

Designing the CERSER Promotional Package

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Abstract - The Center of Excellence in Remote Sensing Education and Research (CERSER) was established in 2002 on the campus of Elizabeth City State University as a leader in Remote Sensing Education and Research in Northeast North Carolina. Since that time ECSU has actively sought methods to promote the CERSEER project and its capabilities. This year the multimedia team built an information package utilizing a variety of software packages used in multimedia design. The informational package is composed of fact sheets, brochures, and multimedia showcase CD's. These informational packages will be used at conferences, meetings, and events to promote the missions and goals of CERSEER.

The software packages used included: Macromedia Dreamweaver, Adobe Pagemaker, Adobe Premier, Microsoft Word, Adobe Photoshop, and Macromedia Authorware. These packages enabled the team to develop paper, video, and computer based multimedia projects. The team began by learning specific software packages followed by a short course in paper and computer based design. This included content management, layout designs, and color selection.

I. INTRODUCTION TO COLOR THEORY

A. What is Color Theory?

The beginning of any web or print design can be hard as the customers and designers pick out colors. There are many resources available to help in this decision. One is the study of Color Theory. Color Theory is a set of principles used to create color combinations that work well together. Color relationships can be seen by taking the color spectrum and bending it into a circle known as the color wheel.

B. History of color theory

Sir Isaac Newton invented the first color wheel. He split white sunlight into red, orange, yellow, green, cyan, and blue beams using prisms. He joined the two ends of the color spectrum together to show the natural flow of colors.

A century later, Johann Wolfgang Goethe began studying psychological effect of colors. Goethe created a color wheel showing the psychological effect of each color. He divided all the colors into two groups – the plus side (from red through orange to yellow) and the minus side (from green through violet to blue). Colors of the plus side produce excitement and cheerfulness. Colors of the minus side are associated with weakness and unsettled feelings.

The current form of color theory was developed by Johannes Itten, a Swiss color and art theorist. Itten developed 'color chords' and modified the color wheel. Itten's color wheel is based on red, yellow, and blue colors as the primary colors.

C. Color Mixing

In color theory, primary colors are the three colors that cannot be formed by any combination of other colors. All other colors are derived from these three hues. Mixing the primary colors forms Secondary Colors and mixing the secondary colors forms the tertiary colors.

II. HARMONIES AND SCHEMES

A. Introduction

According to color theory, color combinations that work well together use any two colors opposite each other, any three colors equally spaced forming a triangle, or any four colors forming a rectangle (actually, two pairs of colors opposite each other). The color combinations are called harmonious or color schemes. Color schemes remain harmonious regardless of the rotation angle.

B. Monochromatic

The monochromatic color scheme uses variations in lightness and saturation of a single color. This scheme looks clean and sophisticated. Monochromatic colors go well together, producing a smooth effect. The monochromatic scheme is very easy on the eyes, especially with blue or green hues. The primary color can be integrated with neutral colors such as black, white, or gray. It can be difficult, when using the monochromatic scheme, to highlight the most important sections of a figure.

Advantages: Monochromatic is easy to manage and it always looks balanced and visually appealing.

Disadvantages: This scheme lacks color contrast. This scheme does not stand out much as the complementary scheme.

C. Analogous

The analogous color scheme uses colors that are adjacent to each other on the color wheel. One color is used as a main color while others are used to aid in the scheme. The analogous scheme is similar to the monochromatic one, but offers more variety.

Advantages: The analogous scheme is as easy to create as the monochromatic, but looks smoother.

Disadvantages: Lacks color contrast. This scheme does not stand out much as the complementary scheme.

D. Complementary

This scheme is made up of two colors that are opposite each other on the color wheel. This scheme works well when you put a warm color against a cool color, for example, red

versus green-blue. The complementary scheme is automatically high-contrast.

It is important to choose a dominant color and use the complementary color for accents. Using one color for the background and its complementary color to highlight important elements, you will get color dominance combined with sharp color contrast.

Advantages: The complementary scheme offers the strongest contrast of all the color schemes and draws the greatest attention.

Disadvantages: It is harder to balance than monochromatic and analogous schemes.

E. Split-Complementary

The split complementary scheme uses a color and the two colors adjacent to its complementary. This provides high contrast without the strong tension of the complementary scheme.

Advantages: This scheme offers more variety while keeping the high contrast.

