



Intelligent Paper to CAD Solutions®

DESIGN AND MANUFACTURING

GTX software works with your evolving CAD strategy. Not only can you automate the flow of documents with GTX technology, you can convert drawings to CAD format for both engineering and manufacturing.

Manufacturing and design firms depend on computer-aided design (CAD) technology to reduce costs and move products to market quickly. The engineering process requires an effective CAD strategy that involves manufacturing, customer service and suppliers from the beginning of the design process. Up to 80 percent of product costs are incurred during the concept and design phase. If the design isn't produced in CAD, these costs escalate. Production with state-of-the-art and numerically controlled machining is impossible without CAD technology.

Yet, many of the best and most useful drawings still remain in paper files. The question is how to bridge design on paper with design on computer. Automated storage and retrieval only solves part of the problem. Images still require input into the design automation process. With GTX technology, you gain control over drawing flow and merge the world of manual design and factory automation.

Stop Deterioration with a Scan

Paper drawings suffer from a common problem, they deteriorate over time. They yellow with age in a flat paper file and are usually marked-up, stained and torn from handling. According to one major CAD firm's research, ten to 21 percent of the 1.5 billion drawings used daily, are lost or misfiled.

The market offers a variety of scanners with built-in features for cleaning-up old and dirty drawings. Adaptive thresholding can capture even faint images, or those that are

not easily distinguished from the background. You can scan drawings of virtually any size, media type or quality. Scanning a drawing into electronic format not only stops the deterioration process, it immediately improves the quality of the drawing.

Reduce Storage and Retrieval Costs

Once a drawing is scanned into electronic format, it is available electronically for future use. If the drawing must be kept in archives, simply file it on optical disk in electronic format. Whether networked or maintained on a single PC, drawings are preserved for future reference and retrieval. You significantly reduce costs and storage space by automating access to paper drawings. One GTX client reduced the storage space for 2,000 drawings from 500 square feet to three square feet.

A Simple Solution for Simple Revisions

Not every drawing is destined for full CAD conversion. If only minor revisions are required, it's probably easiest to edit the drawing in raster (scanned, non-intelligent dots or pixels) format. GTX uses a different approach than the traditional paintbrush editors with its CAD-like capability to perform raster editing. The GTXRaster CAD® or GTXImage CAD™ editor incorporates all the ease of a raster editor with the powerful control and speed of CAD.

You can create process plans using the GTX raster editor. A Department of Defense client uses a GTX raster editing system to



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modify piece-part drawings for maintenance and repair. The part's master drawing is annotated with instructions and modifications, then the resulting process sheet is sent directly to manufacturing. The customer reported that after just one year, turnaround on maintenance improved 80 percent and the system has significantly reduced rework.

Make Product Revisions in CAD

Product design today is both revolutionary and evolutionary. A designer works in CAD from start to finish to design new products. But many new products are an evolution of existing designs which get them to market faster with fewer risks. GTX's automatic CAD conversion allows you to accelerate time to market by converting designs on paper to CAD format.

Once the product is on the market, routine updates are produced more efficiently if revised in CAD. Processing an engineering change order is very complicated if its on a manual design.

CAD revisions take a fraction of the time that is required for manual revisions or overtracing. Second and third revisions are even less expensive, since conversion is a one-time process. Most important, changes are interactively integrated with both manufacturing and automation processes. This integration is impossible if drawings remain in a flat paper file or are revised in raster format.

Create CAD Databases for Long-Life Designs

In the aerospace, defense and heavy equipment industries, long product life cycles mean that drawings and supporting documentation must be updated and maintained for many years. If tooling is done using automated processes, supporting documents must be in CAD. A GTX client in the aerospace industry has created an electronic CAD data-

base of support documents with the GTXRaster CAD® *PLUS* product. The database is converted to three-dimensional format as needed. The company has met target production goals and reduced the number of operators dedicated to the project.

Increase your Return on Investment

Your CAD system is a major investment. Every minute it is used for design, you increase your return on investment. It doesn't make sense to divert its use for drawing conversion methods, such as overtracing or digitizing. These processes consume time from both the CAD system and the operator. With GTX software, the conversion process can be done unattended using GTX OSR®.

When an interactive approach is required, GTXRaster CAD® *PLUS* or GTXImage CAD™ *PLUS* will meet your needs efficiently. To solve your text conversion requirements, use GTXICR® *PLUS*™ to train the software to recognize and convert your individual fonts and text styles.



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A Cost-Effective Investment for Any Size Task

Companies involved in improving their quality programs also benefit when drawings are managed and modified as electronic files rather than manual paper documents. It matters little whether you need to manage a few hundred or several thousand drawings. GTX provides a solution suitable in price and performance for your application requirements.

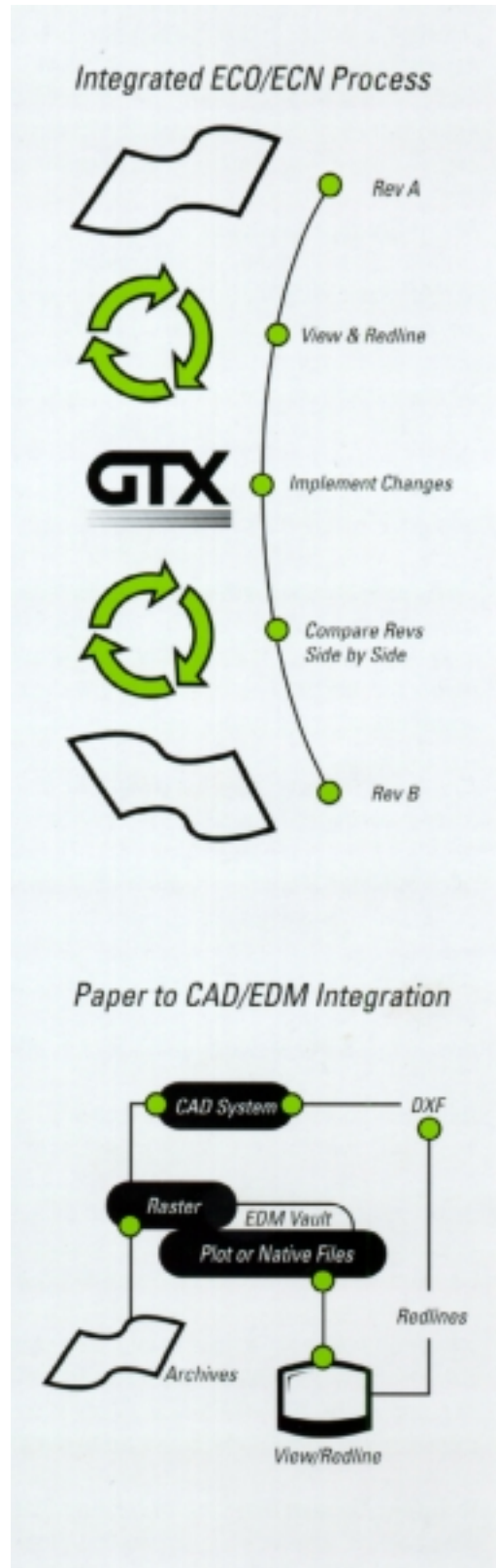
A Sample of GTX's Manufacturing Customers

Aerospace

- Boeing
- British Aerospace
- British Airways
- Grumman
- KLM
- Lockheed Martin
- Martin Marietta
- Rockwell
- SARP Industries
- Thomson Simulation
- Tupolov (Russia)

Automotive

- Allison Transmission
- BMW Rolls Royce
- Cummins Engine
- Ford
- General Motors
- Hyundai
- Iveco
- John Deere
- Land Rover (UK)
- Mercedes Benz
- Opel Belgium
- Volvo
- Winnebago





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Discrete Manufacturing

AEG/Modicon
AMP
Analog Devices
Armstrong
Atwood & Morrill
Avery Dennison
Benjamin Moore
Dresser Rand
Eastman Kodak
Eaton Corp.
General Dynamics
General Electric
GTE
Lenox China
Raytheon
Simplex