

The Powerful PCB Layout Solution

# ultiBOARD

Professional & Power Professional Editions

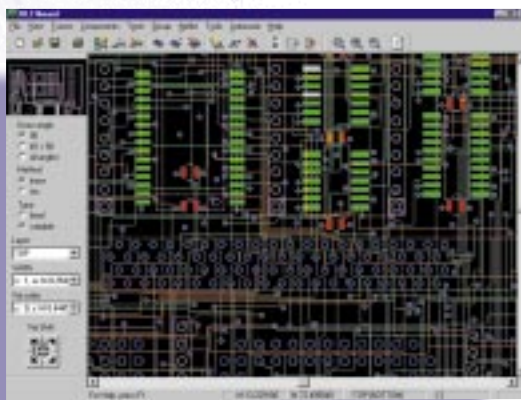


**Electronics**  
WORKBENCH

DESIGN SOLUTIONS FOR EVERY DESKTOP

## Powerful PCB Layout

Ultiboard is a powerful, yet easy to use PCB layout and routing program that delivers the features and flexibility you need to effectively build reliable boards. Ultiboard offers a unique combination of advanced functionality and exceptional ease of use: a combination that has made Electronics Workbench the leading provider of design tools with over 130,000 satisfied users!



*Ultiboard offers a unique combination of advanced functionality combined with exceptional ease-of-use.*

*Ultiboard contains industry leading functionality with an easy-to-use interface.*

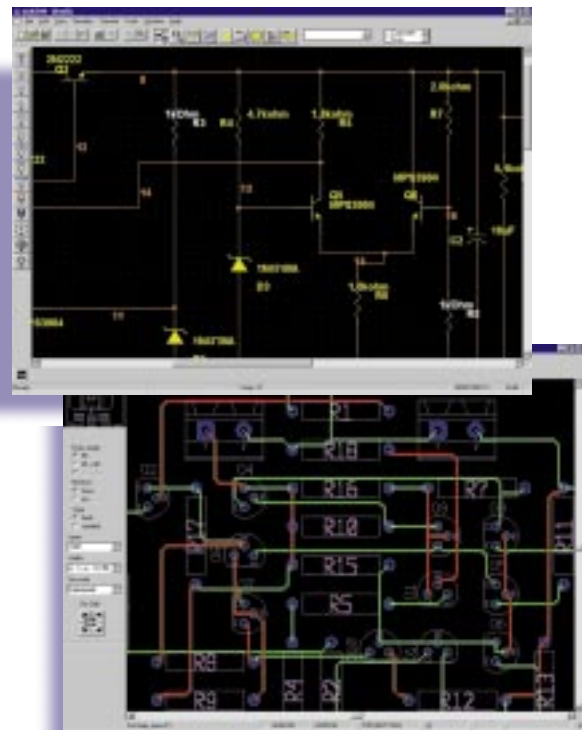
Ultiboard will produce the top quality board layouts you expect from a high-end design tool, but without the high price to match.

### ENGINEERED FOR EASE-OF-USE

Ultiboard is both easy to learn and easy to use. You can double click on most items to edit their properties without having to go through menu items. Ultiboard supports both imperial and metric units of measurements, and you can switch between them as you work. An automatic save feature ensures that your designs are always backed up. A unique "birds eye" window displays an aerial view of your board. You can highlight any area on the birds eye window and the program will zoom to the corresponding portion of the board. Finally, making changes, in Ultiboard is fast and easy since components and traces can be dragged without breaking their copper connections.

## TIGHTLY INTEGRATED WITH SCHEMATIC CAPTURE

If time and accuracy are important to you, then using Multisim as a front-end to Ultiboard will help you create better boards faster. Transferring files from Multisim to Ultiboard is simple and fast. Best of all, tight integration between all Electronics Workbench tools means that you can design confidently knowing that all important design information will be transferred reliably. All parts from Multisim are correctly matched to footprints in Ultiboard; no more "Footprint not recognized errors". In addition, you can perform forward and back annotations between schematics and board layout, and even use a netlist compare command to automatically identify how your schematic has changed since the last time it was sent to Ultiboard.



