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OSGIS10 Brief introduction to gvSIG Mobile 0.3

See attached *pdf*: ***gvSIG_Mobile_introduction_workshop_OSGIS_2010.pdf***

OSGIS10 Installation and requirements

This page last changed on Jun 14, 2010 by jsanz.

- System requirements:link
- Previous requirements: link
- Manual of installation:link

OSGIS10 Download of gvSIG 0.3

This page last changed on Jun 15, 2010 by adelrey.

- To download gvSIG 0.3 this link: link

NOTE: For this workshop as we have to run gvSIG Mobile 0.3 in a PC, we will use the version of gvSIG 0.3 for Tablet PCs for Windows XP: link

OSGIS10 Description of the exercise

The exercise will consist of updating the shape file "services" as if we were in situ with gvSIG Mobile, by the location and editing of a new service (a restaurant) in the street "La Paz" in the center of Valencia.

We need to register this new service with the number of the official Cadastre Reference *(REF_REG)*, that we will take from the WMS of this Public Administration of Spain.

The data we are going to use is:

- Ortophoto of Valencia center: ***vlc_centro_23030.ecw***
- Point shapefile with the services in the center of Valencia: ***services.shp***
- Line shapefile with the services in the center of Valencia: ***streets.shp***
- Web Map Service of the National Cadastre of Spain: http://ovc.catastro.meh.es/Cartografia/WMS/ServidorWMS.aspx?
- We will edit the attributes of the new point through a custom form by using a *xml* file called ***SERVICES_Valencia.xml***

# OSGIS10 Exportation of data from a gvSIG Project into the PDA

This page last changed on Jun 15, 2010 by adelrey.

1.- Extension to synchronize with gvSIG Mobile

To download this extension click here.Currently this extension works under gvSIG 1.1.2 version. To install the gvSIG 1.1.2, the version gvSIG 1.1 have to be previously installed (to download this version click here). After the gvSIG 1.1. instalation we can install the gvSIG 1.1.2 version (to download this version click here).

2.- gvSIG Project and add data

2.1.- We create a new project with gvSIG called: **Valencia Center-services.gvp**
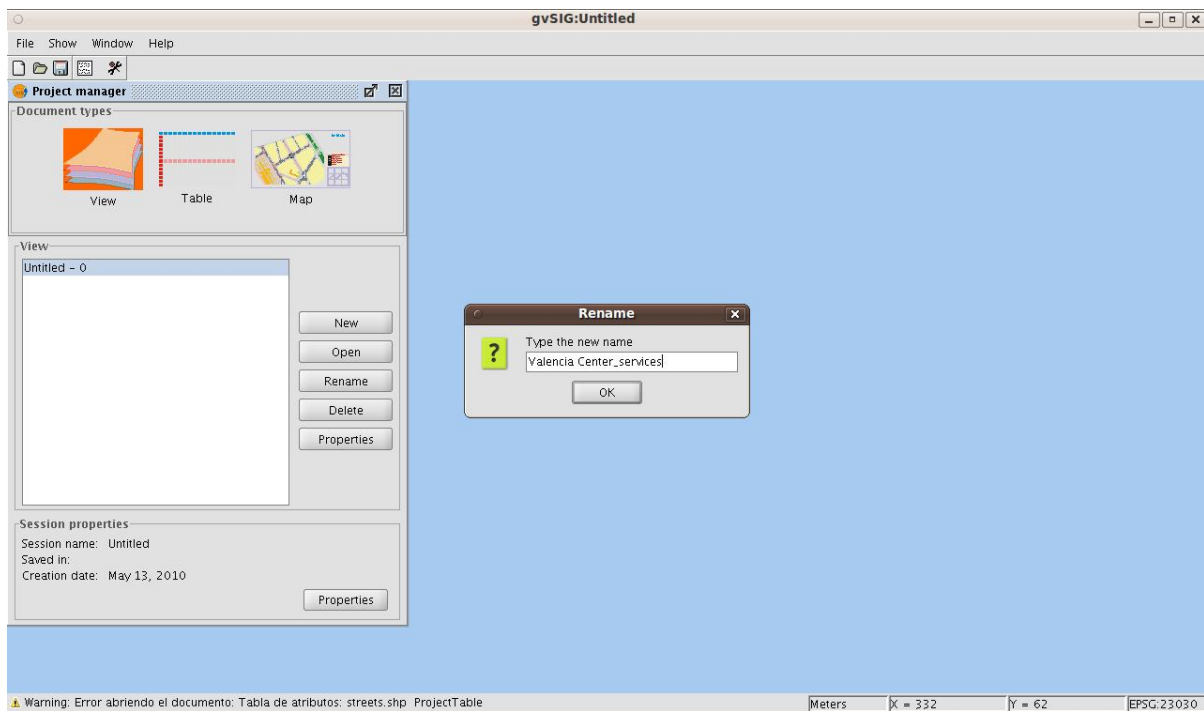
2.2.- We **add data** to the new window:

- an ortophoto of the center of Valencia, tiff format: **ortophoto_valencia_center_tif.tif**
- a shape file with the streets of Valencia : **streets.shp**
- a point shapefile with information about the current services in Valencia center.: **SERVICES. shp**

The structure of the table of shape file of the services of Valencia is the following one:

