

## Introduction

In this Newsletter, we will cover the basics of using **ArcPad on Compaq's Windows CE device (iPAQ)** with Leica's **GS5/GS5+**. Some troubleshooting tips are also included.

The GS5 class of receiver is specifically designed as an all-in-one turnkey system. It is ideal for users who need zero hassle, highly accurate GPS input to field mapping packages, such as ESRI's ArcPad. There are two receiver types available: the GS5, which provides 3-4 m autonomous accuracy, and the GS5+, which includes a two channel beacon receiver, and offers 1-2 m accuracy in DGPS mode. The Arc-Pad field mapping software is a handheld mobile GIS application from ESRI, the world leader in GIS. Use GS5/GS5+ together with ArcPad, you have the capability to **view your live data in the field**, on top of existing GIS data.

## Installation

Installing ArcPad is only a **three- step process**:

1. Install Microsoft ActiveSync 3.1 or higher on your desktop PC.
2. Run setup.exe to install ArcPad and selected components on your desktop PC.
3. Run the Windows CE install programs from your desktop PC to install ArcPad on your iPAQ. The Windows CE install programs are accessed from your desktop PC by clicking on Start > Programs > ESRI > ArcPad 5.01.

## How to connect desktop PC to iPAQ?

ArcPad Windows CE installation programs are created when ArcPad is installed on the desktop PC. The ArcPad Windows CE installation program uses a Microsoft ActiveSync connection to install the appropriate programs for your Windows CE computer. If you are running Windows 98, Windows 95 or Windows 2000, you may connect your iPAQ to your PC **via USB**. To do so, follow these steps on your desktop computer:

1. Open ActiveSync 3.1.
2. Under the File menu, choose Connection Settings.
3. Check the box "Allow USB connection with this desktop computer".
4. Click OK.

This activates the USB port for ActiveSync 3.1. You need to configure your iPAQ to use USB as the default connection. This is done by selecting Start, Settings, Connections, and PC. Check "Automatically synchronise when serial cable is connected, using:". Select USB in the dropdown box. Now you have to ensure that your device is found. On your desktop PC, open ActiveSync 3.1 and under the File menu choose Get Connected, and let the wizard run its course. If all the cables are connected securely, and Windows has already identified the USB port on Pocket PC (see your user manual for more details), you're in business!

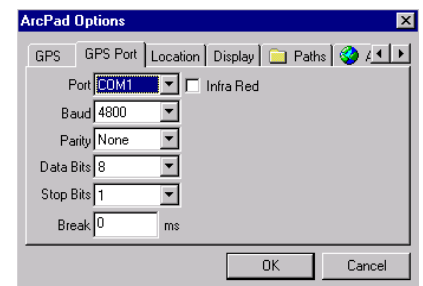
If you are running Windows NT, which does not yet support USB, you need to **connect via a serial cable**. In the dropdown box for the PC connections on your iPAQ, you will need to make a new connection. Set the Baud Rate. Select Advanced to be sure that connection preferences are the following:

- Data bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: Hardware

Test the connection from ActiveSync 3.1. If the connection fails, make sure that the serial cable is securely connected to the desktop PC and review the configuration settings. Sometimes you may also need to lower the baud rate (i.e. from 57600 per second to 19200 bit or lower per second).

## Getting Started with GS5/GS5+

1. Connect the antenna cable to the antenna and battery holder.
2. Insert two GEB 121 batteries into the battery holder.
3. Place the battery holder in the upper pocket portion of the backpack. The antenna cable and the DB9 cable should come through the bottom portion of the pocket.
4. Connect the DB9 cable to the iPAQ with iPAQ supplied cable.
5. Set up the ArcPad to receive NMEA data from the GS5/GS5+:
  - 5.1 Start ArcPad by selecting on Start > Programs > ArcPad 5.0.1
  - 5.2 From the Tools, Options menu item, set ArcPad's GPS port settings as follows:



5.3 Select Add Layer to open the file selection window and open the worldmap.jpg file.

5.4 From the GPS menu, select GPS Active. A yellow cross hair with a red circle around it should appear.

5.5 Turn the GS5/GS5+ system on. The system will begin outputting data.

### How come my GPS Active choice is greyed out?

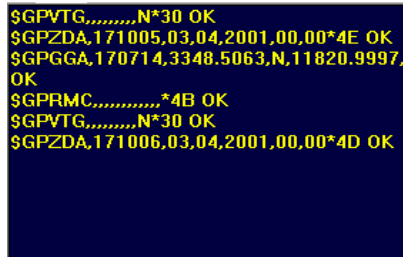
The GPS tools, or buttons, are only enabled when a layer with an **associated projection or .prj file** is added. The layers need to be in a projection supported by Arc-Pad and should have the projection defined in .prj files. If your layers are in a supported projection, then you can create projection files by the following method:

1. Open the Layers window and then click on the Define Projection button (on the top right of the Layers window).
2. In the File Browser, navigate to the Coordinate Systems folder located under the ArcPad 5.01 installation folder (by default C:\ESRI\ArcPad 5.01\CoordinateSystems).
3. Select a projection file from one of the common projection .prj files included with ArcPad. The selected .prj file will be copied to the layers in your ArcPad project.