*Transferring files from Multisim to Ultiboard is simple & fast.*





# Board Setup & Component Placement

## SUPPORTS ANY BOARD SIZE AND SHAPE

With Ultiboard you can define almost any board shape. Boards can be as large as 50"x50" in size with as many as 32 layers with or without power planes. To define board shapes, you can either use Ultiboard's built-in board editor, or import outlines from a file. With an internal grid as small as 1 nanometer, Ultiboard offers one of the finest internal resolutions in the industry.

### BOARD FEATURES

- ♦ Up to 50" x 50"
- ♦ 32 layer support
- ♦ 1 nanometer internal resolution

## PLACING COMPONENTS

Since strategic part placement is critical to achieving optimal routing results, Ultiboard focuses on helping you achieve efficient part placement in three ways.

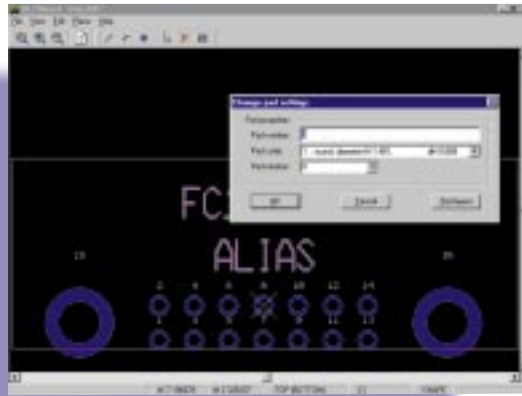
First, a unique Force Vectors option analyzes ratsnest (connectivity) information and places arrows on each component to advise you on the distance and direction to move each part.

Second, a Histogram feature will indicate routing channel densities at cross-sections along the board. This allows you to arrange your parts and avoid high density channels which may create problems when you begin routing your board.

Finally, for parts that require precise placement (eg. connectors), Ultiboard allows you to place these parts by entering their exact coordinate locations. You can also lock critical components (once placed) so that they cannot be moved again unless you unlock them.

## EDITING COMPONENTS

Ultiboard contains one of the largest footprint libraries available, with over 3000 shapes to match any component you might use. When importing design information from Multisim, Ultiboard automatically selects the proper footprint for all parts from its library. Should you ever wish to edit or create new shapes, Ultiboard has a built in shapes editor.



*Ultiboard's Shapes Editor makes it easy to edit or create part footprints.*

### COMPONENT FEATURES

- ♦ 3000 shapes library
- ♦ Force Vectors feature
- ♦ Density histograms
- ♦ Lock feature
- ♦ Built-in shapes editor

*Making changes in ultiboard is fast and easy since components and traces can be dragged without breaking their copper connections.*

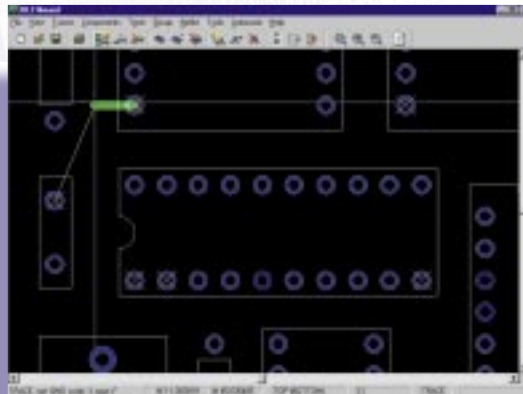
## Trace Placement & Design Rule Check

### HIGHLY FLEXIBLE COPPER AND TRACE PLACEMENT

Ultiboard makes it easy to place traces. When you begin laying a trace from a pin, Ultiboard automatically highlights all the other pins connected on the same net and even advises you which pin you should connect to next.

Traces can be routed in three different angle modes: 90°, 45°, or an angle of your choice. Their widths can be changed while you route. This will enable you to use narrow trace widths to fit through small areas or pin arrays, while maintaining wider trace widths in open areas. Ultiboard also lets you switch layers while you are routing, and will automatically insert a via when you switch a trace to an alternate layer.

