

Designing Accessible Forms and Tables

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Standards for Electronic and Information Technology: An Overview

The Access Board is an independent Federal agency devoted to accessibility for people with disabilities. On December 21, 2000, the Board issued accessibility standards for electronic and information technology under section 508 of the Rehabilitation Act, as amended. The Board also develops and maintains accessibility guidelines for the built environment, transit vehicles, and telecommunications equipment under other laws and enforces design standards for federally funded facilities. Presented here is an overview of the new standards for electronic and information technology and section 508. Questions about the 508 standards should be sent to 508@access-board.gov.

The Law: Section 508

In 1998, Congress amended the Rehabilitation Act and strengthened provisions covering access to information in the Federal sector. As amended, section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden." The law directs the Access Board to develop access standards for this technology that will become part of the Federal procurement regulations.

The scope of section 508 is limited to the Federal sector. It does *not* apply to the private sector, nor does it generally impose requirements on the recipients of Federal funds. (However, States receiving assistance under the Assistive Technology Act State Grant program are required to comply with section 508 and the Board's standards, according to the Department of Education, which administers the Act. The Department plans to issue guidance on how the standards apply to the States under the Assistive Technology Act. For further information, e-mail the [Department of Education](#) or call (202) 205-5666 (voice) or 202-205-5516 (TTY)).

Development of Standards

Shortly after the law was enacted, the Access Board created an advisory committee to develop recommendations on the standards to be developed. In May 1999, the Electronic and Information Technology Access Advisory Committee (EITAAC) completed its work and presented its recommendations to the Board. The committee consisted of 27 representatives from industry, various disability organizations, and other groups with an interest in the issues to be addressed. On March 31, 2000, the Board published proposed standards based closely on the committee's report. The proposed standards were available for public comment for 60 days through publication in the *Federal Register*. The Board

sought information and comment on various issues through questions it posed in a discussion provided in the proposed rule. Over 100 individuals and organizations submitted comments on the standards. Comments were submitted by Federal agencies, representatives of the information technology industry, disability groups, and persons with disabilities. The Board finalized the standards according to its review of the comments and republished them in the *Federal Register*. The final standards, which will become part of the Federal Acquisition Regulations, will help Federal agencies determine whether or not a technology product or system is accessible.

Enforcement and Effective Date

Section 508 uses the Federal procurement process to ensure that technology acquired by the Federal government is accessible. The law also sets up an administrative process under which individuals with disabilities can file a complaint alleging that a Federal agency has not complied with the standards. This process uses the same complaint procedures established under section 504 of the Rehabilitation Act (which covers access to Federally funded programs and services). Individuals may also file a civil action against an agency to seek injunctive relief and attorney's fees (but not compensatory or punitive damages). The enforcement provisions of section 508 take effect six months from the date the Board published its final standards. The Board published its standards on December 21, 2000. Therefore, the enforcement provisions of section 508 are effective as of June 21, 2001. (Originally, they were to take effect August 7, 2000, but section 508 was further amended to allow time for compliance after publication of the standards).

By statute, the enforcement provisions of section 508 apply only to electronic and information technology *procured on or after the effective date*. As a result, section 508 does not authorize complaints or lawsuits to retrofit technology procured before this date to meet the Board's standards. However, even though section 508's enforcement mechanisms apply only to *procurement*, the law does require access to technology *developed, used or maintained* by a Federal agency. Further, other sections of the Rehabilitation Act require access to Federal programs (section 504) and accommodation of Federal employees with disabilities (sections 501 and 504); it is possible that Federal agencies will use the Board's section 508 standards as a yardstick to measure compliance with these other sections of the law.

"Undue Burden"

A Federal agency does not have to comply with the technology accessibility standards if it would impose an undue burden to do so. This is consistent with language used in the Americans with Disabilities Act (ADA) and other civil rights legislation, where the term 'undue burden' has been defined as "significant difficulty or expense." However, the agency must explain why meeting the standards would pose an undue burden for a given procurement action, and must still provide people with disabilities access to the information or data that is affected.

The Standards

General (Subpart A)

The standards define the types of technology covered and set forth provisions that establish a minimum level of accessibility. The application section (1194.2) outlines the scope and coverage of the standards. The standards cover the full range of electronic and information technologies in the Federal sector, including those used for communication, duplication, computing, storage, presentation, control, transport and production. This includes computers, software, networks, peripherals and other types of electronic office equipment. The standards define *electronic and information technology*, in part, as "any equipment or interconnected system or subsystem of equipment, that is used in the creation, conversion, or duplication of data or information."

