Multimedia Kiosk Interface Evaluation:

An Analysis of Usage

by

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(ABSTRACT)

Although the "multimedia computer kiosk" is a relatively new phenomenon, a great deal of academic research has been conducted on the programming of the systems. Little research has been conducted on the effectiveness of kiosk interface design, however, perhaps due to the lack of a formalized methodology for evaluation. This thesis presents one methodology for the evaluation of graphic components used in the interface of a computer kiosk designed for the United States Forest Service. There are many established conventions for multimedia interface design. Many graphic techniques, such as buttons that change colors and generate an audible click when pressed and "windows" on the screen used for displaying images or text, have become commonplace with the increasing popularity of video games, information kiosks, automated teller machines and automated point of sale systems. This thesis examines the usage patterns of the kiosk by analyzing the sequence of buttons pressed, determines search pattern preferences, the success of a non-standard button is evaluated, and sources of confusion or misunderstanding are identified. This study demonstrates the strengths and weaknesses of both the graphic components and the evaluation methodology, and it provides a foundation for the creation of a formalized approach for the evaluation of computer kiosk interfaces.

ACKNOWLEDGMENTS

Limitless thanks to my best friend, therapist and wife, Kathy. I am proud to have succeeded, but prouder still that you can share it with me.

Thanks to Dean Bork, whose commitment to excellence and general good cheer made this project much more than an academic exercise. I began uncertain, grew to respect you considerably, but ended up with a friend, the greatest fortune of any student.

To Samantha -- you were but a remote speculation over glasses of beer when this effort began. You were conceived before the first word was written, and born before the final submission. May you find the satisfaction in achievement that I have found, but more importantly in friends. They are the greatest joy you shall experience.

To wit: Craig, Gary and Chris, the greatest of thanks to you, the three stooges to whom I am most proud to be the fourth (although I will never have Shemp's hair). We have a 6:00 am Tee Time...

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INTRODUCTION

This research effort is an evaluation of several graphic interface elements included in an interactive computer kiosk developed for the United States Forest Service. The evaluations are based largely upon a comparison of the designers' goals and expectations for use of the Kiosk, and user patterns recorded during a two week testing period at the Forest Service Visitor Center in Fort Chiswell, Virginia. As one of two Kiosk program creators, the author of this study is able to relate the design goals and intentions for the kiosk interface, and to interpret the collected data to determine where the interface design is more or less successful in achieving those goals.

Multimedia computer kiosks are used throughout the world to disseminate information on a wide variety of subjects. Informational kiosks are found in airports, museums, government facilities and stores, and many other places. The Forest Service's interest in utilizing computer technology reflects the increasing use of the personal computer and the Internet as valuable tools for sharing and obtaining information on any number of subjects. A computer kiosk is just as appropriate for providing information about recreation sites as it is for medieval Russian Christian icon art. The multi-faceted training of a Landscape Architect suggests that they are ideal designers of kiosk systems -- not only can they speak and write intellectually about the landscape subject matter, but they possess design skills critical to the successful implementation of a public resource.

The United States Forest Service Information Kiosk project began as an adjunct to the Forest Service's effort to assemble and publish a comprehensive directory of developed recreation sites in its Southern Region, which includes the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Kentucky, Mississippi, Louisiana, Oklahoma, Arkansas, Texas, and the territory of Puerto Rico. The directory was to have a particular focus on the accessibility of individual sites to the wide range of potential users, including people with disabilities. This project was planned by the Forest Service headquarters in Atlanta, Georgia. The Kiosk and book began as separate projects with similar goals, but grew together as a result of the involvement of the Landscape Architecture Department at Virginia Tech.

Key Forest Service staff became intrigued with the idea of developing a multimedia kiosk to disseminate facility information, and a parallel development scheme was launched, utilizing

the faculty and student resources of the Landscape Architecture Department. Professor Dean Bork supervised and coordinated both efforts. Forest Service personnel were to provide the appropriate information to the development teams, which would then compile, edit and format the information for use in both the books and the kiosk.

Initial planning for the kiosk commenced early in 1994. The initial broad vision for the kiosk focused on accessibility of the interface, simplicity of use, ease of modification, and the desire that the system avoid the typical, intimidating interface structures so typical of Automated Teller Machine-type computer applications. Professor Bork was familiar with Architecture Department Instructor Andy Honaker's kiosk project, and used it as a model for conceptualization of the Forest Service kiosk. Honaker's team utilized Microsoft FoxPro as the multimedia engine and database management system, with considerable success in their early stages.

The author's familiarity with DBMS programming opened the door for involvement with the project. Beginning in August, 1994, Professor Bork and I began formalizing the programmatic goals and data structures of the kiosk. A database management system (DBMS) provided the ideal means of managing and indexing the substantial quantity of information for the approximately 800 sites in the fourteen states. Andy Honaker's apparent success with Microsoft FoxPro made it the logical choice. In September, 1994, Professor Bork began building the graphic components of the interface, while the author focused on the structure of the database, and the development of program code to manage the multimedia interface. By the end of October, 1994, several thousand lines of code had been written to create the interface, and a mocked-up the database was complete. At the end of November, 1994, the designers had a working kiosk prototype on the IBM Windows platform. Using artificial data, the prototype kiosk was proven successful.

Professor Bork chose to use the Apple Macintosh platform because of its superior graphics capabilities, and purchased a Macintosh computer and touch-screen monitor. In theory and in practice, the platform switch was as simple as modifying screen coordinates for the individual graphic elements, and altering a small portion of the program code to accommodate operating system differences between the IBM and the Macintosh. As the designers were affecting the change to Apple, we learned that Andy Honaker's team had abandoned Microsoft FoxPro for the Macintosh, due to a series of software limitations and bugs. Many of these problems had existed on the IBM platform, but the author had discovered work-arounds and fixes

for all. Unfortunately, we discovered that the same solutions were not applicable on the Macintosh. In early spring, Professor Bork and the author decided that to continue to fight Microsoft FoxPro would be a waste of time and effort, and so decided to use Macromedia's Director as the multimedia engine for the Kiosk.

Changing software meant abandoning all of the code, and the DBMS structure. The graphic components and experience were all that was salvageable from the FoxPro-based system. Professor Bork re-assembled the graphic components and again created the navigation system and sequences, while the author focused on creating a pseudo-database and method for reading text files using Director's archaic Input/Output (I/O) capabilities. By mid-spring, 1995, we had completed digital text files for all of the sites in ten of the fourteen states. By creating a cumbersome but effective system of independent indexing and control files, we were able to organize the data files in such a way that Director could manipulate and read them with sufficient speed.

The Geographic Search path was completed in June of 1995. At this point, we had a viable product. The author had advocated and developed the Activity-based search path early in the project, and began recreating this secondary search method in early summer. Throughout the summer and fall, the designers alternated development and refinement time on the kiosk. The author worked on the file structure and the activity search, and Professor Bork worked on fine-tuning the program and graphics, and developed the Help section. We each worked to the limits of free time and endurance, then passed the program on to the other.

In order to make the Activity Search work, an alternative set of indexing and control files was required, bringing the total number of text and program files to over 3,000. This proved to be one of the more difficult tasks in creating the Activity Search. By early in the fall of 1995, the Activity Search path was complete enough to judge it a viable and worthwhile addition to the kiosk, but required further error corrections. It was not until early December 1995 that the final push was made to clean up the Activity Search and debug the data files. The kiosk was deemed suitable for testing in mid-January, 1996.

RESEARCH GOALS

A comprehensive analysis of a multimedia kiosk such as the one created for the Forest Service would include several basic categories of research. These categories include:

- Quality of the system's information
- Method or methods for searching the information
- Graphic interface design
- On-line instructions and help
- Location and presentation of the kiosk

Within each of these categories, there are numerous specific questions or areas of interest. Each of the issues within the five categories listed above must be clearly defined and understood before the category itself can be well defined and understood. Ultimately, all five categories must undergo the same process of definition before the relationship between the categories can be studied. It is this relationship which truly defines the level of success achieved by a particular kiosk system. For example, suppose that the testing of a particular system reveals that users typically walk away from the kiosk before they have reached the most important information available. The designer has considered all aspects of each of the five categories carefully, and is sure that each is sound. What the designer may have missed, however, is the relationship between each category. The interface design may be sound and the on-line instructions may be well structured, but if the two are incongruous, the user may become confused and abandon the system. To illustrate the complexity of a thorough analysis of a multimedia kiosk system, the five categories are discussed below in greater detail.

Quality of the system's information

The success or failure of any kiosk system ultimately depends upon the appropriateness and accuracy of the information it provides to the user. Insufficient, inappropriate or incorrect information can lead to confusion and frustration. More importantly, it is difficult to differentiate between user rejection of the system interface and the information presented. An awkward interface may lead to user dissatisfaction, but so may the presentation of information that does not interest the user. At the most basic level, assessing the quality of information requires the verification that the information is accurate, concise, clear, and sufficient. These qualifications suggest that the information can be comprehended by the user. The more important issue, however, is the appeal of the information to the user population. The system must provide information that is helpful or interesting to the user. This requires a clear definition of the target population, what information they seek, and the best method for delivery. The quantity of

information provided is also important. If the system provides too little information, the user may become frustrated, particularly if no sources for further information are provided. An overload of information, however, can overwhelm the user, and leave him bewildered and just as frustrated.

Methods for searching the information

The navigation or search method provided in the system can have a clear impact upon the effectiveness of use. The search method is typically based upon a "real-world" metaphor, such as a "Rolodex," "Desktop," or "Control Panel" symbology. The choice of metaphor largely defines the navigation method. The Rolodex metaphor, for example, leads to a navigation system where the user first selects an alphabetic character to filter the information. The kiosk then provides a method for scrolling or paging through alphabetized information beginning with the chosen letter. An evaluation of the navigation method first requires an understanding of the appropriateness of the metaphor for the information available and the target population. The Rolodex metaphor would not be a logical metaphor for system that provides information that is typically presented spatially. Secondly, the accuracy of the metaphor must be considered. A Rolodex metaphor that organized information by grouping vowels and consonants rather than straight alphabetical order would not reflect the nature of a physical Rolodex, and would likely confuse the user. The graphic implementation of the metaphor must be accurate also. Perhaps most importantly, the search method must provide an efficient means of reaching the important information provided by the system. If the search process requires too many selections, the user may loose patience. Similarly, if the choices required are not presented in a logical sequence, the user may become confused.

Evaluating these aspects of any system requires an analysis of the navigation metaphor as it relates to the information provided, and to the target population. The implementation must be evaluated for its efficiency and verisimilitude. Ultimately, it must be considered in concert with an evaluation of the graphic interface design, to determine the accuracy of the implementation.

Graphic Interface Design

The graphic interface design seemingly receives the most attention from designers as a system is developed. An impressive, flashy graphic design can draw users to the system, and it may boost the designer's ego. An evaluation of the interface design, however, must not focus on the flash, rather it should be primarily concerned with the effective use of the interface by the user. A thorough evaluation of the interface design is the most complex task of all those presented in this section, due to the number of variables that must be considered.

The overall design theme of the interface must be evaluated in terms of the goal of the system. Does the screen design reflect the information content and reinforce or enhance it, or does it obfuscate the material, for example. The interface must also be appropriate for the complexity of the information provided. Simple information requires a simple interface. The interface must also be considered in terms of the target population. A flashy, sophisticated interface may be appropriate for a younger audience, but less so for an older one. The continuity between all of the screens within a system is also an important consideration.

More specific characteristics of the interface must also be evaluated. The color scheme selected is clearly a factor in the success of the graphic composition, but it can also reinforce or detract from the information provided. Color may also play an important role in identifying active features or important information for the user. Sound effects, too, can help guide a user through the system and may enliven the interface, but may also be used inappropriately, such as the user of a harsh buzzer sound to indicate an error. Animation can certainly enhance the appeal of the interface, add realism and support the information provided, but overuse may just as well detract.

The subtleties of the interface design are the most important subjects for analysis, but the number of variable and the interaction between them is daunting. The graphic attributes of a text window or panel alone are considerable. For example, the text font, font size, text color and background color must be evaluated for legibility. The text background, too, must stand out from the screen background, to emphasize the information on it. The placement of the text window as a function of the screen composition must be considered. Finally, the functionality of the text display must be evaluated in terms of the information displayed upon it. A large quantity of text on a small text panel may require controls to scroll through the text or "turn pages," which may make it difficult for the user to comprehend the entire body of information. This example also illustrates the intertwining of variables, as the paging or scrolling controls must be evaluated not only as separate entities, but also as a function of the text window.

Below is a partial list of the many specific variables that must be considered, both individually and together, to achieve a thorough understanding of the effectiveness of the graphic interface design:

- Color scheme
- Text format
- Continuity of screen elements
- Appropriateness of animation
- Reflection of the search metaphor
- Button size
- Button placement
- Clarity of symbols or icons
- Transition between screens
- Quality of the graphics

All of the preceding variables must also be considered in terms of the overall graphic composition.

On-line Help and Instructions

The quality and clarity of help and instructions are often insufficient because most of the designers efforts are focused on the interface development. Understanding how effectively the instructions assist the user in manipulating the system is an important consideration in a complete system analysis, however. Help information must be evaluated for ease of access, clarity and presentation of the text and for sufficiency.

Location and Presentation of the Kiosk

The physical placement of the system can play a significant role in both the quantity and quality of use it receives. This includes the geographic placement, in a shopping mall, museum or airport, for example, and the placement of the system within a cabinet, in a wall enclosure or on a table. System placement must be considered in terms of the target population and in terms of the information provided. As an example, a system designed for a target population of people interested in the Civil War might be more successful in a location near several battlefields than near Revolutionary War battlefields. The placement of the system within a particular setting must be considered for its ability to attract users, convenience and accessibility. The system may be well situated to attract attention, for example, but may be placed at a height or angle that makes use awkward or uncomfortable.

The preceding paragraphs are not presented as a comprehensive list of factors that define a comprehensive computer kiosk evaluation, although they may serve as such; rather they represent many of the research possibilities that were available to the author as subjects for this thesis. There is surprisingly little extant literature on any of the subjects discussed above, which indicates a need for "baseline" research to help define future efforts in kiosk evaluation. This thesis seeks to assist in establishing this base information, as well as to provide the developers with meaningful feedback about the Forest Service Kiosk.

As noted previously, the research possibilities in an evaluation of the interface design of the Forest Service Kiosk are substantial and complex. To fully evaluate the effectiveness of a single graphic button, for example, would require the consideration of numerous factors such as color, size, graphic composition, position on the screen, relationship to other buttons, visual and auditory actions provided when the button is pressed, and the text and symbols on the button which indicate its function. These programmatic elements must be evaluated in terms of the expected user population, which might include an age range from five to ninety years old, with

levels of computer literacy that range from complete computer ignorance to very experienced users.

The task of evaluating the Kiosk interface is further complicated by the apparent lack of published studies regarding such research. While it is improbable that this thesis represents the first scholarly evaluation of a graphical kiosk interface, the author's lack of success in locating supporting research indicates a substantial oversight in the development of such systems. There is clearly a need for a formalized, scholarly approach to interface evaluation, particularly in light of the rapidly expanding use of free-standing kiosk systems in public, commercial and educational settings, as well as to maximize the effectiveness and efficiency of the Internet. Given the complexity of the task, and the nature of academic research, an incremental approach is both appropriate and probable. Evaluation methods of the future depend upon initial research to determine and validate the most appropriate methodologies, and subsequent study of one or more of the variables listed above, with each new study building upon those before it.

This research project has two particular goals. The first is to provide the kiosk developers with information to assist in understanding the effectiveness of several specific graphic elements of the interface. This information will provide the developers with some indication of the relationship between their design intent for those elements, and user interpretation of those elements in a "real world" situation. Evidence that the design intent for a particular graphic element was misinterpreted or misunderstood will provide justification for the re-design of that element. The second goal of this research project is to evaluate the chosen testing methodology, in this case an automated user response tracking routine included in the program code, to assess its applicability for future research. An evaluation of the strengths and weaknesses of this methodology may serves as a step in the incremental process of creating a formalized approach to graphical user interface evaluation.

Of the many important program-specific questions that could be asked about the Forest Service Kiosk, the following four form the basis of this portion of the evaluation:

- What differences in usage patterns exist between the two search paths, Geographic and Activity
- Are navigation "short-cut" tools utilized as intended, to allow the user to move efficiently through a search
- Is the Page Turn Button recognized as a button
- Do users attempt to press the Icon Panel, because it appears to include a series of buttons, or the Site Photograph Panel due to a general similarity to functional buttons used in the Kiosk

An investigation of the first question is important for several reasons. Perhaps most importantly, analysis that proves both methods successful would justify the added complexity in the navigation system necessary to include two methods for reaching data. Although the designers intended to provide a "short-cut" method for reaching the site information from the initial planning stage, an additional method of access was in conflict with the goal of a simple navigation path. Data analysis that suggests user difficulty in differentiating the two search methods, or that indicates a problem with one or the other could be used to direct future development toward a single search path. Secondly, a comparison of the two search paths may indicate a preference among users for either the more general, browsing search provided by the Geographic Search, or the more focused and specific search provided by the Activity Search. This question is analogous to research which determines whether readers prefer an information guide with site descriptions indexed by location or by recreation activities, or a combination of the two. An additional benefit of this investigation will be a determination of problems specific to each search method

The second question represents an attempt to understand the somewhat contradictory goals of providing a simple and concise navigation structure, and of providing alternative means for the user to approach the information. The research will determine how effectively these "short-cut" methods were used by the test population, and whether or not those individuals who used the navigation short-cuts did so in a manner consistent with the designers expectations.

The third and fourth questions are concerned with the specific aspects of the graphic interface design. The Page-Turn button is the only active element on the screen that is not rectangular and modeled after a mechanical or physical button. It is important to determine whether or not the user recognizes this button as such, particularly because this one anomalous button controls the display of the detailed site descriptions.

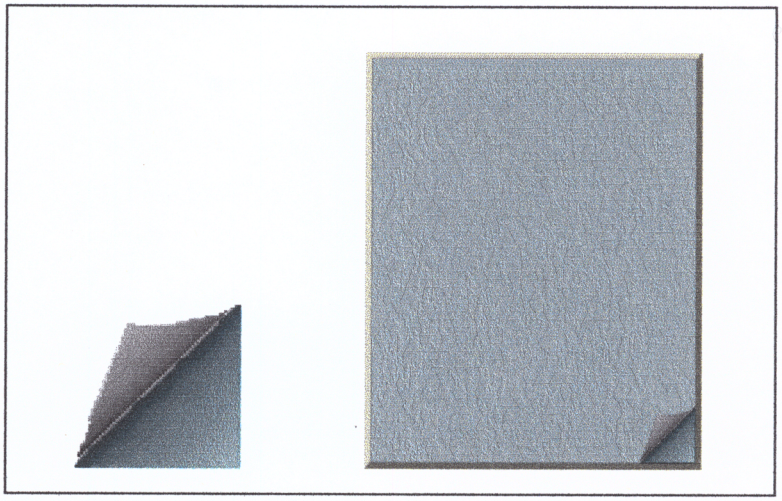


Figure 1. Page Turn Button (L) and placement on Text Panel (R)

The fourth question addresses the situation where an inert element possesses the appearance of a button, and how often users misconstrue the informational function of the element. The Site Icon Panel, shown in Figure 1, includes a variable number of icons that are used to indicate the accessibility of selected recreation opportunities available at a particular site. The three-dimensional appearance of these icons is similar to the appearance of the functional buttons used throughout the Kiosk. The Site Photograph Panel (Figure 1) also has a three-dimensional appearance, but there are no other cues to suggest that pressing it will result in any action. An examination of how frequently these items are pressed may indicate a possible source of confusion and frustration for the user.

Figure 2. Icon Panel

Figure 3. Photograph Panel

DESIGN AND IMPLEMENTATION

As discussed in the Introduction, the Kiosk was developed twice; once on the IBM Windows and Apple Macintosh platforms using Microsoft FoxPro, and ultimately on the Apple platform using Macromedia's Director. This chapter will detail many of the general design issues that were independent of authoring software and platform, and with the implementation of the Kiosk using Director as the multimedia engine. An understanding of the design goals will assist the reader in understanding the analysis and interpretation of the user data, presented in the following chapters.

Interface Accessibility

The initial goal for the Kiosk interface included accessibility to virtually all users. Professor Bork and the author, along with other members of the project team, discussed methods for creating a program accessible to the visually impaired by incorporating audio cues and narration and Braille "stick-on" buttons on the touch screen, visual cues for the hearing impaired, narrated text for illiterate users, and color selection that would provide appropriate greyscale cues for the colorblind. The touch screen would aid all users, but particularly those with mobility and physical impairments, and the graphic buttons were designed to be large enough to be touched with various extremities, not just fingers. Voice command was discussed as a navigation means for those with severe or complete physical impairment. A particular goal of the navigation system was to provide continuity of location for the graphic buttons, to benefit all users, but particularly those with cognitive impairments, and those intimidated by computers.

Several of these goals are unrealized, largely due to the expense of the additional hardware and software required, the complexity of implementation, the added storage requirements, or the ineffectiveness of certain technologies, particularly voice recognition and command. Voice command was rejected early in the conceptualization for this reason. As the Kiosk began to take shape, the idea of complete narration was abandoned, due to the enormous hard drive storage requirements for sound files, and the logistics of having the text-based information stored digitally. With complete narration by the wayside, Braille stickers and accommodation for the blind and severely visually impaired user was necessarily abandoned.

As the actual prototyping of the system began, several of the accessibility issues discussed in the planning stages emerged as foundation elements for the navigation system. First among these was the idea of continuity of button placement. Professor Bork illustrated the importance of continuity using a kiosk-style program dealing with the various National Parks facilities throughout the United States. The individual graphic elements of the program were generally appealing, but the navigation system was confusing and unpredictable. The control buttons had a tendency to migrate around the screen, so that the user had to search for the desired control. With this in mind, and a general vision for the proportions of the finished screen, Professor Bork designed a series of eight navigation buttons, arranged linearly across the bottom of the screen. By keeping each button in exactly the same location on the "Button Bar," as it came to be called, and by displaying a button only when it was a viable option, confusion was reduced significantly, as was the need to search for a particular function. The selection buttons, those buttons that allow the user to make a choice of states, forests and sites to view, were subjected to the same rigid continuity check. They were positioned on the right side of the screen, always with the same locations and proportions. The final elements, the text-based information for each site and the pictorial information, maps and photographs, that were necessary to provide the graphic support to the kiosk, were placed with the same attention. As the kiosk prototype developed, it became evident that there was a hierarchy to the Button Bar that would reinforce the continuity of location. Each successive step in the Geographic Search introduced an additional button to the Navigation Button Bar. When the Button Bar was rearranged to accommodate this process of progressive addition, the Button Bar was made to "build" or grow from left to right as the user moved through the search. This build not only accentuates the continuity of button placement, but provides an additional cue as to the user's location within the search.

The Forest Service has established a system of icons which represent recreation opportunities, such as fishing, hiking and camping. It was a natural choice to use these icons to graphically reinforce the textual information provided by the kiosk. Early in the development process, it was decided to utilize icons where appropriate to communicate the selection and navigation options. Each button on the Navigation Button Bar includes a written name, such as "Back Up" and an icon which represents the function. Even the state selection buttons include a reduced image of the state, color-coded to the map of the entire Southern Region.

Alternative Search Paths

The original goal was to create a hierarchical search path. The user would first select one state from among the fourteen of the Southern Region. Next, the user would select a forest within the chosen state. Finally, a site within the selected forest would be chose, and the information for that site would be displayed. This search path became the Geographic or Location search. The primary modification to the search pattern was to allow the user to move forward or backward through all of the sites in a chosen forest once the selected site had been displayed. The idea of an alternative search path, one that would allow the user to reach the "site data" more directly was discussed from the beginning of conceptualization. The National Parks program that was used as a development guide included a "scrolling search" where the user could view a list of all site names in the database, scroll up and down through the list, and select a site to display without going through the graphic hierarchical search. Our design model for the Kiosk, and the FoxPro prototype, included such a search path.

The logistics of programming the scrolling search proved quite difficult, however, and the value of such an option was debated over the course of several months. This type of search would provide more immediate access to the site data, but requires that the user know the name of the site of interest. In other words, it does not accommodate a browsing search, nor is it likely to alert the user to opportunities he or she was previously unaware of. The Activity Search became a method for providing somewhat faster access to site data, and a method for filtering the vast amount of data based upon the user's recreation opportunity interests. The original concept was to allow the user to select one activity from among the most popular and common recreation opportunities provided in the Southern Region. Once the recreation opportunity was chosen, the user could view all of the sites that provided that recreation opportunity in all of the fourteen state, or filter the information further by selecting a state to search, and then a particular forest, if desired. Had FoxPro remained the engine for the Kiosk, such a complex indexing system would have been a simple, intrinsic function of the Database Management System. Once the move to Director was accomplished, the indexing of nearly 1,000 data files to three levels (region, state and forest) became too complex for the software to handle, and would have required substantially more hard drive space and processing time. The decision was made to pursue the Activity Search as the alternative search path, but to force the user to filter the data by either state or forest. The result of incorporating the Activity Search is that the user has two distinctly different search options; a linear, general path to find information based upon location, and a path concentrating on a particular activity. As an example, if the Smiths are traveling

through Virginia and would like to explore the Forest Service offerings in the Shenandoah Valley, they can use the Kiosk to learn about the sites in the George Washington Forest. They would select a Geographic Search, choose the state of Virginia, the George Washington- North forest, and begin browsing through the sites therein. Alternatively, if the Smiths are traveling through Virginia and are avid fans of interpretive trails, they can select the Activity Search, choose interpretive trails activity, and search either the entire state, or focus on a particular forest in Virginia. The Kiosk will provide site information only on those sites that provide an interpretive trail as a recreation opportunity.

Before programming began, a flow chart was drawn to assist and formalize the project. As with the kiosk itself, the final design flow chart, shown in Figure 4, was a result of several iterations. With each revision, the more detailed, but also more focused. The design flow chart illustrates a relatively simple but ambitious vision for the kiosk, including audio instructions and prompts, three search modes, and provision for a completely audio mode.

By way of comparison, the "as-built" flow chart is shown in Figure 5. The chart represents a more streamlined, somewhat less ambitious program. In retrospect, the less complex structure resulted in a system much easier for the average user to understand and use. In addition, the program code and data storage required to implement many of the features not included in the final kiosk would have slowed the execution to a sluggish pace.

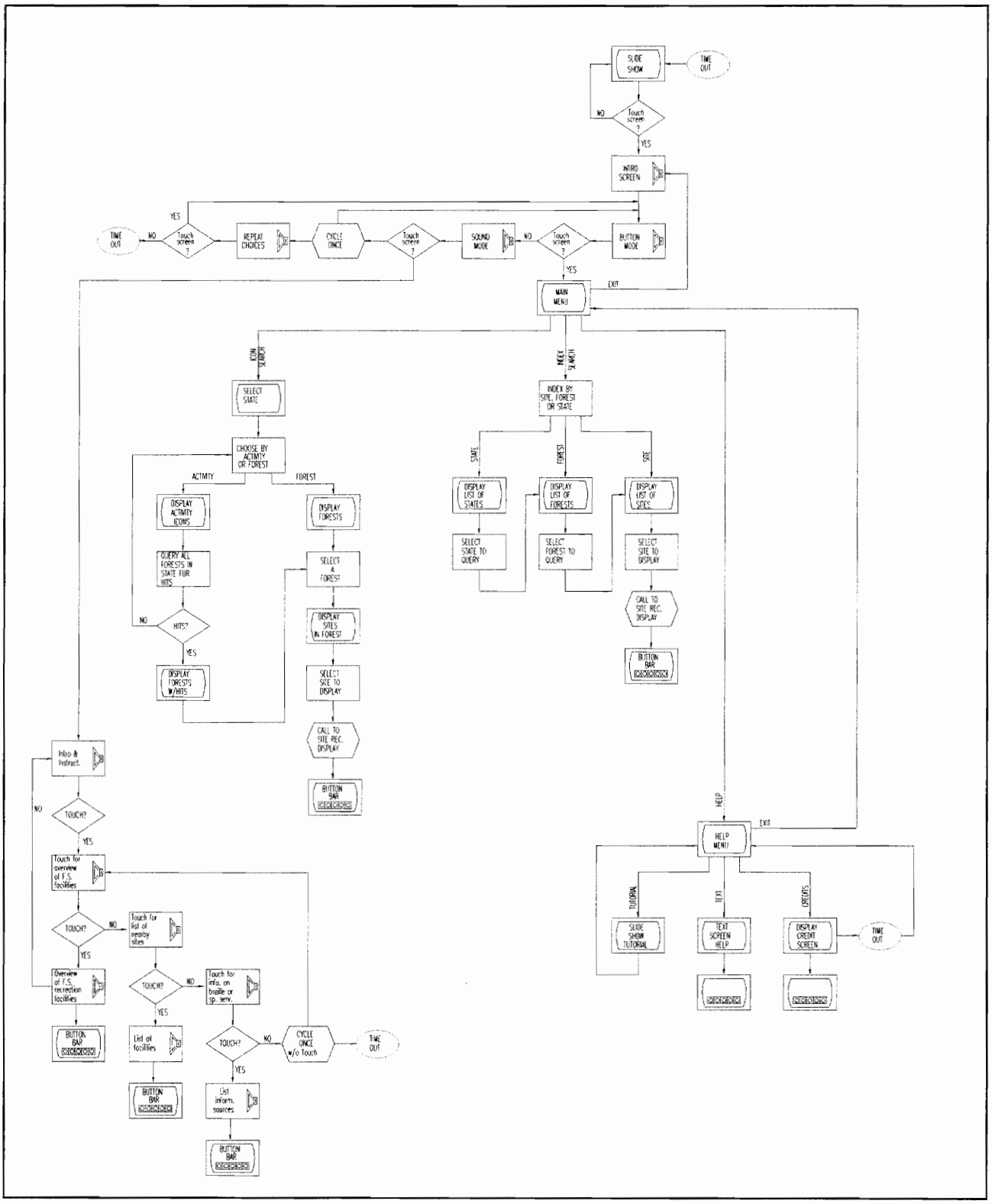


Figure 4. Design Flow Chart

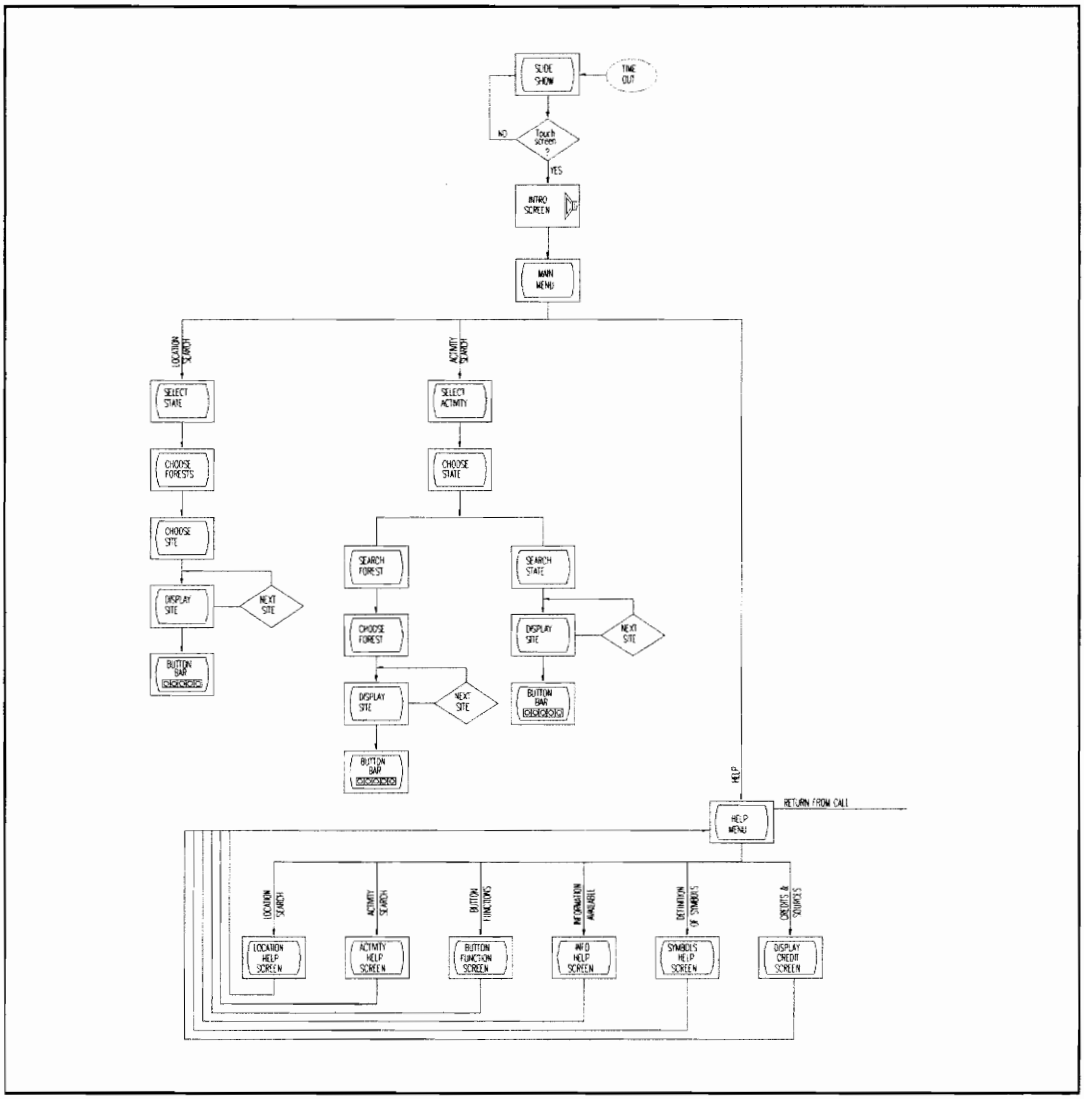


Figure 5. "As-built" Flow Chart

Early in the design process, Professor Bork obtained the book ***Public Access Systems: Bringing Computer Power to the People*** by Greg Kearsley. This book provides a general background and history of the development of computer systems designed for use by the general public. It provides a chapter on interface design guidelines and several chapters on related subjects. Chapter three, *User Interface Design*, enumerates many design goals which assisted in conceptualizing the Forest Service Kiosk interface. A summary of the most important aspects of interface design is excerpted from Kearsley and shown in Figure 6, below.

