How to Make a Street-O Course Map for the Tucson Area
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Overview:

The basic process for making a street-O map consists of 3 steps:

(1)   Download an aerial photo image from the National Map Seamless Server website.
(2)   Create a course map by using an image editing program.
(3)   Print the course map at a specific scale.

Preparation:

Before you begin you will need to determine the scale and the page size that you want to print your map at. Both the scale and page size will determine how large an area your map will cover on the ground. Ideally you will want to use a scale of from 1:4000 to 1:10,000 in order to get good resolution of the ground features. A 1:8000 scale will just barely allow a 1x1-mile area map to fit on letter sized paper.

You will need the following tools: A PC with access to the internet, image editing software such as Microsoft Paint software (Windows XP or later), and a color printer.

Download Procedure:

(1) Go to http://seamless.usgs.gov/ . This is the USGS's National Map Seamless Server website.

(2) Click the "View And Download United States Data" link. This will bring up a screen with an interactive map tool. [1]

(3) Select "Elevation" on the "Display" menu and toggle-off the default settings "NED Shaded Relief (1 arc second)" and "GTOPO60 Color Shaded Relief".

(4) Click the zoom-in button on the "Zoom" panel. Then click and drag a rectangle on the map to zoom in to the location of your street-O.

(5) Select "Orthoimagery" on the "Display" menu and toggle-on "Tucson, AZ" (or "AZ - Pima County" if Tucson data is not available). This will load an aerial view of your street-O site onto your screen. [2]

(6) Click the "Define Rectangular Download Area" button on the "Downloads" panel. A "Request Summary Page" dialogue box will pop up.

(7) In the dialogue box, click on "Modify Data Request" which will upload a new page to the dialogue box. Then toggle-off the requested products in the "Elevation" section (default) and toggle-on all 0.3m orthoimagery products under the "Orthoimagery" section. Then click "Save Changes & Return to Summary," which will return the dialogue box to the first page. Then click the "Download" button for the file you wish to download; this should begin the download process.

(8) The downloaded file should be a .zip file. Go ahead and extract all the files contained in it. The .tif file is the one that you want.

Editing Your Course Map:

You can now use your image editing program, such as Microsoft Paint, to crop your orthophoto image, to adjust the scale for printing, to add control circles and other map features, to add text, and to print your course map. When you are finished editing, save the file to a .bmp or .jpg format file.

Printing and Getting the Scale Right:

Each pixel of the 0.3 m orthoimage is equal to 12 inches on the ground. Depending on the software you use to edit and print your image, the method for making it print to scale will vary.

For those of you using Paint to print your map, review the image attributes in Paint to find out how many pixels your image is wide and tall. Then set the page setup so that both the left and right margins are set equal to (sheet width - (# of pixels wide * 12 / scale)) / 2 and both the top and bottom margins are set equal to (sheet height - (# of pixels tall * 12 / scale)) / 2. For example, say you want to print your map at 1:5000 on letter-size paper and your image is 1200x1600 pixels. Your left and right margins would then be set to (8.5-1200*12/5000)/2=2.81 and your top and bottom margins would be set to (11-1600*12/5000)/2=3.58. Then make sure that you set the page scaling to fit to 1 by 1 pages in order to force the proper scale.

Users with suitable image editing software may control the scale by changing the image's dpi attributes to a number equaling the desired scale divided by 12. For example, for a 5000-scale map the file's dpi should be set to 417x417. (417=5000/12). To print it at the desired scale make sure the print setting is at normal size or 100%. If you send a copy of your image, along with the scale you want, to Ludwig Hill, he can adjust your image's dpi attributes for you before you begin editing it.

Ocad users will find that the .tif file can be automatically opened at the correct scale as a template. [3]

Notes:

[1] You might get a message on your screen stating something like "You have a popup blocker enabled. This means some functionality of the viewer will be limited." This probably will not affect your ability to continue with the download process. If you experience any problems, then go ahead and enable pop-ups and return to step 1 of the download procedure.

[2] It is possible that the viewer will not show the latest Tucson orthoimagery, even if you toggle-on it. However, you should still be able to download it later in step 7 of the download procedure.

[3] If you have the time, it is highly recommended that you try to become familiar with Ocad, as it will ultimately make your course maps much more easier to make and manage. Contact Ludwig Hill if you are interested in learning how to use the freeware version of Ocad 8.