Subpart A also explains what is exempt (1194.3), defines terms (1194.4), and generally recognizes alternatives to what is required that provide equal or greater access (1194.5). Consistent with the law, the standards exempt systems used for military command, weaponry, intelligence, and cryptologic activities (but not routine business and administrative systems used for other defense-related purposes or by defense agencies or personnel). The standards also exempt "back office" equipment used only by service personnel for maintenance, repair, or similar purposes.

The standards cover technology procured by Federal agencies under contract with a private entity, but apply only to those products directly relevant to the contract and its deliverables. An exception clarifies that the standards do not apply to technology that is incidental to a Federal contract. Thus, those products that are not specified as part of a contract with a Federal agency would not have to comply with the standards. For example, a firm that produces a report for a Federal agency under a contract would not have to procure accessible computers and word processing software even if they were used exclusively for the contract; however, compliance would be required if such products were to become the property of the Federal agency as contract deliverables or if the Federal agency purchased the products to be used by the contractor as part of the project. If a Federal agency contracts with a firm to develop its web site, the standards would apply to the new web site for the agency but not to the firm's own web site.

Technical Standards (Subpart B)

The standards provide criteria specific to various types of technologies, including: software applications and operating systems; web-based information or applications; telecommunication products; video and multimedia products; self contained, closed products (e.g., information kiosks, calculators, and fax machines); desktop and portable computers.

This section provides technical specifications and performance-based requirements, which focus on the functional capabilities of covered technologies. This dual approach recognizes the dynamic and continually evolving nature of the technology involved as well as the need for clear and specific standards to facilitate compliance. Certain provisions are designed to ensure compatibility with adaptive equipment people with

disabilities commonly use for information and communication access, such as screen readers, Braille displays, and TTYs.

Software Applications and Operating Systems (1194.21)

Most of the specifications for software pertain to usability for people with vision impairments. For example, one provision requires alternative keyboard navigation, which is essential for people with vision impairments who cannot rely on pointing devices, such as a mouse. Other provisions address animated displays, color and contrast settings, flash rate, and electronic forms, among others.

Web-based Intranet and Internet Information and Applications (1194.22)

The criteria for web-based technology and information are based on access guidelines developed by the Web Accessibility Initiative of the World Wide Web Consortium. Many of these provisions ensure access for people with vision impairments who rely on various assistive products to access computer-based information, such as screen readers, which translate what's on a computer screen into automated audible output, and refreshable Braille displays. Certain conventions, such as verbal tags or identification of graphics and format devices, like frames, are necessary so that these devices can "read" them for the user in a sensible way. The standards do not prohibit the use of web site graphics or animation. Instead, the standards aim to ensure that such information is also available in an accessible format. Generally, this means use of text labels or descriptors for graphics and certain format elements. (HTML code already provides an "Alt Text" tag for graphics which can serve as a verbal descriptor for graphics). This section also addresses the usability of multimedia presentations, image maps, style sheets, scripting languages, applets and plug-ins, and electronic forms.

The standards apply to Federal web sites but not to private sector web sites (unless a site is provided under contract to a Federal agency, in which case only that web site or portion covered by the contract would have to comply). Accessible sites offer significant advantages that go beyond access. For example, those with "text-only" options provide a faster downloading alternative and can facilitate transmission of web-based data to cell phones and personal digital assistants.

Telecommunications Products (1194.23)

The criteria of this section are designed primarily to ensure access to people who are deaf or hard of hearing. This includes compatibility with hearing aids, cochlear implants, assistive listening devices, and TTYs. TTYs are devices that enable people with hearing or speech impairments to communicate over the telephone; they typically include an acoustic coupler for the telephone handset, a simplified keyboard, and a visible message display. One requirement calls for a standard non-acoustic TTY connection point for telecommunication products that allow voice communication but that do provide TTY functionality. Other specifications address adjustable volume controls for output, product interface with hearing technologies, and the usability of keys and controls by people who may have impaired vision or limited dexterity or motor control.

