

PADS Router Basics

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USER **2** USER

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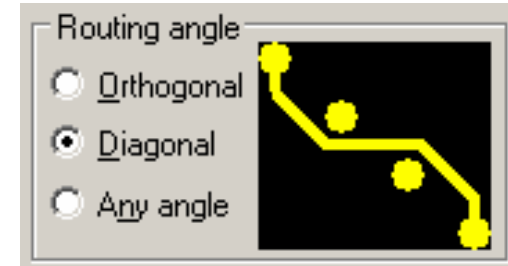
About This Session

- ✓ **This Session Presents Fire For First Time Users To Show You:**
 - **PADS Router Basic Setups and Usage**
 - **The Tools And Shortcuts That Speed Your Design Process**
 - **How To Use Fire And PADS Router Interactively To Complete A Design**

PADS Router Basic Setups

v Routing Angle

- Use Shortcuts (AA, AD, AO)
- Use Options Dialog



v Grids

- Use Shortcuts (G, GV, etc.)
- Use Design Properties Dialog

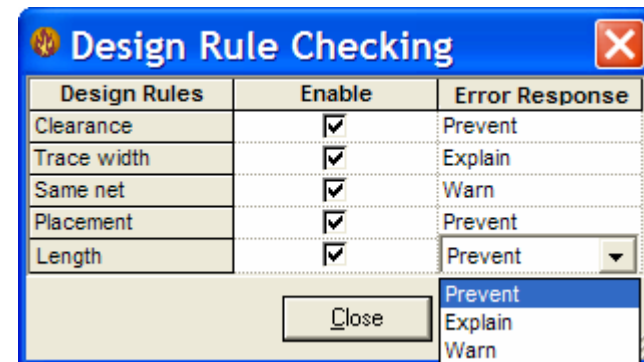
v Layer Pair

- Use Shortcut (PL)
- Default Pair For Layer Change

Grid Type	X Increment	Y Increment	Snap Objects to Grid
Displayed	25	25	
Routing	25	25	<input checked="" type="checkbox"/>
Test Point	25	25	<input checked="" type="checkbox"/>
Via	25	25	<input checked="" type="checkbox"/>
Fanout	25	25	<input checked="" type="checkbox"/>
Component	25	25	<input checked="" type="checkbox"/>

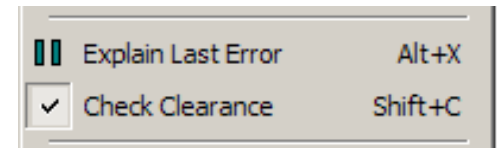
Multi-Mode DRC

- ✓ **Prevent**
 - Design Rules Cannot Be Violated
- ✓ **Explain**
 - Provide Details At Time of Violation
- ✓ **Warn (DRC Off Mode)**
 - Allow Violation And Display Error Markers
- ✓ **Set Mode By Violation Type**
 - Clearance, Trace Width, Same Net, Placement and Length
- ✓ **Can Be Changed At Any Time**



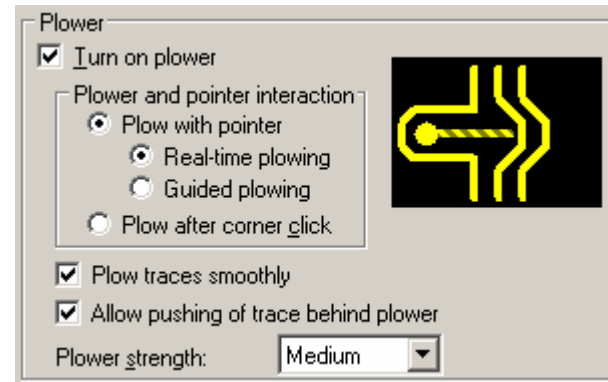
Explain Explained

- v **Explain Is A DRC On Mode**
 - **Pause To Provide Details On Violation**
 - **Available In Prevent Mode (Manual Activation)**
- v **Activated Only When A Violation is Detected**
 - **No Room For Via**
 - **Trace Width Change Results In Violation**
 - **Part Placement Results In Violation**
 - **More...**
- v **Not Activated When Violation Absent**
 - **Dynamic Routing and Trace Stops And Obstacle Boundary**