User Interface Design Principles for Public Access Systems

General
Provide a model or metaphor
Be consistent
Minimize navigation
Users should always have control
User responses should always be acknowledged.

Screen Displays
Don't clutter the screen.
Make sure displays are legible.
Use color and attentional features carefully.
Use Headings and numbering.

Response Processing
State instructions clearly.
Provide default options.
Provide redundant response modes.
Allow people to change or confirm their responses.
Provide helpful feedback.
Provide a help option.

Aesthetics
Use borders, backgrounds, and shadow effects.
Ensure program continuity.

Figure 6. User Interface Design Principles

Many of these principles became central to the design goals for the Forest Service Kiosk, and they provide an excellent structure for discussion of those goals.

GENERAL

The Design Metaphor

As Kearsley notes, there are several typical metaphors for public information systems; the "rolodex," the library metaphor, the "control panel," the "desktop," the library metaphor, the house and the encyclopedia metaphor. "Metaphors do not convey all of the functions of a system, but they provide enough of a foundation for the user to build a useful mental model" (Kearsley, 55). The Forest Service Kiosk uses a modified control panel metaphor "that presents a row of buttons that resemble those on a VCR or television" (Kearsley, 55). The Navigation Button Bar is that series of buttons, but the symbols shown relate more closely to the recreation opportunity symbology of the Forest Service than that of the typical VCR. The attractiveness of

this metaphor is that the only action required of the user is the touch of a button, rather than dragging or pointing a cursor as is required in the house or library metaphor, for example.

Consistency

"Users want things to work in the same way throughout a program. For example, if options in a menu become highlighted or turn color when selected, they should do this in all menus" (Kearsley, 55-6). The issue of consistency became one of the most important guidelines in the development of the Kiosk. The designers decided early that only active buttons (those which would result in some action) would be displayed on the screen, and that button locations would b absolute throughout the program. For example, the Navigation Bar Buttons (Figure 7) always appear in exactly the same locations on each screen. Additionally, all buttons that are used to make state, forest and site choice selections are always found on the right side of the screen, and always in the same positions. The State and Forest buttons which are used for multiple functions, such as the Navigation State Button from the Navigation Button Bar and the Search Entire State Button of the Activity Search have functions that are very closely related. In the first case, the button allows the user to select a new state in which to search for information. In the second occurrence, the button allows the user to search an entire state for information related to a specific recreation opportunity. In both cases, the result is the selection of a particular state in which to search for information.

Minimize Navigation

The essence of this principle is that the user should not be required to contemplate the navigation system, but be allowed to concentrate on the information within the system. Navigation choices should be simple, obvious and easy to activate. The Navigation Button Bar is the heart of the Forest Service Kiosk system (see Figure 7). The icons and text on each button were designed to relate the functions quickly and intuitively. The Icons for the Back Up and Next Site buttons are borrowed from VCR and hi-fi Stereo system, but the other icons are related to the specific function of each button in the system.

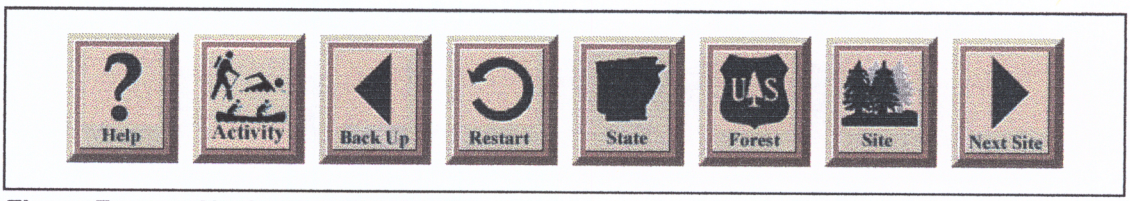


Figure 7. Navigation Button Bar

As an added cue to the user, the State button displays the currently selected state. According to Kearsley:

> One of the fundamental ideas in minimizing navigation is to bring the options to the user, instead of requiring the user to go searching for them (Tognazzini, 1990). All options should be plainly displayed and not hidden from the user (although they might be greyed out if inactive). Control should be clearly recognized as such (e.g., giving all buttons a beveled edge so they literally stand out). Ideally the user is confronted with a single interface that stays the same across all activities. ...[T]he main interface should always be recognizable and active. (58)

The design of the Forest Service addressed all of these important concerns by ensuring the continuity of placement of the Navigation Button Bar elements throughout the system.

Users Should Always Have Control

Within the program design of the Forest Service Kiosk, there is only one action over which the user has no control: the Time-Out feature. This function is automatically activated if no action has taken place within approximately three minutes. Otherwise, the system was designed to make no assumptions about user input or choice, and to place no other limitations on user selections. Rather than prompt user input or choice, the Kiosk uses the limited presentation of options to guide the user through a search path.

User Responses Should Always Be Acknowledged

> It is important to think about human-computer interaction as a conversation or dialog between person and system. The same rules of etiquette apply to both. One such rule is acknowledging what another person has said or done. To be good conversational partners, computer systems must always acknowledge a response or action taken by a user - even if it is just by touching the screen or pressing the next button. This can be accomplished by highlighting the button or making some sort of noise (such as a beep or tone). In most cases a user response will result in new information or a new screen displayed. (Kearsley, 60).

The Forest Service Kiosk was designed to acknowledge all user input by changing the color of the button pressed, simulating the physical depression of the button, and by playing an audible "click" sound.

SCREEN DISPLAYS

Don't Clutter the Screen

The design of the Forest Service Kiosk interface was limited to three essential blocks of information; the Navigation Button Bar, the selection area on the right side of the screen, and the

display area on the left. The Site Display Screen is the anomaly to this scheme, as it presents the only navigation options via the Navigation Bar, and displays information across the top 4/5ths of the screen. This was necessitated by the quantity of site specific information about each Forest Service facility. Although several of the screens in the Kiosk are largely occupied by graphic components, the screen design grid ensured a thoughtful and logical grouping of information and choices, which minimized the appearance and effects of clutter.

Make Sure Displays Are Legible

There were three primarily legibility issues with the Kiosk: legibility of the text on buttons, legibility of the button icons, and legibility of the text on the Site Display screen. In all cases, text fonts, text color contrast and font point sizes were maximized for legibility. The color scheme chosen for the buttons and text backgrounds were light enough that a black text color was appropriate to provide appropriate contrast. Text size for buttons was formatted so that two lines of text could be displayed on selection buttons, to accommodate long site names, but also at an 18 point size, for maximum legibility. The Apple Geneva font was chosen for simplicity and legibility. It is a sans serif font, and therefore less common in printed text, but proved to be aesthetically pleasing, and harmonious with the overall design of the interface. In all cases, the Geneva font is presented in Bold format, to enhance its presence on the screen, and its legibility.

Use Color and Attentional Features Carefully

Early in the design process, it was determined that the colors used in the Kiosk interface would be somewhat subdued earth tones, to acknowledge and reinforce the Forest Service affiliation. Bright colors, therefore, were antithetical to this desire, and were assigned a limited role in the design scheme. The only occasion where brightly colored items seemed appropriate was the Region Map. Because there are thirteen states and the territory of Puerto Rico in the Southern Region of the Forest Service, a unique and impactful method for color coding the states on the Region Map seemed appropriate and helpful (see Figure 17). Seven bright colors were chosen to color-code the states, with duplications in color separated physically by several states. These colors were selected for their difference in grayscale values, to assist color-blind users in determining the relationship between color and state. Although there was no scientific basis for the color selections, the author suffers from partial color-blindness, and can clearly distinguish the seven hues used in the Kiosk. Kearsley uses the term Attentional Features to refer to animations, blinking and other color-changes. The Forest Service Kiosk purposefully avoided these tricks, in an effort to provide as simple an interface as possible.

Use Headings and Numbering

This recommendation applies principally to systems which convey mostly text-based information. The Forest Service Kiosk was design to provide a significant amount of textual only on the Site Display screens. On these screens, the titles Location, Directions, Information, Fees and Accessibility are used to differentiate the several pages of text information.

RESPONSE PROCESSING

State Instructions Clearly

Because of the graphically based user interface, and because most of the buttons use icons to illustrate their function, the instances where written or spoken instructions were used are minimal. Where textual instructions were included, they were written to be brief and concise. Additionally, the written instructions were placed over special backgrounds, or where highlighted to draw the user's attention.

Provide Default Options

The Forest Service kiosk was designed to be a tool for providing information to the user without requiring any input or information from the user. Therefore, default choices, "...the most common or recommended selection" (Kearsley, 65) were inappropriate in the interface design. The Kiosk interface addressed Kearsley's second method for providing defaults, by providing "...special 'short-cut' options or keys" (65). The Navigation Button Bar included several buttons that allow the user to bypass one or more screens. The Navigation Activity Button, for example, moves the program directly from the Geographic Search into the Activity Search, eliminating the need to use the Restart Button to return to the Main Menu screen.

Provide Redundant Response Options

Kearsley recommends that all options or buttons in the graphic interface have a keyboard equivalent to increase the functionality of the program, to accommodate malfunctions of hardware or software and to accommodate the handicapped user (66). Because the Forest Service Kiosk was designed to use the touch screen solely, redundant options were not provided. Rather, the kiosk program provided redundant methods of reaching the Site Display Screen, via the Geographic and Activity Searches, and by the inclusion of "short-cut" keys on the Navigation Button Bar.

Allow People to Change or Confirm Their Responses

This recommendation is appropriate for ATM and POS systems, where user input results in actions with significant consequences, usually involving money. The Forest Service Kiosk, however, was created solely as a tool for the dissemination of information. To require two actions for each selection, the choice and the confirmation, would have slowed the operation of the system far out of proportion to the benefits. As an example, using response confirmation, five choices require ten button presses. Without confirmation, and assuming the user makes one error in every five selections, only seven button presses are required; the five selections, one Back Up and one re-selection. The Back Up button, therefore, was included on every screen to allow the user to rectify an incorrect or unwanted choice.

Provide Helpful Feedback

Kearsley recommends that programs provide helpful feedback in the event of an error in the program or execution. "For example, if the user selects an inappropriate response or types something incorrect, the system should explain the problem and how to correct it (e.g., "Your response cannot be processed; please try again") rather than deliver an error message (e.g., IE0095 - Out of Range error)" (Kearsley, 67). During both the development and testing phases, every effort was made to ensure that no user response would produce an error situation. As Kearsley notes, however, "...people will always come up with ways to respond that were totally unexpected" (67). Director lacks error-handling provisions or routines, a significant deficiency in multimedia authoring software. As a result, program errors resulted in a halt in execution and presentation of an ambiguous error message. To accommodate this problem, the Kiosk program was placed in the Apple Macintosh "Startup Folder," so that the program would load and execute automatically at system power-up. Error situations could then be rectified by shutting down the computer and restarting.

Provide a Help Option

The Help function was included in the initial kiosk design as a matter of course, but was not addressed until the final phases of program development. Every effort was made to create an interface that was intuitive and easy to use minimal instruction, without reliance on lengthy and detailed instructions typical of many help screens. The Forest Service Kiosk Help screens were then designed to reinforce the user's comprehension of the system, and to provide basic information to help in understanding the icons and symbols used throughout.

Use Borders, Backgrounds, and Shadow Effects

Kearsley writes that "[b]orders give screens a more distinctive appearance and focus the eyes on the contents of the screen. Backgrounds (e.g., colors, textures, patterns) provide contrast and make the text or graphics stand out. Shadow effects produce a three-dimensional look (e.g., beveled buttons), providing more realism and richness to the screen" (69). These techniques were all utilized in the Kiosk interface design. The background (Figure 10) was selected to produce a pleasant, serene mood appropriate for the subject matter. All of the graphic buttons and information backgrounds were designed using shadows to emulate physical buttons, in an effort to make the interface as unlike a computer as possible.

Ensure Program Continuity

This proscription became the cornerstone of the Kiosk interface design. This criterion was applied not only to individual buttons, so that they always appeared in exactly the same location from screen to screen, but to the graphic composition of different sections of the program. For example, the Geographic Search and Activity Search were designed to appear quite similar, to cue the user that both paths would result in the same end. The program used the same text font, graphic proportions, colors and sounds throughout.

SCREEN DESIGN

The first step in the design of the kiosk interface was composition of the screen. Professor Bork constructed a grid using the screen dimensions of 800 pixels wide by 600 pixels high (Figure 8). The grid ensured that each button would be large enough to press easily, and spaced widely enough to prevent accidental selection of an unintended choice. The grid also aided in creating individual components that were proportionally related, and a screen composition pleasing to the eye. Figure 9 shows the Navigation Bar buttons, Forest Selection and Paging Buttons and Map components superimposed over the screen grid.

Next, the individual graphic components were created. Several background photographs were tested and rejected before the sunset photograph was chosen (Figure 10). The colors in this scanned photo were extracted to form a color palette for the development of the remaining elements. This ensured a harmony of colors among the various pieces. Blank

buttons were then built, in the several sizes necessary. Finally, text and icons were overlain upon the button blanks. As with much of the development effort, the design and construction of the screen components was an iterative process, with many early adjustments to colors, icon forms and text size and alignments.

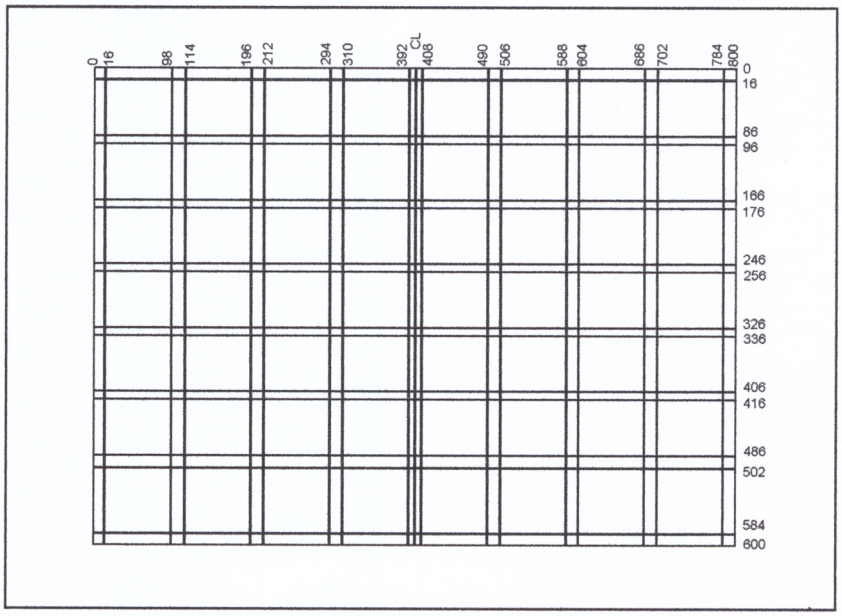


Figure 8. Screen Grid Layout

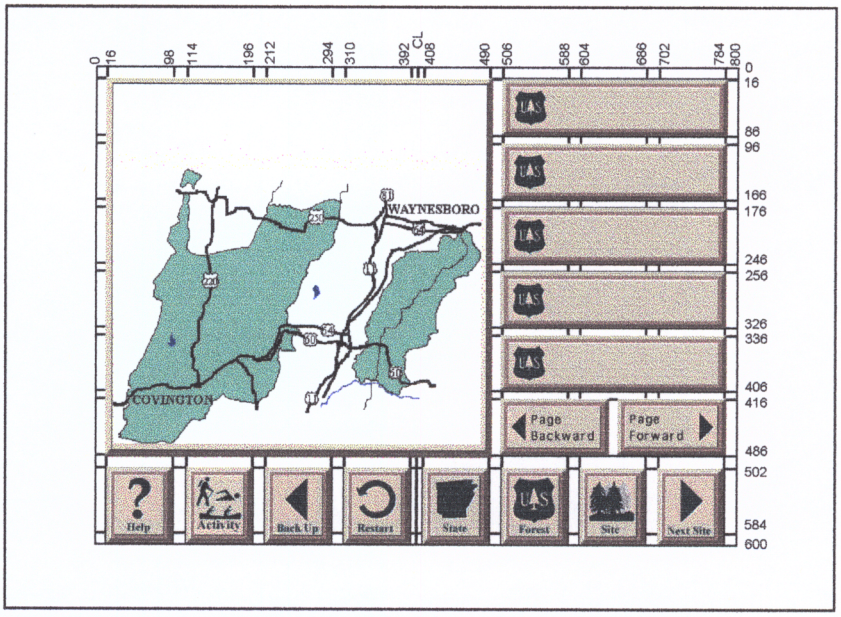


Figure 9. Screen Grid with Graphic Elements

Figure 10. Background Photograph

The screen design was carefully calculated and planned to enhance the impact of the controls and information presented by the Kiosk. The background photograph's black bottom enhanced the contrast of the Navigation Bar Buttons, so that they had a clear and powerful appearance on the screen. The much lighter top of the photograph draws attention to the important information presented on the map background, during the site selection process, and to the site description on the site display screens. Additionally, the photograph is recognizable as a beautiful sunset, and therefore in concert with the expectation of a worthwhile nature experience, but muted enough so that it does not distract from the information presented on the screen. The graphic components were created with colors that provided a high contrast with the background, but that did not become too bright or too muted in relationship with the sunset.

DATABASE DESIGN

The Kiosk database was designed in a hierarchical structure, using the common-sense State-Forest-Site framework suggested by the data. This structure allowed the data to be stored an organized most efficiently, and reflected the selection sequence of the Kiosk. An illustration of the hierarchy is shown below.

Figure 11. Kiosk Database Structure

Because Director lacked DBMS capabilities, an intricate indexing system was developed to handle sorting of data within the program. Although all pertinent data was stored in the file structure illustrated above, the names of the specific forests and site names could not be extracted from these records. Therefore, a system of "master" files was created to provide a list of forest names for each state, and a list of site names for each forest. Every time a state is selected, the State Master File is read to load the names of each forest in that state. Similarly, when a forest is selected, the name of each site within that forest is read to provide the site name labels placed on each site button. The master indexes not only provided text used for display within the program, but was used also as a filename variable in order to read the appropriate text file. This indexing system proved to be cumbersome, and slowed program execution, but was a necessary in the Director version of the Kiosk. When the Activity Search was added to the program, several additional levels of indexing files were added. The first level of files included the names of each state that offer the selected activity. The second level provided the number of sites offering the selected activity within each forest. The tertiary level provided a list of each site within the selected state that offered the selected Recreation Opportunity. This structure emulates a true DBMS structure, but slows program execution substantially. Nevertheless, the

Activity Search provides access to site information faster than the Geographic Search, because fewer site names are loaded for any given search. An Illustration of the Activity Search database indexing structure is shown in Figure 12. It is important to note that the Activity Search index structure does not end with data, but with directions to access data contained in the Geographic Search database, as illustrated above.

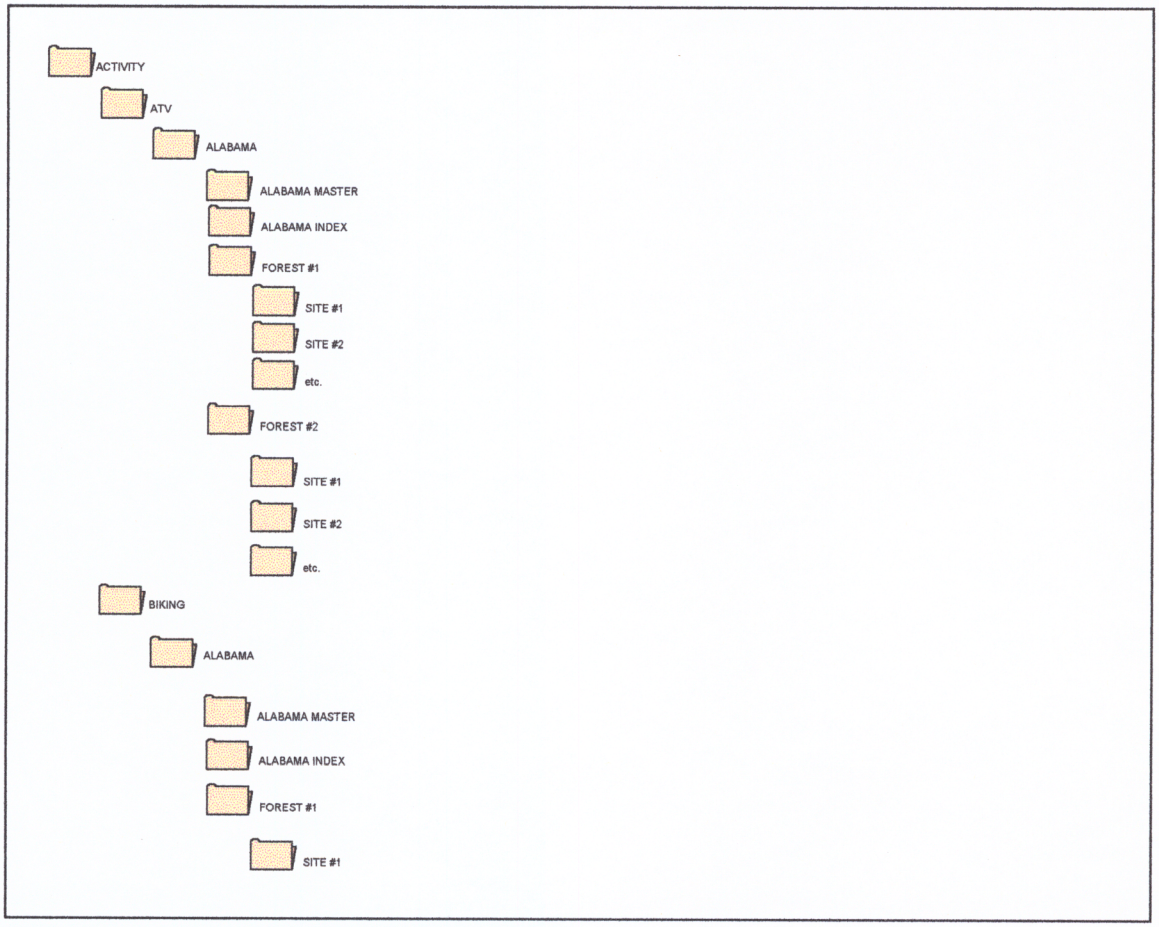


Figure 12. Activity Search Index Structure

The structure of the database was relatively simple to determine; the content, however, was beyond the control of the design team. The database was assembled using data provided by Forest Service personnel from the various states of the Southern Region. Offices from the states of Kentucky, Tennessee, Oklahoma and the territory of Puerto Rico declined to provide data for the Kiosk. As a result, a "no data" screen was added to the program to account for the missing data.

The creation of the indexing files for the Activity Search was accomplished with the use of a Recreation Opportunity matrix, originally created by the book team. A Microsoft Excel spreadsheet was created to organize all of the data for the book, and included fields listing all the reported activities offered for each site. This information was transferred to a Microsoft FoxPro database composed of nineteen fields: State, Forest, Site, and sixteen activity fields. A "breakout" program was written to extract the data for each state, grouped by activity. For example, the program began with the first activity in the matrix, ATV (All Terrain Vehicle), examined each site record for a given state to determine whether ATV use was an activity offered, and recorded the state name, forest name and site name for each "hit." The breakout program also created two Activity Master Files; the first contained the number of "hits" recorded in a state, the second stored the number of hits for each forest within a state. The routine then wrote a file for each activity which included the forest name for each site, the site name, and screen coordinates for locating the site on the forest map. A breakout program was created for each of the fourteen states, and when all were executed, over 2,500 data and index files were created. Ultimately, these files contained no data regarding the site or activity, but were required to access the data file that existed for the Geographic Search. The indexing files proved to be an effective pseudo-database index, but maintenance and error correction were enormously difficult due to the number of files.

THE DIRECTOR PROGRAM

Director's programming language, called Lingo, is based loosely upon an older language named Logo. Lingo is a structured language, similar to Pascal, and utilizes phrase commands, such as "put the color of sprite (variable) into (variable)." Lingo proved to be quite capable of managing the graphic components of the interface, but lacked the sophistication for efficient file I/O. After several aborted attempts, a sub-routine was developed that was capable of reading the text files which comprised the Kiosk database. The successful execution of this routine was paramount to the success of the kiosk because the substantial quantity of data involved precluded "hard-coding," or building in all of the hundreds of sites into the program. Most of the Director program, however, dealt with recording user selections in variables, and with accomplishing the navigation movements requested by the user. Although the navigation within Kiosk program is rather simple, as illustrated by the "as-built" flow chart, the program code to accomplish each move was rather substantial. Figure 13, below, shows the portion of Lingo code required to make a button change color briefly and emit the "click" sound when pressed.

```
---click-------------------------------------
--* makes buttons click and turn grey

on click
  set thiscast=0
  set lastsprite=0
  set oldink=0
  put (the clickOn) into lastsprite
  put the ink of sprite (lastsprite) into oldink
  set the puppet of sprite (lastsprite) to true
  set the ink of sprite (lastsprite) to 4
  updatestage
  sound playFile 1, "Click"
  set the ink of sprite (lastsprite) to (oldink)
  updatestage
  set the puppet of sprite (lastsprite) to false
end
```

Figure 13. Lingo program code

Lingo also proved to be completely intolerant of mistakes. Many programming languages are capable of distinguishing the difference between a global variable (one that retains a value throughout the program) and a local variable(one that retains a value only within a sub-routine); Director, however, had difficulty distinguishing local variables. Lingo also requires absolute precision in the use of the space character and the placement of parentheses. These quirks were quite frustrating during the program development, but once a routine was compiled and executed successfully, it was completely reliable.

TOUCH SCREEN

The touch screen was obtained early in the software development process. Because the user interface was designed exclusively for the touch screen, it was important for the developers to be confident in its functionality. Once calibrated, a tedious process, the screen proved to be very precise and reliable. The sensors responded to even a very light touch, although it required skin contact to activate the grid. There was some concern that the use of a mouth stick or other device necessitated by a severe handicap would be precluded, but there were no clear solutions to the problem. The screen was tested with various extremities, however, and responded appropriately to contact with a knuckle, the back of a wrist, an elbow and even a nose.

On the following pages appears a series of images which represent the Kiosk interface display at each stage of a search. Also included are images that show the various help screens.

Figure 14. Slide Show Screen

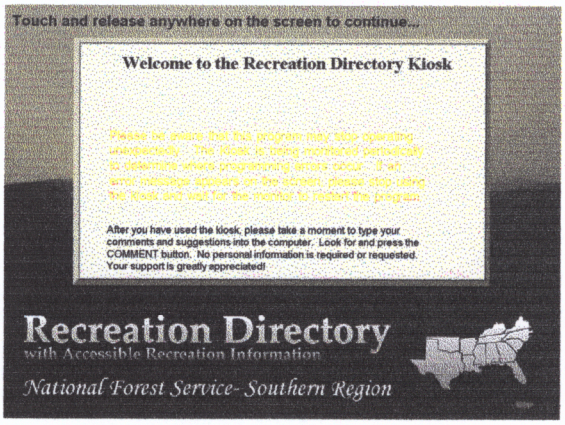


Figure 15. Introduction Screen

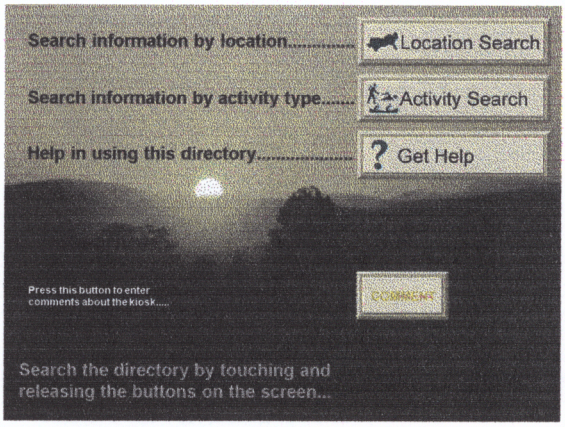


Figure 16. Main Menu Screen

Figure 17. State Selection Screen

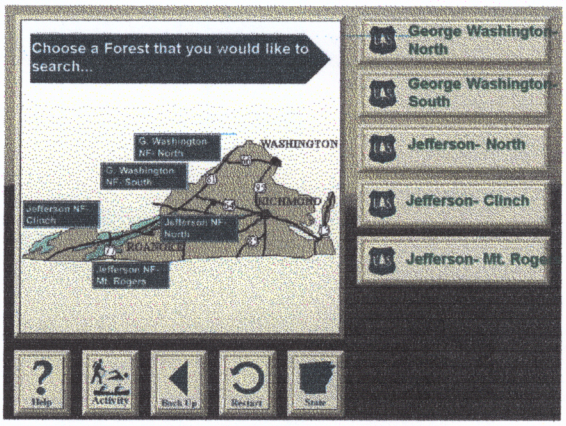


Figure 18. Forest Selection Screen

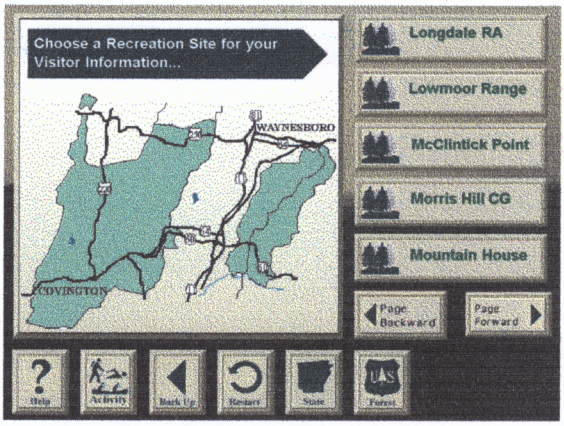


Figure 19. Site Selection Screen

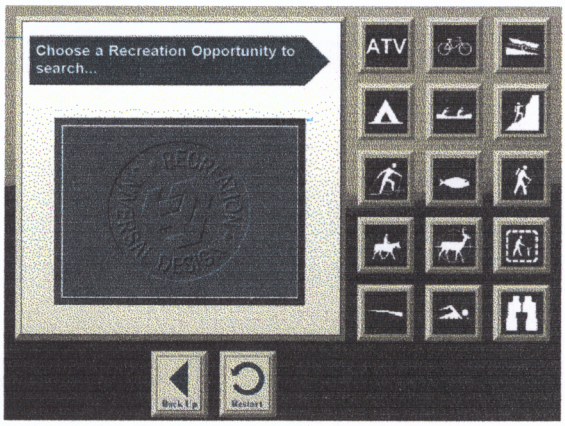


Figure 20. Activity Menu Screen

Figure 21. Activity State Selection Screen

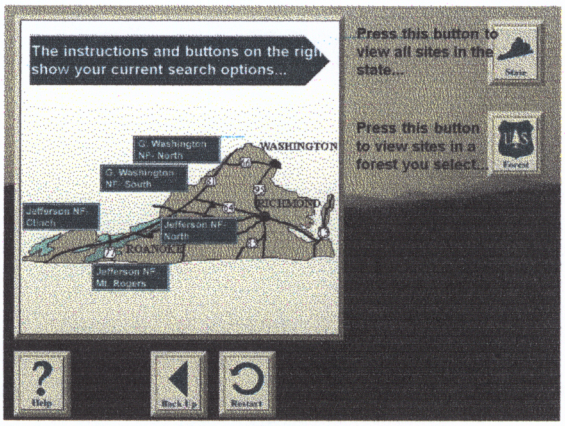


Figure 22. Search Method Screen

Figure 23. Activity Forest Selection Screen

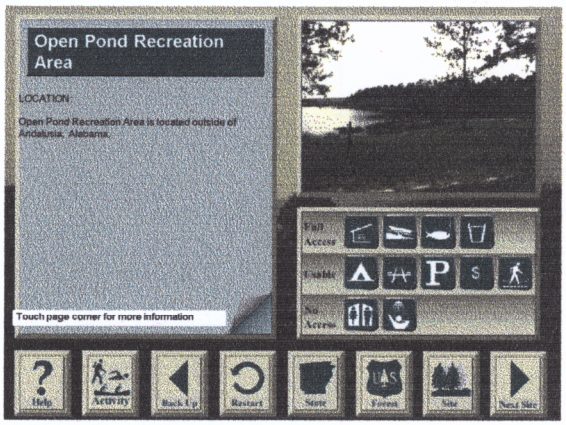


Figure 24. Site Display Screen

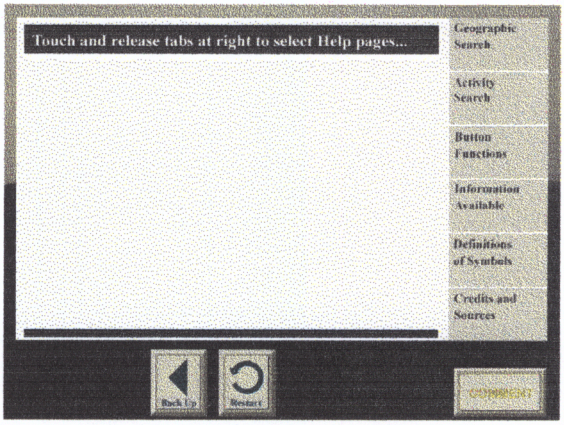


Figure 25. Help Introduction Screen

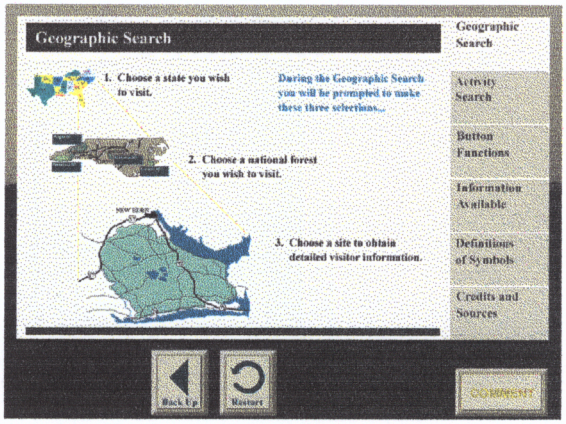


Figure 26. Geographic Search Help Screen

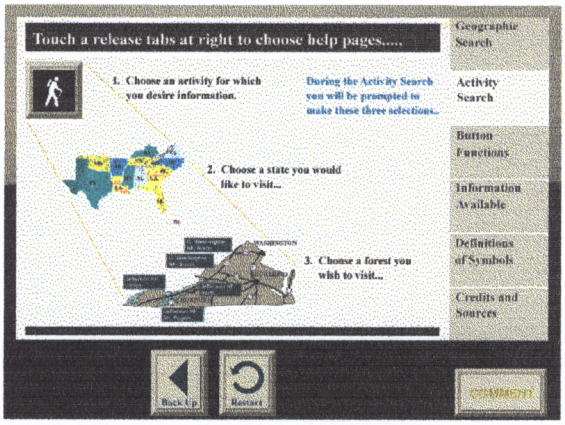


Figure 27. Activity Search Help Screen

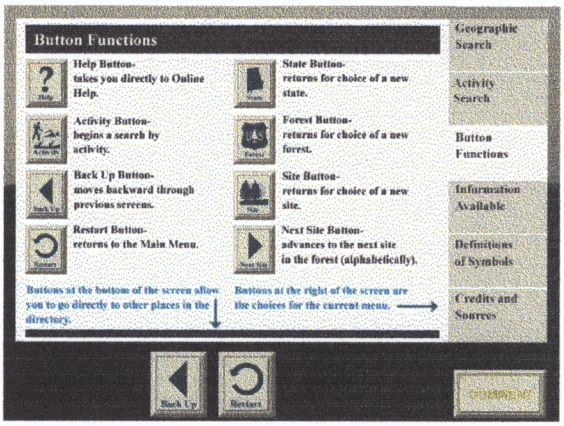


Figure 28. Button Functions Help Screen

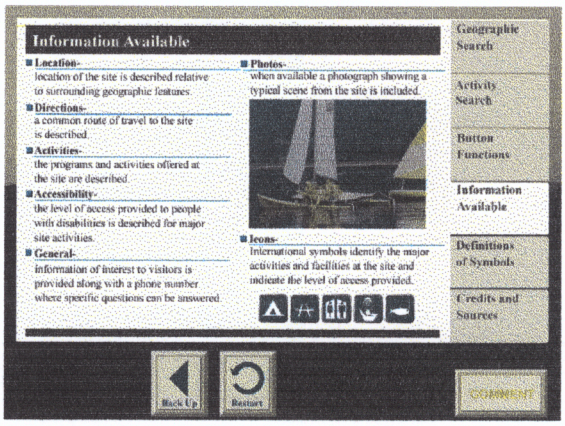


Figure 29. Information Available Help Screen

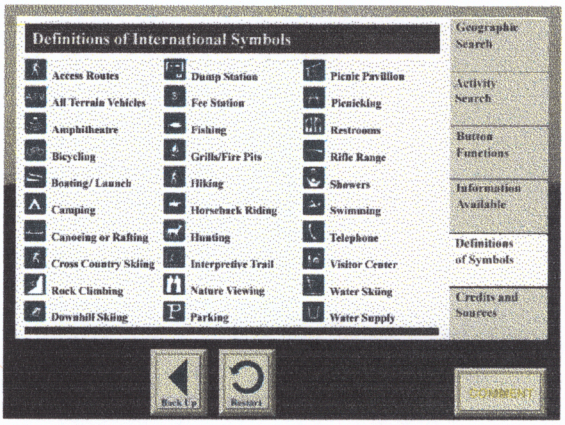


Figure 30. Definition of Symbols Help Screen

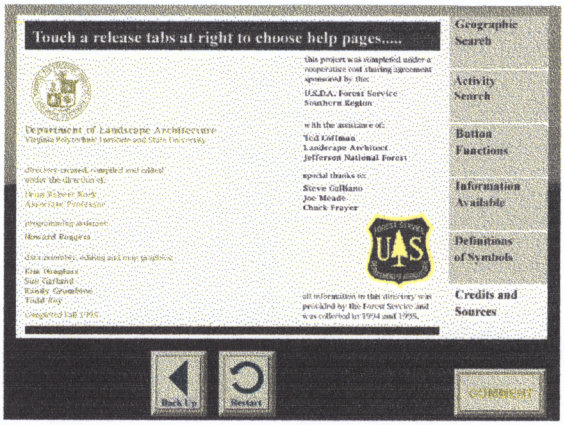


Figure 31. Credits and Sources Help Screen

Once the kiosk program was completed and determined to be stable, the author included a program sub-routine that records the Cast number and Cast name (Director terms that refer to graphic elements) of each button pressed by the user, and the time it was pressed. In addition, the sub-routine records the name of two graphic items which have no inherent function in the program, but which have the graphic appearance of buttons. These items, the Site Icon Panel and the Site Photograph Panel, are discussed in the previous chapter.

