

DO1304 Technical Agreement

Element Style Changes to Accommodate Graphic Product Incompatibilities

1 Introduction

On July 1-2, 2002, NADEP and Intergraph met with Hebcos to define what changes could be made to resolve difficulties arising from incompatibilities in the series of graphic products used to produce and print the Reduced Size Wiring Diagram manuals that are being converted in DO 1304. This agreement documents those changes. Related contractual issues will be worked separately.

The issues that needed to be addressed were:

- **Font Sizes:** Inconsistent and too small font sizes are observed when the Interleaf files are converted to PDF for printing.
- **Disappearing Line Segments:** Some lines that were visible in both Adobe Illustrator (AI) and ISODraw (CGM), were disappearing when the file was viewed via Interleaf.
- **Line Style Visibility:** Special line styles created in AI to match those on the original (e.g. dashed, short dashed, etc.) appear as solid lines when viewed with Interleaf.

2 Root Causes

2.1 Font Sizes

Non-integer font sizes were used in AI in order to match the original as close as possible. These convert correctly into CGM but not into Interleaf. When these are converted to Interleaf, they are changed to integer sizes. This results in inconsistent font sizes on the printed copy as well as sizes that are too small (e.g. 3 pts). The conversion behavior is dependent on the content of the text element.

2.2 Disappearing Line Segments

In AI, lines can be assigned both stroke and fill values. Lines that have no stroke value assigned are converted into "No Pen" lines in CGM. This is okay for some situations, such as arrowheads, where only the fill is needed. However, some lines are showing up with this style that need to be shown as solid lines. In CGM these No Pen lines show up as green where the other lines show as blue. The lines that are in error generally appear to be lines that have had sections erased to make space for inserted text or lines that have been copied from a wrong line type and edited.

2.3 Line Style Visibility

AI supports an infinite number of line styles under user control. In order to match the originals as closely as possible, many custom line styles were created in AI.

CGM via ISODraw converts all these line styles into custom lines styles as well.

However, the template that Interleaf uses to convert linked CGM files for display only recognizes 6 of the default line styles used in ISODraw. All other line styles are converted to one of these 6 styles, usually solid.

This means that dashed lines and dot dashed lines, etc, will appear as solid lines when viewed using Interleaf. Since the line styles contain meaningful information, this is unacceptable.

Attempts were made to add line styles to the template to accommodate all the required lines styles. While styles could be added to the template, they were not used correctly during linking, so this approach was abandoned.

3 Fixes

After much discussion plus some trial and error experiments, the compromise fixes described in the following sections were agreed to.

At this point, it appears that all fixes to Book 2 and 3 (25.6 and 25.5) will need to be done by Hebco. Since Book 1 (25.1) has already been accepted, its changes will have to be done by the Government (NADEP). Because at least one of the problems is likely to be present on every page, every page will have to be changed and then put through some level of re-QA.

A general rule requested by NADEP in applying these fixes is that the illustrator should use their brain to make reasonable choices to accomplish the goal of the original drawing, not necessarily to reproduce it exactly.

3.1 Font Sizes

Three types of pages are involved in the Font size issue. They each have slightly different rules. This email from Hebco gives the information on some of the experiments that produced these results.

-----Original Message-----

From:

Sent: Friday, July 12, 2002 10:47 AM

To

Cc:

Subject: Interleaf Solutions

This is an update to resolving the difficulties with implementing the 1304 guidelines.

I'm still waiting to hear from Broadvision about the problems with unexpected changes to font sizes in Interleaf. In the meantime, here is a "best kluge" set of

fixes (as of 7-12-02). While we are waiting to hear more elegant solutions, this format seems to be a workable response to the 1304.

1. Open the document in Illustrator.
2. Select all the text and change all text to 4.3 point.

(4.2 will actually work, but failed in one instance, so 4.3 is safe.) The reason: Interleaf takes short lines of text-with-hyphens and drops these hyphenated-text lines to 3 point (a full point size!) if the text line is less than 4.3. In other words, text at 4.1 or 4.2 did not revert to 4 point, as would be expected. These point sizes dropped to 3, due to some weird kind of rounding down. That's why they looked shockingly dissimilar to nearby text that might have been 4.41 or any number higher than 4.3).

Example of short hyphenated line = APS130-192A20.

3. Select any hyphenated text that is only 4 or 5 letters and change these to 5 point (not 4.3 point, like the rest of the text.)