The Plow Modes

- v **No Plow**
 - **Obstacles Are Not Pushed**
- v **Plow With Pointer**
 - **Real Time – Plow With Each Cursor Movement**
 - **Guided – Plow When Clear Of Obstacles**
- v **Plow With Click**
 - **Delay Plowing Until Click**
- v **Rip-Up**
 - **Unroutes Portion of Traces As They Are Crossed**

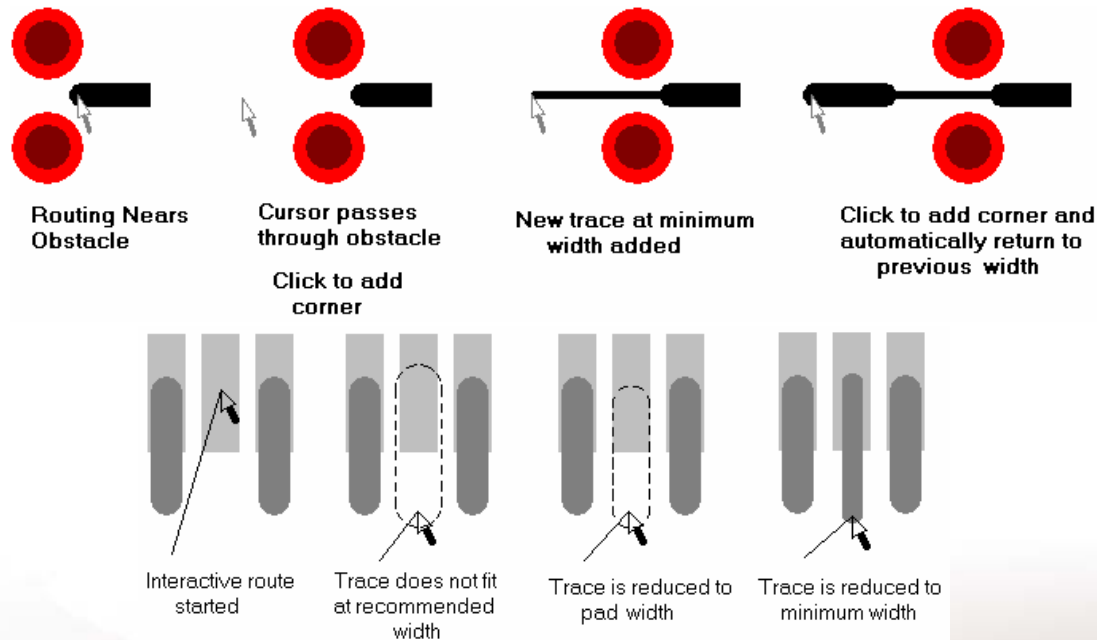


Dynamically Route Or Not

- ✓ **Dynamic Routing On**
 - Trace Pattern Is Defined For You
 - Automatically Avoids Fixed Obstacles
 - Saves Time (Less Clicking)
- ✓ **Dynamic Routing Off**
 - Create Traces One Corner At A Time
- ✓ **A Bit Of Advice**
 - Add Corners To Reduce Long Dynamic Traces
 - Reduces Plowing and More Predictable

Automatic Trace Necking

- v **Automatically Reduces Width**
 - **Detects Fixed Obstacles Only (Vias Are Plowed)**
 - **Available At Pad Exit Also**



Look Ahead Feature

v How it Works

- Combines Layer Shortcut With Layer Change And Quick Layer View
- Scroll Electrical Layers And Look Ahead

v Key Combination

- Z C To Set Display To Current Layer
- Alt + Mouse Wheel Up or Down To Change Layer
- Add Ctrl + Middle Mouse For Layer Toggle
- Add Shift + Middle Mouse For Layer Change

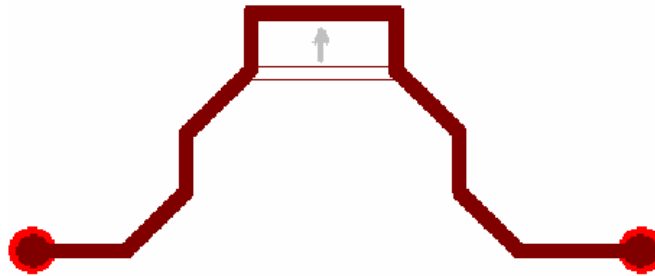
Editing Traces

- ✓ **Same Basic Commands As PowerPCB**
 - Add, Move, Delete, etc.
 - More Routing Angle Aware
- ✓ **Enhanced Commands**
 - Layer, Width, Via (Rules Aware)
 - Stretch
 - Split
- ✓ **New Commands**
 - Stretch Arc (Better Than Convert to Arc)
 - Via Type (Change Via Type of Via)

