Wireless Website User Experience Guide

WEB-MNT-WSG V-1.0

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Prepared by:
Computech—12th Floor
7735 Old Georgetown Road
Bethesda, MD 20814
(301) 656-4030
www.computechinc.com

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1. Introduction

1.1. Purpose

The purpose of the Wireless User Experience Guide is to document the approach, guidelines, and best practices used to design the user experience within hypertext and interactive systems of the Wireless Telecommunications Bureau (WTB or Wireless) of the Federal Communications Commission (FCC). A hypertext system is defined as a web interface driven primarily by hypertext and navigation between content elements that the user perceives to be static. An interactive system is defined as a web interface driven by user/system interactions in such a way that the user can temporarily or permanently change the state and view of stored information.

1.2. Scope

This guide describes the major design elements of the Wireless website (wireless.fcc.gov), including its structure, layout, messaging, style, and behaviors. The approaches and guidelines contained herein apply to all publicly usable hypertext and software systems – in a sense – all that the user experiences while interacting with the Wireless site. The document also applies to internal administrative content and tools that support the site. This includes all content and interactive systems that support spectrum auctions, licensing, and services.

The purpose of the Wireless User Experience Guide is to create a foundation of documented guidelines and approaches. The guide addresses well-known tenants of visual design, usability, information architecture, and interaction design with the goal to optimize the efficiency, learnability, and consistency of the Wireless website.

This document is aimed at a wide diverse audience within the FCC. Most importantly, it serves as a basis for the strategy, planning, and design performed by Wireless web designers, interaction designers, and user experience architects. Additionally, it serves as a resource for project managers, software developers and testers, content providers, and FCC project contacts to understand the interactive and presentation standards of the Wireless site. This guide also aims to educate non-design staff about the many facets of user experience, the Web team's best practices, and to encourage collaboration and further development of standards over time.

Each version of the Wireless User Experience Guide represents a snapshot of a growing, evolving standard, and it is assumed the guide will grow as user needs become better defined and systems become more diverse and more integrated with each other. Updated versions shall incorporate more detailed descriptions as well as a broader range of templates, styles, and features.

1.3. Background

The Wireless Telecommunications Bureau's website has grown and evolved steadily since its launch in the mid-1990s. Over the course of several design iterations, the site expanded to include content on spectrum auctions, licensing programs, and antenna structure registration. At

the same time, many online software applications for auctions and licensing were created, enabling the public to transact with WTB online. These applications, built using interactive technologies such as HTML and Java applets, were accessed through the WTB's content driven site.

In late 2000, WTB began to significantly enhance its online content as well as transition numerous online systems to purely HTML-based user interfaces. This effort occurred over the next two years and was driven by many facets, including contemporary software development environments as well as the accessibility mandate of Section 508.

Of critical importance to this process was the FCC-wide effort to establish a modern, consistent visual design and approach across the www.fcc.gov site. As a result of a usability evaluation of the entire site, the FCC's Internet Working Group collaborated to produce a set of refined HTML hypertext/content templates that the WTB's web design team enhanced, extended, and implemented across the new wireless.fcc.gov site in August 2001. Simultaneously, the visual layout concept evolved from a content-based paradigm into designs applicable to interactive systems, seen first in the launches of the ASR Registration Search, ULS License Search, ULS Ownership Filing, and the Auction 31 interface.

The publishing of a first, followed by a second, version of the Wireless Style Guide was one of numerous significant outcomes of the WTB template creation process. In 2002, the style, layout, and overall visual concept began to account for a broader, more holistic user experience of the wide range of integrated Wireless website content and interactive systems. As a result, this document seeks to document and clarify the many design practices and guidelines that resulted, and continues to result from, that evolution.

1.4. References

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1.5. Assumptions and Constraints

1.5.1 Assumptions

- This document replaces the Wireless Style Guide, Version 2 as the authoritative resource for design approaches and guidelines employed by the Wireless design team.
- The approaches and guidelines described in this document may change and evolve over time.
- An informal review for the accuracy and applicability of the approaches and guidelines document should occur no less than two times per year.
- This document may be provided in alternative media formats, such as a website and/or presentation utilized by its diverse audience.

1.5.2 Constraints

- Technical resources, time, budget, and or feasibility constraints may limit strict system adherence to these approaches and guidelines. However, all effort should be made to ensure the development of consistent and usable hypertext and software application systems.

1.6. Document Overview

The document includes the following sections:

- Section 1 describes the purpose and scope of the User Experience Guide.
- Section 2 describes approaches and guidelines for developing site structures.
- Section 3 describes guidelines for the layouts of the design templates that have been established.
- Section 4 describes site content guidelines and editorial conventions.
- Section 5 describes various forms and controls treatment.
- Section 6 describes approaches and guidelines for system feedback pertaining to client-side validation, server-side validation, and messaging.
- Section 7 describes overall visual design style treatment conventions.

2. Structure

2.1. Information Architecture

Content within the Wireless website, its subsites, and other related projects is ever-growing, and constantly evolving to provide increasingly more information and services. The structure of the site, or more formally, its information architecture, establishes the patterns and relationships of the information contained herein. Information architecture is more than a simple site map. Instead, information architecture:

- ensures the mission and goals of the site are met through proper design and development,
- determines what content and functionality the site will contain,
- defines the site's organization, navigation, labeling, and
- maps out how the site can accommodate change and growth over time.

The information architecture of the Wireless website is driven by many components, including the hierarchy of each section; the creation and labeling of files and folders; and the storage, naming conventions, and primary navigation strategies for the site.

For online software systems, the concept of information architecture widens to include interactive characteristics, such as user flows through dynamic pages, sections, as well as processes to input and extract information from the system.

2.1.1. Information Architecture Approach

The information architecture for the Wireless site is the foundation upon which all information is mapped, enabling users to find their own paths to knowledge, making the complex clear. The Wireless Web Team creates and maintains information architecture for its sites and systems in numerous ways. Through initial interviews, focus groups, and other research, the Web Team gets a clear sense of the site or system's primary and secondary groups of **users**, the **content** they will need to manage, and the **context** through which they interact with that information. The outcomes of this research can be documented in a creative brief that outlines goals, users, content, and context.

Formal visual displays and schematics help clarify information architecture. These diagrams reveal content and interactive models through layouts of pages and sections of pages, hierarchies of sections, process flows, and other interactivity. These diagrams are used to validate concepts with project stakeholders, clarify models and structures for development staff, and plan for content creation.

Figure 1 is a sample of an information architecture schematic depicting the navigation flow and relationship of the Construction Requirements web pages to the ULS and Services web pages.

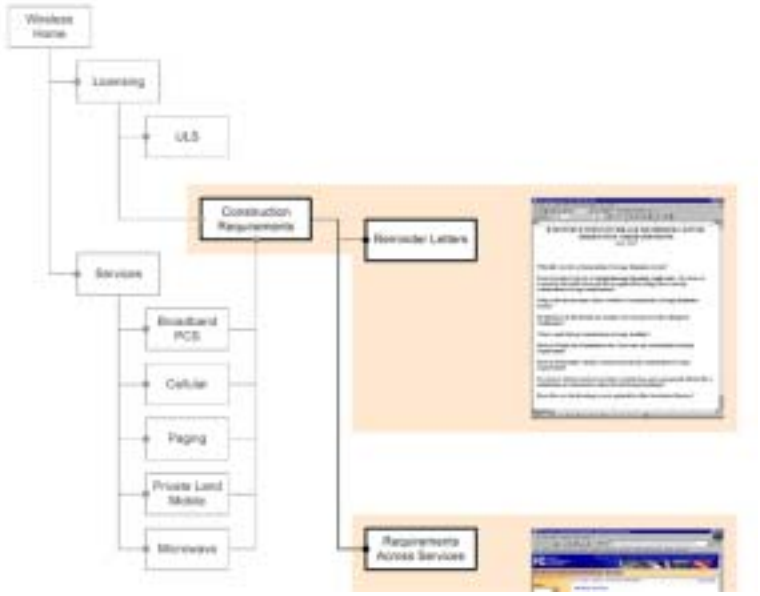


Figure 1 - Information Architecture Schematic

Information Architecture Guideline Tips

Create diagrams
In general, any new or substantially revised section of the site as well as all new interactive systems should be supported by one or more information architecture diagrams.

Get approval before development begins
The information architecture should be established and possibly approved before content and design work begins.

2.2. Sites, Subsites, and Interactive Systems

For the purposes of this document and related sources, wireless.fcc.gov is considered a complete **site**, and the major sections—such as those for Auctions (wireless.fcc.gov/auctions), Universal Licensing System (wireless.fcc.gov/uls), and Antenna Structure Registration (wireless.fcc.gov/antenna)—are considered **subsites** within the same hierarchy. Additionally, all interactive components of the site that include form controls and dynamically driven content are known as **interactive systems**. An interactive system is defined as a web interface driven by user/system interactions in such a way that the user can temporarily or permanently change the state and view of stored information. This includes the manipulation and editing of stored data based on implicit actions by the user, in addition to the system's ability to respond to user requests to provide feedback and assistance when necessary. Conversely, a hypertext system is defined as a web interface driven primarily by hypertext and navigation between content elements that the user perceives to be static. Hypertext systems are based on underlying information architecture, such as hierarchical content models. Interactive systems are based on

an underlying interaction design. Examples of an interactive system include ULS License Search, Auctions Bidding & Results System, and Ownership Filing.

2.2.1. Site Maps

Site maps provide users with an overview and organization of the content within a site or subsite. It is a visual aid organizing major sections, topics, and pages of a site in a hierarchical display of links. Site maps are similar to a table of contents, and are a well-established web design convention easily understood and utilized by most users. Figure 2 is a site map for the Auctions subsite.

Figure 2 - Auctions Site Map

2.2.1.1. Site Map Approach

Each major site and subsite contains a site map that enables users to quickly browse the major categories within it. The site maps within the Wireless website include:

- Wireless: Wireless Telecommunications Bureau
- ULS: Universal Licensing System
- ASR: Antenna Structure Registration
- Auctions
- Public Safety

Site Map Creation Guideline Tips

Show hierarchy
Site maps display the hierarchy of the section.

Use HTML lists
By default, site maps are presented using unordered HTML lists (nested as necessary).

Present up to 3 levels of hierarchy
Site maps generally present up to three levels of the hierarchy, and should not take up more than two folds of vertical scrolling. Note that the site map does not need to contain a link to each and every page within a subsite.

Bold top-level pages
Each of the top-level pages is **boldface** if the site map presents more than two levels of the hierarchy.

Match title to the section it represents
For example, the Wireless Telecommunications Bureau section's site map is titled "WTB Site Map," matching the section header.

Remember, site maps are not always required
Industry standards convey that most major sites would have a site map. However, every subsite does not require a site map.. Site maps should not be used when a subsite's complete (or nearly complete) set of pages is linked to from the left navigation. Additionally, site maps are not used with interactive systems.

2.2.2. Site Indexes

A site index provides an alternative navigation structure to the site map in that it presents an alphabetical list of links to prominent content throughout the site. Indexes are useful because users are familiar with the concept from other media, such as books and documentation. The Wireless site employs a single site index of the entire site.

While site maps focus on the hierarchies and organization of the site's content, indexes highlight specific topics of interest and are useful for known-item searching. Instead of scanning an entire list of categories and their elements, a user can quickly move to a topic's alphabetical location in a list.

However, site indexes are only useful if they (1) are extensive and (2) utilize the controlled vocabularies of synonyms, and related terms within a site's content. In general, all basic conventions of traditional index creation can apply to the creation of a website index.

2.2.3. Subsite Models

While the content throughout the site is diverse and the structures of subsites are often specialized and unique, the site does contain a few oft-used subsite models. The creation of formalized subsite models allows for the execution of a more structured architecture for a few of the subsites, such as the Services and Auctions subsites.

2.2.3.1. Services

The Services section contains over 25 services. Most share common categories such as:

- **Service at a Glance**
  Faceted summary of high level service attributes
- **About**
  General information about the service and historical summaries
- **Data**
  Numerical, tabular, and descriptive data about how the service is defined, including geographic regions, frequencies, and licensees

- **Licensing**
  Online systems links and related content on how entities obtain and maintain licenses for wireless spectrum
- **Operations**
  Content relating to how, once a license is obtained, the service can be operated, including rules on communication
- **Releases**
  News, public notices, and other official documents released by the Commission

2.2.3.2. Auctions

With the continued execution of numerous auctions each year, the publishing and display of auction data has become formalized. Each auction page includes most, if not all, of the following content:

- **Fact Sheet**
  Summary information about the auction's key dates, offered spectrum, license periods, eligibility and bidding credits, and rules
- **Releases**
  News, public notices, and other official documents released by the Commission
- **Results**
  Round results, reports, summaries of markets and bidders, and closing charts once the auction is complete
- **Maps & Bandplans**
  Links to visual displays of the auction's geographic regions and band plans
- **Major Public Notices**
  Specialized display tabulating the most important releases from the Commission during the auction process

2.3. Breadcrumbs

Breadcrumbs are a set of links that provide a hierarchical sense of location within the site, showing the path from the Homepage (i.e., www.fcc.gov) to the page where the user currently is within the site. Each HTML page within the site includes a breadcrumb path. The breadcrumbs should be self-explanatory, not take up much room, and provide a convenient way to do two common operations: 1) back up a level, or 2) go back to the Homepage. Breadcrumbs are formatted using small text with less visual prominence but still enable the reader to clearly read and understand the hierarchy within which the page resides. Figure 3 is a snapshot of the breadcrumbs on one of the Amateur subsite pages.

Figure 3 - Breadcrumbs Example

The breadcrumbs are located just below the header bar and section title, and each breadcrumb section should also include a link to the FCC Site Map at www.fcc.gov/fccsitemap.html. The breadcrumb section *does not* include a link to the subsite-specific sitemap, whose link is displayed in the left column navigation.

Breadcrumb Guideline Tips

Display in same location
Display the breadcrumbs in the same location in each and every page, as specified by the FCC template.

Use ">" between pages/levels.

Use class="breadcrumbs"
Use class="breadcrumbs" within the table cell for formatting the breadcrumbs using tiny type.

Don't use as sole navigation or as a page title
Do not use breadcrumbs as a sole means of navigation or in lieu of a page title.

Use concise descriptions of page title
Do not necessarily display complete page titles, but instead use concise descriptions long enough to reflect which page it is. Acronyms are entirely appropriate, as is shorten page titles. However, if shortened, labels should still be consistent across different pages in the same hierarchy, and related to the original page titles.

Use true hierarchy
Breadcrumbs should include pages only within the page's true hierarchy. For example, an intranet application should include only "Wireless Intranet > ASR > Inbox" in its breadcrumbs, and should link to pages on the external site only within the page's content and other means such as "Related Sites".

2.4. Folders and Files

While naming individual files and folders is discretionary, in general folders and files should map to the site's information architecture and, in most cases, to the breadcrumbs of the particular page. The page location (that is, the visible URL in the location bar of the browser) should provide an intuitive indicator of the user's sense of place within a site. However, due to legacy structures and popular URLs that are likely bookmarked and included in substantial documentation, the physical folders and filenames need not map exactly to the current information architecture or breadcrumbs. Figure 4 is an example of the naming convention common for the Wireless Services folders.

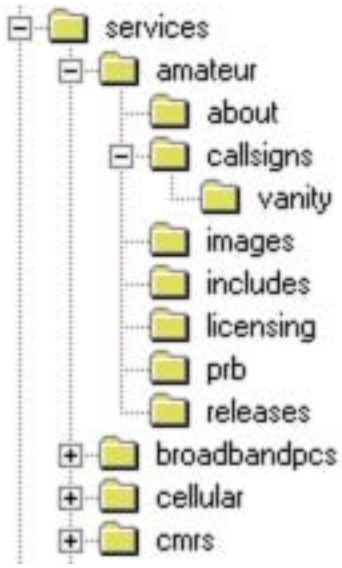


Figure 4 - Files and Folders Example

2.4.1. File Types and Download Size

The Wireless site and other related sites may contain files of many different types. In general, an effort should be made to provide all information in an accessible format (primarily HTML, but also PDF, Word, and/or text when appropriate). The use of other file types should be restricted to situations where conversion places an undue burden on the team or there is a lack of a suitable, more accessible alternative. For example, databases are more suitably stored in their native formats (e.g., Microsoft Access or dBase files), and converted to a text file, if and only if, it is required. However, when a file is converted, the native format should also be made available.. Potential file types include:

- **html**: Hypertext Markup Language
- **htm**: used only for Cold Fusion templates
- **pdf**: Adobe Acrobat file
- **doc, Word**: Microsoft Word Document
- **wpd, WordPerfect**: Word Perfect
- **txt**: Text file
- **xls**: Microsoft Excel file
- **ppt**: Microsoft PowerPoint file
- **mdb**: Microsoft Access database
- **zip**: Zip file
- **dbf**: dBase file

- **cgi**: Common-Gateway Interface file, likely written in Perl
- **pl**: Perl Script
- **css**: Cascading Style Sheet
- **xml**: Extensible Markup Language
- **wml**: Wireless Markup Language
- **exe**: Windows Executable

2.4.2. Creating Files and Folders

Deciding when to create a new folder and "chunk out" particular file assets is subjective. However, in general, a new folder for content should be created when a section will (1) contain a large number of files related primarily to a single page or topic (e.g., numerous notices about anti-collusion, requiring a separate folder), or (2) there are or will be numerous html files associated within a specific topic area. One good rule of thumb to follow: if the section requires unique section navigation, then that section likely belongs in a separate folder. The Web Team can prospectively research these issues by working with the content liaison and understanding the current and future content requirements.