- CATEGORY
- REF_REG
- STREET
- NUM
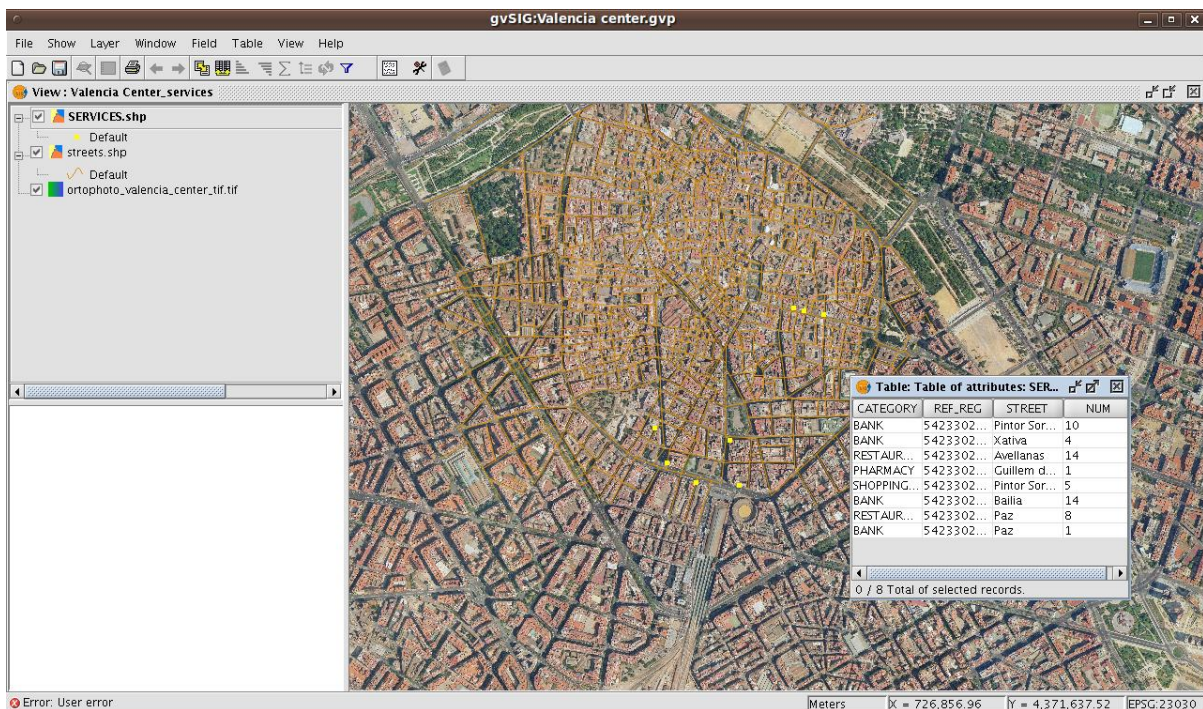
2.3.- To carry out the job at the field,we should select just the information we need through the extension to export data.
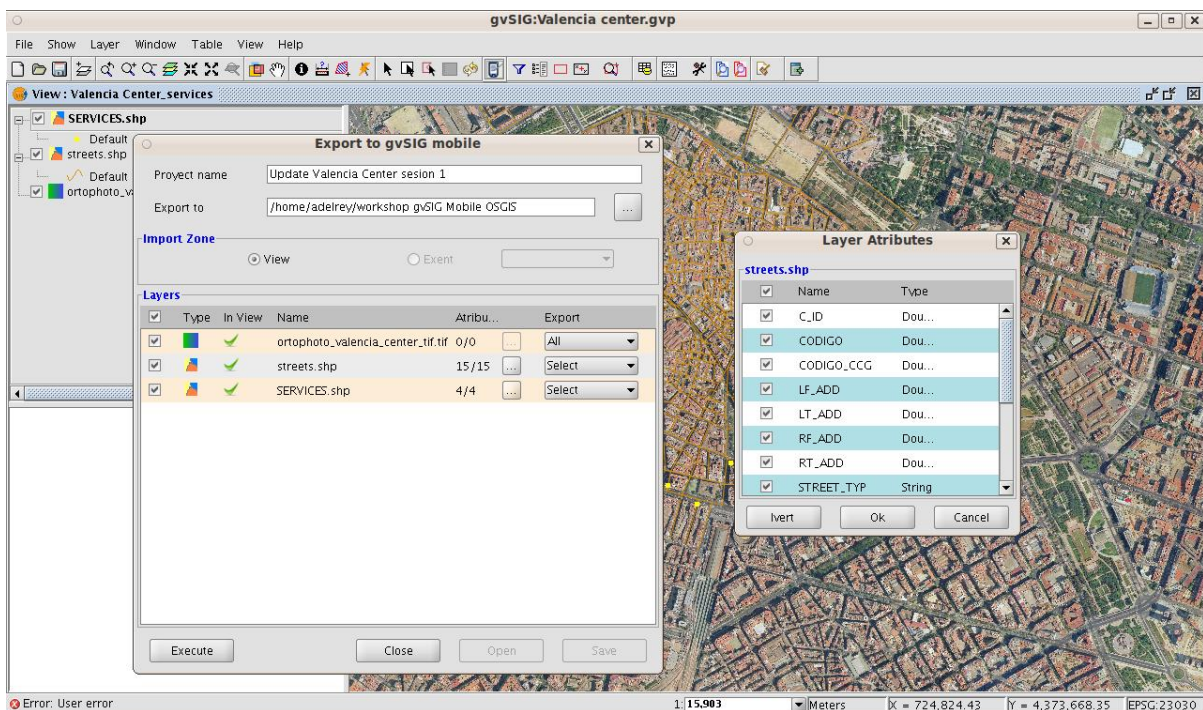
We can select area to export by using:

- Active view.
- Frame.

To export to gvSIG Mobile we can:

- Select layers to export according to their location in the View and the area to be exported.
- Full layers can be exported.
- Clip by rectangle.
- Select geometries to export.

- Select attributes to export.
- Generate gvSIG Mobile export project. (gvm)
- Export simple symbols.
- Export viewing scales.

Project name: **Update Valencia Center sesion 1**

Path: **the default paht of the workshop**

 The result is a folder with the name *...................../Update Valencia Center sesion 1,* that contains the shapes files and the ortophoto and also a gvSIG Mobile project (.gvm):

- **SERVICES_select_points.shp**
- **streets_select_lines.shp**
- **Update Valencia Center sesion 1.gvm**

2.4.- To put this information in the PDA we have to copy this information through a programm like: **ActiveSync.** For this workshop we have already copy this information to the Live DVD.

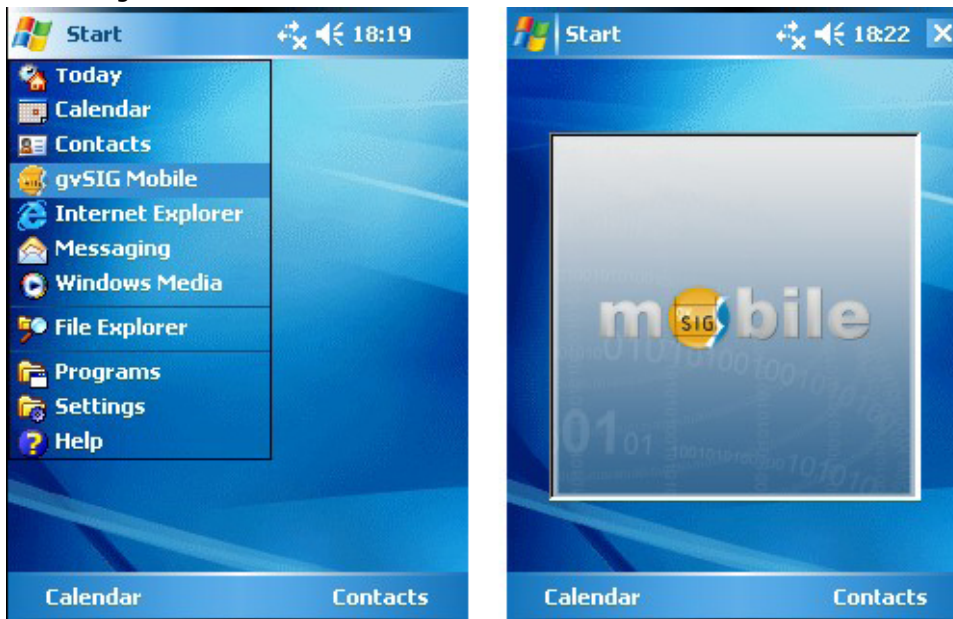# OSGIS10 Configuration of the device and project

This page last changed on Jun 16, 2010 by adelrey.