Otherwise, they will drop down to 3 point. Finding a way to circumnavigate the dreaded hyphen took me an entire day of experiments and still produced unacceptable results that introduced new problems. (For example, I tried substituting another font for the hyphen, which would have been a nightmarishly tedious repair (Find/Change doesn't select for fonts.) It worked, but when I checked the "microdocument" in Interleaf, it was actually three pieces! The change in font forced Interleaf to break 33-A into 33, -, and A.

4. Select zone letters and change them to 6.3 point. (If you change them to only 6 point, they come in as 5 point.)
5. Select the text and move it slightly to the right, especially on the schematic pages.

Unless Interleaf can tell us how to make non-integer fonts come in at non-integer sizes, the wire callouts in schematics will have a large gap on the right. I've shifted the callouts in this document, so that they are centered better. Hal Beck will have to decide whether this is acceptable. The alternative is to move every one of the right-sided line endings closer to the callout. Even when the line endings overlap the callouts in ISODraw, there is still a gap, and obviously the ISODraw document looks awful. (I'm assuming that someday the ISODraw documents may be called into public duty, probably without warning. All those line endings would then have to be re-shifted.)

6. Click on any dashed line and click a similar dash line on the ISODraw palette to make these lines "standard".

The dashed lines come into Interleaf pretty well. However, to get long dashes to come into Interleaf as long dashes, you have to change them to the "hidden" line in the ISODraw palette, which makes the dashed line look too tiny in the ISODraw document. The only solution is to set the preferences in ISODraw so that "hidden" looks long in the ISODraw document. I mistrust this solution, because sooner or later, somebody won't have their preferences set right and the

hidden lines will be wrong, or a program (like Acrobat) or a printer driver (like Hewlett Packard) will fail to accept the 'preferences' substitution. Maybe Broadvision will have a suggestion about creating a new dash-line palette in Interleaf.

There are probably more issues, but these solutions are hopeful. These fixes won't require individually touching every element on the page and they won't destroy the ISODraw document at the expense of the Interleaf product. I haven't heard from Interleaf yet, so all of this may change after better solutions arrive.

Thanks,

3.1.1 Table Pages

Normal text shall be changed to be 4.3 pt, including Index Number Callouts.

Detailed View Callouts shall be changed to 6.3 pt Bold.

Any hyphenated text that is only 4 or 5 letters long shall be changed to 5 pt.

All text should be moved very slightly to the right.

It is okay to change the row height and column width as long as they table stays on the page and maintains the same basic layout. It is okay to reposition the Effectivity legend to accomplish this.

3.1.2 Illustration Pages

Normal text shall be changed to be 4.3 pt, including Index Number Callouts.

Detailed View Callouts shall be changed to 6.3 pt Bold.

Any hyphenated text that is only 4 or 5 letters long shall be changed to 5 pt.

All text should be moved very slightly to the right.

Rotated text should be changed to line work since Interleaf changes any rotated text to orthogonal only. Note that this problem was already known and has probably already been addressed, but is included here for completeness.

Text that is part of the artwork may be smaller than 4 pt, but the size should be an integer pt size.

3.1.3 Schematic Pages

Minimum text size shall be 4.3 pt.

In some cases, the figures of books are 5 pt type. Keep these at 5 pt.

In graphics that have 5 pt type, there's no reason to go smaller.

Any hyphenated text that is only 4 or 5 letters long shall be changed to 5 pt.

There are box frames on some schematics that have titles made of name-number combinations. Keep these titles in 4 pt, but make them bold.

All text should be moved very slightly to the right.

Zone Reference Numbers shall be changed to 6.3 pt.