File and Folder Creation Guideline Tips

Be descriptive
Each file and folder name should be descriptive, concise, and as specific to the content as possible.

Examples:

- Bad: rel.html;
  Better: releases.html
- Bad: atl.cgi;
  Better: attendees.cgi
- Bad: reg.htm;
  Better: registration.html

For a page that pertains to accessibility

- Bad: accessinfo.html,
  Better: accessibility.html

For a page that details the privacy policy, security, and cookies

- Bad: notices.html,
  Better: privacy.html or security.html

Use lower case
Folder names should be entirely lower case.

Create hierarchical URL paths
The full URL path (revealed through the browser's location bar) should make sense and provide a hierarchical sense of location within the overall site.

Title primary file "index.html"
The primary HTML document in a directory, whether it is a major section's Homepage or the default file, should be titled index.html, unless otherwise required by the technology used to implement the view.

Use .html extension
Unless otherwise required, such as by a Cold Fusion engine, all HTML files should use the full, four-letter extension of .html.

Considering sorting effects
When naming a group of files or folders, keep in mind how the label convention will effect sorting.
Bad: rel1098.html;
Better: releases-1998-10.html

Do not use underscores
File and Folder names should not include an underscore ("_"). When the URL is displayed in the browser's location bar, the underscore can be mistaken for a space.

2.4.3. Common Folders

Common folders store shared files across the site, such as images and include files. Images should all be stored in the images subdirectory at the highest level at which that image will be shared. For example, images used by pages throughout the Wireless site should be stored in /images/ instead of having multiple copies of the same image in separate subsites. The same strategy should be used for includes, such that Wireless site-wide-includes are found in /includes/, Auctions site-specific-includes are found in /auctions/includes/, and includes related only to a particular subject or auction within the Auctions site are found in that particular directory (i.e., /auctions/50/includes/).

3. Layout

Throughout the Wireless website, it is important to sustain a consistent, usable layout of pages, content, tables, navigation, help, tasks, and other common interface attributes to approach optimized usability. Template-based approaches are used for the design of hypertext and interactive systems in order to present a consistent user experience, enabling the user to learn and adapt to the system over time.

3.1. Page Templates

Any hypertext or interactive system of the Wireless site falls into one of the following template families:

- External (Content – 1 Column)
- External (Content – 2 Column)
- External (Content – 3 Column)
- External (Interactive)
- Internal

The external content template was the original template design used for the Wireless website and serves as a foundation for concepts in the subsequent designs. This template applies to any content displayed within the Wireless website, other than specific log in-based web interactive systems. External templates apply to any web interactive systems presented to the public, and generally follow the primary blue, secondary gold color scheme. Internal templates are also available for hypertext and interactive systems used solely by FCC staff, and follows a primary blue, secondary green color scheme.

Using an include-based strategy, each template's content has been divided into manageable and customizable chunks. This allows for easy scalability and timesaving updating.

Page Template Guideline Tips

Use 700 pixel browser width minimum
Each page should accommodate a minimum browser window width of 700 pixels.

Test at 640x480 resolution
Although the design is not required to conform to browser windows at 640x480 resolution, high-level and frequently copied page layouts should be tested at this resolution.

Fill 100% of window
Each page will dynamically fill 100% of the browser window width.

Use comments
Comment lines should be placed, within the HTML, labeling the following include file. This is done for easier code management and bug checking.

Omit links to in-development screens
Do not include commented code in production systems that link to in-development/design screens.

3.1.1. Selecting the Right Page Template

The following table indicate the selection criteria for choosing the appropriate page template for any given hypertext or interactive system that is used by non-FCC users (e.g., the public).

External applications that require a logged in/authenticated environment	use the external interactive template.
External applications that do not require a logged in/authenticated environment	use the external content - 1 column template.
External websites where the main content requires related content to be displayed alongside the main content area	use the external content - 3 column template.
External websites where the main content does not require relevant content to be displayed alongside the main content area	use the external content - 2 column template.

3.1.2. External (Content - 1 Column) Page Template & Include Structure

A few external content pages use a one-column format, essentially a header above and a footer below the main content area. This template is usually reserved for areas where a left navigation column is either not needed or impedes the functionality of the page (i.e., the need for greater horizontal space). Page re-directs and ULS search applications typically use this template.

A 15 pixel buffer stands on either side of the main content area, which is set to a width of 100%.

While the include structure for single column external pages can vary moderately, the following list displays the most commonly used includes:

1. **FCC Header**
/includes/fcctop.ssi
The FCC-wide blue header includes the FCC logo graphic and links to major pages within the FCC site, including the FCC home and search. In rare occasions, this header can be modified to replace the FCC major pages navigation with a critical element, such as a bidding round timer.

2. **Application Header**
/[site]/includes/sectiontop-app.ssi
The Application Header displays the application title within a gold bar. The application title should be concise and specific.

3. **Breadcrumbs Start**
/includes/crumbstart-app.ssi

The Breadcrumbs Start include provides the HTML source between the conclusion of the section header and the initial link to the FCC Homepage. The content provided in each individual page (i.e., not in an include file) is the string of breadcrumbs and their surrounding <A> tags and dividers. The final breadcrumb should be the application title, unless the application has its own hierarchy.

4. **Breadcrumbs End**

/includes/crumbend.ssi

The Breadcrumbs End include provides the HTML source after the final breadcrumb to the conclusion of the breadcrumb table.

5. **Content Buffer Begin**

/includes/buffer-app-front.ssi

The content buffer initiates the table cell within which the page's primary content begins.

6. **Content Buffer End**

/includes/buffer-back.ssi

This include ends the content area, closing the necessary table tags.

7. **FCC Bottom**

/includes/fccbottom.ssi

The FCC Bottom contains a repeated set of navigation that is presented in the FCC Header.

8. **Application Section Contact**

/[site]/includes/sectioncontact.ssi

The section contact area includes information about technical support and other relevant contact and application-specific conditions or notices.

9. **FCC Contact**

/includes/fcccontact.ssi

Standard footer that includes the FCC address, phone and fax, and links to web policies, required browsers, customer service standards, and the Freedom of Information Act.

3.1.3. External (Content - 2 Column) Page Template & Include Structure

In general, most external pages will typically use a two-column format consisting of the standard navigation bar on the left with the page's content to its right. The gutter (white space) between the two sections is 15 pixels and is controlled by an additional table column. The main content area is displayed to fit 100% of the space between buffers.

The include structure, displayed as the "Wireless Website Template Design" in the appendix, generally contains the following include files:

1. **FCC Header**

/includes/fcctop.ssi

The FCC-wide blue header includes the FCC logo graphic and links to major pages within the FCC site, including the FCC home and search.

2. **Section Header**

/[site]/includes/sectiontop.ssi

The Section Header presents the section's collage image as well as section title text on the golden bar below the collage.

3. **Breadcrumbs Start**

/includes/crumbstart.ssi

The Breadcrumbs Start include provides the HTML source between the conclusion of the section header and the initial link to the FCC Homepage. The content provided in each individual page (i.e., not in an include file) is the string of breadcrumbs and their surrounding <A> tags and dividers.

4. **Breadcrumbs End**

/includes/crumbend.ssi

The Breadcrumbs End include provides the HTML source after the final breadcrumb to the conclusion of the breadcrumb table.

5. **Orange Start**

/includes/orangestart.ssi

This include contains a short section of source code that begins the table containing the overall content and the cell that contains the left column navigation. This include specifies the width of the left column, currently set at 165 pixels.

6. **Search**

/includes/searchbox.ssi

The Search template displays the FCC-wide search form that is consistent with the display across all other FCC sites. After submitting the search by clicking on the "Go" button, the user is directed out of the Wireless site and into the FCC-wide search results.

7. **Section Navigation**

/[site]/includes/sectionnav.ssi

This include references the left column navigation.

8. **Orange End**

/includes/orangeend.ssi

This include provides the HTML source to the conclusion of the table parameters set by the Orange Start include.

9. **Related Sites**

/[site]/includes/relatedsites.ssi

This include incorporates external links to other related sites.

10. **Buffer Front and Buffer Back**

/includes/bufferfront.ssi, /includes/bufferback.ssi

These two includes contain HTML code creating a 15 pixel gutter on both sides of the primary content box.

11. **FCC Bottom**

/includes/fccbottom.ssi

The FCC Bottom contains a repeated set of navigation that is presented in the FCC Header.

12. **Section Contact**

/[site]/includes/sectioncontact.ssi

This include presents a brief summary of contact information for the site or sub-site, as well as the phone and e-mail of a contact person.

13. **FCC Contact**

/includes/fcccontact.ssi

Standard footer that includes the FCC address, phone and fax, and links to web policies, required browsers, customer service standards, and the Freedom of Information Act.

3.1.4. External (Content - 3 Column) Page Template

Some external pages—including most major pages such as the Wireless, Auctions, ULS, and ASR Homepages—will warrant an additional third column on the right side of the page. This column is typically used to highlight important sections, announcements, and other content of increased interest. Most if not all of the content in the right column should be displayed in tables, using color, images, and typeface treatments to accentuate the content of interest. Other external pages may require this more complex layout, including Homepages for major sections within a site, such as the Support Homepage for the ULS site.

Each page follows the same include file structure as the external 2 column content template. The difference lies in the main content area. The table cell is split into two columns (with a 15 pixel buffer column between both). The most important content can be positioned in the first row that spans both columns below (optional), the secondary content displayed in the middle column, and more tabular and tertiary content displayed in the fixed width, right column.

External (Content – 3 Column) Guideline Tips

Right column
The right column is set to a width of 250 pixels.

Spacer image
A spacer image with a width of 250 pixels is placed in the right column in order to force the desired 250 pixels width.

Center column
The center column is liquid (width = 100%) filling the remaining area.

3.1.5. External (Interactive) Page Template & Include Structure

The external system template is an extension of the external content template. The application header is similar but simpler, containing the same FCC logo as the website, as well as the application title and breadcrumbs if necessary. The footer is also streamlined to visually occupy less space and incorporate fewer links than the typical external content footer templates.

Many external systems take advantage of a tabbed environment (such as the Auctions Bidding & Results System), or a mixed application where components of the design are tabbed (ULS License Search). Regardless of whether an application is tabbed, task guidelines are used to display page-specific and application-wide tasks.

While the include structure for external applications can vary moderately, the following list displays the most commonly used includes:

1. **Application Header**

/external/[application]/includes/app-header.ssi

The Application Header includes the FCC logo graphic, application title, and breadcrumbs. The application title should be concise and specific. The content is the string of breadcrumbs and their surrounding <A> tags and dividers. The final breadcrumb should be the application title, unless the application has its own hierarchy.

2. **Log In**

/external/[application]/includes/loginlogoff.ssi

If the application is in part or completely password-protected, then a toggled log in/log off message is displayed between the breadcrumbs and page title. If a user is not logged in, then "Log In" is displayed. If the user is logged in, then "Logged In: [username/companyname/etc] (Log Out)" is displayed.

3. **Content Buffer Begin**

/external/includes/buffer-app-front.ssi

The content buffer initiates the table cell within which the page's primary content begins.

4. **Task Navigation Start**

/external/includes/side-cellstart.ssi

If the application includes task navigation displayed in the right margin, then Task Navigation Start includes necessary HTML to end the content area table cell and begin the right column.

5. **Task Navigation Topspace**

/external/includes/side-topspace.ssi

In some cases, the right column task content may need to be pushed down in the display to align with a tabbed box navigation or other content. The Task Navigation Topspace includes necessary HTML to move the task navigation down consistently.

6. **Task Navigation**

/external/[application]/includes/sidenav-[type].ssi

Task navigation section display groups of tasks. Refer to Tasks section 3.4 for more information.

7. **Content Buffer End**

/external/includes/buffer-back.ssi

This include ends the content area, closing the necessary table tags.

8. **Application Footer**

/external/[application]/includes/app-footer.ssi

The application footer includes general help links, application specific links, FCC address, phone, fax, and e-mail information. The set of links can be customized per application, but should remain the same application-wide.

3.1.6. Internal Page Template & Include Structure

The internal template is designed after the external interactive template, but incorporates a green and blue (vs. gold and blue) color palette. The application header is similar to the external, incorporating the FCC logo and application title. The footer is also streamlined to visually occupy less space, allowing more room for links to sections of the given application or other applications.

Many internal systems take advantage of a tabbed, or a mixed application where components of the design are tabbed. Regardless of whether an application is tabbed or not, task guidelines are used to display page-specific and application-wide tasks.

While the include structure for internal applications can vary moderately, the following list displays the most commonly used includes:

1. **Wireless Header**
/internal/includes/wireless-header.ssi
The Wireless Header includes the FCC logo graphic and the statement "For Internal Use Only."

2. **Application Header**
/internal/[application]/includes/app-header.ssi
The Application Header presents the application title and high level links for within the application.

3. **Log In**
/internal/[application]/includes/loginlogoff.ssi
If the application is in part or completely password-protected, then a toggled log in/log off message is displayed between the breadcrumbs and page title. If a user is not logged in, then "Log In" is displayed. If the user is logged in, then "Logged In: [username/companyname/etc] (Log Out) is displayed.

4. **Content Table Start**
/internal/includes/content-tablestart.ssi
The content table initiates the table cell within which the page's primary content begins.

5. **Task Navigation Start**
/internal/includes/side-cellstart.ssi
If the application includes task navigation displayed in the right margin, then Task Navigation Start includes necessary HTML to end the content area table cell and begin the right column.

6. **Task Navigation Topspace**
/internal/includes/side-topspace.ssi
In some cases, the right column task content may need to be pushed down in the display to align with a tabbed box navigation or other content. The Task Navigation Topspace includes necessary HTML to move the task navigation down consistently.

7. **Task Navigation**
/internal/[application]/includes/sidenav-[type].ssi
Task Navigation section display groups of tasks. Refer to Tasks section 3.4 for more information.

8. **Content Table End**

/internal/includes/content-tableend.ssi

This include ends the content area, closing the necessary table tags.

9. **Application Footer**

/internal/[application]/includes/app-footer.ssi

The Application Footer includes general help links and application specific links. The set of links can be customized per application, but should remain the same application wide.

10. **Wireless Footer**

/internal/includes/wireless-footer.ssi

The Wireless Footer contains any general Wireless internal links that exist outside of the given applications scope and function.

3.2. Navigation Templates

Section navigation templates provide navigation that reflects the hierarchy of pages determined by the Information Architecture. Presented in the left column beneath header elements (logo, breadcrumbs, etc), this navigation is generally required on the Wireless website and may also be used by applications to link to hierarchical content within. Figure 5 depicts how three levels of navigation are generated from "About Auctions/Conferences" to "Comb. Bidding 2001."

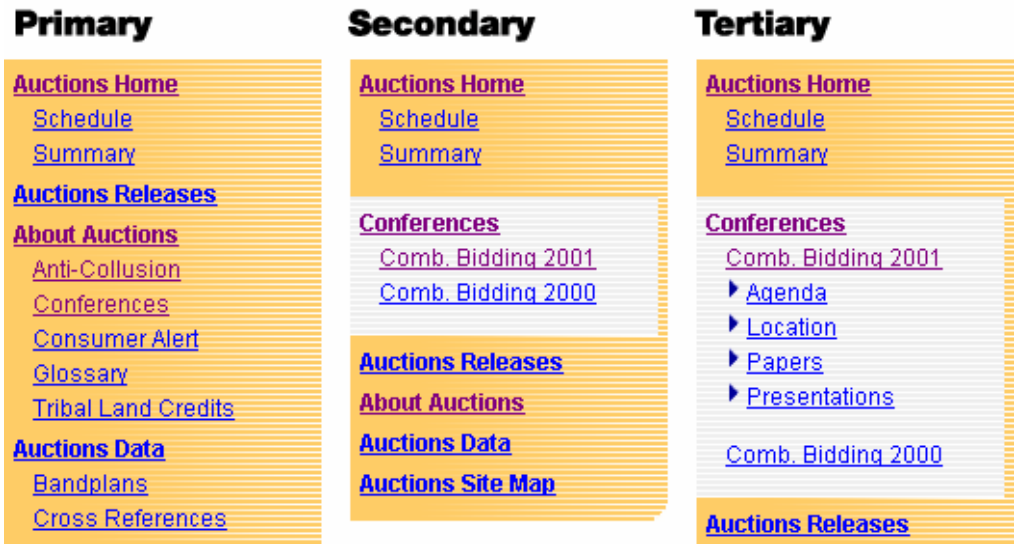


Figure 5 - Left Column Navigation

3.2.1. Primary Set

The most common navigation set consists of pages at the primary and secondary level. The side navigation area will show all primary pages, with secondary pages underneath. This link set constitutes the section navigation include.