1.- Start gvSIG Mobile for Windows XP

Just to click the *gvSIG Mobile.ba*t file that is in the folder: gvSIG MobileXP_OSGIS.
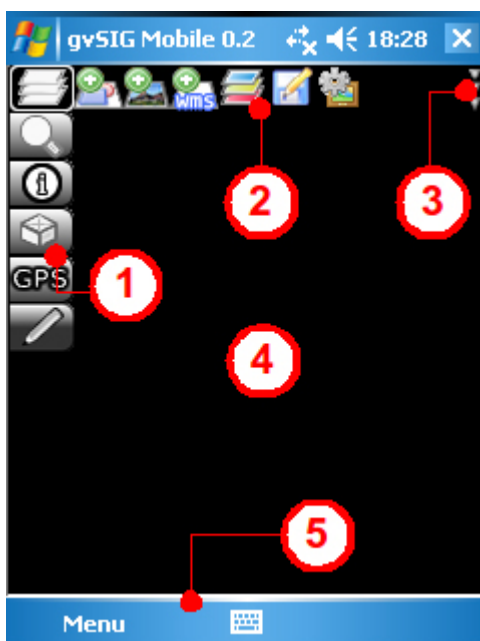
2.- Start gvSIG Mobile from a PDA

We start gvSIG Mobile from the PDA Start Menu.

3.- Main Toolbar

The application has a vertical **Main Toolbar (1)** with icons representing groups of functions, and a horizontal **Secondary Toolbar (2)**, which shows the specific tools of whichever icon is selected on the main toolbar.


Main Toolbar:

- Project Management
- GPS Tools
- Editing Tools
- Layer Management
- Navigation Tools
- Information Tools

4.- Set up the defult settings of the device

Through the **Project Management Function,** we are going to set up the default settings of the device, for example the language, the path to the project files, the spatial reference system, the background colour of the view and the maximun and minimum extends of the project.
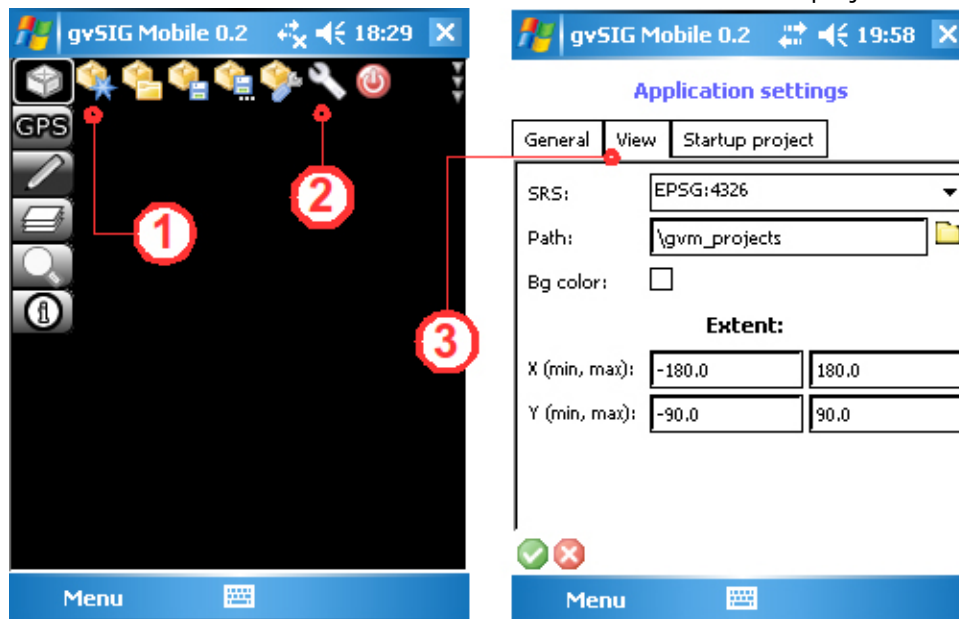

In our case:

- The SRS will be: EPSG:23030 (UTM Hayford Elipsoid ED-50).For example the EPSG: 4326 correspond to WGS84.
- The path: *by default*
- Language: English

The default settings of the application can be different from the properties of the view. For example, we can set up a default SRS for the application and change this SRS fro the view of the Project.

5.- Open a existing project

We open the gvSIG Mobile project created before: ***Update Valencia Center sesion 1.gvm*** by clicking *Open Project*
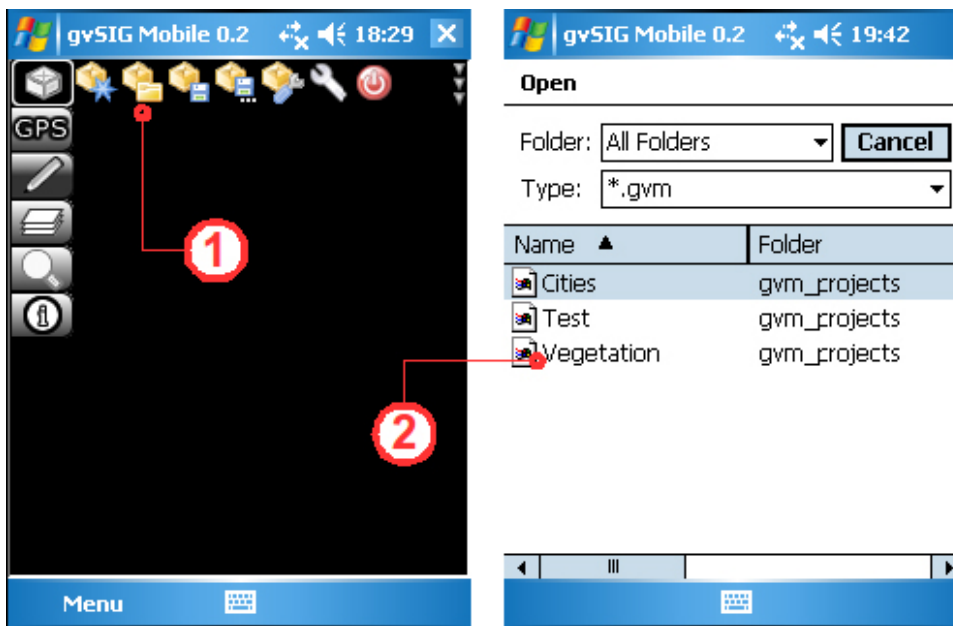
6.- Open a new project and set up the properties of the project