*Ultiboard has a rich set of design rule features to ensure your boards will work properly on the first manufacturing run.*



*When laying traces, Ultiboard shows all pins on the same net*

### COPPER PLACEMENT FEATURES

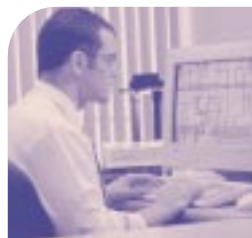
- ◆ Copper fill support
- ◆ Any angle routing
- ◆ Change widths and layer as you route

### DESIGN RULE CHECK

Ensuring that your layout observes design rules is critical to producing error-free boards. Ultiboard provides a rich set of design rule features. By identifying and eliminating errors early, your boards will work properly the first time they are manufactured, so that you won't waste time and money reworking boards.

Ultiboard's Design Rule Check can be run either in real time or in batch mode. The powerful Real Time Check will identify violations as they are made so that you discover errors as they occur, not when it's too late. The Real Time Check can be run either in full check or overrule mode. Full check mode will never allow you to commit a design error, while overrule mode will warn you that you are committing a design violation, but gives you the option to ignore the warning if you choose.

Design rules consider user-specified values for trace, pad, component, and board outline clearances. Because these values critically affect production costs, and are affected by your choice of routing grid, choosing strategic design rule properties is an important but sometimes difficult task. Ultiboard makes this easy by offering 4 standard design settings (easy, standard, dense and very dense) that are most commonly used by designers and production houses. These 4 class settings will automatically select design rules commonly used for each of easy, standard, dense, and very dense designs.



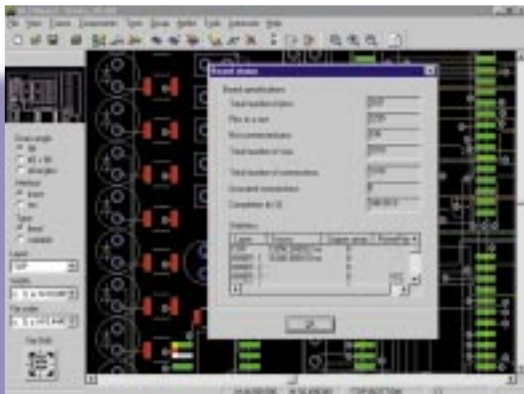
# Manufacturing Support

## BOARD CLEANUP

Ultiboard includes several features to clean up and improve board layout before production. A Chamfer Corners option will automatically replace 90° trace corners with 45° angles for improved manufacturability. A Delete Open Trace End option will remove all open copper connections. Similarly, a Delete Unused Via option removes all vias that are not used. Finally, a Renumber Components feature will annotate your board based on your preferred annotation method.

### BOARD CLEANUP FEATURES

- ♦ Chamfer corners
- ♦ Delete unused vias and traces
- ♦ Component renumbering



*Ultiboard produces detailed statistical summaries of your board status.*

## REPORTS

You can view detailed information on the status of your board using Ultiboard's reporting capabilities. Ultiboard produces summaries on the number of pins, vias and unrouted connections on your boards. In addition, Ultiboard will provide you with total trace length information for your board as well as a breakdown of the amount of copper used on each individual layer.

## EXTENSIVE OUTPUT OPTIONS

Ultiboard produces a number of different output formats to support all your production and manufacturing needs. You can send your output to pen plotters, photoplotters, or to any Windows® compatible printer. Design data can be sent to your board manufacturer in a number of different file formats including standard Gerber output.