Move vs Stretch

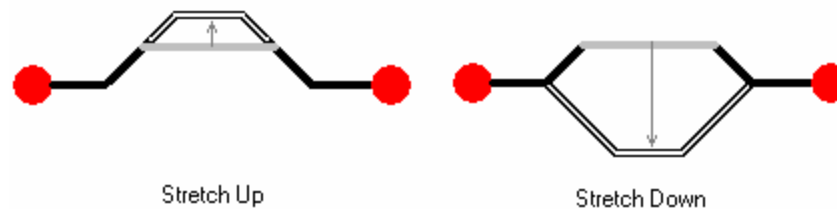
v Move

- Moves Selected Object and Stretches Adjacent Segments



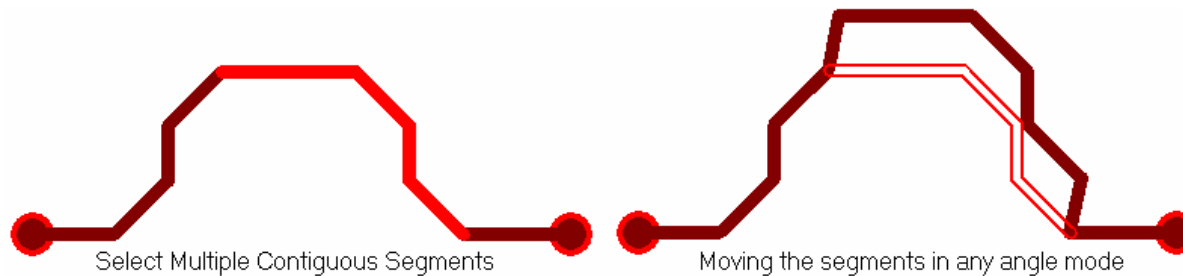
v Stretch

- Changes The Length Of Selected Object

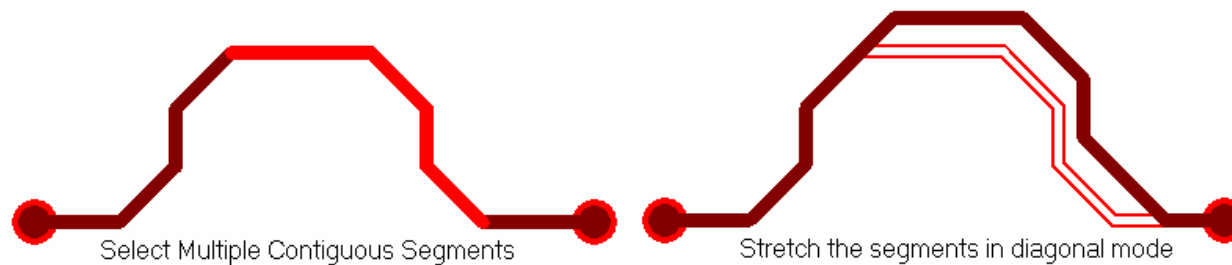


Move vs Stretch

v Multiple Object Move



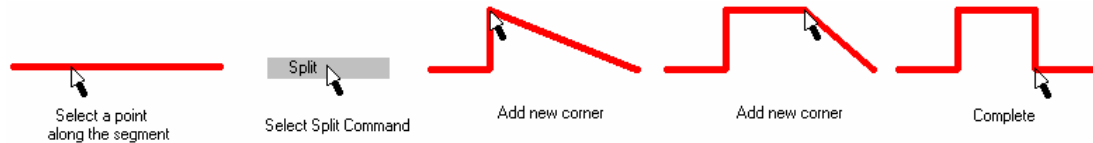
v Multiple Object Stretch



Editing Traces

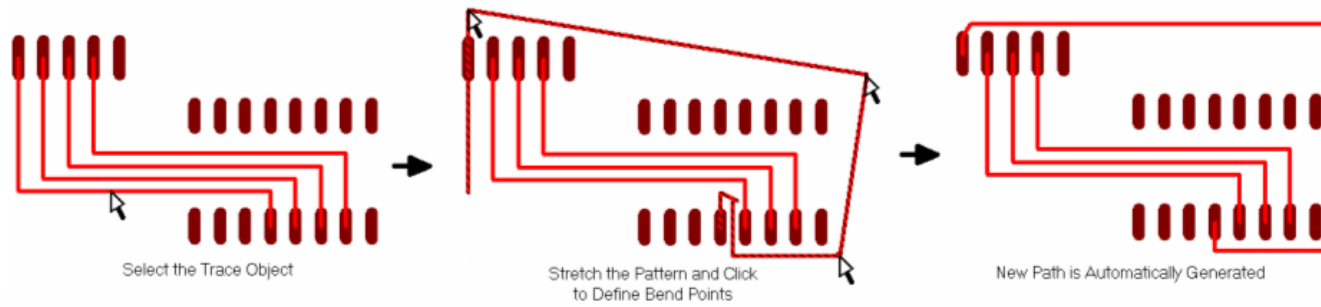
v Split Segment

— It's Really Multiple Add Corner Operation



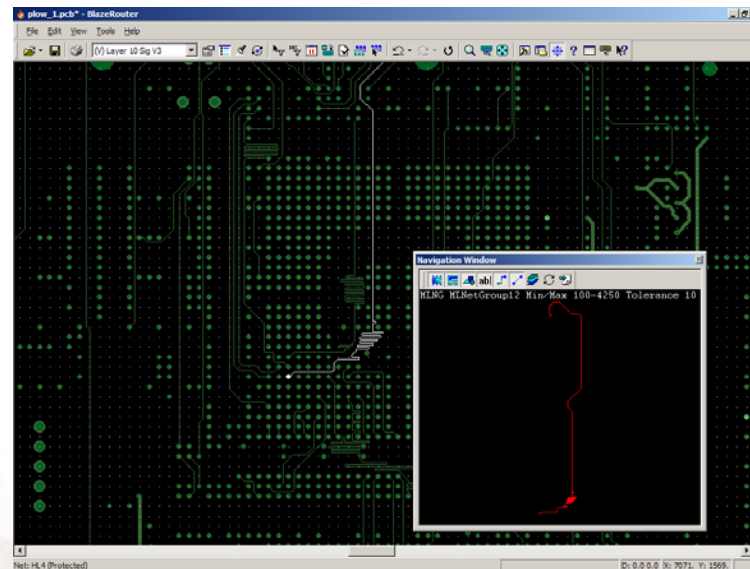
v Quick Route

— Quick Reroute with Smoothing