1.- We click *New project.*

2.- We can set up the properties of the project by clicking *Project Properties.*
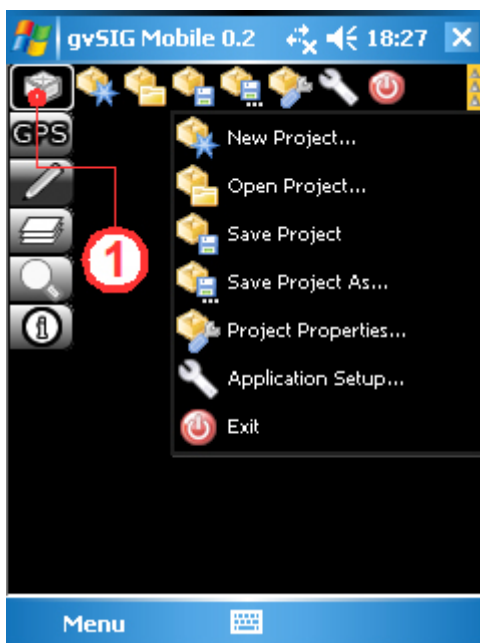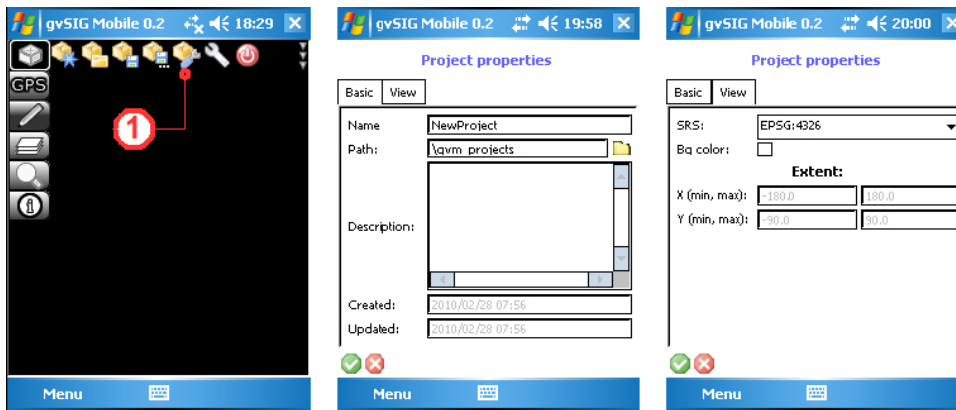
As I said before, the default settings of the application can be different from the properties of the view. For example, we can set up a default SRS for the application and change this SRS of the view of the project.

In our case:

- SRS: EPSG: 23030
- Name of the project:**OSGIS.gvm**
- Path: OSGIS

7.- GPS Configuration

As we are making this exercise by using gvSIG Mobile 0.3 for Windows XP and here there is no GPS signal, we are going to make this exercise without GPS. However I will explain how to set the GPS devide in case we could go to the field.

We can set up the properties of GPS by the *GPS Setup option.*

We can decided if the GPS signals are to be received from an active GPS (Serial Device) or whether the GPS device will be simulated by using data from a text file containing NMEA GPS data (Simulated Device). In our case if we could go to the field we would use a Serial Device. (3) y (4)
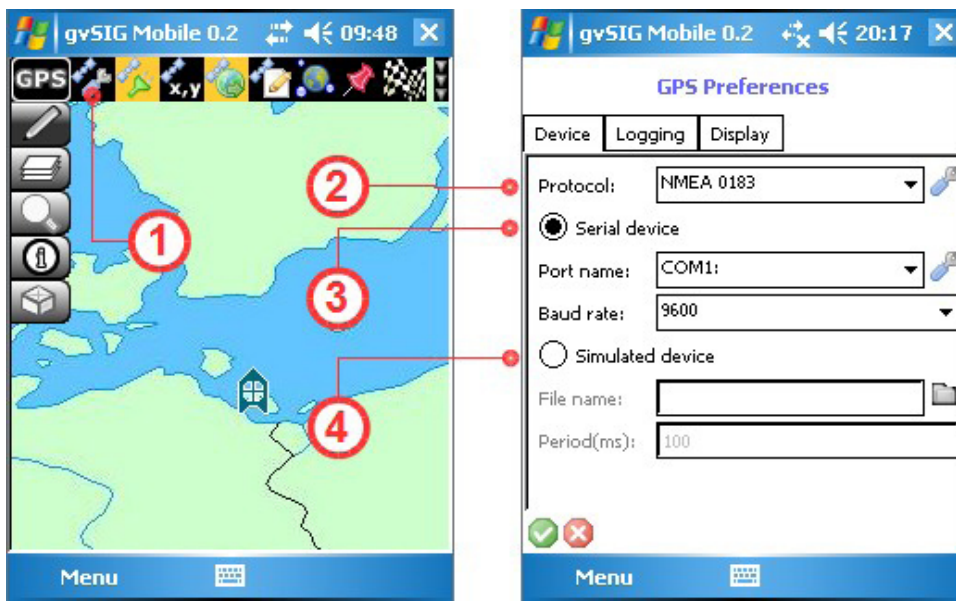
As a simulated exercise, we will define the GPS preferences as:

- Protocol: From the drop-down list we select NMEA 0183 (At present only this protocol is supported but it is been working to give also support to the NTRIP Protocol)
- Port name: COM 2
- Baud rate: 9600

I would like to comment that the _Logging_ tab is used to specify the format and files names for the waypoints and trackpoints . Two formats are currently supported: GPX and CSV.

The _Display_ tab is used to control how GPS icon is displayed. There are options for recentering the view based on the GPS position displaying the GPS icon or a combination of these two options.

OSGIS10 Visualization of local and remote data

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1.- Layer Management Function
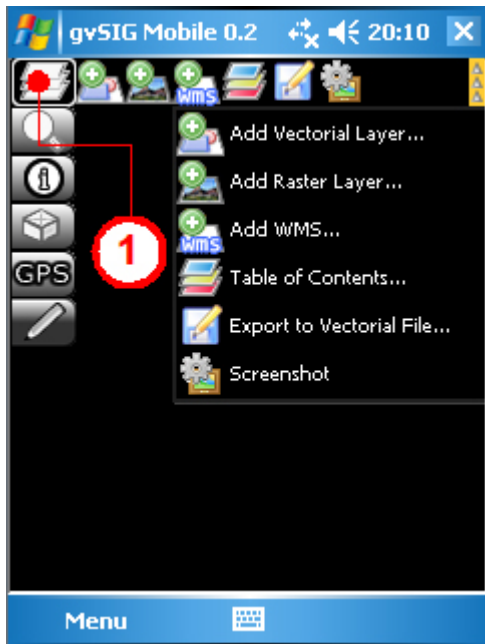
1.1. Add raster data

gvSIG Mobile supports:

- ECW
- PNG
- JPEG (with .wld file)

 We add the ortophoto of Valencia center: *vlc_centro_23030.ecw*

1.2. Add vector data

gvSIG Mobile supports:

- 2D and 3D point and multipoint shape files
- 2D and 3D Line and polyline shape files
- 2D and 3D polygon and multipoligon shape files
- Multigeometry version 2.x and SFP (Simple Features Profile) version 3.2
- GML (Geographic Markup Language) files
- MultiGeometry version 2.1 KML (Keymap Markup Language) files
- Point and track GPX (GPS exchange) files

 We add the two shape files we selected from our gvSIG Project: *Update Valencia Center sesion 1.gvm .*

......../Update Valencia Center sesion 1

- Line shape file with the services in the center of Valencia: *streets_select_lines.shp*
- Point shape file with the services in the center of Valencia: *services_select_points.shp*

1.3. Add remote data

At the moment gvSIG Mobile 0.3 supports WMS but the next version gvSIG 1.0 will also support the WFS protocol.

