

Using Photo Tracing to Create Higher Quality Technical Illustrations – Faster

Tips & Tricks to Save Time, Effort and Cost in Illustrating Specialized Views

As a technical illustrator at the world's leading manufacturer of aircraft cabin interior products, Bert Witsmeer has spent years creating technical illustrations for a host of complex products. And while there have been advancements in illustration applications, the process remains time-consuming and painstaking.

But with today's powerful publishing tools, Mr. Witsmeer's work is now much faster and easier, especially when it comes to illustrating specialized views that are difficult to impossible to create in 3D. Technical illustrators in companies both large and small can benefit from these tools, saving time, effort and money, while producing much higher quality illustrations.

Producing CMMs at B/E Aerospace, Netherlands

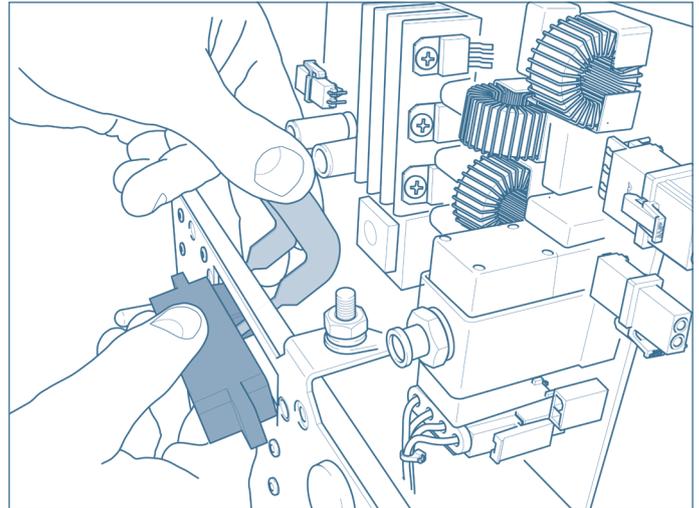
B/E Aerospace, Inc. is the world's leading manufacturer of cabin interior products for commercial passenger aircraft and business jets. The B/E Aerospace facility in Nieuwegein, Netherlands, produces a broad range of food and beverage preparation equipment, which includes several oven types, coffee makers, and water heaters. All of these units are developed, manufactured, sold and serviced at the Nieuwegein facility.

All of the equipment produced in Nieuwegein requires the support of a Component Maintenance Manual (CMM). All CMMs are compiled according to the ATA iSpec2200 regulation, and the textual language is written with Simplified English in accordance with the Association European des Conductors de Materiel Aerospatiale (AECMA).

The CMMs contain all the necessary information for a service person to understand how to overhaul, service or repair the equipment. Some other available chapters in the CMM are for the operation, disassembly, assembly, and cleaning of the equipment, along with electrical diagrams.

Technical Illustrations: How the Process Has Changed

One very important chapter of the CMM is the illustrated parts list. This particular chapter contains all of the assemblies drawn, from top level to bottom level. Each illustration includes a complete parts list.



Example of a technical illustration in a CMM. It was created using the photo tracing technique.

Historically, the Technical Publication department of B/E Aerospace used AutoCAD® and BetterWMF to create all of the necessary illustrations. And while the illustrations were functional, they were very basic and had to be drawn from scratch, which was a very time-consuming and labor-intensive job. Subsequently, Autodesk Inventor was introduced, so that many assemblies and parts could be exported to an AutoCAD format, which reduced the manual effort slightly and increased the quality of the illustrations for the CMMs.

From experience, B/E Aerospace soon discovered that the above combination was not good enough. Bert Witsmeer, Technical Illustrator at B/E Aerospace, explains: "We have searched for an illustration solution that has a much closer interaction with 3D-developing software, and needed fewer time-consuming steps in order to create and finish up the necessary illustrations in a good quality. That was our goal....and ultimately we found Arbortext IsoDraw CADprocess".

Within a short time, B/E Aerospace's Technical Illustration department was able to realize major benefits through the features in Arbortext IsoDraw CADprocess. The creation of all of illustrations was faster and easier, with an exceptional improvement in quality. Arbortext IsoDraw CADprocess was the ideal solution to enable reuse of Autodesk Inventor files for the creation of important technical illustrations.

Some Manual Techniques Still Superior to Automation

Since the introduction of Arbortext IsoDraw CADprocess in 2006, Witsmeer has become quite proficient with its capabilities, having experimented with its many advanced techniques to create the best-possible illustrations. “Clearly, there is a significant differentiator for Arbortext IsoDraw: it was created by and for illustrators and is much more than a conversion tool,” says Witsmeer. “With Arbortext IsoDraw, you can cover each important aspect of the multitude of technical illustration tasks. One of my favorite job tasks is photo tracing and I would like to share some of my experiences and some useful tips and tricks.”

In most cases, Witsmeer uses photo tracing when he needs a special illustrated view which is very hard – or even impossible – to create in 3D. One good example of this type of view would be to add human hands, or to create special views with vanishing points and other aspects. Another good example is when working with a very complex part of a product, which you have to show as a small view, and where only rough outlines are needed. In these cases, it would be easier to trace the most important lines instead of cleaning up a vector graphic.