### OUTPUT FEATURES

- ♦ Printer, plotter & photoplotter support
- ♦ Gerber file output (274X and 274D)
- ♦ .DXF output

*Ultiboard produces a number of different output formats to support all your production and manufacturing needs.*



## Standard Autorouting

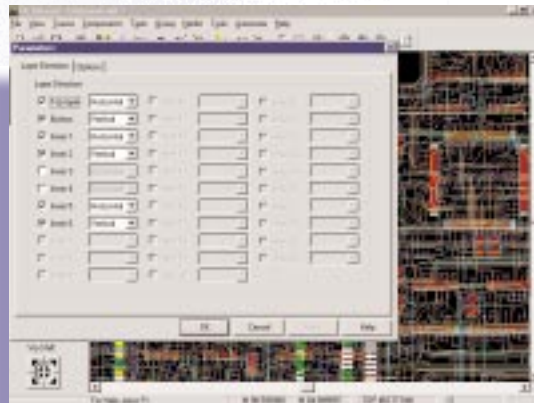
### BUILT IN AUTOROUTING

Ultiboard comes with two autorouters, each offering options for optimizing and customizing performance. The first autorouter uses a single pass routine and is useful for quickly routing simple boards. The second autorouter uses a ripup-and-retry algorithm and is intended for use with more complex boards where 100% completion cannot be achieved with a single routing pass.

### ROUTING OPTIONS

Both autorouters contain user options so that you can customize the routing strategy for each individual board you design. You can activate a Via Reduction option which will attempt to route the board with the minimal number of vias to reduce your production costs. A Pin/Gate Swap option, when selected, can improve routability by strategically rearranging pins and gates within your design. You can even control how the autorouter handles multiple layers by defining which layers should be routed, and by setting routing directions for each layer. By using different routing directions on alternating layers, you can reduce the number of parallel traces between layers and minimize signal interference.

*Built-in  
autorouting gives  
you advanced  
routing  
performance with  
many user-  
defined options.*



*Ultiboard lets you customize autorouting for optimal performance.*

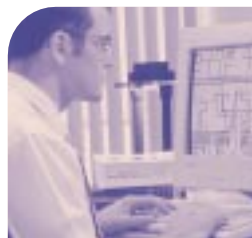
### RIPUP-AND-RETRY

### AUTOROUTER

The ripup-and-retry autorouter achieves high completion rates by iteratively removing previously placed traces, when it encounters difficulty, and rerouting these traces to overcome the blockage. This autorouter also gives you complete control over the costing strategy used when the routing algorithm proceeds. Relative costing values can be given to trace hugging, 90° corners, direction per layer and more. You also have the flexibility to control the number of iterations performed and to set priority traces to be routed first. The ripup-and-retry router supports advanced technology options including offset vias, buried vias, T-connections, trace hugging, and 45° pad entry.

### AUTOROUTING FEATURES

- ♦ Via reduction options
- ♦ Pin/gate swap
- ♦ Custom layer options
- ♦ Costing parameters
- ♦ Trace hugging
- ♦ Offset via support
- ♦ T-connections
- ♦ 45° pad entry



## ultiROUTE

# Advanced Autorouting & Autoplacement

Both the standard autorouters included within Ultiboard are efficient routing engines. However, because routing is so important to both the overall performance of your design and to manufacturing cost, Electronics Workbench also offers the industry leading Ultiroute, available as an additional option, to deliver state-of-the-art routing and autoplacement.

Ultiroute is a unique, high-performance autorouter. Whether you're designing extremely dense or very basic boards, Ultiroute will save you time and money. Ultiroute's fast routing engine will eliminate the need to perform tedious and time consuming manual routing. Benchmark tests show that Ultiroute consistently outperforms other leading autorouters. Ultiroute will help you dramatically improve manufacturing yields, thereby lowering manufacturing costs and achieving more optimal board layouts.

Ultiroute's success is due to its unique application of a combined grid and gridless routing algorithm. The routing engine routes on a grid where possible, but automatically switches to gridless autorouting when necessary. You get all the benefits of gridless autorouting with its ability to handle difficult-to-route traces and the convenience of having most traces located on grids for easy maintenance and fast manipulation.

As part of its routing algorithm, Ultiroute tries, when possible, to produce visually pleasing board layouts. As a result, Ultiroute not only delivers exceptional performance, but it also produces extremely professional looking part and trace layouts.

Start using Ultiroute today and make an investment in a tool that will improve your layouts and reduce production costs, paying for itself many times over.

