresh icon 🔄 on the Bluetooth Manager to perform another scan.

6. Double-tap the MM Beacon icon. This will display a **Serial Port** icon.

7. Double-tap the **Serial Port** icon.

8. On the **Select COM Port** screen, select any of the available COM ports and remember the port number. Tap **OK** to exit the screen.

9. Tap **OK** on the confirmation pop-up screen saying that communication has succeeded.

10. To create a short-cut for Bluetooth communication with this peripheral device, tap-hold on the **Serial Port** icon and tap the **Create Shortcut** option. Then tap **OK** on the pop-up saying the shortcut has been created.

11. Tap **X** at the upper right of the Bluetooth screen. This minimizes the Bluetooth Manager; it does not close it. To redisplay it, tap the Bluetooth icon on the bottom task bar and then tap the **Show** option.

I tapped the Bluetooth Manager icon in my Control Panel and nothing happened. Shouldn't this maximize the Bluetooth Manager?
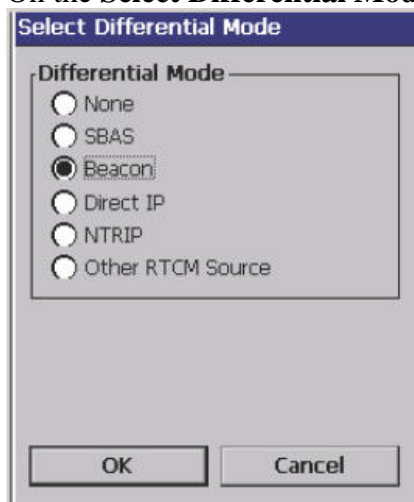
This would turn on the Bluetooth Manager, were it not already running. To maximize the utility when it is running in the background, tap the Bluetooth icon on the bottom task bar and then tap the **Show** option.

Can I still communicate with a Bluetooth device if I set up communications and then turn the Bluetooth Manager off?
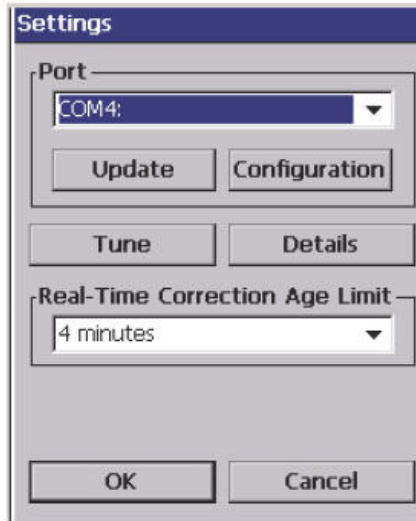
No. The Bluetooth Manager must be running in the background for the MobileMapper CE's internal Bluetooth transceiver to function.

B. Setting up the MobileMapper CE for Real-Time Differential Correction

1. Now that you have set up Bluetooth communications, you must now set up the MobileMapper CE's GPS receiver to accept and apply the differential corrections output by the MobileMapper Beacon. This is done using MobileMapper CE's DGPS Configuration utility. To run this utility, tap the **DGPS Configuration** shortcut icon you placed on the MMCE desktop in Step 2.

2. Tap the **Select Mode** bar in the middle of the screen.

3. On the **Select Differential Mode** screen tap the **Beacon** option and then tap **OK**.

4. This displays the **Settings** screen. Tap the down arrow in the **Port** field and *select the same COM port* you chose in the Bluetooth Manager.

Settings

Port
COM4:

Update   Configuration

Tune   Details

Real-Time Correction Age Limit
4 minutes

OK   Cancel

5. On the **Settings** screen, tap the **Tune** tab. This will bring up the following screen.

Tune Settings

○ Tune Automatically
○ Tune by Frequency
   Frequency   307.0
   MSK Rate (bps)   100
◉ Tune by Site
   Region   Europe
   Country   France
   Station   Sables d'Olonne

OK   Cancel

6. If you know the name of the closest beacon station, or if you want to select one in your geographic area, tap **Tune by Site**. First select the region of the world you work in, then the country and then the name of the site. If you are located in the United States, the name of the state is listed with each site name. If you do not know the name of the closest site, select a site in the state you are in. Remember that the closest beacon site might be in an adjacent state. Similarly, if you are located in Europe, the closest site might be in an adjacent country.

Note: To see a map of all worldwide DGPS beacon sites, go ftp.magellangps.com and download "BeaconLocations.zip" from the /Mobile Mapping/MM Beacon/Application Notes/ folder. Extract the contents to any folder on your PC. Run MobileMapper Office

and open the file called BeaconLocations.mmj. Zoom to your location on the map and make a note of the name of the beacon closest to you. You can download the latest version of MobileMapper Office from the /Mobile Mapping/MM Office/Software/ folder of ftp.magellangps.com.

7. If you do not know which beacon station is closest to you, or if you will be moving to multiple work sites, you may tap the **Tune Automatically** option. When the MobileMapper Beacon locks onto a beacon signal, its green LED light will come on.

Why does it take so long for the green signal lock LED to come on when you select the "Tune Automatically" option?
It can take several minutes for the MobileMapper Beacon to scan all the frequencies to find the strongest signal. The **Tune by Frequency** and **Tune by Site** options are much faster, if you know what you want to tune to.

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8. If you know the frequency of the closest beacon station, tap **Tune by Frequency**, and the **Frequency** down arrow. Select the frequency and then tap the **MSK Rate** down arrow and select it the proper rate.