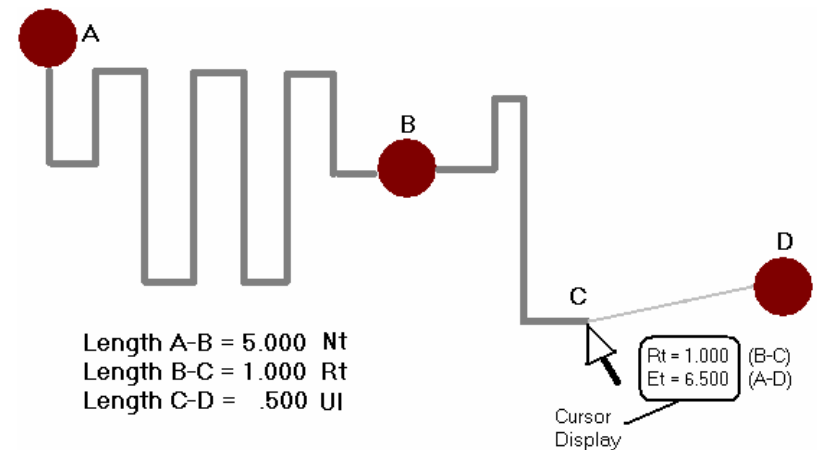
Routing With Length Controlled Trace

- ✓ **Minimum or Maximum Trace Length**
 - Net, Pin Pair, Class (>1 Net), Group (>1 Pin Pair)
- ✓ **Matched Length With Tolerance**
 - Class, Group, Differential Pairs



Trace Length Calculation

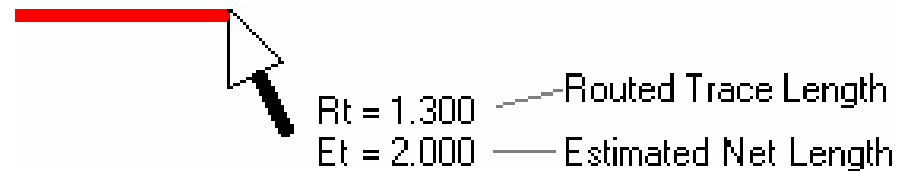
- v **Routed Length (Rt)**
 - All Routed Portions of Net + Length Of Current Trace Being Routed
- v **Estimated Length (Et)**
 - Total Length Of Net If Completed From Current Point
- v **Display Net or Pin Pair Rule (Shift + E)**
 - Aid In Managing Mixed Rules



