



WHEN THE SOLAR ARRAYS DON'T PRODUCE AS EXPECTED, AND ACTUALLY DRAW POWER?

Solar Farms Can Supply Power and Consume Power?

We Must Have the Ability to Determine Power Flow in Both Directions and Analyze Sub Cycle Indicators

GTCO. SOLVES ANOTHER PROBLEM!

The Mission

Determine why a new solar farm is not delivering rated output power and consumes energy at night.

The Challenge

I often refer to trouble shooting in harmonic rich environments as “Chasing Ghosts”. In this engagement, we have four competing parties involved, the solar manufacturer/installer, the University, the electric utility and the electrical contractor. A classic “finger pointing contest ensues. Each party has a vested interest in finding a cause and resolution that will result in proper power output acceptable to all. Each party does their due diligence in double checking their portion of the work and of course finds everything OK, it must be someone else's problem? In fact, GTCO. determined that each of the parties are contributing to the problem but they are “Chasing Ghosts”!

The Solution

GTCO. Examined the site, interviewed interested parties, tested the equipment and found that four major problems existed. Faulty meter programming, leaking bushings and insulators, mis-applied utility vectors

and large zero sequence current flowing on the campus medium voltage distribution system. One contribution to the problem for each participant!

The Results

Acting as a third party independent consultant, GTCO. was able to bring new light to the conversation and instill cooperation between the parties. The term “Chasing Ghosts” is used to describe an exercise of looking for an elusive, sub-cycle problem. If there is a loose connection, you can see it, hear it, and sometimes smell it. So, just fix it! What if the problem is something in the system that you cannot see? Then you will find yourself “Chasing Ghosts”! So..., Who You Gonna Call?

Contact GTCO. For assistance when you find yourself

“Chasing Ghosts”!



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GT THE GERRY THOMAS CO.
ELECTRICAL POWER SOLUTIONS
Sales - Service - Consulting

Using Styles

by Name Style

The body text throughout the articles in this template uses the Normal paragraph style. Following are some other styles applied throughout the template:

- Large article titles, such as on the first page, use **Heading 1** style.
- Orange headings in the sidebars and within articles use **Sidebar Heading** style.
- Orange section titles in articles use the **Heading 2** style.
- Small article titles use **Heading 3** style.
- This style is **List Bullet 2**.
This style is **List Continue**.
- Text in sidebars uses the **Sidebar Text** style.
- White headings on orange text in tables uses the **Heading 4** style.
- The heading inside contact information tables uses **Heading 5** style.
- **Contact Info** is the name of the gray text style inside the small contact



Access all styles used in this template on the **Home** tab, in the **Styles** group.

Using styles helps save you time and keep your document consistent. To modify a style, on the **Home** tab, in the **Styles** group, right-click the name of the style you want to edit and then click **Modify**. All content where the style is applied will update automatically.

Another way to modify a style is to simply customize an instance of the style where it's applied in the document. Then, on the **Home** tab, in the **Styles** group, right-click the style

name and then click **Update [style] to Match Selection**.

HEADING 4, STYLE

Use the small tables provided in some of the articles to call out quick reference information related to the article, such as contact information or event dates.

HEADING 5
Contact Info

tables.



This picture caption uses the Caption 2 paragraph style and is inside a text box so that you can move it easily as needed to accompany a photo.

Working with Columns

by [Article Author]

To set up a document for multiple column text, on the **Page Layout** tab, in the **Page Setup** group, click **Columns** and then click the number of columns you need. You can also click **More Columns** to specify column widths, the space between columns, or to automatically add a vertical line between columns.

To change the number of columns for just part of the document (or if you want text to wrap to just the top part of the page and a new article to start below – as shown on this page), insert a section break before the position where you want to start the new column layout. To do this, on the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and then click the type of section break you need.

Select a section break

When changing many types of page layout formatting for just part of the document—such as paper size, margins, or orientation, the best section break type to use is a **Next Page** section break because it automatically starts the new section on a new page. However, when changing the number of columns as you might in this newsletter, you may prefer to select a **Continuous** break. The continuous section break (used a few times throughout this template) starts a new section immediately after the preceding one. So, for example, you can have a three-column article followed by a four-column article, on the same page.

HEADING 4



Learn about these “thermometer charts” in the article at right.

42%

Cras ut blandit diam. Suspendis quis urna semper aliquam.

This placeholder article provides the following tips: *Article provides the following tips: picture captions. Captions are in text boxes for easy placement relative to images.*

- Creating “thermometer charts” using tables, as shown at left.
- Setting up multipage articles.
- Wrapping text around images
- Adding article titles and bylines

Creating the sidebar thermometer charts

When you work in Word 2010 (or PowerPoint

Formatting Tips

by [Article Author]

FOR MORE INFORMATION

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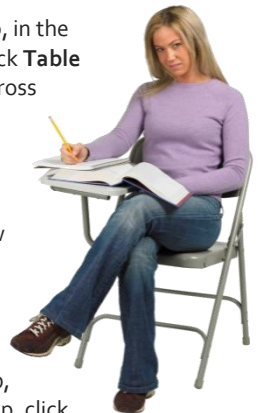
HEADING 5
Contact Info

2010), you have the full power of Excel 2010 charts (provided that Excel is installed on your computer). Insert a chart in Word from the **Insert** tab, in the **Illustrations** group. Charts are easy to create and use and automatically coordinate with your active document theme.