9. When you have made your tuning selection, tap the **OK** at the bottom of the **Tune Settings** screen.

10. Tap the **OK** button on the confirmation pop-up message saying: "Beacon Tuned Successfully!"

11. On the DGPS Configuration **Settings** screen, choose the "Real-Time Correction Age Limit" of real-time corrections you will allow to be applied to the MobileMapper CE positions. The quality of real-time corrections degrades over time, so for the best accuracy select a short age limit. However, if beacon coverage in your area is intermittent, you could have time gaps of even a couple minutes during which the Beacon receives no new correction messages. So you do not want to set an age limit that is so short that some of your positions are not corrected. When conditions are good, you can use one of the lower age limits (as low as 10 seconds). If you see the green lock LED on your MobileMapper Beacon shut off periodically, you should set the age limit to a higher value (as high as 10 minutes). If you are unsure what to select, use the two-minute default limit.
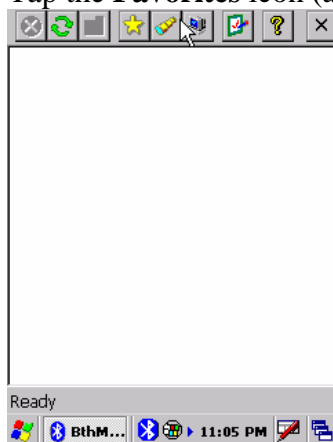

What makes beacon reception intermittent?
There are many factors at play here: distance to the beacon station; absorption and deflection of correction signals by buildings, trees and hills; interference by other radio broadcasts, particularly radar stations near airports and harbors.

If the blue LED on my MobileMapper Beacon turns off while I am recording data, will the positions still be differentially corrected?

Yes, they will continue to be differentially corrected automatically for as long as the age limit that you set in the **DGPS Configuration** screen. This is one reason why it is recommended that you set the age limit to 2 or more minutes. This gives you enough time to cover any gaps in the correction signal without significantly affecting your accuracy.

12. On the DGPS Configuration **Settings** screen, tap the **OK** button at the lower left.

13. On the DGPS Configuration main screen, tap the **Connect** button. Check the field below this button (now relabeled "Disconnect") to see that correction "data packets" are being received from the Beacon.

14. Tap either of the two **OK** buttons on the **DGPS Configuration** screen. Tap **OK** on the confirmation pop-up screen.

15. When you are finished with your mapping session, turn off the stream of corrections coming from the Beacon by tapping the **DGPS Configuration** icon on the MMCE desktop and tapping the **Disconnect** button. Then tap **OK** at the bottom of the screen. Note: this stops the streaming of corrections but it does not close the Bluetooth link.

16. To close the Bluetooth link, tap the Bluetooth icon in the MMCE's task bar and tap **Exit**.

17. The next time you wish to connect via Bluetooth to this peripheral device:
    a. Double-tap the **Bluetooth Manager** icon on the MMCE desktop
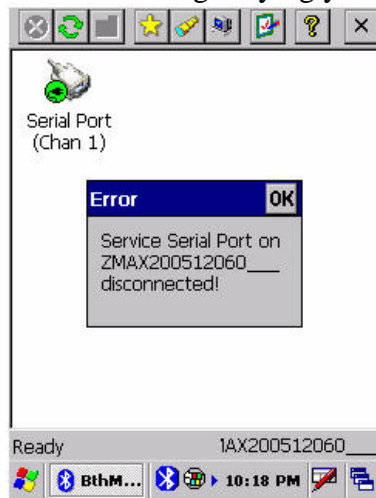   b. Tap the **Favorites** icon (a yellow star) on the task bar (see below)

    c. Double-tap the **Serial Port** icon
    d. Tap **OK** on the pop-up screen saying the communication has succeeded.
    e. Tap the **X** on the upper right of the Bluetooth Manager to minimize it.
    f. Double-tap the **DGPS Configuration** utility's shortcut on the MMCE desktop.

g. Tap the **Connect** button
h. Tap either of the two **OK** buttons on the DGPS Configuration screen
i. Tap **OK** on the pop-up saying data packets are being processed.

Note: to take these instructions with you to the field, print the last page of this tech note.

18. If you move beyond Bluetooth range for several seconds, the Bluetooth Manager will automatically reconnect you to the peripheral device when you move back within range. But if you are out of range for a longer period of time, you will see an error message saying you are disconnected to the device.

Tap **OK** on the error message and the Bluetooth Manager will usually re-connect with the peripheral device. If it does not, do the following:
   a. Tap the Bluetooth Manager icon in the main task bar at the bottom of the screen and tap **Show**

   b. Tap the **Favorites** icon (the yellow star) on the Bluetooth Manager
   c. Double-tap on the **Serial Port** icon. This will make a reconnection.

Re-establishing a Bluetooth connection to the Beacon if you move out of range
Tap **OK** on the error message and the Bluetooth Manager will usually re-connect with the peripheral device. If it does not:
a. Tap the Bluetooth Manager icon in the main task bar at the bottom of the screen
b. Tap the **Show** option
c. Tap the **Favorites** icon (the yellow star) on the Bluetooth Manager
d. Double-tap on the **Serial Port** icon. This will make a reconnection.

Configuring a MMCE for MM Beacon Corrections

a. Turn on the MMCE and Beacon and separate them by at least 60 cm (2 feet)

b. Double-tap the **Bluetooth Manager** icon on the MMCE desktop

c. Tap the **Favorites** icon (a yellow star) on the Bluetooth Manager screen

d. Double-tap the **Serial Port** icon

e. Tap **OK** on the confirmation pop-up screen

f. Tap the **X** on the upper right of the Bluetooth Manager

g. Double-tap the **DGPS Config**. icon on the MMCE desktop

h. Tap the **Connect** button on the DGPS Config. screen

i. Tap either of the two **OK** buttons on the DGPS Config screen

j. Tap **OK** on the confirmation pop-up screen

k. Launch your datalogging application

The following is a pocket-sized version of these instructions: