Genesis 2000 *DFM Toolset*

Automated, Customizable Design for Manufacturing Tools

- Reduces cycle time by automating manual editing sessions
- Slashes errors through automated self-checks
- Increases yield with sophisticated optimizing algorithms
- Supports dense, complex designs, including BGA
- Delivers a growing range of programs for current and emerging applications

Frontline
PCB SOLUTIONS
An Orbotech Valor Company

Full Automation at the Front-end

Genesis 2000's flexible DFM solution offers the most powerful tools available for pre-production engineering since the introduction of conventional CAM.

Manual, interactive editing sessions can be fully automated, reducing errors and cycle times substantially, while giving a big boost to manufacturing yield.

Highly sophisticated algorithms are used to support the most complex tasks and to optimize the results. Best of all, your toolset is fitted to your precise needs in just a few hours.

Yield Enhancers

Yield enhancers reduce waste and increase customer satisfaction. You gain in terms of production economics and grow your business at the same time.

Gold Tie Bars Creation
Defines which pads are to be gold-plated and connects them to a tiebar outside the PCB's profile. For tight connectors, for which electrical testing is very difficult, automatically adds test points to the tielines.

Copper Balancing
Supports more economical, more effective chemical processing: improves the stability of thin inner cores to significantly reduce copper-related waste treatment costs, and automatically balances outer layers to ensure uniform plating of copper.
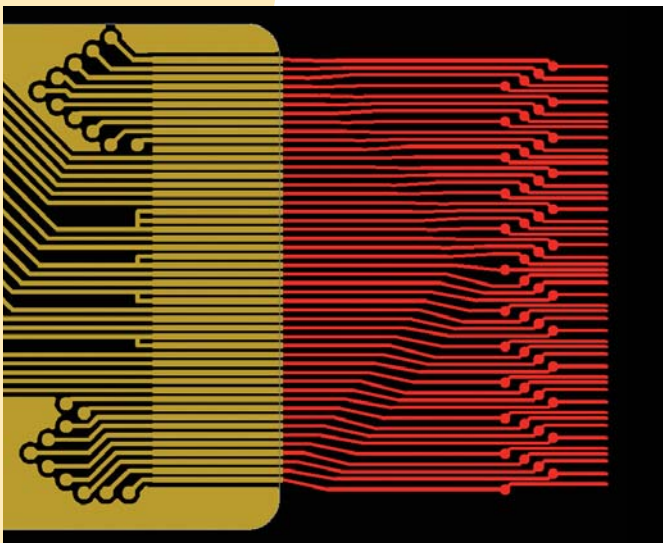
Drill Touching Copper Count
Extends the life cycle of drill bits by distinguishing between drills on the basis of the number of layers where the drills touch copper. Works in conjunction with the Auto Drill Manager.
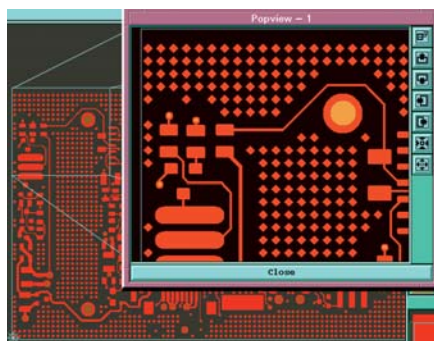
Dynamic Etch Compensation
Simulates a realistic, non-ideal model of etchant (etching material) behavior patterns during chemical etching of ultra-fine line boards, and then automatically compensates for pattern data by unevenly enlarging lines based on local spacing.
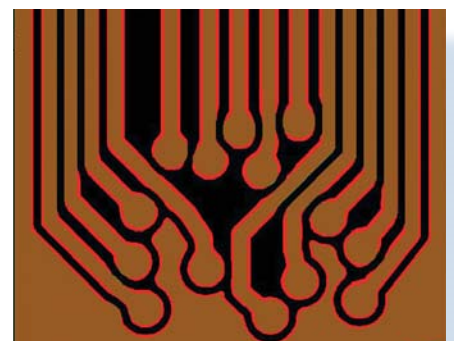
Non-Functional Pad Removal
Prevents redundant drilling, unnecessary amortization of machines, and risk of shorts and other complications by removing non-functional pads.