We add the WMS of the Cadastre National Service of Spain, that it is in the list by default.
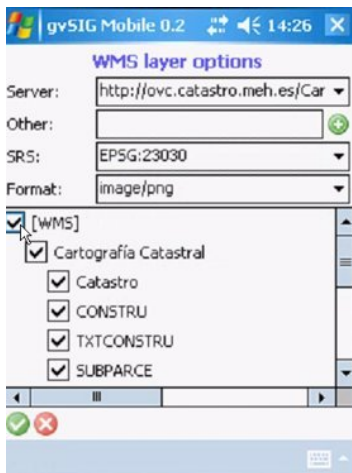
- We select :
  - Server: http://ovc.catastro.meh.es/Cartografia/WMS/ServidorWMS.aspx? from the list.
  - SRS, in this case EPSG:23030
  - The format of the image: png/jpj
  - The layers we want to use: we will select all layers.

**1.4.- Change the properties of the layers through the Table of Contents**
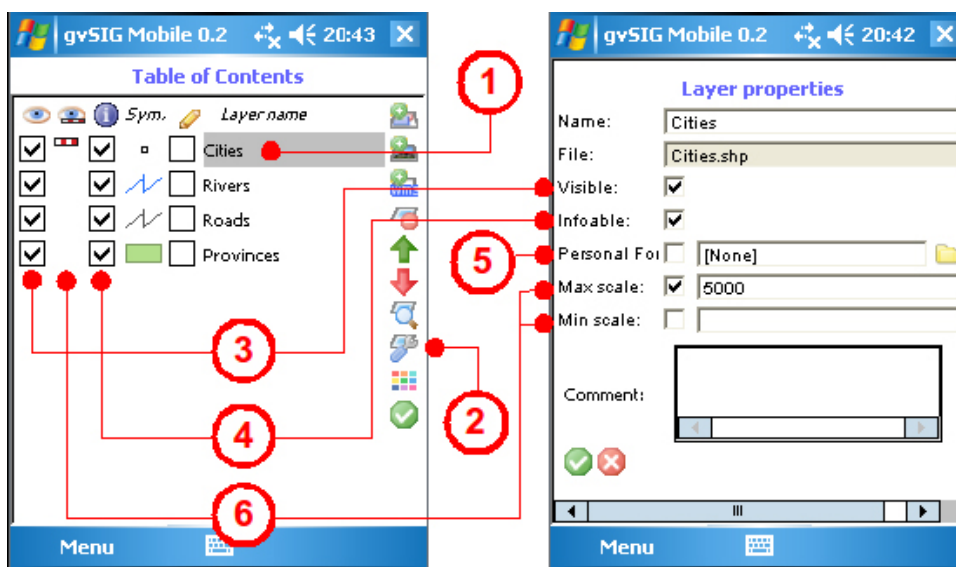
Another feature of the Tablet of Contents is that the properties of any of the layers in the project can be viewed and configured by

the button (2) *Layer properties. We can cange the following properties:*

- **Name**
- **File**
- **Visible.** Indicates if the layer is visible in the project or not (3)
- **Infoable.** Indicates if the attributes associated to the layer can be viewed.
- **Personal Form:** a custom form based on a XML file can be used to display the attributes of the specific layer. By ticking the check box you can provide the path were the *.xml* file is.
- **Max scale.** Indicates the maximum scale of the layer (6)
- **Min scale.** Indicates the minimum scale of the layer (6)
- **Comment.** A space for providing information about the layer.

 From the Table of contents is also possible to add new layers to the project. This window shows all the layers that are currently loaded in the project.

1) We are going to change the symbology of the layers:
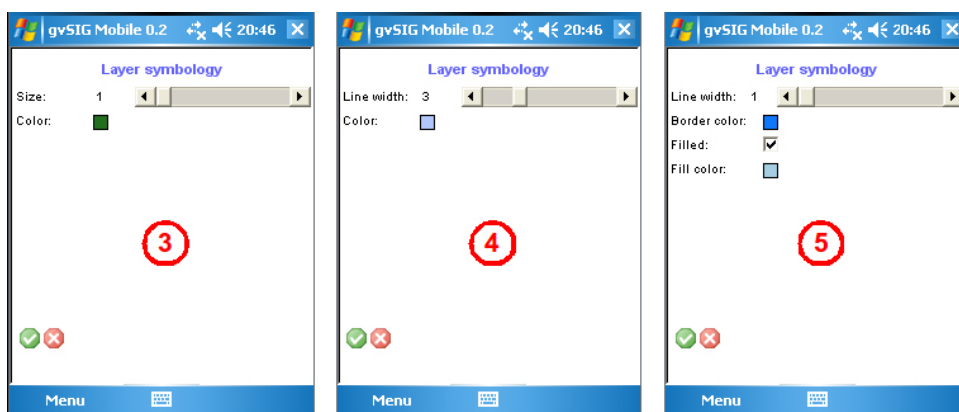
- the colour and line width of the line shapefile **streets_select_lines.shp**
- the colour and size of the point shapefile **services_select_points.shp**

2) We can change the order of the layers, delete the layers, etc.

3) We are going to associate the custom form **SERVICES_valencia.xml** to the shapefile **services_select_points.shp**

2. Navigation Tools

gvSIG Mobile's various navigation tools allow the user to view the project's graphical information at varying levels of detail, making the browsing of
different locations easy and convenient.

Zoom Rectangle

This tool allows a zoom area to be defined by drawing a rectangle around the area of interest.

Zoom In

It zooms in to the View by a fixed amount,thereby increasing the level of detail each time the button is clicked.

Zoom Out

It decreases the level of detail by reducing the display scale each time the button is clicked.

Zoom Previous and Zoom Next

The Zoom previous returns to the previous display in the View,while the Zoom next button advances to the next display.

Pan and Recenter

By using the Pan tool to drag the map around, the user can interactively recenter the map without changing the scale. Clicking on the map with the
Recenter tool, causes the View to be recentered on the point clicked by the user, also without changing the scale.

Zoom Extension

Clicking the Zoom Extension button will result in the View zooming out to the full extent of all the different layers in the project.

OSGIS10 Obtaining and Searching information, making measures

This page last changed on Jun 15, 2010 by adelrey.

1.- Obtain information about a feature

In our case, we are going to obtain information about this two files:

- **street_select_line.shp** (without associated custom form)
- **services_select_point.shp** (with an associated custom form)

For that goal we are going to use the _Query tool (1), that is used to display information about features in the project's layers._


Using the _Get Information button_ , click on a point in the View to obtain information on the feature(s) at that position. This opens the _Information by point form (2), which displays information on the features intersecting the point that was clicked. Note that the query button retains its active or inactive state until clicked again (clicking the button toggles between these two states). With the button in its active state the View can be queried multiple times._