3.2.2. Secondary Set

If a secondary page has its own set of pages (tertiary level), a separate treatment is introduced where the secondary page and its group of tertiary pages are displayed in a gray box within the gold navigation. In this case, the primary navigation pages are collapsed, such that only primary pages are displayed and other secondary page links are hidden. The new gray secondary navigation area is displayed beneath the section home primary link, followed by the remaining primary page links.

3.2.3. Tertiary Set

If a tertiary page itself contains a set of pages, additional pages are displayed below the tertiary each preceded by a blue arrow icon. This links set is only displayed when the user is within tertiary page or its set of pages.

Example:

A site has large amount of content information called XYZ. Most of the sections of content (C, D, E, F, G, and H) are small and are associated with the general site, but there are two larger sections (A and B) of content that create distinct groupings on their own, containing over 20 distinct pages within each. One of those two sections (A) had three major sections of its own (A1, A2, and A3), while the other section (B) had many smaller pages of less significance. The navigation would appear as in Figure 6:

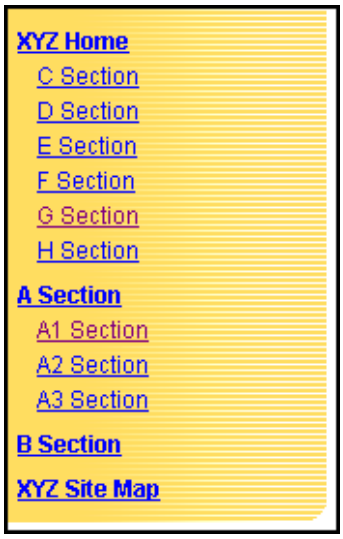


Figure 6 - Navigation Example

Navigation Guideline Tips
Section Name
The first link should be to the section's Homepage, displayed in bold.

The links label should be the section name followed by “Home.” Acronyms are appropriate.

TITLE = “[section name] Home”

The link should be enclosed in and .

Class styles

CLASS=”leftnav” should be used for all major links. The class styles the text as bold and not indented. For example, the site’s Homepage, site map, and major sections should all be formatted using this class.

CLASS=”leftnav-sub” should be used for all sub navigation, such as primary pages within a site. This class presents the text with normal font weight and indented 5 pixels to establish the hierarchy of the site and the nesting of the page within its overall site or section. For example, the primary sections within the site (such as About, Releases, and Databases) should be formatted with this class.

For a tertiary navigation display (secondary set), the secondary page uses the leftnav class and the tertiary pages are indented 5 pixels by using the leftnav-sub class.

Section navigation should be repeated and consistent across all pages within a given section of the site’s hierarchy.

Links

Generally there should be no more than 5 to 7 major links in a section's navigation, including Home and Sitemap.

Section navigation should contain a skip navigation invisible link for accessibility purposes.

Left column navigation should contain no more than 20 links overall.

Each group of links nested within a major link should generally contain no more than 10 links.

If possible, the link label should NOT wrap to a second line. If the label does wrap, consider a shorter label or appropriate abbreviations.

Each link should contain the TITLE= attribute that matches the link’s label unless a more in depth description is necessary. For example, if an abbreviation is used, use the TITLE= attribute to more clearly define the link.

3.3. Tabs and Sub-Tabs

A tabbed design metaphor can be used to group sets of information tied together by a common, larger attribute. For example, Amazon groups products (common attribute) into tabs for product types (such as books, music, etc). In WTB, a ULS license (common attribute) can be grouped into tabs: “Main” (administrative), “Locations” (transmitting locations), and “Market” (market-based and auctions data).

3.3.1. Sub-Tabs

When tabs contain substantial content that can also be grouped into homogeneous or important sections, sub-tab navigation can be used to display links to the section homepage within that tab. For example, a Bidding tab may include Watch lists and Packages sub-tab navigation.

Tab and Sub-Tab Guideline Tips

Groups
Tabs may never be stacked. If you have a large number of tabs, evaluate the groups to determine if a single tab can include all the groups, and they become sub-tab navigation.

Tabs group content, while tasks enable the user to perform an action. A tab can contain multiple tasks, and a task can apply to content in multiple tabs, but a task can never be a tab.

Tasks should not be sub-tab navigation unless the task is an extensive process or include substantial related content.

Justification
Tabs are left justified to its contained table beneath.

The default tab should displayed on the far left.

Order
Tabs should be ordered by priority, left to right, unless a higher priority of ordering is clear.

Tabs should not be used to convey a sequence, but can be used to convey order if the grouped content is ordered. For example, it is inappropriate to use tabs to display a checkout process that includes shopping cart view, checkout, billing address, credit card, and confirmation. Consider an alternative presentation for this sequence. On the other hand, if you have grouped objects into particular categories (such as applications into incomplete, pending, and returned), then the tabs should be presented in ascending order left to right.

Colors
The selected tab is displayed as dark color, other active tabs as light color, and inactive tabs as gray color. Inactive tabs are not clickable.

3.4. Tasks

All web applications enable the user to perform tasks, even in the context of sites that in terms of development contain only static content. Tasks can be displayed in a variety of ways and situations, and in general most tasks are accessed through one of the strategies discussed in the following subsections.

3.4.1. Forms

In this case, the user can see at least one form control (such as a button, text box, or drop down list) and submits that form directly from that page.

3.4.2. Global Tasks

Tasks that apply regardless of what page is displayed are typically displayed in the header (such as a link to “Search”), far upper right of the content area (such as Help), persistent left navigation, or in the footer (such as a link to “Submit a Suggestion”). Such tasks could also be displayed within a page’s content.

3.4.3. Tab Tasks

Tasks specific to the current tab are displayed in the right-side task navigation underneath the section’s label, which matches the tab’s label. In addition, these tasks are presented on the tab’s homepage (i.e., the page displayed when the user clicks on the tab) in a horizontal list beneath the page title, each with leading icon (default is the arrow icon).

3.4.4. Sub-Tab Tasks

Tasks specific to the current sub-tab section are displayed in the right-side task navigation underneath (1) the tab-level task section and (2) the sub-tab section's label, which matches the sub-tab level navigation label. In addition, these tasks are presented on the sub-tab section's homepage (i.e., the page displayed when the user clicks on the sub-tab navigation) in a horizontal list beneath the page title, each with leading icon (default is the arrow icon).

3.4.5. Page/Object Tasks

Tasks specific to a single, given page are displayed contextually within the page content as well as in a horizontal list beneath the page title, each with leading icon (default is the arrow icon). Such tasks are not displayed in the right-side task navigation if the page is not a tab or sub-tab level homepage.

3.4.6. Task Layout Example

The following example demonstrates the display and propagation of task links through a tabbed environment. In this case, there are three generalized tab tasks ("Place & Remove Bids", "Reduce Eligibility", and "Last and Best Bid"), one sub-tab specific task ("Create Package"), and three page-specific tasks within the sub-tab's group ("Delete Package", "Edit Contents", "Edit Name"). The sub-tab specific task treatment is illustrated in Figure 8, and the page-specific tasks treatment is illustrated in Figure 9. Figure 7 is an example of the Auctions Bidding Tab Home illustrating the design treatment for generalized tab tasks.

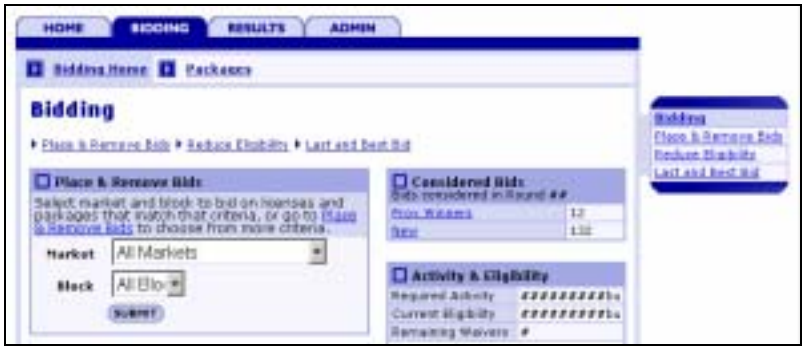


Figure 7 - Bidding Tab Home

On the "Bidding" tab home, the three tasks are displayed on the right in the task navigation as well as horizontally below the page title.

Figure 8 - Packages Sub-tab

On the sub-tab (“Packages”) home, there is a sub-tab specific task displayed below the page title as well as on the right in a separate section below the generalized tab tasks.

Figure 9 - Page Within Sub-tab Section

Finally, on a page (Package) within the sub-tab section, three page-specific tasks are displayed horizontally below the page title, but are not displayed on the right because none apply to any other object (in this case, page) within the application.

Tasks Guideline Tips

Label concisely
Tasks should be labeled concisely as active voice commands, such as “Add File” or “Update Address.” Common task opening words include: add, new, update, delete, remove, create, cancel, upload, and download.

Match label with resulting page title
In general, especially for single form tasks, the task link label should be the same as the resulting page’s title.

Match submit button and task labels
If possible, the button for submitting a task should match either the entire task label, such as “Add File,” or the first word of the task label, such as “Add.”

3.5. Data Tables

Data tables are used in hypertext and interactive systems to display data in easily digestible and scanable formats.

All data table displays nest one HTML table within another, and table attributes vary slightly depending on whether or not a 1-pixel grid separates each cell. The background color that creates the border, and grid if necessary, is mediumdark. Classes for the interior table cell color can range from light to mediumdark depending on the circumstance, but no darker than the exterior table color.

Data table headers and section headers with background color darker than the exterior table's color should be coded in separate table rows within the exterior table to ensure the exterior background color matches the color of the interior cell. The following two examples demonstrate the necessary HTML code to display tables with and without a grid-like visual structure between each table cell.

```
<table width="100%" border="0" cellspacing="0" cellpadding="1">
 <tr>
  <td class="cell-pri-mediumdark">
   <table border="0" cellspacing="1" cellpadding="3" width="100%">
    <tr>
     <td class="cell-pri-light">
     </td>
    </tr>
   </table>
  </td>
 </tr>
</table>
```

Figure 10 - HTML Table Code, Grid Example

```
<table width="100%" border="0" cellspacing="0" cellpadding="2">
 <tr>
  <td class="cell-pri-mediumdark">
   <table border="0" cellspacing="0" cellpadding="3" width="100%">
    <tr>
     <td class="cell-pri-light">
     </td>
    </tr>
   </table>
  </td>
 </tr>
</table>
```

Figure 11 - HTML Table Code, No Grid Example

3.5.1. Single Column

Single column data tables are used for a simple layout of one or more values. These presentations display field labels in the left column in medium color, and field values are displayed in the right column in light color. Table headers are displayed in mediumdark bold. In general, all field value cells should be left/top aligned, enabling quicker visual scanning and presenting each value closer to its label (increasingly necessary in cases where a single column table expands to fit wider spaces).

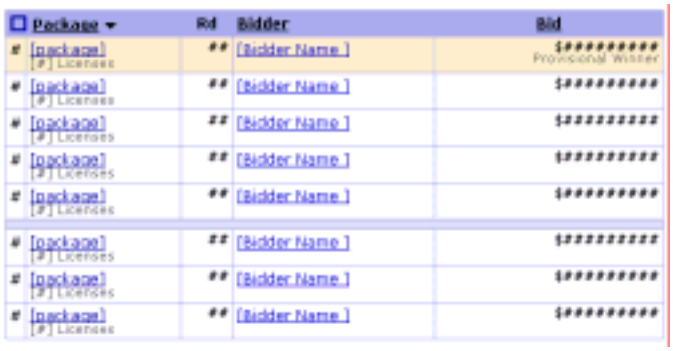
Activity & Eligibility	
Required Activity	##########bu
Current Eligibility	##########bu
Remaining Waivers	#
Round ## Bids	
Exposure	$##########
Activity	##########bu
All Considered Bids	
Exposure	$##########
Activity	##########bu

Figure 12 - Single Column Data Table Example

In addition, data tables should include white color separators spanning all columns to chunk out groups of content that are related within but not between groups.

3.5.2. Multiple Column

Multiple column tables enable the display of truly tabular data, in which columns represent unique fields and the table can be divided into a table header and table body. Column headers are generally displayed in mediumdark, and header labels are bold.



Package	Rd	Bidder	Bid
[package] [#] Licenses	##	[Bidder Name]	$########## Provisional Winner
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########
[package] [#] Licenses	##	[Bidder Name]	$##########

Figure 13 - Multiple Column Data Table Example

3.5.3. Accessibility

All multiple column tables should adhere to recommended W3C accessibility guidelines for proper format and tagging. For example:

- Each table should include <thead> and <tbody> sections, where the <thead> section includes any column labels within <th> tags and <tbody> includes the actual content of the section.
- id= and header= attributes should associate data with column headers.
- summary= should be used within <table> to describe the contents of the table.

Data Tables Guideline Tips

Align left/top and right/top
Character-based data should be left/top aligned, and numeric data should be right/top aligned.

Prevent wrapping
Numeric formats, such as $, m, or bu (bidding units), should be displayed directly adjacent to the value itself to prevent wrapping.

Default to 20 rows
Generally, tables should default to no more than 20 rows and require paging navigation to display additional rows. However, the user should be able to modify this parameter to display from 10 to 100 or even more rows per page via customization.

After every fifth row, if at least one additional row exists, then display a table-spanning cell in medium color.

Use relative cell widths
If cell widths are necessary, relative (percentage based) widths are preferred. For example, the cell with the row count (1, 2, 3, etc) could be specified as width="1%" to constrain it to be of minimum width relative to more important cells in the row. Generally a multiple column table should resize dynamically with browser width and flow well with included content.

3.5.4. Table Description

Reports should always contain a description of the displayed tabular content. The description contains a listing of which records of the total amount is currently displayed and a description of the search criteria used to generate the said list.

[Label] **[low]** to **[high]** of **[total]**

[Criteria details]

Figure 14 - Table Description Example

The data set should begin with a label that appropriately but concisely describes it. For example, if the page results from a submitted search, an appropriate label is "Matches". If the page is a report listing bids in an auction, then "Other Bids" or "Provisionally Winning Bids" may be appropriate labels. The label is followed by a numeric description of the current view, where the page displays records [low] to [high] of [total]. For example, the second page of a search results display would contain the line "Matches 21 to 40 of 324".

If the report content cannot be completely understood given the page title and data set label, then an additional Criteria details line can be added to complete the specification. Criteria details are ideal for displaying extensive search or report criteria.

Table Description Guideline Tips

Create concise labels
Labels should be very concise and appropriately describe the data set. In general, labels should not have more than 3 to 5 words. Descriptions of search or report criteria should be displayed on the following line.

Bold labels
[low], [high], and [label] are all bold.

Display ranks
Each record has a related rank as determined by its position in the ordered data set, and that rank is displayed on the far left of the data table.

3.5.5. Paging Navigation

When the long length of a tabular report requires it to span multiple pages, the report should also include how many records are in that data, what records are displayed on the current page, and *paging navigation* to go to sequentially related pages such as previous and/or next. Paging navigation enables the user to navigate efficiently and correctly between pages. Paging navigation can be used for a wide range of purposes, most notably search results, document lists, and other lists of objects (such as bids) that are highly variable in record count.

If more than one page of data exists, an additional line links to the other pages. If the current page is NOT the first page of data, include the PREVIOUS button (along with a (low to high) record range) that links to the previous page, where the link includes the range of records on that page. If the current page is NOT the last page of data, the line ends with the NEXT button (preceded by a (low to high) record range) that links to the next page of records in the sequence and includes the range of records on that page (which may not necessarily be as many records as exists on the current page). For example, if you were on page 3 of a 153 record data set with 20 records per page, then PREVIOUS (21-40) and (61-80) NEXT would both be displayed:

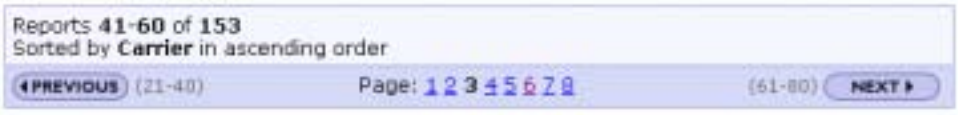


Figure 15 - Paging Navigation Example

In addition, more detailed paging labels are preferred should development schedules provide time and the content provide the correct context. Labels displaying the page's included records, instead of page numbers (such as 3, 4, etc), provide more information and enable the user to choose and navigate quickly and accurately. For example, if the report is search results sorted by Licensee Name, then navigation such as AT&T W-Broadb Broadb-GTE GTE-Verizo are more effective than 1 2 3.

Refer to Appendix A: Paging Navigation Algorithm for more details.

Paging Navigation Guideline Tips

Display Previous and Next
Previous and Next page links should be displayed as images, with the page group text (##-##) either after (Previous button) or before (Next button) with a class of "text-gray-small". Previous and Next page links should be displayed if a previous or next page exists, respectively.

Display 10 pages max
A maximum of 10 pages should be displayed within the page list area, with the current page in bold, in the following manner: [Page: # # # # # # # # # #]. If there are more than 10 pages in the result set, a visual cue with ellipses, "…", should be displayed.

