1 Contents

2 Introduction

Colorbox is an Excel based tool to support the generation of grid based art: Latch hook patterns, cross stitch, etc.

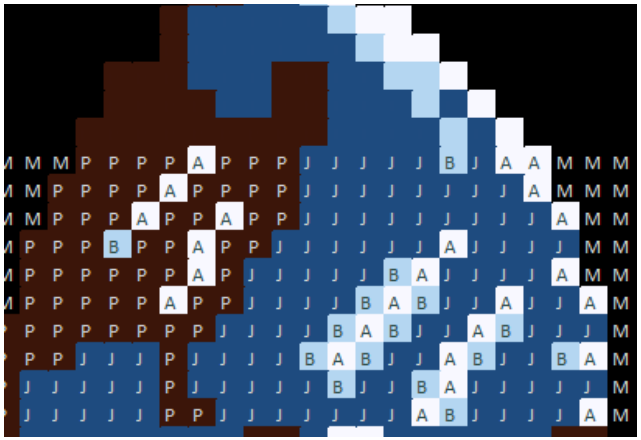
This software is distributed free of charge and is available to all who wish to use it. Please do not modify the code.

It can configure an excel worksheet to look like a hook rug pattern and allow the user to create and edit the pattern. The importing of images is also supported.

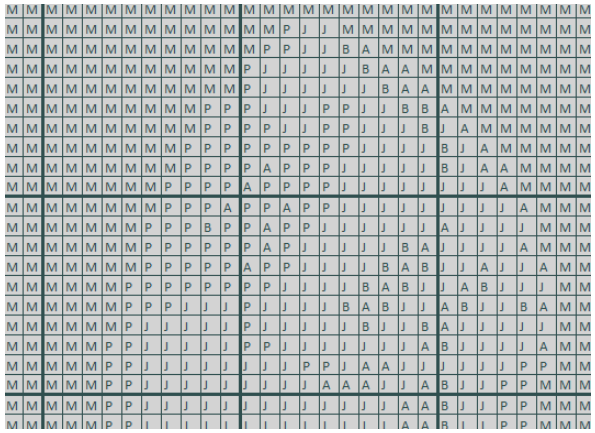
The three following screenshot images show

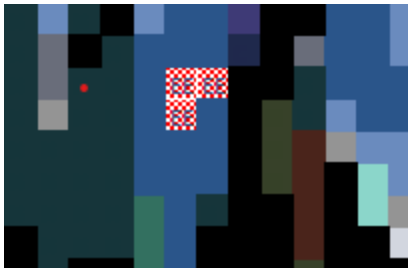
1) A small-scale image of the finished product

2) A larger scale image with the colors and letters visible (during an editing session)



3) A typical pattern showing the letters in uncolored cells with a 10 by 10 grid superimposed.





A user sets the color of each cell by entering a single letter into each cell. If a cell contains than one letter or is not a-z, A-Z, then the cell is marked as invalid: it is colored with a red checkerboard pattern.

The Colorbox provides a user the ability to assign defined colors to specific letters. Currently, the use of all 52 upper- and lower-case letters is supported. Users may wish to avoid the concurrent use of visually similar letters such as I (capital eye) and l (lower case el) or “i” I (lower case eye) and j in patterns.

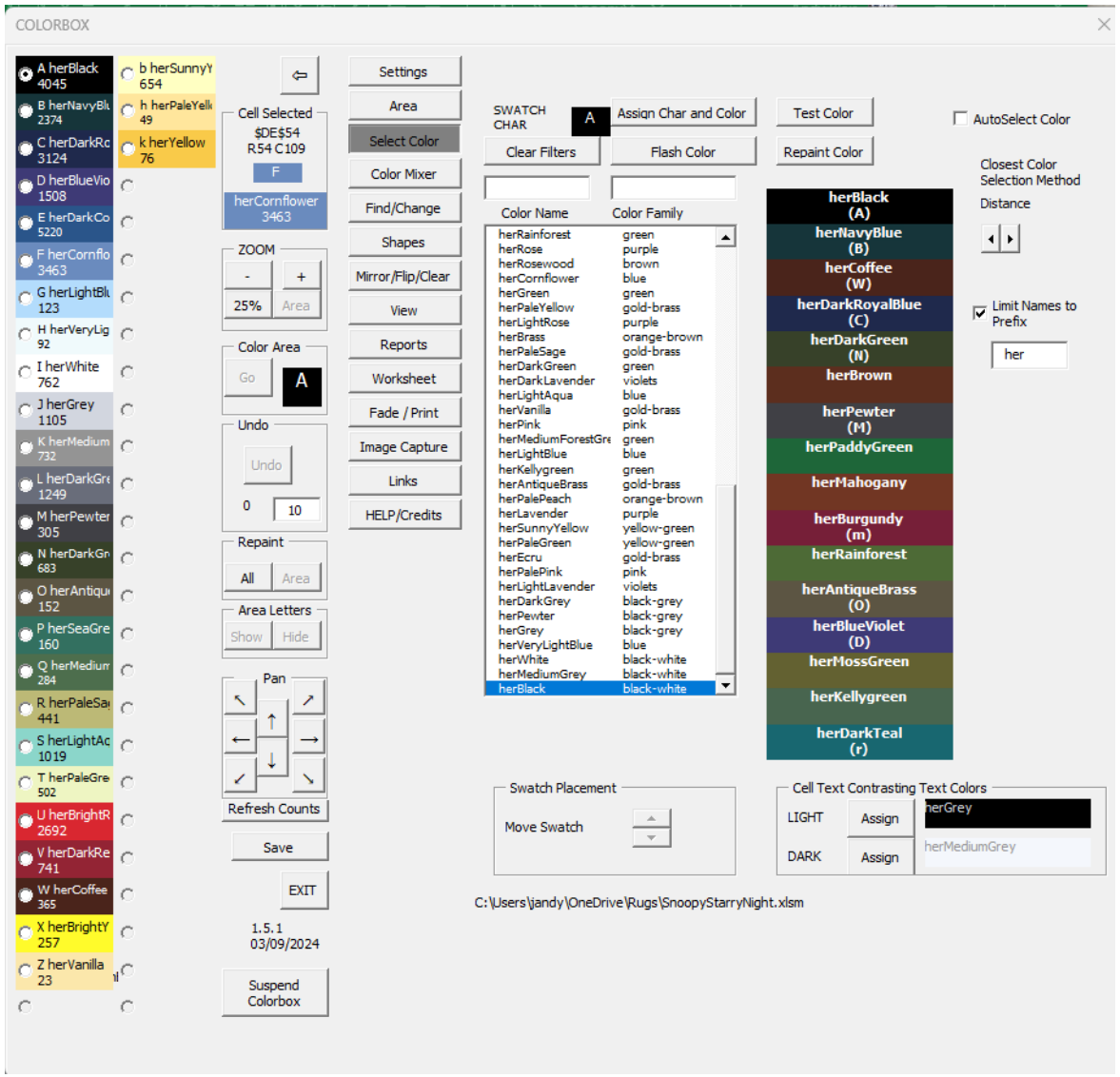
Other capabilities include:

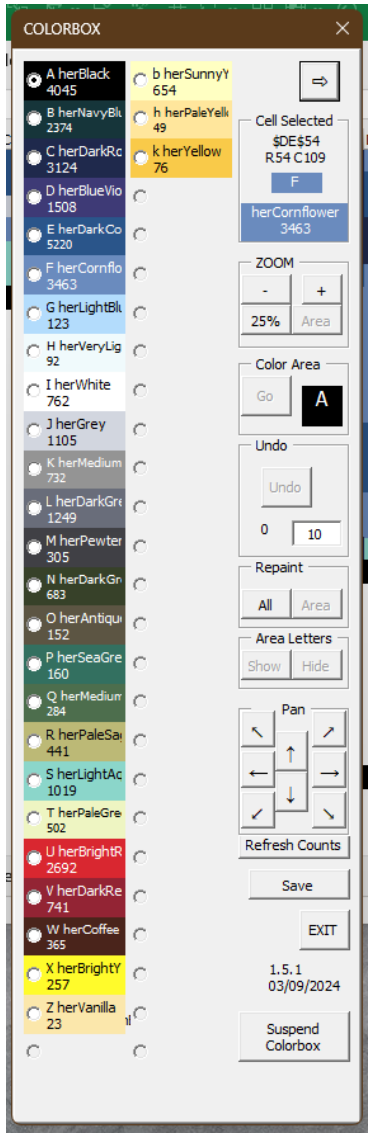
1. Controlling how a cell is displayed: colored/ uncolored, letters shown or not, cell boundaries shown/not, and 10x10 boundaries shown/not.
2. Repaint the image to incorporate settings changes.
3. Allowing the user to “hunt for just the right color”
4. Find/Change Letters and Locate incorrectly filled-on or empty cells.
5. Undo cell changes.
6. Create circles, lines and polygons with user defined colors, or a set of random or patterned colors.
7. Cut/Copy and Paste polygons.
8. Change the displayed zoom level and pan the display.
9. Mirror/Pivot user selected areas right or down.
10. Rotate an image 90 degrees left or 90 degrees right.
11. Generate a shopping list for yarn and canvas.
12. Print patterns and a legend.
13. Import Leftsource csv files. This includes rotating an image X to Y to correct for Leftsource behavior
14. Import a jpg or png file directly using a called Python-based executable that converts the file to an RGB CSV file which is then ingested.
15. Restore from periodic backup snapshots.
16. Access this help file.
17. Suspend the processing to allow native Excel actions to occur.

The Colorbox is loaded by double clicking on a cell in a prepared worksheet. (Users can also configure Excel to load the Colorbox from the shortcut bar)

3 Colorbox Popups

3.1 Main Colorbox





As illustrated on the previous page, the Colorbox is shown in two modes :

1) The full mode, which provides access to the sub pages
2) A Color-only mode which shows just the color pallet and some basic controls (to minimize screen space).

The user can switch between modes by clicking on the arrow just to the right of the first color mapping near the upper left corner of the popup.

The Colorbox popup in Color-only mode shows

1. A list of color swatches with the mapped letter and the selected color name and the number of times the letter is used on the pattern.
    a. Hovering over the color swatches provides addition detail (RGB values in different formats)
    b. Clicking on a swatch puts the swatches letter into the Select Color panel, enabling you to change the letters color
    c. Double clicking on the Swatch brings up a smaller Sample panel that can be moved in order to match a color on your displays.
2. A control to change the mode to full mode in the upper right corner.
3. A description of the currently selected cell.
    a. If a single cell is selected on the pattern, then the following information is shown
        i. the cell's address (in Excel RC form)
        ii. the cell's location in terms of row and column numbers
        iii. the cell's letter
        iv. the cell's color name and letter count
    b. If more than one cell is selected, then the following is shown:
        i. The areas bounds (In Excel RC form) and
        ii. the number of rows and columns
4. A "Zoom" control area, including

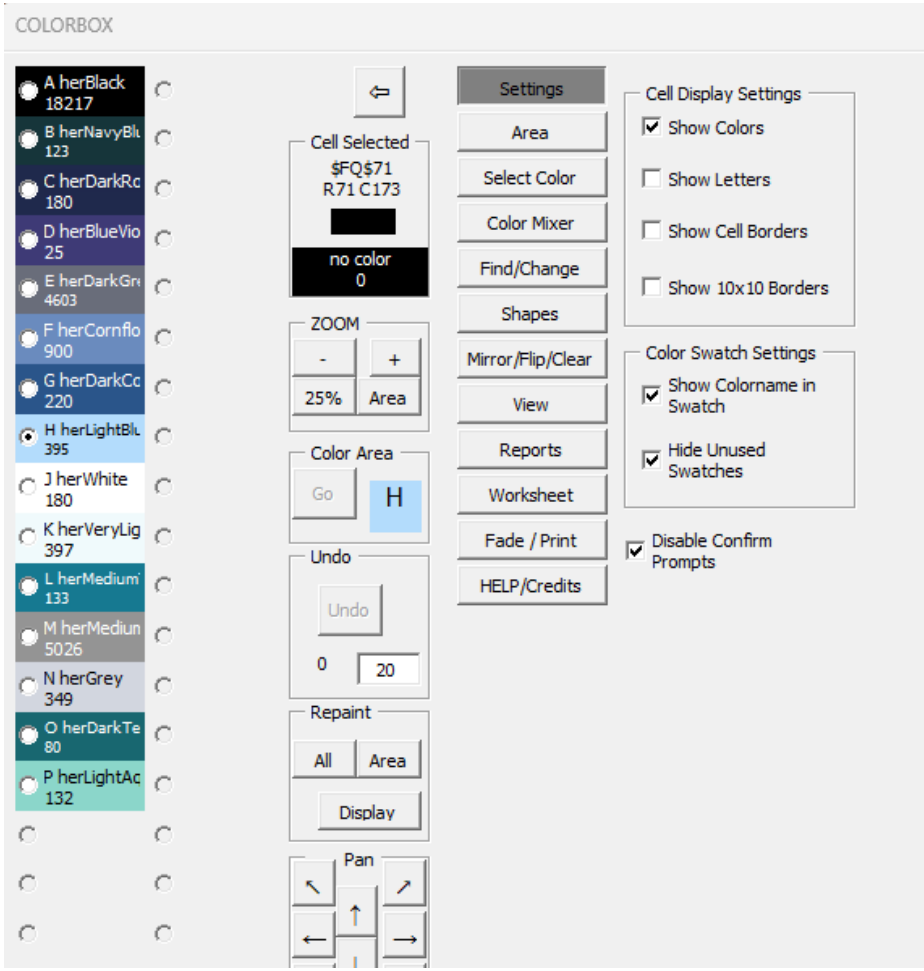
a. "+" and "-" keys, which shift the zoom levels 5%

b. A 25% key which shifts the zoom level to 25%

c. An "Area" key which expands the zoom level (up to a limit of 100%) such that the selected area is zoomed in to.

5. A "Color Area" control, which lets the user apply the currently selected Swatch color to the currently selected area.
6. The Undo Controls (described later)
7. "Repaint" controls, which lets the user repaint either:
   a. The entire pattern
   b. The Selected Area or
8. "Area Letters" controls which let the user quickly show or hide the letters in a selected area.
9. Panning controls which move the screen 10 cells in each of 8 directions.
10. A control to force the update of the thread counts.
11. A "Save" button to save the pattern file.
12. An Exit button which closes the Colorbox but does not disable the underlying pattern color processing.
13. A version number/date
14. A Suspend Color box which disables responses to cell selection and editing.

The Colorbox shows the 52 "swatches". A control in the Settings tab to "Hide Unused Swatches" allows the user to remove unused swatches from the display. Hiding the unused swatches disables the ability to move the swatches relative to each other.



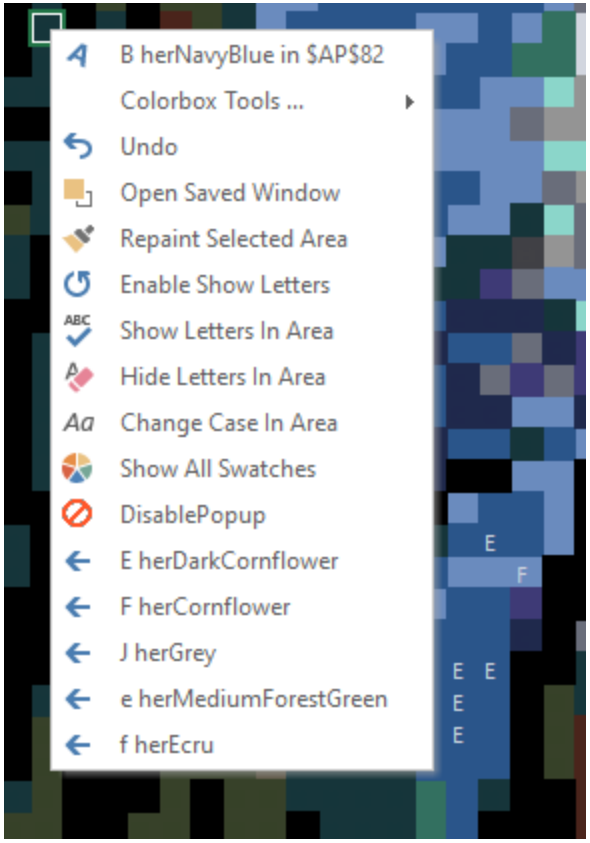
The Colorbox in wide mode provides access to the following sub-pages:

1) **Settings** : Controls what is displayed (colors, letters, cell borders, 10x10 borders). Controls certain Swatch Settings
2) **Area**: allows the user to define a recoverable rectangular area. This capability may be useful when you have a selected area ready for some action and need to select one cell to read its value, and then return to the selected area. It also allows for a more controllable ability to specify the two defining the corners (upper left/ lower right) of an area.
3) **Select color**: Allows the user to map defined colors to letters.
4) **Color Mixer**: Allow the user to create new colors and to search for matching colors.
5) **Find/Change** allows the users to change cell assignments and it allows user to find where colors are used. A used color inventory is also shown here.
6) **Shapes**: Allows the user to define Polygons and lines on the pattern and to color these items in.
7) **Mirror/Flip/Clear**: Allows the user to copy a section of a pattern in a mirror image to the right or bottom of the selected area, to transpose and/or rotate the entire pattern and to clear areas of a pattern.
8) **View**: Allows the user to control the display scale (zoom), to draw a 10 x 10 grid, and to set the cell sizes
9) **Reports**: Allow the user to generate a “bill of materials” for the pattern
10) **Worksheet**: Allows the user to create a new worksheet, support leftsource data import, to force an immediate backup of the pattern, to recover from a backup, and to clean a pattern,
11) **Fade/Print:** Allows the user to print the pattern. The Fade function allows the user to fade all of the displayed colors by a specified percentage. Fading may be of help in creating more readable printed pattens, especially when printed to black and white.
12) **Image Capture:** Allows the user to take a sized/cropped jpg or png image, pass it through a preprocessor, then import the raw image into a special raw image tab. The raw image is then processed to become a “Colorbox” compatable sheet. This processing includes stepping the image size down (1:1, 2:1, 3:1 or 4:1), changing the raw RGB color values into named colors, and then reducing the number of used colors to 52 or less unique colors. Once completed, the image can be editted in Colorbox.
13) **Links:** The user can establish two links in order to enable quick access to other files. (Such as a reference image file.)

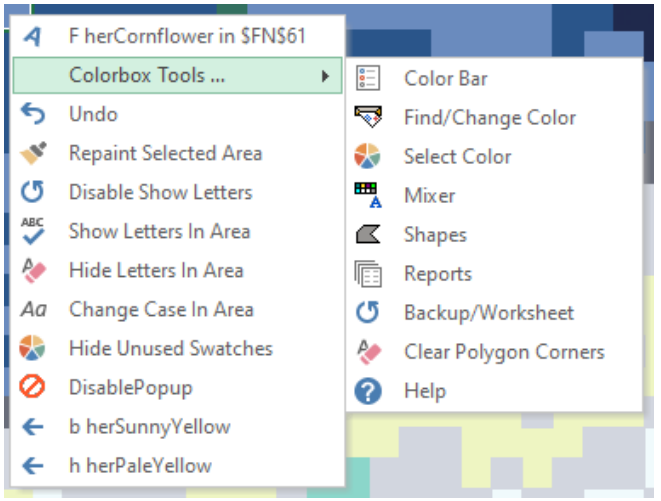
14) **Help/Credits** : Provides access to this help file and provides contact information for support

3.2 Colorbox "Cells" Menu

A second menu can be accessed in the same manner as the Excel "Cell" menu, by **right clicking** on a cell in the spreadsheet (patterns). If the main Colorbox has been loaded, the Excel Cell menu is replaced by an application specific menu. Right clicking inside the pattern tab will load the menu. This menu provides the following: (Funtional details to be provided in subsequent pages)



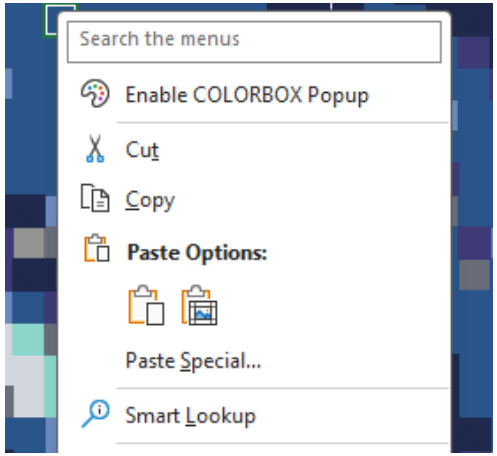
1) The color Letter, color name and cell address of the currently selected cell. (If more than one cell is selected, the data is provided for the upper left most cel of the selected area.)
2) Access to a submenu of Colorbox Tools.
3) Open the saved window as described in the View Section.
4) Access to the Undo Function. Recent cell changes can l be undone up to the Undo depth.
5) Access to the Repaint Selected Area Function. The selected area of cells will be repainted per the current settings.
6) A toggle to enable or disable showing the letter values in subsequently changed cells
7) The ability to show or hide an selected area's letters.
8) The ability to switch the case of each letter in a selected area.
9) The ability to switch the Swatch Display mode to show or hide unused swatches in the Colorbox.
10) The ability to disable this popup, which will allow the normal Excel Cells popup to appear on a right click.
11) A list of up to 10 of the last unique entered color letters. Selecting one of these letters will set the value of any selected cell(s) to that letter. The letters appear in an alphabetic (Capital letters first) order.