If the position queried contains no features, then nothing will be displayed. If the layer being queried is a raster layer, then the information will be displayed in the format shown in the figure below.
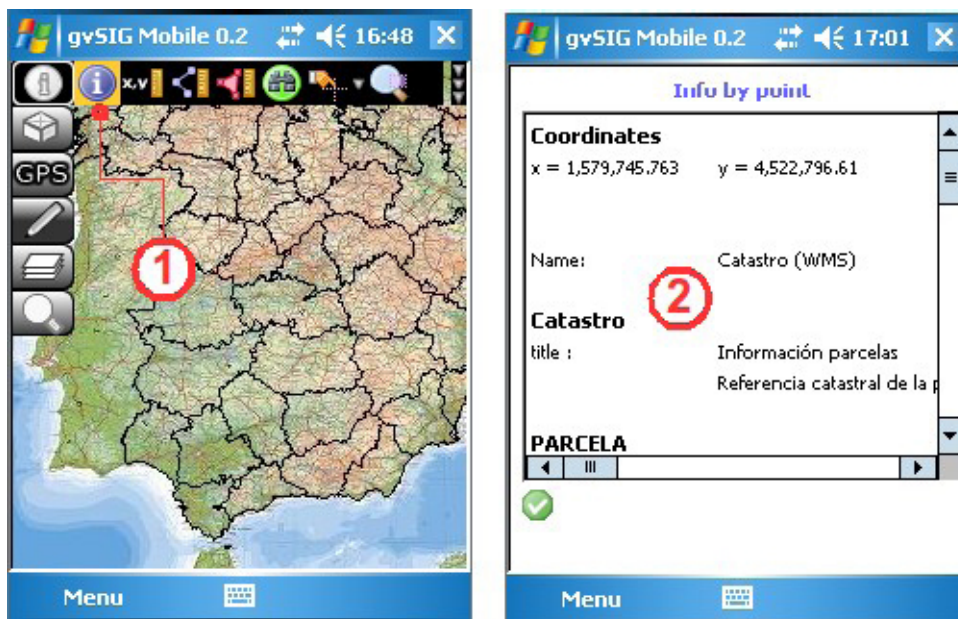
However, **if the queried position contains at least one vector layer with editable attributes, then a form is displayed**. If the first layer intersected by the query point has a personal form, then this is the form that is displayed. If the layer is not editable, the information displayed in the form cannot be changed and is displayed in a grey colour (3). However, if the layer is editable, then the fields in the form can be edited and will be displayed in black (4). The figure below gives examples of the same information displayed in both a _Standard Form (5)_ and a _Personal Form (6)_. _Note that this figure illustrates the forms displayed when the Get Information tool is used to query a vector layer._
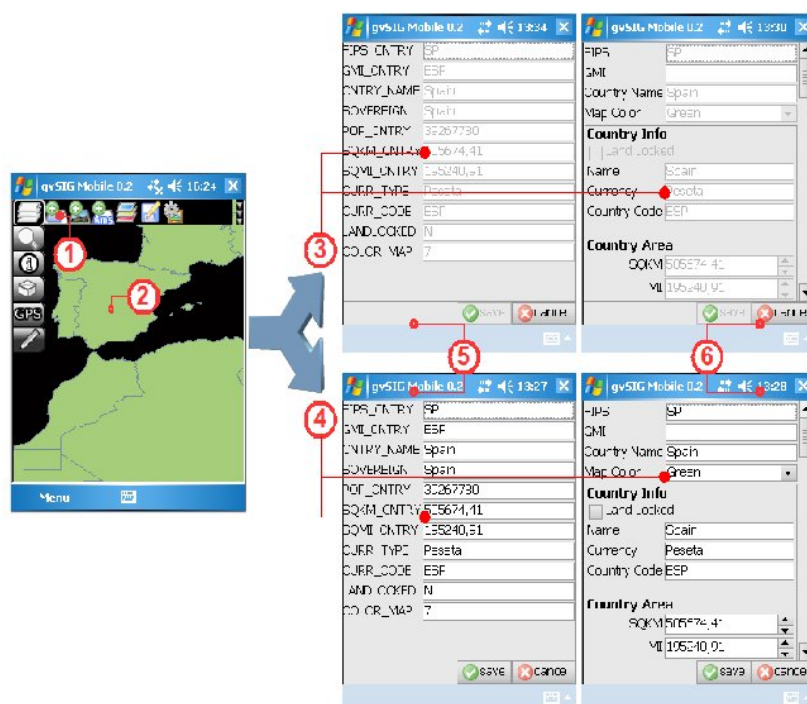
2.- Search by attribute

We are going to make a search in order to locate the street La Paz, where the exercise will be carry out. For that goal we are going to use the _Search by Attribute_ tool (1).
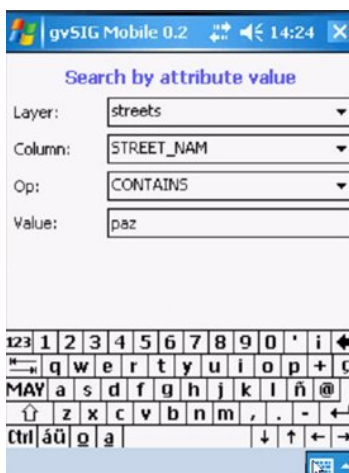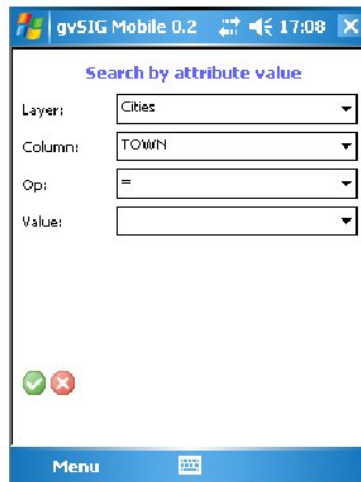
By Clicking the Search by Attributes button (1)o pens the Search by attribute value form, which contains the following
fields:

- Layer. Select the layer to query from the list of layers in the project.: **street_select_lines. shp**
- Column. Select the attribute column in which to conduct the search. **STREET_NAM**
- Op. Select the query operator: **CONTAINS**
- Value. Enter the value to search for in the selected attribute column: **PAZ**

The selected street will be highlighted in yellow colour and we will make a zoom to the selection by clicking the last button.

3.- Select features

We can also select geometries (1) in a vector layer. When using this tool, only one vector layer must be marked selectable (infoable) in the Table of Contents.

We can make three types of selection:

- **Select by point.** (2) Select a geometry (feature) by clicking on it in the View. The selected geometry will be highlighted in yellow.
- **Select by rectangle.** (3) Select a set of geometries by drawing a selection rectangle in the View. Geometries wholly or partially within the selection rectangle will be selected. The selected geometries will be highlighted in yellow.

- **Clear selection.** (4) Deselect all geometries and restore their original colour.
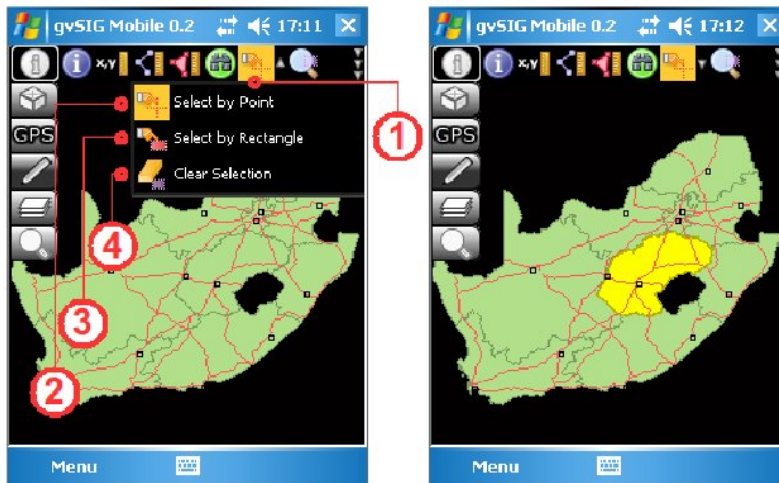
4.- Making measures

We can make measures to obtain coordinates, distances and areas.