3.5.6. Sorting

Advanced reporting designs may include interactive sorting techniques that enable the user to click on hyperlinks to sort data tables by multiple criteria. For example, each sortable column within the data table may have a header label linked (style text-black), such that if the link is clicked, the page is refreshed and report sorted based on that primary criteria:

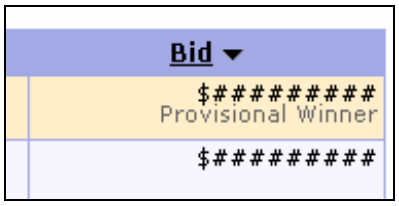


Figure 16 - Interactive Sorting on Bid Column Example

In Figure 16, the default sort order is ascending, but additional clicks on the same label toggle the sort order between ascending and descending. When interactive sorting is enabled, the sort order icon should be displayed to the right of the sorted column's label, indicating whether the sort is ascending (arrow up) or descending (down).

Sorting Guideline Tips

Apply text-black class
The text-black class is applied to the <a> tag, resulting in black links (including the underline).

Display first page after user sorts and refreshes
If the user interactively sorts a data table, then the data table is refreshed and the first page (if the report is a multi-page report) is displayed.

Make title column default
The title column serves as the default sort order but can change based on the application/page requirements (i.e. an archive list of items vs. a list showing most recent documents).

Make "ascending" the default for interactive sorts
The default sort order for selected interactive sorts is ascending, unless a firm contextual reason exists for using descending as the primary option (such as bid values, where the most important bids are the highest bids).

If the data table is sorted by a criterion, and the label for that criterion is clicked, then the data table is resorted in the opposite order (descending or ascending).

Use arrow icon to display sort order
The sort arrow icon is displayed next to the current sort criteria, and its direction reflects the sort order (ascending → up, descending → down).

3.5.7. Filtering

Advanced reporting designs may include interactive filtering techniques that enable the user to filter the resulted data set by a certain criteria. A dropdown menu is the default form mechanism used for the filtering function and is placed in the same row as the Table Description:

Figure 17 - Filtering Example

Filtering Guideline Tips

Rows

- The filtering controls should be displayed on two table rows (with a cellpadding value of 1, cellspacing of 0, left aligned).
- The first row contains the title using "class=text-black-small".
- The second row contains the menu and "Go" button (required). A nowrap tag should be used to keep both form controls on the same line.

Menu options

- Menu options are kept to a 20 character limit. Abbreviations and acronyms are encouraged.
- Menu options are sorted alpha-numerically.
- The default menu option should be blank when there is no filter; when there is a filter active, the default menu option should be that filter.

3.5.8. Size & Liquid Display

The content area of the page refers to the primary section of the page, containing the page title, text, and related graphics displayed on a predominantly white background. The width of content area is dynamic, filling the remaining pixels across the page once the left column navigation column is accounted. Figure 18 displays the external page at the most common screen resolution settings (640x480, 800x600, and 1024x768). The dynamic width is evident, with the fixed width left column and, if present, fixed width right column for highlighted content. In reference to the internal template, the main application view is dynamic with the right column (if needed) fixed.

Figure 18 - External Template at Most Common Screen Resolutions

3.5.9. Frames

Frames divide a browser's web page display area into multiple, distinct scrollable regions. Each region, or frame, has several features:

- It can be given an individual URL, so it can load information independent of the other frames on the page;
- It can be given a NAME, allowing it to be targeted by other URLs, and;
- It can resize dynamically if the user changes the window size. Resizing can also be disabled, ensuring a constant frame size.

These properties offer new possibilities:

- Elements that the user should always see, such as control bars, copyright notices, and title graphics, can be placed in a static, individual frame. As the user navigates the site in "live" frames, the static frame's contents remain fixed, even though adjoining frames redraw.
- Table of contents (TOC) are more functional. One frame can contain TOC links that, when clicked, display results in an adjoining frame.
- Frames side-by-side design allows queries to be posed and answered on the same page, with one frame holding the query form, and the other presenting the results.

However, this potential also includes many drawbacks. Frames break the fundamental model of the browser – the page. With frames, the user's view of information on the screen is now a result of a sequence of actions instead of a single navigation action. Therefore, frames-based navigation becomes much more complex because the unit of navigation is different than the unit of view. In addition, URLs (as displayed in the location bar) may now represent a complete

section or site of information instead of a single page, and specific pages of interest can no longer be accurately book marked. Finally, search engines cannot properly index or link to frame-based pages since search results are based on the page paradigm (results will link to a specific page instead of a frameset that includes that page).

In general, frames are not used for any Wireless online system or site. However, specialized situations may warrant exploring frames as a solution for unique problems.

3.5.10. Pop Up Windows

Pop Up windows are additional windows created either by user selection or an unseen process in the main browser window. These Pop Up windows generally have smaller dimensions than the parent window, and frequently do not include browser components such as the location bar and standard buttons, as illustrated in Figure 19.

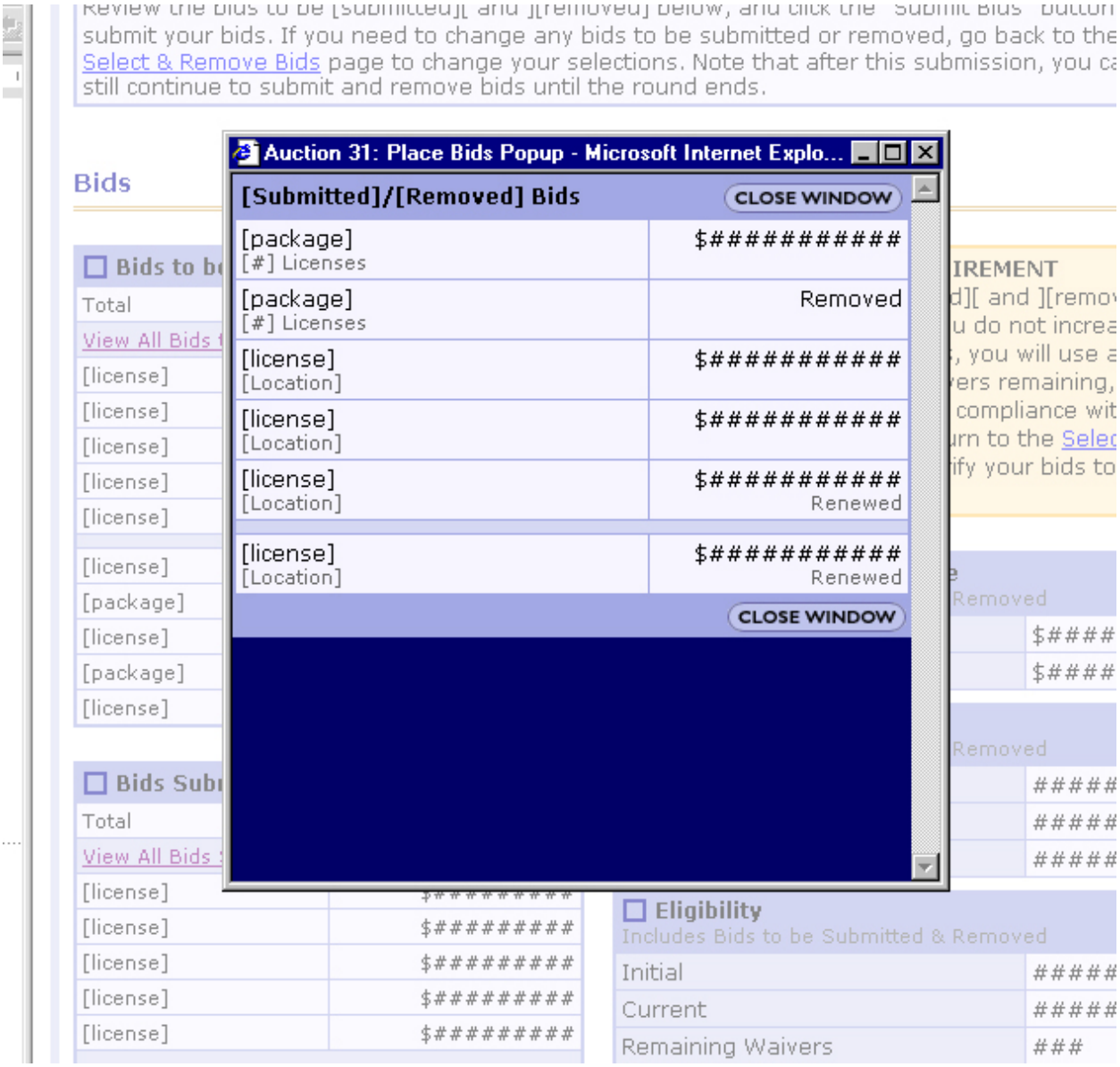


Figure 19 - Pop Up Window Example

Pop Up windows significantly affect the user's experience. They add an additional window to the user's desktop. Also, common browser buttons, menus, status, and scrolling are frequently disabled, which removes the most popular navigation method (the "Back" button) and frequently requires the use of a very small target (X) or right-click the title bar to close the window.

When moving from the single window paradigm, desktops can become littered with Pop Up windows or an important window can be buried. Consider this problem when the user creates a Pop Up and then changes focus back to the primary window thus "hiding" the Pop Up below the

primary window on the desktop. If the user performs another action in the primary window and expects to launch a new Pop Up, it's possible that the old Pop Up is refreshed but remains beneath the primary window. In this case, the user has performed an action with no visible reaction by the system, since the window and its refresh were hidden.

Pop Up windows generated by JavaScript are generally not recommended. Users have "baggage" when it comes to Pop Up windows due to excessive and intrusive advertising techniques. In addition, and more importantly, Pop Up windows fundamentally change the user experience, and thus should be used with caution.

However, some conditions do exist where Pop Up windows can be a useful and effective tool, including:

- **Form Validation** - Forms should include as much client-side validation as possible, and JavaScript alert and focus methods should be used whenever possible to alert users to invalid or incomplete form data.
- **Supplementing a Process** - If the user is proceeding through a multi-page process and the primary window should remain while reviewing supplementary information, then a Pop Up may be used. For example, users of bidding software proceed through four steps to place a bid, and the bid verification page (last page of the process) includes a summary of bids to be verified. Here, the user should not navigate out of the process but would like to review a detailed bid list, so a secondary Pop Up window is advisable.

Pop Up Window Guideline Tips

Omit menus
Pop Up windows generally do not contain menu or location bars, but should enable scrolling and resizing.

Include "Close Window"
Pop Up windows should prominently display a "Close Window" button that, upon being clicked, closes the window immediately.

3.6. Additional Topics

3.6.1. Legends

Applications that use icons to represent functions or content within a data table require a legend table. The function of the legend table is to define the icons in use. The legend table will reside on the right side of the data table, below any application or task specific functions. The table will contain each icon and a title of the function it represents. Figure 20 displays a general legend table example.

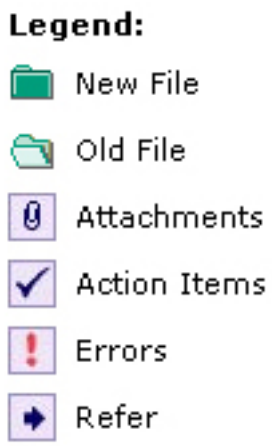


Figure 20 - Legend Table

If the data table contains no task or application specific actions, the legend can be incorporated in the last row of the data table, such that the number of icons and descriptions fits across the width of the table within normal browser window sizes. Figure 21 is an example of the Data Table Legend utilized on the FCC 911 website.

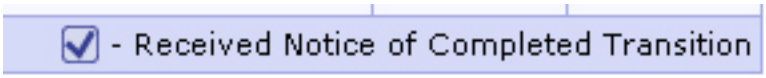


Figure 21 - Data Table Legend

Legends Guideline Tips

Separate Table:
The table should have a fixed width of 130 pixels, a cellspacing value of 0, and a cellpadding value of 3.

First row of the table should be "Legend:" in bold.

Each cell containing the icon title should have a class of text-black-small.

Within the Data Table:
The cell should use a darker cell class than the one used in the data rows.

3.6.2. Return To Top Include File

Pages that exceed in length greater than 450 pixels (one screen browser height on a desktop resolution of 800 by 600 pixels) require a link to allow the user to return to the top of the screen. An include file, entitled returntotop.ssi is used for such instances. The include file should be placed at the bottom of the page before the "Last reviewed" line. Also, on pages that contain numerous sub-sections with their own anchor links linked to from the top of the page, it is recommended to place a Return To Top at the end of each section.

Return To Top Guideline Tips

Location
The returntotop.ssi file is located in the “includes” folder at the root (/includes/).

Placement
When placing a Return To Top above a section header, include an open paragraph tag and non-breaking space (<p>$nbsp;) immediately following the include file call in order to create space between the two elements.

4. Content

Editorial content for the Wireless website includes the following:

- FCC documents posted as individual files,
- HTML page copy,
- Instructional text accompanying interactive systems, and
- Text used to aid content retrieval (e.g. metadata, section names).

Many separate entities are responsible for producing and submitting content for publication on the site, but the Web Team is ultimately responsible for its consistent presentation and style. In traditional print publishing, style often refers to the established set of type and format settings used consistently throughout a document. For the website, such style issues are primarily addressed by design and layout standards outlined elsewhere in this document. On matters of general editorial style, the Web Team follows The Chicago Manual of Style (14th edition, University of Chicago Press), Merriam-Webster Online, which includes Merriam-Webster's Collegiate Dictionary (Tenth Edition, Merriam-Webster, Incorporated) and the Editorial conventions of FCC documentation, including new releases, public notices, and other official documents. General editorial style incorporates grammar, punctuation, hyphenation, capitalization, and usage conventions.

Following are guidelines for editorial and publication questions and issues *specific* to website and web writing that often arise in the content development process.

4.1. Controlled Vocabulary

The website employs a controlled vocabulary, a collection of preferred terms that are used to assist in more precise retrieval of content by users. The controlled vocabulary also helps in establishing consistency in labeling site sections and functionality within site copy.

Preferred terms in the Wireless site controlled vocabulary include:

Term	Description
Accessibility	Refers specifically to electronic technologies and issues related to making the website accessible to individuals with disabilities.
e-mail	Hyphenated lower case version is most preferred in FCC documentation.
Forms	Refers to specific FCC paper forms (e.g. Form 175, Form 601) , but not Web-based forms within interactive pages
Home	Title for a site section homepage (ULS Home, ASR Home, WTB Home). Preferred over "homepage", "landing page", or "main page".
Log In/Log Out	For entering and exiting an online system requiring a user name or password. Preferred over "logon" and "logout".
Online filing	Submitting an application via an online system. Preferred over "e-filing."
Online Systems, **Systems**	Used to refer to any dynamic online application in which the user interacts directly with the page to create a dynamically generated view, input data, or extract data from an application. This generic term for online filing and software applications (e.g. ULS Search, TOWAIR, and Registration) on the site is preferred over "applications", to avoid confusion with form applications users fill out.
Releases	Generic term for all FCC documents (Public Notices, News Releases, etc.). Preferred over "documents."
Services	Used for referring to the radio services overseen by the WTB, not services rendered by the WTB on the website.

Table 1 - Controlled Vocabulary Terms

4.2. Meta Information

Meta information is included for subsite homepages to aid in search retrieval of web pages by the website's search and indexing tool. Included in HTML source code are meta tags that describe the content of the web page in which they are written.

The Web Team creates meta information based on the content of the web page and lists keywords based on the important topics addressed within the site. Two meta tags are used:

- <meta name="description"> – to provide a summary of the site's information or function.
- <meta name="keywords"> – to list main topics and words related to the information or function of the site.

Figure 22 is an example of the meta tags as written in the HTML source code for the Paging subsite homepage.

```
<title>FCC: Paging</title>
<meta name="description" content="Paging is a Commercial Mobile Radio Service (CMRS).  One-way data communications are sent to a mobile device that alerts the user when it arrives. The communication could consist of a phone number for the user to call, a short message, or an information update. Paging is also called  Commercial Paging, One-Way Paging, Traditional Paging.">
<meta name="keywords" content="paging, Paging, commercial paging, one-way paging, traditional paging ">
<link rel="stylesheet" href="/wireless.css" type="text/css">
</head>
```

Figure 22 - Meta Tag Code Example

4.3. Contextual Navigation

While the information architecture, conveyed through the use of diagrams and breadcrumbs, is hierarchical in nature, the site will contain extensive contextual navigation within and between subsites. The "Related Sites" template is one example of cross-subsite navigation. Applying contextual links within each page's content is another example of how to augment the more rigid hierarchical navigation available in the left column.

Contextual Navigation Guideline Tips

Avoid structuring a sentence around a link titled "Click Here" or other related phrases. Instead, compose a concise sentence with the most relevant word or phrase linked.

Bad

Click here for more information about other Federal job opportunities on the USAJOBS page of Office of Personnel Management's site.

Better

For information about other Federal job opportunities, visit the USAJOBS page of Office of Personnel Management's website (www.opm.gov).

Best

For information about other Federal job opportunities, visit the Office of Personnel Management's USAJOBS.

4.4. Editorial Conventions

These conventions are usage guidelines widely practiced by the various entities that develop content for the website. They are not meant to be all-inclusive or supersede other editorial guidelines documents that may exist within the FCC.