Disadvantages: The triadic scheme is harder to balance than monochromatic and analogous schemes.

F. Triadic

The triadic color scheme uses three colors equally spaced around the color wheel in the form of a triangle. This scheme offers strong visual contrast while retaining balance, and color variety. The triadic scheme is not as contrasting as the complementary scheme, but it looks more balanced and harmonious.

Advantages: Offers high contrast while retaining harmony.

Disadvantages: This scheme is not as contrasting as the complementary scheme.

G. Tetradic

The tetradic scheme has the highest variety of all the schemes because it uses four colors arranged into two complementary color pairs. This scheme is hard to harmonize. One color should be chosen to be dominant or subdue the colors.

Advantages: Offers more color variety than any other scheme.

Disadvantages: Hardest scheme to balance.

III. COLORS AND THEIR MEANINGS

A. Red

Red is a very emotionally intense color. It increases human metabolism and respiration rate, and raises blood pressure. Because of its high visibility it is used in stop signs, stoplights, and fire equipment.

Text and images that are colored red stand out in the foreground. It is used as an accent color to stimulate people to make fast decisions. In advertising, red is often used to evoke

erotic feelings (red lips, red nails, "lady in red"). Red is also used to indicate danger (high voltage signs, traffic lights).

B. Orange

Orange is associated with joy, sunshine, and the tropics. It represents enthusiasm, fascination, happiness, creativity, determination, attraction, success, and encouragement.

Orange is a very hot color to the human eye as it gives the sensation of heat. Orange increases oxygen supply to the brain and stimulates mental activity. As a citrus color, orange is associated with healthy food and stimulates appetite. Orange is the color of fall and harvest.

Orange has very high visibility, so it can be used to catch the attention and highlight the most important elements of a design. Orange is often used to promote food products and toys.

C. Yellow

Yellow is associated with joy, happiness, intellect, and energy. It produces a warming effect, arouses cheerfulness, stimulates mental activity, and generates muscle energy. Taxicabs use a bright, pure yellow as an attention getter. If it is used too much, yellow may have a bad effect. It has been found that babies cry more in yellow rooms. Yellow is seen before other colors when placed against black so this combination is often used to issue a warning.

Yellow is best used to promote children's items and to attract attention against a dark background. It is best to avoid using shades of yellow as they may disappear into white or appear dingy.

D. Green

Green symbolizes growth, harmony, freshness, fertility, and safety. Dark green is also commonly associated with money.

Green is the most restful color for the human eye. Green suggests stability and endurance. Sometimes green denotes lack of experience; for example, a 'greenhorn' is a novice. Green, as opposed to red, means safety so it is the color of "go" in road traffic.

Green is directly related to nature, so you can use it to promote 'green' products. Dull, darker green is commonly associated with money.

E. Blue

Blue is often associated with depth and stability. It symbolizes trust, loyalty, wisdom, confidence, intelligence, faith, truth, and heaven. Blue slows human metabolism and produces a calming effect. Blue is strongly associated with tranquility and calmness.

Blue can be used to promote items related to cleanliness, water, and sea. As opposed to emotionally warm colors like red, orange, and yellow; blue is linked to consciousness and intellect. Blue is used to suggest precision when promoting technology products.

Blue is a masculine color; according to studies, it is highly accepted among males. Dark blue is associated with

depth, expertise, and stability; it is a preferred color for corporations in America.

Blue should be avoided when promoting food products as it suppresses the appetite. High-impact color schemes can be achieved when it is combined with yellows and reds.

F. Purple

Purple symbolizes royalty, power, nobility, luxury, and ambition. Purple is associated with wisdom, dignity, independence, creativity, mystery, and magic.

According to surveys, almost 75 percent of pre-adolescent children prefer purple to all other colors. Purple is a very rare color in nature; some people consider it to be artificial. Light purple is a good choice for a feminine design. Bright purple can be used when promoting children's products.

G. White

White is associated with light, goodness, innocence, purity, virginity, and perfection. It means safety, purity, and cleanliness. White usually has a positive inference. White can represent a successful beginning.

In advertising, white is associated with coolness and cleanliness because it's the color of snow. It can be used to suggest simplicity in technology products. White is associated with hospitals, doctors, and sterility, so it can be used to suggest safety when promoting medical products.