OSGIS10 Editing a vector layer by using XML files

This page last changed on Jun 16, 2010 by adelrey.

1.-Editing tools

These editing tools are used to create new geometries in previously loaded vector layers. Three types of geometries can be created:

- Points:Created with the Point tool (1).
- Lines: Created with the Line tool (2).
- Polygons: Created with the Polygon tool (3).

There are also editing tools for creating geometries using information from a GPS:

- Waypoint :Add points with the Add vertex using GPS tool (4).
- Add a trail of points with the Add vertexes automatically using GPS tool (5). Points are captured according to a specified time interval.
  With the editing tools, vector layers can be updated with new data created by the user. Any new geometries automatically inherit the attributes of the layer being edited. These attributes can be entered once the geometry or feature has been digitized.
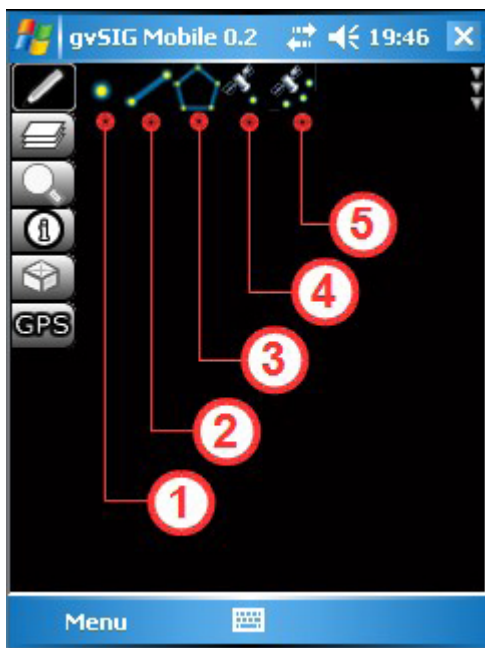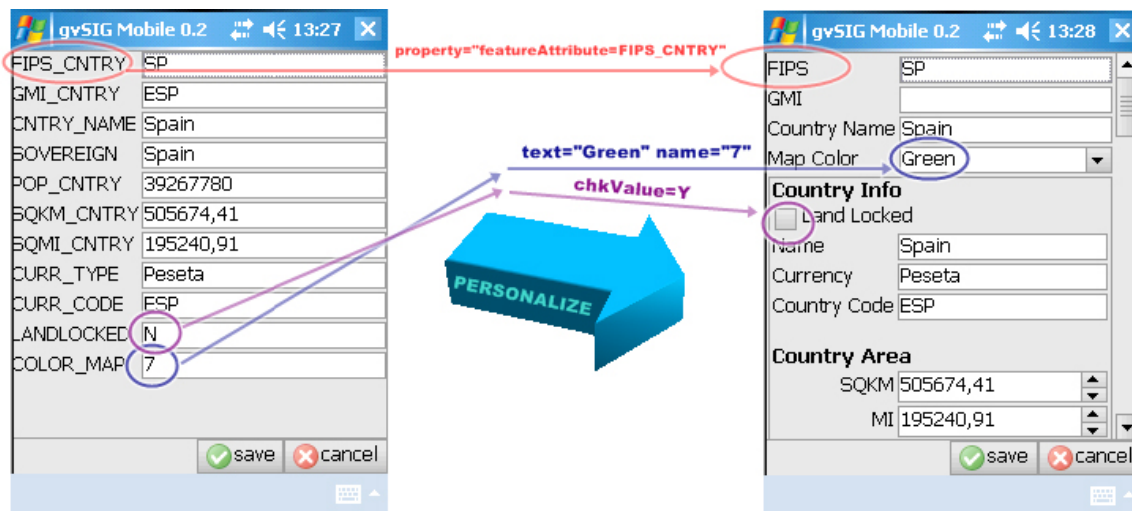

2.-Create a custom form

Personal forms are used to view, edit and insert alphanumeric data, exactly as with a generic form.
A personal form can display data in tabular format, define ranges of integers to be met by the values contained in the fields, or even display icons along side labels.

Personal forms in gvSIG Mobile are based on **Thinlet GUI toolkit**, that is a **User Interface tool**. It is a Java class, which interprets an XML file to display information on screen with a specific design, handle user input, and perform basic associated operations. It separates the graphical display (defined in an XML file) from the methods of the application (which are written in Java).

gvSIG Mobile already has generic application methods that interpret forms and execute the most common field operations, and present data in an appropriate way.

2.1. How can we create a custom form?

This process is explained in the manual attached on the LiveDVD of gvSIG Mobile 0.3. (page 64).

In this exercise we are going to use the file **SERVICES_Valencia.xml**, that it has been designed previously at the office and associated to the **services_select_points.shp** file.

The general steps are:

- **Step 1: Create a new XML:** Use a text editor to create a new text file with an extension of XML, for example "form.xml".
- **Step 2: Select the components to appear on the form**: Decide which components are needed to represent the desired attributes. The types of components that are available are as follows:
    - ◦ **Text field:** A text box to enter data associated with an attribute of a feature.
    - ◦ **Password field :** A text box that hides the text entered by the user.
    - ◦ **Text area :** A box in which to enter several lines of data associated with an attribute.
    - ◦ **Text label :** A label used to name an attribute, or to display information on the form.
    - ◦ **Checkbox :** A selection box associated with an attribute that allows only two values, namely selected or not selected.
    - ◦ **Combo box:** A component that displays a drop-down list of values. Values can be selected from the list or a new value can be entered in the text box part of the
    - ◦ **Numeric ranges :** A box in which to enter number within a particular range.The box has buttons to increase and decrease the number* **Step 3:** Design the layout and grouping of the attributes: If attributes of a feature need to be grouped, or if grouping is needed to structure the form then the following components can be used:
        - - *Tree : Attributes are displayed in hierarchical form using a tree structure.*
        - - *Tab: Tabs can be used to group attributes, which can be displayed using any of the component types described above.*
        - - *Panel: Groups of related attributes can be displayed on separate panels. Apanel can contain any of the component types described above.*
    - ◦ *Table: A table is used to display several attributes that can have multipl values. n x m (n samples of m values).*

- **Step 4**: Write the XML file: Once the components have been selected and the layout has been designed, the XML code can be written.

An easier way of having a fast custom form is to take the **SERVICES_Valencia.xml** created as a template and update it to the features we need to carry out our job.