Video or Multimedia Products (1194.24)

Multimedia products involve more than one media and include, but are not limited to, video programs, narrated slide production, and computer generated presentations. Provisions address caption decoder circuitry (for any system with a screen larger than 13 inches) and secondary audio channels for television tuners, including tuner cards for use in computers. The standards also require captioning and audio description for certain training and informational multimedia productions developed or procured by Federal agencies. The standards also provide that viewers be able to turn captioning or video description features on or off.

Self Contained, Closed Products (1194.25)

This section covers products that generally have imbedded software but are often designed in such a way that a user cannot easily attach or install assistive technology. Examples include information kiosks, information transaction machines, copiers, printers, calculators, fax machines, and similar types of products. The standards require that access features be built into the system so users do not have to attach an assistive device to it. Other specifications address mechanisms for private listening (handset or a standard headphone jack), touchscreens, auditory output and adjustable volume controls, and location of controls in accessible reach ranges.

Desktop and Portable Computers (1194.26)

This section focuses on keyboards and other mechanically operated controls, touch screens, use of biometric form of identification, and ports and connectors.

Functional Performance Criteria (Subpart C)

The performance requirements of this section are intended for overall product evaluation and for technologies or components for which there is no specific requirement under the technical standards in Subpart B. These criteria are designed to ensure that the individual accessible components work together to create an accessible product. They cover operation, including input and control functions, operation of mechanical mechanisms, and access to visual and audible information. These provisions are structured to allow people with sensory or physical disabilities to locate, identify, and operate input, control and mechanical functions and to access the information provided, including text, static or dynamic images, icons, labels, sounds or incidental operating cues.

Information, Documentation, and Support (Subpart D)

The standards also address access to all information, documentation, and support provided to end users (e.g., Federal employees) of covered technologies. This includes user guides, installation guides for end-user installable devices, and customer support and technical support communications. Such information must be available in alternate formats upon request at no additional charge. Alternate formats or methods of communication, can include Braille, cassette recordings, large print, electronic text, Internet postings, TTY access, and captioning and audio description for video materials.

Federal Accessibility Standards for Web-based Intranet and Internet Information and Applications

(Provided by www.usability.gov)

This page contains excerpts from Electronic and Information Technology Accessibility Standards issued by the ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD.

Shown below are:

[Paragraphs from the Overview of the Standards](#)
[Subpart B — Technical Standards: Sec. 1194.22 Web-based intranet and internet information and applications.](#)

This page only contains an excerpt of the summary and standards that directly relate to Web sites. Other parts of the standard may apply to your situation. See the complete, officially posted standards at <http://www.access-board.gov/news/508-final.htm>.

Electronic and Information Technology Accessibility Standards
ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD
[Published in the Federal Register on December 21, 2000]

Summary:

Web-based Intranet and Internet Information and Applications (1194.22)

The criteria for web-based technology and information are based on access guidelines developed by the Web Accessibility Initiative of the World Wide Web Consortium. Many of these provisions ensure access for people with vision impairments who rely on various assistive products to access computer-based information, such as screen readers, which translate what's on a computer screen into automated audible output, and refreshable Braille displays. Certain conventions, such as verbal tags or identification of graphics and format devices, like frames, are necessary so that these devices can "read" them for the user in a sensible way. The standards do not prohibit the use of web site graphics or animation. Instead, the standards aim to ensure that such information is also available in an accessible format. Generally, this means use of text labels or descriptors for graphics and certain format elements. (HTML code already provides an "Alt Text" tag for graphics which can serve as a verbal descriptor for graphics). This section also addresses the usability of multimedia presentations, image maps, style sheets, scripting languages, applets and plug-ins, and electronic forms.

The standards apply to Federal web sites but not to private sector web sites (unless a site is provided under contract to a Federal agency, in which case only that web site or portion covered by the contract would have to comply). Accessible sites offer significant advantages that go beyond access. For example, those with "text-only" options provide a

faster downloading alternative and can facilitate transmission of web-based data to cell phones and personal digital assistants.

§ 1194.22 Web-based intranet and internet information and applications.

(a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).

(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.

(c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.

(d) Documents shall be organized so they are readable without requiring an associated style sheet.

(e) Redundant text links shall be provided for each active region of a server-side image map.

(f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.

(g) Row and column headers shall be identified for data tables.

(h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.

(i) Frames shall be titled with text that facilitates frame identification and navigation.

(j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.

(k) A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.