The names recorded for each button pressed are the variable names assigned to each graphic element in the Director program (see Appendix II). A sample of the resultant text file is shown in Figure 4 below.

```
100 Main Location Search 2:29:47 PM
104 Little Righty Forward 2:29:57 PM
104 Little Righty Forward 2:30:01 PM
119 Virginia 2:30:03 PM
133 fbutt5 2:30:15 PM
136 sbutt2 2:30:43 PM
xxx Site Icons - no action 2:31:08 PM
xxx Site Icons - no action 2:31:11 PM
803 Page_turner 2:31:14 PM
803 Page_turner 2:31:28 PM
803 Page_turner 2:31:44 PM
822 Brestart 2:33:17 PM
```

Figure 32. Sample Button History text file

The kiosk was pre-tested at Anderson and Associates, a multi-disciplinary Engineering firm located in Blacksburg, Virginia. The pre-test revealed several programming errors and problems with several data files. Once these problems were corrected, viable Button History sequences were generated for preliminary analysis. The entire pre-test lasted four days, with viable data collected on the final two days. The pre-test data was used to finalize the structure of the analysis matrix, discussed below.

The Button History text file generated during the pre-test was inserted into a Microsoft Word table for analysis. The original data was placed in column 1, and the Cast numbers were copied into column 2. A global search-and-replace action was executed for each Cast number, to replace the sometimes confusing Cast member names with more easily analyzed action names or phrases. For example, the Cast name "sbutt4" was assigned the action phrase

"Choose fourth state." The third column provide analysis for a series of selections, grouping several selections as "View Site Information," for example. The analysis matrix was then color-coded to assist in recognizing usage patterns, and to highlight actions or selections of particular interest to the study. A synopsis of each action or group of actions was added in the third column. Each discreet usage of the kiosk, as indicated by the time stamp, and the TIMEOUT stamp, was assigned a User Number to facilitate a broad analysis of the usage patterns for the test group as a whole, and discussion of particular patterns exhibited by particular users. A sample of a four completed analysis matrices is shown on pages 8 through 10.

The pre-test data validated the analysis methodology by indicating that the analysis matrix was capable of providing answers to the research questions. By color-coding groups of related actions, the general pattern of usage was easily discerned. Results from the pre-test indicated that usage of the Geographic Search and Activity Search were virtually identical, whether compared by the number of button presses with a search, on the amount of time spent in a particular search, or on the number of sites viewed within an individual search. Additionally, the pre-test indicated that the methodology would provide the ability to compare the use of the Back-up and Restart buttons with the "shortcut" navigation buttons found on the Navigation Bar, and was clearly capable of indicating how often the Page-Turn button was utilized. Also, the analysis method promised to indicate additional information of value in a thorough evaluation of the Kiosk.

Following the pre-test, the Kiosk was placed in the Forest Service's Visitor Center in Fort Chiswell, Virginia. The Kiosk remained in the Visitor Center for two weeks. This data collected during this period included the usage history of 58 users. The Fort Chiswell Visitor Center was selected because of high volume of traffic through the Center and because the typical visitor was more likely to have an interest in learning about the various recreation sites detailed in the Kiosk than the average passer-by in a shopping mall, or other public places unrelated to the Forest Service or outdoor recreation.

The Kiosk was retrieved from the Visitor Center, and the Button History file was subjected to analysis using the matrix described in the pre-test.

102 MainHelp 5:46:53 PM 815 BBackup 5:47:09 PM	Get Help Back up	User #1 Attempts Help, but views no specific information
100 Main Location Search 5:47:15 PM 110 Kentucky 5:47:26 PM 128 statebarbutt 5:47:38 PM 815 BBackup 5:47:45 PM	Begin Geographic Search Select Kentucky Select New State Back up	Begins Geographic Search, selects Kentucky, for which there is no information, then backs up
822 BRestart 5:47:52 PM	Restart	Aborts and Restarts
904 COMMENT 5:47:55 PM 909 finished 5:48:34 PM	Leave Comment Finished Leaving Comment	See Comment 1, Appendix II
102 MainHelp 5:49:04 PM 325 Tab Blank- Light 5:49:17 PM 000 HELP - Button Functions 5:49:43 PM	Get Help Select Help Topic HELP: Button Functions	Attempts Help again, Views Help topic Button Functions
822 BRestart 5:49:49 PM	Restart	Leaves Help by Restart
*** TIMEOUT *** 5:52:49 PM	*** TIMEOUT *** 5:52:49 PM	
904 COMMENT 7:18:28 PM 909 finished 7:18:55 PM 904 COMMENT 7:18:57 PM 909 finished 7:19:38 PM	Leave Comment Finished Leaving Comment Leave Comment Finished Leaving Comment	User #2 begins with comment, assumed to have used kiosk previously. See Comments 2 and 3, Appendix II
100 Main Location Search 7:19:47 PM 104 Little Righty Forward 7:19:53 PM 104 Little Righty Forward 7:19:57 PM 119 Virginia 7:20:01 PM 129 fbutt1 7:20:29 PM 128 statebarbutt 7:20:57 PM	Begin Geographic Search Next Page of States Next Page of States Select Virginia Select a Forest Select New State (Nav Bar)	Selects Virginia, chooses 1st forest, then chooses to select a new state
104 Little Righty Forward 7:21:00 PM 104 Little Righty Forward 7:21:01 PM 119 Virginia 7:21:03 PM 130 fbutt2 7:21:10 PM 121 Site Right 7:21:45 PM 142 sbutt8 7:22:02 PM	Next Page Next Page Select Virginia Select 2nd Forest View Next Site Select 8th Site	Selects Virginia again, choose 2nd forest. Pages beyond first five sites, then selects 8th site
803 Page_turner 7:22:14 PM 803 Page_turner 7:22:19 PM 803 Page_turner 7:22:27 PM	View next Text Page View next Text Page View next Text Page	Views four text screens
815 BBackup 7:22:31 PM 121 Site Right 7:22:37 PM 144 sbutt10 7:22:46 PM 811 BForests 7:23:01 PM 131 fbutt3 7:23:06 PM 139 sbutt5 7:23:39 PM	Back up View next page of Sites Select 10th Site Select a Forest Select 3rd Forest Select 5th Site	Backs up to site selection screen, pages site name list forward, selects 10th site, returns to forest selection, chooses 3rd forest, 5th site
803 Page_turner 7:23:51 PM 803 Page_turner 7:23:55 PM 803 Page_turner 7:24:05 PM 803 Page_turner 7:24:11 PM 803 Page_turner 7:24:20 PM	View next Text Page View next Text Page View next Text Page View next Text Page View next Text Page	Views all text screens
823 BSites 7:24:32 PM 138 sbutt4 7:24:47 PM	Select Sites List Select 4th Site	Returns to beginning of site selection screens
822 BRestart 7:25:01 PM	Restart	Aborts and Restarts
101 Main activity search 7:25:07 PM 416 Swim 7:25:12 PM 104 Little Righty Forward 7:25:15 PM 119 Virginia 7:25:17 PM 811 BForests 7:25:30 PM 130 fbutt2 7:25:53 PM	Begin Activity Search Select Swimming Next Page Select Virginia Select a Forest Select 2nd Forest	Begin Activity Search Chooses swimming, pages forward in state list, selects Virginia, search for swimming by forest, selects 2nd forest
815 BBackup 7:26:15 PM 104 Little Righty Forward 7:26:18 PM 119 Virginia 7:26:20 PM 292 idxstate 7:26:25 PM 815 BBackup 7:26:47 PM 815 BBackup 7:26:49 PM	Back up Next Page Select Virginia Search entire State Back up Back up	At 1st site, chooses to back up to state selection screen, chooses Virginia again and search by entire state Back up to select a state Back up to select activity
822 BRestart 7:26:52 PM	Restart	Abort and restart

904 COMMENT 7:26:54 PM 909 finished 7:27:32 PM	Leave Comment Finished Leaving Comment	Leaves a comment, see Comment #4, Appendix II
102 MainHelp 7:27:39 PM	Get Help	Goes to Help, views nothing
822 BRestart 7:27:54 PM	Restart	Abort Help and Restart
*** TIMEOUT *** 7:30:53 PM	*** TIMEOUT *** 7:30:53 PM	
101 Main activity search 8:31:20 PM 406 Climb 8:31:27 PM 824 activity bar 8:31:53 PM 407 ccski 8:31:59 PM 119 Virginia 8:32:14 PM 292 idxstate 8:32:34 PM 830 BRightArrow 8:33:31 PM 815 BBackup 8:33:40 PM	Begin Activity Search Select Rock Climbing Begin Activity Search (Nav Bar) Select Cross Country Skiing Select Virginia Search entire State Next Site Back up	User #3 begin Activity Search, chooses Rock Climbing, does not search, restarts Activity Search using Nav Bar, selects X-country skiing, Virginia, and search entire state. Only one site available, backs up to select state
822 BRestart 8:33:46 PM	Restart	Abort and Restart
100 Main Location Search 8:34:13 PM 104 Little Righty Forward 8:34:25 PM 104 Little Righty Forward 8:34:34 PM 118 Texas 8:34:38 PM 130 fbutt2 8:35:00 PM 135 sbutt1 8:35:20 PM 830 BRightArrow 8:35:37 PM 830 BRightArrow 8:36:06 PM 128 statebarbutt 8:36:15 PM 104 Little Righty Forward 8:36:22 PM 115 PuertoRico 8:36:27 PM 104 Little Righty Forward 8:36:42 PM 115 PuertoRico 8:36:44 PM 104 Little Righty Forward 8:37:23 PM 104 Little Righty Forward 8:37:25 PM 105 Little Righty Return 8:37:26 PM 107 Arkansas 8:37:28 PM 815 BBackup 8:37:36 PM 104 Little Righty Forward 8:37:38 PM 104 Little Righty Forward 8:37:39 PM 117 Tennessee 8:37:41 PM	Begin Geographic Search Next Page Next Page Select Texas Select 2nd Forest Select 1st Site Next Site Next Site Select New State Next Page Select Puerto Rico Next Page Select Puerto Rico Next Page Next Page Return to Beginning - State list Select Arkansas Back up Next Page Next Page Select Tennessee	Begins Geographic Search, pages through state list, chooses Texas, 2nd forest, 1st site, pages through to 3rd site, then choose new state using Nav Bar. Pages to 2nd state screen, select Puerto Rico, for which there is no info. Returns to state selection, but chooses P.R. again. Pages through all states Selects Arkansas but backs up from forest selection. Returns to state selection, page to 3rd state screen, chooses Tennessee, for which there is no information.
824 activity bar 8:38:00 PM 406 Climb 8:38:13 PM 107 Arkansas 8:38:18 PM 811 BForests 8:38:32 PM 129 fbutt1 8:38:41 PM 830 BRightArrow 8:39:22 PM	Begin Activity Search (Nav Bar) Select Rock Climbing Select Arkansas Select a Forest Select a Forest Next Site	Chooses Activity Search from Nav Bar. Selects Rock Climb, Arkansas is only choice. Chooses to search by forest, selects 1st, views only site, tries to page to next
822 BRestart 8:39:37 PM	Restart	Abort and Restart
102 MainHelp 8:39:53 PM 325 Tab Blank- Light 8:40:14 PM 000 HELP - Definitions 8:40:17 PM 325 Tab Blank- Light 8:40:55 PM 000 HELP - Button Functions 8:40:57 PM	Get Help Select Help Topic 000 Select Help Topic 000	Chooses Get Help View help on definition of terms and button functions
904 COMMENT 8:41:07 PM 909 finished 8:41:12 PM	Leave Comment Finished Leaving Comment	See comment #5, Appendix II
822 BRestart 8:41:22 PM	Restart	Abort Help and Restart
*** TIMEOUT *** 8:44:22 PM	*** TIMEOUT *** 8:44:22 PM	
jan 5 96 12:50pm	jan 5 96 12:50pm	
101 Main activity search 12:57:39 PM 404 Camp 12:57:42 PM 104 Little Righty Forward 12:57:45 PM 119 Virginia 12:57:47 PM 811 BForests 12:57:51 PM 133 fbutt5 12:57:57 PM 830 BRightArrow 12:58:18 PM 830 BRightArrow 12:58:24 PM 803 Page_turner 12:58:31 PM	Begin Activity Search Select Camping Next Page Select Virginia Select a Forest Select 5th Forest Next Site Next Site View next Text Page	User #4 begins Activity Search chooses Camping, pages to 2nd state screen, selects Virginia, choose to search by forest, selects 5th forest Pages from site 1 to site 3 Pages through text screens,

803 Page_turner 12:58:33 PM	View next Text Page	past beginning to 2nd text screen
803 Page_turner 12:58:34 PM	View next Text Page	
803 Page_turner 12:58:36 PM	View next Text Page	
803 Page_turner 12:58:38 PM	View next Text Page	
803 Page_turner 12:58:39 PM	View next Text Page	
128 statebarbutt 12:58:43 PM	Select New State	chooses to select new state from Nav Bar, chooses Ark, search entire state for Camping, pages to 3rd site
107 Arkansas 12:58:50 PM	Select Arkansas	
292 idxstate 12:58:54 PM	Search entire State	
830 BRightArrow 12:59:25 PM	Next Site	
830 BRightArrow 12:59:31 PM	Next Site	
803 Page_turner 12:59:36 PM	View next Text Page	Pages through text screens, past beginning to 2nd text screen
803 Page_turner 12:59:38 PM	View next Text Page	
803 Page_turner 12:59:39 PM	View next Text Page	
803 Page_turner 12:59:41 PM	View next Text Page	
803 Page_turner 12:59:43 PM	View next Text Page	
803 Page_turner 12:59:47 PM	View next Text Page	
815 BBackup 12:59:49 PM	Back up	Backs up through sites, to state selection screen
815 BBackup 12:59:55 PM	Back up	
815 BBackup 1:00:00 PM	Back up	
111 Louisiana 1:00:04 PM	Select Louisiana	Chooses LA, searches entire state
292 idxstate 1:00:09 PM	Search entire State	
824 activity bar 1:00:28 PM	Begin Activity Search (Nav Bar)	Aborts and begin new search
822 BRestart 1:00:30 PM	Restart	Aborts and Restarts
100 Main Location Search 1:00:35 PM	Begin Geographic Search	Begins Geographic Search,
110 Kentucky 1:00:40 PM	Select Kentucky	selects Ky, no info
822 BRestart 1:00:56 PM	Restart	Aborts and Restarts
904 COMMENT 1:00:59 PM	Leave Comment	See Comment #6, Appendix II
909 finished 1:02:16 PM	Finished Leaving Comment	
100 Main Location Search 1:02:19 PM	Begin Geographic Search	Begins Geographic Search, pages to 2nd state screen, selects P.R., for which there is no info, choose new state selects MS, 3rd forest and 2nd site
104 Little Righty Forward 1:02:22 PM	Next Page	
115 PuertoRico 1:02:23 PM	Select Puerto Rico	
128 statebarbutt 1:02:31 PM	Select New State	
104 Little Righty Forward 1:02:33 PM	Next Page	
112 Mississippi 1:02:37 PM	Select Mississippi	
131 fbutt3 1:02:45 PM	Select 3rd Forest	
136 sbutt2 1:02:57 PM	Select 2nd Site	
803 Page_turner 1:03:04 PM	View next Text Page	Pages through all text screens, then attempts to press the site photograph.
803 Page_turner 1:03:05 PM	View next Text Page	
803 Page_turner 1:03:07 PM	View next Text Page	
803 Page_turner 1:03:08 PM	View next Text Page	
		Scrolls to 2nd text screen
803 Page_turner 1:03:13 PM	View next Text Page	
815 BBackup 1:03:16 PM	Back up	Backs up to Select a site then chooses new forest from Nav Bar, 3rd forest
811 BForests 1:03:23 PM	Select a Forest	
131 fbutt3 1:03:24 PM	Select 3rd Forest	
824 activity bar 1:03:36 PM	Begin Activity Search (Nav Bar)	Begins Activity Search from Nav Bar, chooses canoeing in LA, search entire state
405 Canoe 1:03:39 PM	Select Canoeing	
111 Louisiana 1:03:41 PM	Select Louisiana	
292 idxstate 1:03:45 PM	Search entire State	
830 BRightArrow 1:03:57 PM	Next Site	pages through 4 sites
830 BRightArrow 1:04:03 PM	Next Site	
830 BRightArrow 1:04:09 PM	Next Site	Backs up through sites, to select state
815 BBackup 1:04:15 PM	Back up	
815 BBackup 1:04:20 PM	Back up	
815 BBackup 1:04:23 PM	Back up	
815 BBackup 1:04:27 PM	Back up	
822 BRestart 1:04:30 PM	Restart	Abort and Restart
*** TIMEOUT *** 1:07:29 PM	*** TIMEOUT *** 1:07:29 PM	

Figure 33. Sample User Analysis Matrices

Following the completion of the User Analysis matrices, a numerical table was used to make a basic comparison between the Geographic and Activity searches. This table enumerates the total number of each search type initiated by each user, and includes the total number of sites viewed within each search type.

A second analysis table, the Interface Evaluation Matrix, was constructed to assist in the comparison between the developers' expectations of how the Kiosk interface would be used with the usage patterns indicated by the analysis matrices. The Evaluation Matrix provides many of the substantive findings in this study, as it indicates where users utilized the Kiosk interface as the designers intended them to, and where they did not. While this information cannot be extrapolated to make general conclusions regarding the success or failure of the program as a whole, it clearly indicates those interface elements that are successful and those that are subject to misinterpretation.

A final table was constructed to show the number of times each user pressed the Site Icon Panel and the number of Photograph Panel presses. The data collection process could not differentiate between intentional and accidental presses of these two items, so this table serves only as an indicator of a potential misinterpretation of these features.

The nature of the research methodology used in this study precludes absolute conclusions or statistical results. Two reasons are offered here to justify this atypical approach to the research project. The first involves the timely delivery of the Kiosk to the customer, the Forest Service. Development of the Kiosk program was a much more lengthy process than originally anticipated, so it became imperative to complete the research as quickly as possible. The automated process of recording each button press ensured that no data collection opportunity would be missed, as is likely with an observation, interview or a questionnaire approach to similar projects. The second reason deals with the pragmatic goals for the research. The literature search that was a prelude to this project revealed a surprising lack of information about the design of a multimedia interface. Even the considerable multimedia resources available on the Internet included no substantive discussion or analysis of the topic. This research project was approached as a means of establishing the groundwork for future studies, and as such is as much an examination of the methodology as it is of the Kiosk itself. As an additional benefit, the broad approach provided considerable information about the Kiosk, and suggests the levels of success or failure of many Kiosk elements and functions, though it does not provide a rigorous explanation for the findings.

DATA ANALYSIS

The kiosk was delivered to the Forest Service Visitor Center in Fort Chiswell, Virginia on Thursday, January 25, 1996. The Button History and Comment data files were retrieved from the kiosk after one week, and again after the second week. The initial breakdown of the Button History data files revealed a total of 58 uses of the kiosk. Although this number seemed quite high, given the time of year, an examination of the guest book for the first week revealed 58 signatures, including an additional 60 people who were listed as companions of the signees.

Once the data was broken down into separate records for each user, the data was analyzed using the color-coded chart format described in the preceding chapter. Annotations were added to the charts, and a summary of each user's actions were included with each record. The final data analysis records, without color-coding, are found in Appendix I, User Data. During the coding of the data a program error was revealed. This error was caused by a variable which retained an incorrect value, and which caused the program to display incorrect choices on the screen. Several users were able to clear the error by pressing the Restart Button, or by a fortuitous sequence of button presses. Other users were less fortunate, and clearly became confused by the illogical choices presented. As a result, eleven user records were omitted from the final analysis. Six others were discounted because the user failed to initate a search.

GEOGRAPHIC VERSUS ACTIVITY SEARCH AND NAVIGATION EFFECTIVENESS

To clarify the direct comparison between the Geographic Search and the Activity Search, a matrix was used to count the number of discreet searches of each type. Additionally, the number of sites visited within each search type as recorded. The matrix, shown in Table 1, below, shows quite clearly that there was no substantive difference in use. The higher number of sites viewed within the Geographic Search cannot be a direct comparison to the number viewed within the Activity Search, because there are typically many more sites available through the State-Forest selection method than through the Activity-State or Activity-State-Forest method. As an example, each forest in Virginia, the state most often selected for the Geographic Search, has more than 20 sites, whereas the activity ATV, the most frequently selected, has only one site.

User #	Number of Geographic searches	Number of Activity searches	Number of sites viewed in Geographic search	Number of sites viewed in Activity search
1	1	1	3	-
2	1	-	11	-
4	2	3	1	-
5	1	1	24	3
7	1	1	15	6
8	1	-	4	-
10	1	1	3	1
11	1	1	-	-
12	1	1	2	-
13	-	1	-	-
14	-	1	-	2
15	3	4	4	19
20	1	1	-	2
23	1	1	-	1
24	-	1	-	2
26	2	1	3	9
27	1	1	-	7
32	1	1	18	-
34	-	2	-	20
35	1	-	11	-
36	1	-	9	-
37	1	-	9	-
38	2	-	15	-
39	2	-	16	-
40	-	5	-	53
41	4	2	23	11
43	2	2	2	19
44	3	2	31	1
45	1	1	8	-
46	2	3	4	7
47	1	-	3	-
48	3	1	34	-
49	2	-	28	-
50	1	-	25	-
51	1	-	-	-
52	1	2	-	3
54	2	-	18	-
55	-	1	-	1
56	1	-	1	-
57	-	2	-	1
58	1	2	7	-
TOTAL	**53**	**48**	**332**	**168**

Table 1. Inital Matrix

The matrix offers numerical evidence that the Geographic Search was selected slightly more often than the Activity Search, and that nearly twice as many sites were viewed using the Geographic search path.

Table 1 provides a means of comparing the two search methods, but does not allow for the comparison of the designers' intentions with user behavior. A second matrix was developed to facilitate this more significant analysis. Each valid user was evaluated for the following conditions:

- Did the user reach the Site Display Screen in a Geographic Search
- Did the user reach the Site Display Screen in an Activity Search
- Did the user view two or more Site Information pages by using the Page Turn Button
- Did the user complete at least one search, by viewing all Site Information pages
- Did the user press the Select a New State Button on the Navigation Button Bar
- Did the user press the Select a New Forest Button on the Navigation Button Bar
- Did the user press the Select a New Site Button on the Navigation Button Bar

The first two catagories indicate the success each user had in following a search path to the "end," the Site Display Screen. For the Geographic Search, this required the selection of a State, a Forest, and an inital Site. For the Activity Search, the necessary selections were an Activity, a State, and the choice of searching an entire state or a particular Forest, where there were fewer than thirty total sites, or the forced selection of a Forest where there were more than thirty sites. The third catagory indicates whether or not the user pressed the Page Turn Button to view Site Information pages other than the default Location information displayed on the initial Site Display screen. The fourth catagory indicates those users who viewed all five Site Information text pages for one or more sites.The final three catagories indicate those users who utilized the "short-cut" navigation options provided on the Navigation Button Bar, as opposed to using the Back Up Button or the Restart Button to make new State, Forest or Site selections.

User #	Reached Site Display screen (Geog.)	Reached Site Display screen (Act.)	Viewed two or more Site Information pages	Completed at least one search **	Used Select New State Button *	Used Select New Forest Button *	Used Select New Site Button *
1	yes	no	yes	yes	no	no	no
2	yes	-	yes	yes	no	no	yes
4	no	yes	no	no	no	no	no
5	yes	yes	yes	yes	no	no	yes
7	yes	yes	yes	yes	no	no	no
8	yes	-	yes	no	no	no	no
10	yes	yes	yes	yes	no	no	no
11	no	no	no	no	yes	no	no
12	yes	no	no	no	no	no	no
13	-	no	no	no	no	no	no
14	-	yes	yes	yes	no	no	no
15	yes	yes	yes	yes	yes	no	no
20	-	yes	yes	yes	yes	no	no
23	no	yes	no	no	yes	no	no
24	-	yes	no	no	no	no	no
26	yes	yes	no	no	no	no	no
27	no	yes	yes	no	no	no	no
32	yes	no	no	no	no	yes	no
34	-	yes	no	no	no	no	no
35	yes	-	no	no	no	no	no
36	yes	-	no	no	no	no	no
37	yes	-	yes	no	no	yes	no
38	yes	-	no	no	no	no	no
39	yes	-	no	no	no	no	no
40	-	yes	no	no	yes	yes	no
41	yes	yes	no	no	no	yes	yes
43	yes	yes	no	no	yes	yes	no
44	yes	yes	no	no	yes	no	no
45	yes	no	no	no	no	no	no
46	yes	yes	no	no	no	no	yes
47	yes	-	yes	yes	no	yes	no
48	yes	no	yes	yes	no	no	no
49	yes	-	no	no	no	no	no
50	yes	-	no	no	no	yes	no
51	no	-	no	no	no	no	no
52	no	yes	yes	no	no	yes	no
54	yes		yes	yes	no	yes	no
55	-	yes	no	no	no	no	no
56	yes	-	yes	no	yes	no	no
57	-	no	no	no	no	no	no
58	yes	no	yes	no	yes	yes	no

Table 2. Evaluation Matrix

Table 2 provides a method for the comparison of the designers' intentions with user behavior. The foremost goal of was to have the Kiosk provide information to the user, regardless of the serach path selected to reach the information. The Site Display screen is the source of all substantive information within the Kiosk. Therefore, that 14 of the 41 users failed, at some point during the use of the Kiosk, to reach the Site Display screen is indicative of some confusion about the process or the selection information. More significantly, four users failed to reach any Site Information at all. Statistically, this is a nearly 10% failure rate. Six Geographic Searches failed to yield results, while nine Activity searches were fruitless. Of the six Geographic Search failures, one may be attributable to a lack of information. User #11 repeatedly chose to search Kentucky, a state for which no information is inluded inthe Kiosk database. Two users, #51 and #52 pressed the Location Search Button to initiate a Geographic Search and selected a state, then pressed the Activity Button on the Navigation Button Bar to begin an Activity Search. Of the nine Activity Search failures, two may be a result of inadequate information. User #1 selected Rock Climbing, and user #11 chose ATV, both of which have only one site in one state in the database. Four of the users who failed to reach Site Information in the Activity Search never selected an activity to search. Two selected an activity and a state , but did not make the choice of searching the entire state, or selecting a forest within the state to search.

The next two catagories, Viewed two or more Site Information pages and Completed at least one search, provide more detailed analysis of the success in providing specific information to the user. A user must reach the Site Information screen to receive any information about a particular facility, but the database conatins more textual information than can be reasonably displayed on a single screen. Each site, therefore, consists of a primary display, which includes the Icon Panel, the Site Photograph and the Text Panel. The inital text panel includes a descripition of the general location of the site its forest. Four additional text panels provide specific directions to the site, general infomration about the site, an assessment of the accessibiltiy of specific amenities offered, and user fees charged for admission to the facility. These additional text panels are cycled by pressing the Page Turn Button, located on the lower right corner of the Text Panel. The third catagory in Table 2 indicates those users who pressed the Page Turn Button at least once, to view additional site information. The fourth catagory shows those users who viewed all of the descriptive text for at least one site. Only 17 of the 41 valid users chose to press the Page Turn Button to view this additional information, and 11 of 41 viewed all of the additional text. The non-standard appearance of this button may account for the fact that fewer than half of the users pressed it, despite the written instruction on the bottom of the Text Panel to "Touch page corner for more information..."

The final three catagories reveal that few users took advantage of the "short-cut" options available on the Navigation Button Bar. Most of those who did use the Navigation Button Bar did so as the designers intended, that is, as a way to alter one or more choices, state, forest or site, without having to restart the entire search over from the beginning. Two users, however, #2 and #5 used the short-cuts to their disadvantage. User #2 pressed the Select New Site Button while viewing site number 20, pressed the View Next Page of Sites Button four times, then chose to view the 21st site. The more efficient method would have been one press of the Next Site Button. User #2 performed the same manuver to reach the 22nd site. User #5 made a similarly inefficient move in moving from the third site to the second site.

ATTEMPTS TO ACTIVATE THE SITE ICONS AND PHOTOGRAPH PANEL

A third matrix was constructed to indicate those users who pressed the Site Icons and the Photograph Panel. This matrix, shown below, illustrates the number of times each user pressed the Site Icon Panel and the Site Photograph Panel. As noted previously, the analysis method cannot distinguish between intention efforts to activate these items and accidental touches. Sixteen of 41 users, or 39%, recorded at least one press for one or both of the components, however, which indicates a clear possibility that these elements are misunderstood. Over one fourth of all valid users pressed the Icon Panel. More surprisingly, over 75% of those users who pressed the icons did so more than once; one user pressed the icons twelve times. That four users pressed the Icon Panel but did not use the Page Turn Button suggests that these users expected to find information to the activity represented by the icon, or that the button-like appearance misled them. There is a clear logic to this assumption, given the hierarchical nature of the search methods -- as the Geographic Search moves from State, to Forest to Site, for example -- it is reasonable to assume the move to more detailed information regarding the various recreation opportunities illustrated by the Site Icons. The fact that 12 users pressed the Icon Panel during a Geographic Search, as opposed to only 5 who did so during an Activity Search, reinforces this assumption, because the Activity Search is somewhat less hierarchical in nature. Additionally, the Activity Search is filtered by the user in the initial selection. To select Hiking as an activity to search and then to have to select the Hiking icon on the Icon Panel to receive more information is illogical.

User #	number of Site Icon presses	number of Photograph Panel presses
1	-	-
2	12	-
4	-	-
5	1	-
7	4	-
8	-	1
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	2	-
20	3	-
23	-	-
24	-	-
26	4	-
27	-	-
28	1	1
31	-	-
32	3	-
34	-	-
35	1	3
36	-	6
37	-	2
38	-	-
39	-	-
40	7	-
41	-	-
43	-	-
44	-	-
45	-	1
46	-	-
47	2	-
48	-	-
49	-	-
50	-	-
51	-	-
52	8	-
53	-	-
54	5	3
55	-	-
56	-	-
57	-	-
58	-	-

Table 3. Icon and Photo Matrix

The users who pressed the Photograph Panel likely did so expecting a different image on the display. It is interesting to note that this function, the display of multiple site photographs, was included in the kiosk prototype. Few of the Forest Service districts submitted one photograph per site, much less two or more. The photograph cycling function was removed from the final program for this reason, but it is clear that 7 of the 44 valid users, or 16%, attempted to view additional images. The results are not sufficient to indicate whether the 3-dimensional appearance of the feature or the users assumptions led to the expectation of interactivity of the Photograph Panel, but they do suggest that several users desired more information on this portion of the display.

