

## Trace-Router

### Trace-Router Autorouter

The Trace-Router autorouter is the latest productivity development released from Number One Systems. As a direct replacement for the Easy-Router autorouter, the Trace-Router brings the latest routing technology into your Easy-PC PCB designs.

The Trace-Router is based on a numerically stable mathematical topology which means it is capable of routing the finest pitched devices and highest routing density. With the Easy-PC philosophy of ease-of-use ever in-mind, it ensures your designs are completed and driven to market even quicker.

### Complete Integration

Trace-Router is totally integrated within the Easy-PC PCB design environment, there is no additional routing window or translation from one system to another, and no 'additional' processes to go through. It is run from a single, control dialog with no other user interaction required.

Trace-Router is so easy to set-up and use; you can design and change parameters iteratively throughout the design cycle at any time.

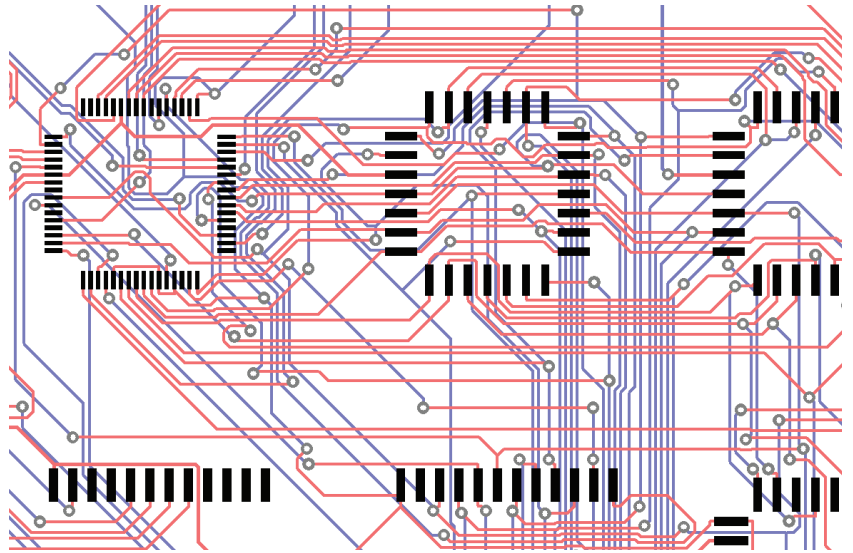
### Single Sided and Multi-layer Boards

Trace-Router can route single-sided, double-sided and multi-layer boards automatically with no fuss or unnecessary complications. Multi-layer boards are routed using all layers concurrently for maximum results. Where there are surface mounted pads connected to inner plane layers, the autorouter will automatically insert stub tracks through vias to these layers.

### Critical Pre-Routing

Critical pre-routing can be fixed in place and ignored by the Trace-Router, simply routing around it using the defined spacing clearances.

Critical areas of the layout like clock nets, RF sections and important nets like power and ground can be wholly or partially routed manually, fixed in place and ignored by the Trace-Router, simply routing around it using the defined spacing clearances.

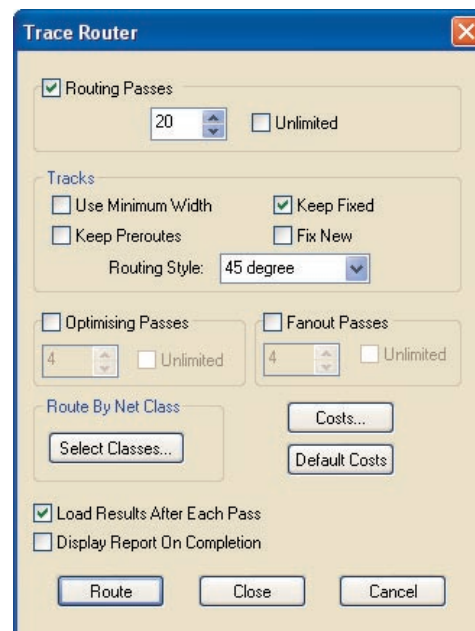


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### Design Rules Driven

As you would expect, all user parameters and design rules defined in the design are passed into the Trace-Router for use. It uses the design spacing clearances so you're assured that the manufacturing rules required are adhered to at all times of the routing process. The constant on-line design rule checking ensures the final results are error free, and because Easy-PC can define Net-Classes to each connection or group of connections, multiple width tracks can be used for designs which require different thickness tracks. These could be for power and ground current carrying capabilities, or fine line high speed signal tracks.

