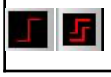
SKILLCAD
Accelerating Custom IC Layout

SKILLCAD Index Guide

(How to use the Guide)

Topical Guide

Highlighted = most useful functions)
(*Functions will also work for Advanced nodes (i.e.. N10, N7, N5))

SKILLCAD Base Functions		
Module	**Featured tools**	**Description**
 Edit Via (OA)	Stretch *	Stretch standard Cadence via
	Stretch Enc *	Stretch via enclosure
	Set Params/Variants *	Edit Via params (cutClass, via variants)
	cutPattern *	Edit Via Pattern
 V-Editor	BusAdjust *	Adjust bus/net space/width
	BusGrow *	Add more bits (or shield lines) along the existing bus/net
	V-Stretch *	Stretch by V-Line
	V-Move	Move by V-Line
	BusTap	Create taps on bus by V-Line
	Bus Connect(BusJoint) *	Connect bus by order, net names
	Bridge *	Change layers for part of bus/net
	Distribute Bus	Evenly distribute bus in a range
	Align BusEnd *	Stretch/Align bus end with right path end spacing rule
	Bus continue	Continue connections
	BreakBus	Split bus with right path end spacing rule
	changeLayer	Change Metal layer and meanwhile update connected vias
	Detour	Make turns on bus
	Dent Corner	Convert 90-degree corners to 45 degree corners
	viaChain (* partially)	Create via arrays over multiple pins
	GateCont	Create gate contact by V-Line
	combRouter *	Pin to trunk Router
	Fix MinArea *	Fix minimum Area
	Taper Connect	Direct Pin to pin wedge connection
	Rounder Corner	Round Bus Corner
	River Router	Single layer pin to pin compact router
	rAdjustor	Adjust the resistance of a path
	Trim Bus Connect	Any angle bus connector
	SameL Connect	Same Length(Resistance) pin to pin connector
 StepRouter	Path Router	User guided single Path Router
	Bus Router	User guided Bus Router
 SegJumper	segJumper	New Interactive wire stitcher, allowing different widths, spaces, fan-in, fan-out, different layer, with integrated busContinue, busConnect and distributeBus features
 FreeJumper	Path Jumper	Interactive Path Stitcher
	Bus Jumper	Interactive Bus Stitcher

 Shield Bus	ShieldBus Jumper *	left/right/middle/top/bottom shielding, allow layer jumping
	Via Wall Shield *	left/right/middle/top/bottom shielding, and via MPP shielding
 UniVia	Create Via	Create SKILLCAD UniVia(IC5) or standard via
 MPP/Ring	Draw MPP	Create regular MPP
	Draw Rect Ring	Create Rectangle guard ring
	Draw Polygon Ring	Create Polygon guard ring
	Change_Mpps	Modify Mpps
	Grow From Obj/layer	Create Ring By Sizing Selected Obj
	Reshape Selected MPP	Reshape the selected Multipart Path
 Fill Via	Draw Rect Via	Fill via in a rectangle region
	Draw Polygon Via	Fill via in a polygon region
	Fill selected regions (* Partially)	Fill via in selected regions
	Fill Overlap by Click (* Partially)	Fill via in overlaps of specified two layers
	Fill overlap of Any two layers By Click (* Partially)	Auto detect overlapping layers and fill proper uniVia
	Fill Overlap of Same VXL net	Drop via on the overlap regions based on VXL net
 LayerHandler	QueryLayer *	Get hierarchical Layer info under point/box/cellview
	LayerSet *	Programmable Buttons to save/retrieve layer settings
 Slot Functions	Draw SlotPath	Draw slot path (pcells)
	Convert To Slot Path	Convert select path(s) to slot paths (pcells)
	Copy Slot Holes	Create Slot From the slot on other Layer with offsets
	Create Mesh	Create Mesh Shapes with Paths/Wires
 GetNet	SelectNet	Select metals/vias of the net
	ExtractNet	Hierarchically extract net to a separate cell view
	HilightNet	Hierarchically highlight a net
 Fill Functions	Advanced Fill (* Partially)	Coverage-aware Dummy Pattern Fill
	Simple Fill (* Partially)	Fill Rectangular dummy shapes.
	Check Density *	Check layer(s) density in a local region/window. Includes a new function to check areas created by Boolean operations.
 Pin Functions	Pin Placer/Browser *	Browse pins/labels, auto place pins.
	Align InstPins To Neighbor *	Place Pins in the editing instance with reference to the pins in the neighboring instances
	Align InstPins To Top *	Place Pins in the editing instance with reference to the top level pins
	Quick Label(Pin) *	Create Labels/pins one by one, by line or all in one click , import schematic pin names
	Promote Pins *	Promote lower level pins to top level
	Create Pin From Label *	Create shape pins from labels
	Create Pin From Coord *	Generate pin placement from a text file with pin name, layer and coordinates information.
	Expand Pin To Shape *	Expand Pin Fig to cover entire shape
	Move pin to PAD Center *	Moves all pins within the pad layer to the Pad center
	Align Distribute Pins *	Move/Align/sort pins (to prBoundary). Can also be used for objects.
	Change Pin Size/Layer *	Change the size or layer of the selected pins
	Rename Pin/Label *	Change bus pin/label names [ ] {} <>
	Cover Pins by Metal Drawing *	Cover Pins by corresponding metal drawing
Placement	Pattern Placer	Create pattern placement by clicking on the place holder array in the GUI. Handle dummy/abutment/guard ring.

 **Label Functions**	Quick Label(Pin) *	Create Labels/pins
	Rename Pin/Label	Change bus pin/label names [ ] {} <>
	Create Inst Label *	Create inst./cell name label on instances
	Create Voltage Label	Create voltage info label on pins
	Mask Label(Letter) *	Create Mask ID Physical labels
 **Kits**	Calculate Area/perimeter *	Hierarchical area/perimeter calculator
	Simple Net R	Calculate resistance for standard bus
	Fix Offgrid *	Fix off grid shapes
	Sky View *	Overall context view for all instances
	Flip Within BBox *	MX/MY/R180 flip within original BBox
	Swap Bit Lines (vias)	Swap vias/connections between two lines
	Toggle Via CutClass	Change (cycle) Via CutClass(size)
	Full Selection	Partial ->full, Full bus selection
	Select Net Objs	Select objects by layer and net names
	nCopy	copy selected objects “n” times
	Manhattan Edge	Convert all edges(ellipse shapes) to Manhattan Shapes
	Create Spiral	Create Spiral Shapes(inductor)
	Formula Plotter	Creating shapes defined by equations
	Fill Holes	Fill holes with certain area/width
	Layer Generation	Create layers from objects, using Boolean functions
	Cut Out Short *	Cut holes to remove short on a big piece(Power) metal
	Cover Fig/Net	Cover shapes or entire net with specify lpp (or color pattern)
	Grow Shapes	Grow shapes from a reference obj
	Edge Grow	Create wires from selected edges of a shape
	Line Distance *	Measure distances between two lines/edges
	Sync Window View *	Zoom to the same layout location of two synchronized windows
	Sync Schematic View *	Zoom to the same schematic location of two synchronized windows
	Replace Part of Layer	
	Copy From Background View	Copy/Move shapes from the background view
	XOR Background View *	XOR a background view with the current view, displaying differences between the two
	Chop Array	Chop Mosaic cells
	Inductor Pin Checker	Check pins on each net (for inductor layout)
	Create Arc Shapes	Create curved shapes (high voltage application)
	Convert Shapes	Convert shapes between path/polygon/wire