H. Black

Black is associated with power, elegance, formality, death, evil, and mystery. It is a mysterious color associated with fear and the unknown. Black denotes strength and authority. It is considered to be a formal, elegant, and prestigious color (black tie, black Mercedes).

Black gives the feeling of perspective and depth, but a black background diminishes readability. A black suit or dress can make a person look thinner. When designing for a gallery of photos, a black or gray background can be used to make the other colors stand out. Black contrasts well with bright colors. Combined with red or orange a very aggressive color scheme can be obtained.

IV. OTHER COLOR VOCABULARY

A. Hue

The color in its purest form, with no black, gray, or white added. For example, scarlet, crimson, and pink have the same hue – red. You can see hues on the outer edge of the color wheel and in the spectrum.

C. Lightness

The 'blackness' or 'whiteness' of the color determines its lightness. Often used in variations with the monochromatic schemes.

D. Saturation

The amount of hue in proportion to the neutral gray of the same lightness, that is the intensity of color. In this example, the leftmost swatch has the saturation of 1 (maximum value)

and the rightmost swatch has the saturation of 0 (minimum value).

E. Shades

Shades are mixtures of a hue and black. This tends to give darker variations of a single hue.

F. Tints

Tints are mixtures of a hue and white. Painters often use this when obtaining pastel colors.

G. Tones

Tones are mixtures of a hue and its complement or grays. This gives variations in single hue schemes.

V. LITHOGRAPHS

A lithograph is an informational sheet that contains an image (ex: an astronaut, hurricane) on the front side and factual information about the image on the reverse side of the sheet. A lithograph is a very good component of the CERSER promotional packet in that it provides to the user a visual image of CERSER's capabilities. Lithographs are very educational and are a fun and exciting way to learn about things that may interest one. The focus of this section will illustrate the steps in developing a CERSER lithograph in Adobe Photoshop and Microsoft Word. The steps may be modified to create a desired lithograph of one's choice. The development of a CERSER lithograph using Adobe Photoshop will be illustrated first.

VI. PHOTOSHOP

A. The Workspace

Before the steps of a lithograph are illustrated, let's explore the basic elements of the Photoshop workspace. There are four components to the Photoshop workspace: the menu bar, the toolbox, the status bar, and the palettes. These four components will be utilized to a certain degree in developing a CERSER lithograph.

The menu bar consists of nine menus: File, Edit, Image, Layer, Select, Filter, View, Window, and Help. You may notice that some menu commands are followed by ellipses (...). This indicates a command that is followed by a dialog box where you can enter additional settings. A right pointing arrow follows some menu commands. This indicates a submenu of related commands. As each menu may be explored, be sure to take a look at the submenus as well. One may notice that many commands are followed by keyboard shortcuts. Gradually, one may want to get to know these keyboard shortcuts, as they can be incredible time savers.

The second component of the Photoshop workspace is the toolbox. The first time one starts the Photoshop application, the toolbox appears on the left side of the screen. Some tools in the toolbox have options that appear in the context-sensitive tool options bar. These include the tools that permit one to use type, select, paint, draw, sample, edit, move, annotate, and view images. Other tools in the toolbox allow one to change

foreground/background colors, go to Adobe Online, work in different modes, and jump between Photoshop and ImageReady applications.

The status bar at the bottom of the window displays useful information. It displays the current magnification, file size of the active image, and brief instructions for using the active tool. To show or hide the status bar (Windows only): Choose Window> Show Status Bar or Window> Hide Status Bar.

The last component of the Photoshop workspace is the palettes. When you first open Photoshop, the palettes are stacked along the right edge of your screen in palette groups. The first group contains the Navigator, Info, and Options palettes. Next is the Color Swatches, and Brushes palettes. Below that are the History and Actions Palettes. Finally, you have the Layers, Channels, and Paths Palettes. Palettes help one to monitor and modify images. By default, palettes appear stacked together in groups. The lithograph development steps in Adobe Photoshop will be illustrated next.