### ULTIRoute FEATURES

#### Autoplacement

- Pre-place critical components
- Through hole and SMD support
- Set minimum distance between parts
- SMD mirroring
- Pin/gate swap
- Graphical progress display
- Advanced SMD fanout
- Cluster placement support
- Automatic block capacitor recognition

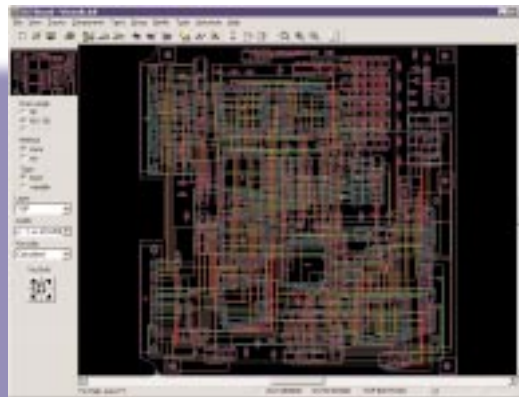
#### Manufacturing optimization

- Fully customizable optimization cost factors
- Trace smoothing
- Via reduction
- Cross-net cleanup
- Corner mitering

#### Grid or gridless autorouting

- Unlimited undo and redo
- Graphical progress display
- Via offset support
- Pin/gate swap
- SMD via pre-placement
- Fully customizable cost factors
- Batch routing option
- User defined grid
- Supports manual wire pre-placement
- Multi-layer routing
- Maximum via setting

*Ultiroute will improve your layouts and reduce production costs, paying for itself many times over!*



*Ultiroute's routing engine delivers efficient board layout with high completion rates.*

# ultiBOARD *Professional & Power Professional Editions*

Ultiboard offers all the advanced features you need to quickly produce reliable boards, but without the steep learning curve and high price tags normally associated with other high-end design tools.

Ultiboard's impressive feature set includes: real-time design rule check, one of the industry's largest footprint libraries, built-in autorouting, and support for 32 layer boards up to 50"x50" in size. Start using Ultiboard today and achieve higher quality boards and shorter design cycles than ever before!

## FEATURES

FEATURES

	ultiBOARD Power Professional	ultiBOARD Professional
POWERFUL INTERACTIVE EDITING	✓	✓
REAL-TIME DESIGN RULE CHECK	✓	✓
LIBRARY SHAPES	3000+	3000+
FORCE VECTORS FEATURE	✓	✓
DENSITY HISTOGRAMS	✓	✓
LOCK COMPONENTS FEATURE	✓	✓
BUILT-IN SHAPES EDITOR	✓	✓
BOARD SIZE (ANY SHAPE)	50" x 50"	50" x 50"
32 LAYERS	✓	✓
INTERNAL RESOLUTION	1 NANOMETER	1 NANOMETER
COPPER FILL SUPPORT	✓	✓
ANY ANGLE ROUTING	✓	✓
CHAMFER CORNERS	✓	✓
DELETE UNUSED VIAS & TRACES OPTION	✓	✓
COMPONENT RENUMBERING	✓	✓
BUILT-IN AUTOROUTER	✓	✓
VIA REDUCTION OPTION	✓	✓
PIN/GATE SWAP	✓	✓
CUSTOM LAYERS	✓	✓
COSTING PARAMETERS	✓	✓
TRACE HUGGING	✓	✓
OFFSET VIA SUPPORT	✓	✓
T-CONNECTIONS	✓	✓
45° PAD ENTRY	✓	✓
REROUTE-WHILE-MOVE	✓	✓
EXTENSIVE OUTPUT	✓	✓
PRINTER/PLOTTER/PHOTOPLOTTER	✓	✓
GERBER FILE (274X AND 274D)	✓	✓
.DXF	✓	✓
SELECTIVE NET HIGHLIGHTING	✓	✓
USER DEFINED PADS	✓	✓
REPORT GENERATION	✓	✓
TIGHT INTEGRATION WITH SCHEMATIC CAPTURE	✓	✓
NUMBER OF PINS SUPPORTED	UNLIMITED	1400



**Electronics**  
**WORKBENCH**

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System requirements: Windows \* 95/NT, 486 or Pentium\*, 16MB RAM, 30MB hard disk space.