The **Colorbox Tools** option provides shortcuts into the Colorbox tool. The user can:

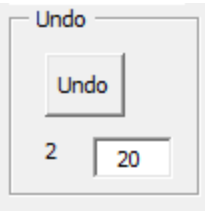
1) Bring up the Colorbox tool in the Color-only (narrow) mode
2) Access the Find/Change page
3) Access the Select Color Page
4) Access the Mixer Page
5) Access the Shapes page
6) Access the reports page
7) Access the Worksheet page, which includes the “restore from backup” capability.
8) Clear any residual shapes arrows or corner markers from the pattern.
9) Access the help manu.

If the Colorbox Cells menu is disabled, the normal Excel Cells popup will be accessible. It will have a control to re-enable the Colorbox Cells popup at the top of the menu. Clicking on “Enable Colorbox Popup” will cause the Colorbox Cells popup to appear on the next right click.



4 Undo

An Undo capability is provided. The Undo capability uses the button and the Undo buffer size value below it. The number of cells that can be "undone" is set by the buffer size. The size of the Undo buffer can affect performance due to the maintenance of an internal queue. Performance may be improved by lowering the size of the buffer.



When pressed, the "Undo" button will undo the last cell change it saw, and continue to undo any additional changes that occurred within a short time (1/10 of a second) of the previous action. Therefore a "bulk" change (a shape creation, or a paste into an area) will be undone as a unit, up to the size of the Undo buffer. Note that the Colorbox also includes a "restore from backup" capability, which allows the user to fall back to a check pointed version of the file. These files are created every two minutes while activity is occurring. Up to 20 such backup files exist at one time.

If the currently selected area's number of cells exceeds the Undo buffer size, the Undo button turns red to indicate that any action with the currently selected area cannot be undone.. If the undo buffer is empty, the Undo button is disabled (greyed out).

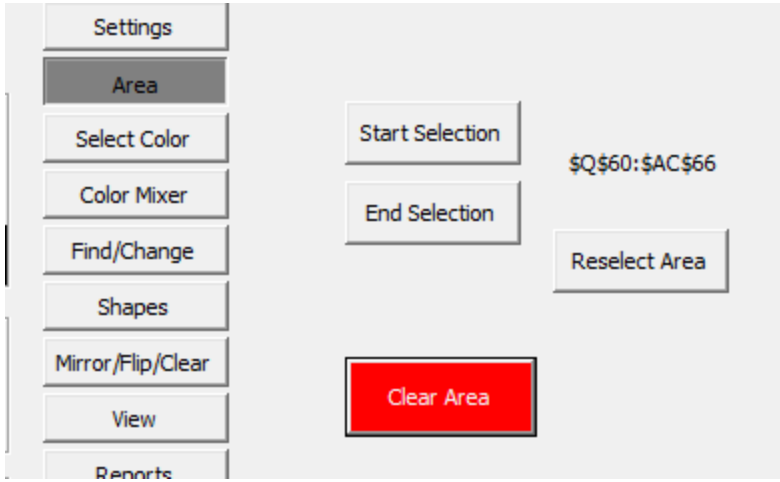
Note that "Undo" cannot undo changes to the spreadsheet that are done by Excel without being processed by the Colorbox tool. Most notably, a cell corner drag which copies the cell across or down cannot be "undone". Likewise a double click too close to a cell boundary that causes a "Clear all the way to the bottom" Excel response can't be undone. However, the <ctrl> Z command, (which calls Excel's native undo capabilties) should undo these sorts of actions. **When an unwanted change occurs to the spreadsheet, it is recommended that the user try the <ctrl> Z command first. Updates by the Colorbox tool will empty out the native Excel Undo buffer.**

Undo can be disabled by setting the buffer size to 0. This will grey out the Undo button. Reset the buffer size to a positive number in order to restore the Undo capability.

Remember to consider the **Recover from Backup** capability when undo does not work.

5 Area Page

The Area page provides two utilities.



1) Defining a Selected Area: The user can quickly select a large area without dragging a cursor across the pattern, using the **Start Selection** and **End Selection** buttons. To set the start of a region, select a single cell and press the **Start Selection** button. To set the end of the region, select the **End Selection** button. When the **End Selection** button is pressed, the range from the start to the end selection cells will be selected. Each action will update the text area to the right of the selection buttons. Selecting any of the Reselect Area command buttons (on this page, the Find/Change or the Mirror/Flip/Clear page will reselect the area indicated in the text.

2) Clear a selected area (rectangle) of letters and colors.

6 Settings Page

The **Settings Page**, allows a user to

1) Control how a cell is colored. The cell optionally can show

   i) The mapped color as the cell background

   ii) The assigned letter for the cell

   iii) A cell border. (The cell border color is automatically set to back or white based on cell contents.

   iv) Enable/Disable the display of a 10x10 master grid.

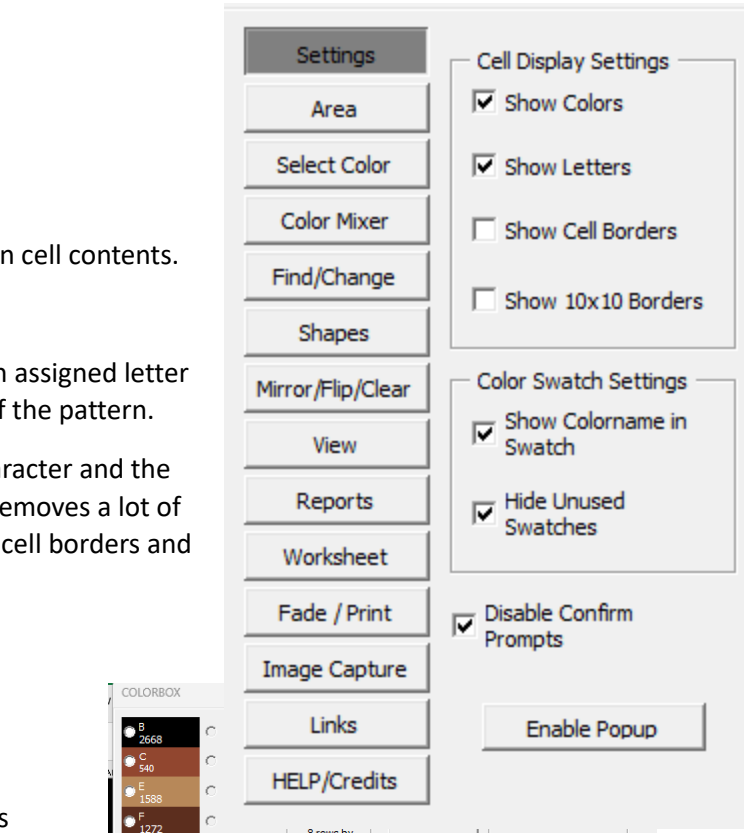
   When an area is repainted, the current display parameters are used. Cells without an assigned letter are shown as white. There is a tool to find "unassigned" cells within the used span of the pattern.

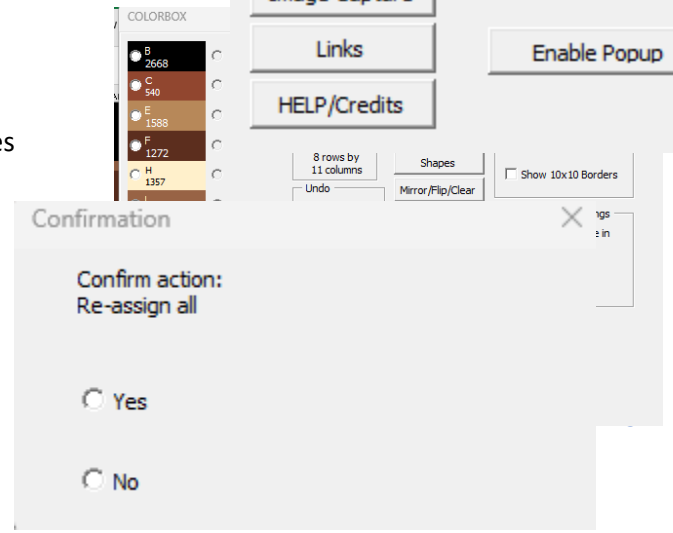
   During a creation/editing session, the user may wish to enable the display of the character and the color or display only the assigned color. Disabling the cell border and 10x10 display removes a lot of visual noise. However, an end-product pattern is created by showing the letters, the cell borders and the 10 x 10 grid.

2) Control The Swatch Display

In order to simplify/declutter the displays, the user can

1. Add/Remove the color name from the displayed swatches.
2. Hide the unused swatches. If the Unused Swatches are hidden, the Move Swatches function is disabled.





A "Disable Confirm Prompt" option disables the presentation of certain "Are you sure?" confirmation boxes. Some activities that involve large numbers of cells in a pattern can take a long time. The confirmation boxes allow the user a chance to cancel one of these processes before it begins. If prompts are disabled, a "yes" answer is presumed.

Note that some prompts cannot be disabled.

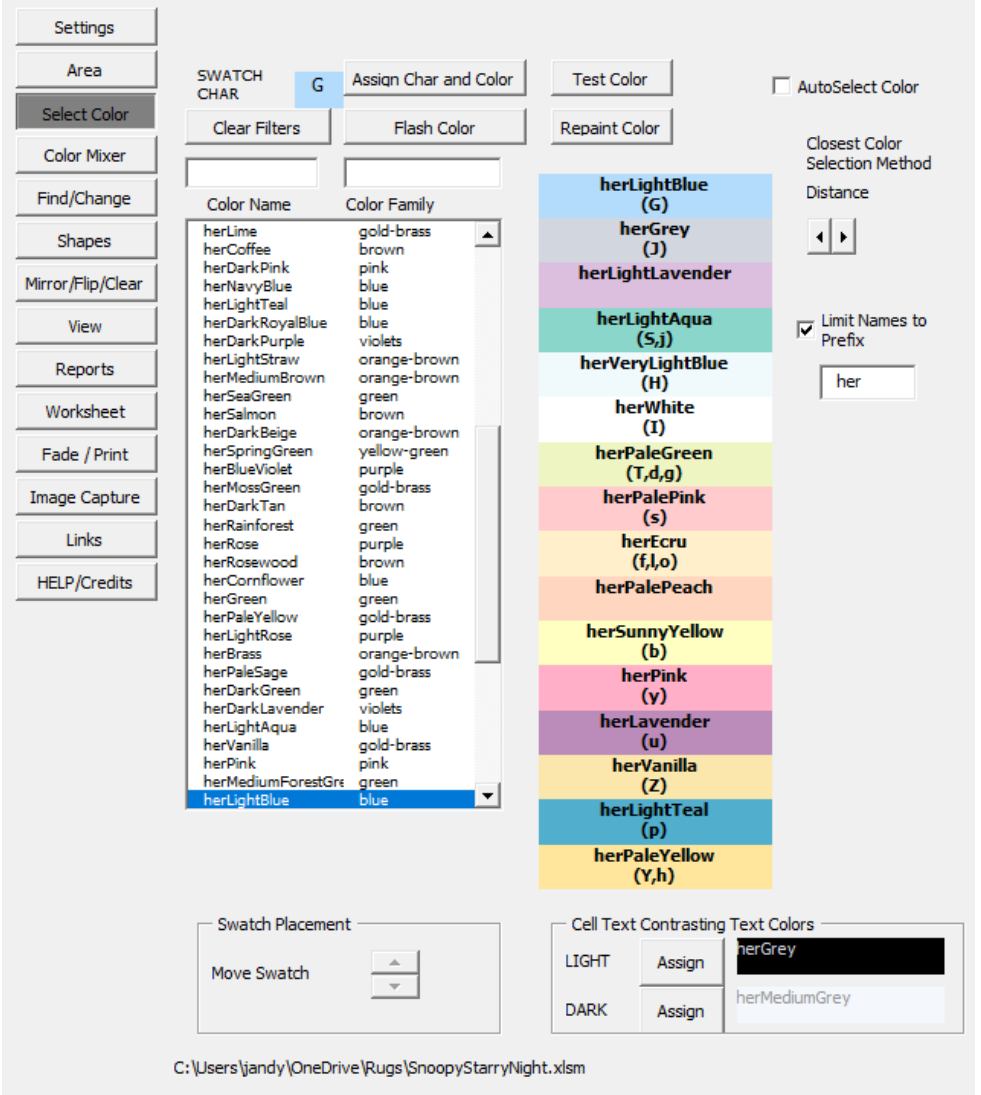
The Enable Popup function re-enables the Colorbox “Cells” popup if needed.

7 Select Color Page

7.1 Selecting a Color

The **Select Color** page allows a user to map a symbol to a color. To do this

1. Click on a Swatch from the left column, which loads the letter into the swatch char field.
2. Select a color from the list by clicking on the name. Filtering on the name (the 1st column) or the color family (the 2nd column) is supported. Note that when "AutoSelect Color" is enabled, the selection of a colored cell in the pattern will
   (1) Set the Selected Color (SWATCH CHAR) to the colors letter, and
   (2) Select that color's swatch on the left, if the letter is visible.
3. Click "**Assign Char and Color**" to update the Swatch with the symbol and color.
4. A list of the "closest colors" (by RGB Distance) is provided on the center of the panel.
   (1) Clicking on one of these patches selects the color from the list, providing the color name/family meets the current filters. (Clearing out filter can be useful here if the color is not selected.) The list of colors presented is subject to the "Limit Names to Prefix" function.
   (2) Double clicking on one of the patches opens the Sample box (described later) to allow for color matching elsewhere on the display.

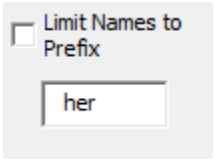


There are four methods used to determine the list of closest colors.

1. Distance
2. White Vector
3. Black Vector
4. Hue, Saturation and Value

The dual arrow control below the “Color Distance Selection Method” allows the user to cycle through the set. Note that this information and control is mirrored on the Mixer page and the Image Capture page.. Each method is based on determining the color distance from a reference point[1]. The distance method seeks the closest color in the RGB space to the color itself. The black and white vector methods measure the angles from either Black (0,0,0) or White (255,255,255) to the subject color as compared to the colors in the inventory. These methods select those colors closest with respect to their angular distance. The Hue/Sat/Value uses the relative distance in a HSV space. Each method provides different results. When searching for closest colors, the users may want to cycle through the set.,

7.2 Limiting Colors by Prefixes

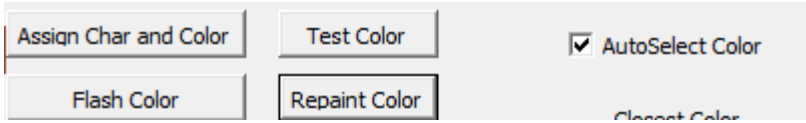


The user can limit the colors displayed by using the “Limit Names to Prefix" function. As a convention, the color names are prefixed. The basic Microsoft RGB colors are prefixed with “rgb”, as in “rgbRed”. Colors that correspond to Herrschner thread colors are prefixed with “her”. When new colors are defined, the users are expected to follow the convention.

If the user enters a three-character prefix in the field below the check box, the check box is enabled. If selected, the displayed list of colors and any display of closest colors will be limited to those names that start with the prefix. This allows a user to limit themselves to a known inventory of colors if they so desire.

[1] Color Distance: Given R,G,B values for two colors, the simple distance is SQRT [$(R1-R2)^2 + (G1-G2)^2 + (B1-B2)^2$]

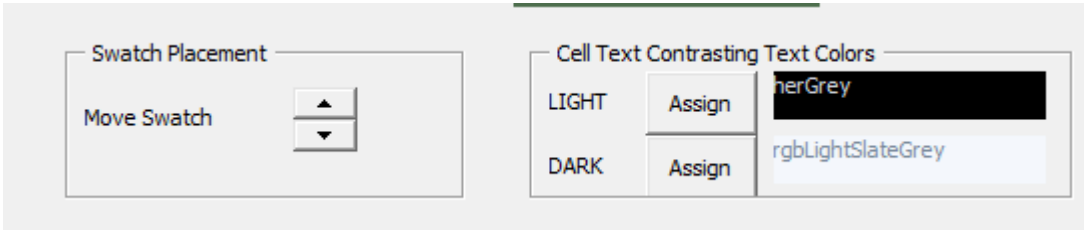
7.3 Other Select Color Page Functions



The “Repaint Color” function allows the user to apply a color change to the pattern after a color assignment is made. (it should be faster than a complete repaint.

When enabled the “Auto Select Color”, the tool re-acts to the selection of a pattern cell be reading the color letter and placing it in the SWATCH CHAR field. This action updates the Closest Color array. Leaving the function enabled may impact performance.

The “Test Color” button will temporarily recolor any cell with the Swatch Character to the color selected in the list ***while the Test Color button is held down***. Note that the cell’s text (letter) and Cell boundaries remain unchanged. Using the test color button on a color in wide spread use may be slow.



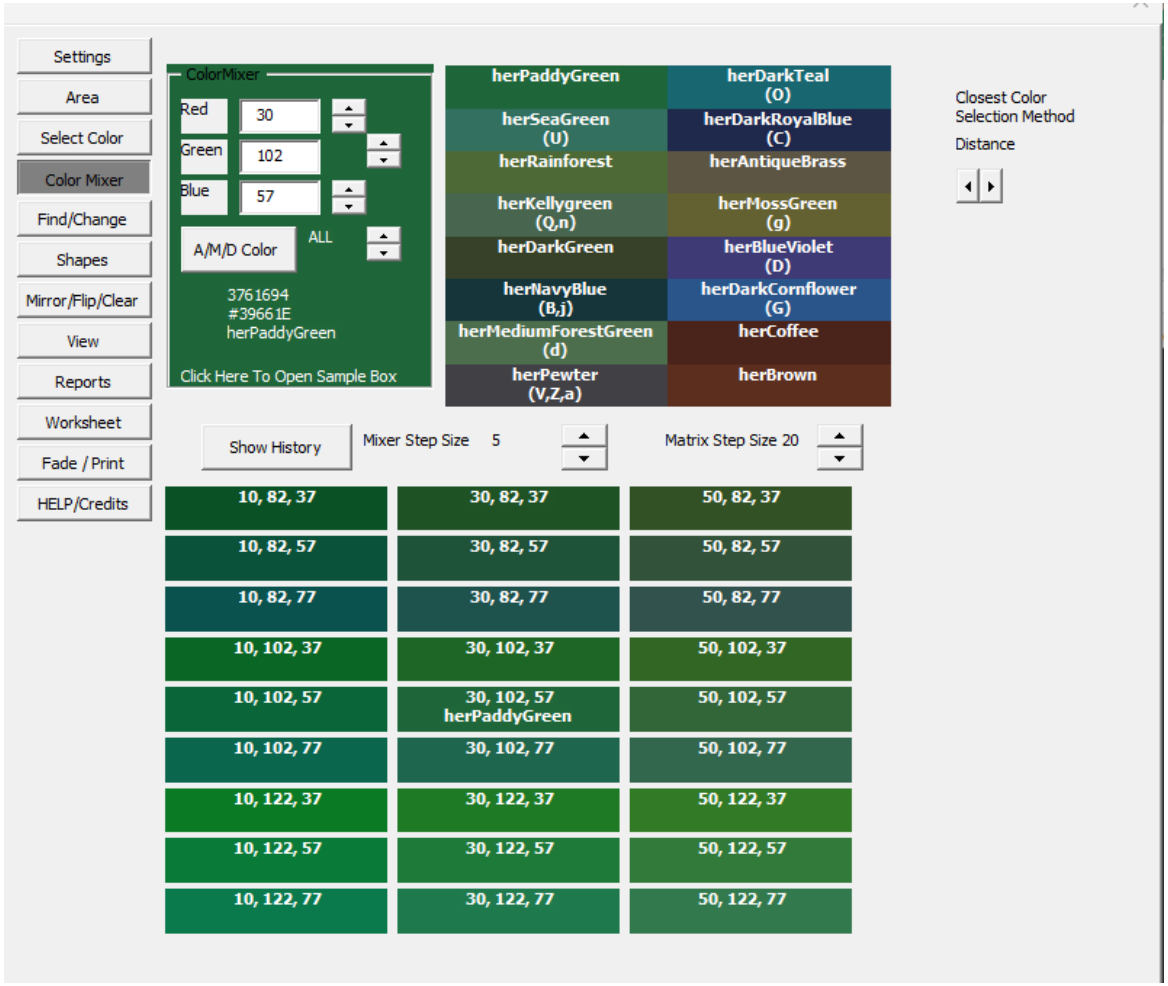
The Flash color simply applies reverse video to the applicable letters, allowing for the identification of its usage.

The Swatch Placement/ Move Swatch lets a user move a selected swatch on the left side of the panel up or down. In some cases, the grouping of colors can be beneficial. Note that this capability is only available if all of the swatches are shown. The tool does not allow swatches to move between columns, keeping the capitals on the left and lower case on the right.

The final control on this panel allows the user to set the font colors shown on the pattern. The user selects a color from the color list and then presses the appropriate “Assign” button to implement the assignment. There are separate fields for light color font text and the dark color font texts. The user will need to request a repaint in order to see the change.

8 Color Mixer

The **Color Mixer** is intended to help the user search for "just the right color". The page provides direct access to the RGB values that make up a color. Each value can be individually altered. A "new, user created" color can be added to the inventory of available colors. This page includes:



a) A mixer area in the upper left portion that allows each RGB value to be independently altered by the selected step size. The "All" control allows the user to change all three values by the same step size at once, generally changing the darkness of the color. The background color of this box changes to reflect the modified RGB values. This read only area in the mixer shows the Decimal and HEX values of the RGB values. If the RGB value matches a color in the inventory, the color name is also presented there.

b) Another set of 16 "Closest colors" to the right of the color mixer. This set is updated each time the color mixer is updated. Clicking on one of these closest colors puts the color in the mixer. Double clicking brings up the sample panel. The list is subject to the "Limit Names to Prefix" function. This list is also controlled by the variable distance methods using the control in the upper right corner.