(l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

(m) When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).

(n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

(o) A method shall be provided that permits users to skip repetitive navigation links.

(p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

Note to §1194.22:

1. The Board interprets paragraphs (a) through (k) of this section as consistent with the following priority 1 Checkpoints of the Web Content Accessibility Guidelines 1.0 (WCAG 1.0) (May 5, 1999) published by the Web Accessibility Initiative of the World Wide Web Consortium:

Section 1194.22 Paragraph	WCAG 1.0 Checkpoint
(a)	1.1
(b)	1.4
(c)	2.1
(d)	6.1
(e)	1.2
(f)	9.1
(g)	5.1
(h)	5.2
(i)	12.1
(j)	7.1
(k)	11.4

2. Paragraphs (l), (m), (n), (o), and (p) of this section are different from WCAG 1.0. Web pages that conform to WCAG 1.0, level A (i.e., all priority 1 checkpoints) must also meet paragraphs (l), (m), (n), (o), and (p) of this section to comply with this section. WCAG 1.0 is available at <http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505>.

Creating Accessible Tables

Introduction

The World Wide Web offers the ability of designers to communicate vast amounts of information in a relatively simple and easy method. However, the rendering of such content can vary from web browser to web browser in such a manner that the presentation and design considerations that originally dictated the web page are now lost due to variations in the user's web browser. To solve this issue, many web authors utilize tables to control for layout and presentation purposes. In addition to using tables for presentation purposes, tables are also used to present data information on a web page. Tables used for presentation purposes are generally referred to as Layout Tables while tables used to organize information are referred to as Data Tables. This section will present information on designing accessible Data Tables.

Formatting Data Tables

Data tables are exactly what the name implies - a table that contains data about some information sequenced in a specific format. For example, if you have a list of days, a list of appointments on specific days, and a list of specific times for those appointments on specific days, it would make sense to develop a table to display that information. Here is a practical example below:

	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
9:00 AM	Sleep		Work	Work		Work	Sleep
12:00 PM	Nap	Lunch			Lunch		Nap
2:00 PM	Hamster Feeding			Cat Pruning			Breakfast
5:00 PM				Hospital			Nap
6:00 PM		Football					

The benefit of such a data table is that it provides information in a visually organized format such that one can quickly identify the day of the appointment and time in a simple and easy manner. There are several methods to make data tables more accessible using specific HTML attributes.

Using the Scope Method:

(from Section 508 Standards, www.access-board.gov)

Using the "scope" attribute is one of the most effective ways of making HTML compliant with these requirements. It is also the simplest method to implement. The scope attribute also works with some (but not all) assistive technology in tables that use "colspan" or "rowspan" attributes in table header or data cells.

The first row of each table should include column headings. Typically, these column headings are inserted in <TH> tags, although <TD> tags can also be used. These tags at the top of each column should include the following attribute:

```
scope="col"
```

By doing this simple step, the text in that cell becomes associated with every cell in that column. Unlike using other approaches (notably "id" and "headers") there is no need to include special attributes in each cell of the table. Similarly, the first column of every table should include information identifying information about each row in the table. Each of the cells in that first column are created by either <TH> or <TD> tags. Include the following attribute in these cells:

```
scope="row"
```

By simply adding this attribute, the text in that cell becomes associated with every cell in that row. While this technique dramatically improves the usability of a web page, using the scope attribute does not appear to interfere in any way with browsers that do not support the attribute.

Example:

```
<table>
<tr>
<th>&nbsp;</th>
<th scope="col" >Spring</th> <th scope="col" >Summer</th> <th scope="col"
>Autumn</th> <th scope="col" >Winter</th> </tr>
<tr> <td scope="row" >Betty</td> <td>9-5</td> <td>10-6</td> <td>8-4</td><td>7-
3</td>
</tr>
<tr> <td scope="row" >Wilma</td> <td>10-6</td> <td>10-6</td> <td>9-5</td> <td>9-
5</td>
</tr>
<tr> <td scope="row" >Fred</td> <td>10-6</td> <td>10-6</td> <td>10-6</td> <td>10-
6</td>
</tr>
</table>
```

This table would be displayed as follows:

	Spring	Summer	Autumn	Winter
Betty	9-5	10-6	8-4	7-3
Wilma	10-6	10-6	9-5	9-5
Fred	10-6	10-6	10-6	10-6

Using the "ID" and "Headers" attribute:

(from Section 508 Standards, www.access-board.gov)

The "id" and "headers" attributes require that every data cell in a table include special attributes for association. Although its usefulness for accessibility may have been diminished as browsers provide support for the "scope" attribute, the "id" and "headers" attributes are still very useful and provide a practical means of providing access in smaller tables.