MultiColor Functions (Temporarily Covered by SKILLCAD Base license)		
Module	**Featured tools**	**Description**
 MultiColor Functions	Quick Color	Change/assign wire Colors by click or line
	nanoJumper	Create Wire and meanwhile assign color

NanoWire		
Module	**Featured tools**	**Description**
 Track Functions	NanoTrack Router	Track Pattern based wire Stitcher
	Transition Connector	Track Pattern based Bus Connector
	View Patterns	Interactively view defined track patterns
	Push Bus to Tracks	Push/snap wires to tracks
	Fill Via By Click	Fill via on a metal overlap according to the via Configuration
	Fill Via By Box (same Net)	Fill via on all metal overlaps within a box area according to the via Configuration

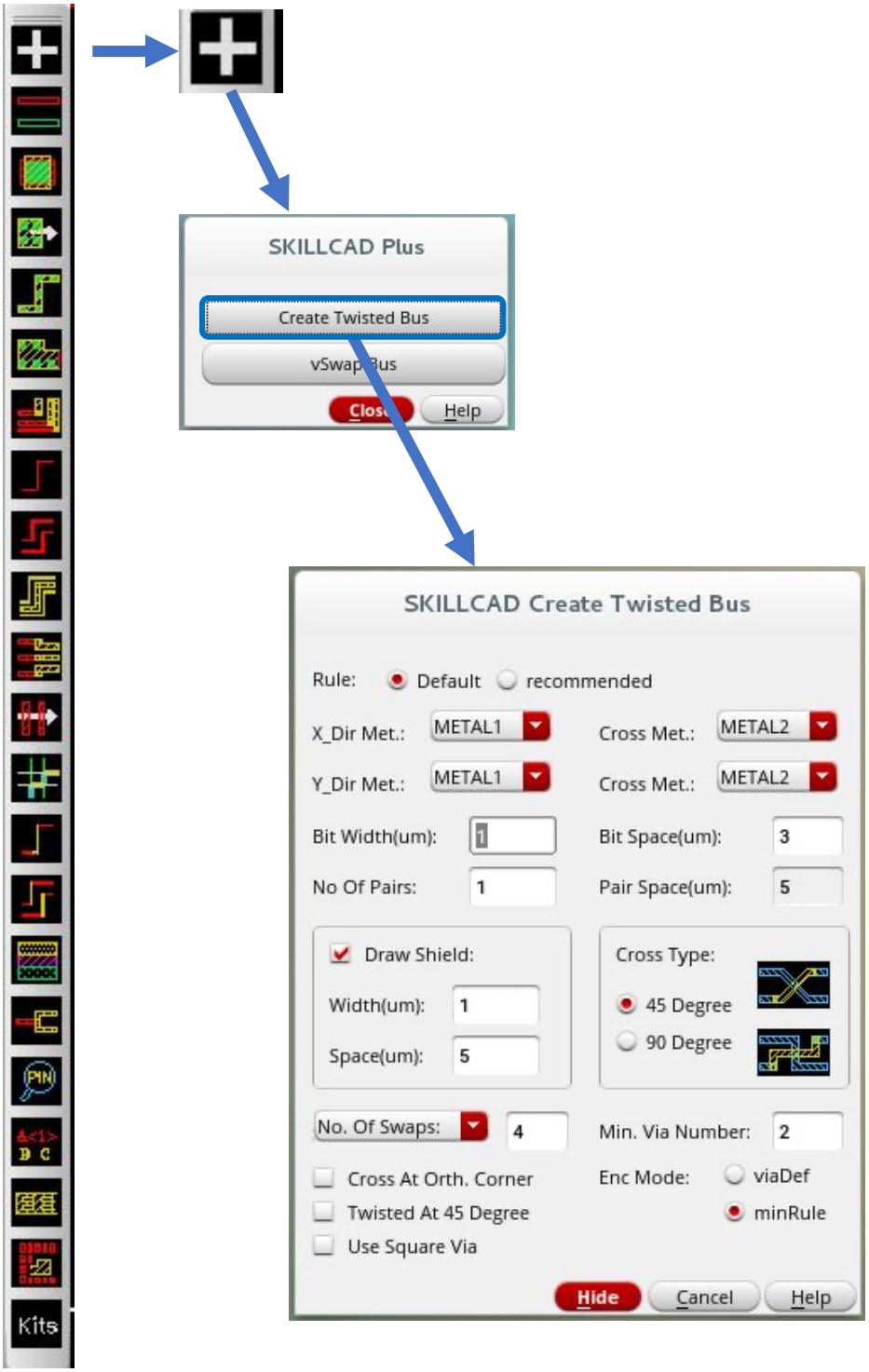
rSolver		
Module	**Featured tools**	**Description**
rSolver	rSolver	Point to point resistance extraction.

TwistedBus		
Module	**Featured tools**	**Description**
 TwistedBus	Create Twisted Bus	Create Twisted Bus
	vSwap Bus	Create/insert a swap by drawing a line cross two wires

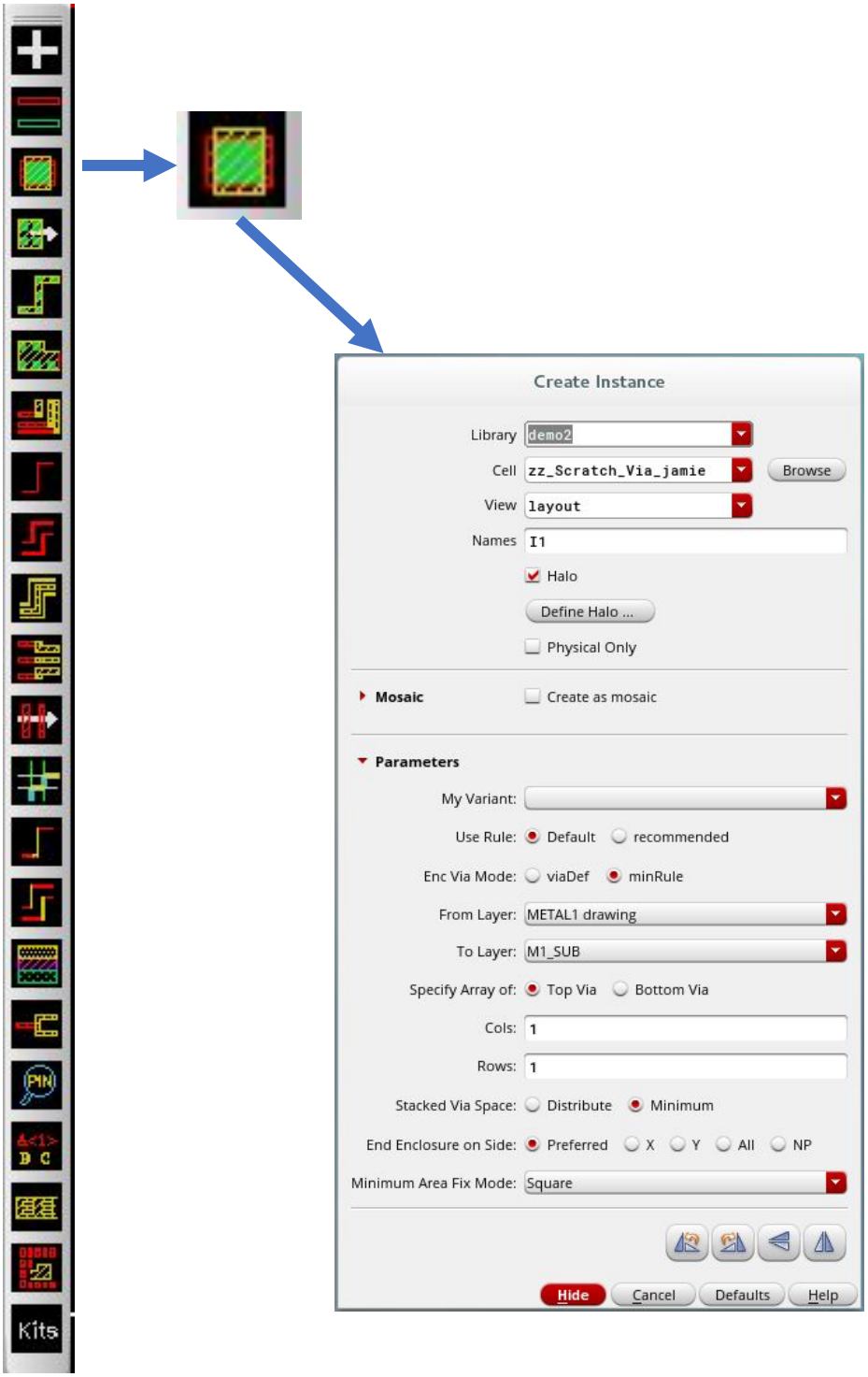
SKILLCAD Setup		
Module	**Step**	**Description**
Setup View the Complete Setup (start to finish)	Setup Technology Library	Select the technology library and set the grid and database units.
	Setup Routing Layers	Set up metal layer parameters. These are used in capacitance calculations.
	Setup Special Metals	Set up special metals, such as MIM cap.
	Setup LVS Labels and Pin Layers	Set up the layers for metal and pin labels.
	Setup Base Layers	Set up base layers, such as poly and diffusion.
	Setup Implant Groups	This setup is only needed when using Cadence IC5.
	Setup Equivalent Layers	Set up metal equivalent layers. This is used in the GetNet functions.
	Setup General Metal and Via Rules	Set up general metal rules, such as coupling capacitances, minimum default number of vias, etc.
	Setup Individual Metal Layer Rules	Set up metal rules, such as widths and spacings, and resistances.
	Setup Contact and Via Rules	Set up contact and via rules, and metal enclosure of vias rules. Also set up contact and via resistances. These are used in the rSolver and other resistance calculations.
	Setup Wire Configuration Rules (Nano Router)	Set up wire configuration rules. This is only necessary if you are using a track routing methodology.
	Setup Metal and Via Keepout Regions	Define layers to be used as keep out layers.
	Define Metal Direction and Via Costs	Define cost factors for metals and vias. This sets the preferred metal routing directions and is used by the step routing functions.
	Setup Metal Slotting Parameters	Set up parameters for metal slotting and metal mesh.
	Compiling The Setup File	Check and compile the Setup file.
	Customizing The Icon Bar	Select icons to appear on the icon bar.

User Preference Setup		
Module	**Step**	**Description**
Preferences	Setting Up User Preferences	Set pop-up dialog box preferences, template file name, and select where the icon bar will appear in the layout window.

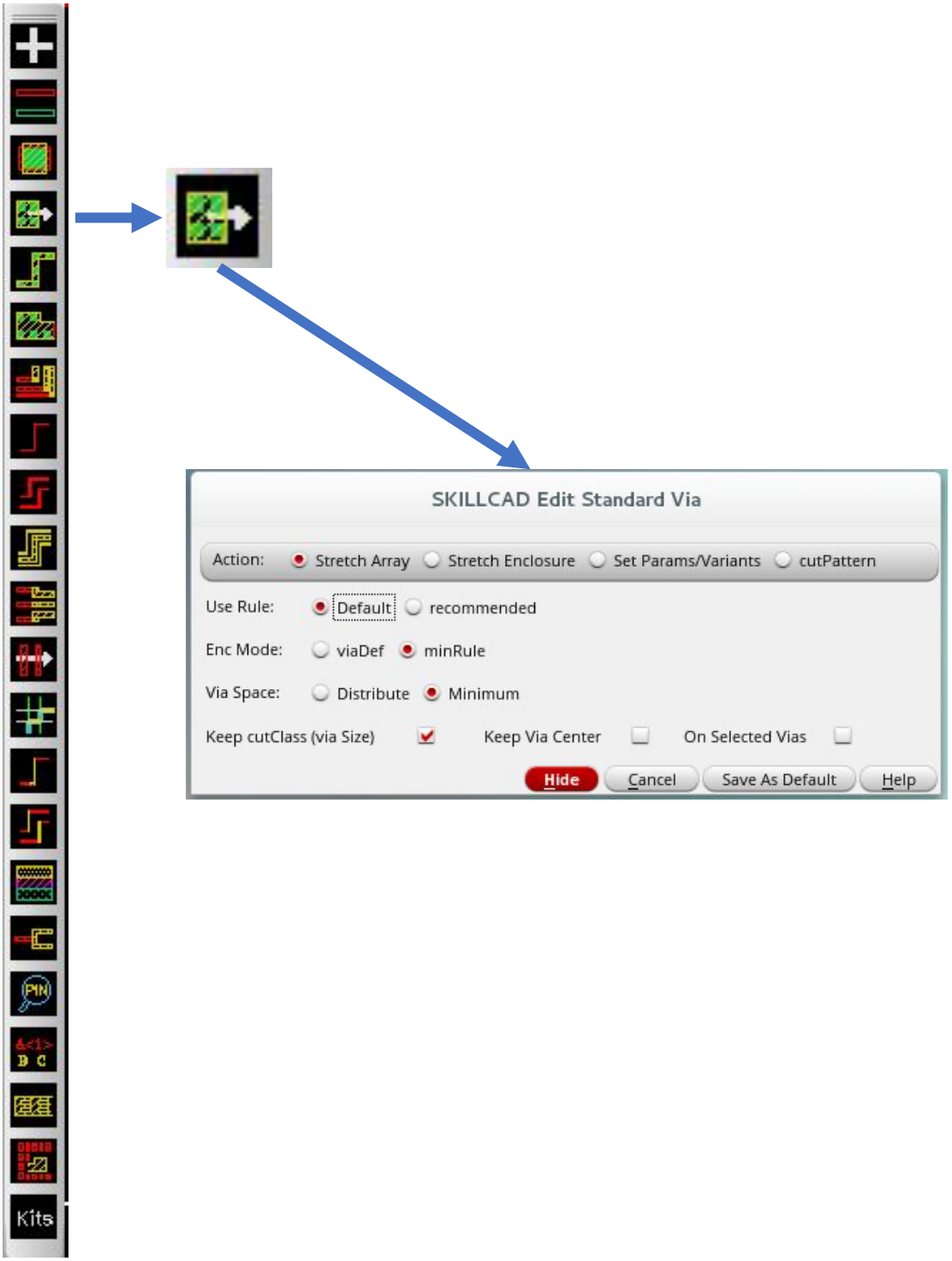
SKILLCAD Plus, Create Twisted Bus



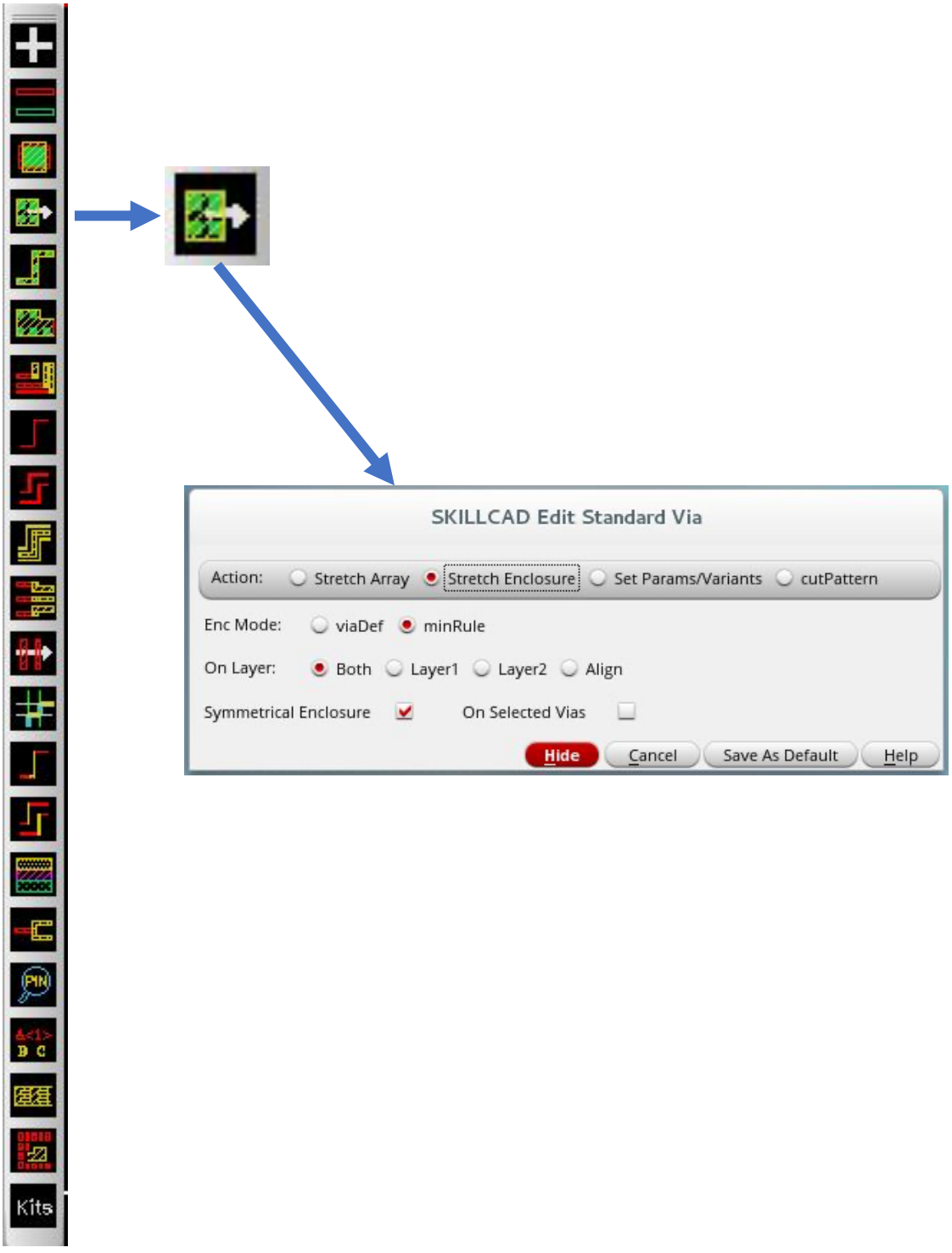
SKILLCAD Create Via



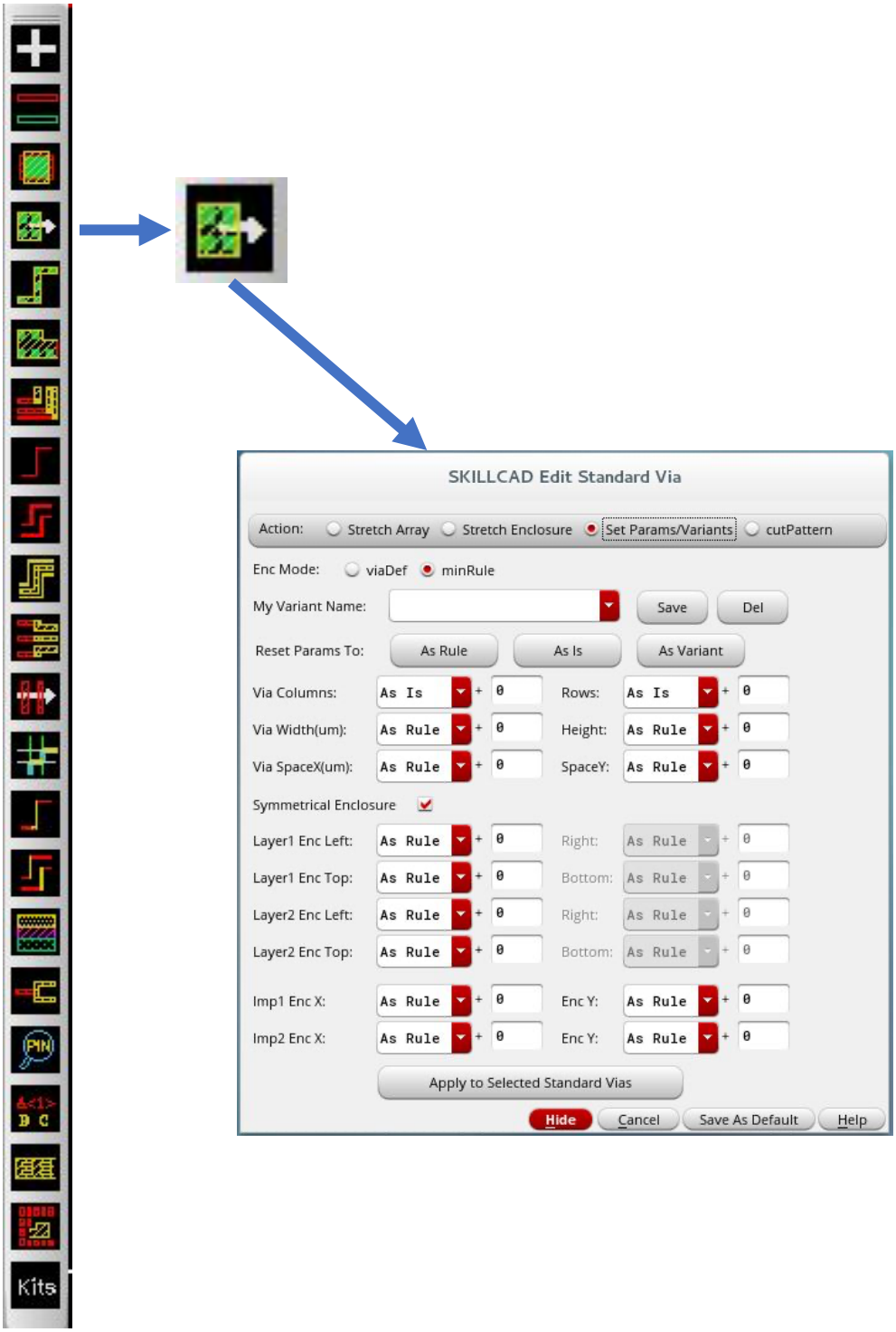
SKILLCAD Edit Standard Via



SKILLCAD Edit Standard Via, Stretch Enclosure

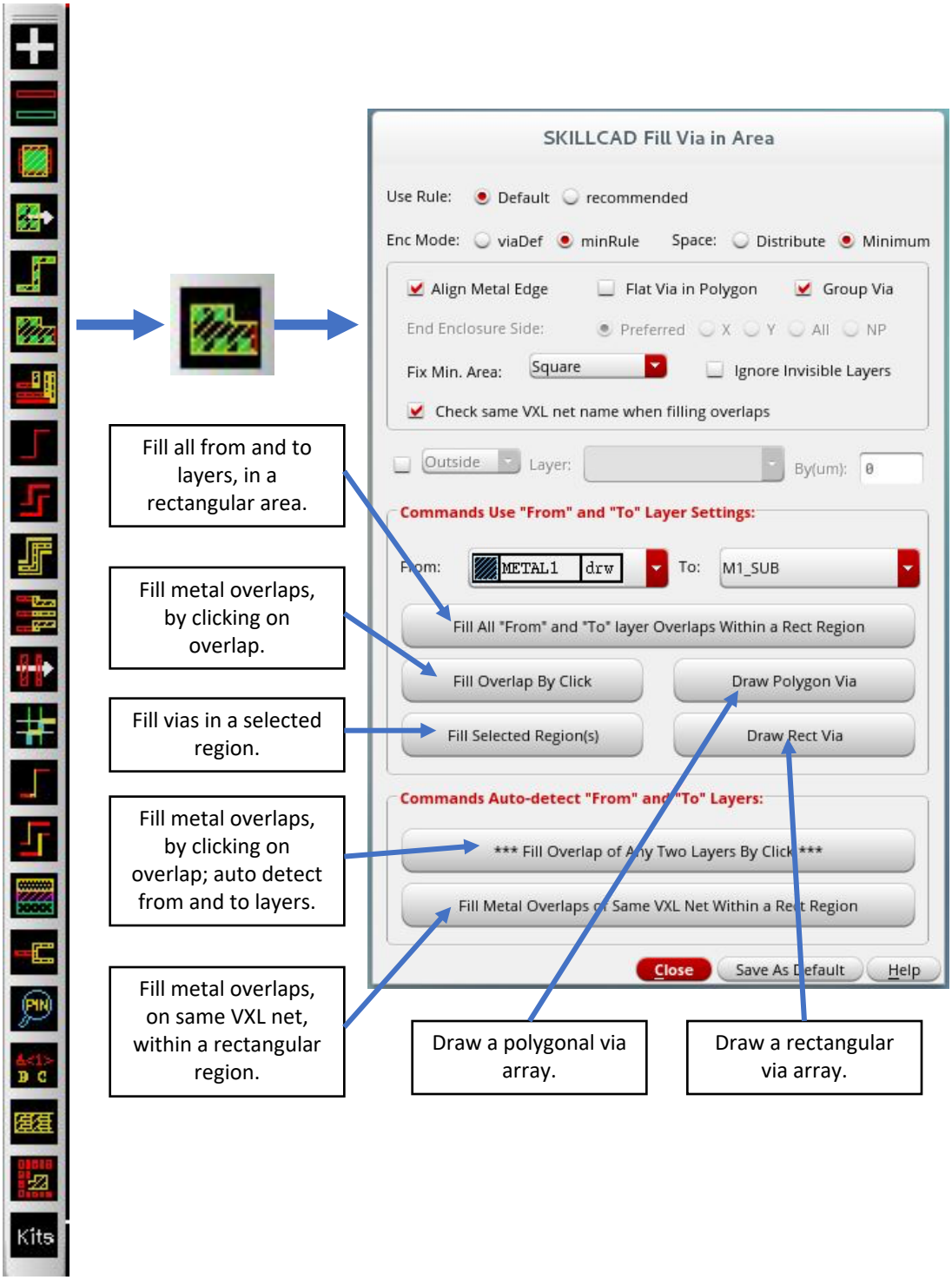


SKILLCAD Edit Standard Via, Set Params/Variants

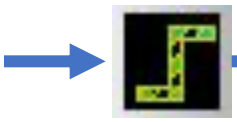


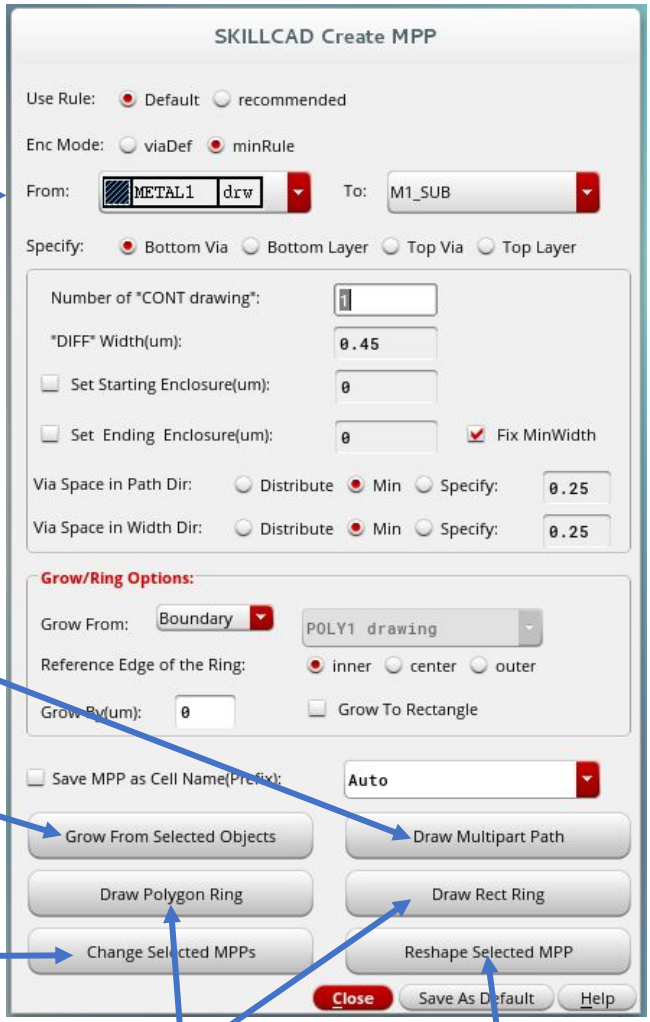
SKILLCAD Edit Standard Via, Cut Patterns

SKILLCAD Fill Via



SKILLCAD Create Multi-Part Path (MPP)





Creating an MPP.

Creating a ring around existing shapes, instances.

Changing selected MPPs.

Creating a ring, guard ring.

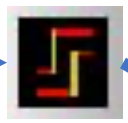
Reshaping an MPP/ring.

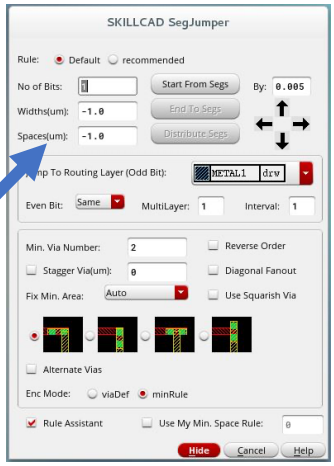
PDF Doc

PowerPoint Doc

Video

SKILLCAD Creating a Metal Bus, (3 Ways)





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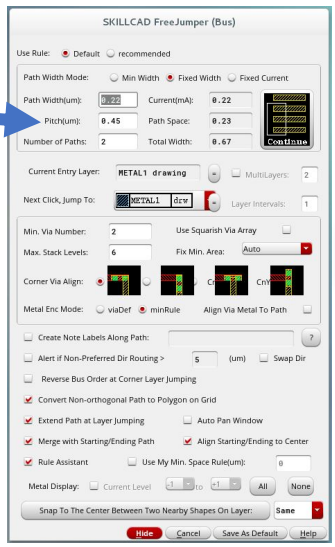
PowerPoint Doc

Video



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Word Doc

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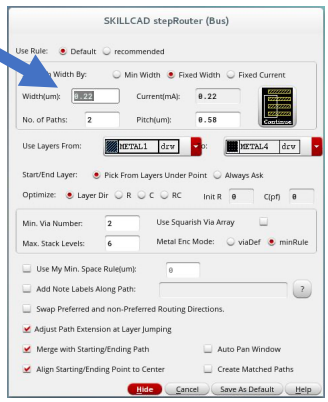

