

3.5 PDF Accessibility Troubleshooting – Special Characters

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Identifying Special Characters

An accessible PDF document should be understandable to any user regardless of the limitations in their assistive technology. Special characters, defined in this case as any nonalphanumeric characters, marks or symbols, often create issues for a PDF's universal compatibility. For example, some screen readers have the vocabulary to announce a paragraph symbol while others do not. It is therefore important to identify which special characters will be automatically recognized by any screen reader and which will need to be remediated.

Universal Symbol Types

A symbol that can be universally understood by screen readers needs no further attention and can be left 'as is' within the context of surrounding tag elements.

Universally Recognized Special Characters Include:

- **Keyboard Characters** such as the ampersand, asterisk and 'at' symbols.
- **Intellectual Property Symbols** like trademark and copyright symbols.
- **Mathematical Operators** involving characters like plus, minus, greater than, etcetera.
- **Mathematical Symbols**, including the pi, mu and sigma symbols.

Regardless if the symbols within a PDF appear universally recognizable, test symbols in question with the Adobe 'Read Out Loud' feature. As this built-in Adobe screen reader is relatively simplistic, it is a good benchmark for determining legibility.

Remediating Unsupported Special Characters

If 'Read Out Loud' or another screen reader test fails to identify and announce a special character in the correct context, the element should be appropriately tagged and given alternative text. This procedure will vary for different unsupported special character types such as obscure symbols, strikethrough text and equations.

Obscure Symbols

Most unsupported special character types will fall under the obscure symbols category. They include the 'Paragraph' (or Pilcrow) symbol, the 'Section' sign, and many other symbols that can be individually identified and understood. Remediating obscure symbols involves standard procedures for tagging special characters which are tagged as paragraph elements and identified through alternative text.

To Tag and Identify a Special Character:

1. Open the **Tags** 'Options' menu and select 'Reading Order'. Use the 'Reading Order' selection window to highlight and tag the special character as 'Text/Paragraph'. Locate and reassert the new paragraph tag into its proper placement in the tag tree.
2. Locate the special character's paragraph tag. Right-click the tag and select 'Properties' to open the 'Object Properties' window. In the 'Tags' section, select within the 'Alternative Text' field and type the name of the symbol followed with 'symbol', 'character' or another descriptor.

The special character is now assorted in the tags menu and identifiable through alternative text.

Strikethrough Text

Text with strikethrough formatting (in other words, text that has been crossed out) creates unsupported special characters because, while text elements can still be read, most assistive technology will not announce a strikethrough.

To Remediate and Identify Strikethrough Text:

1. Open the **Tags** 'Options' menu and select 'Reading Order'. Use the 'Reading Order' selection cursor to highlight only the lines of the strikethrough text which have been designated as separate path elements in the PDF. Tag the paths as 'Background/Artifact' in the 'Reading Order' window to hide them from the document's reading order.
2. Use the 'Reading Order' cursor to select all of the strikethrough text (both the paths and characters). While holding the 'Ctrl' button, drag a selection box over the paths or strikethrough lines to exclude them from the selection. Tag the remaining character-only selection as 'Text/Paragraph' in the 'Reading Order' window. The text content is now located in a single paragraph tag and separate from the strikethrough lines.
3. To identify the content as strikethrough text, alternative text will be assigned to the paragraph tag that announces the beginning of the strikethrough, reiterates the original text and then announces the end of the strikethrough format. Before assigning alt text, close the 'Reading Order' window and highlight the strikethrough text with the normal text cursor. Right-click the text and select 'Copy' to save the content to the clipboard. The copied text will be used in the alt text description.
4. Right-click the text's paragraph tag and select 'Properties'. In the 'Object Properties' window, locate the 'Alternative Text' field in the 'Tag' tab. In this field, perform the following: add 'beginning of strikethrough text', paste the original text and then add 'end of strikethrough text'.

The strikethrough text is now fully accessible. When assistive technology identifies this paragraph element, the new alt text description will be read in place of the text in the actual document.

Equations

Equations in a PDF are often derived from an 'Insert' feature in Microsoft Word, in which case it will be in a text format that Acrobat will try to encode into content containers. If a screen reader encounters an equation, only some characters like mathematical operators will be automatically recognizable. Parentheses, long division lines and even variables will not translate to a screen reader. If an equation is in the form of text elements, it will be tagged as a single paragraph element and given alternative text to be read in place of the actual content.

To Tag an Equation as a Paragraph Element:

1. Open the **Tags** 'Options' menu and select 'Reading Order'. Use the 'Reading Order' selection cursor to highlight the entirety of the equation, which should be in the form of separate text elements. In the 'Reading Order' window, tag the equation as 'Text/Paragraph'.
2. To locate the tagged content, re-highlight the equation and select 'Find Content from Selection'. Arrange the new tag into the tag tree and expand its contents. Notice that the new paragraph tag's content container has identified only some of the equation's variables or operators (which will not make sense when read by a screen reader). In this case, alt text should be assigned to the content's paragraph tag to be read in place of the equation's confusing text elements.

3. To add alt text to the equation, right-click its paragraph tag and open ‘Properties’. In the ‘Tag’ tab of the ‘Object Properties’ window, select within the ‘Alternative Text’ field. Type ‘Equation of’ followed by a text-based description of the equation.

While the vernacular of the equation’s description will vary depending on its content and complexity, the user should always prioritize clarity when writing them.

General Guidelines for Describing Equations in Alt Text Include:

- **Avoiding the use of operators or symbols.** Spell out and describe the equation’s operators in basic terms (for example, using the wording ‘sum of’ instead of ‘the plus symbol’). This will best prevent a loss of meaning when the alt text is processed by a screen reader.
- **Describing any unknown variables.** If the variables of an equation are not provided in supporting text but in equation format, they should be defined as part of the equation’s alt text. The user should determine whether this addition is necessary to understanding the content.

These same alt text guidelines should be followed for images of equations. An equation can either be in image format originally or converted into an image out of necessity. Keep in mind that converting a figure to an image requires the **Edit PDF** tool to be opened which may alter the tag structure or reading order of the document. The user may have to reassign and reorder tags if they convert an equation into an image. However, if the remediator has issues tagging the equation as a paragraph, either due to its content or formatting, an image format remains a viable alternative to making the equation accessible.

To Convert and Tag an Equation as an Image:

1. Create a cropped screenshot of the equation. For windows operating systems, Microsoft’s ‘Snip & Sketch’ software can be used. Save the screenshot image.
2. Open the **Edit PDF** tool. In the **Edit PDF** top toolbar, select ‘Add Image’ and open the screenshot from the file menu. Adjust the equation’s image to match the approximate size of the original equation elements.
3. Press ‘Edit’ in the top **Edit PDF** toolbar. Next, select and delete the equation elements. Position the image of the equation in place of the original equation.
4. Now that the equation is in image form, it can be tagged and assigned alt text. Close the **Edit PDF** tool, open the **Tags** ‘Options’ menu and select ‘Reading Order’. Use the ‘Reading Order’ window and selection cursor to tag the image as a ‘Figure’.

Open the new figure tag ‘Properties’ window to create alternative text for the equation, following the previously mentioned guidelines. The equation is now tagged and accessible to screen readers.

Conclusion

In this module, we’ve learned how to identify universal symbols and remediate unsupported special characters involving obscure symbols, strikethrough text and equations. We’ve also used Adobe’s ‘Read Out Loud’ feature as a benchmark to ensure that all special characters are accessible.