CONCLUSIONS

As stated in Chapter 2, this research project involves the effort to answer four specific questions about several individual elements of the graphic interface, and an evaluation of the automated user response tracking methodology used to collect data.

Program-Specific Conclusions

The direct, numerical comparison between the Geographic Search and the Activity Search revealed that the Geographic Search was used more often than the Activity Search, but only by a small margin. More significantly, the evaluation of those users who initiated a Geographic Search and reached the Site Display screen revealed a success rate of better than 4 in 5 users, while the success rate for the Activity Search was just slightly better that 2 of 3 users. The higher failure rate of the Activity Search is due, in part, to the repeated selection of ATV as the activity to search. Only one site, located in Mississippi, is included in the Kiosk database for this activity. User #4 selected ATV five times without completing a search. The Activity Search was clearly not as successful as the designer intended, and may have problems associated with the structure or method of the search path, or of the graphic components of the Activity Search interface; however, insufficient data for the activities available for searching seems the most significant culprit.

The infrequent use of the Navigation Button Bar buttons is not only a disappointment, given the substantial efforts of the designers to create a navigation system that was simple, efficient and comprehensive, but also indicates a subject for considerable future research. The three buttons evaluated in this study, the Select New State Button, Select New Forest Button and the Select New Site Button were all designed to complement the basic, linear "next page," "previous page" controls by providing faster, "short-cut" methods for making new selections. The icons one each of the three buttons and their placement on the screen were thoughtfully calculated to help the user understand their functions. It is readily apparent that the majority of the users in the study group did not take advantage of these short-cut navigation tools. Those individuals who did not use these buttons may have misunderstood their function or may have simply preferred the next page-previous page method. As Greg Kearsley notes, however, "...designers must accept the fact that people need to explore a system in their own fashion,

even if it results in suboptimal choices. User acceptance of a system is usually more important than efficient use in most public access systems" (59). Future research should include study of short-cut navigation tools to determine if their inclusion is justified and if so, how these alternative navigation tools are best presented to the user.

The Page Turn Button proved to be somewhat more successful than the Navigation Button Bar buttons, but the Evaluation Matrix indicates that it is not as successful as the designers had hoped. The appearance of the button is a clever metaphor for its function, and it is graphically appealing, but the non-standard appearance may account for the fact that fewer than half of the valid users pressed it. Clever design, even when backed by sound logic and careful consideration, may obfuscate the buttons function, rather than enhance a metaphorical understanding of its function. Again, this finding suggests an important subject for continued study.

The final finding of this portion of the study, that sixteen of 41 users touched one or both of the inert elements tested, is also a clear indication of unexpected user behavior. As noted in the previous chapter, there is no way to differentiate between an intentional effort to activate these items, and an accidental touch. The number of users who recorded at least one touch, however, suggests that many users misinterpreted the items, and assumed that some action would result from touching them. Even if every occurrence of contact with the Icon Panel and Photograph Panel were accidental, there is a clear indication for future study; specifically, how can placement of graphic elements on a touch screen be optimized to eliminate or minimize accidental selections. The likelihood is, however, that a portion of the recorded touches were intentional, and that the designer of future kiosks should design inert elements in a manner that clearly differentiates them from active elements. These design issues, too, are critical issues for future studies.

It is interesting and important to note that the Comment Button, which allowed users to type remarks and suggestions into the system, was rarely used during the testing period. Of the eleven users who pressed the Comment Button, fewer than half actually typed a comment. Of those few actual comments recorded, only two were significant; one comment refered to the need for more specific maps for each site, the second was a request for a printer, so that hard copy of the site information could be genereated for the user. The balance of the comments were praise of the system. Perhaps most surprising was the lack of comments about the program error that the author was able to recognize in the data, but that few users seemed to be

aware of. On several occasions, the program error cause the system to present choices that were illogical an inconsistent. Those users who encountered the error either chose not to comment upon it, or did not recognize the problem. The lack of significant information from the comment function is not an indictment of the feature, but does suggest that future research should not depend upon voluntary comments from the user population.

A cumulative evaluation of the Kiosk interface, based upon the results of this portion of the study, is easy to draw, and clearly simplistic; the interface succeeds in some respects and is less than successful in others. The Geographic Search proved to be the most effective means for a user to receive specific site information. The Activity Search was less successful, but the fact that the most frequently selected activity provided information for only one site may have skewed the results. The linear navigation buttons provided on the Navigation Button Bar were utilized effectively, but the short-cut button were less effective. Fewer users than expected explored the site information, and more than expected attempted to activate non-functional screen elements.

Methodology Conclusions

The second facet of this research exposes the strengths and weaknesses inherent in automated data collection methodology. It is an efficient and effective means of collecting specific, detailed information from every individual who comes in contact with the system. It illustrates quite clearly what a person did, but provides no clues about why the person did what they did. More specifically, the author was able to recreate every move each user made within the Kiosk navigation system, much as a chess aficionado may replay a classic game between two masters using the standard notation, such as "B2 to C4." The aficionado, however, cannot know the motivation for any move, although he may speculate accurately about each. By replaying numerous games, the chess fan may begin to observe patterns in the chess record, and gain an understanding of those strategies which generally lead to success, and those which commonly fail. Similarly, the research methodology employed in this study is most effective in the identification of usage patterns, and provides an absolute record of button selections.

Clearly, this research method is appropriate for the collection and analysis of data that is quantitative in nature. The automated user response tracking method was sufficient to answer the four specific questions of this research project, and would certainly be an appropriate method

for the investigation of numerous other, similar questions. The methodology falls short, however, in gaining substantive insight into user motivation for making particular selections. It can determine the success or failure of a graphic component, but it can provide no information about the reasons for success or failure. The user records indicated that the Page Turn Button, for example, was not utilized as frequently as the designers had expected. That there may be some problem with the design of this button is suggested by the results of the study, but the data alone provides no clear direction for further study. The non-standard appearance of the button may be the cause, but it is also possible that the quality of site data was insufficient to arouse interest, or that the text instructions which accompany the button were misleading.

Despite the shortcomings of this research methodology, the ability to automate data collection, the convenience of remote or unattended collection and the ability to insure that every interaction can be recorded all support the technique, and guarantee that it will be used, in some fashion, in future research efforts. The methodology also provides an additional tool for th e identification of program errors.

Chapter 2, Research Goals, presented five catagories of research that comprise a thorough evaluation of a computer kiosk application. These catagories, Quality of the system's information, Method or methods for searching the information, Graphic interface design, Online instructions and help and Location and presentation of the kiosk, help to define the direction for future research. Each of the specific issues within each catagory, as discussed in Chapter 2, are appropriate subjects for future studies. As each catagory is studied in depth, comparisons between catagories will be more valid, and profitable.

This study also identifies several specific subjects for further study. Clearly all facets of the graphic interface warrant closer examination, but the interpretation of button icons, the interpretation of buttons with a non-standard appearance and the interpretation of button-like graphic elements have all been demonstrably problematic in this study. Additionally, an evaluation of user satisfaction or effectiveness as related to database content would prove to be quite valuable. There is also a need for the assessment of other testing methodologies, to further the development of graphical user interface evaluation.

DATA ANALYSIS

USER #1

100 Main Location Search 11:16:58 AM	Begin Geographic Search	
104 Little Righty Forward 11:17:09 AM	Next Page	
104 Little Righty Forward 11:17:11 AM	Next Page	
119 Virginia 11:17:13 AM	Select Virginia	Begin Geo. search
133 fbutt5 11:17:29 AM	Select 5th Forest	select 9th site and
121 Site Right 11:17:49 AM	View next page of Sites	view 4 text pages,
143 sbutt9 11:18:00 AM	Select 9th Site	view 1st screen for
803 Page_turner 11:18:23 AM	View Next Text Page	following 2 sites
803 Page_turner 11:18:27 AM	View Next Text Page	
803 Page_turner 11:19:17 AM	View Next Text Page	
803 Page_turner 11:19:21 AM	View Next Text Page	
830 BRightArrow 11:19:32 AM	Next Site	
830 BRightArrow 11:19:57 AM	Next Site	
822 BRestart 11:21:28 AM	Restart	
904 COMMENT 11:21:38 AM	Leave a Comment	
909 finished 11:22:34 AM	Finished Leaving Comment	
101 Main activity search 11:23:15 AM	Begin Activity Search	Begin activity
406 Climb 11:23:24 AM	Select Rock Climbing	search, view list
815 BBackup 11:23:27 AM	Back Up	of states avail. for
416 Swim 11:24:10 AM	Select Swimming	climbing and
815 BBackup 11:24:13 AM	Back Up	swimming, back-
815 BBackup 11:24:31 AM	Back Up	up to main menu
904 COMMENT 11:24:33 AM	Leave a Comment	
909 finished 11:24:50 AM	Finished Leaving Comment	Repeated
904 COMMENT 11:24:52 AM	Leave a Comment	comments
909 finished 11:25:45 AM	Finished Leaving Comment	suggest a problem
904 COMMENT 11:25:48 AM	Leave a Comment	or confusion
909 finished 11:27:36 AM	Finished Leaving Comment	
*** TIMEOUT *** 11:30:36 AM	*** TIMEOUT ***	

User #1 utilized both the Geographic and Activity Searches. In the former, user #1 viewed three sites, and used the Page Turn Button to view four of five text pages for one site. User #1 was less successful with the Activity Search, as no sites were viewed. The first activty selected, Rock Climbing, includes only one site in the entire Southern Region, located in Arkansas. The user then backed up and searched Swimming, but never selected a state to search. Rather, User #1 left a series of three Comments. It must be noted that during the first week of data collection, a programming error existed, where the comment field retained all previous entries. It may have appeared, therefore, that user comments were not properly recorded. Comments left by the user may be found in Appendix II, User #1.

USER #2

100 Main Location Search 12:13:07 PM	Begin Geographic Search	
104 Little Righty Forward 12:13:10 PM	Next Page	Begin Geog.
104 Little Righty Forward 12:13:11 PM	Next Page	search. Selected
119 Virginia 12:13:12 PM	Select Virginia	Virginia, 3rd
131 fbutt3 12:13:52 PM	Select 3rd Forest	forest, 3rd site
137 sbutt3 12:14:33 PM	Select 3rd Site	
803 Page_turner 12:14:56 PM	View Next Text Page	Viewed three text
803 Page_turner 12:14:57 PM	View Next Text Page	pages
803 Page_turner 12:15:04 PM	View Next Text Page	
815 BBackup 12:16:52 PM	Back Up	Backed up but
137 sbutt3 12:16:59 PM	Select 3rd Site	selected 3rd site
803 Page_turner 12:17:36 PM	View Next Text Page	again. Viewed all
803 Page_turner 12:17:40 PM	View Next Text Page	text pages
803 Page_turner 12:17:42 PM	View Next Text Page	
803 Page_turner 12:18:16 PM	View Next Text Page	
803 Page_turner 12:18:22 PM	View Next Text Page	
830 BRightArrow 12:18:25 PM	Next Site	Viewed the next
803 Page_turner 12:19:24 PM	View Next Text Page	site and two text
803 Page_turner 12:19:27 PM	View Next Text Page	pages
xxx Site Icons - no action 12:20:58 PM	xxx Site Icons	Atttempted to
xxx Site Icons - no action 12:20:59 PM	xxx Site Icons	press icons
xxx Site Icons - no action 12:21:00 PM	xxx Site Icons	
803 Page_turner 12:22:36 PM	View Next Text Page	
803 Page_turner 12:22:42 PM	View Next Text Page	View last 3 text
803 Page_turner 12:23:12 PM	View Next Text Page	pages, and the 1st
803 Page_turner 12:23:17 PM	View Next Text Page	two again
803 Page_turner 12:23:20 PM	View Next Text Page	
830 BRightArrow 12:23:23 PM	Next Site	Go to next site,
823 BSites 12:23:42 PM	Select New Site	then back to site
121 Site Right 12:23:49 PM	View next page of Sites	selection, pick
121 Site Right 12:24:12 PM	View next page of Sites	12th site
146 sbutt12 12:24:21 PM	Select 12th Site	
803 Page_turner 12:24:41 PM	View Next Text Page	View all text pages
803 Page_turner 12:24:44 PM	View Next Text Page	and 1st two again
803 Page_turner 12:25:56 PM	View Next Text Page	
803 Page_turner 12:25:58 PM	View Next Text Page	
803 Page_turner 12:26:02 PM	View Next Text Page	
803 Page_turner 12:26:16 PM	View Next Text Page	
803 Page_turner 12:26:18 PM	View Next Text Page	
830 BRightArrow 12:26:53 PM	Next Site	Moves to next site,
823 BSites 12:26:59 PM	Select New Site	then back to site
121 Site Right 12:27:08 PM	View next page of Sites	selection, moves
120 Site Left 12:27:14 PM	View Previous Site List	through the list, to
121 Site Right 12:27:20 PM	View next page of Sites	15th site
121 Site Right 12:27:26 PM	View next page of Sites	
149 sbutt15 12:27:33 PM	Select 15th Site	
xxx Site Icons - no action 12:28:17 PM	xxx Site Icons	
xxx Site Icons - no action 12:28:18 PM	xxx Site Icons	Attempts to press
xxx Site Icons - no action 12:28:18 PM	xxx Site Icons	icons several
xxx Site Icons - no action 12:28:19 PM	xxx Site Icons	times

xxx Site Icons - no action 12:28:19 PM	xxx Site Icons	
xxx Site Icons - no action 12:28:22 PM	xxx Site Icons	
803 Page_turner 12:29:11 PM	View Next Text Page	
803 Page_turner 12:29:14 PM	View Next Text Page	
803 Page_turner 12:29:30 PM	View Next Text Page	Views all text
803 Page_turner 12:29:31 PM	View Next Text Page	pages except 5th
803 Page_turner 12:30:12 PM	View Next Text Page	twice
803 Page_turner 12:30:14 PM	View Next Text Page	
803 Page_turner 12:30:15 PM	View Next Text Page	
803 Page_turner 12:30:18 PM	View Next Text Page	
803 Page_turner 12:30:19 PM	View Next Text Page	
823 BSites 12:30:33 PM	Select New Site	Uses button bar
121 Site Right 12:30:42 PM	View next page of Sites	again to choose
121 Site Right 12:30:49 PM	View next page of Sites	new site, pages
121 Site Right 12:30:59 PM	View next page of Sites	through to 20th
154 sbutt20 12:31:04 PM	Select 20th Site	site
803 Page_turner 12:32:19 PM	View Next Text Page	
803 Page_turner 12:32:21 PM	View Next Text Page	Again views all
803 Page_turner 12:32:29 PM	View Next Text Page	except 5th text
803 Page_turner 12:32:31 PM	View Next Text Page	page twice
803 Page_turner 12:33:24 PM	View Next Text Page	
803 Page_turner 12:33:28 PM	View Next Text Page	
803 Page_turner 12:33:32 PM	View Next Text Page	
803 Page_turner 12:33:50 PM	View Next Text Page	
803 Page_turner 12:33:52 PM	View Next Text Page	
823 BSites 12:34:37 PM	Select New Site	Next selects 21st
121 Site Right 12:34:42 PM	View next page of Sites	site by restarting
121 Site Right 12:34:49 PM	View next page of Sites	site list, rather
121 Site Right 12:34:55 PM	View next page of Sites	than using Next
121 Site Right 12:35:00 PM	View next page of Sites	Site button
155 sbutt21 12:35:07 PM	Select 21st Site	
xxx Site Icons - no action 12:35:45 PM	xxx Site Icons	Again attempts to
xxx Site Icons - no action 12:35:46 PM	xxx Site Icons	press icons
xxx Site Icons - no action 12:35:46 PM	xxx Site Icons	
803 Page_turner 12:36:04 PM	View Next Text Page	
803 Page_turner 12:36:09 PM	View Next Text Page	
823 BSites 12:37:46 PM	Select New Site	Selects 22nd site
121 Site Right 12:37:52 PM	View next page of Sites	again by restarting
121 Site Right 12:37:59 PM	View next page of Sites	the site list
121 Site Right 12:38:05 PM	View next page of Sites	
121 Site Right 12:38:11 PM	View next page of Sites	
156 sbutt22 12:38:20 PM	Select 22nd Site	
803 Page_turner 12:39:28 PM	View Next Text Page	View all 5 text
803 Page_turner 12:39:30 PM	View Next Text Page	pages
803 Page_turner 12:39:51 PM	View Next Text Page	
803 Page_turner 12:39:54 PM	View Next Text Page	
803 Page_turner 12:40:00 PM	View Next Text Page	
*** TIMEOUT *** 12:42:59 PM	*** TIMEOUT ***	

User #2 exhibited a confusing and conflicting usage pattern during the search. This user chose the Geographic search, the state of Virginia and the 3rd forest, and searched within this forest throught the use time. User #2 chose the 3rd site in the selected forest, viewed three of the five text pages, backed up to the site selection screen, and chose the 3rd site again. User #2 viewed all five of the text pages during the second selection of the 3rd site, then moved to the nest site. In the 4th site, user #2 viewed all five text pages, pressed the icons three times, then viewed the first and second text pages again. The user then moved to the next site, but chose to go back to the site selection list. User #2 then paged to the third screen of sites, and selected the 12th site. Again, the user viewed all text pages, and repeated the first two. And again, User #2 Chose to view the next site, but then moved back to the site selection list. The user selected the 15th site, immediately attempted to activate the icons, then viewed all text pages, except the 5th, twice. Without moving to the next site, User #2 returned to the site selection list, and chose site 21, and again attempted to activate the site icons. Only three of the text pages were viewed before the user returned to the site selection list, and this time paged forward to the 22nd site. User #2 then viewed all of the text pages, and left the system.

Clearly, User #2 expected the site icons to produce some result, as the icon panel was pressed a total of twelve times despite the lack of response from the kiosk. User #2 recognized the function of the Page Turn Button from the beginning, but apparently paid little attention to the text presented, as indicated by the repeated viewing of many text pages. It is interesting that User #2 exhibited an understanding of the Back Up and Next Site Buttons early in the search, but in the latter stages, chose to re-display the site list in order to select a new site, rather than using the Next Site button. This might indicate some confusion on the part of User #2, or simply a haphazard approach to determining which location to view.

USER #3

100 Main Location Search 12:48:56 PM	Begin Geographic Search	
104 Little Righty Forward 12:49:05 PM	Next Page	
104 Little Righty Forward 12:49:07 PM	Next Page	Begins Geog.
119 Virginia 12:49:09 PM	Select Virginia	search, selects
128 statebarbutt 12:49:25 PM	Select New State	VA, then a new
108 Florida 12:49:37 PM	Select Florida	state, FL, 3rd
131 fbutt3 12:49:57 PM	Select 3rd Forest	forest.
121 Site Right 12:50:28 PM	View next page of Sites	Pages back and
120 Site Left 12:50:35 PM	View Previous Site List	forth through
121 Site Right 12:50:42 PM	View next page of Sites	sites
122 Site Return 12:50:46 PM	Return to Site List Beginning	
815 BBackup 12:50:56 PM	Back Up	Backs up to state
815 BBackup 12:51:03 PM	Back Up	selection, chooses
128 statebarbutt 12:51:10 PM	Select New State	AL, then abandons
106 Alabama 12:51:18 PM	Select Alabama	kiosk
*** TIMEOUT *** 12:54:17 PM	*** TIMEOUT ***	

User #3 accomplished nothing of consequence during the search. The user did view the list of sites available in one forest in Florida, but never viewed site information. User #3 did recognize the ability to choose a new state via the Button Bar.

USER #4

100 Main Location Search 1:20:03 PM	Begin Geographic Search	Begins Geog.
104 Little Righty Forward 1:20:09 PM	Next Page	search, selects VA
104 Little Righty Forward 1:20:13 PM	Next Page	and 1st forest
119 Virginia 1:20:15 PM	Select Virginia	
129 fbutt1 1:20:23 PM	Select 1st Forest	
824 activity bar 1:20:45 PM	Begin Activity Search	Abandons and
401 ATV 1:20:51 PM	Select ATV	begins activity
815 BBackup 1:21:04 PM	Back Up	search with ATV
401 ATV 1:21:07 PM	Select ATV	backs up, ATV
822 BRestart 1:21:14 PM	Restart	
101 Main activity search 1:21:17 PM	Begin Activity Search	Restarts activity,
401 ATV 1:21:19 PM	Select ATV	chooses ATV for
112 Mississippi 1:21:25 PM	Select Mississippi	3rd time, selects
815 BBackup 1:21:29 PM	Back Up	only state, then
815 BBackup 1:21:31 PM	Back Up	backs up to
815 BBackup 1:21:33 PM	Back Up	main menu
100 Main Location Search 1:21:37 PM	Begin Geographic Search	Begins new Geog
104 Little Righty Forward 1:21:40 PM	Next Page	search, selects
104 Little Righty Forward 1:21:42 PM	Next Page	VA again
119 Virginia 1:21:43 PM	Select Virginia	
824 activity bar 1:21:48 PM	Begin Activity Search	Again abandons
401 ATV 1:21:51 PM	Select ATV	and starts act. with
824 activity bar 1:21:59 PM	Begin Activity Search	ATV for 4th time,
402 Bike 1:22:01 PM	Select Bike Riding	then restarts with
104 Little Righty Forward 1:22:05 PM	Next Page	Bike, views states
103 Little Lefty 1:22:09 PM	Previous Page of States	
104 Little Righty Forward 1:22:11 PM	Next Page	
824 activity bar 1:22:17 PM	Begin Activity Search	restarts again, and
401 ATV 1:22:20 PM	Select ATV	selects ATV for
112 Mississippi 1:22:25 PM	Select Mississippi	5th time, again
104 Little Righty Forward 1:22:39 PM	Next Page	accepts state,
104 Little Righty Forward 1:22:41 PM	Next Page	stays in site list
119 Virginia 1:22:42 PM	Select Virginia	**this selection
119 Virginia 1:22:49 PM	Select Virginia	represents a
*** TIMEOUT *** 1:25:48 PM	*** TIMEOUT ***	program error**

User #4 represents a determined effort to find information that was not available. This user selected ATV as an activity to search five times, but never viewed the site information for the two opportunities avaliable in Mississippi. The two attempts at the Geographic search were almost identical, and equally fruitless. User #4's persistence in choosing ATV as an activity to search is perhaps indicative of frustration at the limited information available within the kiosk, or a complete lack of understanding about the system and computers in general. Unfortunately, the program error indicated by the selection of the Virginia Button at a point where it should not have been an option may have prevented a more thorough understanding of User #4's frustration with the kiosk.

USER #5

101 Main activity search 2:51:06 PM	Begin Activity Search	Begin activity
404 Camp 2:51:24 PM	Select Camping	search, Camping
104 Little Righty Forward 2:51:30 PM	Next Page	in VA, selects
119 Virginia 2:51:32 PM	Select Virginia	4th forest
811 BForests 2:51:35 PM	Select a Forest	
132 fbutt4 2:51:44 PM	Select 4th Forest	
803 Page_turner 2:52:18 PM	View Next Text Page	Views all 5 text
803 Page_turner 2:52:21 PM	View Next Text Page	screens, and the
803 Page_turner 2:52:53 PM	View Next Text Page	1st three a 2nd
803 Page_turner 2:52:56 PM	View Next Text Page	time
803 Page_turner 2:53:01 PM	View Next Text Page	
803 Page_turner 2:53:03 PM	View Next Text Page	
803 Page_turner 2:53:05 PM	View Next Text Page	
830 BRightArrow 2:53:31 PM	Next Site	moves through the
830 BRightArrow 2:53:51 PM	Next Site	next two sites
822 BRestart 2:53:59 PM	Restart	
100 Main Location Search 2:54:01 PM	Begin Geographic Search	Begins geog.
104 Little Righty Forward 2:54:03 PM	Next Page	search, selects
104 Little Righty Forward 2:54:04 PM	Next Page	VA, 4th forest,
119 Virginia 2:54:06 PM	Select Virginia	3rd site
132 fbutt4 2:54:12 PM	Select 4th Forest	
137 sbutt3 2:54:27 PM	Select 3rd Site	
803 Page_turner 2:54:47 PM	View Next Text Page	
803 Page_turner 2:54:49 PM	View Next Text Page	
803 Page_turner 2:55:03 PM	View Next Text Page	
803 Page_turner 2:55:11 PM	View Next Text Page	Views all text
803 Page_turner 2:55:23 PM	View Next Text Page	pages twice, and
803 Page_turner 2:55:26 PM	View Next Text Page	the 1st three
803 Page_turner 2:55:27 PM	View Next Text Page	a third time
803 Page_turner 2:55:29 PM	View Next Text Page	
803 Page_turner 2:55:32 PM	View Next Text Page	
803 Page_turner 2:55:36 PM	View Next Text Page	
803 Page_turner 2:55:38 PM	View Next Text Page	
803 Page_turner 2:55:40 PM	View Next Text Page	
830 BRightArrow 2:55:45 PM	Next Site	Moves to next site
803 Page_turner 2:56:34 PM	View Next Text Page	
803 Page_turner 2:56:36 PM	View Next Text Page	Views all text
803 Page_turner 2:57:03 PM	View Next Text Page	pages once, then
803 Page_turner 2:57:06 PM	View Next Text Page	the 1st three
803 Page_turner 2:57:48 PM	View Next Text Page	a second time
803 Page_turner 2:57:52 PM	View Next Text Page	
803 Page_turner 2:58:01 PM	View Next Text Page	
xxx Site Icons - no action 2:58:05 PM	xxx Site Icons	
830 BRightArrow 2:58:40 PM	Next Site	Moves to next site
803 Page_turner 2:59:20 PM	View Next Text Page	
803 Page_turner 2:59:22 PM	View Next Text Page	Views all text, and
803 Page_turner 2:59:35 PM	View Next Text Page	the 1st page a
803 Page_turner 2:59:50 PM	View Next Text Page	second time
803 Page_turner 3:00:06 PM	View Next Text Page	
830 BRightArrow 3:00:08 PM	Next Site	Moves to next site

815 BBackup 3:00:26 PM	Back Up	but backs up,
803 Page_turner 3:00:35 PM	View Next Text Page	then views the
803 Page_turner 3:00:39 PM	View Next Text Page	same text pages
803 Page_turner 3:00:43 PM	View Next Text Page	through again, and
803 Page_turner 3:00:46 PM	View Next Text Page	the 1st two pages
803 Page_turner 3:00:52 PM	View Next Text Page	twice
803 Page_turner 3:00:55 PM	View Next Text Page	
830 BRightArrow 3:01:05 PM	Next Site	Moves to next site
803 Page_turner 3:01:34 PM	View Next Text Page	again, then views
803 Page_turner 3:01:36 PM	View Next Text Page	all text pages once
803 Page_turner 3:01:51 PM	View Next Text Page	and the 1st two a
803 Page_turner 3:01:57 PM	View Next Text Page	second time
803 Page_turner 3:02:08 PM	View Next Text Page	
803 Page_turner 3:02:12 PM	View Next Text Page	
830 BRightArrow 3:02:19 PM	Next Site	Moves two sites
830 BRightArrow 3:02:57 PM	Next Site	forward, and then
815 BBackup 3:03:01 PM	Back Up	backs up one
803 Page_turner 3:03:07 PM	View Next Text Page	
803 Page_turner 3:03:12 PM	View Next Text Page	Views all text once
803 Page_turner 3:03:55 PM	View Next Text Page	and 1st page a
803 Page_turner 3:03:57 PM	View Next Text Page	second time
803 Page_turner 3:04:03 PM	View Next Text Page	
830 BRightArrow 3:04:08 PM	Next Site	Moves to next site
803 Page_turner 3:05:23 PM	View Next Text Page	
803 Page_turner 3:05:27 PM	View Next Text Page	Views text as
803 Page_turner 3:06:07 PM	View Next Text Page	previous site
803 Page_turner 3:06:09 PM	View Next Text Page	
803 Page_turner 3:06:12 PM	View Next Text Page	
830 BRightArrow 3:06:14 PM	Next Site	Moves to next site
803 Page_turner 3:06:38 PM	View Next Text Page	
803 Page_turner 3:07:14 PM	View Next Text Page	Views all text
803 Page_turner 3:07:23 PM	View Next Text Page	pages through
803 Page_turner 3:07:39 PM	View Next Text Page	once, views 1st
803 Page_turner 3:07:56 PM	View Next Text Page	three sites a
803 Page_turner 3:08:01 PM	View Next Text Page	second time
803 Page_turner 3:08:04 PM	View Next Text Page	
823 BSites 3:08:18 PM	Select New Site	Uses button bar
137 sbutt3 3:08:31 PM	Select 3rd Site	to select new site
803 Page_turner 3:08:42 PM	View Next Text Page	chooses 3rd,
803 Page_turner 3:08:44 PM	View Next Text Page	views 1st 4 text
803 Page_turner 3:08:46 PM	View Next Text Page	pages
823 BSites 3:08:50 PM	Select New Site	Uses button bar
136 sbutt2 3:08:58 PM	Select 2nd Site	again, selects 2nd
803 Page_turner 3:09:03 PM	View Next Text Page	site, views 1st
803 Page_turner 3:09:04 PM	View Next Text Page	four text pages
803 Page_turner 3:09:06 PM	View Next Text Page	
823 BSites 3:09:19 PM	Select New Site	Again uses button
121 Site Right 3:09:26 PM	View next page of Sites	bar, pages forward
811 BForests 3:10:39 PM	Select a Forest	in site list, selects
131 fbutt3 3:10:43 PM	Select 3rd Forest	new forest, then
139 sbutt5 3:11:12 PM	Select 5th Site	selects 5th site
803 Page_turner 3:11:23 PM	View Next Text Page	Views five text
803 Page_turner 3:11:25 PM	View Next Text Page	screens, then

803 Page_turner 3:11:48 PM	View Next Text Page	repeates 1st
803 Page_turner 3:11:53 PM	View Next Text Page	two
803 Page_turner 3:11:59 PM	View Next Text Page	
803 Page_turner 3:12:04 PM	View Next Text Page	
830 BRightArrow 3:12:08 PM	Next Site	Moves forward
830 BRightArrow 3:12:27 PM	Next Site	two sites
803 Page_turner 3:13:00 PM	View Next Text Page	
803 Page_turner 3:13:01 PM	View Next Text Page	Views five text
803 Page_turner 3:13:04 PM	View Next Text Page	pages, repeating
803 Page_turner 3:13:06 PM	View Next Text Page	1st two
803 Page_turner 3:13:36 PM	View Next Text Page	
803 Page_turner 3:13:38 PM	View Next Text Page	
830 BRightArrow 3:13:44 PM	Next Site	
830 BRightArrow 3:13:49 PM	Next Site	Moves forward 4
830 BRightArrow 3:13:54 PM	Next Site	sites
830 BRightArrow 3:14:00 PM	Next Site	
803 Page_turner 3:14:28 PM	View Next Text Page	
803 Page_turner 3:14:38 PM	View Next Text Page	
803 Page_turner 3:14:45 PM	View Next Text Page	
803 Page_turner 3:14:49 PM	View Next Text Page	
803 Page_turner 3:14:54 PM	View Next Text Page	Views all five text
803 Page_turner 3:14:57 PM	View Next Text Page	pages three times,
803 Page_turner 3:15:41 PM	View Next Text Page	and views 1st
803 Page_turner 3:16:00 PM	View Next Text Page	three pages a
803 Page_turner 3:16:03 PM	View Next Text Page	fourth time
803 Page_turner 3:16:08 PM	View Next Text Page	
803 Page_turner 3:16:12 PM	View Next Text Page	
803 Page_turner 3:16:43 PM	View Next Text Page	
803 Page_turner 3:16:51 PM	View Next Text Page	
803 Page_turner 3:16:54 PM	View Next Text Page	
803 Page_turner 3:16:58 PM	View Next Text Page	
803 Page_turner 3:17:00 PM	View Next Text Page	
803 Page_turner 3:17:28 PM	View Next Text Page	
830 BRightArrow 3:18:06 PM	Next Site	Moves forward 1
815 BBackup 3:18:12 PM	Back Up	site, then returns
803 Page_turner 3:18:20 PM	View Next Text Page	and views the
803 Page_turner 3:18:23 PM	View Next Text Page	same site text
803 Page_turner 3:18:58 PM	View Next Text Page	a fifth time
803 Page_turner 3:19:00 PM	View Next Text Page	
803 Page_turner 3:19:04 PM	View Next Text Page	
803 Page_turner 3:19:06 PM	View Next Text Page	
830 BRightArrow 3:19:08 PM	Next Site	Moves forward
830 BRightArrow 3:19:13 PM	Next Site	three sites and
830 BRightArrow 3:19:18 PM	Next Site	backs up one
815 BBackup 3:19:24 PM	Back Up	site
803 Page_turner 3:20:01 PM	View Next Text Page	
803 Page_turner 3:20:06 PM	View Next Text Page	
803 Page_turner 3:20:11 PM	View Next Text Page	
803 Page_turner 3:20:14 PM	View Next Text Page	Views all text
803 Page_turner 3:20:18 PM	View Next Text Page	pages twice
803 Page_turner 3:20:20 PM	View Next Text Page	
803 Page_turner 3:20:23 PM	View Next Text Page	
803 Page_turner 3:20:27 PM	View Next Text Page	

803 Page_turner 3:20:30 PM	View Next Text Page	
830 BRightArrow 3:20:43 PM	Next Site	move forward then
100 Main Location Search 3:25:41 PM	Begin Geographic Search	begin a new
104 Little Righty Forward 3:25:46 PM	Next Page	search
104 Little Righty Forward 3:25:47 PM	Next Page	
119 Virginia 3:25:48 PM	Select Virginia	Selects VA, 3rd
131 fbutt3 3:25:55 PM	Select 3rd Forest	forest and 14th
121 Site Right 3:26:28 PM	View next page of Sites	site
121 Site Right 3:26:34 PM	View next page of Sites	
148 sbutt14 3:26:41 PM	Select 14th Site	
803 Page_turner 3:26:49 PM	View Next Text Page	Views 1st 3 pages
803 Page_turner 3:26:51 PM	View Next Text Page	of text
823 BSites 3:27:19 PM	Select New Site	
121 Site Right 3:27:25 PM	View next page of Sites	returns to site
121 Site Right 3:27:31 PM	View next page of Sites	selection and
121 Site Right 3:27:36 PM	View next page of Sites	abandons search
*** TIMEOUT *** 3:30:36 PM	*** TIMEOUT ***	

User #5 began by using the Activity Search and viewed three sites, including all of the text pages for one of the three. The user then restarted, and began an extended Geographic Search, which lasted for over 30 minutes. User #5 chose to search the fourth forest in Virginia. Throught the search, the user viewed the same sites and text pages multiple times. In the fourth forest, user #5 selected sites 3,4,5,6, then returned to 5, then 6,7,8, then returned to 7, then 8 and 9, but returned to 3, then 2, then 5 a third time, then 6 and 7, through 8,9 and 10 to 11, moved to 12 but returned to 11, then through 12, 13 to 14 but again backed up to 13 and finally to 14, then began a brief search of the third forest. Additionally, the user frequently viewed a series of text pages several times, and with site 11, user #5 viewed each of the five text screens five times.