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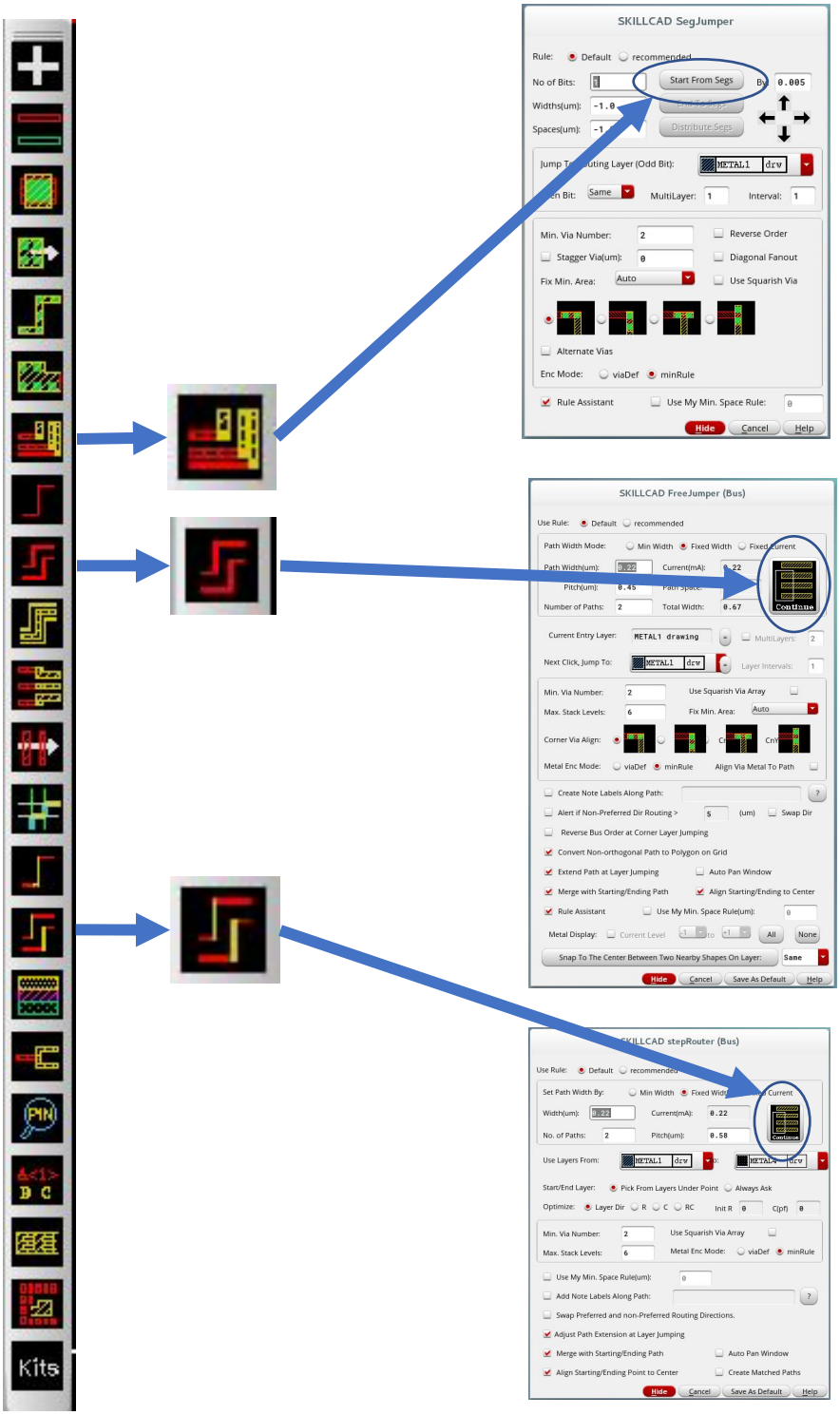
Video

SKILLCAD
Accelerating Custom IC Layout

Back

SKILLCAD Continuing a Metal Bus, (3 Ways)



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Video

PDF Doc

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Video

PDF Doc

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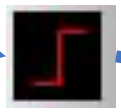
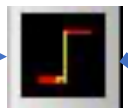
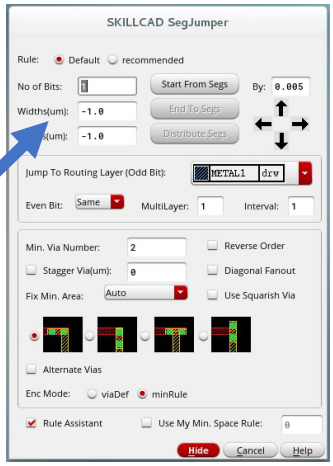
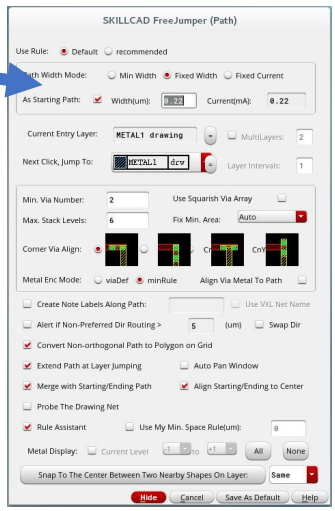
Video

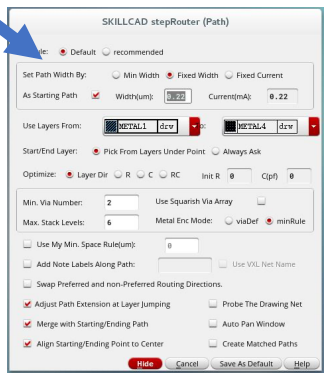
SKILLCAD Creating a Metal Path/Path Segment, (3 Ways)