The following table is much more complicated than the previous example and demonstrates the use of the "id" and "headers" attributes. Both methods provide a means of complying with the requirements for data tables in web pages. The table in this example includes the work schedules for two employees. Each employee has a morning and afternoon work schedule that varies depending on whether the employee is working in the winter or summer months. The "summer" and "winter" columns each span two columns labeled "morning" and "afternoon." Therefore, in each cell identifying the work schedule, the user needs to be told the employee's name (Fred or Wilma), the season (Summer or Winter), and the shift (morning or afternoon).

Example:

```
<table>
<tr>
<th>&nbsp;</th>
<th colspan="2" id="winter" >Winter</th>
<th colspan="2" id="summer" >Summer</th>
</tr>
<tr>
<th>&nbsp;</th>
<th id="am1" >Morning</th>
<th id="pm1" >Afternoon</th>
<th id="am2" >Morning</th>
<th id="pm2" >Afternoon</th>
</tr>
<tr>
<td id="wilma" >Wilma</td>
<td headers="wilma am1 winter" >9-11</td>
```

```

<td headers="wilma pm1 winter" >12-6</td>
<td headers="wilma am2 summer" >7-11</td>
<td headers="wilma pm2 summer" >12-3</td>
</tr>
<tr>
<td id="fred" >Fred</td>
<td headers="fred am1 winter" >10-11</td>
<td headers="fred pm1 winter" >12-6</td>
<td headers="fred am2 summer" >9-11</td>
<td headers="fred pm2 summer" >12-5</td>
</tr>
</table>

```

This table would be displayed as follows:

	Winter		Summer	
	Morning	Afternoon	Morning	Afternoon
Wilma	9-11	12-6	7-11	12-3
Fred	10-11	12-6	9-11	12-5

Summary Attribute:

Not all assistive technology products will interpret data tables using these options in the same manner, but data tables encoded in an accessible format will provide a greater opportunity for those needing assistive technology to gain access to on-line information. Using the **<summary>** tag can also assist screen-reader users in understanding the layout and content presented in a table. It is important to note that not all assistive technology developers support this attribute at the current time.

Example:

1. Design the table using either the **scope** or **id** and **header** attributes.
2. Within the **<table>** tag insert the attribute **summary= "descriptive table summary goes here"**. It is recommended to place this information as close to the start of the table as possible.
3. A good description of the table will include a brief identification of the content displayed in the row, the column, and the cell.
4. If possible, check the table and summary using screen-reader technology.

Creating Accessible Forms

Introduction

One element that poses difficulty for even experienced screen-reader users is completing forms in an on-line environment. Forms require the input of information from the user that, while visually understandable, may not make sense when using a screen-reader. In part, this is due to the manner in which a screen-reader communicates the on-screen information to the user. For instance, a web-based form may require information about the person's address in order to complete a purchase. If the address information is not associated with the form input field then the information entered by the user may not be what is required to process the order.

Making a web-based form accessible can be accomplished using various HTML attributes that associates the query with the form field elements. Care must be taken, however, when creating forms within tables used for presentation purposes. Nesting table content can make it difficult for screen-readers to communicate the on-screen information to the user in a recognizable format.

Form Attributes

There are several HTML form attributes that are necessary to develop accessible forms. Not all of these commands are available from a web authoring tool interface (e.g., Dreamweaver, FrontPage 2000, etc.) and require the web creator to edit this information in the HTML code.