B. The Process

In creating a lithograph in Adobe Photoshop, you must first go to FILE> NEW. After selecting NEW, the NEW dialog box will appear. ¹⁾ The preset size should be set to Letter format. By doing this, the workspace will automatically be set to 8 1/2 x 11 size. ²⁾ The Resolution should be set to 300 pixels per inch (PPI). Resolution is a measurement of the output quality of an image, usually in terms of pixels and dots per inch. The terminology varies according to the intended output device. PPI (pixels per inch) refers to screen resolution and DPI (dots per inch) refers to print resolution. ³⁾ In the third step, the Mode should be set to RGB color. The RGB Mode is needed for most of the manipulations that can be performed. "RGB" stands for the intensity value of the colors red, blue, and green that are assigned to each pixel in the image. These intensities range from 0 (black) to 255 (white). A value of 255 for each of the components yields the color white, and a value of 0 for each of the components yields the color black. The RGB mode is the default for new documents. The entire spectrum of colors will be shown automatically unless changed. You can control the number and range of colors available by changing the intensities of the RGB values.

Now that the Letter, Resolution, and RGB color mode are fixed, go to the menu bar and select 4) VIEW>SHOW RULERS. When the ruler appears, right click on any area of the ruler for a sub-menu and select inches. The other choices from the ruler preferences are pixels, centimeters, millimeters, points, picas, and percent. Points and picas are measurement systems used in print and typesetting. Points are the smallest unit of measurement with 72 points to the inch. Picas are used for measuring columns and margins. There are 12 points in a pica and six picas to one inch. One should use the ruler to set boundaries for photo utilizing guide purposes. ⁵⁾ The top boundary should be set to 1 inch, the sides to .5 inches, and the bottom to .5 inch. ⁶⁾ From the menu bar, got to LAYER>

NEW >LAYER, and click ok. The next step will involve the use of the Marquee tool from the toolbox. The Marquee tool is the most basic of selection tools and often the one most useful. This tool is used to draw selections based on geometric shapes. Specifically, the marquee tool allows you to draw rectangular, elliptical, single row, and singled column selections. ⁷⁾ Using the Marquee tool, select the inside square formed by the guides that were set using the ruler. From the menu bar, got to ⁸⁾ SELECT> INVERSE. The Inverse command selects the subject and not the unwanted detail. Next, one should always ensure that the foreground color on the toolbox is white by selecting the keys "D" (default), then "X" (switch foreground/ background). Fill the selected area with white. ⁹⁾ Name this layer "MASK" on the layers palette. A mask lets one isolate and protect areas of an image as you apply color changes, filters, or other effects to the rest of the image. When you select part of an image, the area that is not selected is "masked" or protected from editing. One can use masks for complex image editing such as gradually applying color or filter effects to an image.

In the next step, one must ¹⁰⁾ copy the desired image into the clipboard (these were from the web). Once that is done, ¹¹⁾ select the "background" layer, then paste the selection. Resize if needed using the menu bar commands: EDIT> TRANSFORM> SCALE>. Also, note that the "mask" layer enables one to make the graphic as large as one would like while preserving the borders. ¹²⁾ Next, put the description at the top right by first selecting the text tool from the toolbox. ¹³⁾ The "mask" Layer should be selected after. ¹⁴⁾ Click on the screen at the desired location and insert the text. Verify that the correct font (Veranda and Arial are recommended) and font size are selected by going to the Options palette, which is displayed across the top. Veranda and Arial are recommended because they are sans-serif fonts. Sans-serif fonts (from the French word "sans" that means without) are all those fonts that have letters with straight lines and no curls or appendixes. Their letterform is neat, defined, and clean. They are mostly used for titles, captions, callouts, and in general any time there is not too much text and readability is an issue. Sans-serif fonts are definitely more readable than Serif fonts. ¹⁵⁾ Now, one may insert text information across the bottom utilizing the same steps. The final steps in developing a CERSER lithograph includes ¹⁶⁾ opening the CERSER logo previously created and copying and pasting the logo into the litho file. Use EDIT> TRANSFORM> SCALE if necessary to fit the logo into the top left corner. Finally, utilizing the steps and tools previously mentioned, format the back of the document on the next page.

VII. MICROSOFT WORD

A. The Workspace

Developing a CERSER lithograph in Microsoft Word requires being knowledgeable on the fundamentals of Microsoft Word's workspace. There are four main components of Microsoft Word that will be utilized in developing a CERSER lithograph. These components are the menu bar, toolbars, the ruler, and the text area.