User #5 pressed the Site Icons one time. The user recognized the Page Turn Button early in the search, and took advantage of several of the Navigation Bar Buttons.

USER #6

100 Main Location Search 3:50:09 PM	Begin Geographic Search	
104 Little Righty Forward 3:50:13 PM	Next Page	Selected VA
104 Little Righty Forward 3:50:18 PM	Next Page	
119 Virginia 3:50:20 PM	Select Virginia	
128 statebarbutt 3:50:39 PM	Select New State	Chose a new state
104 Little Righty Forward 3:50:42 PM	Next Page	
104 Little Righty Forward 3:50:45 PM	Next Page	Selceted VA
119 Virginia 3:50:48 PM	Select Virginia	again
*** TIMEOUT *** 3:53:47 PM	*** TIMEOUT ***	

User #6 never moved beyond selecting a state to search, and used the kiosk for only 39 seconds. No data of consequence was obtained from this user.

USER #7

100 Main Location Search 4:22:08 PM	Begin Geographic Search	
104 Little Righty Forward 4:22:16 PM	Next Page	Begin geog.
104 Little Righty Forward 4:22:24 PM	Next Page	search, choose
119 Virginia 4:22:29 PM	Select Virginia	VA, 5th forest,
133 fbutt5 4:22:47 PM	Select 5th Forest	1st site
135 sbutt1 4:23:22 PM	Select 1st Site	
830 BRightArrow 4:23:44 PM	Next Site	
830 BRightArrow 4:24:31 PM	Next Site	moves through
830 BRightArrow 4:24:49 PM	Next Site	sites to 5th
xxx Site Icons - no action 4:25:03 PM	xxx Site Icons	
830 BRightArrow 4:25:15 PM	Next Site	
823 BSites 4:25:34 PM	Select New Site	returns to site list
121 Site Right 4:25:41 PM	View next page of Sites	selects 9th site
143 sbutt9 4:25:59 PM	Select 9th Site	
xxx Site Icons - no action 4:26:31 PM	xxx Site Icons	
xxx Site Icons - no action 4:26:32 PM	xxx Site Icons	
830 BRightArrow 4:26:35 PM	Next Site	
830 BRightArrow 4:26:41 PM	Next Site	moves to 12th
830 BRightArrow 4:26:47 PM	Next Site	site
803 Page_turner 4:27:17 PM	View Next Text Page	
803 Page_turner 4:27:23 PM	View Next Text Page	Views all text
803 Page_turner 4:27:30 PM	View Next Text Page	pages
803 Page_turner 4:27:33 PM	View Next Text Page	
803 Page_turner 4:27:34 PM	View Next Text Page	
830 BRightArrow 4:27:40 PM	Next Site	
830 BRightArrow 4:27:47 PM	Next Site	
830 BRightArrow 4:27:52 PM	Next Site	moves to 18th site
830 BRightArrow 4:27:57 PM	Next Site	
830 BRightArrow 4:28:04 PM	Next Site	
830 BRightArrow 4:28:12 PM	Next Site	
815 BBackup 4:28:22 PM	Back Up	
815 BBackup 4:28:28 PM	Back Up	
815 BBackup 4:28:46 PM	Back Up	
815 BBackup 4:28:51 PM	Back Up	moves back to 7th
815 BBackup 4:28:56 PM	Back Up	site
815 BBackup 4:29:12 PM	Back Up	
815 BBackup 4:29:17 PM	Back Up	
815 BBackup 4:29:22 PM	Back Up	
815 BBackup 4:29:26 PM	Back Up	
815 BBackup 4:29:31 PM	Back Up	
815 BBackup 4:29:37 PM	Back Up	
xxx Site Icons - no action 4:29:41 PM	xxx Site Icons	
813 BHelp 4:29:46 PM	Get Help	Get help
904 COMMENT 4:30:06 PM	Leave a Comment	
909 finished 4:30:25 PM	Finished Leaving Comment	after comment,
822 BRestart 4:30:33 PM	Restart	restarts
101 Main activity search 4:30:41 PM	Begin Activity Search	begin activity
412 Hunt 4:30:47 PM	Select Hunting	search, selects
108 Florida 4:30:52 PM	Select Florida	hunting in FL
292 idxstate 4:30:58 PM	Search Entire State	

830 BRightArrow 4:31:19 PM	Next Site	
830 BRightArrow 4:31:32 PM	Next Site	
830 BRightArrow 4:31:38 PM	Next Site	moves through
830 BRightArrow 4:31:45 PM	Next Site	sites 1-6
830 BRightArrow 4:31:53 PM	Next Site	
822 BRestart 4:32:00 PM	Restart	
102 MainHelp 4:34:33 PM	Get Help	
325 Tab Blank- Light 4:34:45 PM	Select Help Topic	get help
000 HELP - Definitions 4:35:27 PM	Help: Definitions	
822 BRestart 4:35:31 PM	Restart	Restart
*** TIMEOUT *** 4:38:31 PM	*** TIMEOUT ***	abandon

User #7 viewed the first screen for 15 sites in the Geographic Search, and six screens in the Activity Search. The user pressed the Site icon panel four times and used the Page Turn Button to view all text pages for one site. User #7 used the Back Up Button 11 consecutive times, rather than use the Restart Button. This suggests that the user was browsing through data, and was interested enough in the sites to view them a second time. The time interval between uses of the Back Up Button, however, averaged 5 seconds, which indicates the user was simply returning to a previous selection opportunity. User #7 exhibited an understanding of the Selet New Site Button on the Navigation Bar early in the search, so there is some inconsistancy in user behavior.

The user pressed the Leave Comment Button during the search, but pressed the Finished Button without entering text. User #7 next used the Restart Button and began an Activity Search. The user selected Hunting in Florida, and searched the entire state. Six sites were viewed before the Restart Button was pressed, the user returned to the Help Screen, and the Definitions topic was viewed. User #7 pressed the Restart Button again, then abandoned the Kiosk.

USER #8

100 Main Location Search 4:56:56 PM	Begin Geographic Search	
104 Little Righty Forward 4:57:01 PM	Next Page	Began geog.
104 Little Righty Forward 4:57:05 PM	Next Page	searched in TX,
118 Texas 4:57:07 PM	Select Texas	select 3rd forest,
131 fbutt3 4:57:20 PM	Select 3rd Forest	1st site
135 sbutt1 4:57:39 PM	Select 1st Site	
xxx Site Photograph - no action 4:57:43 PM	xxx Site Photograph	
803 Page_turner 4:57:54 PM	View Next Text Page	viewed 2nd text
830 BRightArrow 4:57:59 PM	Next Site	page, moved to
830 BRightArrow 4:58:09 PM	Next Site	4th site
830 BRightArrow 5:00:28 PM	Next Site	
815 BBackup 5:00:57 PM	Back Up	Backed up through
815 BBackup 5:01:01 PM	Back Up	all steps in the
815 BBackup 5:01:06 PM	Back Up	search and
815 BBackup 5:01:10 PM	Back Up	abandoned
815 BBackup 5:01:19 PM	Back Up	
815 BBackup 5:01:23 PM	Back Up	
*** TIMEOUT *** 5:04:23 PM	*** TIMEOUT ***	

User #8 initiated a Geographic Search, and searched the third forest in Texas. The user chose the 1st site in the forest, and immediately pressed the Photograph Panel, then viewed the second text page. User #8 then moved forward to the fourth site. Finally, the user pressed the Back Up Button six times, and returned to the State Selecion screen before the kiosk was abandoned.

This user discovered the function of the Page Turn Button, but used it only once. The only Navigation Bar Button User #8 pressed was the Back Up Button.

USER #9

102 MainHelp 9:58:24 AM	Get Help	Get help,
822 BRestart 9:58:43 AM	Restart	restart
102 MainHelp 9:58:48 AM	Get Help	Get help again
325 Tab Blank- Light 9:59:03 AM	Select Help Topic	
000 HELP - Activity Search 9:59:25 AM	HELP: Activity Search	Activity
325 Tab Blank- Light 9:59:27 AM	Select Help Topic	
000 HELP - Information Available 9:59:44 AM	HELP: Information Available	Information
325 Tab Blank- Light 9:59:53 AM	Select Help Topic	
000 HELP - Information Available 10:00:10 AM	HELP: Information Available	Information again
325 Tab Blank- Light 10:00:13 AM	Select Help Topic	
000 HELP - Button Functions 10:00:38 AM	HELP: Button Functions	Button Funtions
*** TIMEOUT *** 10:03:12 AM	*** TIMEOUT ***	

User #9 began with the Get Help Button. The user viewed the help topics Activity Search, Information Available twice, and Button Functions. Interestingly, the user pressed the Restart Button after the main Help screen was displayed, then returned immediately to Get Help.

USER #10

100 Main Location Search 10:09:55 AM	Begin Geographic Search	Begin geog.
108 Florida 10:10:03 AM	Select Florida	search, FL, 1st
129 fbutt1 10:10:16 AM	Select 1st Forest	forest, 2nd site
136 sbutt2 10:10:49 AM	Select 2nd Site	
830 BRightArrow 10:11:20 AM	Next Site	moved to
830 BRightArrow 10:11:36 AM	Next Site	4th site
822 BRestart 10:11:50 AM	Restart	restart
101 Main activity search 10:11:53 AM	Begin Activity Search	Begin activity
401 ATV 10:12:05 AM	Select ATV	select ATV
112 Mississippi 10:12:14 AM	Select Mississippi	MS (only choice)
292 idxstate 10:12:17 AM	Search Entire State	
830 BRightArrow 10:12:35 AM	Next Site	viewed only site
803 Page_turner 10:12:54 AM	View Next Text Page	
803 Page_turner 10:13:01 AM	View Next Text Page	
803 Page_turner 10:13:05 AM	View Next Text Page	viewed all text
803 Page_turner 10:13:11 AM	View Next Text Page	pages and 1st two
803 Page_turner 10:13:17 AM	View Next Text Page	again
803 Page_turner 10:13:33 AM	View Next Text Page	
822 BRestart 10:13:38 AM	Restart	restart
102 MainHelp 10:13:45 AM	Get Help	Get help
325 Tab Blank- Light 10:14:06 AM	Select Help Topic	
000 HELP - Activity Search 10:14:28 AM	HELP: Activity Search	Activity
325 Tab Blank- Light 10:14:48 AM	Select Help Topic	
000 HELP - Activity Search 10:15:09 AM	HELP: Activity Search	Activity again
904 COMMENT 10:15:12 AM	Leave a Comment	
909 finished 10:15:22 AM	Finished Leaving Comment	
325 Tab Blank- Light 10:15:31 AM	Select Help Topic	
000 HELP - Information Available 10:15:47 AM	HELP: Information Available	Information
325 Tab Blank- Light 10:15:57 AM	Select Help Topic	
000 HELP - Information Available 10:16:14 AM	HELP: Information Available	Information again
325 Tab Blank- Light 10:16:17 AM	Select Help Topic	
000 HELP - Button Functions 10:16:42 AM	HELP: Button Functions	Button Functions
325 Tab Blank- Light 10:16:57 AM	Select Help Topic	
000 HELP - Activity Search 10:17:19 AM	HELP: Activity Search	Activity
325 Tab Blank- Light 10:17:22 AM	Select Help Topic	
000 HELP - Credits and Sources 10:17:37 AM	HELP: Credits and Sources	Credits
325 Tab Blank- Light 10:17:44 AM	Select Help Topic	
000 HELP - Information Available 10:18:01 AM	Information Available	Information 3rd
822 BRestart 10:18:04 AM	Restart	restart and
*** TIMEOUT *** 10:21:04 AM	*** TIMEOUT ***	abandon

User #10 utilized both the Geographic and Activity Searches, beginning with the former. The user viewed the first page of three sites in Florida before pressing the Restart Button. The user then began the Activity Seach, and chose to search ATV. User #10 selected the only choice, Mississippi, and searched the entire state. After the first site was displayed, the user pressed the Next Site Button, and idscovered that only one site was found for ATV. User #10 then viewed all text pages for that site before the Restart Button was pressed. The user chose

Get Help, and selected the Activity Search topic twice. The Leave Comment Button was pressed, though no comment was entered in the text field. User #10 next viewed the help topics Information Available twice, Button Functions, Activity Search a third time, and Information Available a third time. User #10 finally pressed the Restart Button and abandoned the search.

User #10 recognized the Page Turn Button and did not attempt to press the Site Icons or Photograph Panel. The only Navigation Bar Button the user pressed was the Restart Button. The user utilized both search methods, but viewed more information in the Activity Search.

USER #11

100 Main Location Search 11:22:51 AM	Begin Geographic Search	Begin geog.
110 Kentucky 11:22:56 AM	Select Kentucky	selects KY, views
110 Kentucky 11:23:24 AM	Select Kentucky	no info screen
128 statebarbutt 11:23:27 AM	Select New State	repeats KY
110 Kentucky 11:23:29 AM	Select Kentucky	selection 3 times
128 statebarbutt 11:23:43 AM	Select New State	
110 Kentucky 11:23:47 AM	Select Kentucky	
824 activity bar 11:23:59 AM	Begin Activity Search	Begin activity
401 ATV 11:24:07 AM	Select ATV	ATV, only MS
815 BBackup 11:24:24 AM	Back Up	Back up
822 BRestart 11:24:28 AM	Restart	restart
102 MainHelp 11:25:04 AM	Get Help	Get Help
325 Tab Blank- Light 11:25:17 AM	Select Help Topic	
000 HELP - Activity Search 11:25:39 AM	Activity Search	Activity
904 COMMENT 11:25:58 AM	Leave a Comment	
909 finished 11:26:07 AM	Finished Leaving Comment	
325 Tab Blank- Light 11:26:24 AM	Select Help Topic	
000 HELP - Information Available 11:26:41 AM	Information Available	Information
*** TIMEOUT *** 11:29:24 AM	*** TIMEOUT ***	abandon

User #11 was unfortunately interested in the state of Kentucky, for which no information is available in the Kiosk. The user's frustration is evident in the repeated selection of Kentucky, despite the "no information" screen. The user next began an Activity Search, and made the unfortunate choice of ATV as the activity to search. ATV is found in only one state, Mississippi, and in only one site in the state. User #11 chose to restart, rather than explore Mississippi. The user chose Get Help, and viewed the topics Activity Search and Information Available. The Leave Comment Button was also pressed, but no text was entered in the text field.

Given the user's lack of success, the selection of Get Help: Information Available was a logical attempt to discover what information the Kiosk might provide. User #11's data indicates the importance of providing complete information. It is unfortunate that the user selected two of the several "weak links" in the database.

USER #12

102 MainHelp 2:19:57 PM	Get Help	Begin with help
822 BRestart 2:20:10 PM	Restart	restart
101 Main activity search 2:20:13 PM	Begin Activity Search	Begin activity
822 BRestart 2:20:17 PM	Restart	restart
100 Main Location Search 2:20:44 PM	Begin Geographic Search	Begin geog.
104 Little Righty Forward 2:20:47 PM	Next Page	
104 Little Righty Forward 2:20:49 PM	Next Page	select VA
119 Virginia 2:20:51 PM	Select Virginia	5th forest
133 fbutt5 2:21:00 PM	Select 5th Forest	views 1st page of
135 sbutt1 2:21:18 PM	Select 1st Site	1st and 2nd
830 BRightArrow 2:21:31 PM	Next Site	sites
*** TIMEOUT *** 2:24:30 PM	*** TIMEOUT ***	abandon

User #12 accomplished little during the search, but did view the first screen of infomation for two sites. That the user began an Activity Search but chose to restart and begin a Geographic Search suggests that the user did not find an activity of interest, or perhaps simply wanted to explore the offerings. This assumption is reinforced by the user's move to the main Help menu, and the subsequent Restart.

The user did not attempt to press the Page Turn Button, and did not press the non-functional items on the Site Display screen.

USER #13

904 COMMENT 2:30:28 PM	Leave a Comment	Begin with
909 finished 2:30:33 PM	Finished Leaving Comment	comment
101 Main activity search 2:30:53 PM	Begin Activity Search	Begin activity
404 Camp 2:31:00 PM	Select Camping	select camping
104 Little Righty Forward 2:31:08 PM	Next Page	page through
103 Little Lefty 2:31:14 PM	Previous Page of States	site list, choose
106 Alabama 2:31:17 PM	Select Alabama	AL, but back-up
815 BBackup 2:31:27 PM	Back Up	
824 activity bar 2:31:31 PM	Begin Activity Search	restarts activity
403 Boat 2:31:52 PM	Select Boating	choose boating
106 Alabama 2:31:55 PM	Select Alabama	select AL
813 BHelp 2:32:06 PM	Get Help	Get help
*** TIMEOUT *** 2:35:06 PM	*** TIMEOUT ***	abandon

User #13 Began the use by pressing the Leave Comment Button, although no text was entered in the entry field. The user then began an Activity Search, but never viewed a Site Display screen. The user's final move was to Get Help, but no help topics were selected before the search was abandoned.

It is possible that this user had used the Kiosk previously, due to the immediate selection of the Comment Button. It may be, though, that the user was simply exploring the system and was curious about the function of the Comment Button.

USER #14

904 COMMENT 3:09:11 PM	Leave a Comment	Begin with
909 finished 3:09:16 PM	Finished Leaving Comment	comment
101 Main activity search 3:09:38 PM	Begin Activity Search	Begin activity
815 BBackup 3:09:42 PM	Back Up	
101 Main activity search 3:09:45 PM	Begin Activity Search	restart activity
412 Hunt 3:09:47 PM	Select Hunting	select hunting in
113 NorthCarolina 3:09:59 PM	Select North Carolina	NC, search
292 idxstate 3:10:06 PM	Search Entire State	entire state
803 Page_turner 3:10:21 PM	View Next Text Page	views 1st site,
803 Page_turner 3:10:25 PM	View Next Text Page	all text pages
803 Page_turner 3:10:41 PM	View Next Text Page	and 1st two a
803 Page_turner 3:10:52 PM	View Next Text Page	second time
803 Page_turner 3:11:18 PM	View Next Text Page	
803 Page_turner 3:11:21 PM	View Next Text Page	
830 BRightArrow 3:11:27 PM	Next Site	move to next site
803 Page_turner 3:11:53 PM	View Next Text Page	view all text pages
803 Page_turner 3:12:05 PM	View Next Text Page	and 1st page
803 Page_turner 3:12:14 PM	View Next Text Page	a second time
803 Page_turner 3:12:20 PM	View Next Text Page	
803 Page_turner 3:12:47 PM	View Next Text Page	
*** TIMEOUT *** 3:15:47 PM	*** TIMEOUT ***	abandon

As with User #13, User #14 began the search by pressing the Leave Comment Button, and as before, no text was entered in the comment field. The user then began an Activity Search, pressed the Back Up Button, and restared the Activity Search. The user chose to search for Hunting opportunities in North Carolina, and searched the entire state. User #14 viewed all text pages for the first site, and moved to the second site. Again, the user viewed all text pages before abandoning the system.

User #14 did not attempt to press the Site Icon Panel, nor the Site Photograph, but clearly recognized the function of the Page Turn Button. No Geographic Search was attempted by User #14.

USER #15

100 Main Location Search 3:37:49 PM	Begin Geographic Search	Begin geog.
104 Little Righty Forward 3:37:53 PM	Next Page	
104 Little Righty Forward 3:37:56 PM	Next Page	select VA,
119 Virginia 3:37:59 PM	Select Virginia	second forest
811 BForests 3:38:03 PM	Select a Forest	
130 fbutt2 3:38:10 PM	Select 2nd Forest	
830 BRightArrow 3:38:28 PM	Next Site	move through list
830 BRightArrow 3:38:38 PM	Next Site	of sites
830 BRightArrow 3:39:04 PM	Next Site	
811 BForests 3:39:12 PM	Select a Forest	select new forest
130 fbutt2 3:39:20 PM	Select 2nd Forest	select 2nd forest
815 BBackup 3:39:35 PM	Back Up	again, but back-up
119 Virginia 3:39:38 PM	Select Virginia	select VA again
811 BForests 3:39:44 PM	Select a Forest	select 1st forest
129 fbutt1 3:39:50 PM	Select 1st Forest	
128 statebarbutt 3:40:11 PM	Select New State	select new state
119 Virginia 3:40:13 PM	Select Virginia	again choose VA
811 BForests 3:40:17 PM	Select a Forest	
104 Little Righty Forward 3:40:37 PM	Next Page	does not select
104 Little Righty Forward 3:40:40 PM	Next Page	forest, but new
119 Virginia 3:40:42 PM	Select Virginia	state, VA again
822 BRestart 3:40:47 PM	Restart	Restart
101 Main activity search 3:40:51 PM	Begin Activity Search	Begin activity
404 Camp 3:40:58 PM	Select Camping	choose camping
104 Little Righty Forward 3:41:01 PM	Next Page	select VA
119 Virginia 3:41:03 PM	Select Virginia	
811 BForests 3:41:08 PM	Select a Forest	select 5th forest
133 fbutt5 3:41:18 PM	Select 5th Forest	
803 Page_turner 3:41:41 PM	View Next Text Page	view 1st 3 text
803 Page_turner 3:41:46 PM	View Next Text Page	pages of 1st site
830 BRightArrow 3:41:50 PM	Next Site	move to next site
815 BBackup 3:42:00 PM	Back Up	but back up to 1st
xxx Site Icons - no action 3:42:10 PM	xxx Site Icons	
803 Page_turner 3:42:14 PM	View Next Text Page	view 1st four text
803 Page_turner 3:42:17 PM	View Next Text Page	pages
803 Page_turner 3:42:23 PM	View Next Text Page	
830 BRightArrow 3:42:32 PM	Next Site	
830 BRightArrow 3:42:40 PM	Next Site	move forward to
830 BRightArrow 3:42:49 PM	Next Site	6th site
830 BRightArrow 3:42:57 PM	Next Site	
830 BRightArrow 3:43:09 PM	Next Site	
815 BBackup 3:43:22 PM	Back Up	
815 BBackup 3:43:31 PM	Back Up	Back up to forest
815 BBackup 3:43:36 PM	Back Up	selection screen
815 BBackup 3:43:42 PM	Back Up	
815 BBackup 3:43:49 PM	Back Up	
815 BBackup 3:43:55 PM	Back Up	
104 Little Righty Forward 3:43:59 PM	Next Page	
119 Virginia 3:44:01 PM	Select Virginia	select VA again
811 BForests 3:44:04 PM	Select a Forest	

133 fbutt5 3:44:15 PM	Select 5th Forest	select 5th again
803 Page_turner 3:44:37 PM	View Next Text Page	view 1st two text
803 Page_turner 3:44:39 PM	View Next Text Page	pages again
824 activity bar 3:45:15 PM	Begin Activity Search	begin new activity
412 Hunt 3:45:21 PM	Select Hunting	select hunting
119 Virginia 3:45:23 PM	Select Virginia	in VA
811 BForests 3:45:27 PM	Select a Forest	
130 fbutt2 3:45:34 PM	Select 2nd Forest	select 2nd forest
xxx Site Icons - no action 3:45:49 PM	xxx Site Icons	
830 BRightArrow 3:45:50 PM	Next Site	move to 2nd site,
128 statebarbutt 3:45:57 PM	Select New State	then to select new
119 Virginia 3:45:59 PM	Select Virginia	state, VA again
811 BForests 3:46:04 PM	Select a Forest	the forest list
822 BRestart 3:46:13 PM	Restart	Restart
102 MainHelp 3:46:15 PM	Get Help	Get Help
822 BRestart 3:46:28 PM	Restart	Restart
101 Main activity search 3:46:36 PM	Begin Activity Search	Begin new activity
412 Hunt 3:46:42 PM	Select Hunting	select hunt again
119 Virginia 3:46:45 PM	Select Virginia	VA again
811 BForests 3:46:49 PM	Select a Forest	2nd forest again
130 fbutt2 3:46:54 PM	Select 2nd Forest	
830 BRightArrow 3:47:11 PM	Next Site	move to 2nd site
815 BBackup 3:47:17 PM	Back Up	return to 1st site
119 Virginia 3:47:22 PM	Select Virginia	select new state,
811 BForests 3:47:27 PM	Select a Forest	VA again, choose
129 fbutt1 3:47:36 PM	Select 1st Forest	1st forest, move
830 BRightArrow 3:47:57 PM	Next Site	to 3rd site
830 BRightArrow 3:48:13 PM	Next Site	
811 BForests 3:48:22 PM	Select a Forest	choose new forest
130 fbutt2 3:48:28 PM	Select 2nd Forest	2nd forest again
803 Page_turner 3:48:46 PM	View Next Text Page	view 1st site, all
803 Page_turner 3:48:49 PM	View Next Text Page	text pages and
803 Page_turner 3:48:55 PM	View Next Text Page	repeat 1st two
803 Page_turner 3:48:58 PM	View Next Text Page	
803 Page_turner 3:49:04 PM	View Next Text Page	
803 Page_turner 3:49:09 PM	View Next Text Page	
815 BBackup 3:49:14 PM	Back Up	Back up to select
119 Virginia 3:49:16 PM	Select Virginia	new state, choose
292 idxstate 3:49:21 PM	Search Entire State	VA, search entire
830 BRightArrow 3:49:33 PM	Next Site	state, move to 2
822 BRestart 3:49:42 PM	Restart	Restart
100 Main Location Search 3:49:47 PM	Begin Geographic Search	Begin new geog.
110 Kentucky 3:49:48 PM	Select Kentucky	attempt KY,
822 BRestart 3:49:58 PM	Restart	Restart
101 Main activity search 3:50:02 PM	Begin Activity Search	Begin new activity
409 Fish 3:50:14 PM	Select Fishing	choose fishing
104 Little Righty Forward 3:50:17 PM	Next Page	select VA,
119 Virginia 3:50:18 PM	Select Virginia	select 5th forest
811 BForests 3:50:21 PM	Select a Forest	
133 fbutt5 3:50:29 PM	Select 5th Forest	move to 2nd
830 BRightArrow 3:50:49 PM	Next Site	site
*** TIMEOUT *** 3:53:49 PM	*** TIMEOUT ***	abandon

User #15 Began with a Geographic Search, but seemed somewhat uncertain or confused by the selection required. After an inital success, where the first page of four sites were viewed in Virginia, the user decided to select a new forest. User #15 selected the second forest again, but backed up to select a new state. Virginia was again selected, and the user chose the first forest. After the first page of site names was displayed, the user decided to select a new state, but again chose Virginia. Some confusion is evident in the subsequent moves, as the user pressed the Select New Forest button, despite the list of forests displayed on the screen. Once again, the user chose to select a new state, and again chose Virginia, but aborted the search by pressing Restart.

The user next began an Actvity Search, choosing Camping in Virginia. User #15 then began a series of moves, shown above, which reflect similar confusion. The user did recognize and use the Page Turn Button several times, but also attempted to press the Site Icon Panel. Midway through the inital Activity Search, User #15 presed Restart and moved to Get Help. The user did not select a help topic, but pressed Restart again and began a new Activity Search. After a number of moves within the Activity Search, User #15 again attempted a Geographic Search, and chose Kentucky. As noted with a previous user, no information is available for Kentucky, and User #15 pressed Restart after viewing the "For more information..." screen displayed when Kentucky is selected. The user ended with a brief Activity Search, before abandoning the kiosk.

This user spent 13 minutes using the system, and explored most of the offerings, despite the tenative manner in which the system was apporached. User #15 used the Page Turn Button to view several text pages, pressed the Site Icon Panel twice, and utilized many of the Navigation Bar Buttons. The user exhibited a preference for the Activity Search, and viewed substantially more site information in Activity than in Geographic Search.

USER #16

102 MainHelp 10:07:21 AM	Get Help	Begin with Help,
325 Tab Blank- Light 10:07:34 AM	Select Help Topic	choose Definitions
000 HELP - Definitions 10:08:16 AM	HELP: Definitions	
*** TIMEOUT *** 10:10:34 AM	*** TIMEOUT ***	abandon

User #16 viewed only one help topic, Definitions, before abandoning the kiosk.

USER #17

100 Main Location Search 11:20:30 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 11:20:34 AM	Next Page	
104 Little Righty Forward 11:20:38 AM	Next Page	choose VA
119 Virginia 11:20:42 AM	Select Virginia	
104 Little Righty Forward 11:20:58 AM	Next Page	** Program error**
103 Little Lefty 11:21:02 AM	Previous Page of Sites	** program entered
815 BBackup 11:21:06 AM	Back Up	** activity search
104 Little Righty Forward 11:21:12 AM	Next Page	
119 Virginia 11:21:14 AM	Select Virginia	
407 ccski 11:21:33 AM	Select X-Country Skiing	
119 Virginia 11:21:53 AM	Select Virginia	
407 ccski 11:22:05 AM	Select X-Country Skiing	
*** TIMEOUT *** 11:25:04 AM	*** TIMEOUT ***	

USER #18

102 MainHelp 2:22:05 PM	Get Help	Begin with help
822 BRestart 2:22:17 PM	Restart	Restart
101 Main activity search 2:22:22 PM	Begin Activity Search	Begin activity
416 Swim 2:22:30 PM	Select Swimming	choose swimming
111 Louisiana 2:22:35 PM	Select Louisiana	select LA, search
292 idxstate 2:22:41 PM	Search Entire State	entire state
824 activity bar 2:22:54 PM	Begin Activity Search	start new activity
415 Rifle 2:22:55 PM	Select Rifle Range	select rifle range
116 SouthCarolina 2:22:58 PM	Select South Carolina	in SC,
811 BForests 2:23:03 PM	Select a Forest	choose forest
104 Little Righty Forward 2:23:17 PM	Next Page	
104 Little Righty Forward 2:23:18 PM	Next Page	** Program error**
119 Virginia 2:23:24 PM	Select Virginia	** Program error**
292 idxstate 2:23:30 PM	Search Entire State	
*** TIMEOUT *** 2:26:30 PM	*** TIMEOUT ***	abandon

USER #19

904 COMMENT 2:27:42 PM	Leave a Comment	
909 finished 2:27:46 PM	Finished Leaving Comment	
*** TIMEOUT *** 2:30:46 PM	*** TIMEOUT ***	abandon

User #19 Pressed the Leave Comment Button, but did not enter any text in the comment field.

USER #20

100 Main Location Search 2:59:39 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 2:59:45 PM	Next Page	
104 Little Righty Forward 2:59:48 PM	Next Page	
119 Virginia 2:59:49 PM	Select Virginia	select VA
107 Arkansas 3:00:16 PM	Select Arkansas	** Program error **
824 activity bar 3:00:26 PM	Begin Activity Search	Begin activity
416 Swim 3:00:34 PM	Select Swimming	choose swimming
104 Little Righty Forward 3:00:38 PM	Next Page	
119 Virginia 3:00:40 PM	Select Virginia	select VA, search
292 idxstate 3:00:47 PM	Search Entire State	entire state
803 Page_turner 3:01:24 PM	View Next Text Page	view all text pages
803 Page_turner 3:01:27 PM	View Next Text Page	for 1st site
803 Page_turner 3:01:32 PM	View Next Text Page	
803 Page_turner 3:01:35 PM	View Next Text Page	
803 Page_turner 3:01:40 PM	View Next Text Page	
xxx Site Icons - no action 3:01:45 PM	xxx Site Icons	
xxx Site Icons - no action 3:01:48 PM	xxx Site Icons	
830 BRightArrow 3:01:49 PM	Next Site	move to 2nd site
xxx Site Icons - no action 3:02:01 PM	xxx Site Icons	
128 statebarbutt 3:02:04 PM	Select New State	choose new state
104 Little Righty Forward 3:02:17 PM	Next Page	
119 Virginia 3:02:19 PM	Select Virginia	choose VA
*** TIMEOUT *** 3:05:19 PM	*** TIMEOUT ***	abandon

User #20 began with a Geographic Search, but the ongoing program error prevented the user from reaching the Forest Selection screen. The user next initated an Activity Search, which was executed without the recurrance of the program error. The latter portion of this search is considered valid for evaluating the use of the Page Turn Button and attempts to activate the Icon Panel and Photograph Panel. User #20 did use the Page Turn Button to view all text pages for one site, and also pressed the Site Icon Panel three times.