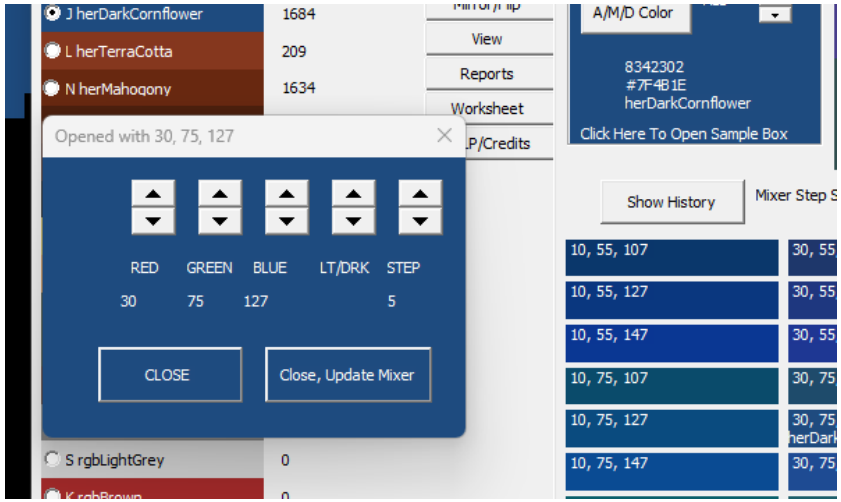
c) A control to vary the step size of the mixer steps. The RGB values range from 0 to 255 for Red, Green and Blue each. Very small step sizes are not likely to be visibly different to the user. The Step size adjuster allow the user to quickly home in on the general area of a desired color. As described at the end of this paper, the MS Paint application provides a mechanism to detect the RGB value for a particular pixel. The user can enter those values into the RGB value boxes in order to "transfer" those colors in.

d) A matrix of varied colors in the lower 2/3rds of the display. The matrix varies each of the RGB values by the matrix step size one-at-a-time. The user can alter the matrix step size. Clicking a matrix cell loads the color into the mixer, double clicking loads the sample panel. If the matrix entry matches a color defined in the inventory, the matrix cell includes the name. Note that if an RGB values beyond the 0-255 range are stopped at the limits, possibly repeating colors in the matrix.

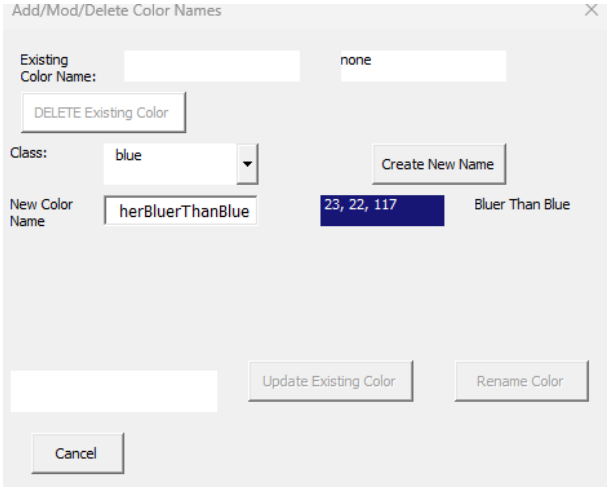
e) An A/M/D Color (Add/Modify/Delete) button, which brings up a popup to allow the creation, modification or deletion of an inventory color.

f) The **"Show History"** button brings up a list of the last 10 RGB values shown in either the sample box or the AMD popup. Selecting from the list loads that color's RGB values. This allows the user to "go back" to a previously examined color.

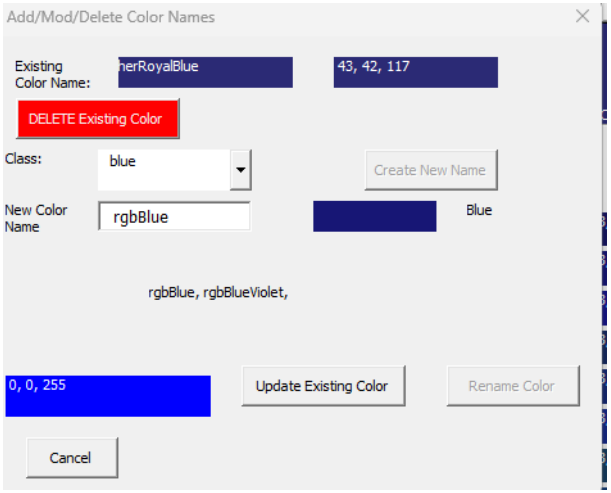
Double clicking inside of the ColorMixer box or on any color label brings up a Sample Box pop-up window with RGB controls. This pop up can be moved to allow the user try to match a color sample somewhere on the display(s). The spin buttons operate in the manner as the mixer. The user can incorporate any changes made in the pop-up back into the mixer by choosing the "Close, Update Mixer" button on the pop-up.



The **Add/Mod/Delete Color** popup provides a mechanism for defining new color names. The name field should follow the pattern of a 3 character prefix (“rgb” for standard colors, “her” for Herrschner’s colors (https://www.herrschners.com). (“jab” are my initials). The software protects against reusing a name. It also requires that any new name be associated with a color class. The pull-down provides a list of the current classes. Existing colors can be modified or deleted if the color mixer has a recognized color in it when the A/M/D popup is opened. Please don’t modify or delete the RGB colors.

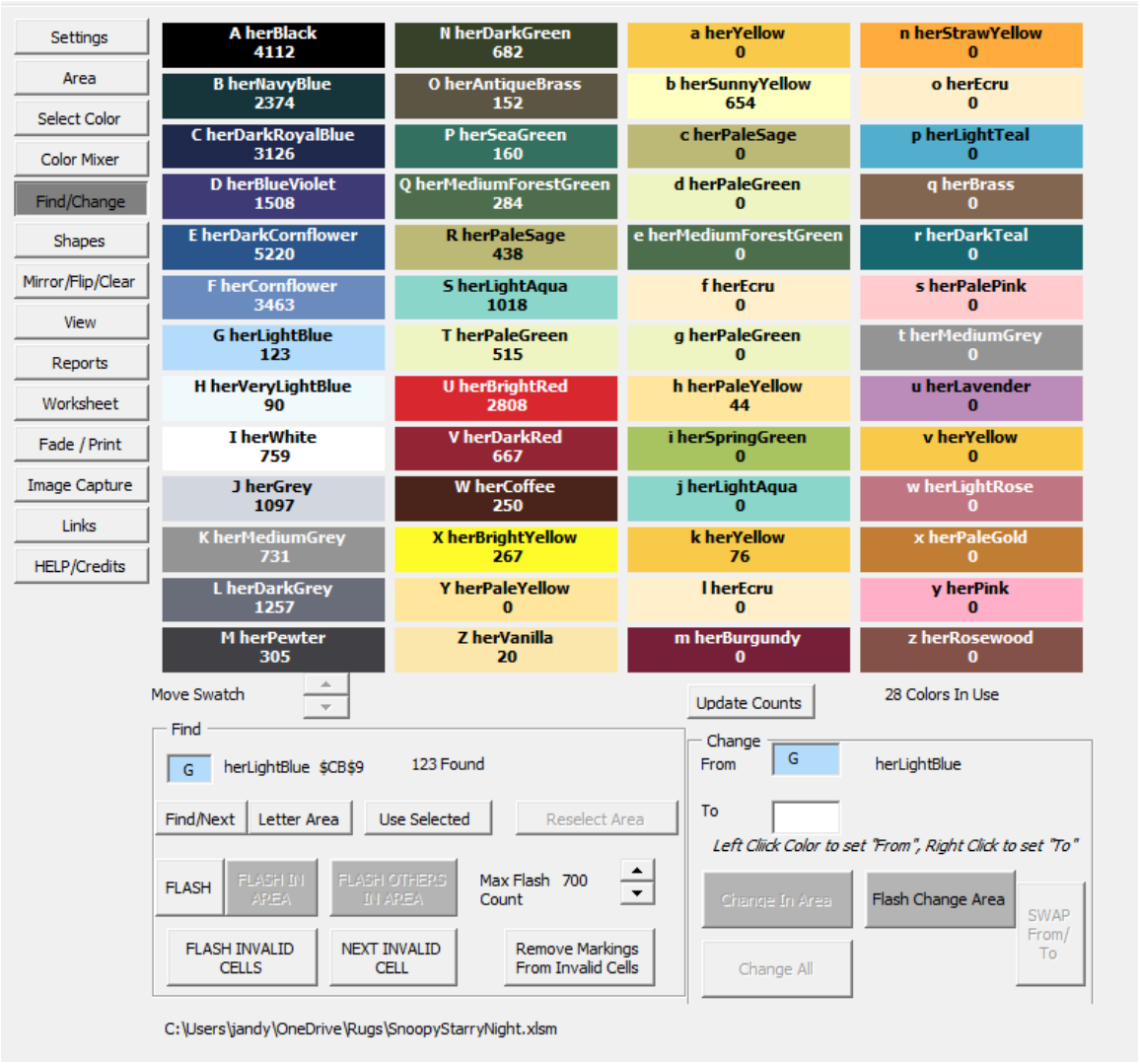


New color names are created from this popup. When 3 or more characters are entered in the new color name, a list of already existing color names will be populated below the text entry box. The data is retained in the “rgbname” worksheet of the Excel workbook.



9 Find/Change

The Find/Change page provides the following functions and tools



1) The entire set of available letters and their assigned colors are presented in the “inventory” area starting from the top of the panel. The letter, the assigned color and the number of times the letter is used is displayed. Hovering over each item also brings up the same detail information provided for the swatches.

2) The user can find where a letter is used as follows:

   a) Enter a letter into the **Find** text box. The address of the first found matching cell will be presented and the count of matching cells will be updated. Alternatively, the user can

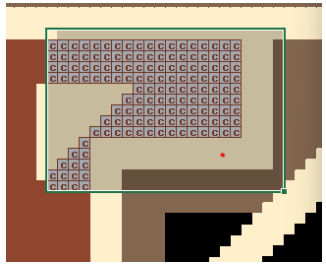
      i) Click an inventory item to cause the associated letter to be placed in the **Find** letter box and the Change **From** box, Or

      ii) Press the **Use Selected** button which will place the letter of the currently selected swatch into the find letter box.

   b) Press the **“Find/Next”** button to select the next cell (move the cursor to that cell and change the focus). The cell address will appear to the right of the entry. Pressing the button again will move to the next instance of the letter in the pattern.

   c) The “**Letter Area”** control to the right will “repaint the cells around the currently selected cell(s) with the letters showing. It will repaint the cells 5 rows above/below and 10 rows left/right

of the selected cell(s).

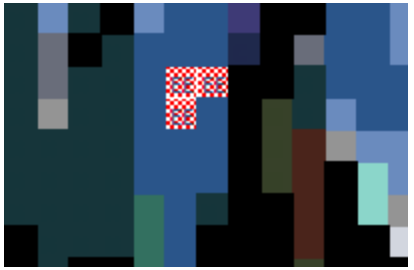


3) The **Flash** and **Flash in Area** a more global capability. If the user selects and holds a flash button, the cells which meet the criteria are shown in a "reverse mode", where the font color is used to color the cell, and the cell color is used as the font color. If the control is released in less than three seconds, the cells are redrawn according to the current display rules. If the control is held more than 3 seconds, the flash button will turn aqua and the reverse mode will prersist after the button is released. Re-commanding the flash or requesting a **repaint** will reset the colors. This "3 second" persistence feature is common to all "flash" buttons. The follow logic applies here:

   a) The FLASH is disabled if more than the **Max Flash Limit** of cells meet the search criteria. The **Max Flash Limit** can be altered dymanically using the spinner to the right of the value. Large values of this limit can impact performance. 700 seems to be a workable value.

   b) The Flash Area is disabled if zero or one cells are selected.

4) The "**Flash Others in Area**" function flashes those cells in the area that DON'T match the find character.



5) The **Flash Invalid Cells** button identifies cells inside the used portion of the pattern which don't contain a valid single letter color value. These cells are shown as red checkerboards These cells remain colors until either

   a) The User puts a valid letter a cell

   b) The User hits the "Remove Markings From Invalid Cells" button

   Note that the "bounds" of the pattern are determined by locating the last row with a cell with a value, and the last column with a cell with a value. All cells within these limits are considered "in the pattern".

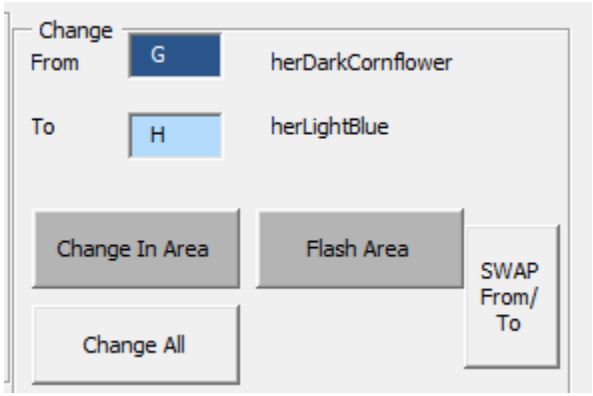
   A separate report tool exists to list the invalid cells. See **13 Reports**

6) The **Next Invalid** button move the cell selection to the next invalid cell.

7) The **Reselect Area** will re-select an area defined on the Area tab.

8) The **Remove Markings From Invalid Cells** removes the red markings from the invalid cells. (Corrected cells are displayed per their cell value colors.)

9) The user can change one set of letters for another. The change can be applied in a selected area or across the whole pattern. The Flash Area control here allows the user to confirm the impact of a change before committing to it. Holding the **Flash Area** control for 3 seconds or more keeps the flashed color present unto the area is repainted or the color reflashed.



   a) Left clicking a color label in the color inventory above will populate the **From** color value. Right clicking a color label will populate the **To** color value.

10) The SWAP From/To function allows the user to swap the definition of two letters. As an example, pressing the SWAP From/To button in the situation on the right, will cause the originally Dark Cornflower "G" cells in the pattern to show "H" and the Light Blue color. The defined color of H will then become Dark Cornflower. This tool may be useful in allowing the set of used letters be re-arranged. (For example, moving all of the used colors to the start of the upper case alphabet.) Note that the speed of the swap is dependent on the number of times the selected From letter appears in the spreadsheet tab.

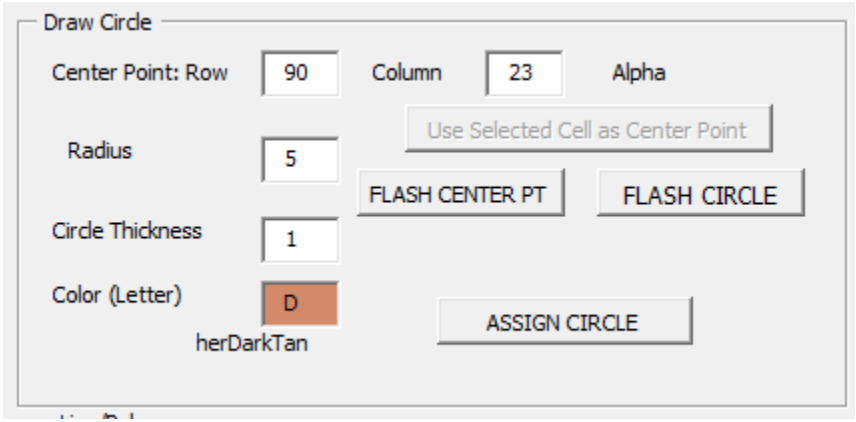
The **Find/Change** page also provides the ability to Move Swatches up and down and to force an update of the thread counts in the swatch displays.

10 Shapes Page

10.1 Draw Circle

The Shapes page allows the user to

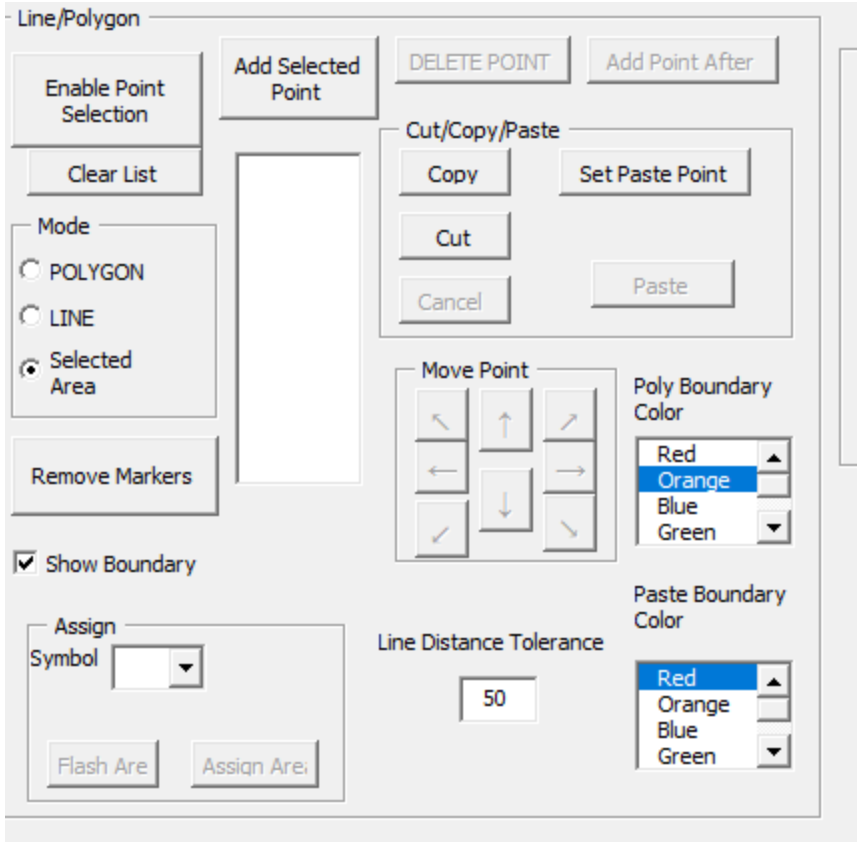
1) Draw a Circle with a user specified center point , radius, thickness and color (defined by a symbol)
   a) The user can select a cell and press the “Use Selected Cell as Center Point” to fill in the center point row/column using the coordinates of the currently selected cell.
2) A **Flash Center Point** functions colors the row and column cells that lead to the selected center point. The 3 second flash behavior applies here with respect to removing the coloring.
3) A **Flash Circle** flashes the circle in the same manner.
4) The **Assign circle** puts the color/letter into the circle’s cells.



The following was made using the circle tool, expanding out from the center point.

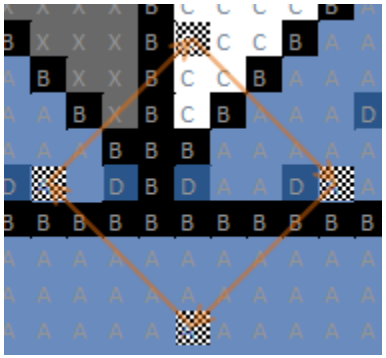
10.2 Line/Polygon Tool

The Line/Polygon area allows a user to define a set of points to be set to an assigned value. The line/polygon tool is also the basis for the copy, cut and paste functions.



10.2.1 Creating Lines and Filled In Areas

The Line/Polygon tool's focus point is the list of selected cells. As cells are entered into the list, they are marked on the pattern. The figures on the right show a selection of four cells. The selected cells have a checker board pattern overlaid. The Cells are connected with orange lines. Three modes are supported, Polygon, Line and Selected Area. I



In Polygon mode, the last point is presumed to connect back to the first.

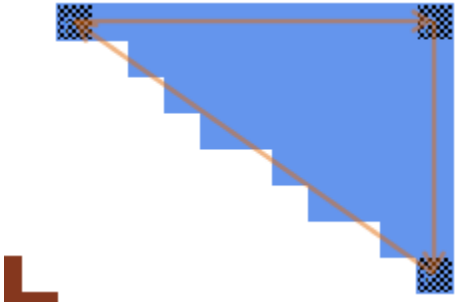
In Line mode, the last point is not connected back to the start.

In Selected Area Mode, the native Excel area selection capability is used to establish an area. When the user holds and drags the left mouse button and then releases it, the list is automatically emptied and the four corners of the area are added to the point list.

When the mode is changed to either Polygon or Line Mode, the "Enable Point Selection" control is turned blue. This indicates that any double click on the pattern will be considered to be a point selection which adds the cell to the end of the list. Clicking the blue Enable Point Selection control will disable this behavior.

Note that at all other times, a double click is interpreted as a "load the Colorbox command". If a cell double click wipes out the Line/Polygon page and returns you to the settings display, the most likely cause was not being in the Enable Point Selection mode.

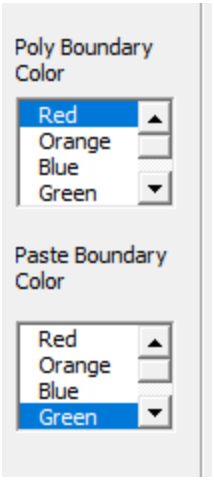
The user can Clear the list (which removes any indications from the pattern), remove the display of the marker and enable or disable the display of the (orange) boundary.