The menu bar is directly below the Title bar and it displays the menu. The menu begins with the word File and continues with Edit, View, Insert, Format, Tools, Table, Window, and Help. One may use the menu to give instructions to the software. One can point with the mouse to the menu option and click the left mouse button to open a drop-down menu. One can also use the left and right arrow keys on your keyboard to move left and right across the Menu bar options. The up and down arrow keys can be used to move up and down the drop-down menu. To select an option, highlight the item on the drop-down menu and press Enter. An ellipse after a menu item signifies additional options; if you select that option, a dialog box will appear.

The toolbars in Microsoft Word provide easy access and functionality to the user. There are many shortcuts that can be taken by using the toolbar. Toolbars are generally located just below the Menu bar. The toolbars are great in number but the main one that will be discussed is the drawing toolbar. The drawing toolbar allows you to jazz up your document without opening a draw or paint program. The drawing toolbar lets you draw lines and shapes, as well as create text, color objects, and manipulate pictures within text. Different styles of lines, colors, and drawing tools may be chosen.

The ruler is generally found below the main toolbars. The ruler is used to change the format of your document quickly. Although the ruler is displayed by default, you will need to turn it on if it is not showing. Select VIEW> RULER from the menu bar to display the ruler. The ruler shows your page margins and indents.

Below the ruler is a large area called the "text area". One may create or type documents in the text area. The blinking vertical line in the upper left corner of the text area is the cursor. It marks the insertion point. As one may create or type a document, the work will show at the cursor location. The horizontal line next to the cursor marks the end of the document.

B. The Process

The CERSER lithograph development steps in Microsoft Word follow.

¹⁾ One should prepare graphics (logos, images) in a graphics program of choice (Photoshop, Fireworks, Draw, etc...). ²⁾ Proceed to open a NEW file in Microsoft Word. ³⁾ Next, select FILE> PAGE SETUP. Once the dialog box appears, ⁴⁾ set the margins to "0" (the printer will fix the margins to it minimums). Also, ensure that the orientation is set to "Portrait" and select "OK". ⁵⁾ From the menu bar, insert the CERSER logo by selecting INSERT> PICTURE> FROM FILE. ⁶⁾ Locate the logo and insert it into the document. ⁷⁾ Select the logo graphic and select FORMAT> PICTURE from the menu bar. ⁸⁾ Select the SIZE tab and set the image to 0.6 inches high. The width will change to keep the proportions correct. ⁹⁾ Next, select the LAYOUT tab and set the image to "Behind Text" and select "OK". ¹⁰⁾ Place the image into the top left corner .1 inches from the left border and .2 inches from the top. ¹¹⁾ View the DRAWING toolbar by selecting the drawing icon on the STANDARD toolbar. ¹²⁾ Select the TEXT BOX icon on the DRAWING toolbar. ¹³⁾ Click and

drag a small box in the top right corner. ¹⁴⁾ Enter your text for the photo description into the box. ¹⁵⁾ Format the text with right align, Arial font, bold, and size-10 pt. ¹⁶⁾ Select FORMAT> TEXT BOX from the menu bar and select the COLORS AND LINES tab. Set the fill color to NO FILL and the line color to NO LINE and select "OK". ¹⁷⁾ Repeat steps 12-16 to place the text at the bottom of the document. ¹⁸⁾ From the menu bar, insert the main image by selecting INSERT> PICTURE> FROM FILE. ¹⁹⁾ Locate the image and insert it into the document. Select the image and select FORMAT> PICTURE from the menu bar. ²⁰⁾ Select the SIZE tab and set the image to 9.5 inches high. The width will change to keep the proportions correct. Select the LAYOUT tab and set the image to "Behind Text" and select "OK". Next, center the image in the "text area". Finally, utilizing the steps and tools previously mentioned, format the back of the document on the next page.

In comparing the two software packages, Adobe Photoshop and Microsoft Word, some advantages and disadvantages were discovered. Beginning with Adobe Photoshop, one advantage was that this software package was more versatile as far as images were concerned. Another advantage was that the use of the layers allowed one to repeatedly use images and text on several lithographs. Capabilities of Adobe Photoshop are very independent in itself; therefore, it was never required to use another software package to assist in the development of the lithographs. Also, the use of the guides allowed an accurate setup between the lithographs.

There are several disadvantages to Adobe Photoshop. One disadvantage was that this software package was memory intensive. Another disadvantage was that it was slower to respond to text changes. It also requires more storage space and the document sharing capability is less due to knowledge requirements.