USER #21

101 Main activity search 3:50:59 PM	Begin Activity Search	Begin activity
405 Canoe 3:50:59 PM	Select Canoeing	choose canoe
104 Little Righty Forward 3:51:07 PM	Next Page	in NC
113 NorthCarolina 3:51:10 PM	Select North Carolina	
292 idxstate 3:51:27 PM	Search Entire State	search entire state
824 activity bar 3:51:50 PM	Begin Activity Search	restart activity
407 ccski 3:51:53 PM	Select X-Country Skiing	choose skiing
119 Virginia 3:51:58 PM	Select Virginia	in VA (only choice)
407 ccski 3:52:09 PM	Select X-Country Skiing	** Program error **
119 Virginia 3:52:11 PM	Select Virginia	** Program error **
104 Little Righty Forward 3:52:18 PM	Next Page	
104 Little Righty Forward 3:52:21 PM	Next Page	
119 Virginia 3:52:22 PM	Select Virginia	
811 BForests 3:52:30 PM	Select a Forest	
104 Little Righty Forward 3:53:06 PM	Next Page	
113 NorthCarolina 3:53:08 PM	Select North Carolina	
113 NorthCarolina 3:53:17 PM	Select North Carolina	
104 Little Righty Forward 3:53:23 PM	Next Page	
105 Little Righty Return 3:53:28 PM	Return to 1st Page of States	
104 Little Righty Forward 3:53:33 PM	Next Page	All choice are
113 NorthCarolina 3:53:37 PM	Select North Carolina	invalid: program
113 NorthCarolina 3:53:41 PM	Select North Carolina	is in wrong set
113 NorthCarolina 3:53:44 PM	Select North Carolina	of sub-routines
113 NorthCarolina 3:53:50 PM	Select North Carolina	
104 Little Righty Forward 3:54:07 PM	Next Page	
119 Virginia 3:54:09 PM	Select Virginia	
104 Little Righty Forward 3:54:18 PM	Next Page	
114 Oklahoma 3:54:22 PM	Select Oklahoma	
815 BBackup 3:54:26 PM	Back Up	
115 PuertoRico 3:54:28 PM	Select Puerto Rico	
128 statebarbutt 3:54:47 PM	Select New State	
815 BBackup 3:54:52 PM	Back Up	
815 BBackup 3:54:52 PM	Back Up	
113 NorthCarolina 3:54:55 PM	Select North Carolina	
104 Little Righty Forward 3:55:17 PM	Next Page	
813 BHelp 3:55:19 PM	Get Help	
325 Tab Blank- Light 3:55:31 PM	Select Help Topic	
000 HELP - Credits and Sources 3:55:47 PM	HELP: Credits and Sources	
325 Tab Blank- Light 3:55:50 PM	Select Help Topic	
000 HELP - Information Available 3:56:06 PM	HELP: Information Available	
815 BBackup 3:56:20 PM	Back Up	
815 BBackup 3:56:24 PM	Back Up	
815 BBackup 3:56:29 PM	Back Up	
103 Little Lefty 3:56:33 PM	Previous Page of States	
104 Little Righty Forward 3:56:34 PM	Next Page	
105 Little Righty Return 3:56:35 PM	Return to 1st Page of States	
109 Georgia 3:56:41 PM	Select Georgia	
108 Florida 3:56:45 PM	Select Florida	
106 Alabama 3:56:47 PM	Select Alabama	
107 Arkansas 3:56:50 PM	Select Arkansas	
108 Florida 3:56:52 PM	Select Florida	

109 Georgia 3:56:56 PM	Select Georgia
110 Kentucky 3:57:02 PM	Select Kentucky
824 activity bar 3:57:12 PM	Begin Activity Search
412 Hunt 3:57:15 PM	Select Hunting
119 Virginia 3:57:25 PM	Select Virginia
292 idxstate 3:57:33 PM	Search Entire State
822 BRestart 3:57:42 PM	Restart
100 Main Location Search 3:57:46 PM	Begin Geographic Search
109 Georgia 3:57:49 PM	Select Georgia
100 Main Location Search 4:04:30 PM	Begin Geographic Search
*** TIMEOUT *** 4:07:28 PM	*** TIMEOUT ***

USER #22

102 MainHelp 4:17:36 PM	Get Help
*** TIMEOUT *** 4:20:35 PM	*** TIMEOUT ***

User #22 made no selections of consequence.

USER #23

101 Main activity search 4:35:42 PM	Begin Activity Search	Begin activity
417 view 4:36:00 PM	Select Wildlife Viewing	select viewing
104 Little Righty Forward 4:36:19 PM	Next Page	in VA
119 Virginia 4:36:21 PM	Select Virginia	
292 idxstate 4:36:41 PM	Search Entire State	search entire state
824 activity bar 4:37:16 PM	Begin Activity Search	restart activity
815 BBackup 4:37:20 PM	Back Up	
824 activity bar 4:37:24 PM	Begin Activity Search	restart activity
822 BRestart 4:37:27 PM	Restart	Restart
100 Main Location Search 4:37:35 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 4:37:40 PM	Next Page	
104 Little Righty Forward 4:37:46 PM	Next Page	
119 Virginia 4:37:51 PM	Select Virginia	select VA
128 statebarbutt 4:38:04 PM	Select New State	select new state
813 BHelp 4:38:19 PM	Get Help	Go to Help
325 Tab Blank- Light 4:38:48 PM	Select Help Topic	
000 HELP - Information Available 4:39:05 PM	HELP: Information Available	Information
325 Tab Blank- Light 4:39:12 PM	Select Help Topic	
000 HELP - Geographic Search 4:39:28 PM	HELP: Geographic Search	Georgraphic
822 BRestart 4:40:03 PM	Restart	Restart
102 MainHelp 4:40:08 PM	Get Help	Back to Help
325 Tab Blank- Light 4:40:20 PM	Select Help Topic	
000 HELP - Button Functions 4:40:45 PM	HELP: Button Functions	Button Functions
*** TIMEOUT *** 4:43:48 PM	*** TIMEOUT ***	abandon

User #23 exhibited confusion or uncertainty similar to the behavior of user #15. Unlike user #15, however, this user never viewed site information, as each selection was "undone" by the Back Up Button or a Navigation Button Bar selection. The user did view the Information Available, Geographic Search and Button Function help screens before abandoning the system.

USER #24

101 Main activity search 12:08:11 PM	Begin Activity Search	Begin activity
412 Hunt 12:08:19 PM	Select Hunting	choose hunting
119 Virginia 12:08:21 PM	Select Virginia	in VA
811 BForests 12:08:24 PM	Select a Forest	
130 fbutt2 12:08:30 PM	Select 2nd Forest	select 2nd forest
830 BRightArrow 12:08:46 PM	Next Site	view 1st & 2nd
*** TIMEOUT *** 12:11:45 PM	*** TIMEOUT ***	abandon

User #24 attempted only the Activity Search, and viewed only two sites during the search. The user never used the Page Turn Button, nor were either the SiteIcon Panel or Site Photograph Panel pressed.

USER #25

100 Main Location Search 12:19:18 PM	Begin Geographic Search	Begin Geog
104 Little Righty Forward 12:19:27 PM	Next Page	
104 Little Righty Forward 12:19:30 PM	Next Page	
119 Virginia 12:19:33 PM	Select Virginia	select VA
813 BHelp 12:19:41 PM	Get Help	Go to Help
325 Tab Blank- Light 12:20:14 PM	Select Help Topic	
000 HELP - Geographic Search 12:20:30 PM	HELP: Geographic Search	Geographic
325 Tab Blank- Light 12:20:41 PM	Select Help Topic	
000 HELP - Definitions 12:21:23 PM	HELP: Definitions	Definitions
325 Tab Blank- Light 12:21:46 PM	Select Help Topic	
000 HELP - Geographic Search 12:22:02 PM	HELP: Geographic Search	Geographic again
325 Tab Blank- Light 12:22:05 PM	Select Help Topic	
000 HELP - Activity Search 12:22:26 PM	HELP: Activity Search	Activity
325 Tab Blank- Light 12:23:11 PM	Select Help Topic	
000 HELP - Activity Search 12:23:32 PM	HELP: Activity Search	Activity again
325 Tab Blank- Light 12:23:35 PM	Select Help Topic	
000 HELP - Credits and Sources 12:23:50 PM	HELP: Credits and Sources	Credits
*** TIMEOUT *** 12:26:34 PM	*** TIMEOUT ***	abandon

User #25 began a Geographic Search, but moved to Help before any site information was displayed. Within Help, the user viewed the Geographic and Activity Search topics twice, and the Definitions and Credits screens once each.

USER #26

101 Main activity search 12:48:07 PM	Begin Activity Search	Begin activity
410 Hike 12:48:21 PM	Select Hiking	choose hiking
104 Little Righty Forward 12:48:30 PM	Next Page	
113 NorthCarolina 12:48:34 PM	Select North Carolina	in NC
811 BForests 12:48:55 PM	Select a Forest	
130 fbutt2 12:49:02 PM	Select 2nd Forest	2nd forest
xxx Site Icons - no action 12:49:33 PM	xxx Site Icons	
830 BRightArrow 12:49:43 PM	Next Site	move to 2nd site
xxx Site Icons - no action 12:49:56 PM	xxx Site Icons	
830 BRightArrow 12:50:10 PM	Next Site	
830 BRightArrow 12:50:24 PM	Next Site	view sites 3
830 BRightArrow 12:50:38 PM	Next Site	through 8
830 BRightArrow 12:50:53 PM	Next Site	
830 BRightArrow 12:51:09 PM	Next Site	
830 BRightArrow 12:51:20 PM	Next Site	
xxx Site Icons - no action 12:51:45 PM	xxx Site Icons	
xxx Site Icons - no action 12:51:50 PM	xxx Site Icons	
830 BRightArrow 12:52:08 PM	Next Site	move to site 9
822 BRestart 12:52:38 PM	Restart	Restart
100 Main Location Search 12:52:44 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 12:52:51 PM	Next Page	
104 Little Righty Forward 12:52:53 PM	Next Page	in VA
119 Virginia 12:52:55 PM	Select Virginia	
133 fbutt5 12:53:12 PM	Select 5th Forest	5th forest
135 sbutt1 12:54:22 PM	Select 1st Site	view 1st site
822 BRestart 12:55:04 PM	Restart	Restart
100 Main Location Search 12:55:10 PM	Begin Geographic Search	restart Geog.
109 Georgia 12:55:24 PM	Select Georgia	choose GA
130 fbutt2 12:55:38 PM	Select 2nd Forest	2nd forest
135 sbutt1 12:56:09 PM	Select 1st Site	view 1st site
830 BRightArrow 12:56:37 PM	Next Site	
830 BRightArrow 12:56:55 PM	Next Site	move to 3rd site
815 BBackup 12:57:15 PM	Back Up	
815 BBackup 12:57:30 PM	Back Up	back up to select
815 BBackup 12:57:41 PM	Back Up	a forest
822 BRestart 12:57:48 PM	Restart	Restart
*** TIMEOUT *** 1:00:47 PM	*** TIMEOUT ***	abandon

User #26 began with an Activity Search. The user chose to search for Hiking in North Carolina, and choe the second forest. User #26 viewed the first text page for nine sites, though never pressed the Page Turn Button to view additional text pages. The user did press the Site Icon Panel four times, however. After pressing the Restart Button, a Geographic Search was initiated. User #26 chose Virginia, selected the 5th forest and began with the first site. After viewing the first text page, the user pressed the Restart Button again and began a new Geographic Search. The user selected Georgia, second forest, first site. Three sites were

viewed, then the user backed up to the Forsest Selection screen, pressed Restart and abandoned the Kiosk.

User #26 moved through the system effectively, as indicated by the direct moves toward the site display screens, and effective use of the Restart Button rather than the Back Up Button, excepting the final three moves. The user did not utilize the Page Turn Button, however, but did attempt to activate the Site Icon "buttons."

USER #27

100 Main Location Search 1:03:26 PM	Begin Geographic Search	Begin Geog.
824 activity bar 1:03:39 PM	Begin Activity Search	Begin Activity
410 Hike 1:03:44 PM	Select Hiking	choose hiking
104 Little Righty Forward 1:03:52 PM	Next Page	
119 Virginia 1:03:55 PM	Select Virginia	in VA
822 BRestart 1:04:07 PM	Restart	Restart
101 Main activity search 1:04:12 PM	Begin Activity Search	restart activity
410 Hike 1:04:16 PM	Select Hiking	select hiking again
104 Little Righty Forward 1:04:20 PM	Next Page	
119 Virginia 1:04:23 PM	Select Virginia	in VA again
811 BForests 1:04:36 PM	Select a Forest	select a forest
815 BBackup 1:04:47 PM	Back Up	but back-up
130 fbutt2 1:04:50 PM	Select 2nd Forest	** possible
830 BRightArrow 1:05:27 PM	Next Site	program error**
830 BRightArrow 1:05:42 PM	Next Site	move through to
830 BRightArrow 1:05:55 PM	Next Site	4th site
803 Page_turner 1:06:06 PM	View Next Text Page	View 1st three
803 Page_turner 1:06:10 PM	View Next Text Page	text pages
824 activity bar 1:06:17 PM	Begin Activity Search	restart activity
410 Hike 1:06:21 PM	Select Hiking	choose hiking
104 Little Righty Forward 1:06:30 PM	Next Page	again
119 Virginia 1:06:32 PM	Select Virginia	select VA
811 BForests 1:06:47 PM	Select a Forest	
130 fbutt2 1:07:00 PM	Select 2nd Forest	2nd forest
830 BRightArrow 1:07:23 PM	Next Site	
830 BRightArrow 1:07:36 PM	Next Site	move to 3rd site
824 activity bar 1:07:46 PM	Begin Activity Search	restart activity
410 Hike 1:07:53 PM	Select Hiking	select hiking again
104 Little Righty Forward 1:08:01 PM	Next Page	
119 Virginia 1:08:02 PM	Select Virginia	select VA again
410 Hike 1:08:21 PM	Select Hiking	** Program error**
*** TIMEOUT *** 1:11:20 PM	*** TIMEOUT ***	abandon

User #27 was a victim of the program error that appeared in the record of two previous users. The user Began with a Geographic Search, but immediately pressed the Activity Search Navigation Button Bar button. After selecting Hiking as the activity and Virginia as the state to search, the user pressed Restart. These actions were repeated, though for the second attempt, the user chose to search a partcular forest. The user pressed the Back Up Button, then was able to select the second forest. This indicates an error in the navigation system, as the next choice should have been a new state selection. Nevertheless, the user viewed the first text page for four sites, and utilized the Page Turn Button to view additional text pages for the fourth site. The user then repeated these actions, and viewed the first three sites a second time. User #27 next initated a new Activity Search, againselected Hiking in Virginia, but the program error re-

appeared and presented the Activity Selection screen again. The user abandoned the search at this point.

Despite the program error, User #27 demostrated a clear direction and goal for the use. The user reached the site display screen several times, but the repetition of the search twice, with a third similar but aborted attempt, suggests some confusion. It is quite possible that the program error led to the confusion, or enhanced the user's uncertainty about the navigation or information provided.

USER #28

100 Main Location Search 2:49:59 PM	Begin Geographic Search	Begin Geog
104 Little Righty Forward 2:50:04 PM	Next Page	
113 NorthCarolina 2:50:08 PM	Select North Carolina	select NC
292 idxstate 2:50:19 PM	Search Entire State	** Program error **
830 BRightArrow 2:50:59 PM	Next Site	
830 BRightArrow 2:51:20 PM	Next Site	
830 BRightArrow 2:51:41 PM	Next Site	
830 BRightArrow 2:52:08 PM	Next Site	
830 BRightArrow 2:52:20 PM	Next Site	
830 BRightArrow 2:52:34 PM	Next Site	
830 BRightArrow 2:52:55 PM	Next Site	
803 Page_turner 2:53:24 PM	View Next Text Page	
803 Page_turner 2:53:28 PM	View Next Text Page	
803 Page_turner 2:53:32 PM	View Next Text Page	
803 Page_turner 2:53:36 PM	View Next Text Page	
xxx Site Photograph - no action 2:53:51 PM	xxx Site Photograph	
xxx Site Icons - no action 2:53:54 PM	xxx Site Icons	
830 BRightArrow 2:53:58 PM	Next Site	
830 BRightArrow 2:54:14 PM	Next Site	
830 BRightArrow 2:55:09 PM	Next Site	
830 BRightArrow 2:55:27 PM	Next Site	
830 BRightArrow 2:55:42 PM	Next Site	
830 BRightArrow 2:55:55 PM	Next Site	
830 BRightArrow 2:56:11 PM	Next Site	
830 BRightArrow 2:56:29 PM	Next Site	
830 BRightArrow 2:56:40 PM	Next Site	
830 BRightArrow 2:57:04 PM	Next Site	
830 BRightArrow 2:57:28 PM	Next Site	
830 BRightArrow 2:57:48 PM	Next Site	
822 BRestart 2:58:03 PM	Restart	Restart
100 Main Location Search 2:58:07 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 2:58:16 PM	Next Page	
104 Little Righty Forward 2:58:20 PM	Next Page	select VA
119 Virginia 2:58:23 PM	Select Virginia	
*** TIMEOUT *** 3:01:22 PM	*** TIMEOUT ***	abandon

User #28 began the session with a Geographic Search. As with the User #27, a program error presented the user with an incorrect choice. The user, however, was able to move beyond the error and reach the site display screen. The user viewed and passed the first text page for seven site, before utilizing the Page Turn Button for the eigth site. The user also pressed the Site Photograph Panel and Site Icon Panel for this site. User #28 then paged through the next twelve sites. After pressing the Restart Button, the user began a new Geographic Search, selected Virginia, but abandoned the search.

Despite the error, the user was able to view site data through the Geographic Search. Additionally, the user recognized the function of the Page Turn Button and attempted to activate both of the non-functional items on the site display screen.

USER #29

102 MainHelp 9:51:50 AM	Get Help	Begin with Help
325 Tab Blank- Light 9:52:02 AM	Select Help Topic	
000 HELP - Activity Search 9:52:23 AM	HELP: Activity Search	Activity Search
325 Tab Blank- Light 9:52:30 AM	Select Help Topic	
000 HELP - Button Functions 9:52:55 AM	HELP: Button Functions	Button Functions
325 Tab Blank- Light 9:53:00 AM	Select Help Topic	
000 HELP - Activity Search 9:53:21 AM	HELP: Activity Search	Activity again
904 COMMENT 9:53:24 AM	Leave a Comment	
909 finished 9:53:30 AM	Finished Leaving Comment	
325 Tab Blank- Light 9:53:37 AM	Select Help Topic	
000 HELP - Activity Search 9:53:59 AM	HELP: Activity Search	Activity 3rd time
325 Tab Blank- Light 9:54:11 AM	Select Help Topic	
000 HELP - Information Available 9:54:28 AM	HELP: Information Available	Information
325 Tab Blank- Light 9:54:33 AM	Select Help Topic	
000 HELP - Information Available 9:54:50 AM	HELP: Information Available	Information again
904 COMMENT 9:54:53 AM	Leave a Comment	
909 finished 9:54:55 AM	Finished Leaving Comment	
325 Tab Blank- Light 9:55:01 AM	Select Help Topic	
000 HELP - Geographic Search 9:55:17 AM	HELP: Geographic Search	Geographic
325 Tab Blank- Light 9:55:30 AM	Select Help Topic	
000 HELP - Activity Search 9:55:52 AM	HELP: Activity Search	Activity 4th time
325 Tab Blank- Light 9:56:00 AM	Select Help Topic	
000 HELP - Activity Search 9:56:21 AM	HELP: Activity Search	Activity 5th time
325 Tab Blank- Light 9:56:24 AM	Select Help Topic	
000 HELP - Geographic Search 9:56:40 AM	HELP: Geographic Search	Geog. 2nd time
*** TIMEOUT *** 9:59:23 AM	*** TIMEOUT ***	abandon

User #29 viewed only the Get Help portion of the program. Curiously, the user viewed the Activity Search topic five times, the Geographic Search and Information Available topics twice each, and the Button Functions topic once. The user also pressed the Leave Comment Button twice, but did not leave a comment either time. Otherwise, the user did not provide data significant to this research.

USER #30

100 Main Location Search 11:29:38 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 11:29:41 AM	Next Page	
104 Little Righty Forward 11:29:43 AM	Next Page	
119 Virginia 11:29:45 AM	Select Virginia	select VA
133 fbutt5 11:29:55 AM	Select 5th Forest	select 5th forest
121 Site Right 11:30:22 AM	View next page of Sites	
122 Site Return 11:30:29 AM	Return to Site List Beginning	
135 sbutt1 11:30:40 AM	Select 1st Site	select 1st site
811 BForests 11:31:02 AM	Select a Forest	select new forest
133 fbutt5 11:31:06 AM	Select 5th Forest	select 5th again
104 Little Righty Forward 11:32:31 AM	Next Page	
104 Little Righty Forward 11:32:33 AM	Next Page	
119 Virginia 11:32:35 AM	Select Virginia	** Program error **
131 fbutt3 11:32:57 AM	Select 3rd Forest	
138 sbutt4 11:33:27 AM	Select 4th Site	
*** TIMEOUT *** 11:36:34 AM	*** TIMEOUT ***	abandon

User #30 made several moves that indicate uncertainty or confusion. Unfortunately, the program error that appeared during several previous uses reappeared. User #30 abandoned the search shortly after the error required the user to begin a new use unexpectedly. This user, therefore, will not be included in the final data analysis.

USER #31

100 Main Location Search 11:51:12 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 11:51:15 AM	Next Page	
104 Little Righty Forward 11:51:18 AM	Next Page	
119 Virginia 11:51:20 AM	Select Virginia	select VA
133 fbutt5 11:51:41 AM	Select 5th Forest	5th forest
135 sbutt1 11:51:59 AM	Select 1st Site	1st site
824 activity bar 11:52:24 AM	Begin Activity Search	Begin activity
401 ATV 11:52:35 AM	Select ATV	choose ATV
824 activity bar 11:52:45 AM	Begin Activity Search	restart activity
822 BRestart 11:52:53 AM	Restart	Restart
100 Main Location Search 11:52:57 AM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 11:53:00 AM	Next Page	
104 Little Righty Forward 11:53:02 AM	Next Page	
119 Virginia 11:53:05 AM	Select Virginia	select VA again
129 fbutt1 11:53:20 AM	Select 1st Forest	1st forest
824 activity bar 11:53:47 AM	Begin Activity Search	Begin activity
401 ATV 11:53:51 AM	Select ATV	choose ATV again
824 activity bar 11:53:56 AM	Begin Activity Search	restart activity
410 Hike 11:54:05 AM	Select Hiking	choose hiking
104 Little Righty Forward 11:54:10 AM	Next Page	
119 Virginia 11:54:12 AM	Select Virginia	select VA
104 Little Righty Forward 11:54:22 AM	Next Page	** Program error **
104 Little Righty Forward 11:54:24 AM	Next Page	** Program error**
119 Virginia 11:54:26 AM	Select Virginia	choose VA
811 BForests 11:54:32 AM	Select a Forest	choose new forest
133 fbutt5 11:54:54 AM	Select 5th Forest	choose 5th forest
824 activity bar 11:55:46 AM	Begin Activity Search	restart activity
410 Hike 11:55:49 AM	Select Hiking	choose hike again
104 Little Righty Forward 11:55:52 AM	Next Page	
119 Virginia 11:55:56 AM	Select Virginia	select VA again
811 BForests 11:56:04 AM	Select a Forest	choose new forest
130 fbutt2 11:56:10 AM	Select 2nd Forest	choose 2nd forest
*** TIMEOUT *** 11:59:10 AM	*** TIMEOUT ***	abandon

As with User #30, this user, #31, suffered the recurring program error. It is worth noting that User #31 initiated several searches, two Geographic and four Activity, but aborted all but one before reaching the site display screens. The program error invalidates a portion of this use, but the user movements prior to and after the error are significant for their ineffectiveness. Of the seven valid searches, only one site was reached.

The user did not utilize the Page Turn Button, nor did the user attempt to press the Icons Panel or Photograph Panel, but the opportunty to do either was limited but the repeated restart actions.

USER #32

100 Main Location Search 4:27:28 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 4:27:30 PM	Next Page	
104 Little Righty Forward 4:27:31 PM	Next Page	
119 Virginia 4:27:33 PM	Select Virginia	select VA
811 BForests 4:27:40 PM	Select a Forest	
133 fbutt5 4:27:57 PM	Select 5th Forest	select 5th forest
xxx Site Icons - no action 4:28:19 PM	xxx Site Icons	
xxx Site Icons - no action 4:28:30 PM	xxx Site Icons	
830 BRightArrow 4:28:38 PM	Next Site	move from 1st to
830 BRightArrow 4:28:55 PM	Next Site	11th site
830 BRightArrow 4:29:15 PM	Next Site	
830 BRightArrow 4:29:25 PM	Next Site	
830 BRightArrow 4:29:39 PM	Next Site	
830 BRightArrow 4:29:52 PM	Next Site	
830 BRightArrow 4:30:10 PM	Next Site	
830 BRightArrow 4:30:21 PM	Next Site	
830 BRightArrow 4:30:29 PM	Next Site	
xxx Site Icons - no action 4:30:39 PM	xxx Site Icons	
830 BRightArrow 4:30:44 PM	Next Site	
811 BForests 4:30:57 PM	Select a Forest	choose new forest
132 fbutt4 4:31:07 PM	Select 4th Forest	select 4th forest
830 BRightArrow 4:31:34 PM	Next Site	move from 1st to
830 BRightArrow 4:31:45 PM	Next Site	7th site
830 BRightArrow 4:32:06 PM	Next Site	
830 BRightArrow 4:32:24 PM	Next Site	
830 BRightArrow 4:32:35 PM	Next Site	
830 BRightArrow 4:32:49 PM	Next Site	
822 BRestart 4:32:55 PM	Restart	Restart
101 Main activity search 4:33:01 PM	Begin Activity Search	Begin Activity
410 Hike 4:33:10 PM	Select Hiking	choose hiking
104 Little Righty Forward 4:33:14 PM	Next Page	
119 Virginia 4:33:16 PM	Select Virginia	in VA
822 BRestart 4:33:21 PM	Restart	Restart
102 MainHelp 4:33:27 PM	Get Help	Go to Help
325 Tab Blank- Light 4:34:58 PM	Select Help Topic	
000 HELP - Activity Search 4:35:20 PM	HELP: Activity Search	Activity Search
325 Tab Blank- Light 4:35:30 PM	Select Help Topic	
000 HELP - Information Available 4:35:47 PM	HELP: Information Available	Information
*** TIMEOUT *** 4:38:29 PM	*** TIMEOUT ***	abandon

User #32 began with a Geographic Search. After selecting the fifth forest in Virginia, the user pressed the Icon Panel on the first site display screen. The user then moved forward through the next eleven sites, and pressed the Icon Panel once more. Next, User #32 selected a new forest to serach. After the fourth forest was selected, the uesr moved from the first site through the seventh. After pressing the Restart Button. the user initated an Activity Search. User #32 selected the Hiking activity, and chose to search Virginia. The Restart Button was pressed before the choice to search the entire site or a particular forest was made, however, and

the user proceeded to the Get Help screen. The Activity Search topic was selected, followed by the Information Availabel screen. The user then abandoned the search.

User #32 exhibited some understanding of the Navigation Button Bar options, and demostrated simple effectiveness in utillizing the Geographic Search. The user did not use the Page Turn Button, but did press the Site Icon Panel.

USER #33

100 Main Location Search 9:23:02 AM	Begin Geographic Search	Begin Geog
104 Little Righty Forward 9:23:06 AM	Next Page	
104 Little Righty Forward 9:23:08 AM	Next Page	
119 Virginia 9:23:10 AM	Select Virginia	select VA
110 Kentucky 9:23:19 AM	Select Kentucky	** Program error **
822 BRestart 9:23:33 AM	Restart	Restart
100 Main Location Search 9:23:35 AM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 9:23:39 AM	Next Page	
104 Little Righty Forward 9:23:40 AM	Next Page	
119 Virginia 9:23:42 AM	Select Virginia	select VA
133 fbutt5 9:23:49 AM	Select 5th Forest	5th forest
135 sbutt1 9:24:06 AM	Select 1st Site	1st site
830 BRightArrow 9:24:20 AM	Next Site	move to 2nd site
*** TIMEOUT *** 9:27:19 AM	*** TIMEOUT ***	abandon

User #33 began with the Geographic Search. The user selected Virginia, but a program error cauesd the system to ignore the response. The user selected Kentucky next, and it is not apparent whether the "No information is available for this state" screen was displayed or the program reject this selection also. After the user pressed the Restart Button, a successful Geographic Search was initiated. The user was able to select Virginia, then the 5th forest and first site. The user moved to the second site before abandoning the Kiosk.

The user was able to reach the site display screen, in spite of the error in the inital attempt. User #33 did not use the Page Turn Button did not attempt an Activity Search, and did not press the non-functional items on the site display screen.

USER #34

101 Main activity search 9:29:46 AM	Begin Activity Search	Begin activity
410 Hike 9:29:56 AM	Select Hiking	choose hiking
104 Little Righty Forward 9:29:58 AM	Next Page	
119 Virginia 9:30:00 AM	Select Virginia	in VA
811 BForests 9:30:06 AM	Select a Forest	
133 fbutt5 9:30:11 AM	Select 5th Forest	in 5th forest
830 BRightArrow 9:30:31 AM	Next Site	
830 BRightArrow 9:30:39 AM	Next Site	
830 BRightArrow 9:30:45 AM	Next Site	move from 1st
830 BRightArrow 9:30:52 AM	Next Site	through 8th site
830 BRightArrow 9:31:02 AM	Next Site	
830 BRightArrow 9:31:08 AM	Next Site	
830 BRightArrow 9:31:17 AM	Next Site	
822 BRestart 9:31:25 AM	Restart	Restart
102 MainHelp 9:31:28 AM	Get Help	Go to Help
325 Tab Blank- Light 9:31:45 AM	Select Help Topic	
000 HELP - Activity Search 9:32:07 AM	HELP: Activity Search	Activity
325 Tab Blank- Light 9:32:14 AM	Select Help Topic	
000 HELP - Information Available 9:32:31 AM	HELP: Information Available	Information
325 Tab Blank- Light 9:32:36 AM	Select Help Topic	
000 HELP - Geographic Search 9:32:52 AM	HELP: Geographic Search	Geographic
325 Tab Blank- Light 9:32:58 AM	Select Help Topic	
000 HELP - Activity Search 9:33:20 AM	HELP: Activity Search	Activity again
325 Tab Blank- Light 9:33:26 AM	Select Help Topic	
000 HELP - Information Available 9:33:42 AM	HELP: Information Available	Information again
822 BRestart 9:33:45 AM	Restart	Restart
101 Main activity search 9:33:51 AM	Begin Activity Search	Start new Activity
410 Hike 9:33:58 AM	Select Hiking	choose hiking
104 Little Righty Forward 9:34:00 AM	Next Page	
113 NorthCarolina 9:34:04 AM	Select North Carolina	in NC
811 BForests 9:34:13 AM	Select a Forest	
130 fbutt2 9:34:25 AM	Select 2nd Forest	in 2nd forest
830 BRightArrow 9:34:47 AM	Next Site	
830 BRightArrow 9:34:59 AM	Next Site	
830 BRightArrow 9:35:08 AM	Next Site	
830 BRightArrow 9:35:22 AM	Next Site	move from 1st site
830 BRightArrow 9:35:34 AM	Next Site	through 12 site
830 BRightArrow 9:35:45 AM	Next Site	
830 BRightArrow 9:35:54 AM	Next Site	
830 BRightArrow 9:36:04 AM	Next Site	
830 BRightArrow 9:36:14 AM	Next Site	
830 BRightArrow 9:36:23 AM	Next Site	
830 BRightArrow 9:36:32 AM	Next Site	
822 BRestart 9:36:39 AM	Restart	Restart
*** TIMEOUT *** 9:39:39 AM	*** TIMEOUT ***	abandon

User #34 chose the Activity Search, selected Hiking in the fifth forest of Viginia, and viewed eight sites in succession before pressing the Restart Button. The user then proceeded to the Get Help screen, and viewed the Activity Search and Information Available topics twice each,

and the Geographic Search topic once. User #34 next began a new Activity Search, this time selecting Hiking in North Carolina. The user viewed the first page of twelve sites before the Kiosk was abandoned.

User #34 did not use the Page Turn Button and did not press the inactive screen elements on the site display screens.

USER #35

100 Main Location Search 10:51:31 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 10:51:33 AM	Next Page	
104 Little Righty Forward 10:51:35 AM	Next Page	
119 Virginia 10:51:36 AM	Select Virginia	select VA
133 fbutt5 10:51:43 AM	Select 5th Forest	5th forest
135 sbutt1 10:51:59 AM	Select 1st Site	1st site
xxx Site Icons - no action 10:52:07 AM	xxx Site Icons	
830 BRightArrow 10:52:14 AM	Next Site	
830 BRightArrow 10:52:33 AM	Next Site	
830 BRightArrow 10:52:45 AM	Next Site	move from 1st
830 BRightArrow 10:52:59 AM	Next Site	through 7th site
830 BRightArrow 10:53:12 AM	Next Site	
830 BRightArrow 10:53:21 AM	Next Site	
xxx Site Photograph - no action 10:53:35 AM	xxx Site Photograph	
xxx Site Photograph - no action 10:53:35 AM	xxx Site Photograph	
830 BRightArrow 10:53:40 AM	Next Site	move to 8th site
xxx Site Photograph - no action 10:53:51 AM	xxx Site Photograph	
830 BRightArrow 10:53:54 AM	Next Site	move from 8th site
830 BRightArrow 10:54:19 AM	Next Site	to 11th site
830 BRightArrow 10:54:32 AM	Next Site	
822 BRestart 10:54:40 AM	Restart	Restart
*** TIMEOUT *** 10:57:39 AM	*** TIMEOUT ***	abandon

User #35 initiated a Geographic Search, selecting the 5th forest in Virginia to search. The user immediately pressed the Site Icon Panel, then moved through successive sites, stopping on the eleventh. The Site Photograph Panel was pressed three times among the Next Site moves. The user then pressed Restart, but abandoned the search.

This user offers perhaps the strongest evidence that the non-standard appearance of the Page Turn Button may confuse some users, in that User #35 pressed both of the non-functional elements, but never pressed the PageTurn Button.

USER #36

100 Main Location Search 11:37:42 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 11:37:47 AM	Next Page	
104 Little Righty Forward 11:37:51 AM	Next Page	
119 Virginia 11:37:58 AM	Select Virginia	select VA
133 fbutt5 11:38:05 AM	Select 5th Forest	5th forest
135 sbutt1 11:38:21 AM	Select 1st Site	1st site
xxx Site Photograph - no action 11:38:39 AM	xxx Site Photograph	
xxx Site Photograph - no action 11:38:39 AM	xxx Site Photograph	
xxx Site Photograph - no action 11:38:39 AM	xxx Site Photograph	
xxx Site Photograph - no action 11:38:39 AM	xxx Site Photograph	
xxx Site Photograph - no action 11:38:39 AM	xxx Site Photograph	
830 BRightArrow 11:38:46 AM	Next Site	move to 2nd site
xxx Site Photograph - no action 11:39:09 AM	xxx Site Photograph	
830 BRightArrow 11:39:10 AM	Next Site	
830 BRightArrow 11:39:30 AM	Next Site	
830 BRightArrow 11:39:51 AM	Next Site	move from 2nd
830 BRightArrow 11:40:07 AM	Next Site	site through 9th
830 BRightArrow 11:40:23 AM	Next Site	site
830 BRightArrow 11:40:46 AM	Next Site	
830 BRightArrow 11:40:58 AM	Next Site	
*** TIMEOUT *** 11:43:58 AM	*** TIMEOUT ***	abandon

The record for User #36 is very similar to that of User #35. This user began with the Geographic Search, selected the fifth forest in Virginia and began with the first site, just as User #35 did. Like the previous user, #36 advanced through several sites, pressed the Site Photograph Panel, but never pressed the Page Turn Button. It should be noted that the five records indicating that the Site Photograph was pressed all have the same time stamp, suggesting that the user held a finger on the Panel long enough that five writes to the Button Histry text file were executed. Nonetheless, User #36 did press the photograph at least two times.