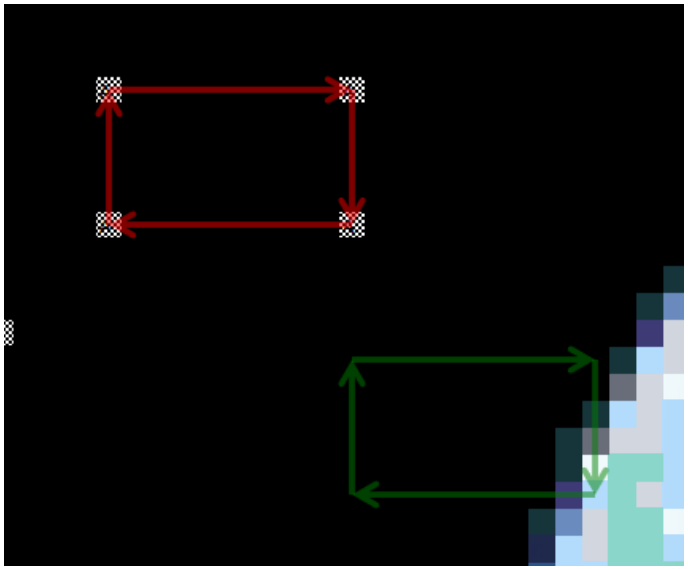


Clicking on a cell address in the list “selects” the cell on the pattern. While a list cell is selected, the point can be deleted, or shifted in any of 8 directions (via the “Move Point Controls”), or a point can be added after the selected point. An “added after” point is placed between the selected point and the next point in the list (or the first point in the list if the last point is selected).

Once the Points List is established using the Define Polygon pop-up, the line/polygon can be Flashed/Colored as before. Once a symbol character is defined, the line/polygon can be assigned to the area.

The two List areas in the lower right allow the user to modify the colors of the arrows used to draw the polygons. This allows the user to make sure that the polygons can always be seen against the pattern behind them. The second “paste” polygon will be described shortly.



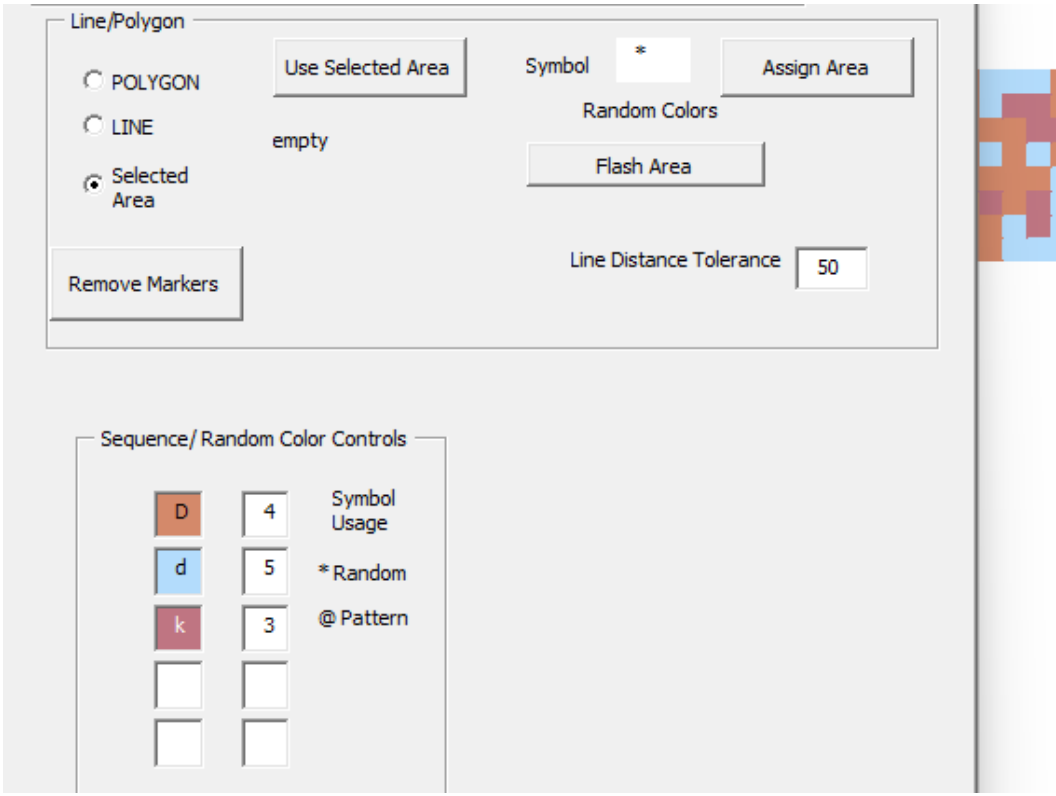


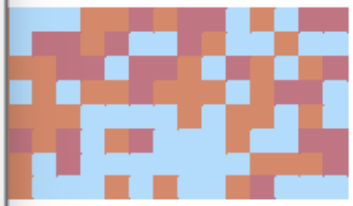
10.2.2 Random and Pattern Fills

3) The user can define a set of random colors to be used to fill in a line/polygon, using the Random Color Controls at the bottom of the page.

   i) The user needs to specify symbols and relative weights. In the example shown, approximately 4/12th's of the cells will be light brown, 5/12 will be light blue, and 3/12th's will be a light rose. Each time the Assign Polygon button is pressed, the color assignments will be randomly updated.

   ii) Once at least two valid symbol/weight pairs are defined, the user can put the "*" symbol in the Symbol field. When the assignment runs, it will assign color to cells using the relative weights.

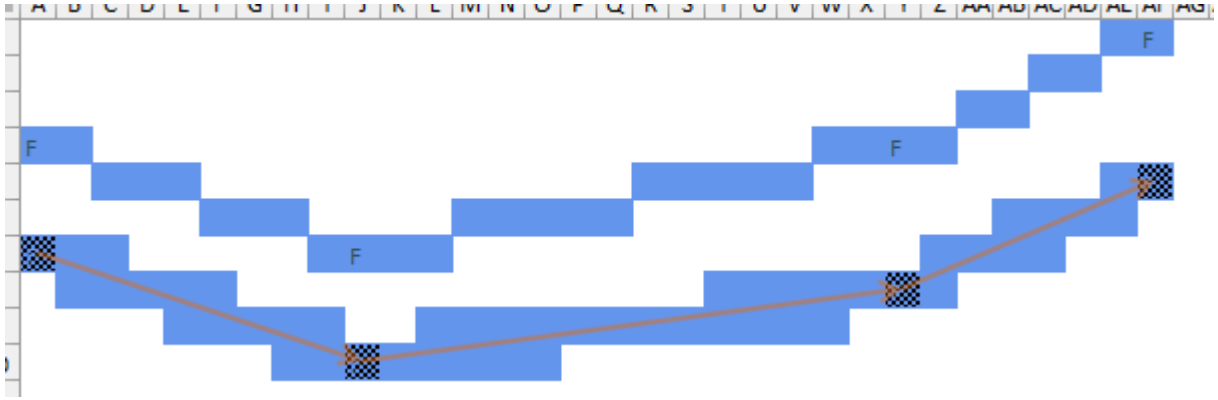




4) Using the "@" as the symbol will generate a uniform pattern, cycling through each letter for its number.

5) The Line drawing mechanism follows the defined sequence of points from the first to the last point. It utilizes the Line Distance Tolerance value. If the center point of a cell is within the tolerance of the line segment measured at the center of the a cell, the cell is colored. The Value is a percentage. Adjusting this value up or downward varies the apparent “thickness” of the line.

6) In the example shown to the right, the upper line has a Line Distance Tolerance of 50, the lower line 75.



10.3 Polygon Interactions with Find/Change

Combining the use of the polygon tool and the Flash in the Change page, users can try out a set of color changes, by

1 Defining the region with the polygon

2 Moving to the Find/Change page. Note that the Change In and Flash command buttons in the Change frame now read “Polygon”.

3 Flashing a series of changes, holding down the “Flash Polygon” button long enough for it to back light (turn blue). The extended hold down of the button will cause the “change to” colors to remain displayed on the pattern in place of the letter appropriate color. One or more color changes can be trialed in this way.

4 Requesting a repaint of the region or of the whole pattern will restore the letter defined colors.

10.3.1 Cut and Paste

If at least two points are present in the list, the contents of the line and/or polygon can be cut or copied and pasted.

To activate the capability, the user needs to designate a “paste point” and designate either Copy or Paste. Setting the Paste Point is done by selecting a cell on the pattern and pressing the Set Paste Point command button. A valid paste point’s address will be displayed below the command button. Press either the Copy or Cut to set the activity type. (Selecting “Cut” will result in the selected area cell’s being set to blanks when the paste is executed.) The Paste Command button will be enabled when a paste point and a copy/cut selection is made.

When the Paste capability is activated, the user is prevented from changing the point list. The mode selection buttons, the Enable Point Selection Buttons and the Move Point buttons are all disabled.

When the Paste capability is activated, the “paste to area is indicated on the pattern in red. Note that the Paste Point is defined to be “the left most cell in the top most row of the selected area.

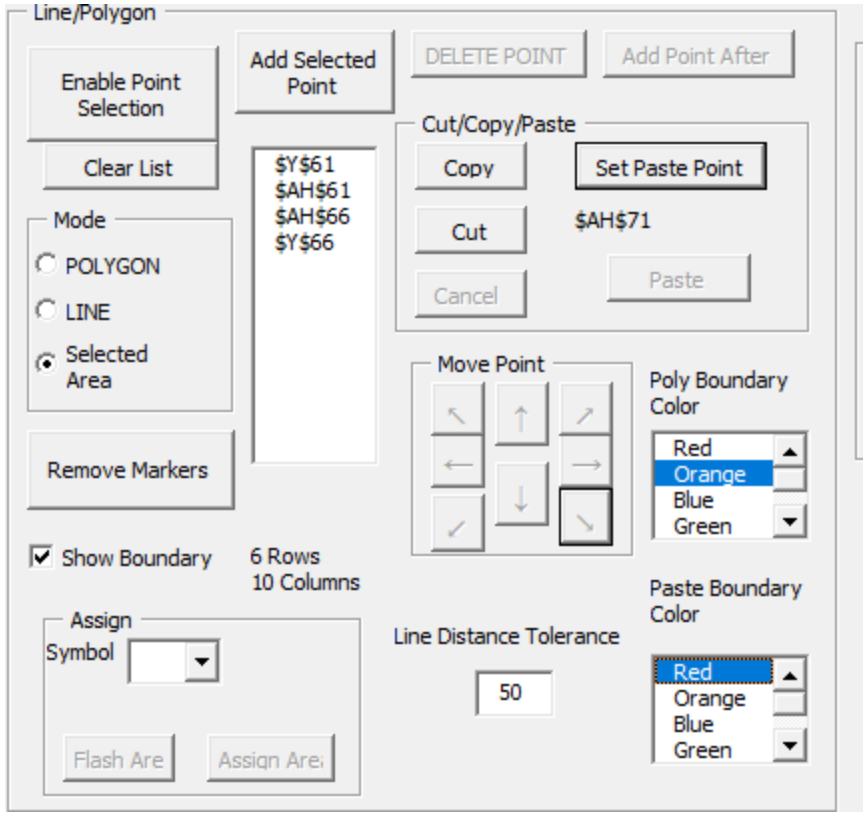
In this state, the user can

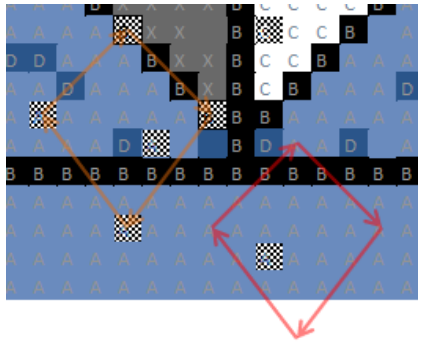
7) Reestablish a new paste point,

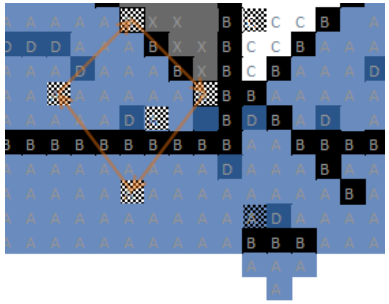
8) Make the cut/copy and paste happen by pressing the “Paste” command, or

9) Exit the state by pressing the “cancel” command,

The pasted area will be updated and redisplayed using the current display settings. Note the controls on the lower right which allow for altering the polygon colors.



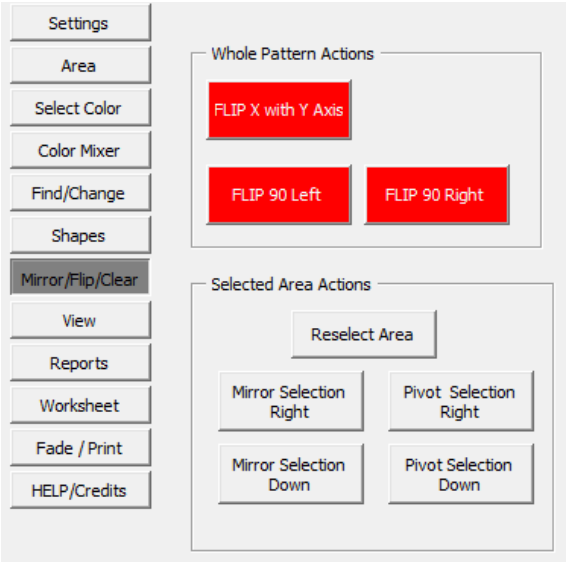


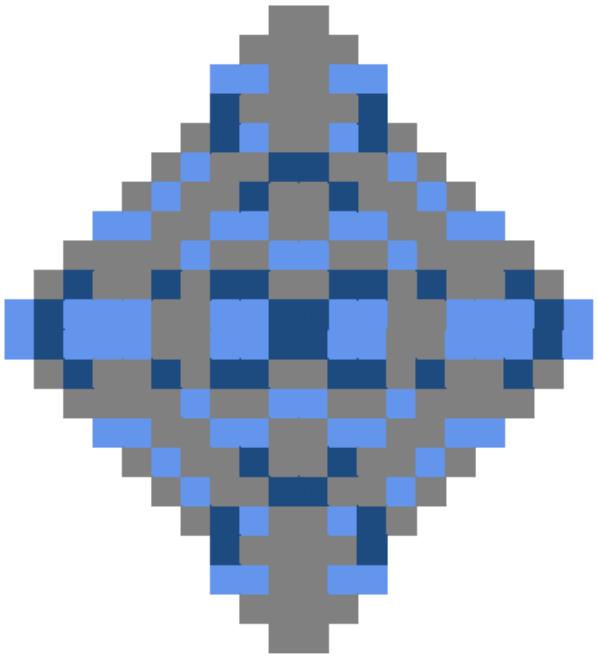


11 MIRROR/FLIP

The Mirror/Flip page allows the user to

1) Perform “Whole Pattern” operations:
    a. Copy a page (tab) onto a new page, flipping rows and columns for each other. (The web site *www.leftsource.com* provides a picture to pattern service which generates a CSV file. However the images need to be flipped in this manner. (The Apollo 11 rug seen earlier started with a “leftsource” csv file.)
    b. Copy the current page onto a new page, rotated either 90 degrees left or right.
2) Perform “Area” actions (on areas defined in the Area tab)
    a. Flip a selected area of a pattern to the right or down, creating “mirror images”. This can be very useful when creating geometric patterns. For example, the following pattern was created by first creating a randomly filled triangle, then mirroring it right and then down. Two forms of “mirror images” are supported. The simple “mirror” copies the edge (bottom or right) as a part of the operation. The “pivot” does not copy the edge.



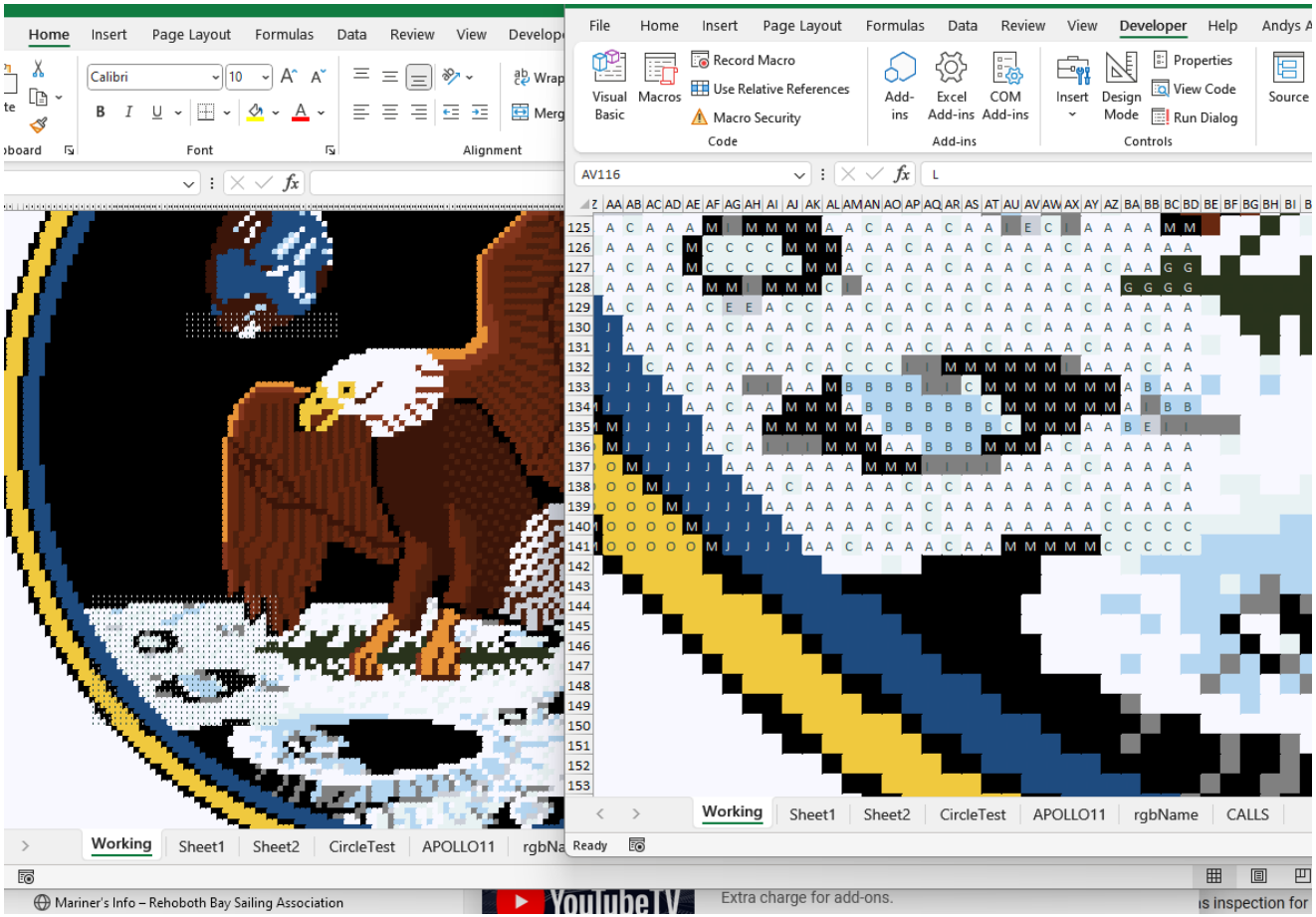


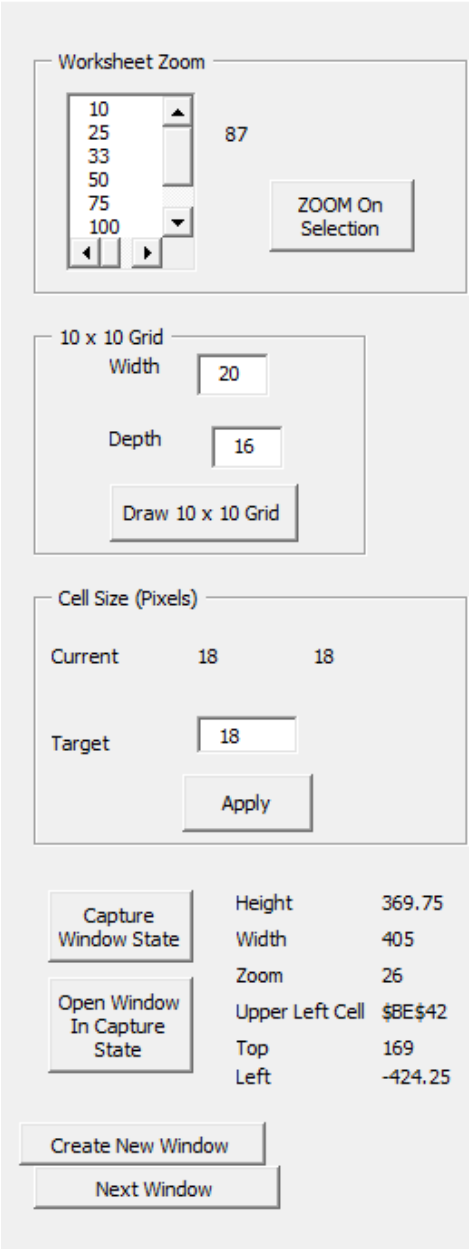
12 View

The view control allows the user to

1) Change the worksheet zoom level (by double clicking on a presented value).

   a. Note that Excel supports the concurrent display of the same worksheet in multiple windows. The **Create New Window** control on the **Main** page allows the creating of such a “copy” window. The contents of any window showing the same sheet will be identical. However the area of focus and zoom levels are independent in each sheet. Changing the zoom level of





the worksheet does not change the zoom level of any other window. Therefore, a user can simultaneously see both a “close up” view of a portion of the pattern while also seeing the “big picture” view, screen size permitting. The contents of the sheets remain identical, but the viewed area and zoom can vary.