Like Adobe Photoshop, Microsoft Word has advantages in developing a lithograph. One advantage is that the text changes are quick. Another advantage is that the requirement of memory storage space is less. Also, Microsoft Word has a greater degree of document sharing capability.

Shifting to the disadvantages of Microsoft Word, one might find that this software package is not as powerful in developing a lithograph as Adobe Photoshop. One disadvantage is that Microsoft Word needs a separate software package to develop graphics. Another disadvantage is that Microsoft Word is less accurate when aligning graphics and text boxes. Most importantly, new lithographs must be designed on a new page-no reuse of text or graphic.

Adobe Photoshop would be the software of choice as it enables the user to utilize one software package to complete the project. Without Adobe Photoshop or some high-end graphics software, Microsoft Word will complete the task with limitations of less complicated graphics and less consistency between lithographs.

VIII. UTILIZING AUTHORWARE TO CREATE A CD PRESENTATION

A. What is Authorware?

Authorware is a software package for developing cross-platform interactive multimedia pieces. The software has tools for producing interactive learning and training applications that use digital movies, sound, animation, text and graphics. Authorware enables the developer to create applications without any programming if desired. Dragging icons onto a flow line creates the applications. The Multimedia Team utilized Authorware to make a short interactive executable that will fit on a business card sized CD to be placed into the folder or handed out alone. This CD presents The Center of Excellence in Remote Sensing Education and Research (CERSER) and its capabilities.

B. Authoring Systems

An authoring system is a software package that enables a developer to create applications in as much as 1/8th the time it would take when coding in a language such as C, C++, or other programming language.

There are several different paradigms in authoring systems. The first is an icon-based system. This paradigm utilizes icons placed on a flow line to obtain displays, interactions, and presentation. Examples are Authorware and IconAuthor.

The Card Based system uses one screen after another, not unlike a PowerPoint display. These software packages tend to be more robust though in their capabilities. SuperCard and HyperCard are examples of this paradigm.

The last system is the Time Based. This paradigm is not unlike a movie score as the flow is from left to right with items placed in different levels to obtain different effects. Examples of this paradigm are Macromedia Flash and Macromedia Director.

C. Which is Best?

If someone asked for a hammer several questions would have to be answered before the correct one could be supplied. The same things have to be asked in selecting and authoring system.

Questions a manager might want to ask are:

1. How much money is available for the project?
2. How much experience do the developers have?
3. What does this software have to accomplish?
4. Is there time to learn the software and develop the application too?

Many other questions should be answered before money is spent on development so that a return-on-investment (ROI) is realized.

IX. BREAKING AUTHORWARE DOWN

Authorware has three main palettes that a developer should be knowledgeable before beginning development. These are the Tool Bar, Tool Box, and Icon Palette. Learning these tools is essential in producing a software package in the required time.

X. THE TOOL BAR

A. Introduction

The toolbar gives a convenient shortcut to the commands available in the Menu Bar. This presentation will concentrate on these commands, as they are the most often used.

B. New File

Creates a new file. If another file is open, Authorware will close it before creating a new one.

C. Open

Open's a file. If another file is open, Authorware will close it before opening another one.

D. Save All

Saves all open documents (files and libraries) at once without saving them individually.

E. Import

Imports text and graphics, sound, and movies into display or interaction icons. When the Import command is chosen, the Import dialog box will appear. The dialog box allows the selection of the required file or files.

F. Undo

Reverses the last action.

G. Cut

Removes the selected item and places it on the clipboard. One or more icons on the flow line can be selected, objects from a display or interaction icon, or the contents of a calculation icon.

H. Copy

Places a copy of the selected item on the clipboard. One or more icons on the flow line or objects in the Presentation window can be selected and copied.

I. Paste

Places a copy of the clipboard contents at the cursor location. Items can be pasted as many times as needed. If another object is copied, it replaces the current object in the clipboard.

J. Find

Searches for and change text within text objects, calculation icons, keywords associated with icons, and icon titles.

K. Text Styles list

A list of Text Styles that can be applied to selected text.

L. Bold

Makes the selected text bold.

M. Italics

Makes the selected text italic.

N. Underline

Underlines the selected text.