USER #37

100 Main Location Search 11:51:29 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 11:51:31 AM	Next Page	
104 Little Righty Forward 11:51:33 AM	Next Page	
119 Virginia 11:51:35 AM	Select Virginia	select VA
133 fbutt5 11:51:42 AM	Select 5th Forest	select 5th forest
135 sbutt1 11:51:58 AM	Select 1st Site	select 1st site
830 BRightArrow 11:52:05 AM	Next Site	move to 2nd site
xxx Site Photograph - no action 11:52:15 AM	xxx Site Photograph	
xxx Site Photograph - no action 11:52:16 AM	xxx Site Photograph	
830 BRightArrow 11:52:18 AM	Next Site	
830 BRightArrow 11:52:27 AM	Next Site	move to 4th site
815 BBackup 11:52:31 AM	Back Up	
815 BBackup 11:52:35 AM	Back Up	
815 BBackup 11:52:40 AM	Back Up	move back to 1st
811 BForests 11:52:44 AM	Select a Forest	select new forest
131 fbutt3 11:52:49 AM	Select 3rd Forest	select 3rd forest
136 sbutt2 11:53:18 AM	Select 2nd Site	
830 BRightArrow 11:53:28 AM	Next Site	
830 BRightArrow 11:53:34 AM	Next Site	
830 BRightArrow 11:53:40 AM	Next Site	
830 BRightArrow 11:53:46 AM	Next Site	move to 6th site
803 Page_turner 11:54:07 AM	View Next Text Page	
803 Page_turner 11:54:12 AM	View Next Text Page	view 1st 3 pages
811 BForests 11:54:24 AM	Select a Forest	select new forest
131 fbutt3 11:54:28 AM	Select 3rd Forest	
121 Site Right 11:54:59 AM	View next page of Sites	
144 sbutt10 11:55:06 AM	Select 10th Site	select 10th site
811 BForests 11:56:30 AM	Select a Forest	select new forest
*** TIMEOUT *** 11:59:29 AM	*** TIMEOUT ***	abandon

User #37 initiated a Geographic Search, beginning with the fifth forest in Virginia. The user viewed the first text page for each of the first four site, and pressed the Site Photograph Panel twice. The user then backed up to the first site and selected the third forest to search using the Navigation Bar Forest Button. User #37 began with the second site, and moved forward to the sixth site, where the Page Turn Button was used twice. The user next chose to search a new forest, selected the third forest again, then selected and viewed the tenth site. Finally, the user chose to search a new state, but abandoned the search before a selection was made.

The actions of User #37 were very much like those of the preceeding two users. #37, however, did recognize and use the Page Turn Button to view subsequent text pages. The user did not attempt an Activity Search, and did press the Site Photograph Panel.

USER #38

100 Main Location Search 1:28:07 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 1:28:12 PM	Next Page	
104 Little Righty Forward 1:28:17 PM	Next Page	
119 Virginia 1:28:21 PM	Select Virginia	select VA
131 fbutt3 1:28:30 PM	Select 3rd Forest	select 3rd forest
136 sbutt2 1:28:59 PM	Select 2nd Site	select 2nd site
830 BRightArrow 1:29:16 PM	Next Site	
830 BRightArrow 1:29:36 PM	Next Site	
830 BRightArrow 1:29:47 PM	Next Site	
830 BRightArrow 1:30:02 PM	Next Site	
830 BRightArrow 1:30:15 PM	Next Site	
830 BRightArrow 1:30:28 PM	Next Site	
830 BRightArrow 1:30:38 PM	Next Site	
830 BRightArrow 1:30:53 PM	Next Site	
830 BRightArrow 1:31:04 PM	Next Site	
830 BRightArrow 1:31:22 PM	Next Site	
830 BRightArrow 1:31:38 PM	Next Site	
830 BRightArrow 1:31:51 PM	Next Site	move to 14th site
822 BRestart 1:31:55 PM	Restart	Restart
100 Main Location Search 1:31:57 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 1:32:00 PM	Next Page	
104 Little Righty Forward 1:32:01 PM	Next Page	
119 Virginia 1:32:03 PM	Select Virginia	select VA again
133 fbutt5 1:32:09 PM	Select 5th Forest	select 5th forest
135 sbutt1 1:32:25 PM	Select 5th Site	select 5th site
830 BRightArrow 1:32:36 PM	Next Site	move to 6th site
*** TIMEOUT *** 1:35:36 PM	*** TIMEOUT ***	abandon

User #38 began a Geographic Search, chose to search the third forest in Virginia, and viewed the first text page for fourteen sites before pressing the Restart Button. The user then began a new search, chose the fifth forest in Virginia, and began the site display with the fifth site. The user moved to the sixth site, but abandoned the system.

This user did not use the Page Turn Button, did not press the inactive screen elements, and did not attempt an Activity Search.

USER #39

100 Main Location Search 1:52:46 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 1:52:48 PM	Next Page	
104 Little Righty Forward 1:52:50 PM	Next Page	
119 Virginia 1:52:52 PM	Select Virginia	select VA
133 fbutt5 1:52:58 PM	Select 5th Forest	select 5th forest
135 sbutt1 1:53:14 PM	Select 1st Site	select 1st site
830 BRightArrow 1:53:22 PM	Next Site	
830 BRightArrow 1:53:47 PM	Next Site	
830 BRightArrow 1:53:59 PM	Next Site	
830 BRightArrow 1:54:08 PM	Next Site	
830 BRightArrow 1:54:16 PM	Next Site	
830 BRightArrow 1:54:25 PM	Next Site	
830 BRightArrow 1:54:36 PM	Next Site	
830 BRightArrow 1:54:45 PM	Next Site	
830 BRightArrow 1:54:56 PM	Next Site	
830 BRightArrow 1:55:07 PM	Next Site	move to 11th site
822 BRestart 1:55:22 PM	Restart	Restart
100 Main Location Search 1:55:26 PM	Begin Geographic Search	Begin new Geog
104 Little Righty Forward 1:55:30 PM	Next Page	
104 Little Righty Forward 1:55:33 PM	Next Page	
119 Virginia 1:55:35 PM	Select Virginia	select VA again
131 fbutt3 1:55:41 PM	Select 3rd Forest	select 3rd forest
136 sbutt2 1:56:15 PM	Select 2nd Site	select 2nd site
830 BRightArrow 1:56:30 PM	Next Site	
830 BRightArrow 1:56:41 PM	Next Site	
830 BRightArrow 1:56:52 PM	Next Site	
830 BRightArrow 1:57:02 PM	Next Site	move to 6th site
*** TIMEOUT *** 2:00:01 PM	*** TIMEOUT ***	abandon

The actions of "User #39 are virtually identical to those of User #38. As with the previous user, this one did not use the Page Turn Button, did not press the non-functional screen items, and did not attempt an Activity Search.

USER #40

101 Main activity search 10:19:28 AM	Begin Activity Search	Begin Activity
411 Horse 10:19:38 AM	Select Horseback Riding	Select Horse
104 Little Righty Forward 10:19:43 AM	Next Page	
119 Virginia 10:19:48 AM	Select Virginia	select VA
292 idxstate 10:20:40 AM	Search Entire State	search entire state
830 BRightArrow 10:21:14 AM	Next Site	
830 BRightArrow 10:21:36 AM	Next Site	
830 BRightArrow 10:21:57 AM	Next Site	
830 BRightArrow 10:22:28 AM	Next Site	
830 BRightArrow 10:22:47 AM	Next Site	move to 6th site
815 BBackup 10:23:05 AM	Back Up	
815 BBackup 10:23:11 AM	Back Up	return to 4th site
108 Florida 10:23:16 AM	Select Florida	** Program error **
811 BForests 10:23:39 AM	Select a Forest	** Program error **
109 Georgia 10:24:05 AM	Select Georgia	** Program error **
108 Florida 10:25:39 AM	Select Florida	** Program error **
292 idxstate 10:26:01 AM	Search Entire State	
830 BRightArrow 10:26:22 AM	Next Site	
830 BRightArrow 10:26:41 AM	Next Site	
830 BRightArrow 10:26:52 AM	Next Site	
830 BRightArrow 10:27:28 AM	Next Site	
815 BBackup 10:27:46 AM	Back Up	
108 Florida 10:27:50 AM	Select Florida	
811 BForests 10:27:54 AM	Select a Forest	
129 fbutt1 10:28:10 AM	Select 1st Forest	
811 BForests 10:28:39 AM	Select a Forest	
110 Kentucky 10:29:06 AM	Select Kentucky	
128 statebarbutt 10:29:25 AM	Select New State	** end of error **
107 Arkansas 10:29:32 AM	Select Arkansas	Select AR
292 idxstate 10:29:41 AM	Search Entire State	
830 BRightArrow 10:29:58 AM	Next Site	view 1st four
830 BRightArrow 10:30:12 AM	Next Site	sites
830 BRightArrow 10:30:22 AM	Next Site	
128 statebarbutt 10:30:30 AM	Select New State	select new state
104 Little Righty Forward 10:30:36 AM	Next Page	
113 NorthCarolina 10:30:42 AM	Select North Carolina	select NC
292 idxstate 10:30:49 AM	Search Entire State	
830 BRightArrow 10:31:10 AM	Next Site	view 1st three
830 BRightArrow 10:31:17 AM	Next Site	sites
128 statebarbutt 10:31:30 AM	Select New State	select new state
104 Little Righty Forward 10:31:33 AM	Next Page	
116 SouthCarolina 10:31:38 AM	Select South Carolina	select SC
811 BForests 10:31:57 AM	Select a Forest	
129 fbutt1 10:32:11 AM	Select 1st Forest	
830 BRightArrow 10:32:34 AM	Next Site	view 1st two sites
101 Main activity search 10:55:43 AM	Begin Activity Search	new activity
411 Horse 10:56:03 AM	Select Horseback Riding	select horse again
104 Little Righty Forward 10:56:12 AM	Next Page	
119 Virginia 10:56:14 AM	Select Virginia	select VA
811 BForests 10:56:23 AM	Select a Forest	
130 fbutt2 10:56:47 AM	Select 2nd Forest	

830 BRightArrow 10:57:10 AM	Next Site	view 1st three
830 BRightArrow 10:57:33 AM	Next Site	sites
811 BForests 10:57:54 AM	Select a Forest	
129 fbutt1 10:58:11 AM	Select 1st Forest	select new forest
830 BRightArrow 10:58:34 AM	Next Site	
830 BRightArrow 10:58:45 AM	Next Site	view 1st four
830 BRightArrow 10:58:53 AM	Next Site	sites
811 BForests 10:59:01 AM	Select a Forest	select new forest
106 Alabama 10:59:29 AM	Select Alabama	** Program error **
811 BForests 10:59:41 AM	Select a Forest	
130 fbutt2 10:59:50 AM	Select 2nd Forest	
830 BRightArrow 11:00:11 AM	Next Site	
824 activity bar 11:00:27 AM	Begin Activity Search	start new activity
410 Hike 11:00:38 AM	Select Hiking	choose Hiking
104 Little Righty Forward 11:00:43 AM	Next Page	
119 Virginia 11:00:45 AM	Select Virginia	select VA
811 BForests 11:00:51 AM	Select a Forest	
133 fbutt5 11:01:04 AM	Select 5th Forest	
830 BRightArrow 11:01:27 AM	Next Site	
830 BRightArrow 11:01:39 AM	Next Site	view 1st through
830 BRightArrow 11:01:55 AM	Next Site	8th sites
830 BRightArrow 11:02:07 AM	Next Site	
830 BRightArrow 11:02:15 AM	Next Site	
830 BRightArrow 11:02:38 AM	Next Site	
830 BRightArrow 11:02:46 AM	Next Site	
xxx Site Icons - no action 11:03:06 AM	xxx Site Icons	
xxx Site Icons - no action 11:03:17 AM	xxx Site Icons	
xxx Site Icons - no action 11:03:19 AM	xxx Site Icons	
xxx Site Icons - no action 11:03:21 AM	xxx Site Icons	
xxx Site Icons - no action 11:03:22 AM	xxx Site Icons	
xxx Site Icons - no action 11:03:25 AM	xxx Site Icons	
811 BForests 11:03:29 AM	Select a Forest	select new forest
132 fbutt4 11:03:39 AM	Select 4th Forest	
830 BRightArrow 11:04:14 AM	Next Site	
830 BRightArrow 11:04:29 AM	Next Site	view 1st six
830 BRightArrow 11:04:45 AM	Next Site	sites
830 BRightArrow 11:05:04 AM	Next Site	
830 BRightArrow 11:05:29 AM	Next Site	
128 statebarbutt 11:05:42 AM	Select New State	select new state
104 Little Righty Forward 11:05:45 AM	Next Page	
119 Virginia 11:05:47 AM	Select Virginia	select VA
292 idxstate 11:05:54 AM	Search Entire State	
822 BRestart 11:06:28 AM	Restart	Restart
101 Main activity search 11:06:50 AM	Begin Activity Search	start new activity
410 Hike 11:07:05 AM	Select Hiking	select Hiking
104 Little Righty Forward 11:07:11 AM	Next Page	
119 Virginia 11:07:13 AM	Select Virginia	choose VA
811 BForests 11:07:19 AM	Select a Forest	
133 fbutt5 11:07:27 AM	Select 5th Forest	
815 BBackup 11:08:01 AM	Back Up	
104 Little Righty Forward 11:08:04 AM	Next Page	** Program error **
119 Virginia 11:08:06 AM	Select Virginia	

292 idxstate 11:08:16 AM	Search Entire State	
824 activity bar 11:08:51 AM	Begin Activity Search	start new activity
410 Hike 11:09:02 AM	Select Hiking	select Hiking
104 Little Righty Forward 11:09:05 AM	Next Page	
119 Virginia 11:09:07 AM	Select Virginia	choose VA
292 idxstate 11:09:11 AM	Search Entire State	
830 BRightArrow 11:09:45 AM	Next Site	view 1st two sites
822 BRestart 11:09:54 AM	Restart	Restart
101 Main activity search 11:09:59 AM	Begin Activity Search	begin new activity
412 Hunt 11:10:06 AM	Select Hunting	select Hunting
119 Virginia 11:10:11 AM	Select Virginia	select VA
292 idxstate 11:10:18 AM	Search Entire State	
830 BRightArrow 11:10:40 AM	Next Site	
830 BRightArrow 11:10:54 AM	Next Site	
830 BRightArrow 11:11:10 AM	Next Site	view 1st six sites
830 BRightArrow 11:11:25 AM	Next Site	
830 BRightArrow 11:11:33 AM	Next Site	
822 BRestart 11:11:47 AM	Restart	Restart
101 Main activity search 11:11:51 AM	Begin Activity Search	begin new activity
410 Hike 11:12:00 AM	Select Hiking	choose Hiking
109 Georgia 11:12:03 AM	Select Georgia	select GA
811 BForests 11:12:09 AM	Select a Forest	
129 fbutt1 11:12:15 AM	Select 1st Forest	view 1st site
822 BRestart 11:13:02 AM	Restart	Restart
101 Main activity search 11:13:16 AM	Begin Activity Search	begin new activity
402 Bike 11:13:24 AM	Select Bike Riding	select Bike
104 Little Righty Forward 11:13:39 AM	Next Page	
103 Little Lefty 11:13:43 AM	Previous Page of States	
104 Little Righty Forward 11:13:55 AM	Next Page	doesn't pick state
103 Little Lefty 11:14:09 AM	Previous Page of States	
824 activity bar 11:14:31 AM	Begin Activity Search	restart activity
402 Bike 11:14:39 AM	Select Bike Riding	select Bike
104 Little Righty Forward 11:14:46 AM	Next Page	
815 BBackup 11:15:05 AM	Back Up	
813 BHelp 11:15:11 AM	Get Help	Get Help
325 Tab Blank- Light 11:15:27 AM	Select Help Topic	
000 HELP - Activity Search 11:15:49 AM	HELP: Activity Search	Activity Search
815 BBackup 11:16:27 AM	Back Up	
815 BBackup 11:16:30 AM	Back Up	
104 Little Righty Forward 11:16:42 AM	Next Page	
824 activity bar 11:16:57 AM	Begin Activity Search	restart activity
410 Hike 11:17:08 AM	Select Hiking	choose Hiking
104 Little Righty Forward 11:17:10 AM	Next Page	
119 Virginia 11:19:05 AM	Select Virginia	choose VA
104 Little Righty Forward 11:19:17 AM	Next Page	** Program error **
104 Little Righty Forward 11:19:21 AM	Next Page	
119 Virginia 11:19:23 AM	Select Virginia	
292 idxstate 11:19:34 AM	Search Entire State	
128 statebarbutt 11:20:52 AM	Select New State	** end of error **
104 Little Righty Forward 11:21:02 AM	Next Page	
119 Virginia 11:21:04 AM	Select Virginia	choose VA
811 BForests 11:21:16 AM	Select a Forest	

133 fbutt5 11:21:26 AM	Select 5th Forest	choose 5th forest
xxx Site Icons - no action 11:23:06 AM	xxx Site Icons	
811 BForests 11:23:24 AM	Select a Forest	select new forest
130 fbutt2 11:23:34 AM	Select 2nd Forest	view 1st site
*** TIMEOUT *** 11:26:34 AM	*** TIMEOUT ***	abandon

User #40 suffered many program errors through the several searches undertaken. Remarkably, the user was patient enough, or persistent enough, that the program recovered from each error. This search is noteworthy for the duration of the search, and the demonstration of the user's determined efforts to obtain information about three particular activities: Hunting, Hiking and Bike Riding. It is particularly interesting that the user made Herculean efforts to find information using the Activity Search, and viewed the first page of a number of sites, but never used the Page Turn Button. The user did press the Icon Panel seven times, though, suggesting that the user did not recognize the Page Turn Button as a functional element, but did interpret the Site Icons as such.

USER #41

100 Main Location Search 12:03:12 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 12:03:24 PM	Next Page	
113 NorthCarolina 12:03:28 PM	Select North Carolina	select NC
406 Climb 12:04:09 PM	Select Rock Climbing	** Program error **
815 BBackup 12:04:24 PM	Back Up	
815 BBackup 12:04:25 PM	Back Up	
811 BForests 12:04:33 PM	Select a Forest	
822 BRestart 12:04:53 PM	Restart	Restart
100 Main Location Search 12:04:56 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 12:05:00 PM	Next Page	
113 NorthCarolina 12:05:06 PM	Select North Carolina	Select NC
131 fbutt3 12:05:17 PM	Select 3rd Forest	select 3rd forest
121 Site Right 12:06:09 PM	View next page of Sites	
143 sbutt9 12:06:28 PM	Select 9th Site	select 9th site
830 BRightArrow 12:06:46 PM	Next Site	move to 10th site
823 BSites 12:06:55 PM	Select New Site	select new site
121 Site Right 12:07:04 PM	View next page of Sites	
121 Site Right 12:07:14 PM	View next page of Sites	
71 stext14 12:07:27 PM	Site Text for 14th Site	select 14th site **
121 Site Right 12:07:51 PM	View next page of Sites	
121 Site Right 12:07:58 PM	View next page of Sites	
158 sbutt24 12:08:13 PM	Select 24th Site	select 24th site
830 BRightArrow 12:08:29 PM	Next Site	
830 BRightArrow 12:08:37 PM	Next Site	
830 BRightArrow 12:08:46 PM	Next Site	
830 BRightArrow 12:08:56 PM	Next Site	
830 BRightArrow 12:09:04 PM	Next Site	
830 BRightArrow 12:09:13 PM	Next Site	
830 BRightArrow 12:09:29 PM	Next Site	
830 BRightArrow 12:09:40 PM	Next Site	
830 BRightArrow 12:09:49 PM	Next Site	
830 BRightArrow 12:09:57 PM	Next Site	
830 BRightArrow 12:10:08 PM	Next Site	
830 BRightArrow 12:10:18 PM	Next Site	
830 BRightArrow 12:10:26 PM	Next Site	
830 BRightArrow 12:10:38 PM	Next Site	
830 BRightArrow 12:10:47 PM	Next Site	
822 BRestart 12:11:06 PM	Restart	Restart
101 Main activity search 12:11:13 PM	Begin Activity Search	Begin activity
411 Horse 12:11:34 PM	Select Horseback Riding	select Horse
104 Little Righty Forward 12:11:43 PM	Next Page	
113 NorthCarolina 12:11:45 PM	Select North Carolina	select NC
811 BForests 12:11:51 PM	Select a Forest	
129 fbutt1 12:12:03 PM	Select 1st Forest	select 1st forest
822 BRestart 12:12:32 PM	Restart	Restart
100 Main Location Search 12:12:37 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 12:12:40 PM	Next Page	
113 NorthCarolina 12:12:42 PM	Select North Carolina	select NC
131 fbutt3 12:13:03 PM	Select 3rd Forest	select 3rd forest
121 Site Right 12:13:41 PM	View next page of Sites	

121 Site Right 12:13:47 PM	View next page of Sites	
121 Site Right 12:13:58 PM	View next page of Sites	
121 Site Right 12:14:04 PM	View next page of Sites	
121 Site Right 12:14:13 PM	View next page of Sites	
164 sbutt30 12:14:34 PM	Select 30th Site	select 30th site
830 BRightArrow 12:14:43 PM	Next Site	move to 1st site
824 activity bar 12:14:58 PM	Begin Activity Search	Begin new activity
402 Bike 12:15:10 PM	Select Bike Riding	select Bike
104 Little Righty Forward 12:15:14 PM	Next Page	
113 NorthCarolina 12:15:15 PM	Select North Carolina	select NC
292 idxstate 12:15:24 PM	Search Entire State	search entire state
830 BRightArrow 12:15:44 PM	Next Site	
830 BRightArrow 12:15:53 PM	Next Site	
830 BRightArrow 12:16:00 PM	Next Site	move to 4th site
815 BBackup 12:16:14 PM	Back Up	
815 BBackup 12:16:20 PM	Back Up	move back to state
109 Georgia 12:16:28 PM	Select Georgia	select GA
811 BForests 12:16:42 PM	Select a Forest	
129 fbutt1 12:16:49 PM	Select 1st Forest	select 1st forest
830 BRightArrow 12:17:12 PM	Next Site	
830 BRightArrow 12:17:26 PM	Next Site	move to 3rd site
824 activity bar 12:17:44 PM	Begin Activity Search	begin new activity
411 Horse 12:17:48 PM	Select Horseback Riding	select Horse
104 Little Righty Forward 12:17:53 PM	Next Page	
103 Little Lefty 12:18:02 PM	Previous Page of States	
104 Little Righty Forward 12:18:10 PM	Next Page	
119 Virginia 12:18:20 PM	Select Virginia	select VA
292 idxstate 12:18:35 PM	Search Entire State	search entire state
830 BRightArrow 12:18:55 PM	Next Site	
830 BRightArrow 12:19:03 PM	Next Site	move to 3rd site
813 BHelp 12:19:16 PM	Get Help	Get Help
325 Tab Blank- Light 12:19:30 PM	Select Help Topic	
000 HELP - Geographic Search 12:19:47 PM	HELP: Geographic Search	Geographic
325 Tab Blank- Light 12:19:54 PM	Select Help Topic	
000 HELP - Information Available 12:20:11 PM	HELP: Information Available	Information
325 Tab Blank- Light 12:20:33 PM	Select Help Topic	
000 HELP - Credits and Sources 12:20:49 PM	HELP: Credits and Sources	Credits
822 BRestart 12:21:35 PM	Restart	Restart
100 Main Location Search 12:21:42 PM	Begin Geographic Search	Begin new Geog.
109 Georgia 12:21:47 PM	Select Georgia	select GA
130 fbutt2 12:21:52 PM	Select 2nd Forest	select 2nd forest
135 sbutt1 12:22:13 PM	Select 1st Site	select 1st site
830 BRightArrow 12:22:24 PM	Next Site	move to 2nd site
822 BRestart 12:22:32 PM	Restart	Restart
102 MainHelp 12:22:37 PM	Get Help	Go to Help
325 Tab Blank- Light 12:22:51 PM	Select Help Topic	
000 HELP - Definitions 12:23:33 PM	HELP: Definitions	Definitions
904 COMMENT 12:23:58 PM	Leave a Comment	
909 finished 12:24:18 PM	Finished Leaving Comment	
815 BBackup 12:24:36 PM	Back Up	
325 Tab Blank- Light 12:24:43 PM	Select Help Topic	New Help topic
000 HELP - Activity Search 12:25:05 PM	HELP: Activity Search	Activity

325 Tab Blank- Light 12:25:12 PM	Select Help Topic	
000 HELP - Button Functions 12:25:37 PM	HELP: Button Functions	Button Functions
822 BRestart 12:25:58 PM	Restart	Restart
*** TIMEOUT *** 12:28:58 PM	*** TIMEOUT ***	abandon

User #41 got off to a bad start, as the program error that appeared in previous searches occured in the beginning of this user's search. After pressing the Restart Button, however, the program returned to proper operation, and the subsequent search efforts were error free.

The user began the error-free portion of the usage with a Geographic Search. After viewing over twenty sites in the Geographic Search, the user pressed the Restart Button and began an Activity Search. User #41 selected and activity state and forest, viewed the first site, then restarted and began a new Geographic Search. The user viewed the first page of text for six sites, and then started a new Activity Search. The second Activity Search included the activities Bike Riding and Horseback Riding, and viewed information in the states of North Carolina, Georgia and Virginia. User #41 then moved to Get Help, and viewed the Georgraphic Search, Information Available and Credits topics before pressing Restart and beginning a new Geographic Search. After viewing two sites, the user returned to Help, and viewed the Definitions topic. The user pressed the Leave a Comment Button, but entered no text in the comment field. Upon returning to the main Help screen, the Activity Search and Button Function topics were viewed. The user then pressed the Restart Button and abandoned the Kiosk.

User #41 spent 22 minutes using the system, and utlized both search paths extensively. The user never pressed the Page Turn Button, but did utilize several of the Navigation Bar Buttons.

USER #42

100 Main Location Search 1:11:06 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 1:11:12 PM	Next Page	
104 Little Righty Forward 1:11:16 PM	Next Page	
119 Virginia 1:11:18 PM	Select Virginia	select VA
131 fbutt3 1:11:45 PM	Select 3rd Forest	select 3rd forest
138 sbutt4 1:12:21 PM	Select 4th Site	select 4th site
813 BHelp 1:12:58 PM	Get Help	Go to Help
*** TIMEOUT *** 1:15:58 PM	*** TIMEOUT ***	abandon

User #42 initiated a Geographic Search, selected Virginia and the third forest. The user chose to view the fourth site, viewed the first text page, then pressed the Help Button before abandoning the Kiosk. The user viewed only one site, and did not use the Page Turn Button.

USER #43

100 Main Location Search 2:06:19 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 2:06:29 PM	Next Page	
104 Little Righty Forward 2:06:32 PM	Next Page	
119 Virginia 2:06:38 PM	Select Virginia	select VA
824 activity bar 2:06:45 PM	Begin Activity Search	Begin Activity
410 Hike 2:06:51 PM	Select Hiking	select hiking
104 Little Righty Forward 2:06:54 PM	Next Page	
119 Virginia 2:06:55 PM	Select Virginia	select VA
811 BForests 2:07:06 PM	Select a Forest	
129 fbutt1 2:07:13 PM	Select 1st Forest	select 1st forest
830 BRightArrow 2:07:37 PM	Next Site	
830 BRightArrow 2:07:50 PM	Next Site	
830 BRightArrow 2:08:07 PM	Next Site	
830 BRightArrow 2:08:15 PM	Next Site	move to 5th site
811 BForests 2:08:38 PM	Select a Forest	select new forest
129 fbutt1 2:08:48 PM	Select 1st Forest	select 1st again
824 activity bar 2:09:09 PM	Begin Activity Search	begin new activity
406 Climb 2:09:15 PM	Select Rock Climbing	select climbing
815 BBackup 2:09:30 PM	Back Up	return to activity
406 Climb 2:09:33 PM	Select Rock Climbing	select climb again
822 BRestart 2:09:42 PM	Restart	Restart
100 Main Location Search 2:09:45 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 2:09:49 PM	Next Page	
104 Little Righty Forward 2:09:52 PM	Next Page	
119 Virginia 2:09:53 PM	Select Virginia	select VA
129 fbutt1 2:10:02 PM	Select 1st Forest	select 1st forest
121 Site Right 2:10:33 PM	View next page of Sites	
121 Site Right 2:10:41 PM	View next page of Sites	
146 sbutt12 2:10:59 PM	Select 12th Site	select 12th site
830 BRightArrow 2:11:12 PM	Next Site	move to 13th site
824 activity bar 2:11:22 PM	Begin Activity Search	start new activity
417 view 2:11:29 PM	Select Wildlife Viewing	select viewing
104 Little Righty Forward 2:11:36 PM	Next Page	
118 Texas 2:11:38 PM	Select Texas	choose TX
811 BForests 2:12:01 PM	Select a Forest	
129 fbutt1 2:12:12 PM	Select 1st Forest	select 1st forest
830 BRightArrow 2:12:33 PM	Next Site	
830 BRightArrow 2:12:42 PM	Next Site	move to 3rd site
811 BForests 2:13:00 PM	Select a Forest	select new forest
104 Little Righty Forward 2:13:16 PM	Next Page	
113 NorthCarolina 2:13:23 PM	Select North Carolina	** Program error **
811 BForests 2:13:27 PM	Select a Forest	Select NC
129 fbutt1 2:13:34 PM	Select 1st Forest	1st forest
830 BRightArrow 2:13:55 PM	Next Site	view 1st through
830 BRightArrow 2:14:06 PM	Next Site	3rd sites
128 statebarbutt 2:14:13 PM	Select New State	select new state
107 Arkansas 2:14:20 PM	Select Arkansas	choose AR
811 BForests 2:14:25 PM	Select a Forest	search by forest
129 fbutt1 2:14:32 PM	Select 1st Forest	select 1st forest
830 BRightArrow 2:14:54 PM	Next Site	

830 BRightArrow 2:15:01 PM	Next Site	
830 BRightArrow 2:15:10 PM	Next Site	
830 BRightArrow 2:15:21 PM	Next Site	move from 1st to
830 BRightArrow 2:15:28 PM	Next Site	7th site
830 BRightArrow 2:15:42 PM	Next Site	
822 BRestart 2:15:52 PM	Restart	Restart
*** TIMEOUT *** 2:18:51 PM	*** TIMEOUT ***	abandon

User #42 began a Geographic Search, but aborted it before reaching site information. The user then initated an Activity Search, and viewed several sites in Virginia. The user then selected Rock Climbing, backed up to select a new activity, and selected Rock Climbing a second time. Before viewing site information, the user began a new Geographic Search and viewed the first text page for two sites. The user then began a new Activity Search, and selected several activities, states and forests to search. During this portion of the search, a program error caused the display of an incorrect selection screen, but the user managed to move beyond the innappropriate choice, and the program returned to normal operation. User #42 continued the Activity Search, viewing several more sites.

This user did not press the Page Turn Button during the search, and did not press the inactive site display screen elements.

USER #44

102 MainHelp 3:44:10 PM	Get Help	Begin with get
325 Tab Blank- Light 3:44:33 PM	Select Help Topic	help
000 HELP - Information Available 3:44:49 PM	HELP: Information Available	Information
815 BBackup 3:45:10 PM	Back Up	return to main
815 BBackup 3:45:14 PM	Back Up	menu
100 Main Location Search 3:45:20 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 3:45:29 PM	Next Page	
104 Little Righty Forward 3:45:42 PM	Next Page	
117 Tennessee 3:45:49 PM	Select Tennessee	select TN
128 statebarbutt 3:46:18 PM	Select New State	choose new state
104 Little Righty Forward 3:46:25 PM	Next Page	
104 Little Righty Forward 3:46:27 PM	Next Page	
116 SouthCarolina 3:46:31 PM	Select South Carolina	select SC
128 statebarbutt 3:46:51 PM	Select New State	choose new state
104 Little Righty Forward 3:46:53 PM	Next Page	
104 Little Righty Forward 3:46:56 PM	Next Page	
117 Tennessee 3:46:58 PM	Select Tennessee	select TN again
128 statebarbutt 3:47:26 PM	Select New State	select new state
104 Little Righty Forward 3:47:29 PM	Next Page	
104 Little Righty Forward 3:47:30 PM	Next Page	
116 SouthCarolina 3:47:33 PM	Select South Carolina	select SC again
129 fbutt1 3:48:11 PM	Select 1st Forest	select 1st forest
139 sbutt5 3:48:42 PM	Select 5th Site	select 5th site
830 BRightArrow 3:48:54 PM	Next Site	
830 BRightArrow 3:49:04 PM	Next Site	
830 BRightArrow 3:49:13 PM	Next Site	
830 BRightArrow 3:49:29 PM	Next Site	move to 11th
830 BRightArrow 3:49:41 PM	Next Site	site
830 BRightArrow 3:50:00 PM	Next Site	
824 activity bar 3:50:27 PM	Begin Activity Search	begin activity
401 ATV 3:50:34 PM	Select ATV	select ATV
112 Mississippi 3:50:47 PM	Select Mississippi	select MS (only
811 BForests 3:50:56 PM	Select a Forest	choice)
130 fbutt2 3:51:09 PM	Select 2nd Forest	select 2nd forest
830 BRightArrow 3:51:34 PM	Next Site	
830 BRightArrow 3:51:52 PM	Next Site	
830 BRightArrow 3:52:05 PM	Next Site	move to 4th site
822 BRestart 3:52:13 PM	Restart	restart
100 Main Location Search 3:52:18 PM	Begin Geographic Search	begin new Geog.
824 activity bar 3:52:31 PM	Begin Activity Search	begin new activity
401 ATV 3:52:33 PM	Select ATV	select ATV again
822 BRestart 3:52:49 PM	Restart	Restart
100 Main Location Search 3:52:57 PM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 3:53:00 PM	Next Page	
104 Little Righty Forward 3:53:02 PM	Next Page	
119 Virginia 3:53:03 PM	Select Virginia	select VA
131 fbutt3 3:53:35 PM	Select 3rd Forest	select 3rd forest
135 sbutt1 3:54:30 PM	Select 1st Site	select 1st site
830 BRightArrow 3:54:49 PM	Next Site	
830 BRightArrow 3:54:58 PM	Next Site	

830 BRightArrow 3:55:15 PM	Next Site	
830 BRightArrow 3:55:25 PM	Next Site	
830 BRightArrow 3:55:41 PM	Next Site	
830 BRightArrow 3:55:55 PM	Next Site	
830 BRightArrow 3:56:28 PM	Next Site	
830 BRightArrow 3:56:45 PM	Next Site	
830 BRightArrow 3:57:01 PM	Next Site	
830 BRightArrow 3:57:16 PM	Next Site	
830 BRightArrow 3:57:30 PM	Next Site	
830 BRightArrow 3:57:54 PM	Next Site	
830 BRightArrow 3:58:04 PM	Next Site	
830 BRightArrow 3:58:15 PM	Next Site	
830 BRightArrow 3:58:34 PM	Next Site	
830 BRightArrow 3:58:52 PM	Next Site	
830 BRightArrow 3:59:05 PM	Next Site	
830 BRightArrow 3:59:24 PM	Next Site	
830 BRightArrow 3:59:32 PM	Next Site	
830 BRightArrow 3:59:53 PM	Next Site	
830 BRightArrow 4:00:00 PM	Next Site	
830 BRightArrow 4:00:08 PM	Next Site	
830 BRightArrow 4:00:30 PM	Next Site	move to 24th site
822 BRestart 4:00:40 PM	Restart	Restart
904 COMMENT 4:00:58 PM	Leave a Comment	
909 finished 4:01:17 PM	Finished Leaving Comment	
904 COMMENT 4:02:54 PM	Leave a Comment	
909 finished 4:03:59 PM	Finished Leaving Comment	
904 COMMENT 4:04:01 PM	Leave a Comment	
909 finished 4:05:55 PM	Finished Leaving Comment	
*** TIMEOUT *** 4:08:54 PM	*** TIMEOUT ***	abandon

User #44 spent over 15 minutes using the Kiosk. The first selection was Get Help, and the user viewed the Information Available topic.After backing up to the Main Menu, the user then began a Geographic Search. The user first selected Tennessee, viewed the "No information available..." screen, and then selected South Carolina. Before selecting a forest, the user chose a new state, Tennessee, to search. After viewing the same "No information..." screen a second time, the user returned to South Carolina, and viewed the first text page for seven site. Next, User #44 began an Activity Search and chose ATV as the activity to search. Only one site results from this choice, but the user viewed this site four times, by pressing the Next Page Button. After pressing Restart, the user began a Geographic Searc, but immediately aborted and initiated a new Activity Search, and again selected ATV. User #44 then pressed Restart and began a new Geographic Search, selected the third forest, and began viewing site information with the first site. The user then viewed the first page of text for the following twenty-three sites. before pressing the Restart Button. The user pressed the Leave A Comment Button three times, and left one comment, found in Appendix II, User #44.