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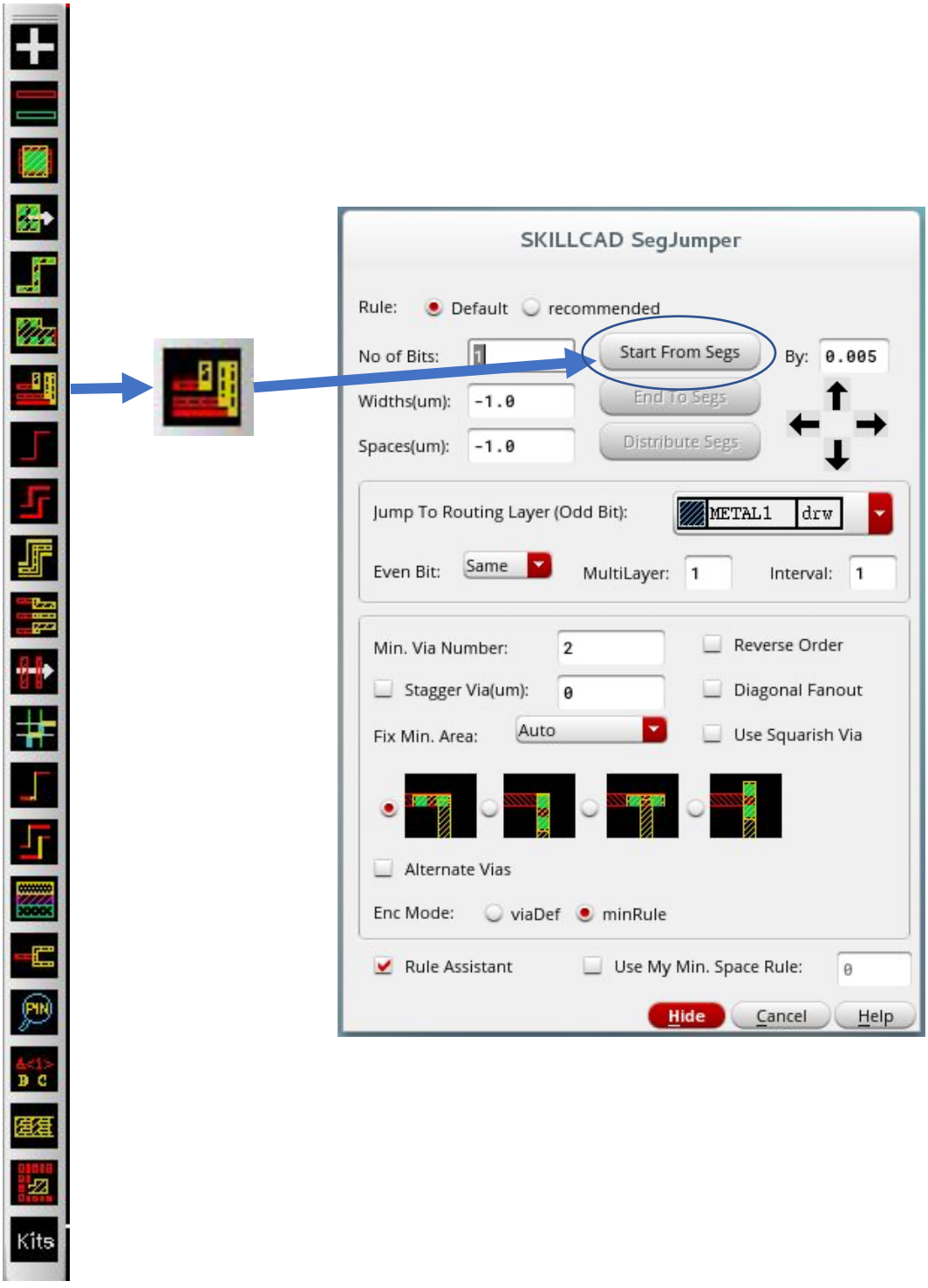
SKILLCAD Continuing a Metal Path/Path Segment



SKILLCAD SegJumper, Various Functions

Distributing bus metals.

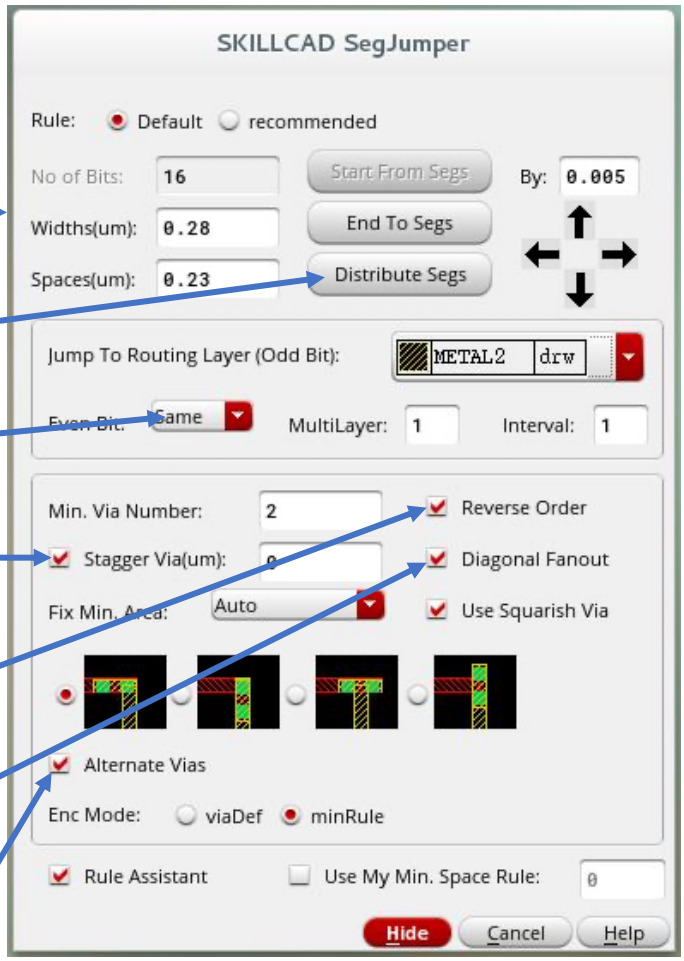
Alternating bus metal layers.

Staggering in-line vias.

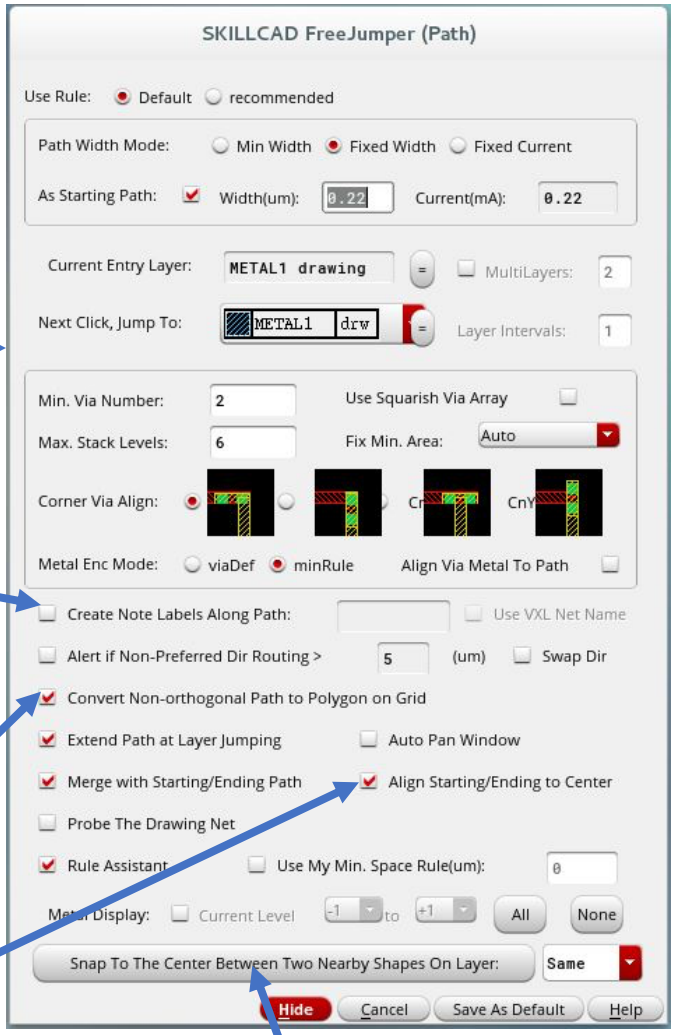
Reversing bus routing order at via corners.

Fan out/in of bus routes.

Alternating via directions at bus via corners.



SKILLCAD Path/Path Segments, Various Functions



Creating labels along the path.

Convert a non-orthogonal path to a polygon, on grid.

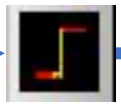
Align the starting and ending path to the center of the existing metal.

Snap path/path segment to the center, between two existing shapes.