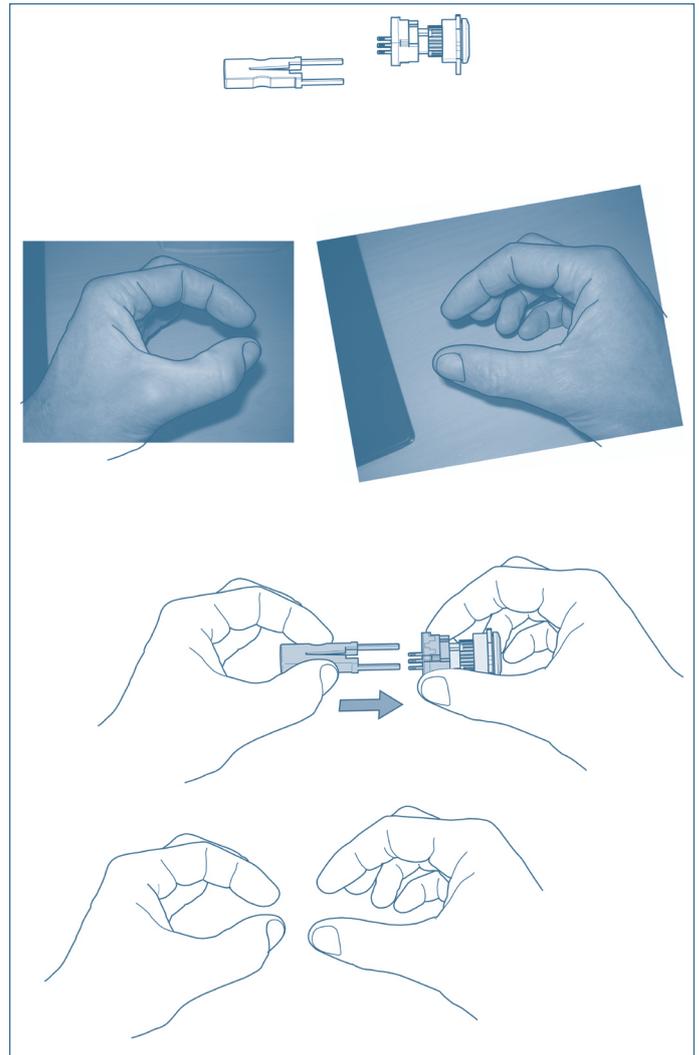
Here, it is much easier to take a sharp snapshot with a digital camera, which serves as a very good template for the illustration. Witsmeer uses photo tracing mostly in the CMMs or Service Bulletins, where special disassembly/assembly instructions are needed for B/E Aerospace customers.

The first step in the process is to open the JPEG file and “lock” the photo on a layer. Tracing the photo is simple because the illustrator can frequently examine the illustration’s progress by switching off the snapshot (in the background layer).

One important consideration is to decide how to apply thick or thin lines. With a little experience and by looking at some examples from standard illustrations, you can see how Arbortext IsoDraw CADprocess automatically makes the selection with the popular thick and thin line technique.

Sometimes, after taking the snapshot, a special item can become a little fuzzy. In that case, Witsmeer uses Autodesk Inventor to search for that particular item, and exports it to a 3D IGES format. Inside Arbortext IsoDraw CADprocess he can manipulate the item via the X-Y-Z-axes, which matches the same position mentioned on the photo. He can then project this to a 2D illustration, which he includes into the traced illustration. “This method provides impressive results,” states Witsmeer.

To understand how photo tracing really works depends of some criteria. The key is to practice photo tracing as much as possible, and to follow some good examples via the Internet. After creating a couple of illustrations, you will discover that it is not very difficult to handle photo tracing, and you’ll be able to create high quality illustrations in a fraction of the time.



If you need to draw a hand for an assembly instruction, the photo tracing technique is a good choice.

Bert Witsmeer's Tips and Tricks for Successful Photo Tracing

If photo tracing is important to your work and you want to become proficient, then practice with the tools as much as you can.

To get started, try to illustrate a simple part to get a good feeling of how photo tracing works; pay careful attention to the Bezier tool with its handles, as this provides a major drawing benefit.

Try to keep your illustrations as basic as possible and avoid too much detail, otherwise the illustration becomes too difficult for the user to understand.

Lock the photo before starting to draw, to prevent the photo from sliding accidentally.

For best results, try using a little grey scale with the filling option, to give some items inside your illustration more expression.

By using the grid option you can match the grid angle, which is applicable to the position of the traced object. The grid option is very helpful and it makes much easier to draw lines and ellipses, especially when using fillets of corner rounds.

When using human hand photo in your illustration, it is wise to collect as many hand photos as you can find. Personally, I have taken many snapshots of my own hands in many positions – some holding different parts, some holding nothing. You can trace a hand – left or right – in a specific position, which might be necessary to use inside an illustration.

When finishing an illustration that features lots of different line types such as arcs and splines, you should group everything, so you don't accidentally alter the entire illustration.



About the Author

Bert Witsmeer is an illustrator in the Technical Publication Department of B/E Aerospace in Nieuwegein in the Netherlands. He has extensive experience with AutoCAD, AutoDesk Inventor, and Arbortext IsoDraw CADprocess.