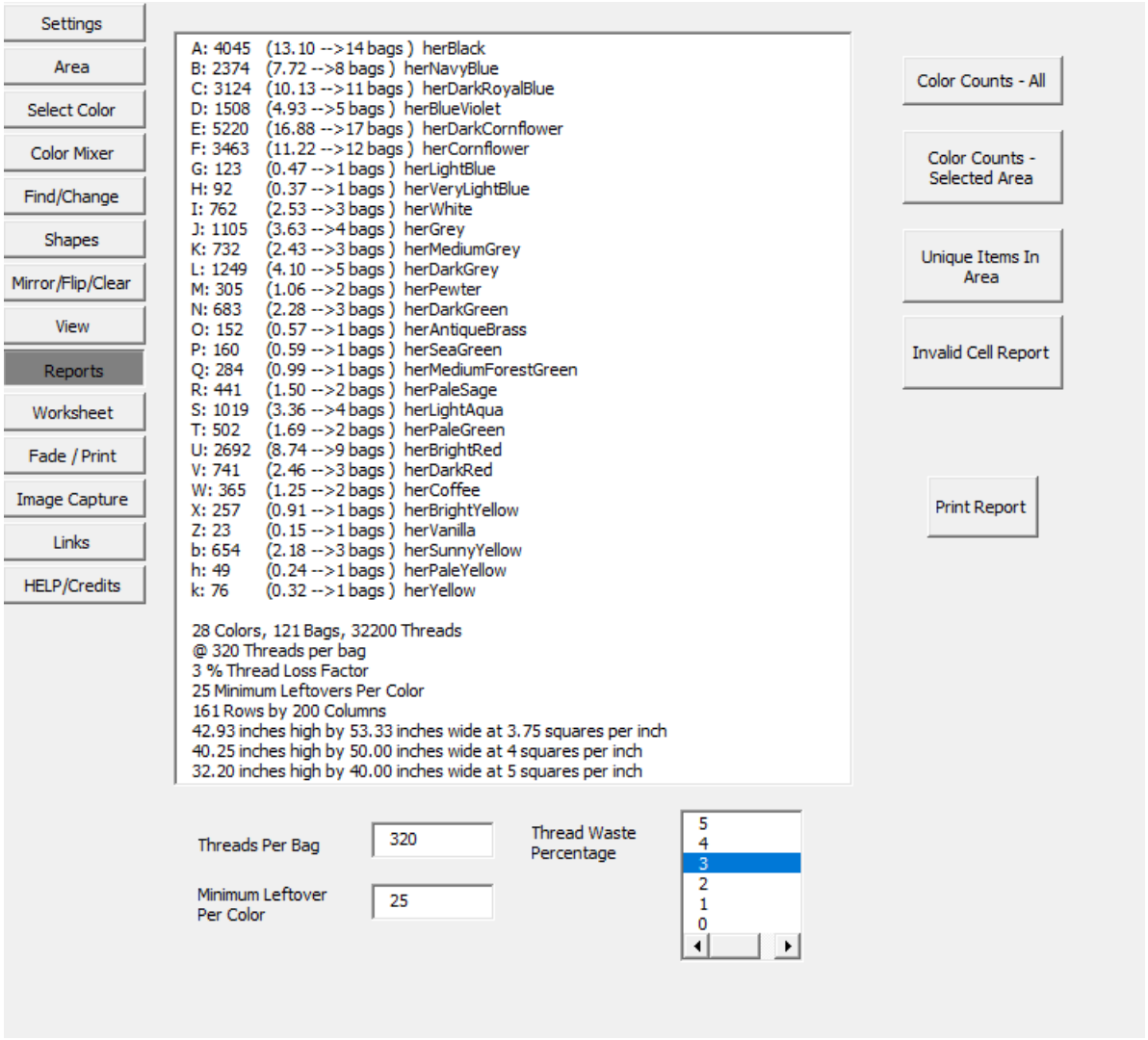
2) **Zoom** on a selected area. If the user selects an area of cells and then presses the “ZOOM On Selection button, the display will resize to fit the selected area in the display (up to 100% ZOOM level) and center the area in the display. The actual zoom level will be updated to the right of the Zoom Level list box.

3) Draw a 10x10 grid on the pattern, using user selected values for the number of vertical and horizontal 10x10 boxes.

4) Change the cell size of the used portion of the pattern. The values are in Pixels. Nominal values include 18 and 20 pixels per side.

5) Users can **Capture** the current **Window State** and then later **Open** a new **Window** in this saved state. Operating with two windows open with large numbers of cells can impact performance. This save and reopen capability allows the user to save off a “Big Picture view” (i.e. a reduced scale view) and then close this window, improving performance. The saved window can be recalled when needed. The saved window state data are saved as SYS_PARM data and are therefore recovered when the spreadsheet and/or tool is reloaded

13 Reports



The available reports are listed on the right side of the page. exist at this time.

The **Color Counts** report produces a summary of the materials needed for the pattern.

The Color Counts – Selected Area report provides the same function, limited to a user selected area.

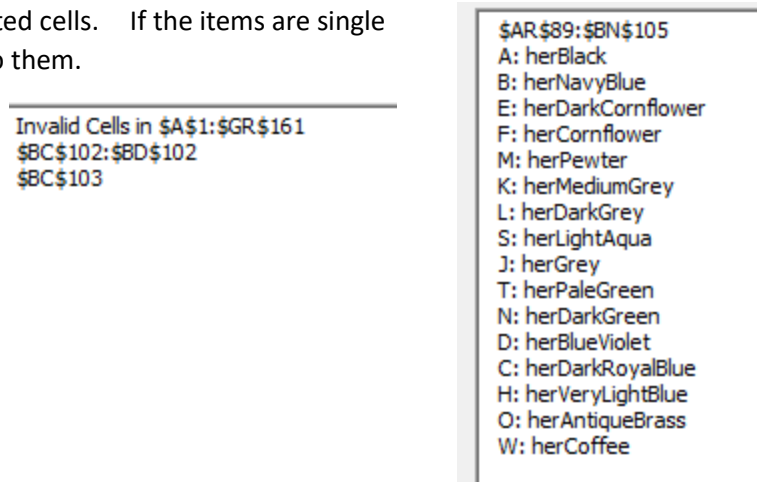
Both of these reports have common behavior.

Each used letter (1 or more threads used in the pattern) is listed with the thread count, a bag estimate, and the color name. Summary data is provided at the bottom. The following controls are provided:

- **Threads Per Bag**. Sets the package size for the units you buy in.
- **Thread Waste Percentage**: (0 to 5%). This percentage is added to the needed thread count to account for unusable threads in each bag.
- **Minimum Leftover Per Color**. This value is added to the total thread count for a color before the number of bags in determined. This provides an additional buffer against not quite having enough to finish.

The report also shows the estimated size of the pattern using three common canvas sizes.

The **Unique Items in Area** report simply reports the unique items in a set of selected cells. If the items are single letters, they are presumed to be color designators and the colors are listed next to them.



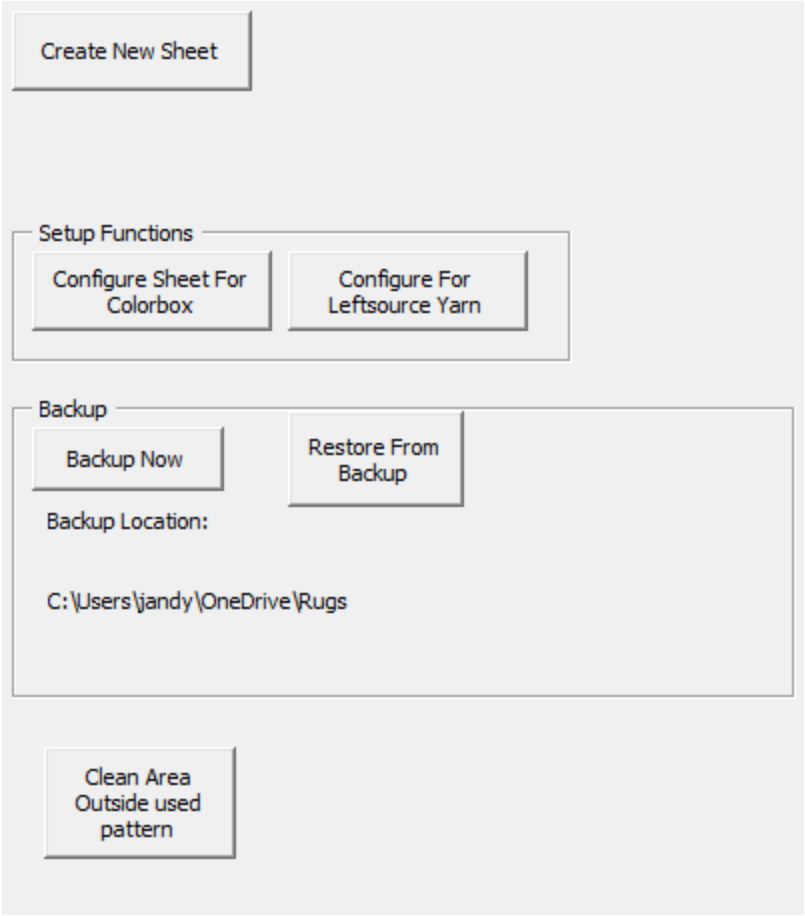
The **Invalid Cell Report** lists the cells or cell ranges in a sheet that are inside the "used range" of the tab and do not have a single letter value.

The errors are listed one row per line, with adjacent invalid cells described as a range.

Each report can be printed.

14 Worksheet

This page provides the following capabilities:



1) A new pattern sheet can be created. The user is prompted to confirm the action and is then prompted for a sheet name. The new sheet has code inserted into it that enables the Colorbox functions to work. The new sheet will be created with the letters A-Z in the first column and a-z in the second. Goto the Main page and press the “Repaint all” button to color in these cells, confirming that everything is set up.
2) Configure an existing sheet to work with the Colorbox tool. This command also inserted the required code into the sheet. Note that if the sheet is already configured for the Colorbox, the program will complain and not do the action.
    a. To remove the code, select the sheet tab (at the bottom), right click and select the “View Code” command. Simply select all of the text on the pop-up and delete it.
3) Configure For Leftbank Yarn. (See the **Image Capture**

This set of function provides an alternative import path to the just described Left Source process. The flow is as follows:

1) As a one time task, provide the location for the Prepare for Colorbox executable in the text area at the bottom by double clicking the path. The Prepare Python Image command button will be disabled until a valid reference is provided.
    a. Note that you will probably have to identify this executable as “trusted” to your virus protection software.
2) Using a photo editor of your choice, crop and size the image. Images should be less than 600 x 600 pixels. Save the file as jpg or png.

3) From Colorbox, double click on the **Image File Path and Name**. Locate the file you wish to process. The Prepare Python Image command button will be enabled if both the file is found and the PrepareImageForColorbox.exe is found.

4) Press the Prepare Python Image command button to invoke the image preprocessor.

    a. This invokes a Python executable that generates a comma separated file with a line for each pixel of the image. Each line contains the x/y coordinates and the RGB values for the color.

    b. The **Import Python** button will not be enabled until a valid path is provided..

    c. The executable will provide a popup with the image. Close the popup by clicking the “X” in the upper right corner. The image on the right is used.

    d. The executable will write a new file, with the same name as the selected image, but with a “.csv” extension. This file name and path will be copied into the **CSV Filename and Path** field on the page.

5) Ion the Import Python Area, import the image as follow

   a. Set the **Limit Color** switch as desired. (Limiting is recommended). Set the limit string from the **Color Mixer** Tab.

   b. Set the **Closest Color Selection Method**. The user can choose between the 4 color distance methods described earlier to control the conversions. The Distance method seems to provide the best results, but feel free to experiment.

   c. Press "**Import Python"**. A file selection pop-up is then presented. Select the .csv file previously created.

   d. The python executable created file is then read in, populating the **rawimage** tab. Each cell's RGB value is converted into a Colorbox color name. (rgbRed, or herGreen). A counter in the lower left corner will provide evidence that the processing is continuing, Once completed, manually changing the Excel scale (in the lower right corner) will allow you to view the image.

6) From Colorbox, step the image down. * This step down process does the following:

   a. Image is normally reduced in size. The step down sizes (reduction factors) are 1:1 (no change in image size), 2:1, 3:1 and 4:1. In the step down process, a group of cells are combined into one. One color from the group is selected as the stepped down color. Generally this is the most prevalent color in the group. (Ties go to the first color seen in the group). There is an experimental capability to apply some pattern detection processing (straight lines, diagonals, etc.) to favor line preservation that has not shown significant usefulness at this point.

   b. The number of used colors is reduced to 52 or less colors. (The user can choose a number less than 52). The color reduction process operates by taking the least used color and remapping it to another color already in use. Then shampoo, rinse and repeat until the desired number is reached. Note that for the 72 Herrschner colors, this seems to be effective.

      i. The color reduction steps are provided in a text box.

   c. The Step-down image is placed into the “Reduced” tab.

   d. The user can then use the “Prepare sheet for Colorbox” capability to enable the Colorbox editing.

   e. Note: if the User chooses to not remove the Raw Image when prompted to, the step down process can be repeated, allowing the used to vary the step down ratio and/or the number of colors desired.

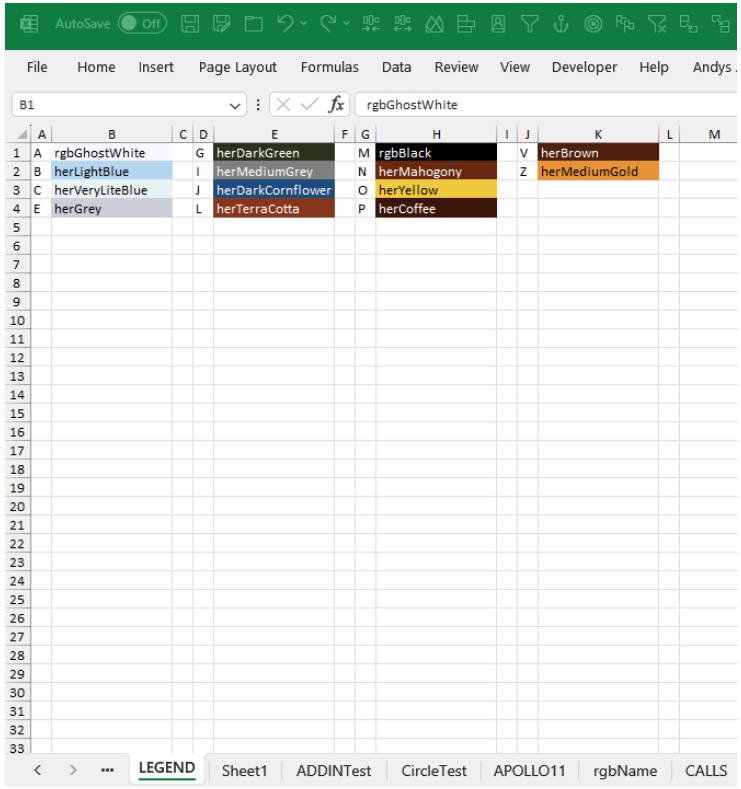
   f. REPAINT the image

The image capture process presumes that the image has been right-sized using image processing tool. The process is limited by the number of pixels to be captured and the subsequent number of rugs threads. Rug sizes approaching 200 x 200 squares may strain Excel. Images larger than that have been known to hang or crash Excel.

15 Legend Sheet

The software maintains a Legend sheet, which lists each used letter/color in a grid. Click on the tab marked “LEGEND” to access it.

The legend is updated each time the Colorbox palette is rebuilt. It can be printed using normal Excel commands.

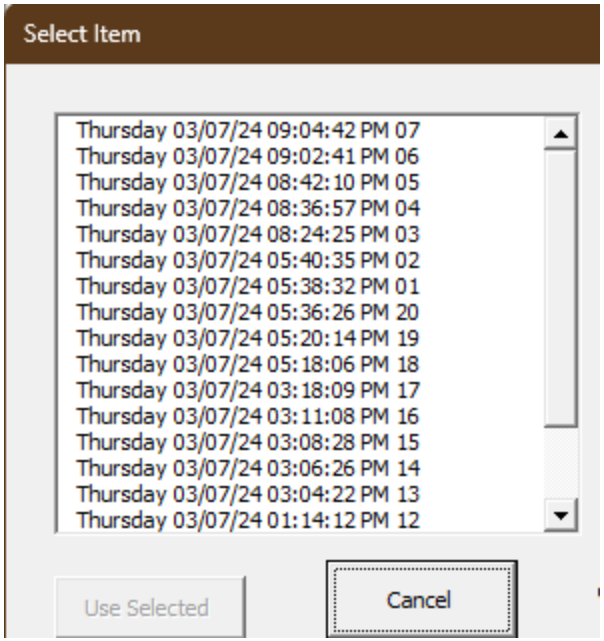


4) Leftsource Import.) This function updates the letter to color mappings using the Leftbank provided “Yarn” mapping data.

5) Run the backup tool immediately. Backup files are taken every 2 minutes when activity is occurring. Backup files are stored at the same location as the pattern file. The source file name is extended with “_Backup_x” where x is 1 to 20. Once file 20 is written, the next file written is backup 1. Users can access these files to recover from catastrophic events. The backup process always replaces the oldest backup file when it runs. The backup files are listed in newest to oldest time order.

6) Do a “restore from backup”. When a restore from backup is requested, the user is presented with a list of backup files and each file’s date/time stamp. Select the desired file to start the restore. The restore recovers the contents of the current worksheet (tab in the spreadsheet) if the tab exists in the backup file. The backup file access is read only.

7) Clean Area Outside Pattern. This function removes cell and cell border coloring outside of the pattern boundaries. It is useful in removing stray formatting which may impact the size of a printed pattern.



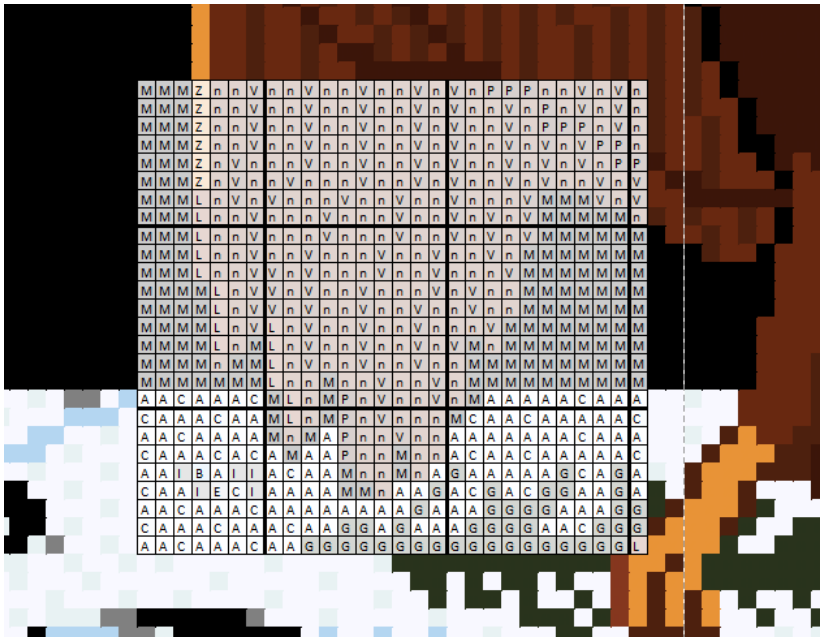
16 Fade/Print

This panel supports the printing of the pattern. The Print Pattern button calls the Excel printing function.

The Fade buttons fade each color in the area of interest (either a selection or the whole pattern) by the user specified percentage. The fading does not "read" the assigned color: It just applies the fading percentage to the displayed color in each cell. Therefore repeated use of the fade function will continue to wash out the colors even more. The fading can be removed by using the Repaint function. Faded images always show the assignment (letter) and the 10x10 boxes.

Fading is intended to be used to support printing, in that a more readable pattern can be created by printing a faded image instead of a simple uncolored image. (This is especially true when using black and white printers).

The accompanying illustration shows the application of the default 80% fade in an area.