Trace Length Monitor

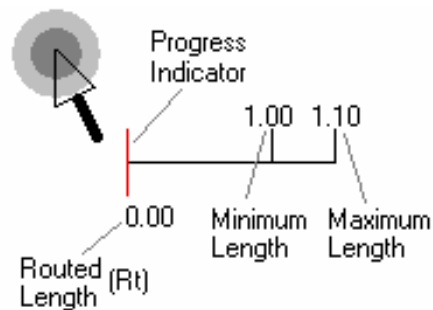
- v **Non-Rule Based Monitor**

- Show Routed Length and Estimated Total



- v **Rule Based**

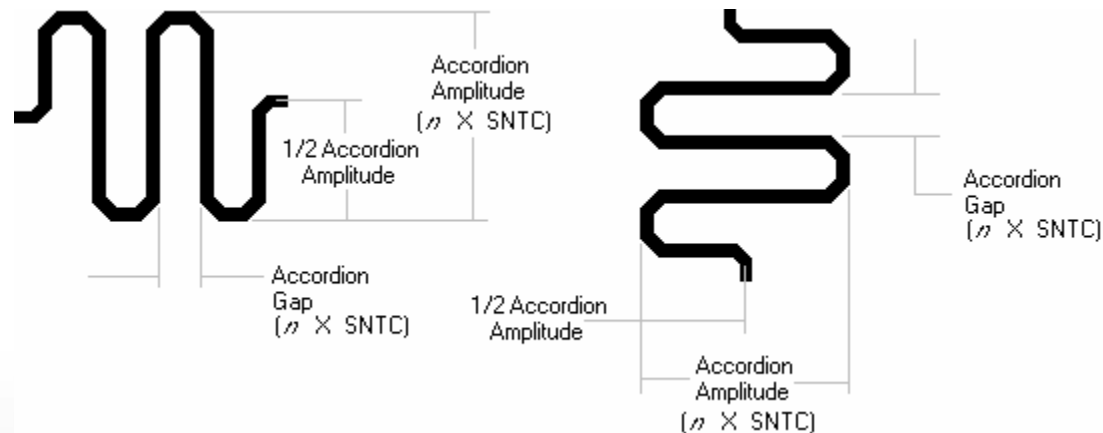
- Show Current Length Against Objective Total



- v **Estimated Length Is Angle Dependent**

Adding Accordions

- ✓ **Accordion Parameters**
 - Amplitude and Gap
 - Factors Of Same Net Trace To Corner
- ✓ **Avoids Obstacles**
 - Adjusts Pattern Around Obstacles Automatically



PADS Router Shortcuts To Remember

- ✓ **DRC – Toggles DRC On Or Off**
- ✓ **G(rid) – Set Various Grid Settings**
- ✓ **H(ighlight) – Highlight Nets**
- ✓ **L(ayer) - Change Current Layer**
- ✓ **U(nroute) – Toggle Unroute Display**
- ✓ **V(ia) – Set Via Mode**
- ✓ **Z – New Quick Layer View**

Differential Pairs

- ✓ **Routed As Pair**
 - **Select One It Selects The Other**
- ✓ **Absolute Control**
 - **Splitting Around Obstacles**
 - ✓ **Max Number**
 - ✓ **Max Size**
- ✓ **Enhanced DRC**
 - **Length Matching**
 - **Minimum Gap Length**
 - ✓ **Percent of length**
 - **Maximum Irregular Trace Length**

The image shows a settings dialog box for routing differential pairs. It contains the following controls:

- Gap between objects when routing: 12
- Restrict layer changes
- Length section:
 - Minimum: 0
 - Maximum: 448000
- Obstacles section:
 - Allow pair to split around obstacles
 - Maximum number of obstacles: 0
 - Maximum obstacle size: 25

Summary

- ✓ **PADS Router Offers More Than PowerPCB's DRE**
- ✓ **PADS Router Can Be Used In The Easiest To The Most Complex Of Designs**

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