

Summary

In this example, two methods for adding a bitmap (BMP) background image to a new model will be described. The bitmap files used in this example are scanned images from USGS topographic maps. Once a background image is attached to a model, the model piping can be added by tracing over the background image.

Steps

The following assumes that GASWorkS has already been started. If a model is already open, close it by selecting the *Close* menu item from the *File* menu list. Use the following procedure to work this example...

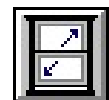
Method 1

1) Create The New Model

- From the *File* menu list, select the *New* menu item. The File Selection screen will be displayed. Enter a *Filename* for the new model, then select the *Continue* command button.
- The Graphic Data Interface (GDI) Window will be displayed.

Note - If the GDI Window is not automatically displayed, select the *View/Edit* menu item from the *Graphics* menu list to display the GDI Window.

- Resize the GDI Window using the *Maximize GDI Window* icon from the *GDI Window Controls Toolbar*.



2) Add The Background Image

Before we can add the background image we need to determine a few values which will need to be set in order to properly display the image. We will need to know the image resolution and scale. For this example, the map scale was 1 Inch = 2000 Feet and the image resolution was 400 dots (pixels) per inch. We will also need to determine a value for the upper-left X and Y-coordinates of the image. This value can be arbitrary and only needs to be large enough to ensure that negative coordinate values aren't encountered. For this example, we will use 100000 Feet for both of these values.

- From the *Graphics* menu list, select the *Background Settings* menu item. The Background Image Settings screen will be displayed.



- Select the *Attach New Image* command button. The Attachment File Type screen will be displayed. Select **BMP - Windows Bitmap Style Raster Or Image File** from the list, then select the *Continue* command button. The File Selection screen will be displayed. Use the *Drives* and *Directories* lists to navigate to the directory containing the desired file - **gathering.bmp**. Select the file, then select the *Continue* command button.
- Select the *Calculate Scale Factor* command button. The Scale Factor screen will be displayed.
 - For *Image Resolution* enter **400 Pixels Per Inch (DPI)**, and for *Image Scale 1 =* enter **2000 Inch = Feet**. The *Scale Factor* will automatically be calculated. The value should be **5.0**. Select the *Apply* command button to set the value.
- For the *Insertion Point (Upper-Left Coordinates) X and Y* values enter **100000**, then select the *Apply* command button to attach the BMP image.

3) Zoom The GDI Image

- Zoom the GDI Image to fill the display using the *Zoom To Fit* icon from the lower-left corner of the GDI Window

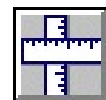


Note - If the background image is not displayed in the GDI Display, select the *Display Background Image* icon from the *Display Controls Toolbar*. The background image should now be displayed.

4) Check The Scale Of The Background Image

Now, use the various *Zoom* and *Pan* commands so that the entire length of the north-south section line between Sections 33 and 34 is visible in the GDI Display. Measure the length of the section line between Sections 33 and 34.

- Select the *Measure Distance* icon from the *Utility Commands Toolbar*.



- For the *First Point*, click on the northern section intersection. For the *Next Point*, click on the southern section intersection. Right-click the mouse to end the measurement selection.

- The Measured Values screen will be displayed. What is the distance? The scaled distance on the original map was 5200 Feet. The measured length will not be exact and varies according to the accuracy of the scanner, the original map, and how well the measurement points were selected by the User. Select the *OK* command button to clear the message.



Method 2

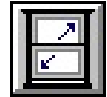
With this method, we do not need to know the resolution or scale of the image, however we will need to know a known distance between two points. We will attach the background image and then rescale it in GASWorkS to match the known value.

1) Create The New Model

- From the *File* menu list, select the *New* menu item. The File Selection screen will be displayed. Enter a *Filename* for the new model, then select the *Continue* command button.
- The Graphic Data Interface (GDI) Window will be displayed.

Note - If the GDI Window is not automatically displayed, select the *View/Edit* menu item from the *Graphics* menu list to display the GDI Window.

- Resize the GDI Window using the *Maximize GDI Window* icon from the *GDI Window Controls Toolbar*.

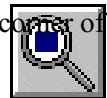


2) Add The Background Image

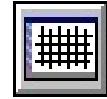
- From the *Graphics* menu list, select the *Background Settings* menu item. The Background Image Settings screen will be displayed.
 - Select the *Attach New Image* command button. The Attachment File Type screen will be displayed. Select **BMP - Windows Bitmap Style Raster Or Image File** from the list, then select the *Continue* command button. The File Selection screen will be displayed. Use the *Drives* and *Directories* lists to navigate to the directory containing the desired file - **valley.bmp**. Select the file, then select the *Continue* command button.
 - For the *Scale Factor* enter an arbitrary value of **10**, and for the *Insertion Point (Upper-Left Coordinates)* *X* and *Y* values enter **100000** for both values. Select the *Apply* command button to attach the BMP image.

3) Zoom The GDI Image

- Zoom the GDI Image to fill the display using the *Zoom To Fit* icon from the lower-left corner of the GDI Window



Note - If the background image is not displayed in the GDI Display, select the *Display Background Image* icon from the *Display Controls Toolbar*. The background image should now be displayed.



4) Set The Scale Of The Background Image

Now, use the various *Zoom* and *Pan* commands so that the “crosses” in the two San Juan Cemeteries are visible. The distance between the centers of the two crosses is known to be 2000 Feet.

- Select the *Scale Background Image* item from the GDI Command List.

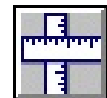


- For the *Background Image File To Scale*, select **...valley.bmp** from the list. For the first *Known Point*, select the center of the southwest cross. For the second *Known Point*, select the center of the northeast cross. For the known *Actual Distance*, enter **2000** and press the *Enter* key.
- A message will displayed stating the amount that the background image needs to be changed (the *Scale Factor*). If the value is appropriate, select the *Yes* command button to apply the change.

5) Check The Scale Of The Background Image

Use the various *Zoom* commands to display the crosses again. Measure the distance between the crosses.

- Select the *Measure Distance* icon from the *Utility Commands Toolbar*.



- For the *First Point*, click on the center of the southwest cross. For the second *Next Point*, click on the center of the northeast cross. Right-click the mouse to end the measurement selection.
- The *Measured Values* screen will be displayed. What is the distance? The *Absolute Distance* should be about 2000 Feet. The measured length will not be exact and varies according to the accuracy of the scanner, the original map, and how well the measurement points were picked. Select the *OK* command button to clear the message.

Notes & Considerations

- In this example, existing bitmap (BMP) files were used to create a background image. In one case we set the scale of the image when it was attached, in the other case the scale was set after the image was attached. By ensuring that the scale is correct, when we trace the piping system over the background image, the lengths and locations of the new pipes will also be to scale.
- If we weren't able to determine or set the actual scale of the image we could still trace over it. However, we would need to manually enter the correct pipe lengths when we entered the pipe data.
- If a background image needs to be moved or shifted to a specific location after it has been attached, for example to match another adjacent image, use the *Move Background Image* command to interactively move the background image.
- The BMP files used in this example were relatively small in physical size. As a consequence the resolution of the image was pretty good. Much of the text and line work was readable. As the physical size of the bitmap file increases, the resolution of the displayed image will decrease and the amount of memory required to display it will increase. Using a very large bitmap file may result in a background image whose resolution and memory requirements are unacceptable. In these cases it is advisable to “chop” the file up into smaller pieces and view each piece individually.