HTML Form Tags

<form>; </form>

This defines the form for user input. This is not seen by the user, rather it signals to the browser to receive information.

```
<form name="form1" method="post" action="" ">  
...  
</form>
```

<input>

Defines the input field element. It is generally followed by the type="" tag to specify the type of input field.

```
<form name="form1" method="post" action="">  
First Name:  
<input type=""text"" name=""firstname"">  
</form>
```

<label>; </label>

This element associates the label to a control. If the label is associated to a particular control, then clicking on the label will activate the control. When used with the “for” and “id” tags, it binds the label to another element. If you are coding this tag by hand, it is important to place the **<label>** attribute next to the text and form field element you are associating.

```
<form name="form1" method="post" action=" ">
<label for="fname">First Name:</label>
<input type="text" name="firstname" id="fname">
<br>
<label for="lname">Last Name:</label>
<input type="text" name="lastname" id="lname">
<br>
<input type="checkbox" name="happyday" id="hday">
<label for="hday">I am having a happy day.</label>
</form>
```

<fieldset>; </fieldset>

Draws a box around the set of form input elements that you wish to relate to one another.

```
<form name="form1" method="post" action=" ">
<fieldset>
<label for="fname">First Name:</label>
<input type="text" name="firstname" id="fname">
</fieldset>
</form>
```

The **<fieldset>** HTML tag can also be used with the **<legend>** tag to create a caption for the form input elements that exist within the **<fieldset>** attribute.

```
<form name="form1" method="post" action=" ">
<fieldset>
<legend>Name Information</legend>
<label for="fname">First Name:</label>
<input type="text" name="firstname" id="fname">
</fieldset>
</form>
```

<select>; </select>

The `<select>` attribute provides the flexibility of a drop-down option box from which the user can select one choice from multiple options. It is often used with the `<option>` and `<optgroup>` tags. If you wish to highlight a particular option in the drop-down box, you can use the `<option selected>` tag.

```
<select>
<option selected>Please choose a wine type</option>
<optgroup label="White Wine">
<option value="chardonnay">Chardonnay</option>
<option value="pinotgris">Pinot Gris</option>
<option value="sauvignonblanc">Sauvignon Blanc</option>
</optgroup>
<optgroup label="Red Wine">
<option value="merlot">Merlot</option>
<option value="sangiovese">Sangiovese</option>
<option value="cabernetsauvignon">Cabernet Sauvignon</option>
</optgroup>
</select>
```

<button>; </button>

There are essentially two methods to create a button for a web page. The first method uses the `<input type="submit" value="Submit">` tag to create a button. This is the standard button that is present on many web pages. The message on the button can be changed by altering the text in the `value=" "` field.

The other method is to use the `<button>` tag that allows the web developer to vary a button style and appearance. A *submit* button sends the information contained in the form to the server for processing. A *reset* button resets all the form field elements to their original condition essentially returning the form to its default state. A *push* button does not have a default behavior. Rather a *push* button will have some type of scripting information that triggers a process or function. The *push* button function will not be covered at this time due to its reliance on scripting languages. If the `<button>` tag is used and the button representation is a graphic image, then it is necessary to include an alt-tag in the HTML code.

```
<button name="submit" type="submit">
Send

</button>
<button name="reset" type="reset">
Reset

</button>
```

<tabindex>

The <tabindex> tag allows the web developer to set the order in which form field elements become available when using the **tab** keyboard button. This insures the correct form field is selected when the user moves through the on-line form using the keyboard instead of the mouse. Navigation will proceed from the lowest tab index value to the next greater tab index value.

```
<form name="form1" method="post" action=" ">
<fieldset>
<legend>Name Information</legend>
<label for="fname">First Name:</label>
<input type="text" name="firstname" id="fname" tabindex="1">
<br>
<label for="lname">Last Name:</label>
<input type="text" name="lastname" id="lname" tabindex="2">
</fieldset>
</form>
```

Types of Input Elements

There are several types of input elements a web design author can implement to facilitate the collection of information from the site visitor. These input elements may be text areas, radio buttons, or checkboxes.

Text Area

A text area is a multi-line text input area that allows the user to enter an unlimited amount of text information. If necessary, the web developer can control the type of information entered and/or the length of the text entry. You can give the text area a "name" attribute to distinguish between several responses.

Please enter information into the area below:

```
<textarea name="Information" rows="5" columns="20">
</textarea>
```

Example:

Please enter information into the area below:

Radio Button

When a user clicks on a radio button that button will be selected and all other buttons with the same “name” attribute will be unselected. This is effective when a web developer is only interested in gathering a response where the answer cannot be both items at the same time (i.e., Boolean).