Usre #44 viewed many sites, but never pressed the Page Turn Button and did not press the non-functional screen elements.

USER #45

100 Main Location Search 5:12:31 PM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 5:12:39 PM	Next Page	
104 Little Righty Forward 5:12:43 PM	Next Page	
119 Virginia 5:12:45 PM	Select Virginia	select VA
133 fbutt5 5:13:03 PM	Select 5th Forest	select 5th forest
139 sbutt5 5:13:25 PM	Select 5th Site	select 5th site
830 BRightArrow 5:14:24 PM	Next Site	
830 BRightArrow 5:14:41 PM	Next Site	move to 7th site
xxx Site Photograph - no action 5:14:58 PM	xxx Site Photograph	
830 BRightArrow 5:15:10 PM	Next Site	
830 BRightArrow 5:15:17 PM	Next Site	
830 BRightArrow 5:15:25 PM	Next Site	
830 BRightArrow 5:15:31 PM	Next Site	
830 BRightArrow 5:15:51 PM	Next Site	move to 12th site
822 BRestart 5:16:24 PM	Restart	Retstart
904 COMMENT 5:16:34 PM	Leave a Comment	
909 finished 5:17:49 PM	Finished Leaving Comment	
102 MainHelp 5:18:09 PM	Get Help	Go to Help
822 BRestart 5:18:22 PM	Restart	Restart
102 MainHelp 5:18:27 PM	Get Help	Get Help
815 BBackup 5:18:47 PM	Back Up	return to main
101 Main activity search 5:19:07 PM	Begin Activity Search	being activity
822 BRestart 5:19:16 PM	Restart	Restart
*** TIMEOUT *** 5:22:16 PM	*** TIMEOUT ***	abandon

User #45 began with a Geographic Search. The user viewed the first text page for eight sites in Virginia, pressed Restart and then the Leave A Comment Button. The user's comment may be found in Appendix II, User #45. After the comment was entered, the user chose Get Help, but pressed Restart before selecting a topic. The user then returned to Get Help, but again left the Help section and began an Activity Search. Before an activity was selected, the user pressed Restart, then abandoned the Kiosk.

This user viewed several sites, but did not press the Page Turn Button. The user did, however, press the Site Photograph Panel once.

USER #46

100 Main Location Search 10:56:13 AM	Begin Geographic Search	Begin Geog.
104 Little Righty Forward 10:56:16 AM	Next Page	
104 Little Righty Forward 10:56:17 AM	Next Page	
119 Virginia 10:56:19 AM	Select Virginia	Select VA
133 fbutt5 10:56:25 AM	Select 5th Forest	select 5th forest
135 sbutt1 10:56:41 AM	Select 1st Site	select 1st site
830 BRightArrow 10:56:49 AM	Next Site	
830 BRightArrow 10:57:28 AM	Next Site	move to 3rd site
822 BRestart 10:57:45 AM	Restart	Restart
101 Main activity search 10:57:48 AM	Begin Activity Search	Begin activity
406 Climb 10:57:50 AM	Select Rock Climbing	select rock climb
107 Arkansas 10:57:59 AM	Select Arkansas	select AR
292 idxstate 10:58:18 AM	Search Entire State	search entire state
830 BRightArrow 10:58:58 AM	Next Site	
830 BRightArrow 10:59:09 AM	Next Site	move to 3rd site
822 BRestart 10:59:15 AM	Restart	Restart
100 Main Location Search 10:59:20 AM	Begin Geographic Search	Begin new Geog.
104 Little Righty Forward 10:59:26 AM	Next Page	
104 Little Righty Forward 10:59:27 AM	Next Page	
119 Virginia 10:59:29 AM	Select Virginia	select VA
131 fbutt3 10:59:35 AM	Select 3rd Forest	select 3rd forest
136 sbutt2 11:00:04 AM	Select 2nd Site	select 2nd site
823 BSites 11:00:23 AM	Select New Site	choose new site
121 Site Right 11:00:29 AM	View next page of Sites	
121 Site Right 11:00:35 AM	View next page of Sites	
121 Site Right 11:00:41 AM	View next page of Sites	page through sites
824 activity bar 11:00:51 AM	Begin Activity Search	Begin activity
415 Rifle 11:00:58 AM	Select Rifle Range	select rifle range
104 Little Righty Forward 11:01:01 AM	Next Page	
119 Virginia 11:01:04 AM	Select Virginia	select VA
811 BForests 11:01:14 AM	Select a Forest	
131 fbutt3 11:01:20 AM	Select 3rd Forest	choose 3rd forest
830 BRightArrow 11:01:37 AM	Next Site	
830 BRightArrow 11:01:45 AM	Next Site	
830 BRightArrow 11:01:51 AM	Next Site	move to 4th site
822 BRestart 11:02:00 AM	Restart	Restart
101 Main activity search 11:02:02 AM	Begin Activity Search	Begin new activity
415 Rifle 11:02:04 AM	Select Rifle Range	select rifle again
104 Little Righty Forward 11:02:07 AM	Next Page	
119 Virginia 11:02:08 AM	Select Virginia	select VA again
811 BForests 11:02:12 AM	Select a Forest	
130 fbutt2 11:02:20 AM	Select 2nd Forest	select 2nd forest
830 BRightArrow 11:02:38 AM	Next Site	move to 2nd site
*** TIMEOUT *** 11:05:37 AM	*** TIMEOUT ***	abandon

User #46 used both the Geographic and Activity Searches. In each individual search, the user viewed at least one site diaplay screen, though the user never pressed the Page Turn

Button. This user did demonstrate an understanding of the Navigation Bar Buttons, however, and never pressed the inactive screen elements.

As a prelude to the synthesis of the analysis of individual user actions into a composite analysis of the success or failure of the Kiosk functions that are the subject of this research effort, it is worth restating the research questions:

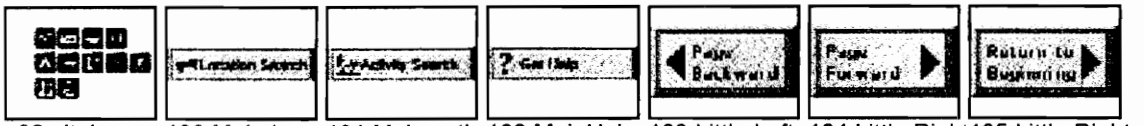
- Which search path, Geographic or Activity, is preferred by users
- Is the Page-Turn button recognized as a button
- Do users attempt to press the Site Icon Panel, because it appears to be a series of buttons

Despite the program error that plagued several users and several searches that never reached specific site information, there remains ample data to support this final phase of analysis.

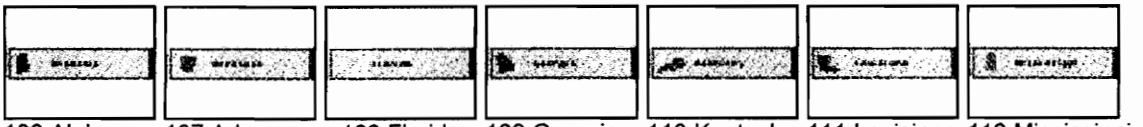
APPENDIX II: KIOSK PROGRAM CAST MEMBERS

--Recreation Directory with Acc	Choose a State that you would like to	Search the directory by touching and releasing the	Search information by location.....	on enterFrame assignForest	on mouseUp put the pathName in	Choose a Recreation Opportunity to search...
1	2	3	4	5	6	7
Search information by activity type.....	Help in using this directory.....	on enterFrame pause end	on mouseUp put the pathName in	on enterFrame assignState bu	on enterFrame put the pathName	Please wait a moment while information is
8	9	10	11	12	13	14
on mouseDown global idx clic		Choose a Forest that you would like to	Choose a Recreation Site for your Visitor	on exitFrame play frame "sli	on exitFrame slidechange end	on enterFrame global MyPath,St
15	16:Title-banne	17	18	19	20	21
Information on the Recreation Site you	on enterFrame altState end	Information on the State you have selected.....			on mouseDown sound stop 1	Kentucky
22	23	24	25:Photo_pan	26:New_text_p	27	28:AltStateText1
Daniel Boone National Forest	Kentucky is home to the Daniel Boone National	Daniel Boone National Forest	1700 Bypass Road	Winchester, KY 40391	Phone: (606) 745-3100	on mouseDown click idsite
29:AltStateTex	30:AltStateTex	31:AltStateTex	32:AltStateTex	33:AltStateTex	34:AltStateTex	35
Touch State Button to make another selection..			on enterFrame global ButtonNum	on enterFrame global idx if	Open Pond Recreation Area	Open Pond Recreation Area is located
36	37:access_par	38:Site_Name	39	40	41:tsitename	42:tlocation
Take US 29 southwest from Andalusia for	Open Pond Recreation Area offers camping.	Day-Use/Camping: $4.00 to $10.00	The boat launch, fishing pier, water source.	For further information: (205) 222-2555		
43:tdirections	44:tinformation	45:tfees	46:taccessible	47:tfurther	48:nullgraphic	49:forestmap
^		William Bankhead	Talladega-Oakmulgee	Talladega-Shoal Creek	Conecuh	
50:trash	51:statemap	52:ftext1	53:ftext2	54:ftext3	55:ftext4	56:ftext5
	Open Pond RA					
57:ftext6	58:stext1	59:stext2	60:stext3	61:stext4	62:stext5	63:stext6

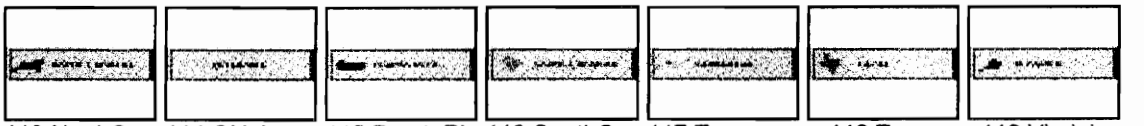
Coles Point Swimming	Confederate Breastworks	Fortney Branch	Hidden Valley	Longdale RA	Lowmoor Range	McClintick Point
64:stext7	65:stext8	66:stext9	67:stext10	68:stext11	69:stext12	70:stext13
Morris Hill CG	Mountain House	Sherando Lake				
71:stext14	72:stext15	73:stext16	74:stext17	75:stext18	76:stext19	77:stext20
	Rifle Range	Rotary Ann PS	Shores Lake RA	Spring Lake RA	Sylamore Horse Trail	White Rock Mountain RA
78:stext21	79:stext22	80:stext23	81:stext24	82:stext25	83:stext26	84:stext27
Wolf Pen RA				on enterFrame put the pathName	LOCATION:	DIRECTIONS:
85:stext28	86:stext29	87:stext30	88:stext31	89	90	91
INFORMATION:	FEES:	ACCESSIBILITY	on mouseDown click play fr			
92	93	94	95	96	97:Little Blank	98:sitePhoto



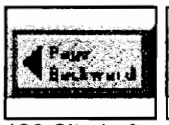
99:siteIcons 100:Main Loca 101:Main activ 102:MainHelp 103:Little Lefty 104:Little Right 105:Little Right



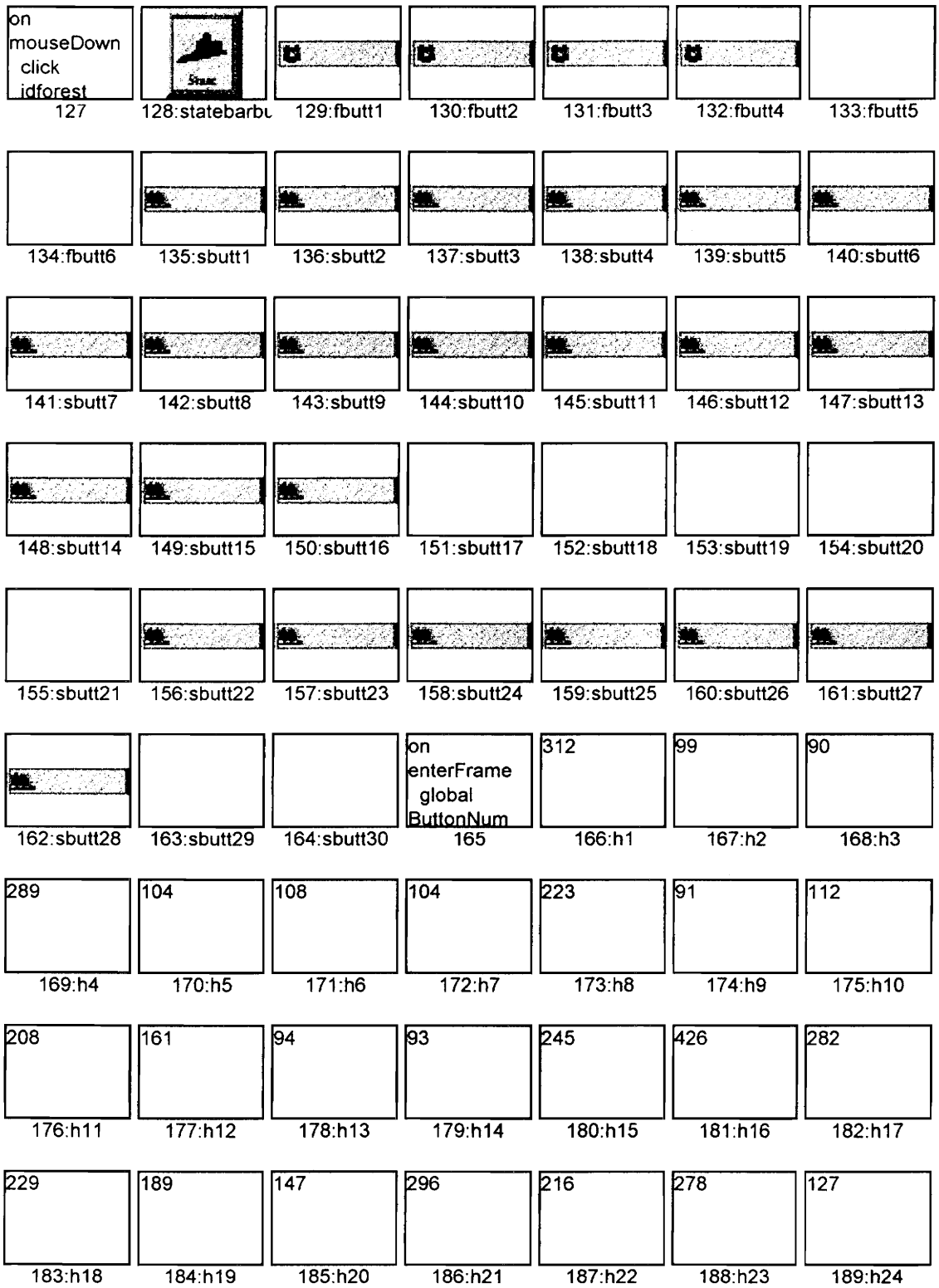
106:Alabama 107:Arkansas 108:Florida 109:Georgia 110:Kentucky 111:Louisiana 112:Mississippi

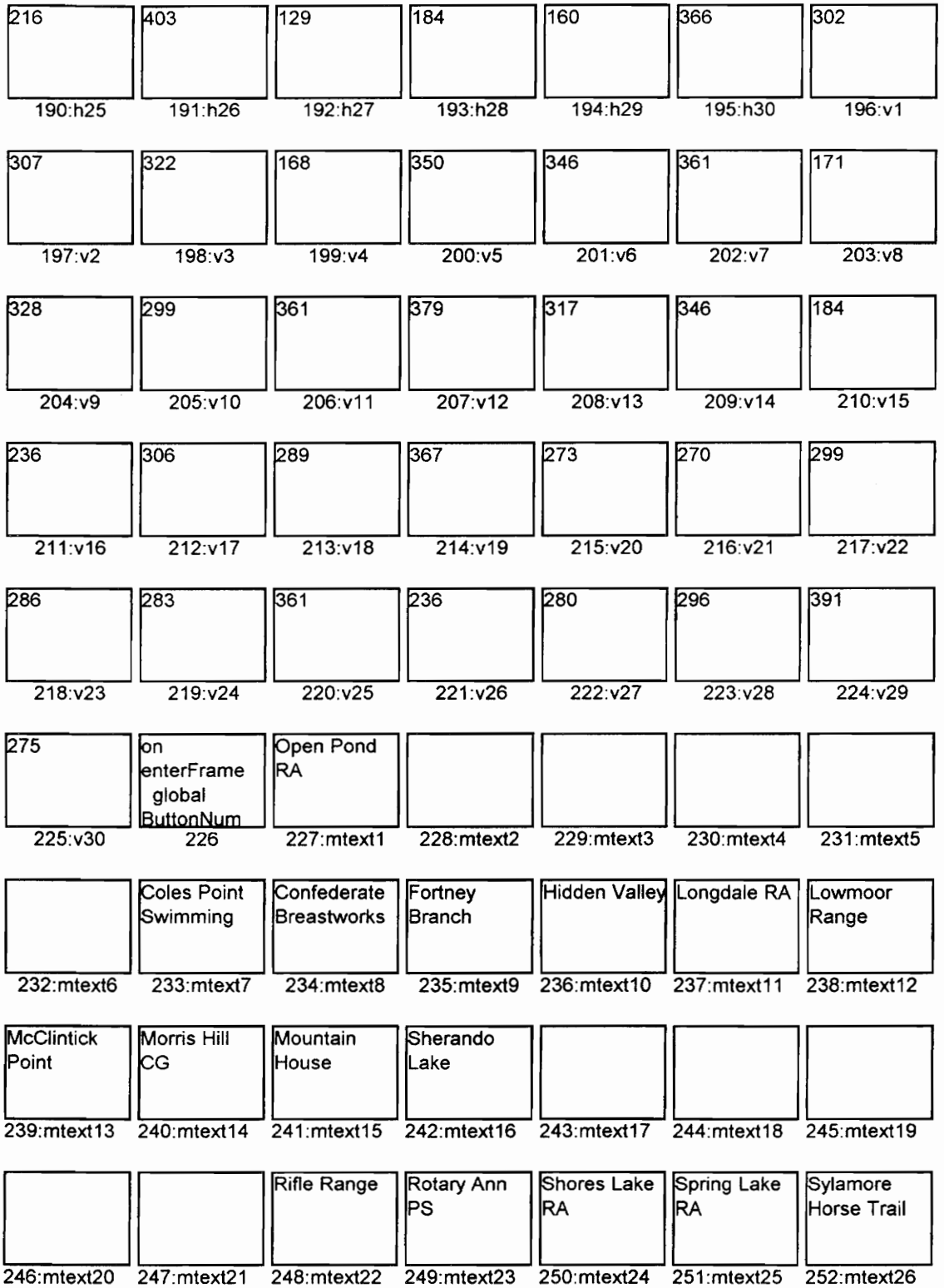


113:NorthCaro 114:Oklahoma 115:PuertoRic 116:SouthCarc 117:Tennesse 118:Texas 119:Virginia



120:Site Left	121:Site Right	122:Site Retur	Touch Page Corner for more information...	Touch Page Corner to return to beginning...	on mouseDown click continue	on enterFrame if the clickon =
			123	124	125	126


on
mouseDown
click
idforest
127
128:statebarbu
129:fbutt1
130:fbutt2
131:fbutt3
132:fbutt4
133:fbutt5
134:fbutt6
135:sbutt1
136:sbutt2
137:sbutt3
138:sbutt4
139:sbutt5
140:sbutt6
141:sbutt7
142:sbutt8
143:sbutt9
144:sbutt10
145:sbutt11
146:sbutt12
147:sbutt13
148:sbutt14
149:sbutt15
150:sbutt16
151:sbutt17
152:sbutt18
153:sbutt19
154:sbutt20
155:sbutt21
156:sbutt22
157:sbutt23
158:sbutt24
159:sbutt25
160:sbutt26
161:sbutt27
162:sbutt28
163:sbutt29
164:sbutt30
on
enterFrame
global
ButtonNum
165
312
166:h1
99
167:h2
90
168:h3
289
169:h4
104
170:h5
108
171:h6
104
172:h7
223
173:h8
91
174:h9
112
175:h10
208
176:h11
161
177:h12
94
178:h13
93
179:h14
245
180:h15
426
181:h16
282
182:h17
229
183:h18
189
184:h19
147
185:h20
296
186:h21
216
187:h22
278
188:h23
127
189:h24


216
190:h25
403
191:h26
129
192:h27
184
193:h28
160
194:h29
366
195:h30
302
196:v1
307
197:v2
322
198:v3
168
199:v4
350
200:v5
346
201:v6
361
202:v7
171
203:v8
328
204:v9
299
205:v10
361
206:v11
379
207:v12
317
208:v13
346
209:v14
184
210:v15
236
211:v16
306
212:v17
289
213:v18
367
214:v19
273
215:v20
270
216:v21
299
217:v22
286
218:v23
283
219:v24
361
220:v25
236
221:v26
280
222:v27
296
223:v28
391
224:v29
275
225:v30
on enterFrame global ButtonNum
226
Open Pond RA
227:mtext1
228:mtext2
229:mtext3
230:mtext4
231:mtext5
232:mtext6
Coles Point Swimming
233:mtext7
Confederate Breastworks
234:mtext8
Fortney Branch
235:mtext9
Hidden Valley
236:mtext10
Longdale RA
237:mtext11
Lowmoor Range
238:mtext12
McClintick Point
239:mtext13
Morris Hill CG
240:mtext14
Mountain House
241:mtext15
Sherando Lake
242:mtext16
243:mtext17
244:mtext18
245:mtext19
246:mtext20
247:mtext21
Rifle Range
248:mtext22
Rotary Ann PS
249:mtext23
Shores Lake RA
250:mtext24
Spring Lake RA
251:mtext25
Sylamore Horse Trail
252:mtext26

White Rock Mountain RA	Wolf Pen RA			on enterFrame global ButtonNum	on enterFrame global ButtonNum	on enterFrame global ButtonNum
253:mtext27	254:mtext28	255:mtext29	256:mtext30	257	258	259

		R	R	R	L	R
260:tree site m	261:killmarker	262:rl1	263:rl2	264:rl3	265:rl4	266:rl5

R	R	R	R	R	R	R
267:rl6	268:rl7	269:rl8	270:rl9	271:rl10	272:rl11	273:rl12

R	R	R	L	R	L	R
274:rl13	275:rl14	276:rl15	277:rl16	278:rl17	279:rl18	280:rl19

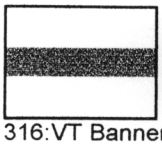
R	R	L	R	R	R	L
281:rl20	282:rl21	283:rl22	284:rl23	285:rl24	286:rl25	287:rl26

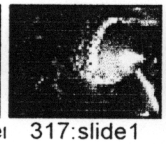
R	R	R	L		on enterFrame put the pathName	on enterFrame assignrecstat
288:rl27	289:rl28	290:rl29	291:rl30	292:idxstate	293	294

on enterFrame global MyPath.re	on mouseUp end	on enterFrame global SearchFil	on enterFrame global verifysta	on enterFrame recreadfortex	on enterFrame pause end	on mouseDown click end
295	296	297	298	299	300	301

on mouseDown click play done	on mouseDown click play fram	on mouseDown click play fram	on mouseDown click killmarke	on mouseDown click play fram	on exitframe set the timeoutPl	on mouseDown click play fram
302	303	304	305	306	307	308

on enterFrame set the timeoutP				Touch and release the Screen to Start....		
309	310:photopane	311:Back Bar	312	313	314:color slide	315:Slide Show


316:VT Banner


317:slide1


318:slide2

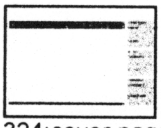
319:kill slides

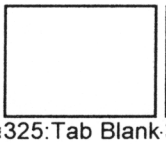
```
on
mouseDown
  click
  play fram
```
320

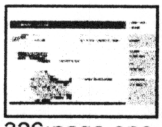
```
on
mouseDown
  click
  play fram
```
321

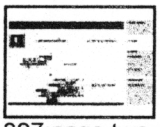
```
Welcome to
Online Help
```
322

```
Use these
bar buttons
to return to
search
```
323

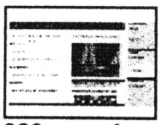

324:cover pag

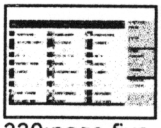

325:Tab Blank


326:page one


327:page two


328:page thre


329:page four


330:page five

Conecuh
331:fn1

Conecuh
332:fn2

Conecuh
333:fn3

Conecuh
334:fn4

Conecuh
335:fn5

Conecuh
336:fn6

Conecuh
337:fn7

Conecuh
338:fn8

Conecuh
339:fn9

Conecuh
340:fn10

Conecuh
341:fn11

Conecuh
342:fn12

Conecuh
343:fn13

Conecuh
344:fn14

Conecuh
345:fn15

Conecuh
346:fn16

Conecuh
347:fn17

Conecuh
348:fn18

Conecuh
349:fn19

Conecuh
350:fn20

Conecuh
351:fn21

Conecuh
352:fn22

Conecuh
353:fn23

Conecuh
354:fn24

Conecuh
355:fn25

Conecuh
356:fn26

Conecuh
357:fn27

Conecuh
358:fn28

Conecuh
359:fn29

Conecuh
360:fn30

361:page six

```
on
enterFrame
  global
  SearchFil
```
362

```
on
mouseDown
  click
  siteback
```
363

```
on
mouseDown
  global idx
  clic
```
364

```
on
enterFrame
  pause
end
```
365

```
on
enterFrame
  put the
pathName
```
366

```
on
enterFrame
  put the
pathName
```
367

```
on
enterFrame
  put the
pathName
```
368

```
on mouseUp
  play frame
"recstat
```
369


370

```
on mouseUp
  click
  play frame
```
371

372

```
on
mouseClick
  playdone
end
```
373

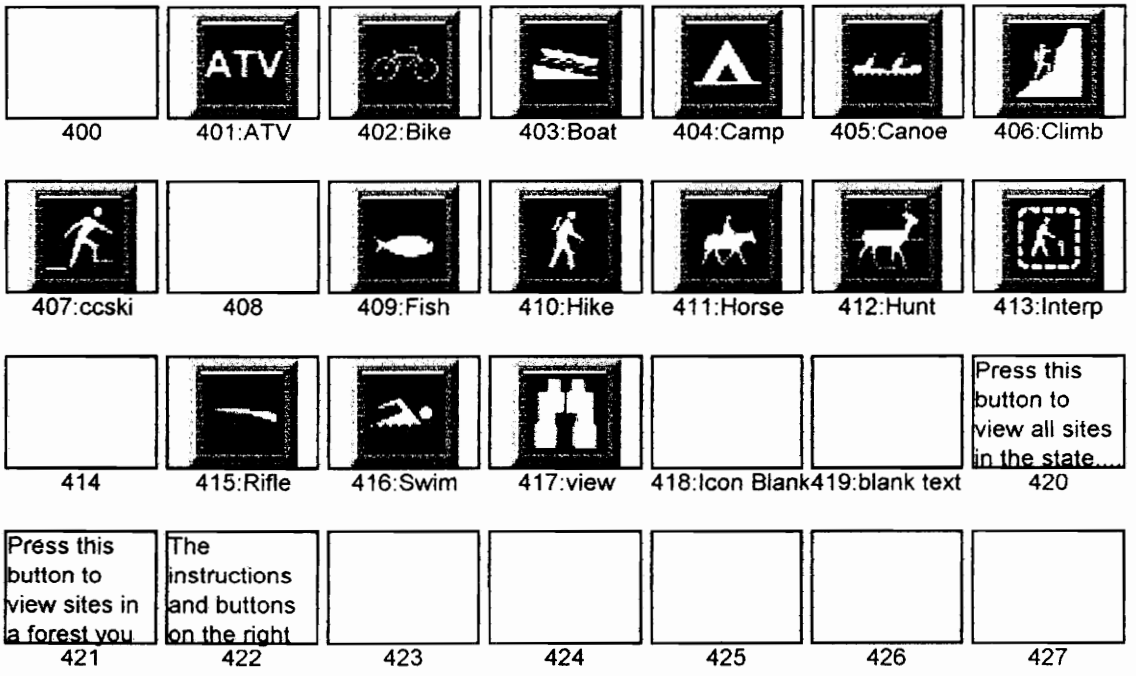
```
on
mouseDown
  click
  killmarke
```
374

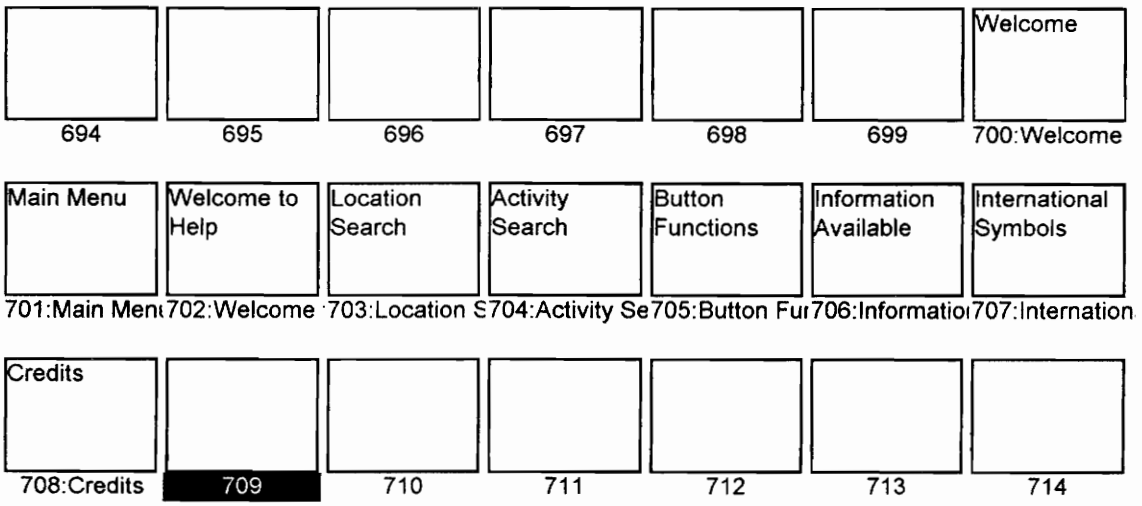
375:sbutt31


376

377

378


400
ATV
401:ATV
402:Bike
403:Boat
404:Camp
405:Canoe
406:Climb
407:ccski
408
409:Fish
410:Hike
411:Horse
412:Hunt
413:Interp
414
415:Rifle
416:Swim
417:view
418:Icon Blank
419:blank text
Press this button to view all sites in the state....
420
Press this button to view sites in a forest you
421
The instructions and buttons on the right
422
423
424
425
426
427


694
695
696
697
698
699
Welcome
700:Welcome
Main Menu
Welcome to Help
Location Search
Activity Search
Button Functions
Information Available
International Symbols
701:Main Men
702:Welcome
703:Location S
704:Activity Se
705:Button Fu
706:Informatio
707:Internation
Credits
708:Credits
709
710
711
712
713
714

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Roanoke, Virginia

Bachelor of Arts, English — 1990
Roanoke College, Salem, Virginia

Master of Landscape Architecture — 1996
Virginia Polytechnic and State University, Blacksburg, Virginia

Professional Experience

Computer Sales and Support — 1982-1983
Database, Inc., Roanoke, Virginia

Technical Consultant — 1984
Fred D'Ignazio, Author, Roanoke, Virginia

Office Space Planner — 1985-1990
Professional Office Systems, Briggs Business Systems, Roanoke, Virginia

Remodeling Contractor — 1990-1993
Roanoke, Virginia

Landscape Architect — 1994-present
Anderson & Associates, Blacksburg, Virginia