### How do I know if I am receiving data from the GS5/GS5+?

ArcPad has a GPS Debug screen, which will allow you to view incoming NMEA data. To view incoming NMEA messages, select GPS Debug from the GPS Position dropdown list. NMEA messages will ap-

pear in the GPS debug window.



### What if my GPS debug screen is blank?

If you are not receiving NMEA data from the GS5/GS5+, check the following:

1. Is the GS5/GS5+ system turned on? A green light should appear on the power switch.
2. Is everything connected properly? Make sure that the serial connection between the GS5/GS5+ and the iPAQ is OK.
3. Are the batteries charged? Sometimes the green light on the power switch is on even though the batteries are running low.
4. Check the GPS Port settings in ArcPad.

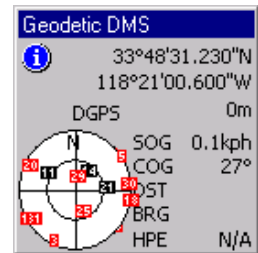
If you checked all the above and still don't see any data on the debug screen, you may have hardware problems. In this case, contact Leica service.

### What if I get an "Error opening port" message on my iPAQ?

You need to do a normal reset by pressing the reset button on the bottom with the stylus pen.

### GPS Position Window

Select the **GPS Position** to open the GPS Position window:



The Skyplot (Satellite Status) shows the positions of satellites (SV) in the sky. The colour of the SV indicates its availability. Black is active, Blue is available but not used, and Red is low signal strength.

The **GPS Mode** shows the type of mode in which you are receiving data: 2D, 3D, or DGPS. The cursor on the map should be changed to a crosshair centred within a red circle and displays your current position on the map. To collect GPS data, you must be getting at least a 2D positional fix. If GS5+ is used, because it includes a two-channel beacon receiver for real-time differential correction, you will get 1-2 meter accuracy in DGPS mode. Also displayed on the window: Speed Over Ground (SOG) and Course Over Ground (COG).

### Data Collection

In ArcPad, all editing and drawing takes place after a data layer is set as editable in Layers. The target layer needs to be set as editable in the Layers dialog box. Once a layer is set as editable, the Edit/Drawing toolbar is automatically opened.



When collecting data using GS5/GS5+, use the collect by GPS Tool pull-down. For example, select Capture Point, a one epoch location will be taken, followed by an attribution form. ArcPad supports customised forms created by ArcView 3.2 to provide a method for adding meaningful captions to field names and a user-friendly interface to the database. In this example for point collection, install date field is customised so that user may select a data from a calendar. Also, a combo box control is used on the form for the condition field to provide a choice list.

**I can not get the Edit/Drawing toolbar to come up on my Arc-Pad. When I try and tick the edit box a message comes up saying "Error enabling write mode on layer \*.shp". What's happening?**

It could be that the shape files are read only. To check this, you need to have your mobile device hooked up to your PC with a cable and ActiveSync. Use the Windows explorer to

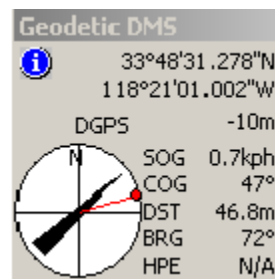
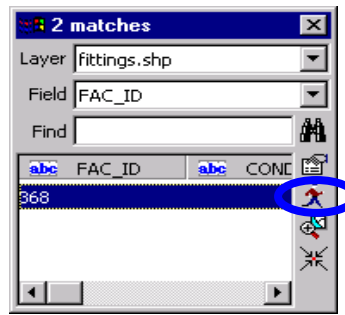
check and change the read only flag for .SHP, .SHX and .DBF files that you are trying to edit.

### Can I UNDO my edits in ArcPad?

No. ArcPad edits the original shapefile. It does not operate on a copy of the file and there is **no UNDO functionality**.

### Navigation

In ArcPad, you may set a destination point using the Information or Find tool.



Select GPS Position to open the GPS Position window. Select the Satellite Status twice to show the Compass. The Compass shows the direction with

the black compass arrow and direction to the destination in red.

### More Information

For more information on ArcPad, check ESRI on the Web at [www.esri.com](http://www.esri.com).

### Remember...

- The GS5 provides 3-4 m autonomous accuracy, the GS5+ 1-2 m accuracy in DGPS mode.
- Both system are used in combination with ArcPad from ESRI running on a on Compaq's Windows CE device.
- Information on satellites and the data receiving mode can be found in the GPS Position window and GPS Mode.
- For editing and drawing, a data layer has to be set as editable in ArcPad.