Male:

```
<input type="radio" name="sex" value="male">
```

```
<br>
```

Female:

```
<input type="radio" name="sex" value="female">
```

Example:

Male:

Female:

Checkboxes

Checkboxes are effective if the web developer wants the user to select one or more choices from the selection set.

```
<input type="checkbox" name="bike" value="yes">
```

I like to bike ride.

```
<input type="checkbox" name="run" value="yes">
```

I like to run.

```
<input type="checkbox" name="swim" value="yes">
```

I like to swim.

Example:

I like to bike ride.

I like to run.

I like to swim.

Special Considerations

Drop Down Menus

Drop down menus provide the flexibility of allowing the user to select from a list of options without the list of information occupying space on a web page. These menus are developed using the `<select>`, `<optgroup>`, and `<option>` tags. When coupled with a JavaScript function, it is possible to automatically redirect the user to another web page or institute a specific function by selecting one of the drop-down menu options. However, this prevents a user from using the arrow keys to scroll through the list of option because the first item selected will initiate the

automatic function. While it is possible to access these menus using a combination of keyboard commands, it is generally recommended to not couple the drop-down menu with a JavaScript function.

Title Attribute of Input Elements

When developing forms for a web page it can be difficult to insure that the form will be easily accessible by all individuals. This is particularly true when creating forms within tables to maintain structure and layout properties from one machine to the next. The use of the `<title>` tag can be incorporated into the HTML coding to improve the ability of a screen-reader to communicate the on-screen information. For instance, the following example is a form investigating the population of birds during two different times of the year:

	Northern Hemisphere	Southern Hemisphere
Summer	<input type="text"/>	<input type="text"/>
Winter	<input type="text"/>	<input type="text"/>

In this situation, it is difficult for a screen-reader to communicate accurately to a user as to what form field elements apply to the appropriate row and column heading. The `<title>` attribute can provide the screen-reader user with more information and allow the user to complete the information with greater accuracy. To use the `<title>` tag, place the code `<title="descriptive information goes here">` within the `<input>` tag of the form field element. This will provide more information for the screen-reader user to complete a complex web-based form.

Forms and Tables Resources

W3Schools.com

http://www.w3schools.com/html/html_forms.asp

Contains a number of different web building tutorials of varying difficulty levels. Can edit and try out different coding combinations and see the result immediately. W3Schools.com provides information on HTML, CSS, XHTML coding, and JavaScript tutorials.

Webaim

<http://www.webaim.org/howto/forms>

A useful website that demonstrates how inaccessible web-based forms can be and the different workarounds that can be incorporated into the HTML coding. This site also contains an example of how a screen-reader will render an on-line form audibly.

W3C Forms Specifications

<http://www.w3.org/TR/REC-html40/interact/forms.html>

The website for information about the HTML language and HTML definitions and specifications. Information at this site describes how to implement certain HTML tags in order to achieve the desired result.

Using Dreamweaver to Create Web-based Forms

<http://its.ncsu.edu/instruction/guides/forms/>

Website put up by North Carolina State University demonstrating how a user can create simple forms using the Dreamweaver interface. Does not contain specific accessibility information.

Guide to Web-based Forms

<http://www.denison.edu/websrv/tutorials/forms/>

Informative site on the basics and some advanced concepts to creating web-based forms. Does not contain specific accessibility information.

Accessible Forms and Tables

<http://www.jimthatcher.com/webcourse8.htm>

This site has been developed by Jim Thatcher to identify the different methods of making HTML more accessible. The site contains example markup and details on how assistive technology will interact with properly coded web pages.

Additional Web Resources

Accessible Web Design Guidelines

Microsoft: <http://www.microsoft.com/enable/dev/web/default.htm>

WebAIM: <http://www.webaim.org/howto/frontpage.php>

EASI: <http://www.isc.rit.edu/~easi/>

A-Prompt

<http://aprompt.snow.utoronto.ca/>

Bobby

<http://www.cast.org/bobby/>

InSight/InFocus

<http://www.ssbtechnologies.com/>

Section 508 Standards

<http://www.section508.org>

<http://www.access-board.gov>

Usability.gov

<http://www.usability.gov>

VisCheck

<http://www.vischeck.com>

Web Accessibility Initiative (WAI) Guidelines

<http://www.w3c.org/WAI/>

WebAIM

<http://www.webaim.org>

WebABLE

<http://www.webable.com/>

Macromedia

<http://www.macromedia.com/macromedia/accessibility/tools/contents.html>

<http://www.macromedia.com/macromedia/accessibility/>