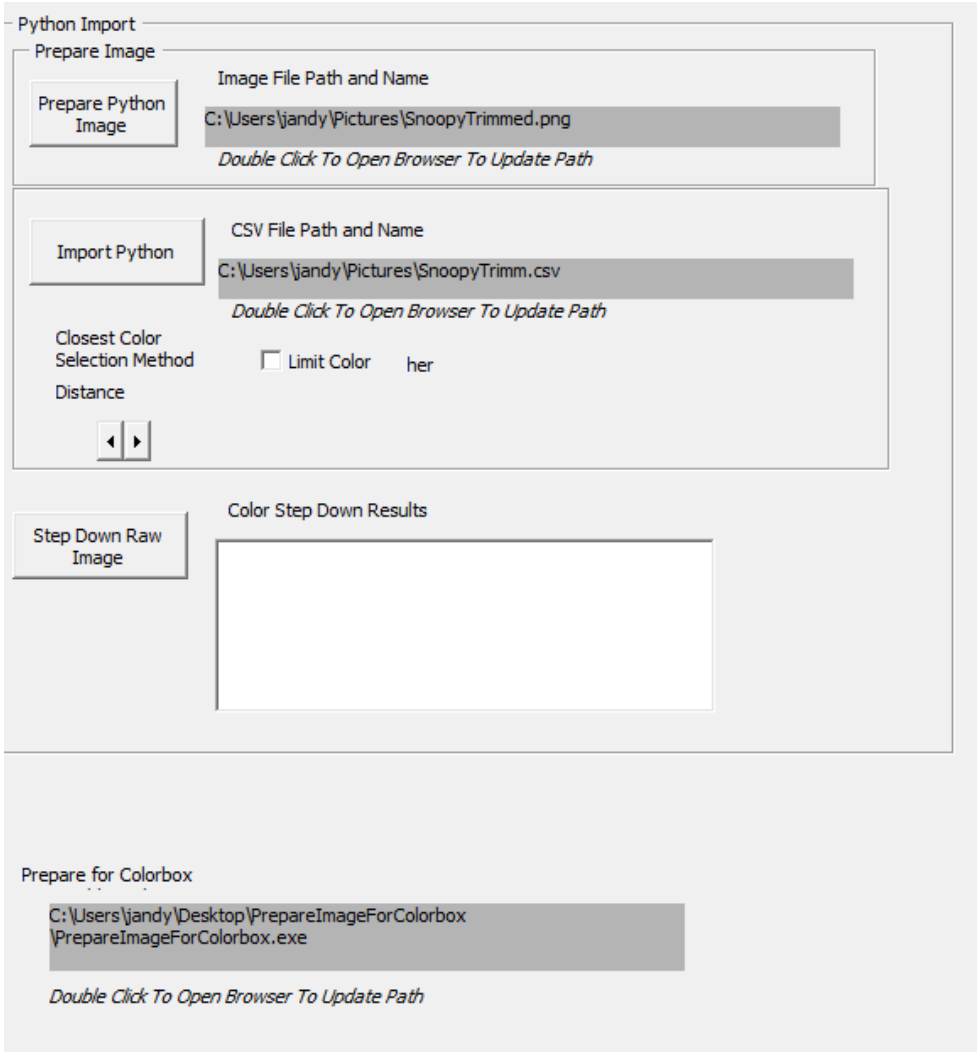


pg. 43

17 Image Capture

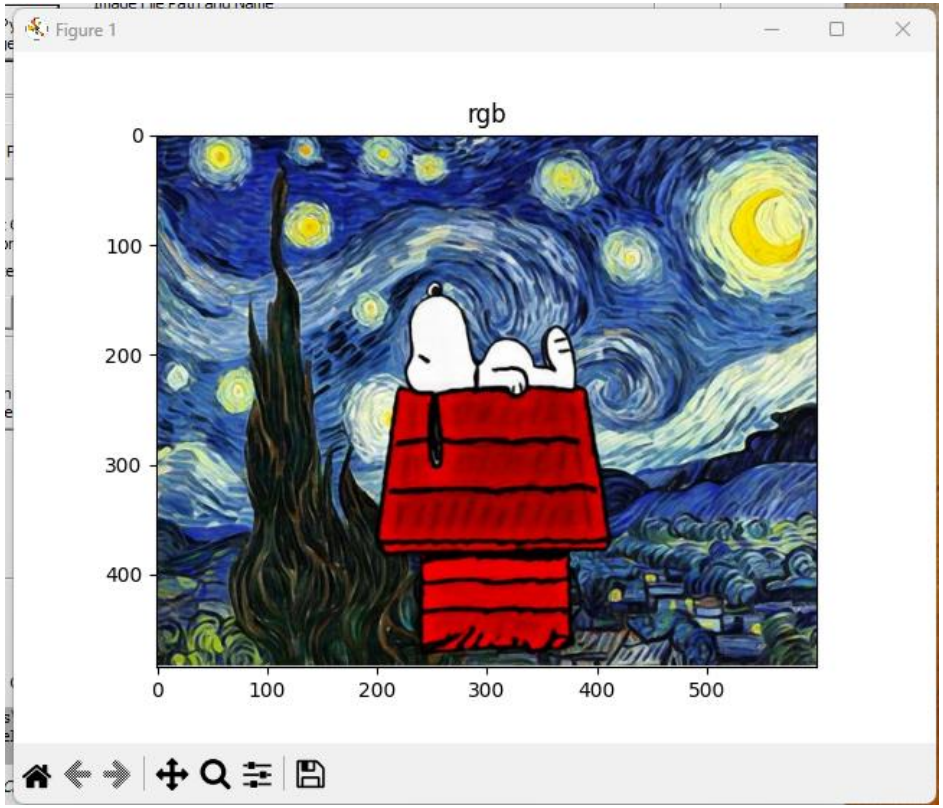
This set of function provides an alternative import path to the just described Left Source process. The flow is as follows:

7) As a one time task, provide the location for the Prepare for Colorbox executable in the text area at the bottom by double clicking the path. The Prepare Python Image command button will be disabled until a valid reference is provided.
    a. Note that you will probably have to identify this executable as “trusted” to your virus protection software.
8) Using a photo editor of your choice, crop and size the image. Images should be less than 600 x 600 pixels. Save the file as jpg or png.
9) From Colorbox, double click on the **Image File Path and Name**. Locate the file you wish to process. The Prepare Python Image command button will be enabled if both the file is found and the PrepareImageForColorbox.exe is found.
10) Press the Prepare Python Image command button to invoke the image preprocessor.
    a. This invokes a Python executable that generates a comma separated file with a line for each pixel of the image. Each line contains the x/y coordinates and the RGB values for the color.
    b. The **Import Python** button will not be enabled until a valid path is provided..



c. The executable will provide a popup with the image. Close the popup by clicking the “X” in the upper right corner. The image on the right is used.

d. The executable will write a new file, with the same name as the selected image, but with a “.csv” extension. This file name and path will be copied into the **CSV Filename and Path** field on the page.



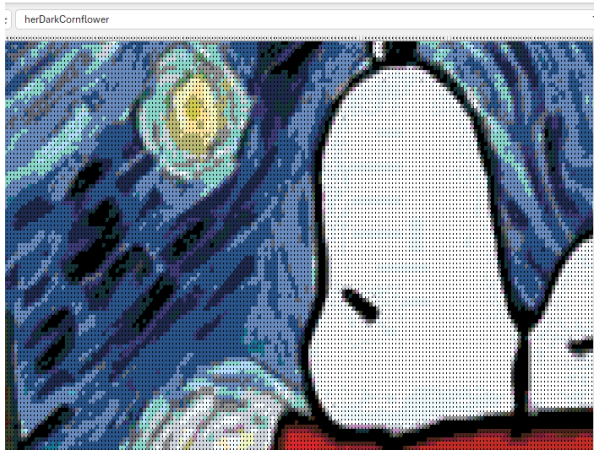
11) Ion the Import Python Area, import the image as follow

a. Set the **Limit Color** switch as desired. (Limiting is recommended). Set the limit string from the **Color Mixer** Tab.

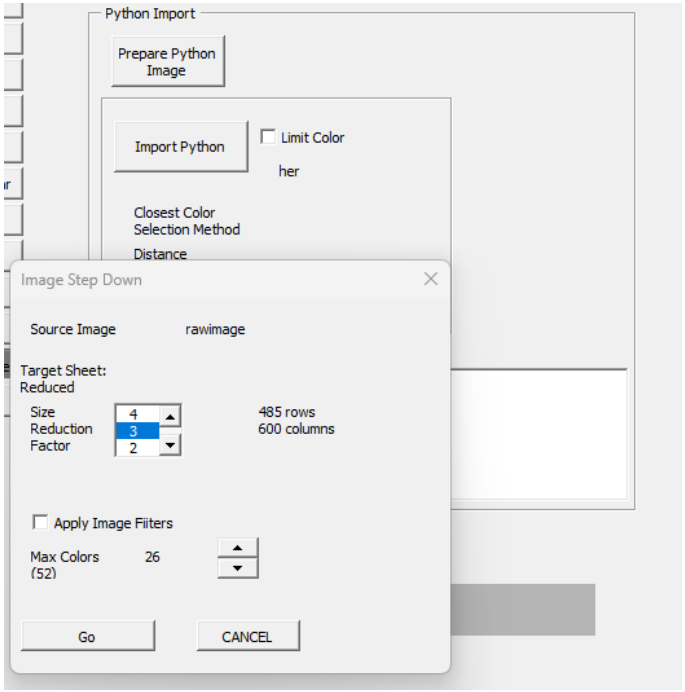
b. Set the **Closest Color Selection Method**. The user can choose between the 4 color distance methods described earlier to control the conversions. The Distance method seems to provide the best results, but feel free to experiment.

c. Press "**Import Python"**. A file selection pop-up is then presented. Select the .csv file previously created.

d. The python executable created file is then read in, populating the **rawimage** tab. Each cell's RGB value is converted into a Colorbox color name. (rgbRed, or herGreen). A counter in the lower left corner will provide evidence that the processing is continuing, Once completed, manually changing the Excel scale (in the lower right corner) will allow you to view the image.



12) From Colorbox, step the image down. * This step down process does the following:



a. Image is normally reduced in size. The step down sizes (reduction factors) are 1:1 (no change in image size), 2:1, 3:1 and 4:1. In the step down process, a group of cells are combined into one. One color from the group is selected as the stepped down color. Generally this is the most prevalent color in the group. (Ties go to the first color seen in the group). There is an experimental capability to apply some pattern detection processing (straight lines, diagonals, etc.) to favor line preservation that has not shown significant usefulness at this point.

b. The number of used colors is reduced to 52 or less colors. (The user can choose a number less than 52). The color reduction process operates by taking the least used color and remapping it to another color already in use. Then shampoo, rinse and repeat until the desired number is reached. Note that for the 72 Herrschner colors, this seems to be effective.

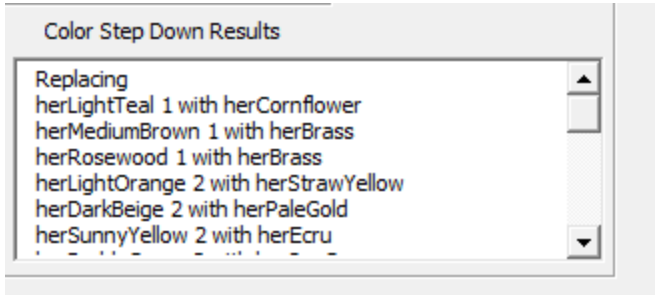
    i. The color reduction steps are provided in a text box.

c. The Step-down image is placed into the “Reduced” tab.

d. The user can then use the “Prepare sheet for Colorbox” capability to enable the Colorbox editing.

e. Note: if the User chooses to not remove the Raw Image when prompted to, the step down process can be repeated, allowing the used to vary the step down ratio and/or the number of colors desired.

f. REPAINT the image

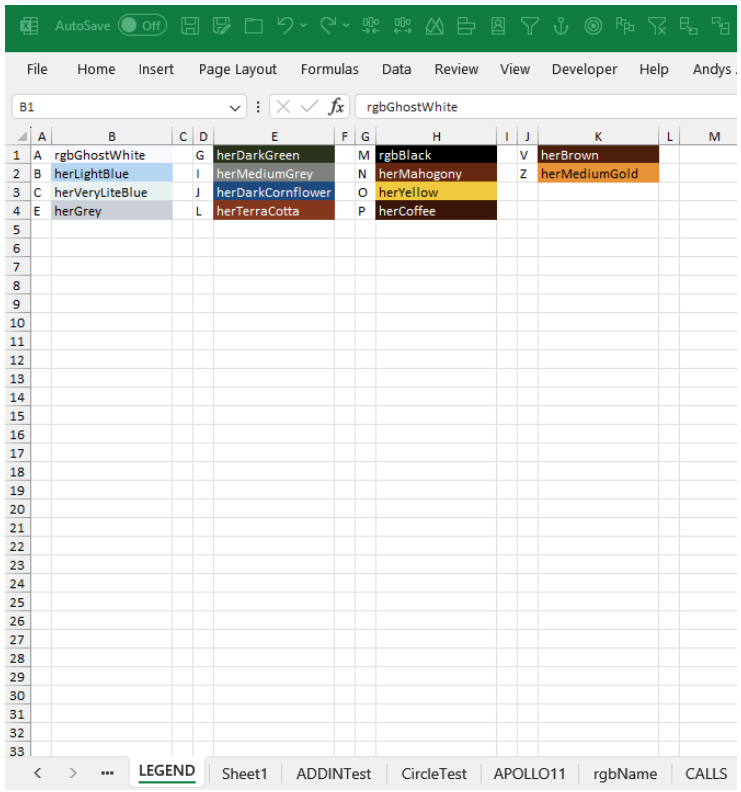


The image capture process presumes that the image has been right-sized using image processing tool. The process is limited by the number of pixels to be captured and the subsequent number of rugs threads. Rug sizes approaching 200 x 200 squares may strain Excel. Images larger than that have been known to hang or crash Excel.

18 Legend Sheet

The software maintains a Legend sheet, which lists each used letter/color in a grid. Click on the tab marked “LEGEND” to access it.

The legend is updated each time the Colorbox palette is rebuilt. It can be printed using normal Excel commands.



19 Leftsource Import

1) Download the Leftsource generated file. It should include
    a. a pattern sheet that reflects the name of the file you feed into Leftsource.
    b. A “Yarn” sheet
    c. A “no letters” sheet which is not used by this process. (It has the image colors with no letters in it)
2) Go to the yarn sheet and scroll to the bottom of the file. Look for color entries the letters that are not simple characters. For example <c:uline>A</c:uline>. The Colorbox tool only supports 52 characters (A-Z, and a-z). If the Leftsource file has more than these characters, you will have to manually remove these and insert your own values. You can rerun Leftsource with a lower number of preferred colors if the number of “on-beyond-Z” threads are too numerous to fix. If you choose to use native Excel features like find/replace and row/column deletions, you may want to press the **Suspend Colorbox** control prior to doing so. When suspended, the Colorbox software won’t react to any changes or mouse selections on the pattern.
3) Copy the Patterns sheet and the Yarn sheet into your template sheet
4) Goto the YARN sheet and put the following formula into first cell in column E whose row has a color. (Should be E3)
    a. =ReformatLeftSourceYarnName(D3)
    b. Copy this formula down to the last color row
5) On the YARN Sheet : Run “ConfigureForLeftBankColors”
    a. Developer -> Macros -> ConfigureForLeftBankColors
6) On the pattern sheet: Run ConfigureSheetForColorbox
    a. Developer -> Macros -> ConfigureSheetForColorBox
7) Initial Edits
    a. Bring up the colorbox tool

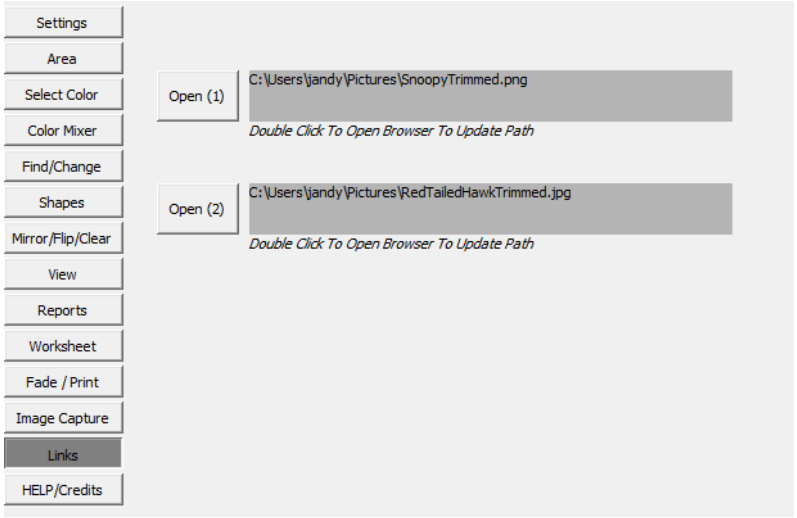
b. Change the zoom to view the whole image (View – Worksheet Zoom -> 25)

c. If the cells are not all square, update the cell size. (18 or 20 are common values)

d. Flip the image (Mirror/Flip/Clear -> FLIP X with Y Axis). This will create a new spreadsheet tab with a corrected image. You should work in this sheet. Saving the old tab for reference. Note that you can rename the tabs by double-clicking on them.

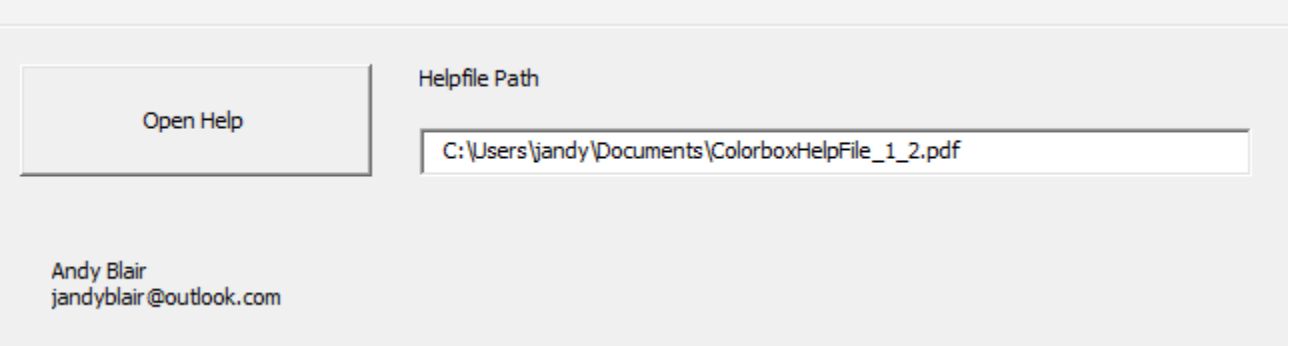
20 Links

Users can record the paths of two files in the link page. Double-clicking on the path name brings up a Windows file explorer. When the user selects a file, the path is copied in. Selecting the Open command opens the file. This function is intended to allow the user to quickly get back to a reference image or other important data. The paths are retained as spreadsheets state data as SYS_PARMS.



21 Help/Credits

The Help/Credits page provides a mechanism to define the location of the help file and to access this file.



When setting up the tool set, record where the help file is located and make sure that the location is reflected correctly here. After editing the file location, click the “Open Help” button to read the updated location. If the helpfile is found there, a popup will confirm the update of the help file. Any subsequent presses of the Open Help button will open the help file.

If you need to reach me to resolve issues, suggest improvements or to just generally disparage my existence, I can be reached at the e-mail address listed.

22 Usage Scenario

The Apollo 11 pattern was processed using the Colorbox tool as it was being developed.

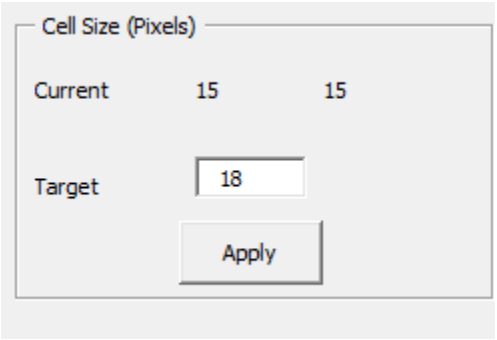
The original image was captured using www.leftsource.com. The resulting csv file was downloaded and opened in Excel. Note that the image is rotated back 90 degrees and is a mirror image of the desired pattern.

This worksheet should be copied/moved into a Colorbox worksheet. (i.e. one that contains the rgbName control file.)

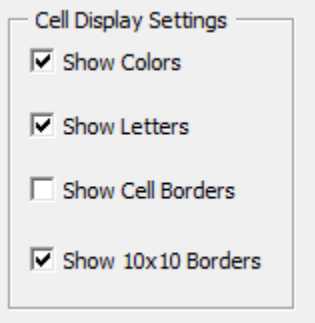
Open the Colorbox tool (from the tool bar after installation) and move to the new worksheet (tab).

Go to the **Mirror/Flip/Clear** page and select “Flip A with Y Axis”

A new sheet with the flipped image will be presented. If the cell sizes are not consistent, go to the **View** page and set the Cell sizes.

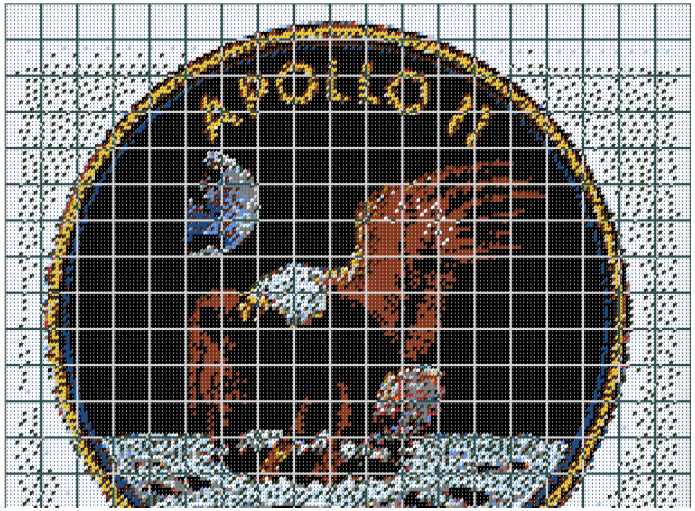


Go to the **Settings** page and select to Show Colors, Show Letters and 10 x 10 borders.



Press “Repaint All”

The “starting image” should appear.



At this point, access the color map that was provided by your file source. Access the **Reports** page and run the Color Count report. Note that any used upper- or lower-case characters will be listed. Some upper-case letters and all lower case letters won’t have colors assigned to them. Take a screen shot of this report (Snipping tool) and print it.

Use the Select Color tool to assign/redefine letters.

Use the Find/Change find functions to see where colors are used.

Use the Color Area or Shapes polygon toosl to clean up areas that should be single colored. In the example, there is a lot of “noise” in the white area. Use the Color Area to quickly set a rectangular area to a single color. Use the Polygon tool for the same impact on non-rectangular area.

In some cases, there will be colors with slight variations that you may want to consolidate into a single color. The use of the Change Tool is recommended for addressing these edits.

Once the large-scale updates to the image are done, the detailed editing can be done using the narrow color only Colorbox form and editing cell by cell.

In cases where the exact color is not what you want, you can use the Select Color page to remap letters to existing colors or using the Color Mixer page to “find just the right shade”. MS Paint has an eyedropper tool that lets you pick a point in an image (snipping tool again) and get its exact RGB values. The Color Mixer can help you find the exact color or to find an existing color that is close to what you want.