Gold Tie Bars Creation

Copper Balancing

Dynamic Etch Compensation

Hammer Head Etch Compensation
Specifically designed to maintain design integrity of highly complex, extremely dense boards. Allows copper to be added in pad corners, compensating for manufacturing-related etching which tends to create round rather than square corners.

Etch Compensation
Protects line and feature integrity from the chemical processes. When relevant, automatically increases the size of features on layers, taking into account netlist and spacing rules. Automatically resolves conflicts by creating a shavedown. Offers Shave and Non-Shave modes.

Pinhole Elimination
Helps avoid resist chips by searching the design for pinholes and automatically repairing them.

Sliver & Peelable Repair
Eradicates all types of slivers, from acute angles to incomplete shaves, and everything in between. Features four sub-menus: Slivers and Acute Angles Tangency Elimination, Legend Sliver Fill, and Acute Angles & Slivers.

Advanced Teardrops Creation
Prevents impaired electrical connectivity resulting from drill breakouts towards an entering vector, by automatically thickening the vector's entrance location to the pad.

BGA Tie Line Generation
Features special BGA capabilities. Connects all inner networks of the circuit and enables extension of lines to gold plating tie bars.

Galvanic Etch Compensation
Compensates for exposed outer layer pads with OSP finish ("OSP pads"), while providing enough spacing for adjacent copper and pads.

Positive Plane Optimization
Increases yield by enlarging isolation around non-connected drills on positively drawn power & ground planes, allowing a bigger layer registration tolerance.

Data Simplifiers

Critical to time efficiency and maximized utilization of resources, data simplifiers also ensure a more accurate job. You benefit on two levels: you cut turnaround time and increase yield.

Construct Pads
Recognizes all combinations of line-drawn pads and automatically reconstructs them into proper pads. Data reduction and added intelligence help improve tooling quality and reduce tooling costs.

Legend Detection
Searches each layer for text and nomenclatures, automatically assigning a text attribute to such features. These features are then removed from analysis and automatic edits that do not apply to text. Frees memory by doing away with reevaluation of the same group of lines, and saves time by reducing false calls.

Lines Unification
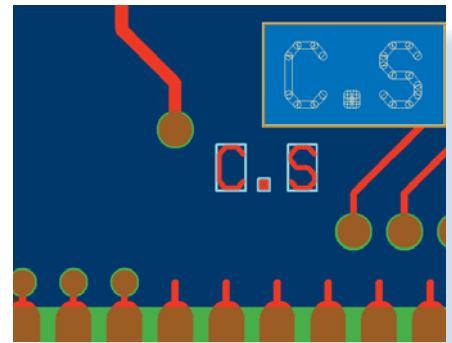Reduces data size and enables correct analysis by locating drawn lines within the design and replacing them with a single feature.
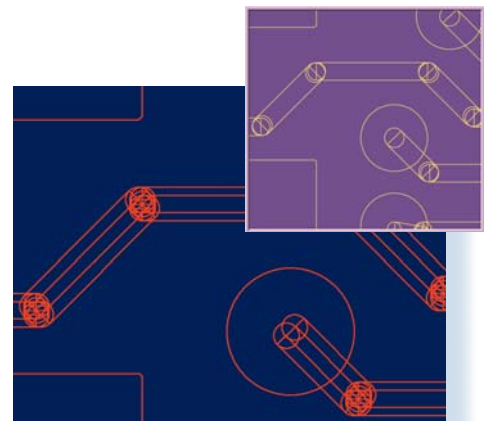
Neck-Down Repair
Eliminates neck down caused by line-to-line and line-to-pad connections, by widening lines to achieve uniform line width.
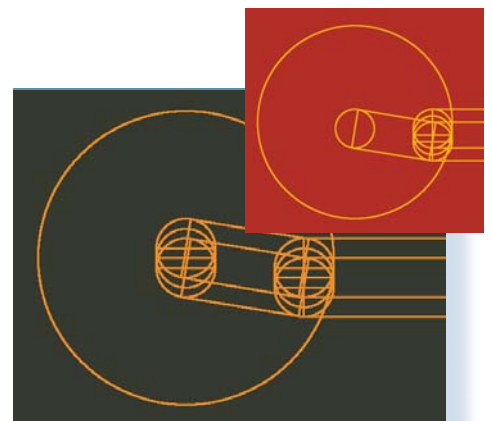
Redundant Line Removal
Searches for and eliminates frequently hidden redundant features. Prevents generation of superfluous data to Photo Plotters and Electrical Test.
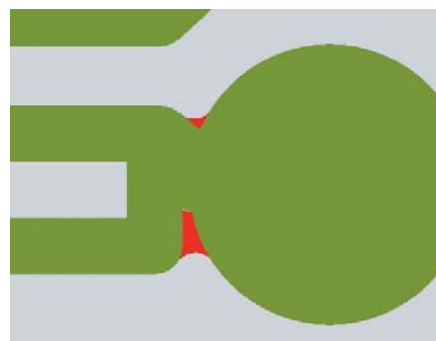