3.- Edit the point shape file
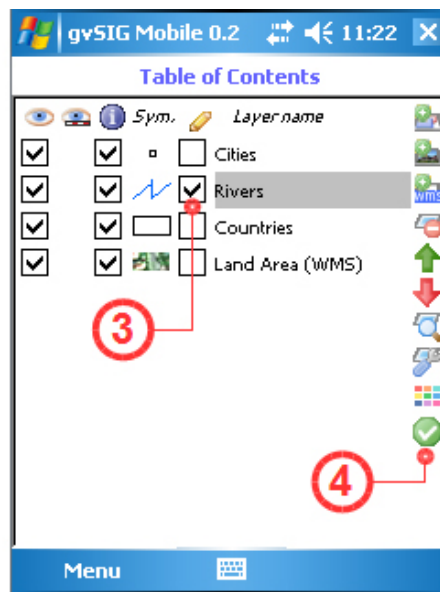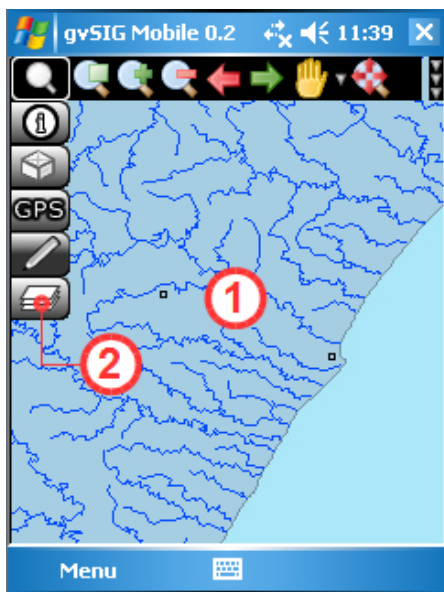
Once we have select the street La Paz we are goin to edit it . The procedure is as follows:

- **Step 1 - Enable Editing:** Once a layer has been loaded into the View(1), <u>editing of the layer is enabled in the Table of Content</u>s (hereafter referred to as TOC). The TOC is opened from the Layers toolbar (2). To enable editing tick the checkbox (3) below the **pencil icon** of the layer ***services_select_points.shp*** . Return to the View by clicking the <u>*Accept button*</u> *(4) to close the TOC.*
- **Step 2 - Select the drawing tool:** Select the appropriate drawing tool from the Editing toolbar (1). Note that if the layer being edited is a point layer, then only the <u>*Add point*</u> *(2)*, <u>*Add vertex*</u> *using GPS (5) and* <u>*Add vertexes automatically using GPS (6)*</u> *tools can be activated. For line layers only the* <u>*Add line*</u> *(3) and the GPS buttons mentioned above can be activated, while for polygon layers only the* <u>*Add polygon*</u> *tool (4) is available. For layers that support multiple geometries, for example GML layers, any of the drawing tools can be activated. When a tool is selected and activated for editing it is displayed with a yellow background. As we have not GPS, we edit the layer by using the edit tool (*<u>*Add a point*</u>*) (1)*
- **Step 3-- Add New Geometries:** In our case , once the <u>*Add point tool*</u> *(1) is activated, new points are added to the editable layer by clicking at the desired positions in the View (2). As many points as is needed can be digitised in this manner. New points are generated with the same attributes as in the layer being edited, except that these attributes are empty.*
- **Step 4_ Select the custom form.** In the TOC we indicated previously that the ***service_select_points. shp*** has an associated custom form ***SERVICES_Valencia.xml.***

- **Step 5_ To get information about the WMS:** We need to have the information about the REF of the new point, so we go to the TOC, we change the order of the layers by setting up that the WMS is on the top.After that with the _Get Information tool_ from the Information Management toolbar we get this information. We can copy this value from the PDA by using Crtl+C.

  NOTE: This way to copy the data only works by using gvSIG Mobile in the PDA, in our case we have to introduce manually the value.

- **Step 6_intoduction of attributes.** To enter attribute data for a new point first activate the _Get Information tool_ from the Information Management toolbar, _then click on the new point to bring up the attributes form_. We have to enter the following atributes:
  ◦ CATEGORY: _(CATEGORY table register name)_: Restaurant (we select this value from the scroll bar)
  ◦ REFERENCE: _(REF_REG table register name)_: By using Crtl+V we paste the value that we have copied before. NOTE: This way to copy the data only works by using gvSIG Mobile in the PDA, in our case we have to introduce manually the value.

- **Step 7_Save the layer.** To disenable editing, tick the checkbox (3) below the pencil icon of the layer **services_select_point.shp.**

- **Step 8_To check that the file has been updated.** With the _Get Information tool_ from the Information Management toolbar, click on the new point to bring up the attributes currently updated.

4.- Limitations when editing layers

- The layer must be a vector layer.
- Only one vector layer can be edited at a time.
- If the original vector layer contains a single type of geometry (points, lines or polygons) then only the same type of geometry can be added.
- It is not possible to create new attributes that are not already in the layer being edited. Each new geometry only inherits attributes already existing for other geometries in the layer.
- It is not possible to modify geometries that existed in the layer before editing was enabled. However, it is possible to edit their attributes.
- To cancel any changes made since editing was enabled, simply uncheck the Editing checkbox in the TOC and click the cancel button when asked to save changes. The layer will return to the state it was in prior to any editing.
- Generating of points and track points from a GPS is only be possible if the GPS is enabled and working properly.
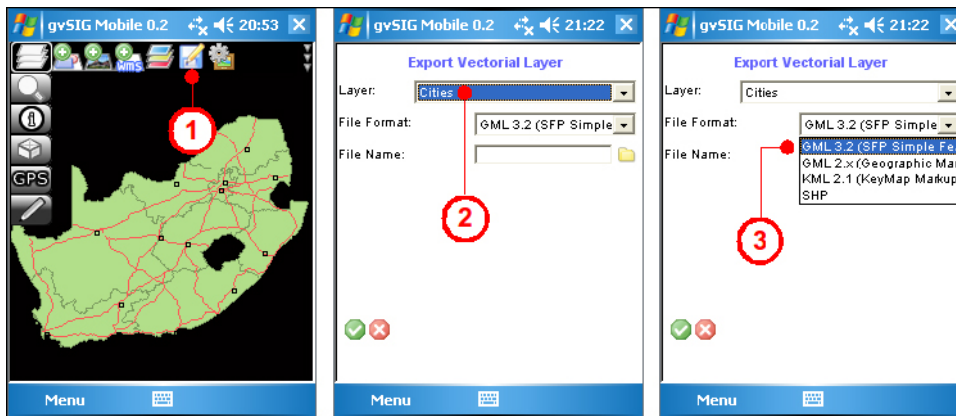
OSGIS10 Export data

This page last changed on Jun 15, 2010 by adelrey.

1.- Exporting the results

We can export the result of our shape file into the following formats:

- GML 3.2
- GML 2.x
- KML 2.1
- SHP

We are going to export the results as:

_services_select_point_update.KML_

OSGIS10 Thematic maps generation

This page last changed on Jun 15, 2010 by adelrey.

1. Creation of a thematic map

We are going to create a thematic map of the file **_services_select_point.shp_** by range of value.
For example by the NUM value selected from the scroll bar.