Different via styles can also be assigned to net-classes further enhancing the capabilities and variety of routing possible. As well as design styles and spacing clearance settings the physical routing layers (which are already setup and used by Design Rules Check, Manufacturing output etc.) are all utilised by the router.



# Trace-Router

## Shape Based Routing

The Trace-Router is shape based in its routing topology, this means the design isn't split up into inefficient grid segments like gridded routers but does instead make maximum use of the space available. At all times Trace-Router is totally aware of where every obstacle is in the design, even if the router is stopped to make manual adjustments to component placement and then restarted. If stopped and restarted, the Trace-Router simply continues where it left off but using the amended design; placement or routing. Using shape based routing also means the real shape of obstacles within the design can be identified and avoided during routing, whereas the older style routers can only approximate shapes which wastes valuable routing space and potential routing area.

## Gridless Routing

Gridless routing handles surface mounted components and mixed technologies, like the new fine pitched SM packages, making the maximum use of available space to complete the design as efficiently and quickly as possible. Gridless routing combined with the ultra fine database resolution possible within Easy-PC (at 1/10th Micron - 0.000001m) means Trace-Router can handle the latest chips and technologies in the future. With an efficient routing algorithm, refinement of the layout is continually monitored during the routing process. This means vastly reducing track segment lengths and minimising the number of vias to produce an eye-pleasing result.

## Multi-Pass Routing Technology

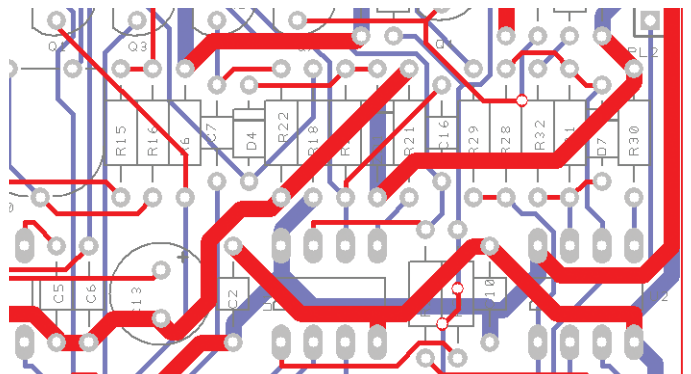
Rip-up and retry technology provides Trace-Router with an internal iterative process of self-correction and track length minimisation throughout the routing operation. At each pass, the router attempts to route the connections which it had previously discarded until the maximum number of passes has been exceeded or the router has totally completed its task. Results using this methodology are 'cleaner' because the router has a chance to self correct and rework its own routing path, thus reducing both vias and track segments making the finished design require less manual rework and providing a more manufacturable board.

## Post-Routing Optimisation

An additional optional routing strategy for enhanced track and via reduction is a post-routing optimisation pass. This control can be used where the ultimate 'clean' design is required and where time is not such a high priority as completion might be.

## Fanout Passes

The Fanout pass invokes a number of passes that routes short 'stub' tracks to vias from SMD pads, typically, these would be for power and ground connections to power or split planes. When selected, this is done before the main Routing passes and ensures these critical escape tracks are routed.



## Features

- Integrated into the Easy-PC PCB design environment
- Dialog driven graphical user interface
- Shape-based for complete obstacle awareness
- Multi-layer concurrent routing
- Gridless
- Uses 1/10th Micron internal database precision
- Intelligent push-aside, rip-up and re-routing
- 90 or 45 degree routing modes
- Multi-pass routing for optimum routing completion
- Ideal for surface-mount and mixed technology
- Automatically connects to power planes using stub routes
- Single, double-sided, and multi-layer routing
- Advanced user-defined routing costs selection
- Track and Via optimisation pass
- Selection of Route-All design or by selected Net Class