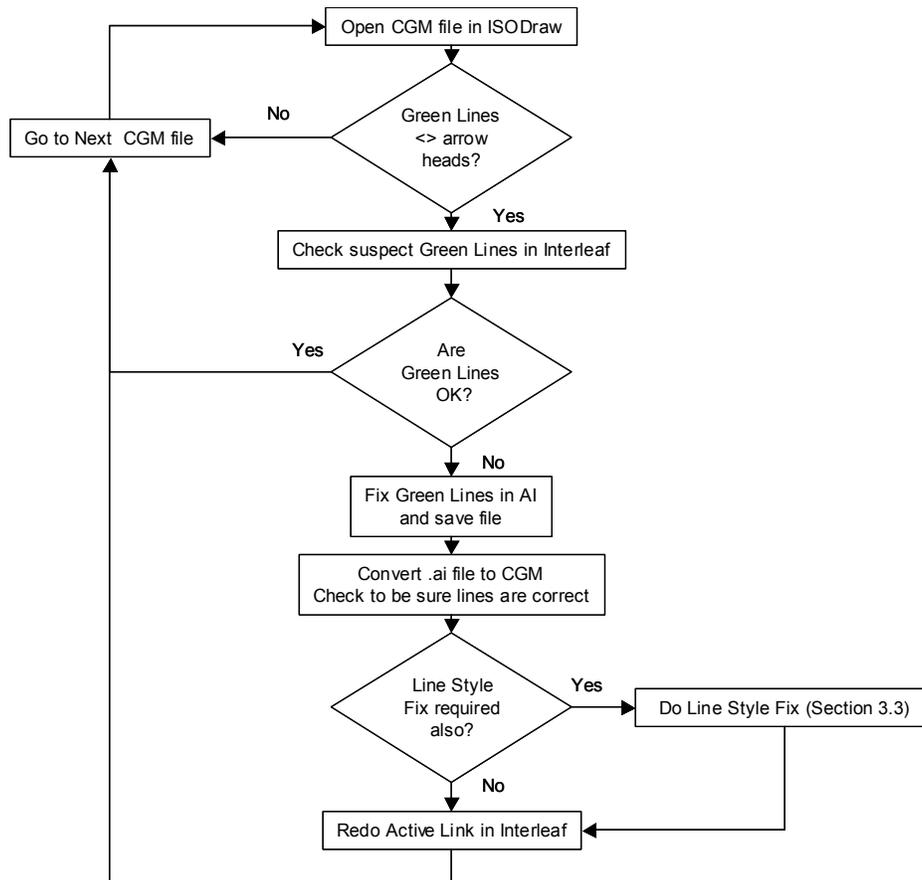
For text in boxes that push the edges when the size is changed, line breaks can be added as needed, as long as the text stays in the box.

For text embedded in artwork, see Section 3.1.2.

3.2 Disappearing Line Segments

This fix involves finding the problem lines using ISODraw, then correcting them in AI and flowing the files back through the multiple products to check the results.

The following procedure is recommended for making the corrections:



3.3 Line Style Visibility

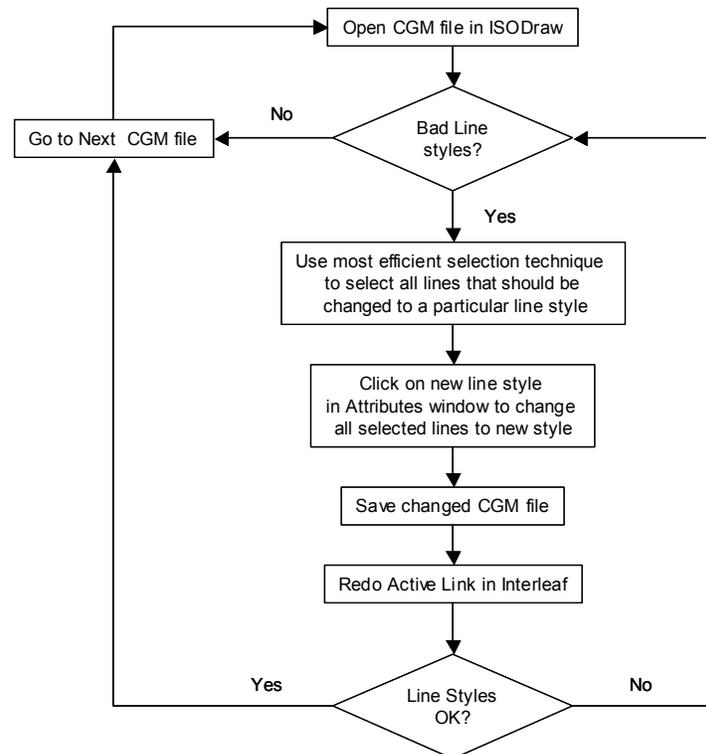
Only the following ISODraw standard line styles shall be used since they flow correctly from ISODraw to Interleaf.

- Solid
- Dashed
- Dotted

- Dot Dash
- Dot Dot Dash

CGM line definitions can be set so that the lines look good in CGM. For instance, dashed lines can be set to 2mm, 2mm. However, remember that ISODraw only allows one definition for Dashed line per drawing. In addition, these definitions do not flow with the file and must be reset by each user in their own Preferences setup.

The following procedure is recommended for making the corrections:



4 Lesson Learned

When initiating a conversion project that involves multiple graphic products that seem to interface well, confirm that the product marketing claims hold up at the detailed level. The most cost effective way to accomplish this is a pilot: take a small set of originals (e.g. 10 pages) that are typical and take them absolutely all the way through the process.