4.4.1. Abbreviations and Acronyms

Abbreviations and acronyms are widely used in FCC documents and are acceptable in website content when the following standards are applied:

- Use only official FCC acronyms and familiarly accepted abbreviations (e.g. WTB, PN, MHz, bureaus, application, procedures, forms, etc.).
- Each web page should be considered "self-contained" and, as in print documents, infrequent acronyms should be spelled out at first use.
- Acronyms used frequently site-wide, in headers and graphics in the site template do not necessarily have to be spelled out in first use on all pages (e.g. FCC and WTB)
- Periods are not necessary after the letters that form an acronym.

4.4.2. Addresses

Use full official addresses. Spell out names and *Street*:

Federal Communications Commission
445 12th Street SW
Washington, DC 20554

4.4.3. Capitalization

Capitalize proper nouns. Words derived from proper nouns or associated with them are lowercased without loss of clarity or significance. Note that "Commission" and "Bureau" are exceptions (as in, *Federal Communications Commission or, the Commission* and *Wireless Telecommunications Bureau or, the Bureau*).

- Site page titles are capitalized (Amateur Radio Service, ULS Home); but note that same reference in text, when not a proper name (of the page, service, initiative, etc.), may not necessarily be capitalized. For example, "The amateur and amateur-satellite services are for qualified persons of any age who are interested in radio technique solely with a personal aim."
- Online system names are capitalized (e.g., ULS Online Filing).
- Use newspaper headline style for capitalization of document titles. Always capitalize first word and last word. Prepositions and articles are lower case.

4.4.4. Codes and Descriptions

FCC often assigns codes to Radio Services and ULS filing purposes. In text, the code and description are written together, especially when the code is essential to know (e.g., when providing instructions or referencing licensing processes).

- Radio service codes and descriptions are formatted: ***[Description] ([Code])***
- Auctions are formatted Auction [##]: [Auction description]

4.4.5. Dates

Spell out months and days of the week. If necessary for space, you can abbreviate Jan., Feb., Aug., Sept., Oct., Nov., and Dec. Use no punctuation if listing only the month and the year, but set the year off with commas if listing the day of the month as well.

When using the numbers format to write dates, the format should contain no zeroes in front of single digit dates and the year is written in full: 11/2/2002.

4.4.6. Emphasis

Generally, formatting content for emphasis (i.e., with bolding, italicizing, using all caps) is avoided so as to not conflict with design style guidelines that may be set forth. If emphasis can aid the comprehension or clarification of the writing, choose **one form** of emphasis and be consistent (italics or bold with lowercase are most common). For example, in online systems instructional copy (ULS, ASR, and Auctions), system buttons and page titles are **bolded.**

Other text (headlines, hypertext links) follow the standards defined in their respective design template.

4.4.7. Internet

Internet is capitalized.

4.4.8. Headline Style

Headlines are the hyperlinked titles of FCC documents displayed on the Wireless homepage in the releases sections of subsites.

- Use newspaper headline style for capitalization of document titles. Always capitalize first word and last word. Prepositions and articles are lower case.
- Use common abbreviations and acronyms to shorten text.
- Use clauses if they can help shorten the length of the headline title.
- Use max length for release displays: 150 characters.

4.4.9. Lists

Lists provide a way for data to be organized on a page. The use of lists is encouraged throughout the web applications for informational content, or for separating items that need to be easily found and read. Lists are an effective means of breaking up large amounts of content and presenting the key points. There are three types of list: ordered (list by numbers), unordered (bullet points), and definition lists (this indents an explanatory paragraph underneath the definition word). Definition lists are rarely used, but can be useful in formatting text.

Lists Guideline Tips

Use standard HTML list formats
All listed items should be put in standard HTML list format, using the <li> tag within <ul> or <or> tags. Text items separated by commas (i.e. item 1, item 2, item 3 etc.) should be avoided because such lists hinder quick and efficient scanning of structured content. For example, instead of displaying an extensive list of states as "New York, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Virginia, Wyoming, and Nebraska", display the list as a more readable bulleted list:

- New York
- New Jersey
- North Carolina
- Ohio
- Pennsylvania
- South Carolina
- Virginia
- Wyoming
- Nebraska

Using Unordered Lists
The use of unordered lists should be used for content that is not arranged in a specific order, or does not imply a sequence. Unless the order of list items is necessary, unordered lists should be used.

Keep lists short
List items should be kept as short and concise as possible.

Use table if list becomes unreadable

If a list becomes too long to read comfortably in bulleted format, or contains multiple sub-sections, then the information might be better presented within a table layout. If listed information contains several sections per item, such as a document title, date and version number, then a table layout is recommended, with appropriate column headings.

- Use numbers or letters only when indicating a priority or sequence to the items (e.g. instructions). When items of a list are numbered or lettered, follow each number or letter with a period. Otherwise, if the items in a vertical list need to be set off, use bullets.

- If one or more item in the list is a complete sentence, use a period at the end of each item. Otherwise, no punctuation is needed at the end of each item.
- It is most common to alphabetize the entries in a list, but other methods include organizing according to importance, size, cost, rarity, or position in space and time. If the method of order is not obvious, explain the order.
- Make lists parallel by using the same sentence construction for each item. Figure 23 is an example of a parallel list constructed on the Amateur subsite.

Amateur licensees can submit applications using the Universal Licensing System (ULS) or paper applications using Form 605 and Form 159. Common filing tasks include:

Changing Address
Checking Application Status
Obtaining a Vanity Call Sign
Renewing a License
Replacing a License

Figure 23 - Parallel List Example

4.4.10. Numbers

Spell out whole numbers from one through nine; use numerals for 10 or greater.

Exceptions: Numbers applicable to the same category should be treated alike within the same sentence. Do not use numerals for some and spell out others.

4.4.11. Portable Document Format (PDF)

Use the acronym in lower case when noting the file type of a document. In text, the acronym is usually in all caps.

4.4.12. Plurals

All regular plural guidelines are applied. Do not add "**'s**" when pluralizing FCC acronyms and abbreviations (e.g. "PNs").

4.4.13. Quotation Marks

Use quotation marks to indicate a direct quotation or cite (e.g. from the CFR). Place commas and periods inside the closing quotation mark; colons and semicolons outside. Placement of a question mark depends on the meaning. Determine whether it applies to the part quoted or to the whole sentence.

4.4.14. Telephone Numbers

Include area code and hyphens:

1- (888)-CALL-FCC

(202) 123-4567

4.4.15. Time

Within sentences, using numerals with a.m. and p.m. set in lower case or small caps is most common. Eliminate zeros if all time referred to in the statement is on the hour. Never use a.m. with "morning" or p.m. with "evening," and never use "o'clock" with either a.m. or p.m. or with numerals.

In headlines and alert messages, all caps and no periods is acceptable (e.g., Technical support hours are 8 AM to 5 AM ET)

ET = Eastern time. All hour references should specify time zone. ET covers both EDT and EST, and it is not necessary to specify EDT or EST.

4.4.16. Titles of People

Official personal titles immediately preceding a name are capitalized; those following a name or set off by commas are not (e.g,, Commissioner Joe Jones; Joe Jones, an FCC commissioner).

4.4.17. Titles of Works

FCC documents, titles and subtitles of books, pamphlets, proceedings and collections, periodicals, newspapers and sections of newspapers published separately are set in italics. (e.g., "*Third Report and Order and Second Further Notice of Proposed Rule Making*.")

References to an FCC document type and number, but not its full title, are partially italicized:

Public Notice DA-12-345

Order FCC 12-232

Titles of official FCC documents and releases listed as headlines and on releases pages use designated HTML stylesheets. In release listed, text and links appear as:

3/28/2002
NEWS RELEASE
WTB Announces New Website for ITFS and MDS

4.4.18. Titles of Site Sections

Subsite and subsite section names are considered stand-alone titles and should be treated as such editorially. References to subsite titles and sections should be capitalized.

4.4.19. Rule Citations

All Code of Federal Regulation cites on site HTML pages should be hypertext links to the rules page, http://wireless.fcc.gov/rules.html. No distinction is made between when content explicitly says to "see" a rule part ("see 47 CFR 22.901") vs. being mentioned in the context of a sentence (" The Commission's rules, set forth in 47 CFR 22.901 and 22.933…")

The preferred formatting style for site pages is the simplest of the many acceptable commonly used formats that appear in FCC documents:

- 47 CFR 22.915
- 47 CFR Part 1 and Part 2

4.4.20. URLs and e-mail Addresses

URLs are not written out, when referenced within content. A contextual link should be created, making the link the text most closely matching the title of the page of further detail.

4.4.21. Web

Capitalize *Web* when referring to the World Wide Web or the Web. If writing about aspects of the Web (web safe colors) or using compound words (webmaster, webcam) use a lowercase "w" for these generic references.

4.4.22. Web site vs. Website

Use "website." While "Web site" is still widely used, the compound generic form of the word is increasingly becoming conventional as industry standard.

4.5. Common Editorial Style Treatments

These style treatments provide guidelines for layout and design issues related to editorial elements of the website.

4.5.1. Page Titles

Page titles should be displayed in the upper left corner of the content area on the web page. Figure 24 displays the page title treatment for "License Search". Figure 25 displays the page title treatment for "Radio Service" within the "Apply for a New License" sequence.

Figure 24 - Page Title Example 1

Figure 25 - Page Title Example 2

Page Titles Guideline Tips

Create concise and relevant title
The page title should be concise and reflect the content of the unique page. The page title should be relevant to the content specific to that page and should differentiate the page from other pages appropriately.

Use title and formatting tags
The HTML page's <title> tags must contain the same page title as displayed on the page, preceded by "FCC : [section title] :" The page title should be formatted using [page title].

Match link names with page title
When linking to this page, the linking text should match the page title as closely as possible. For example, if you were linking to the "Congested Areas Check" page from another page, an appropriate sentence would be "You can use the congested area check to identify congested areas."

Display sequence titles
If the page is part of a sequential series of pages (such as the ULS Getting Started section), then the sequence title should appear above the page title (see Figure 25). If the sequence navigation is not displayed separately on the right side, then the sequence navigation is displayed alongside/integrated with the sequence title.

4.5.2. Section Headers and Dividers

The use of section headers and dividers can improve the understanding of chunked content within a page, visually separating distinct content and enabling the user to scan the page and find a section of interest more efficiently.

Section Headers and Dividers Guideline Tips

Section headers are liquid and fill 90% of the width of the containing box.

Bold, text-blue header text can also be used to make less important and less visually impacting distinctions.

4.5.3. Anchor Link Lists

When page content extends beyond one to two scrollable views, anchor links can be used to appropriately link to content of interest displayed further down the page. Such anchor links require content that can be chunked into clearly differentiated categories.

Anchor Link Lists Guideline Tips

The list of anchor links is typically displayed immediately underneath the page title.

The arrow icon precedes each link and displayed on separate lines separated by <br> line breaks. This vertical display is contrasted with the horizontal display of tasks or links to separate pages typically also displayed underneath a page title.

Anchor link labels should match the resulting section header as closely as possible. See Contextual Navigation guidelines for more details.

4.5.4. *Releases*

Each release is formatted to include a number of fields, each on separate lines and listed with its style class:

- **Release Date**
  Style Class: releaseHeader
  Format: MM/DD/YYYY
- **Release Type and Number**
  Style Class: releaseHeader
  Format: [Release Type] (DA [Release Number])
- **Release Title**
  Style Class: releaseTitle

Format: Maximum 150 characters
Secondary Format (New Wireless Homepage): Maximum 50 characters

- **Release Description**
  Style Class: releaseDescription
  Format: Maximum 250 characters
- **Release Files**
  Style Class: releaseFiles
  Format: see order below.
- **Supporting Files** (such as attachments)
  Style Class: releaseFiles

Releases Guideline Tips

Link to mail filetype
The release title is linked to the most prominent release filetype, such as html or pdf.

Use 150 characters or less
Release title should contain generally no more than 150 characters when displayed on a page that is not uniquely for releases. If the provided title is longer, then the designer should work with the content liaison to find a suitable, shorter title.

The release description is only displayed on pages specifically listing releases only, or where the description reinforces contextual meaning (such as a seminal release on a service's bandplan on a "Bandplan" page). However, exceptions exist such that release descriptions are included on the Wireless homepage, Auctions homepage, ULS homepage, and ASR homepage.

Abbreviate titles
Release titles may abbreviate commonly used acronyms such as WTB, ULS, and ASR.

List supporting files separately
Each separate supporting file is listed on a separate line. For example, if a release contains attachments A and B, then A is listed on one line and B on the next line.

Each file available for a release (or supporting file) is listed in the following order, separated by " - ": html - pdf - text - Word - WordPerfect - xls.

4.6. Web Writing Style

In addition to being edited for the general conventions of good writing (correct grammar, punctuation, organization, etc.), content submitted for publication on the website is edited for "Web writing style." These general editorial conventions seek to optimize the readability and credibility of text on a website.

Web Writing Style Guideline Tips

Optimize for scanability

Use lists, short paragraphs, and key words for which users will likely be scanning.

Break up long sections with headings and headlines that are descriptive. Use anchor links.

Provide summaries to long documents and sections, when possible.

Be concise
Cut unnecessary details and information and use simple sentence structures.

Be current
Watch for dates, numbers, and statistics that make content time-sensitive. Eliminate unnecessary references.

Use links to organize lengthy pages
Take advantage of hypertext links to reduce lengthy pages and organize the layout of information. Use links to cross-reference to other related content instead of heavily paraphrasing from referenced document. Use anchor links to link to sections.

Avoid being web-referential
Users know where they are on a web page. Focus attention on content substance instead of web-referential language (e.g. “click here.”, “our website…”).

Use controlled vocabulary
Be consistent in the use of preferred terms in labeling and in site copy.

Use conversational tone
Site copy is moving towards more conversational first person copy (us, you) especially in sections with a highly targeted audience.

Avoid passive voice
Use active voice to indicate content and information ownership.

5. Forms and Controls

Forms are the presentation of blank or pre-filled fields on a web page that enable the user to input details or information to the system. Forms include the display of one or more form controls, which are graphic elements that represent the properties or operations of other objects. Form controls can include text boxes, radio buttons, check boxes, drop-down list boxes, and multiple-selection list boxes.

5.1. Layout

Form layout should follow the current form components templates already standardized across the Wireless website. In general, a section-based approach is taken where a form is presented in logical groups. Each group can be defined using a labeled section header and a horizontal blue bar beneath. Generalized text is optionally presented below the bar, followed by a two-column approach with controls on the right and their labels on the left. This example is illustrated in Figure 26.

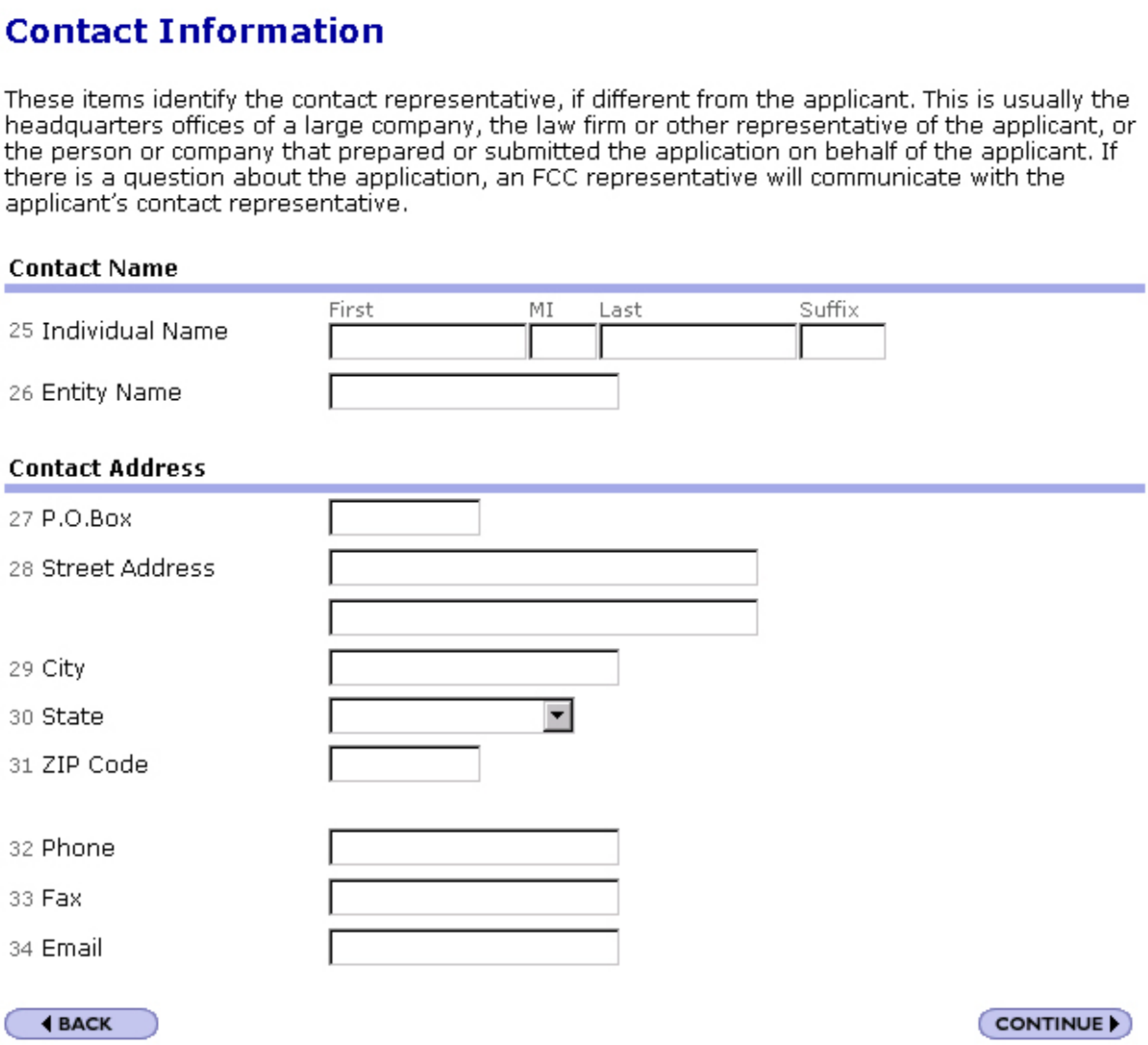


Figure 26 - Form Layout

Forms can frequently include sets of related controls, most often a set of related radio buttons or check boxes. These controls are contained in a nested table to control alignment and wrapping and to separate the set from other sets and single controls.