You will find yourself reducing the number of colors/symbols used over time. As part of the color matching process, access the web sites of the thread sellers (Herrschner’s) and make sure you can match their colors. Note that the manufacturer names don’t always match the rgbName colors. This is the reason for the ability to create your own color names.

The Apollo 11 pattern has a set of concentric circles. The **Shapes** Draw Circle tool was used to re-create these circles after some experimentation with center points, radius and circle thickness. It is recommended that you create a copied worksheet (tab) and work in the copy while attempting such high risk edits. Once everything is working, you can move from the old basis to the new copy, or discard the copy and fall back. You can also work in a scratch tab and cut and paste block into a main image using native Excel cut and paste.

When fine editing is to be done if you have the screen real estate (a large screen or two screens), it is recommended that you open two images of your pattern, one small scale (25%) and one large scale (100%). Edit in the large-scale window and look at the small scale window to see if you are getting the results you want.

The **Shapes** page lets you create Circles, Lines and Polygons on an ad-hoc basis. The Polygon’s can be filled in with a set of Random colors. This tool was helpful in creating backgrounds that weren’t too static. (I hope to try this feature out to Autum Tree images soon.)

Please note that the images displayed are much sharper in the spreadsheet than they will appear in yarn. Differences between similar colors are lessened, and 1 thread wide lines may appear rather ragged and spotty. Remember that the display shows a square of color, while the yarn is two ends of a bundle of fabric that can move relative to each other and to other threads.

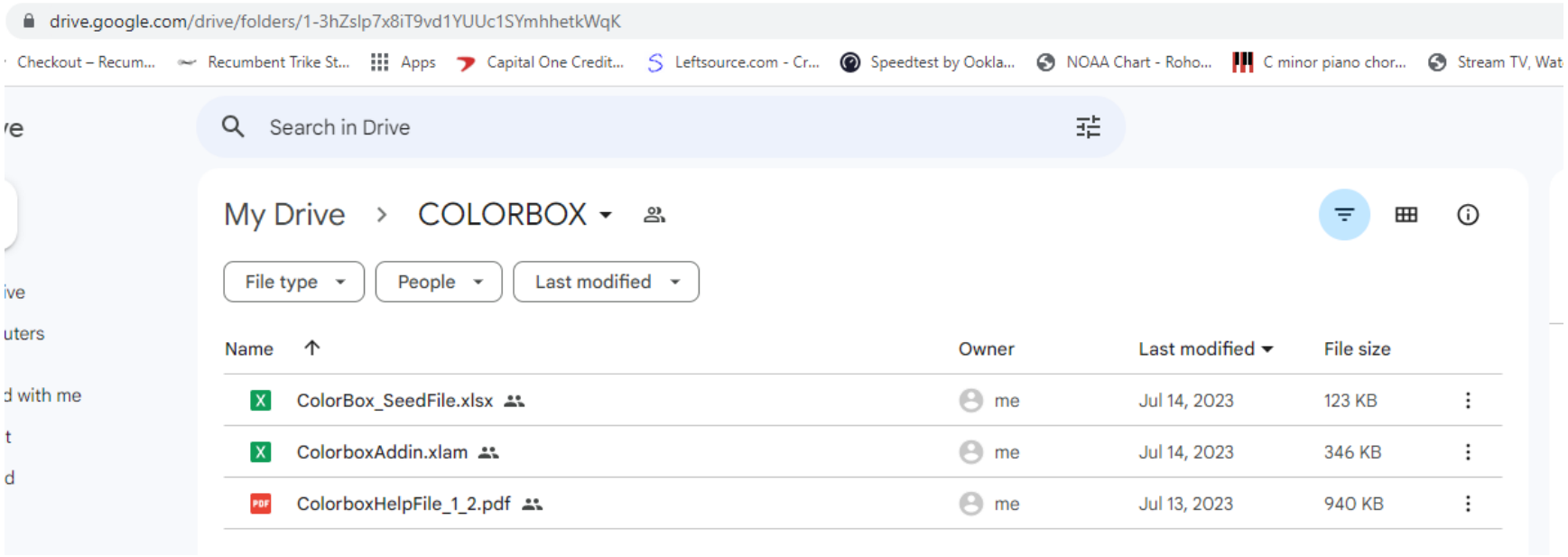
23 Installation

The following files/directories are needed to install and run Colorbox.

1) The “Seed file”, which contains the rgbName control file.
2) The ColorboxAddin.xlam file which contains the Colorbox VBA software
3) The ColorboxHelpFile (this file).
4) The PrepareForColorbox pyhton script and its associated support files, which convert image files into CSV files. It is recommended that the file be placed near the top of the User’s file system. For example, in in the C:\Users**"user name"**\ directory. Copy the zip file of to the desired directory and unzip the file using normal window right click options. Remember to update the application’s path for this function as described in Section 17 **Image Capture.**

The files can be found at: https://drive.google.com/drive/folders/1-3hZslp7x8iT9vd1YUUc1SYmhhetkWqK

23.1 Accessing the Code From Google Drive



The xlam file needs to be copied to the correct location to be accessed by Excel. The location should be

C:\Users**"user name"**\App Data\Roaming\Microsoft\Addins\

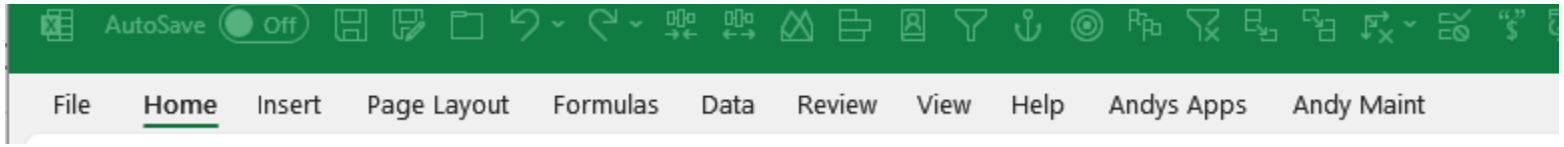
For most users, the file explorer will need to “show hidden files” in order to reach these locations. (See the menu on the right)=

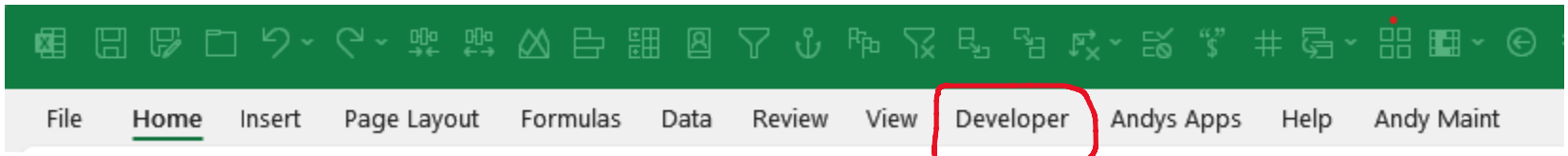
The Seed file and the Help File should be copied to the location where you will store the pattern(s).

23.2 Setting Up A Quick Access Toolbar Entry for the Colorbox

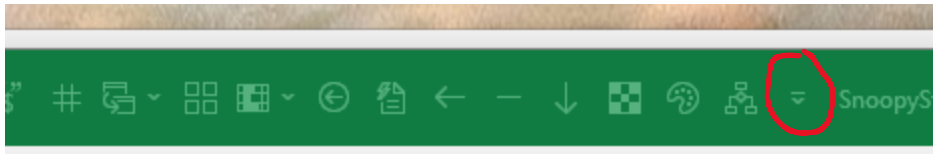
Open the Seed file in Excel

Look at the tabs in the toolbar at the top. (Your toolbar won't have the two "Andy" tabs).

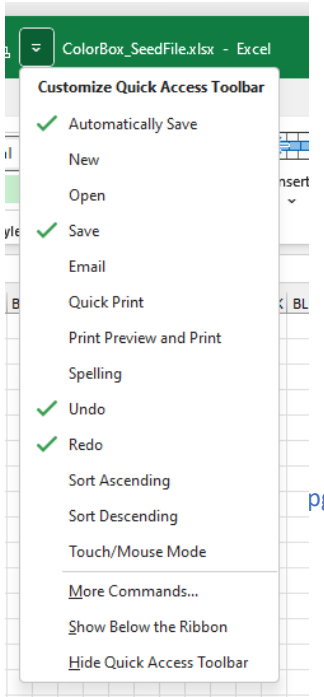




If "Developer" is not shown (it would be after "View"), do the following:



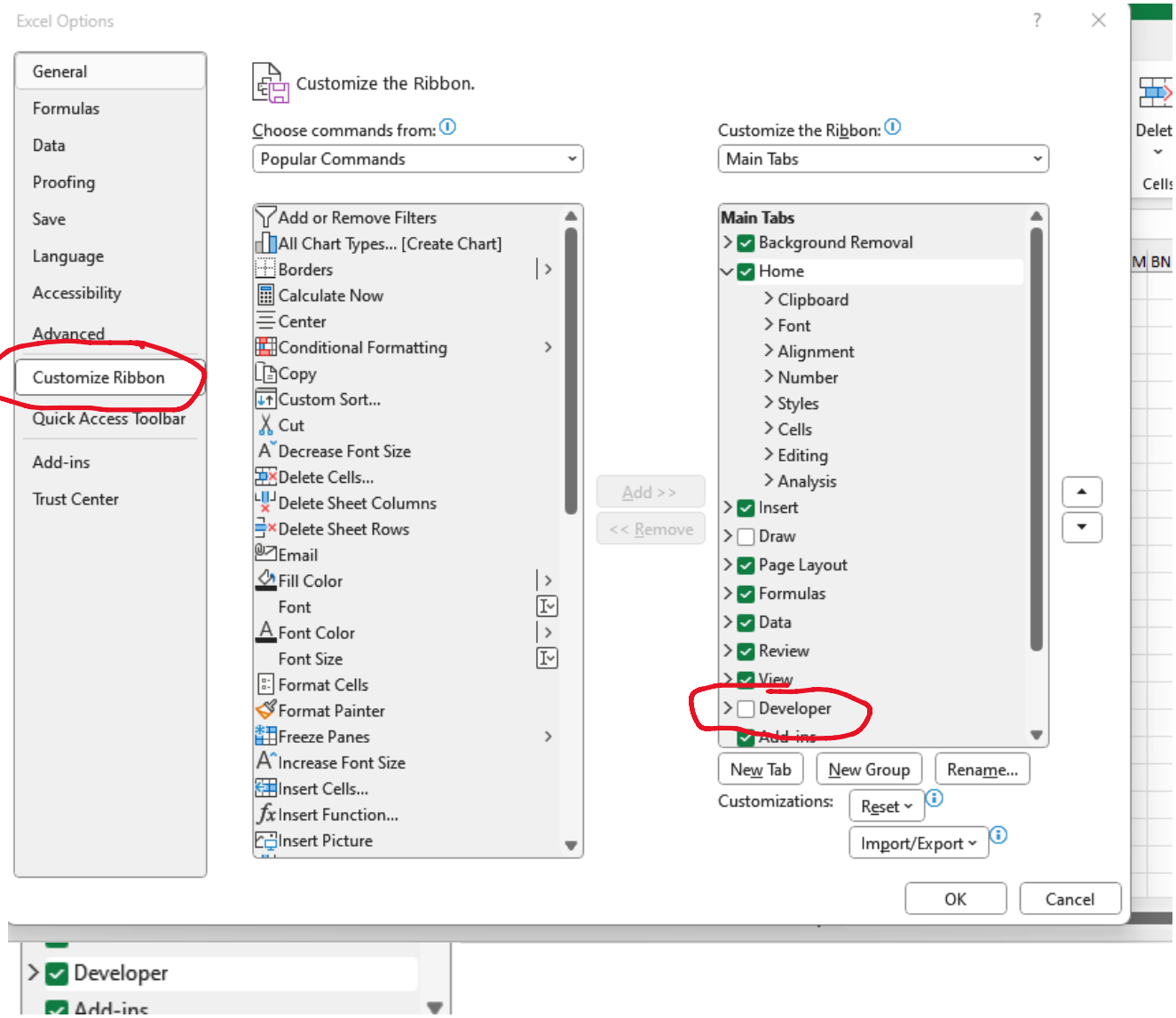
Access the "Customized Quick Access Toolbar" function – which is at the far right of the tool bar. It is a downward symbol. (In most cases, the quick access tool bar is not as filled as this one is and the "far right" is near the left side of the ribbon.



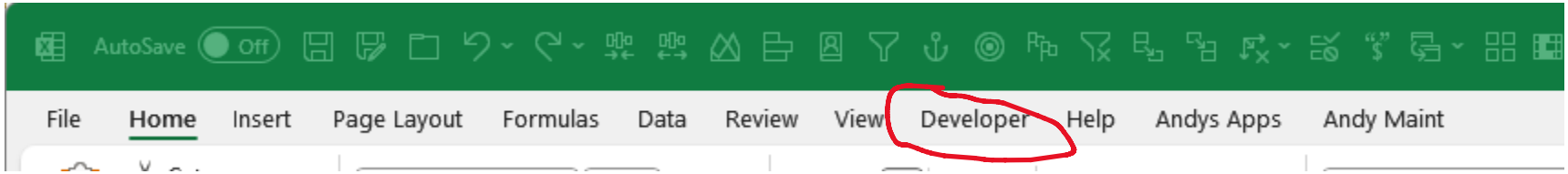
Clicking on the ICON should present the following:

Select the "more Commands"

Select “Customize Ribbon” on the left, and then select “Developer” on the right.

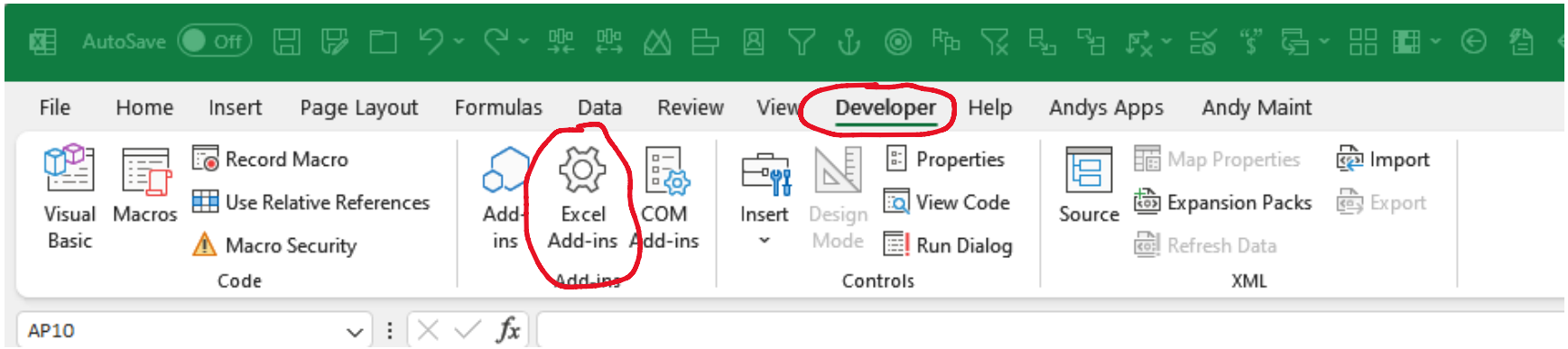


This should put the Developer on the Ribbon.



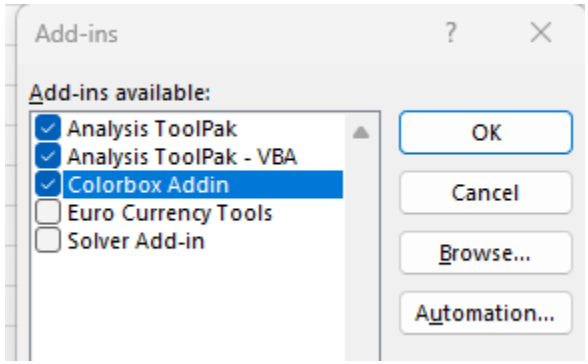
23.3 Accessing the Colorbox Add-In

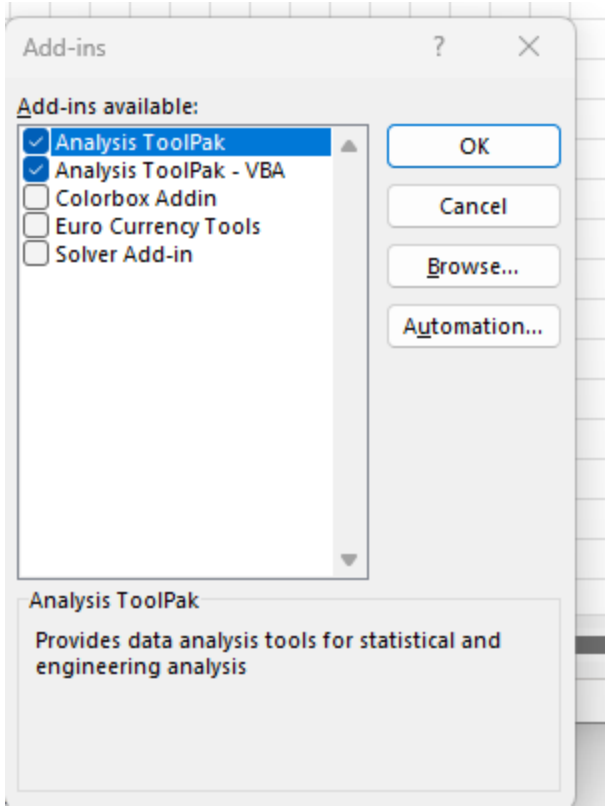
Once the Developer is Visible, click it and access “Excel Add-ins”



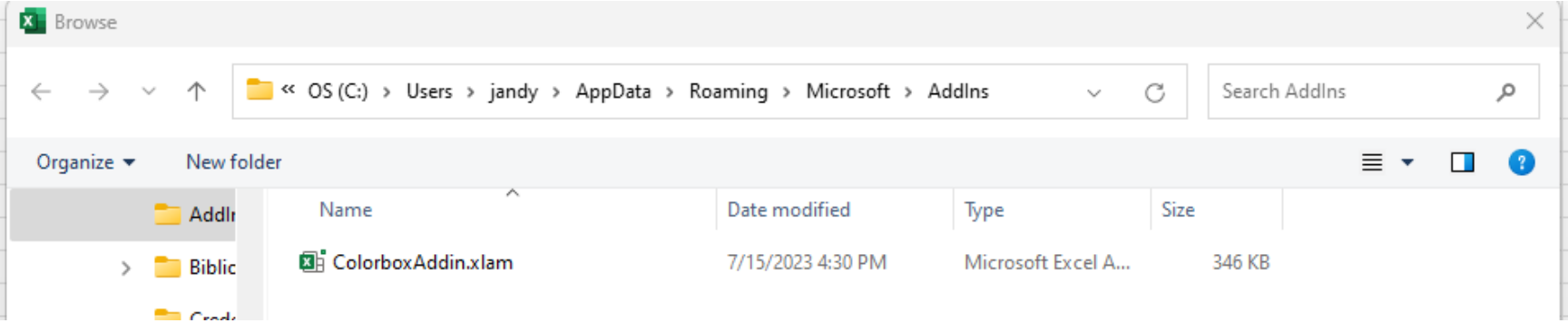
A menu will be presented. If the Colorbox tool is visible, select it.

Should become





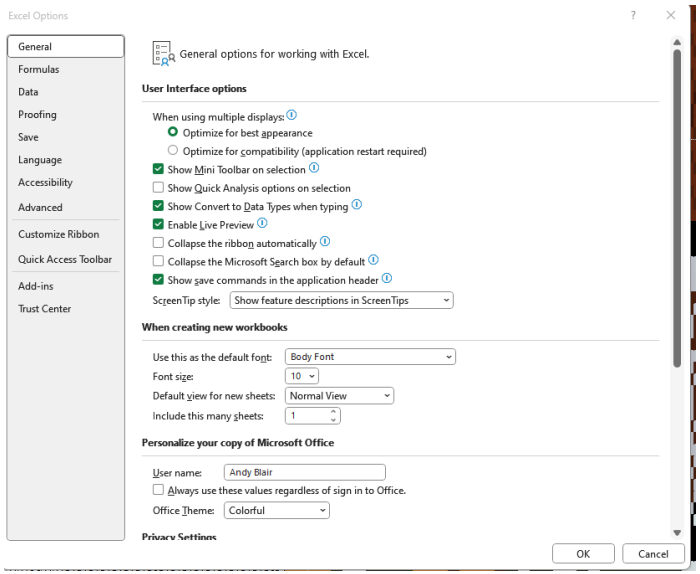
If the Colorbox Add-in is not present, click the “browse” button. A file explorer should pop-up and the Colorbox add-in should be there. Double click the file to add it in. If the Colorbox xlam file is not there, note the location and copy the xlam file there. Reopen the add-in menu and select the Colorbox.