However, notice in the sidebar at left that the “thermometer charts” were created using single-row Word tables. This is because they automatically fit the tight space without having to remove any chart elements. And you might be surprised to learn that it’s easy to make them essentially mathematically accurate.

To use a table as a thermometer chart, do the following:

1. On the **Insert** tab, in the **Tables** group, click **Table** and then drag across the grid to select the first two cells in the first row. Click to insert a two-cell, one-row table.
2. Click in the table and then, on the **Table Tools Layout** tab, in the **Table** group, click **Properties**.
3. On the **Columns** tab of the **Table Properties** dialog box, change the **Measure In** setting to **Percentage**. You can then set the percentage to up to one decimal point in accuracy.



Sidebar Setup

The sidebars in this template use simple, single-row tables for the gray-shaded headings and thermometer charts shown below for easy alignment.



Add Sidebar Content

Adding content into a column to create a sidebar is no different from adding text. As noted earlier in this template, apply the styles provided for headings, sidebar text, and even pictures to align them quickly and easily.

FAST FACTS

68%

Setting up multipage articles

Word is designed to allow text to automatically flow from one page to the next. So, when you want an article to continue on the next page, just keep typing.

In the case of this placeholder article, it is separated into two placeholder content controls (one on this page and another that starts at the top of the following page) just so that you can still see the layout of the following page while you begin adding your own text on this page. As mentioned on the first page of this template, remember that it might look like the layout is skewed when you replace a long piece of placeholder text by starting to type your own, but it is not. As you add your content, the layout that follows will move down automatically and back into position.

To remove the second placeholder control that starts immediately following this one, just select it and then press any key. You can then continue typing from this page and your text will automatically flow onto the next.

Wrap text around images

The photos in this article that are angled with white borders are “floating” images. That is, they are setup for text to wrap around them—which is why they can span multiple columns in a three-column section. Additionally, as mentioned earlier, the photo of the young woman that’s within a text column on the preceding page. The background has been removed from that image to allow text to wrap directly around the subject.

Office 2010 introduced several new and improved picture formatting tools in Word, PowerPoint, and Excel. Among those is the Remove Background tool that you can use to remove backgrounds from your own images, similar to the sample image on the preceding page.

To do this in Word, first insert your image into the document (on the **Insert** tab, click **Picture**), and then select it. Then, on the **Picture Tools Format** tab, in the **Adjust** group, click **Remove Background**.

The Remove Background feature automatically displays what it believes to be the central subject of the image. However, it’s easy to adjust this if the immediate result is not what you need.

On the **Background Removal** tab, click **Mark Areas to Keep** or **Mark Areas to Remove**

of the young woman in the body of this article is set to wrap text so that text will flow around the image as you add your own text.

To select text wrap settings, start by selecting the image and then do the following:

1. On the **Picture Tools Format** tab, in the **Arrange** group, click **Wrap Text** and then select either **Square, Tight, or Top and Bottom**—depending on how you want the text to wrap.

You might be happy with the default behavior as soon as you do this. Otherwise, continue to step two for customization options.

2. To set a specific position or control behavior (such as whether or not the image moves with text), on the **Picture Tools Format** tab, in the **Arrange** group, click **Position** and then click **More Layout Options**.

➔ On the **Text Wrapping** tab of the **Layout** dialog box, you can set a specific distance from the image for text to wrap and control whether text can wrap on both sides, one side only, or just above and below the image.

➔ On the **Position** tab of that dialog box, you can set a specific position for the

and then drag your mouse pointer in a line across the portion of the image you want to add or remove. When you are finished making adjustments, click **Keep Changes**.

image on the page and select or clear the option to allow the picture to move with text.

Adding article titles, bylines, and dividers

The article titles and bylines for this newsletter are created in text boxes. This is because text can wrap around a text box just like it can around a picture. Similarly, the orange divider bars that you see on pages containing more than one article are shapes set to wrap text. So, these text boxes and shapes can easily span multiple columns without having to insert a section break or change the number of columns for just that portion of the page.

When you select a text box or a shape, on the **Drawing Tools Format** tab, in the **Arrange** group, you have the same settings for text wrapping and positioning that are described above for wrapping text around pictures.

Note that, because text is set to wrap around the orange divider bars, your article might appear to slip below or above a bar, depending upon length. To adjust the position of a divider bar shape to accommodate the length of your articles, just select the shape and then use the up and down arrow keys on your keyboard to nudge it to the proper position.

FOR MORE INFORMATION

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HEADING 5
Contact Info

Remove Image Backgrounds

by [Article Author]



Title Lorem Ipsum Dolor

by [Article Author]

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Solar
Farms
Can
Supply
Power
and

Consume Power? Quarterly

[Street Address]
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