Form Layout Guideline Tips

Optional Header and Bar
If a page contains only one section of form controls, then the section header and blue horizontal bar are optional. In this case, general descriptive text and the page title should adequately describe the form.

Related Links
If the descriptive text contains links to related processes, calculators, or other useful tools, those links are presented immediately following the descriptive text in an arrow-based list.

Label Alignment
All control labels are horizontally aligned to the left. If a label applies to controls on only one line, such as a text box or single check box, then that label is vertically aligned in the middle of its cell. If a label applies to controls that span multiple lines, such as a list of radio buttons or a multiline text area, then the label is vertically aligned to the top of its cell.

Control Alignment
Controls, including rows containing buttons such as submit, should be left aligned.

Set Separators
If the form control section contains radio button or check box sets as well as other controls such as a text box, then each radio button or check box should be separated from other controls using a 2-pixel blue bar contained in a table.

Form Numbers
If a section contains controls that must be numbered to associate the form elements with items in a paper form, then a third column is added to the left of the label presenting numbers in small gray text.

Sub-Control Labels
If a single control line contains multiple controls—such as where Name contains first name, middle initial, last name, and suffix—small gray labels are provided above each individual control using a two-row table.

Radio Buttons vs. Drop-Down Lists
In general, if the set of options is a small number, typically seven or fewer, but always at least two, then display the options using radio buttons. If more choices exist, consider using a different type of control, such as a drop-down list box.

Button Spacing
If two or more buttons are displayed adjacently in a single row (such as “Submit” and “Cancel”), then the buttons are spaced using a spacer image that is 5 pixels wide.

5.2. Form State

The initial state of a page’s form controls can be vitally important to the successful completion of that form. For example, if an address is being updated, it is important that the form be pre-filled with the user address currently stored in the system.

Form State Guideline Tips

Default Values
If the user is editing data already stored by the system, then the default values of the form controls in that view should match the current state of the user’s data when the page was loaded.

Reset Button
If the form’s data is prefilled (see previous point) and the form contains a Reset button, then the form should reset to the initial state of the data when the page was loaded, as opposed to removing all selections and data to create a blank form.

Default Drop-Down Selections
When a drop-down list is used to navigate a list of items and one of the selections is the current page, then that page should be default selection of the list. Examples include auctions on the Auctions site and bidder names within the Bidding & Results system. Also reference Section 5.4 for more guideline tips.

5.3. Text Boxes

A text box is a rectangular form control that enables the user to enter and edit text.

Text Box Guideline Tips

Instructional Text
Instructional text (such as "Enter Name") may not be displayed within a text box, but instead should be persistently displayed outside but near and immediately after the text box. For example, "Format: MM/DD/YYYY" could be displayed next to a date entry text box.

Auto-Exit
The use of auto-exit should be limited to situations involving extensive data entry, such as online filing. Auto-exit is the automatic change of focus to the next form control once the user has entered a valid and maximum number of characters in the current control.

Read-Only
Text boxes should not be presented as read-only until the Wireless site recommends browsers that consistently enable and disable form controls.

Field Length
The maximum allowable length of a text box or other textual data entry should be established by the control's maxlength property. Therefore, no client-side validation of length exceeding a maximum should be necessary.

5.4. Drop-Down Lists

A drop-down list box is displayed on demand allowing the selection of only a single item from a list. In its closed state, the control displays the current value for the control. The user opens the list to change the value.

Drop-Down Lists Guideline Tips

Blank Selection
If the drop-down list includes a default value that corresponds to a null selection (or non-selection), then the visible label for the selection should be blank.

Instructional Text
Instructional text such as "Select a State" should only be displayed when a drop down list is used as a navigational device and is presented with no controls other than a "Go" button. Otherwise, including all data entry scenarios, the default selection should be blank (see above).

Default Selections
When a drop-down list is used to navigate a list of items and one of the selections is the current page, then that page should be default selection of the list. Examples include auctions on the Auctions site and bidder names within the Bidding & Results system.

5.5. Initial Focus

When a web page first loads into the browser and a form is displayed, the system can apply focus – the indication of where input is being directed – to a single form control on the page.

Initial focus is applied to forms on the Wireless site when a page's purpose is primarily repetitive data entry, such as pages for advanced search, entering filing information such as name and address, or placing a bid in an auction.

Initial Focus Guideline Tips

Use of Initial Focus
Initial focus to a form control should only be applied if a page's primary purpose is data entry / input. That is, if the page is content-based and includes a search utility within it's primary navigation, then the search form's text box should not receive focus.

Determining the Appropriate Form
If a page contains more than one form, then the first control of the page's primary form receives focus. If two or more forms are of equal weight in value, then the first form control of the first form displayed receives focus.

5.6. Mouseover Effects

A mouseover effect occurs when the mouse pointer moves over a button or area of interest and the system responds by changing color, shape, or texture. This dynamic change serves two purposes: it typically connotes that the screen area under the pointer may be a link or button, and it confirms to the user that the mouse is appropriately positioned over the area so that a click will generate a response. Mouseover effects are most commonly found in navigation bars and similar structure.

Mouseover effects are used sparingly throughout the Wireless site. The most common use of mouseover images are buttons that denote entrance from the general hypertext site into an interactive system such as online filing or search.

The Wireless style does not support the dynamic change of link color or underline based on mouseovers.

5.7. Enabling/Disabling

Form interactions can be enhanced such that specific form controls are enabled or disabled based on the initial state of the loaded page or user action. Most often, controls can be grayed out such that further interaction with that control is impossible until the state of other controls or pages is changed.

Because of a lack of consistency in client-side scripting across browser/platform combinations, no HTML-based form controls can be enabled or disabled. Client-side validation can be used to ensure valid user input before submission to the server.

If a form control cannot be enabled when a page is loaded or when a user takes action on that page, the form control should not be displayed to the user at all.

5.8. Tabbing Order

The tabbing order defines the order in which form elements will receive focus when navigated by the user via the keyboard. The tabbing order may include elements nested within other elements.

For each form that has at least two visible form controls, all form controls within the form that are visible to the user should be included in the form's tabbing order. The tabbing order is established using the tabindex attribute of each control's HTML tag.

Tabbing Order Guideline Tips

Determining Tabbing Order
The tabbing order established by the tabindex attribute should mirror the visual display of the form elements, from left to right and top to bottom. If the form is divided into multiple columns, then the tabbing order should proceed within each column and then across columns.

Connecting Controls and Submit Button
The form's primary submit button should be included in the tab index and should follow the last visible form control. That is, if the user is presented with two text fields and a submit button, then the user's tabbing experience should not include any links or other page elements between the two text fields and submit button. For example, if a "Forgot your password" link is displayed near a log in form, then the user should only tab to that link *after* tabbing through username, password, and the submit button.

5.9. Submission

Submitting data that has been entered via online forms should behave similarly regardless of where a user is on the site. Submitting typically triggers a trip to the server to process the results, after which a page is returned to the user to confirm the action or continue a process.

Submission Guideline Tips

Button Presentation
The system should present an unambiguous set of buttons that represent submission of data to the system for processing. This includes a single button to submit a search, continue and back buttons to navigate a wizard sequence, and update and cancel buttons to update data within a system.

Client-side Validation
Client-side validation is performed when a user clicks on a button to submit a form and prevents the submission of the form to the server should the data fail validation checks.

5.10. Buttons vs. Links

Buttons and hyperlinks provide the two most common elements for user selection on a web page. Choosing the right interactive for the proper situation is important.

Buttons are used whenever the user submits or requests data from the system, such as search submission, continuing with data entry, and paging through search results. However, buttons should not be displayed where the object's label is dynamically generated.

Hyperlinks should generally be used to enable the user to navigate to a page where the rendering of the page is not dependent on user input on the previous page or to generate a page where the label must be dynamically displayed, such as a call sign, bidder name, or individual page numbers within paging navigation.

Buttons/Links Guideline Tips

Hypertext Links
Clicking on a hypertext link does not save or submit data to the system nor persist user input from page to page.

Button Use
Buttons should be used for the following interactive situations: submit, cancel, delete, update, amend, continue, back, next, previous, go, and reset.

Minimize Ambiguity
Numerous buttons should not be displayed on the same page unless significant distinction can be made between their applicable areas and actions. For example, if the user is within a wizard sequence that is supported by continue and back buttons, and the system prompts the user for a yes or no answer, then the system should display radio buttons to select the answer. In this case, presenting buttons both for continue and yes/no may result in confusion because all three may navigate to the next page.

5.11. Common User Input

While each section and system within the Wireless system is unique and serves a distinct purpose, many common form control sets are shared by numerous applications. HTML-based templates for each common set have been created and are available along with the more generalized templates and page components.

5.11.1. Log In

Numerous applications and online systems authenticate (verify that a user is who they claim to be) and authorize (determine whether the user has permission to access the requested resource) users. The Log In page enables the user to provide credentials, such as a User Name and Password, that enables the system to verify the user against some authority, such as a database that contains information on valid users. Users arrive at the Log In page by clicking on a Log In link from elsewhere on the site.

The Log In page generally provides a simple display that includes controls for the user name and password along with submit and reset buttons. Additionally, the page can include security information specific to that application and links to related tasks, such as "Forgot your password?" and "Contact Tech Support." Upon successfully submitting a user name and password combination on the “Log In” screen, the user is directed to the initially requested page, such as the homepage for an online system or the previous view that had been in an unauthenticated state.

Figure 27 - Log In Example

Log In Guideline Tips

Presentation
Separate lines should be used to display User Name, Password, and Submit. A “Forget your password?” link should be displayed below the submit button.

Upfront Login
If a user must "Log In" to the application in order to view any data, then the "Log In" page is the first page displayed to the user, should contain general application information, and should redirect the user to the application's homepage upon submission unless "Select your Start Page" is available on the "Log In" page.

Displaying Form Vs. Link
"Log In" forms can also be displayed prominently on one or more high level pages within the application, removing the requirement for the user to navigate to a separate page to "Log In". However, this should be avoided if the log in form would need to be displayed on *every* page. In this case, limit the display to linking to a separate log in page.

Logged In
Once a user has logged into a system, the system should persistently display their log in information on every page based on the chosen template. The display should include the label “Logged In:”, the user’s name (such as first and last name, company name, or FRN), and a link to immediately log out in parens, “(Log Out)”.

5.11.2. Address / Contact Information

Users may be required to submit their address and contact information, as in the form example shown in Figure 28.

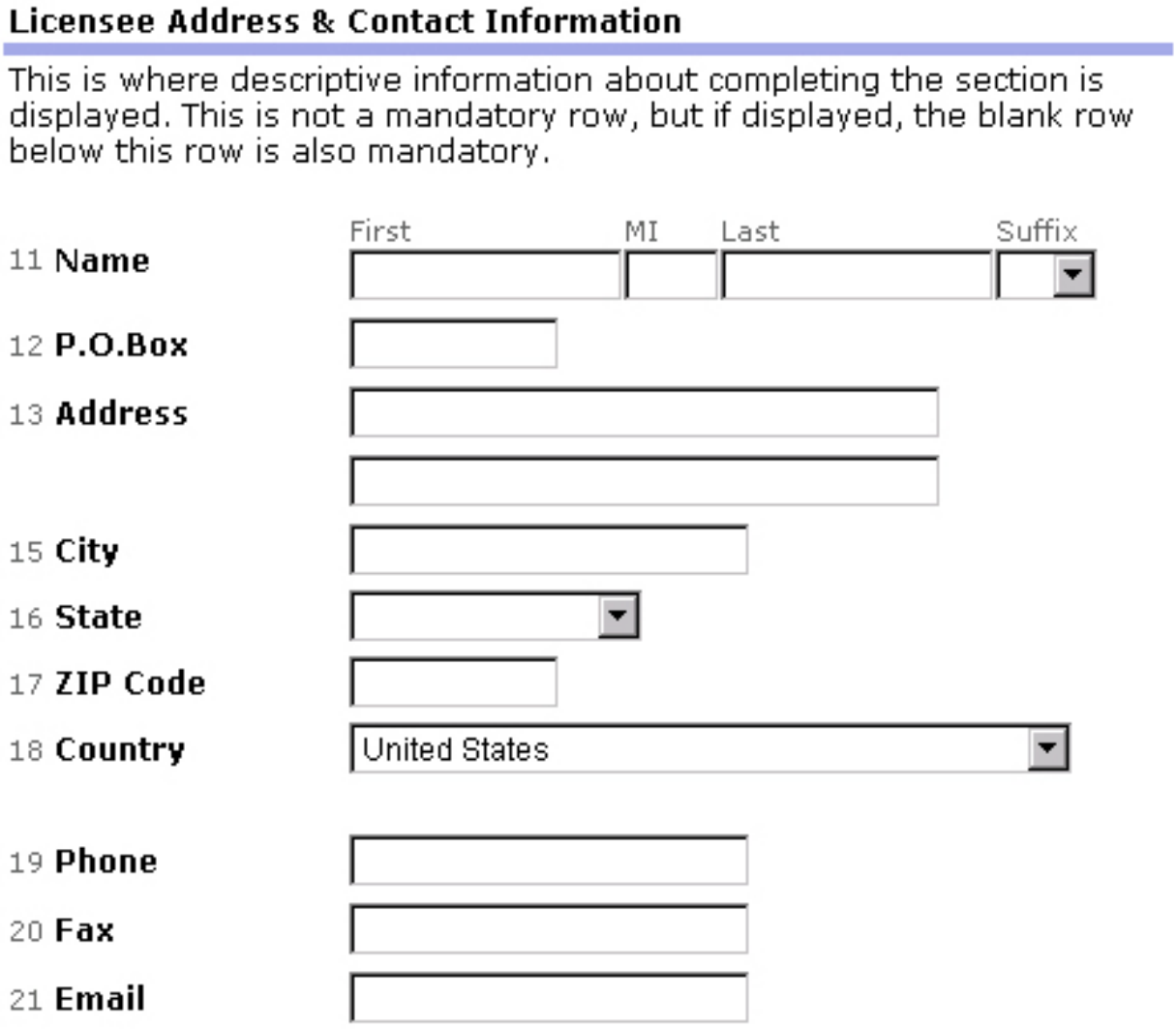


Figure 28 - Address and Contact Information Example

Address/ Contact Guidelines

Fields
Address fields should follow this order, one per line: [PO Box], [Address 1], [Address 2], [City], [State], [ZIP Code], [Country].

Contact info
Contact information should follow this order, one per line: [Phone], [Fax], [E-mail].

Drop-down lsits
The drop-down list for State should present full state names in ascending alphabetical order. Although state codes can be used as the HTML option values, these should not be displayed to the user.

5.11.3. Dates

Users may be required to submit date information, as in the form example shown in Figure 29.

Figure 29 - Dates Example

Dates Guideline Tips

Use single text box
Specifying a single date is done via a single text box as opposed to separate text boxes or separate drop-down lists for month, day, and year.

Format correctly
Dates should generally be formatted as MM/DD/YYYY.

The data format for a specific form control should be displayed to the right of text box..

Validate dates
Dates on forms must be validated via client-side scripting, including verifying that the day is valid within the month. For example, 6/31/2002 is an invalid date because there are only 30 days in June. Note that validation may also be done from the server-side.

Present according to needs
Dates can be presented in numerous ways, including a single text box, a drop-down list that selects predefined ranges (such as "Yesterday" or "Within the Last 90 Days"), or as a specified range (From, To).

If a date range must be entered, the form controls should be formatted as "From [from-textbox] to [to-textbox]". The dates should be validated such that the from-textbox value precedes or is equal to the to-textbox value.