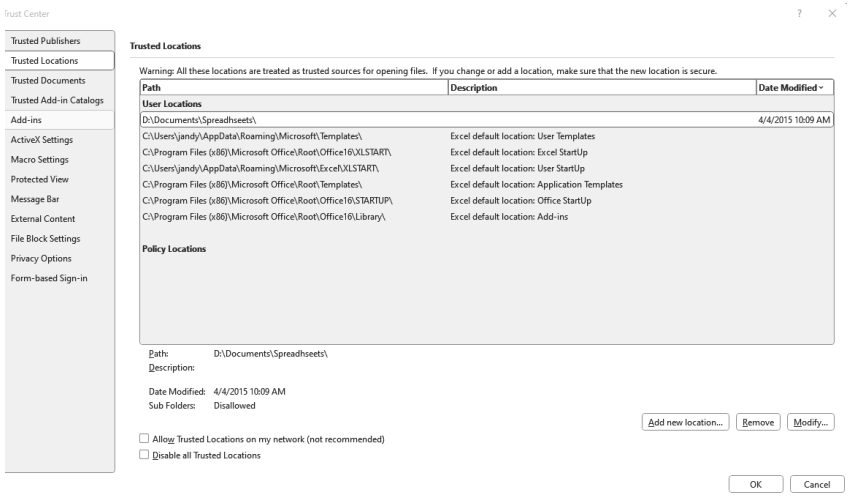
23.4 Trustng the xlam file location

Excel will not run the xlam as an untrusted file. The simplest way to address this issue is to make the add-in location trusted. Please be sure that you are willing to trust this software and any other add-ins in this location before continuing.

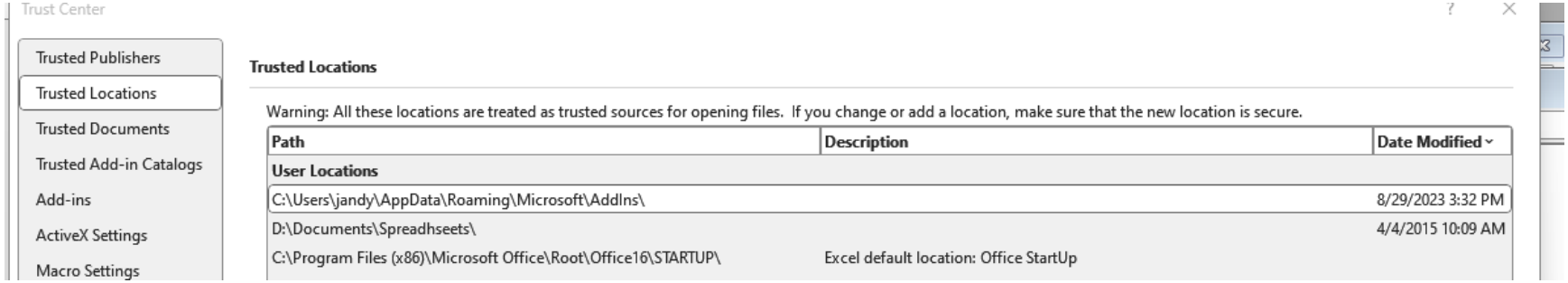
From Excel, follow File -> Options -> Trust Center



Then open Trust Center Settings and access Trusted Locations:



Press the “add new location..” button and browse to find the location of the add-ins. (for example : C:\Users\jandy\AppData\Roaming\Microsoft\AddIns) and add this location. Exit using OK’s.

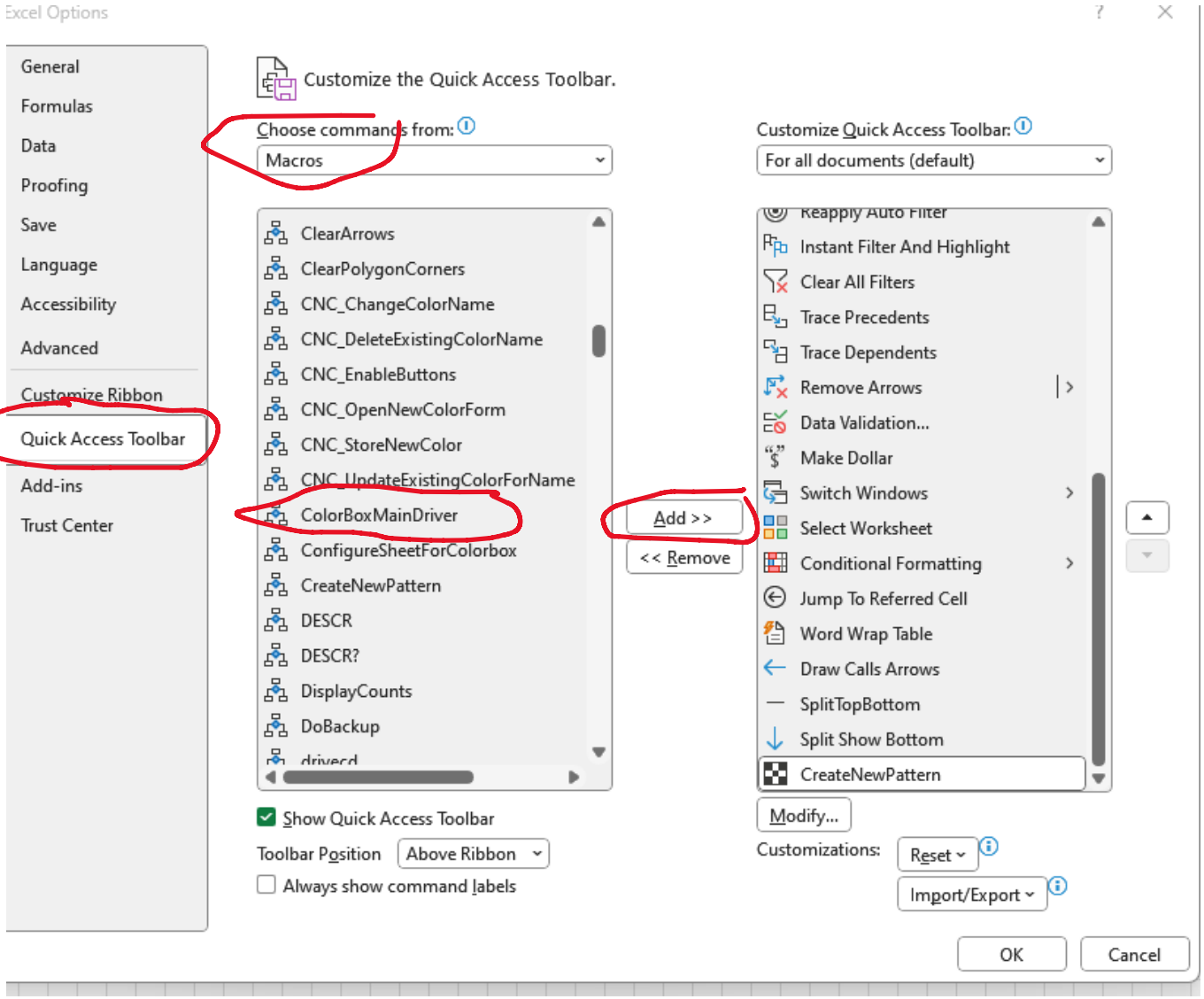


23.5 Put Colorbox On The Quick Access Toolbar

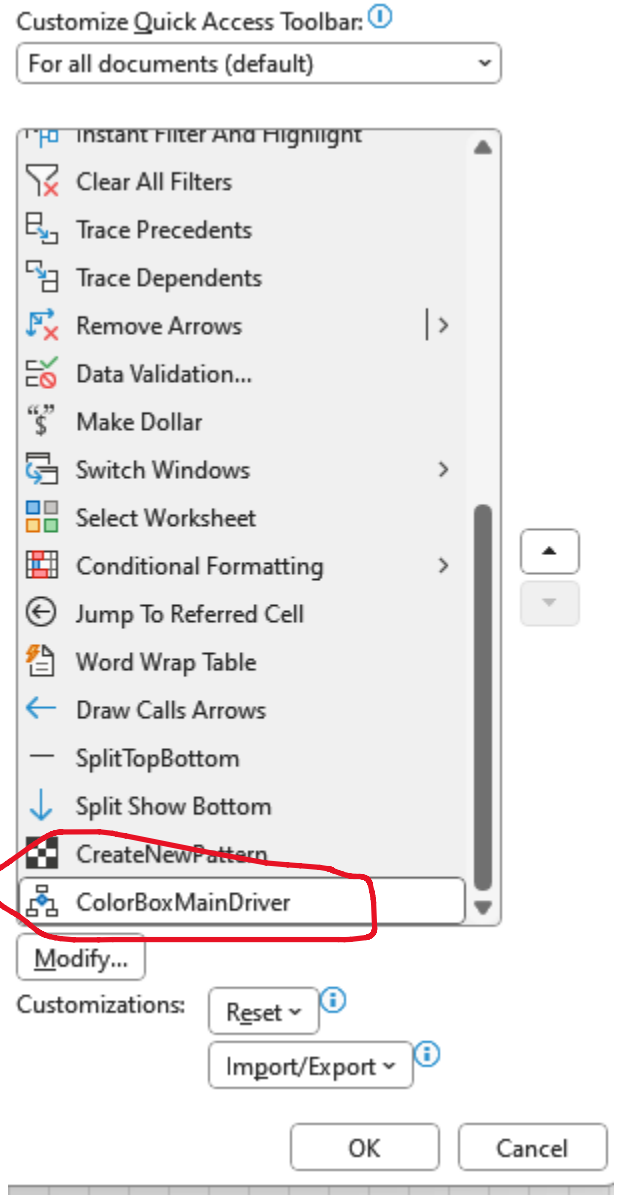
Go back to the Ribbon Editor as before and select the Quick Access Tool Bar.

In the middle area, select “Macros” and scroll down until you see “Colorbox Main Driver”

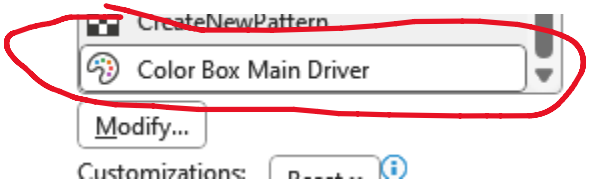
Select ColorboxMainDriver and press the “Add” button.



The Quick Access Button list will have the command added to it as shown on the right.

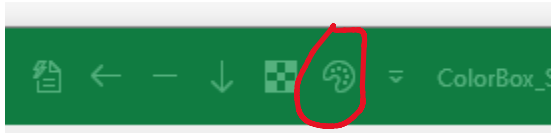


If you click on the Modify button, you can associate a more meaningful symbol to the command the Add spaces into the name.



Select OK at the lower right.

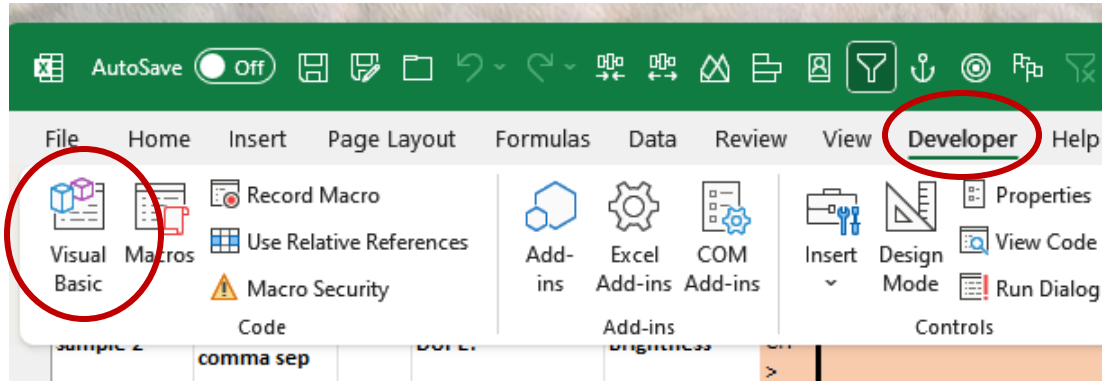
The Ribbon should now include the Color Box Main Driver.



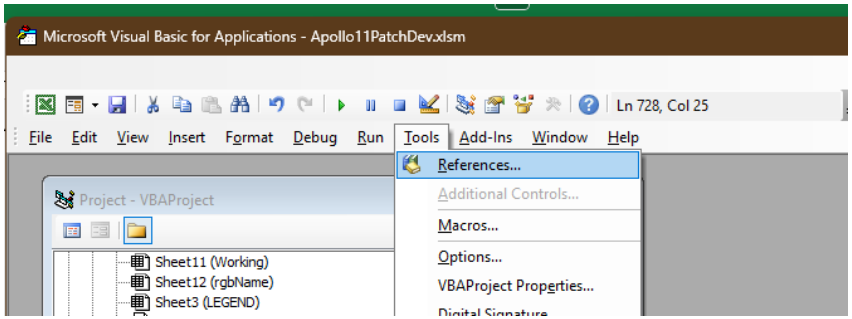
23.6 Updating the Reference Files

The ColorBox uses some functions (references) not usually installed in Excel. Follow this one time procedure to set it up.

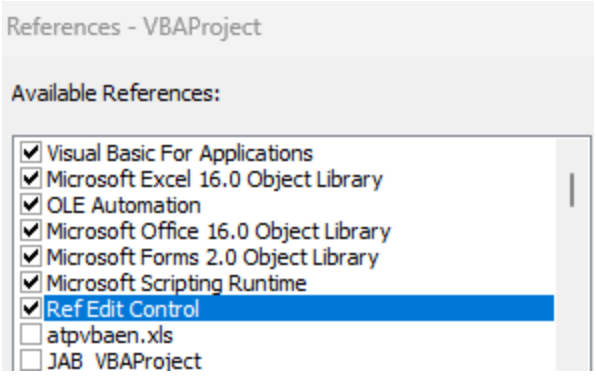
1) Access the Developer by Clicking on "Developer" and then "Visual Basic" when it appears on the left side.



2) When a new tool bar is presented, click on Tools -> References



3) Find the items checked in the sample to the right and click them.

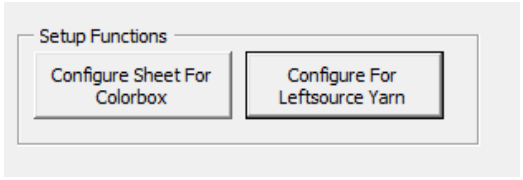


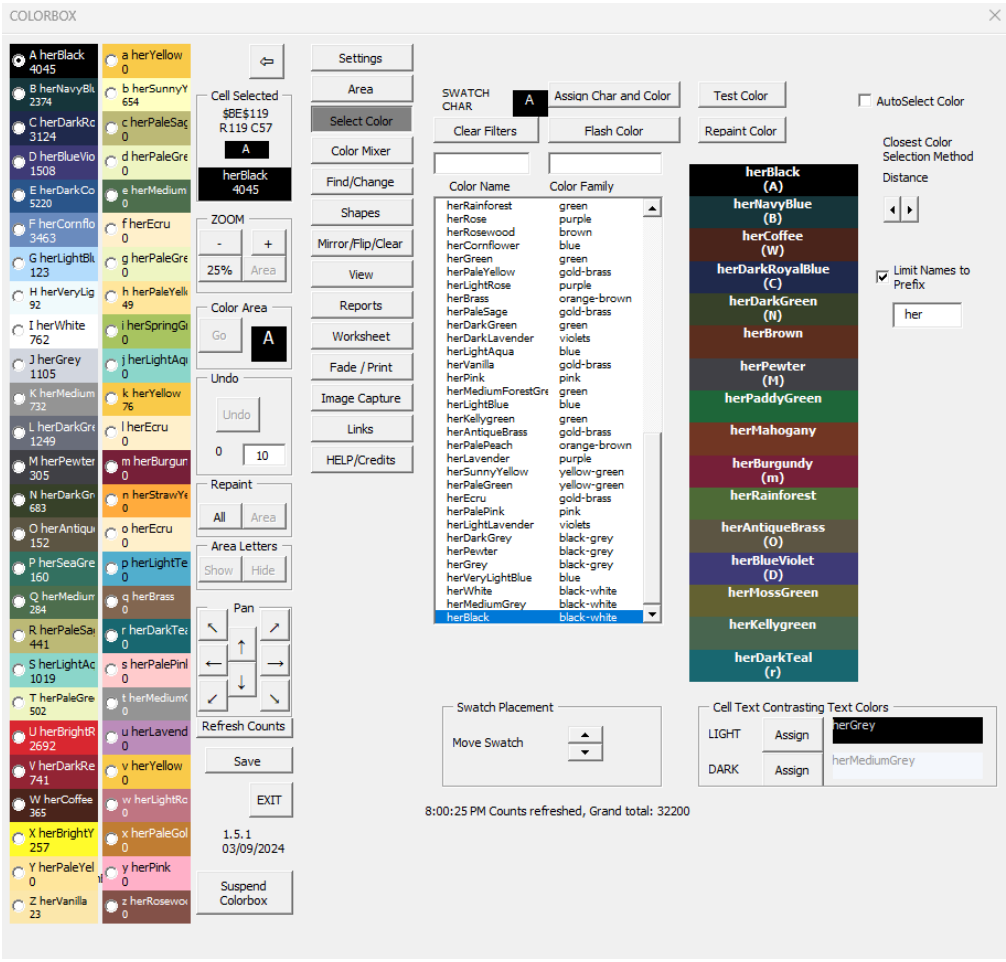
24 Load the Tool

Go to the Colorbox Main Driver in the ribbon and click it: You should see the Colorbox load. You should be ready to use the tool. Remember to condition any new sheet with the **Worksheet-> Configure Sheet For Colorbox** command. Note, if a new Window pops up during this process, just close it.

If you start in the existing sample sheet, remember to apply “Configure Sheet For Colorbox” in order to see the colors applied.

This software is distributed free of charge and is available to all who wish to use it. Please do not modify the code.





25 Support Tabs

The following tabs are required for operation and should not be renamed or removed. (its best if they are left alone).

1) rgbName : Provides the list of color names and the supporting data. Read/Edited by the software.
2) SwatchList : Provides the mapping of letters to color names. Read/Edited by the software.
3) ImageFilters : provides for the sets of image filter masks used in the experimental attempt at edge detection during raw image step down processing.
4) SYSPARM : the location of statically stored variables. These parameters generally impact the User Interface. Read/Edited by the software.
5) Log : Provides a log of the software's activity. This is a wrap-around buffer.
6) PrintSheet : used in printing text box contents

The following tabs may also be present:

1) CALLS and MODULES : provides software architecture information.
2) Reduced and rawimage. These tabs are used in the image import processing and are deleted and recreated by the software
3) SwatchList : a tool for viewing colornames

26 Finding RGB Color Values

The following was found on line:

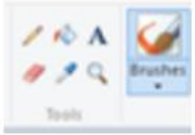
How to Get an RGB Value From a Screenshot

Do you see a color online that you would like to use in a map you are creating and need to know the RGB values of that color? Follow these steps:

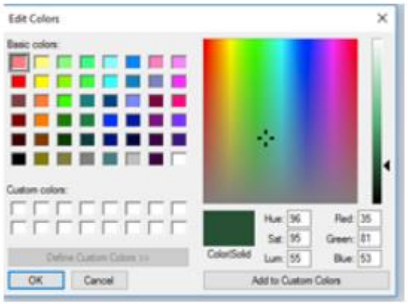
1. Click the 'print screen' button on your keyboard to take a snapshot of your screen. Paste the image into MS Paint.

Screenshot of color palette found online

2. Click on the color selector icon (the eyedropper), and then click on the color of interest to select it, then click on 'edit color'.



3. The RGB values for that color will appear in a dialogue box.



GIS Quick Tips Presented by CDC's GIS Exchange https://www.cdc.gov/dhdsp/maps/gisx/index.html

27 Generating the Addin

This process describes how the add-In was generated and is included for the convenience of the author.

1. Debug.compile the original file, make fixes there.
2. Save the original file.
3. Run Software Arch, refresh it. Reset Inventory
4. Save file as **Colorbox_Seedfile.xlsm**
    a. Within Seed File
        i. DELETE THE VBA Code by saving it as an xlsx file. Close the file and reopen it
        ii. Save the file as an xlsm file
        iii. Delete the Working Tab
        iv. Recreate the Working Tab. (make sure that there is no code for that sheet
        v. Fill in two rows or columns with the upper and lower case alphabets
        vi. Delete unwanted sheets, leave the working sheet and the following sheets:
            1. rgbName
            2. SwatchList
            3. UsedColors
            4. ImageFilters
            5. SYSPARM
            6. Palette
            7. LOG
        vii. Save This File

5. Go back to the original file and Save As (Copy) the source file to **ColorboxAddin.xlsm**
    a. Create a stubb sheet, and remove all others
    b. Set add-in a name and description. This can be done by filling in the
        i. **(File > Info > Properties, Advanced Properties)(Summary Tab)**.

From <https://bettersolutions.com/excel/add-ins/creating.htm>

6. Protect code : **(Visual Basic -> Tools > VBAProject Properties)(Protection tab)**.

From <https://bettersolutions.com/excel/add-ins/creating.htm>

7. Make sure add in is not being used (**Developer -> Excel Add ins)**
8. File -> Save As .xlam
    a. C:\Users\jandy\AppData\Roaming\Microsoft\AddIns
9. Locale the python **Prepare For Colorbox** Directory and **zip it.**
    a. C:\Users\jandy\Desktop\COLORBOX_RELEASE\PrepareImageForColorbox
10. Copy the following to the COLORBOX RELEASE directory
    a. The PrepareImageForColorbox from above
    b. The xlam file
    c. The seed file
    d. The help file

11. Copy (Drag and drop) the xlam, start up file (the small speadsheet) and pdf files to the google drive https://drive.google.com/drive/folders/1-3hZslp7x8iT9vd1YUUc1SYmhhetkWqK
    a. The **PrepareImageForColorbox** zip file
    b. The **ColorboxAddin.xlam** file (C:\Users\jandy\AppData\Roaming\Microsoft\AddIns)
    c. The seed file Colorbpx_SeedFile.xlsm (C:\Users\jandy\OneDrive\Rugs)
    d. The users manual (this document) as a published pdf file. (C:\Users\jandy\OneDrive\Rugs)