O. Restart/Restart from Flag

Runs the file from the beginning or from the start flag if it is inserted into the flow line.

P. Control Panel

Displays the Control Panel. The Control Panel is used to control the display of a file and trace or debug the workings of your file.

Q. Functions Window

Displays the functions in the Functions dialog box. The dialog box displays the syntax and description of a particular function and a list of icons in which that function is used.

R. Variables Window

Displays the system or custom variables and displays the following information for any variable: the initial and current value, a description, and a list of icons in which the variable is used.

The developer can create, rename, and delete custom variables; change their initial and current values; jump to an icon that uses a selected variable; and paste a variable into a calculation icon or in a field.

S. Help Pointer

Changes the cursor into the Help pointer. This allows the developer to select an item and retrieve information about it from the help files.

XI. THE ICON PALETTE

A. Introduction

The icon palette contains the icons that the developer drags to the flow line to create content and interaction. While each icon has multiple uses, these are the basic descriptions and uses here.

B. Display Icon

Displays text and graphics on the screen.

C. Motion Icon

Moves an object along a path or to a specific point. You can restrict where an object can move.

D. Erase Icon

Erases any or all objects from the screen when they are no longer needed.

E. Wait Icon

Adds pauses with or without onscreen buttons that let users decide when to continue.

F. Navigate Icon

Sets up automatic or user-controlled navigation in a hypermedia framework.

G. Framework Icon

Used to lay out a hypermedia framework, a structure of text, graphics, sound, animation, and data that users can navigate through.

H. Decision Icon

Sets up various paths Authorware can take depending on conditions and events.

I. Interaction Icon

Gives users a variety of ways to make choices, such as clicking buttons or hot spots. Evaluates a user's actions. If you do nothing more than present text, graphics, animation, video, and sound to users, you're creating the equivalent of a television commercial. At best, it will entertain and inform; at worst, users will ignore it. It's a passive, one-way form of communication.

J. Calculation Icon

Updates values in variables. Executes functions that affect what the piece does.

K. Map icon

Simplifies and organizes the flow line by grouping it into smaller segments.

L. Digital Movie Icon

Plays Macromedia Director 5 and earlier, AVI, MOV, FLC, MPEG, and QuickTime 2 digital movies. You will need to use the QuickTime Xtra to import QuickTime 3 or later movies.

M. Sound Icon

Includes music, narration, or sound effects in a piece.

N. Video Icon

Includes still images, sound, or animation from videodisc.

O. Start and Stop Flags

Speed up development by letting you test segments of the flow line as you create them. (The start and stop flags are usually used together.)

P. Icon color palette

Organize icons by color-coding them.

XII. THE TOOL BOX

A. Introduction

XII. FUTURE RECOMMENDATIONS

The toolbox appears when you open a display or interaction icon for editing. Use tools in the toolbox to draw, resize, and rearrange graphics in the Presentation window.

B. Pointer

Select and move objects in the Presentation window. Click an object to select it. Shift-click to select several objects. Drag the center of a filled object to move it. Drag a handle on a selected object to resize it.

C. Text tool

Creates and edits text. Click in the Presentation window to create a new text object. Click an existing text object to open it for editing. Type in an open text object to edit text.

D. Straight Line Tool

Draws horizontal, vertical, or 45° lines. Click the start point and drag to draw a line. The line snaps to a horizontal, vertical, or 45° position.

E. Diagonal Line Tool

Draw a line between any two points. Click the start point and drag to draw the line.

F. Oval Tool

Draw an ellipse. Click and drag to draw an oval; click and Shift-drag to draw a circle.

G. Rectangle Tool

Draw a rectangle. Click and drag to draw a rectangle; click and Shift-drag to draw a square.

H. Rounded Rectangle Tool

Draw a rectangle with rounded corners. Drag the control point that is inside the object to adjust the bevel of the corners.

J. Polygon Tool

Draw irregular polygons or multi-line objects. Click to create the polygon's corners; double-click the last point to complete the polygon. Drag points to modify the line.

There are several paths that the team recommends for future development and research. The first of these is the inclusion of more video into the CD presentation with actual voice over. The second is the continued development of lithographs and educational products that can be distributed to K-12 schools. A partnership with NASA or NOAA could help with distribution and funding for this project. The third recommendation is the further research of color combinations that would put the best light on satellite images and the supporting material.

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