5.11.4. Other Common Components

While the preceding sets are used frequently throughout the site, there are also other sets that are used across multiple online systems. These sets do not have particular guidelines but do have HTML templates already established:

- FRN
- Latitude/Longitude
- Frequencies
- Antenna Heights

6. Feedback

In the use of interactive systems, it is critical for the software application to maintain a dynamic action/reaction relationship with the user. This enables the user to understand their navigation through simple and complex tasks, anticipate next steps, and recover when misunderstandings and malfunctions occur. Proper feedback - ranging from client-side validation of form controls to more complex informational and warning messaging strategies - is critical to that relationship.

6.1. Client-side Validation

Client-side validation refers to the validation of page or form elements before a request is submitted to the server for processing. These checks are typically performed via browser-based JavaScript that validates specific form controls to ensure that they are accurate. Validations performed on the client offer immediate response for the user, enabling the user to correct invalid data without having to wait for a new page to load.

All Wireless site and system forms should include as much JavaScript client-side validation as possible, including the following checks:

- Required fields (non-null)
- Numeric type (number, integer, etc)
- Length (that is, if text box data has a minimum length – maximum length should be enforced via the text box maxlength property)
- Numeric range (greater than zero, between a minimum and maximum, etc – useful for frequencies, coordinates, and more)
- Valid e-mail address
- Valid date format
- Valid date value (e.g., not 6/31/2002)

Client-side validation is performed via JavaScript, and if a form contains invalid data, a message is displayed upon submission that summarizes all errors.

Client-side Validation Guideline Tips

Alert Displays
Error messages are displayed using a message box produced by the alert() function.

List Summaries
Error messages should summarize all errors in list format.

Timely Display
If an error can be detected immediately, the message should be displayed once the user's focus leaves the form

control in error. In this case, based on the onBlur event, the alert should be displayed followed by firing the focus() event for that control.

Alert Limit
All error messages based on a single event should be displayed in a single alert box. Therefore, the system should not display more than one alert box at a time before enabling the user to correct the problem or make a decision.

Continue With Errors
In the case when a system allows users to continue through a form even though specific fields contain errors, the system should display an alert that notifies the user of the error but enables them to continue. In the case when both "continuable errors" and errors that require correction occur, the system should first display an alert for required corrections, enable the corrections, and then display the "Continue With Errors" alert.

6.2. Server-side Validation and Error Handling

Server-side checks refer to all logic and validation performed by the server once a page has been submitted and the user is awaiting a response or a new page. Server-side error handling is unavoidable in some situations, since some checks require comparing user input to data stored in a database and more complex validation may be impossible or overly difficult to code in browser-independent JavaScript.

All online systems that offer interactive, non-static views should provide server-side validation of content and reveal errors through warning and critical messages.

Sever-side Validation Guideline Tips

Repeat Client-Side Validation
All client-side validation should also be performed via server-side validation to ensure valid data. This provides a second check for data validity in case of inconsistent browser validation behavior, and user submission/posting through means other than system-rendered form controls.

Error Message
Server responses for invalid data should generally be formatted using Critical messages. See section 6.3.3 for more guideline tips.

Error Icons
If one or more form controls contains invalid data determined by server-side validation, then an error icon should be displayed to the right of the form control(s).

Same-Page Refresh
If the user is completing a form on a given page and the submission results in a server-side error, the same page should be refreshed with the message displayed at the top of the page. The form elements should be set to their submitted state.

6.3. Messages

The Wireless site and its applications frequently display messages about a particular situation or condition. Messages are an important part of the site, educating users about the state of applications, advising users on results of a command or request, or alerting the user about a condition before they proceed or provide input.

This site provides for three distinct types of message displays. In increasing order of severity, they are: informational, warning, and critical. Distinct from JavaScript alert boxes generated by client-side validation code, these messages are displayed within the page layout rendered in HTML and are produced by a server response or are hardcoded into the hypertext system of a static site or subsite.

6.3.1. Informational Messages

Informational messages are displayed to provide information about the results of an action or the state of a system or component of the system. Examples include information on activity and eligibility levels in an auctions bidding system, normal ULS system state, and the ramifications of a selected task. Figure 30 is a sample treatment for displaying Informational Messages.

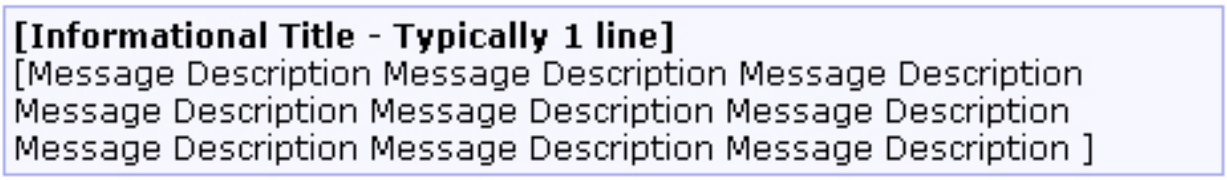


Figure 30 - Informational Message Example

Informational Messages Guideline Tips

Display
Informational messages are displayed with combinations of the primary color, white, and black only. These messages should include neither the secondary color nor red.

Labeling
This message should contain a concise title label in bold, followed optionally by a secondary description.

6.3.2. Warning Messages

Warning messages alert the user to a condition or situation that requires attention, such as an impending action with potentially destructive or irreversible consequences. Figure 31 is a sample treatment for displaying Warning Messages.

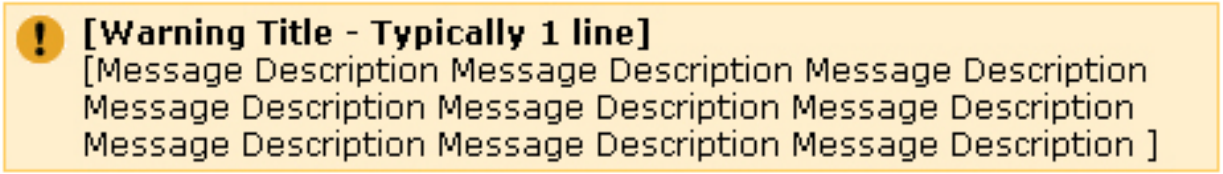


Figure 31 - Warning Message

The Wireless site displays warning messages for a wide range of reasons, both to inform the user and to require a response from a user before continuing with a process. Examples include when a user is below required activity in a round for an auction, no results are returned by a search, and the user is requesting to cancel or delete an object of interest, such as a bid, license, or application.

Warning Messages Guideline Tips

Display in secondary template color
Warning messages are displayed in the template's secondary color and include an "!" icon displayed to the left of the title and description. Whenever the "!" icon is used, the secondary background colors should be used.

Make title concise
Warning message titles should be concise and generally not span multiple lines.

Offer a choice if appropriate
Warning messages can be for display only or can offer a choice to the user (continue/cancel, yes/no, save/delete, etc) If the message offers a choice, the buttons displayed depend on the choice offered:

- If the user has the option of either continuing the action or restoring the previous state of the process, include the Continue and Cancel buttons.
- If the user must decide between two choices of how to continue, use Yes and No buttons and phrase the message so that the choice is not ambiguous. If Yes and No is too ambiguous, then use more specific buttons such as Save and Delete.

6.3.3. Critical Messages

Critical messages inform the user of a serious problem that requires intervention before the user can continue (e.g., failed server-side validation). A critical message treatment may also be used to notify the user that a system is not currently operating.

Critical messages are the only messages where red may be used to highlight information. Although the basic critical message appears in a layout similar to informational and warning messages, critical displays can also be messaged via smaller icons and coloring of individual cells to highlight where an error occurred. Figure 32 is a sample treatment for displaying Critical Messages.

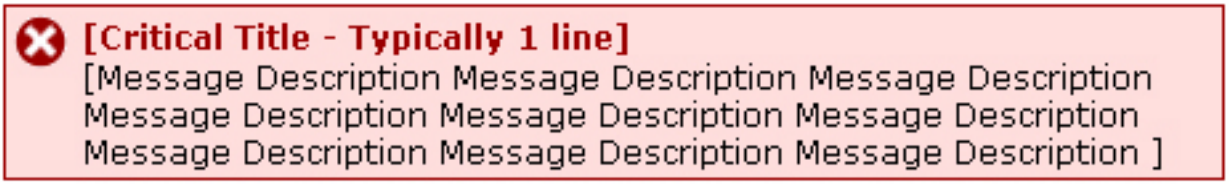


Figure 32 - Critical Message

Critical Messages Guideline Tips

Critical messages are reserved for the following situations:

- System(s) are down for maintenance, have a scheduled maintenance or downtime within the next week, or other problems.
- System error during processing .
- Errors in server-side form validation.
- Critical messages are displayed in red and include an “X” icon displayed to the left.
- Whenever the “X” icon is used, the red/red-light background combinations should be used.
- If a critical message is the result of a system / server error that displays the message on a separate page, then the message or page should provide a link back to the page preceding the error.

7. Visual Style& Design

Visual design is an important tool for effective communication, in addition to providing an attractive look and feel. It should complement, not replace, the structural design of the application. The organization of information on the screen is crucial in enabling users to interact successfully with the software. A functionally brilliant software product may be rendered ineffective if that function is not communicated properly to the user.

7.1. Composition and Organization

The following principles should be considered in the organization and composition of visual elements in an application interface:

- **Hierarchy of Information**
  The placement of information based on its relative importance to other visual elements. This will affect all other composition and organization principles. To determine the best hierarchy of information, first determine which information is most important to the user, and what are the user's priorities. Ideally, the visual display should match the user's priorities.
- **Focus and Emphasis**
  This relates to the placement of priority items. Emphasis of chosen items can be determined by isolating them from other elements, or making them stand out in other ways.
- **Structure and Balance**
  Maintaining structure and balance are two of the most important visual design principles. Without an underlying structure and balance of visual elements, the whole design will lack order, meaning and integrity, resulting in an interface that is hard for the user to understand.
- **Relationship of Elements**
  This is important in establishing the previous principles. The placement of visual elements relative to each other should aid the user's understanding of the interface. For example, there should be a spatial relationship between form elements that affect each other, such as a text field and the Submit button that is needed to submit the text in the field.
- **Readability and Flow**
  This enables a user to work through an application directly and simply with minimum visual interference.
- **Unity and Integration**
  This relates a design to its larger environment. If users are presented with a consistent and predictable work environment, they typically find an application easier to use. This

is very applicable when designing a series of applications under one environment, such as ULS.

7.1.1. General Markup

Markup is information that is added to a text document in order to delimit (i.e. contain or define the borders of) certain content. Markup is not part of the content; it sits alongside, marking the content up into specific chunks. For example, some text within a document could be treated as a heading, and be wrapped with a <h1> or other heading tag. The tags ensure that the content they contain is presented in a certain way by a browser or spoken aloud by screen reader software. By definition, anything that is not markup is content. Strip away the markup, and what is left is the content the markup was supposed to delimit, surround, or contain.

Markup affects accessibility – how screen reader software reads the pages. Markup also allows software to search for content of a specific type, such as quotes or addresses.

Markup includes stylesheets and scripts, which are interpreted by the browser, but not visually displayed to the end user. Some content, such as images or Flash files, can only be embedded in a page by way of markup. These files are still 'content', but they are separate from the actual HTML markup.

Markup Guideline Tips

Separate from content
Markup should always be considered as separate from content.

Avoid extraneous markup
Extraneous markup should be avoided, with unnecessary tags (such as font tags) being removed. Extraneous markup can make a document more complicated and difficult to edit, and in extreme cases may increase the file size.

Validate to an HTML standard
Markup should validate to an HTML standard. Markup is hierarchical, and should be presented in the proper structure and order that the HTML standard dictates. For example, HTML contains certain obligatory elements, such as <html> and <head> and <title> and <body>. These elements should be placed in a certain order - <html> contains a <head> and a <body>.

7.1.2. Style Sheets

The Wireless sites make widespread use of style sheets, which contribute to a consistent site design and layout as well as improved maintenance. Three primary style sheets exist:

- wireless.css for the WTB website
- wireless.css for external wireless applications
- wireless.css for internal wireless applications

The style sheet for the external site and external applications should be the same. These two style sheets differ from the internal applications style sheet primarily in the colors that cell styles refer to (gold vs. green).

Each wireless style sheet contains two major sets of styles: those that apply to table cells and those that apply to text. The table cell styles define a range of styles for background color, font size, font color, and font family.

Stylesheet Guideline Tips

Permitted style attributes:

- Font-family, font-size, font-weight, font-decoration
- Color, background-color
- Line-height
- Margin-top, margin-bottom, margin-left, margin-right

All type and color formatting should use style sheet attributes except in unique situations where alternative treatments are required. <font> tags and colors specified in <td> and <table> cells are prohibited.

If a table cell contains text that requires formatting, use a "cell-" class in the <td> tag to format the cell AND "text-" class in a tag to format the textual content.

Styles
Styles may not be used to dynamically position content using DHTML, which potentially render the page "unreadable" by screen readers.

Styles should all be added to and maintained in separate style sheet files, i.e., pages may not have a separate <style></style> section with page-specific styles.

Inline styles should be used sparingly. If an inline style is used more than 3 times, consider adding the style to an external style sheet.

Each site and subsite may have separate external style sheets if necessary, but all pages should include the overall Wireless style sheet.

Font sizes should be displayed using fixed specifications in pixel size unless otherwise specified as a variable, such as small and x-small.

Styles are used to format all textual content, including headers, releases (and each component of a release), table cells, and more.

7.2. Typography

Typography deals with the arrangement and appearance of the text on a page, and is affected by such factors as font character, design and style, leading (the space between the lines), and the formatting of the type and the paragraphs that contain it.

7.2.1. Fonts/Character

In addition to providing letterforms for reading, fonts can be used to organize information, or to create a particular mood. The particular size and weight of a font can be used to communicate the order or importance of particular pieces of information.

Fonts do not render as well on computer displays as they do on the printed page, because the printed page presents a much higher definition. Also, the illumination is different - computer

screens emit light, whereas the printed page reflects it, making the printed page easier and more pleasant to read. For these reasons, the following guidelines are suggested:

- Avoid italic and serif fonts for large blocks of text.
- Limit the number of fonts used in the interface.
- Use bold and italic text sparingly. While bold and italic text attract attention, overusing them can distract the user and make it difficult to focus on what is important.
- When employing specified fonts, use common fonts that are found across operating systems. If a specified font is not found on a particular system, then the standard system font will be substituted.

All Wireless sites predominantly use two fonts for rendering text in HTML format: Verdana and Arial. These two fonts render consistently across major browsers and platforms, are compact, and read well from the screen. The use of each is specific to the location on the page:

- Arial is used for the text in the left navigation and in the footer.
- Verdana is used for most other text, including content and breadcrumbs.

The style sheet contains a number of font treatments that primarily control the font's color, spacing, size, and family:

- Some of these characteristics are by default located in the styles for the P, TD, BODY, and LI tags.
- Additional styles labeled "text-[color]" and "text-[color]-small" display type in a variety of colors, including black, white, red, blue, and gray.

7.3. Graphics

Graphics encompasses all photographic images, screen shots, and other related logo, icon and visual treatments. Graphics should always support or illustrate the user's task, and help the user complete the task rather than compete with or distract from it.

Consistency is important in the design of graphic images. The scale, orientation, and color of the graphics should be consistent with other related objects, and they should fit into the overall environment in which they appear.

Graphics that enable users to interact with the application, such as buttons or icons, should provide obvious visual cues as to their purpose.

In general, graphics should not be used for rendering text, except as part of an icon or button, or if the text forms as integral part of a collage or other graphic image. Section titles, major headings, and frequently used navigation elements such as “Return to Top” should all be rendered in HTML text and supplemented by icons. All other information should be rendered as HTML text, including but not limited to content, most links, and all tabular information.

7.3.1. Buttons

Buttons are important graphic elements because they are a key means for user interaction with the application. Unlike hyperlinks, buttons are used throughout the website and applications whenever a user's interaction will perform an action, such as update data in a database, submit a bid or search, or navigate in such a way that preferences or attributes are stored. Hyperlinks are used for general navigation, including canned reports (such as a license view, table of bids, or navigation *to* a page where the user will perform an action, such as Add Item).

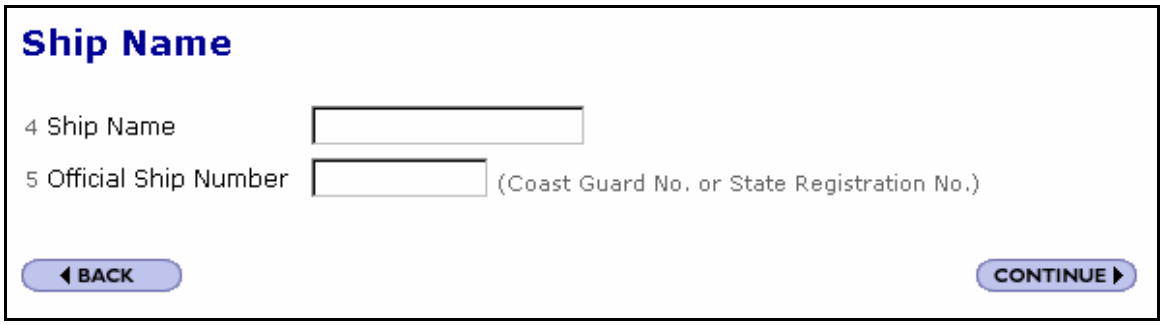


Figure 33 - Back and Continue Button Examples

Buttons Guideline Tips

Standard Size

For interactive systems, buttons are stored in a 'buttons' directory separate from other graphic elements. Buttons that are shared across interactive systems should not be duplicated, and should be stored in a high-level directory that can be accessed by these interactive systems.