Legend Detection

Lines Unification

Redundant Line Removal

Sliver & Peelable Repair

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Board Optimizers

Shorten the entire CAM process with sophisticated automatic repair actions. You make the most of your customer's design. The results: a better product, more efficient production and a happier customer.

Line Width Optimization

Maximizes yield of tight designs by ensuring optimal line widths, without compromising spacing. Beefs up lines to optimal space wherever spacing permits.

Power and Ground Optimization

Prevents disconnections and shorts by optimizing power and ground layer clearances and annular rings, without impacting electrical connectivity or compromising manufacturing constraints.

Signal Layer Optimization

Drastically cuts manual editing time by executing automated signal layer optimization in seconds.

Silk Screen Optimization

Based on user-defined rules, avoids slivers by intelligently clipping the silkscreen, resulting in a legible silkscreen. Minimum widths for text are maintained.

Solder Mask Repair

Performs global optimization in minutes, eliminating hours of tedious work and delivering enhanced results. Automatically fixes all violations.

Solder Paste Optimization

Automatically adjusts solder paste layer to ensure correct location and proportions of solder paste stencil cutouts.
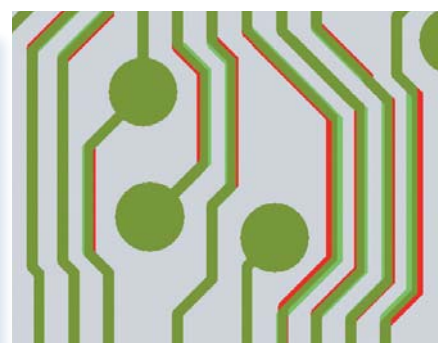
Parallel Spacing Optimization

Reduces opportunities for shorts between ultra-fine lines located within a running bus across inner/outer layers. Minimizes the run length of a multi-line channel by automatically enlarging its footprint width, using available space on the layer surface.

Line Width Optimization

Silk Screen Optimization

Prallel Spacing Optimization

Integrated Engineering Solutions

Genesis 2000 is part of a complete integrated engineering product suite, from the quoting stage, through process planning and CAM all the way to the production floor. The Frontline suite comprises industry leading, rules-based engineering applications, all revision controlled.

Minimum System Requirements

Platforms	HP-C3750, SUN Blade 1500, Intel Pentium IV and above.
Monitors	Minimum 17" color monitor, resolution 1024 x 768 for HP, 1150 x 900 for SUN.
Memory	Minimum 1 GB RAM; recommended 2 GB
Hard Disk	Minimum 40 GB; recommended: 80 GB
OS	HP-UX11 - HP-UX11i, SUN Solaris 7 - Solaris 10, Windows XP, Windows 2000 and LINUX RH & SUSE

About Frontline

Frontline PCB Solutions is the leading global provider of pre-production CAM and engineering software solutions for the PCB industry. Frontline draws on proven technologies from Orbotech and Valor to create new standards in vertical and horizontal integration for the PCB industry. Frontline builds on the strategic vision, knowledgebase and hands-on track record of two market leaders, as well as over two decades of experience and the largest installed base of front-end solutions in the world.

FLBR-DFM-0051 4/07 Specifications are for information only and are subject to change without notice.

www.frontline-pcb.com

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