Button labels should be as short and concise as possible, and for the most part will simply state the action (Submit, Continue, Search).

All buttons will have identical design (color, font), with only the button width varying according to the length of the text it contains. Next and Continue buttons can also contain an appropriate arrow.

The <img> tag for each button should contain alternative text that is the same text as that on the image.

All non-Submit buttons should have a minimum width of 70 pixels. This will create a consistent size for most simple buttons, avoid very small buttons that appear bunched up, and improve the currently very small target (clickable) areas. All buttons have a height of 17 pixels, except in the case of certain large buttons (see guideline below).

A non-breaking space, or a spacer image with a width of 5 pixels, should separate buttons located next to each other.

Buttons typically do not include mouseover effects. These effects may, however, be used on an entry page to a number of online systems, such as the ULS home page.

Large Buttons

Larger buttons with a height of 20 pixels can be used to emphasize an important action, such as the Submit button at the final stage of an application.

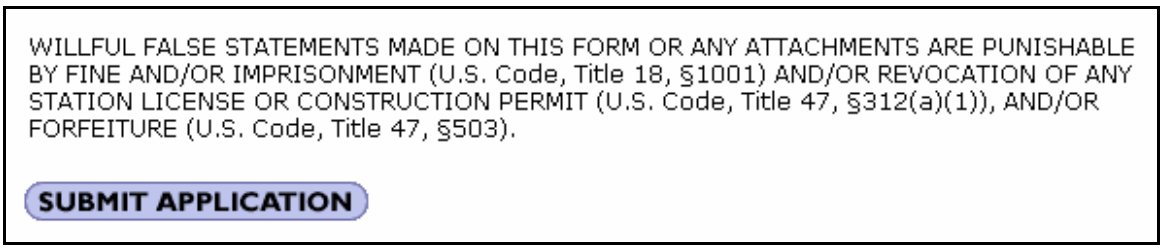


Figure 34 - Large Buttons Example

7.3.2. Icons

Icons provide a compact graphic depiction of an action or attribute, and enable the user to visually identify a state or link quickly (e.g., warning/error and informational message icons as depicted in section 6.3). Icons are also useful for compactly displaying an action that is linked to from numerous similar objects on the same page, where buttons would prove more cumbersome and visually distracting.

Figure 35 - Icons Example

Icons are most effective when they use real-world metaphors and should relate to specific tasks performed within a page. It is often difficult to design icons that define operations or processes, and activities that rely on verbs. Nouns should be considered instead. For example, scissors can represent the action to cut, and a printer can represent the print preview task.

Icons Guideline Tips

Size 18x18
In general, icons are 18×18 gif files.

Store in icons directory
Icons are stored in an 'icons' directory separate from other graphic elements. Icons that are shared across applications should not be duplicated, and should be stored in a high-level directory that can be accessed by these applications.

Make differentiable
Icons should be easily differentiable and convey meaning specific to the action/attribute.

Make consistent
Icons should be consistent in their style. It is recommended that because of their small size, icons should not have soft edges or faded shaded – should be hard-edged in their style.

Display legend if necessary
If a page includes numerous icons or a repeated icon throughout, then an icon legend should be displayed.

7.3.2.1. The Arrow

A small blue arrow is sometimes used in conjunction with a hyperlink, or in a hierarchical navigation tree structure. For example, the arrow used in the Ownership application (see Figure 36) works in the same way as the Windows Explorer feature. Arrows are used only with hyperlinks that denote a task, and not with a purely navigational link. Arrows precede each anchor link in a list. Figure 3.6 depicts treatment for arrows denoting two sample tasks.

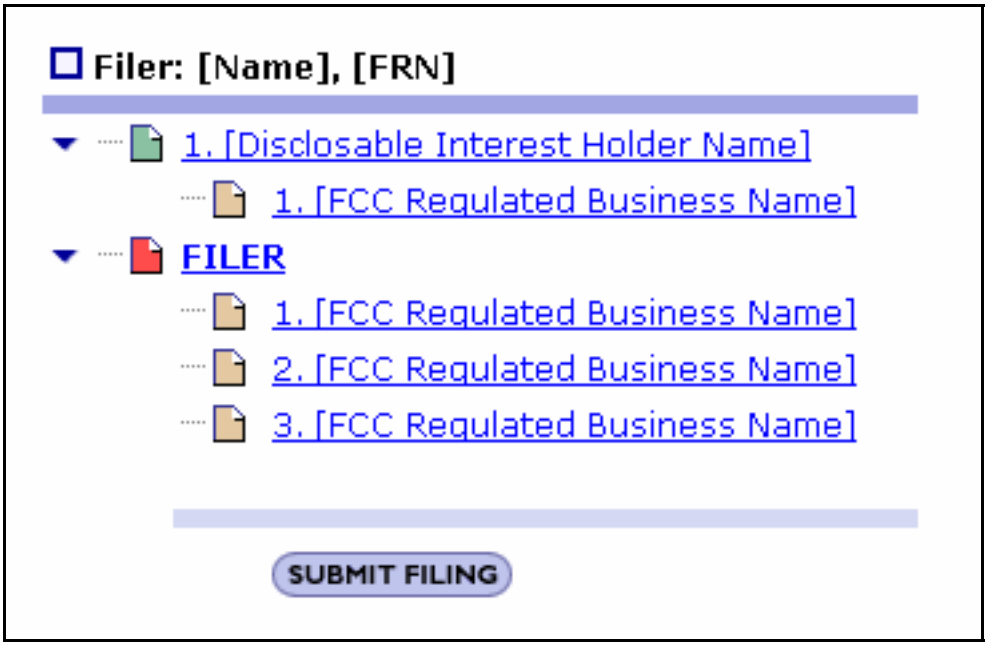


Figure 36 - Arrow Example

7.3.3. Other images

All other website section or application specific images are stored in one of many /images directories. In general, an image should be stored at the highest level at which it may be shared by multiple sections or applications, and images used by general templates should all be stored in /template/images/ for web applications and /images/ for the website.

7.3.3.1. Spacer.gif

This 1 pixel-by-1 pixel transparent image is a useful image used in the aligning or positioning of other graphic elements on the web page. The width and height of this image can be defined in the HTML code, and its transparency ensures that it will not be visible on the computer screen. The spacer.gif image file should have an ALT attribute with empty quotes – “ ”.

7.3.3.2. Alternate Text

For all graphic images, a suitable ALT= attribute should be included within the IMG tag to properly describe the graphic for screen readers. If the graphic is being used only for page layout purposes (such as a spacer.gif), then the ALT= attribute should be " ". This is necessary for assistive screen reader software.

Alternate Text Guideline Tip
An application should not refer to an image within a folder of another application. If two applications share an image, consider placing the image in the /template/images/directory.

7.3.4. Patterns

Patterns are images specifically designed to "tile", or continuously repeat themselves horizontally, vertically, or both, across a web page. In FCC applications, these are generally used as table cell backgrounds as part of the header design. Filling a table cell with a repeated pattern background is a useful technique that allows a pattern to fill out across a page regardless of browser width, and also allows HTML text to be written on top of the image background. In Wireless applications, different patterns denote different sections of the header – for example, the application/section title typically has a yellow striped background, while the breadcrumbs have a gray striped background pattern. These patterns are used in conjunction with static images, which provide suitable "endcaps".

Patterns Guideline Tip
Because the pattern repeats itself, the graphic image should obviously be such that when it is tiled, the join should be invisible. Pattern images (and subsequent file size) should be as small as possible.

7.4. File Formats and Size

7.4.1. JPGs vs. GIFs

All graphics on the site should be in either .gif or .jpg formats. Generally the format is determined by file size. Gif files are most suited for images, which use primarily flat colors, which encompasses most buttons and icons on the wireless site. Gifs tend also to be smaller in file size than equivalent jpgs, although this is not always the case. Jpegs are most suited for photographic images, and if possible they should not be used for images that contain text, as the text does not read as clearly.

The cumulative file size of all graphics downloaded for a single page (including all included content such as headers) should not exceed 50K unless a valid exception can be made. Valid exceptions include large, hi-resolution graphic presentations, such as geographic maps and exhibit hall floor plans, and long lists of repeated images requiring distinct images for each list item.

7.5. Color

Color is a very important element in the design of a visual interface. It can be used to draw the user's attention to a specific element (for example, the current selection) or to associate elements that belong to a common group. There are also the emotional and psychological qualities of color, such as the categorization of certain colors as being warm or cool.

Colors used for the Wireless website and applications should demonstrate a consistent visual style. Although any color available on the RGB color palette may be used, for the external site, it is advisable to adhere to the web-safe color palette for major, often repeated colors. The two primary colors of this site, blue (#000099) and gold (#FFCC66), are both web-safe.

Color is the main element used to differentiate the FCC external and internal applications. External applications are those used by the public, and have the predominantly blue and gold color-scheme. Internal applications, those used only by internal FCC staff, have a predominantly blue and green color scheme, made up of the blue (#000099) and green (#70C4B1). The colors of the Wireless external and internal palette are displayed in the following chart.

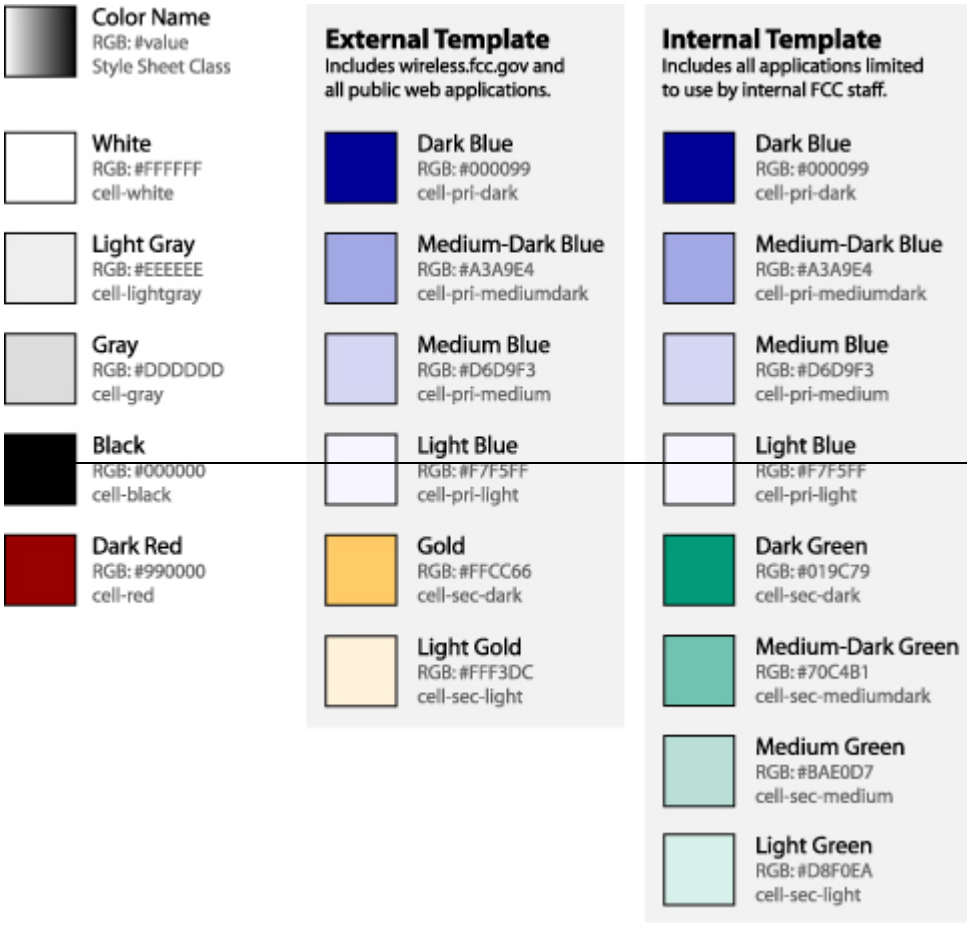


Figure 37 - Color Chart

Color Guideline Tips

Use related shades
Most images and background color selections should use the related shades of primary and secondary colors.

In general, the secondary color is used to highlight important content, and gray is used to layout less visually prominent content.

Reserve red for warnings
Red, especially for text, is reserved for displaying warnings, alerts, and messages of high importance to the user. Any message to be displayed for more than one week (on the content site) should not be displayed entirely in red.

Contrast with background colors
All text rendered in HTML should have a significant contrast with the background color.

Most text, including all standard paragraph-formatted content, should be displayed as black text on a white background.

Background colors should be used to highlight data in tables and highlighted content positioned using tables.

Don't use color solely to convey meaning
Each page should be designed so that all information required for navigation or meaning is not dependent on the ability to identify specific colors. For example, using red to format warning text without also including the word "Warning" prior to the message is inappropriate.

7.5.1. Links

Generally, hyperlinks contained within the main body of the page should be rendered in the browser-standard hyperlink colors of blue (#0000FF) for unvisited links, and purple (#990099) for visited links. Combined with the standard hyperlink underline, this will make clear to the user that the link is in fact a link. These colors should not be used on text that is not a link. It is permissible to use other colors for hypertext links that are not part of the main body of information, such as menu items in a clearly defined nav-bar. The License Search Help, and other Help sections, use hypertext links that have black bold formatting (still underlined). These are located in the nav-column at the left, separate from the main body of text.

7.5.2. Cells

Color is used extensively in table cell backgrounds, for visual style, to define certain table borders, to highlight certain types of information, and to aid readability for tables that contain many rows and columns of information. All cell-colors are defined using "cell-" classes in the style sheets, never directly in the file itself. The following list defines the colors and their respective classes. In general, "pri" indicated a primary color, and "sec" indicates a secondary color.

- **Dark Blue** (cell-pri-dark)
  Used for the dark background for tables as well as column headers.
- **Medium Dark Blue** (cell-pri-mediumdark)
  Used for labeling major sections of a table as well as background 1-pixel borders for data tables.

- **Medium Blue** (cell-pri-medium)
  Used for data labels, alternate rows, and other purposes.
- **Light Blue** (cell-pri-light)
  Used for displaying data values.
- **Dark Green or Gold** (cell-sec-dark)
  Used for the dark background for tables as well as column headers.
- **Medium Dark Green** (cell-sec-mediumdark)
  Used for labeling major sections of a table as well as background 1-pixel borders for data tables.
- **Medium Green** (cell-sec-medium)
  Used for data labels, alternate rows, and other purposes.
- **Light Green or Gold** (cell-sec-light)
  Used for displaying data values. Also sparingly used for non-warning informational messages.
- **Gray** (cell-gray)
- **Light Gray** (cell-graylight)
- **Gold** (cell-gold)
  Used for the headings for highlighted content and other table column headers *on the external site only*.
- **Light Gold** (cell-goldlight)
  Used for data in highlighted tables *on the external site only*.
- **White** (cell-white)
  Used for table cells requiring a white background, particularly those where the cell is nested and inherits a background color from another cell or table it resides within. For example, this background is used for the cells in the table of Related Sites where the table has a background color of gray.
- **Red** (cell-red)
  Rarely used. Used for highlighting warning text or other information that must visually stand out.

Appendix A. - Paging Navigation Algorithm

If the current page is NOT the only page of matches, up to ten pages of matches are displayed in sequence, where all but the current page provide links to the displayed page. The following algorithm determines the beginning and ending pages in the sequence:

```
totalPage = (recordCount \ hit) + 1;
if (totalPage LT p) {
  p = 1;
}
if (totalPage LT 11 OR p LT 6) {
  startPage = 1;
} else if (totalPage - p LT 6) {
  startPage = totalPage - 9;
} else {
  startPage = p - 4;
}
```

"p" is the current page of results, `recordCount` is the number of overall matches returned by the search, "hit" is the specified number of hits displayed per page, and "startPage" defines the number of the first page of paging links. The application then displays the up to ten paging links in sequence beginning with page # "{startPage}", where the current page is NOT presented as a link but is instead listed in bold.

For example, if you are on page 7 of a 13 page report listing 255 records at 20 records per page, then paging navigation would be displayed as: 3 4 5 6 **7** 8 9 10 11 12. Using the calculations:

p = 7

recordCount = 255

hit = 20 (per page)

totalPage = (255\20) + 1 = 12 + 1 = 13

totalPage – p = 13 – 7 = 6 is not < 6

Therefore, startPage = p – 4 = 7 – 4 = 3

Appendix B - Acronym List

ASR – Antenna Structure Registration

CFR – Code of Federal Regulation

CSS – Cascading Style Sheets

FCC – Federal Communications Commission

HTML – Hypertext Markup Language

MHz - Megahertz

PDF – Portable Document Formamt

PN – Public Notice

ULS – Universal Licensing System

URL - Uniform Resource Locator

W3C – World Wide Web Consortium©

WTB – Wireless Telecommunications Bureau

XML – Extensible Markup Language