SKILLCAD Step Router Path/Path Segments, Various Functions

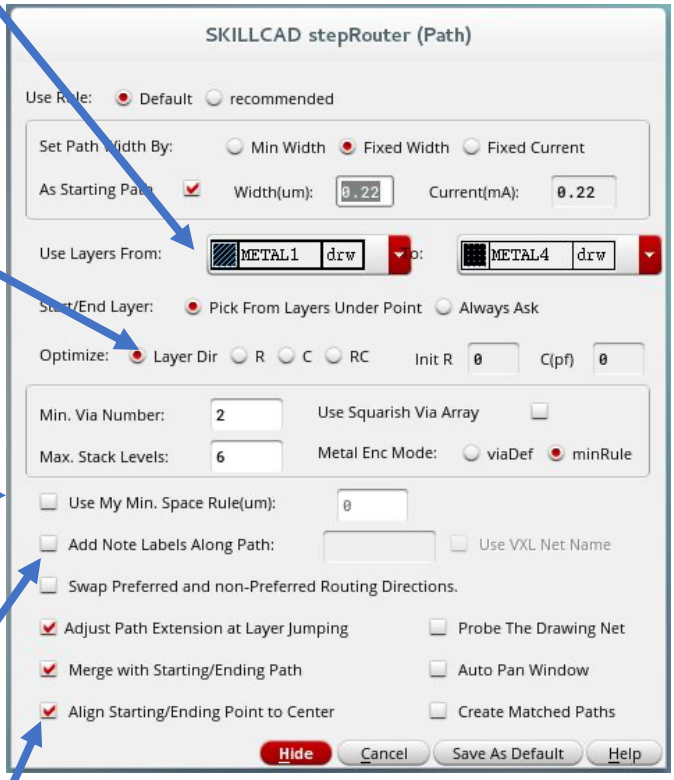
Creating a path/path segment that automatically vias over/under existing metal layers.

Creating a path/path segment that automatically optimizes for layer direction, R, C, and RC.

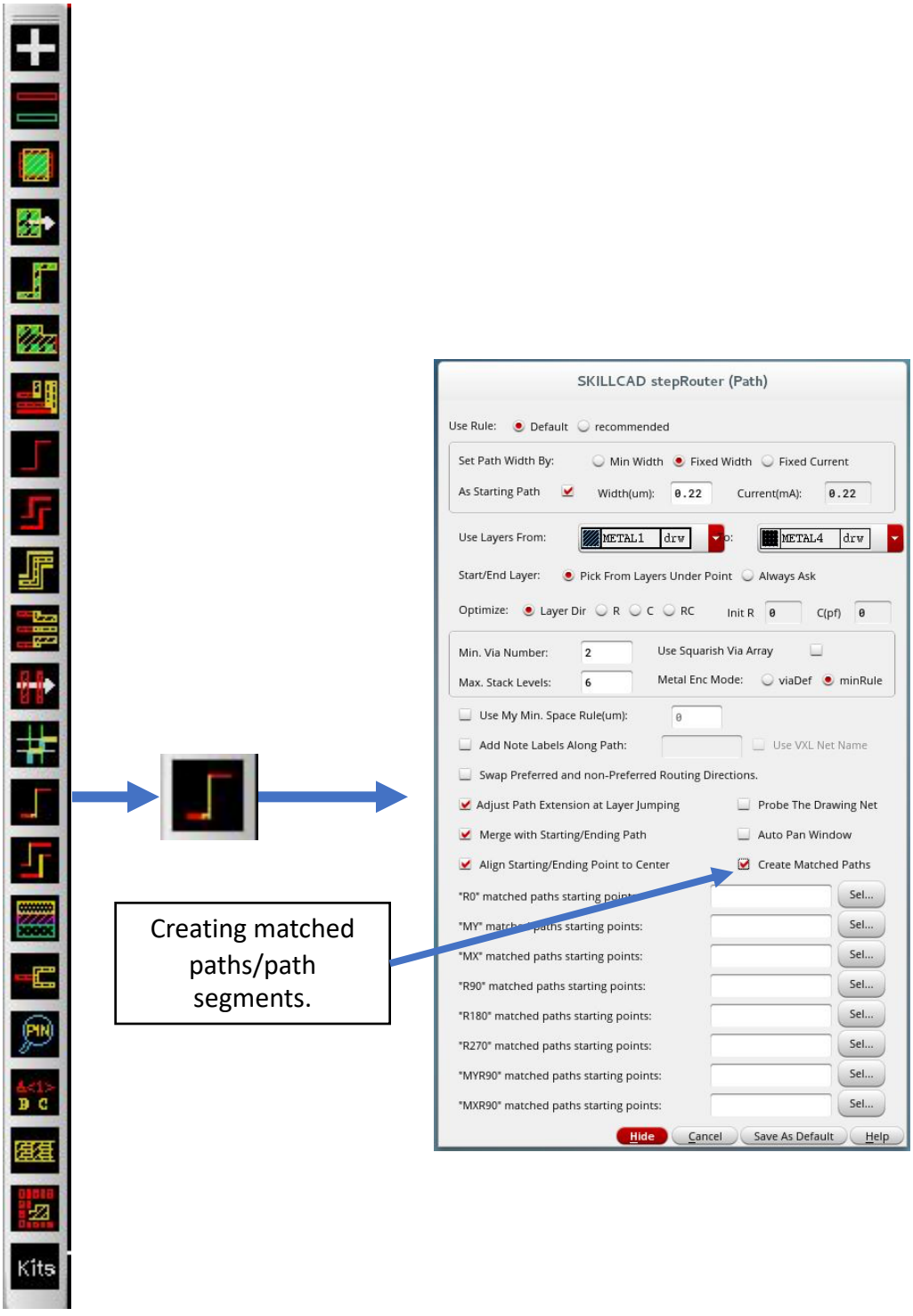


Add labels along path/path segment.

Aligning the starting/ending points of the path/path segment to the center of existing metals.



SKILLCAD Step Router Path/Path Segments, Matched Paths



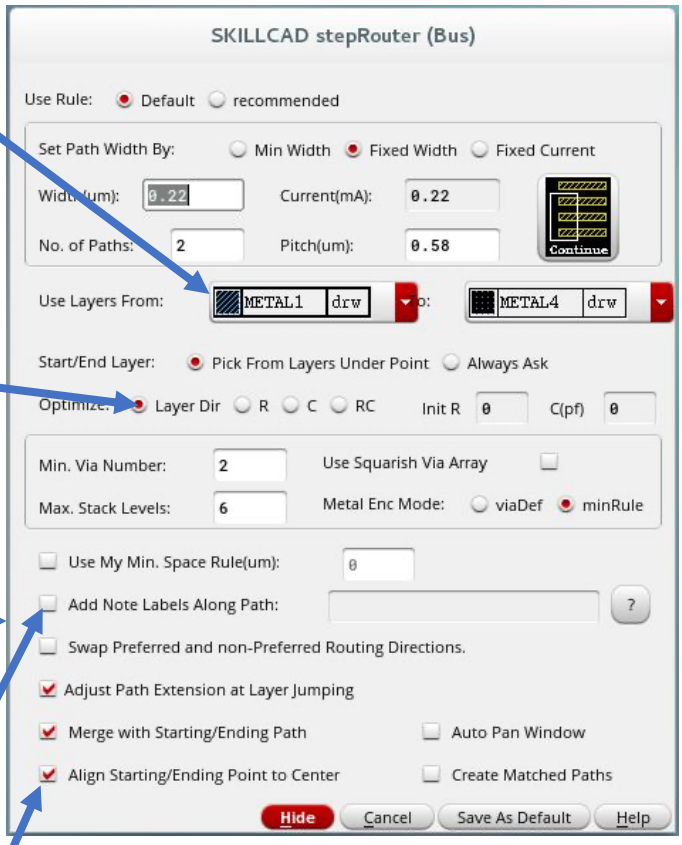
SKILLCAD Step Router Bus, Various Functions

Creating a bus that automatically vias over/under existing metal layers.

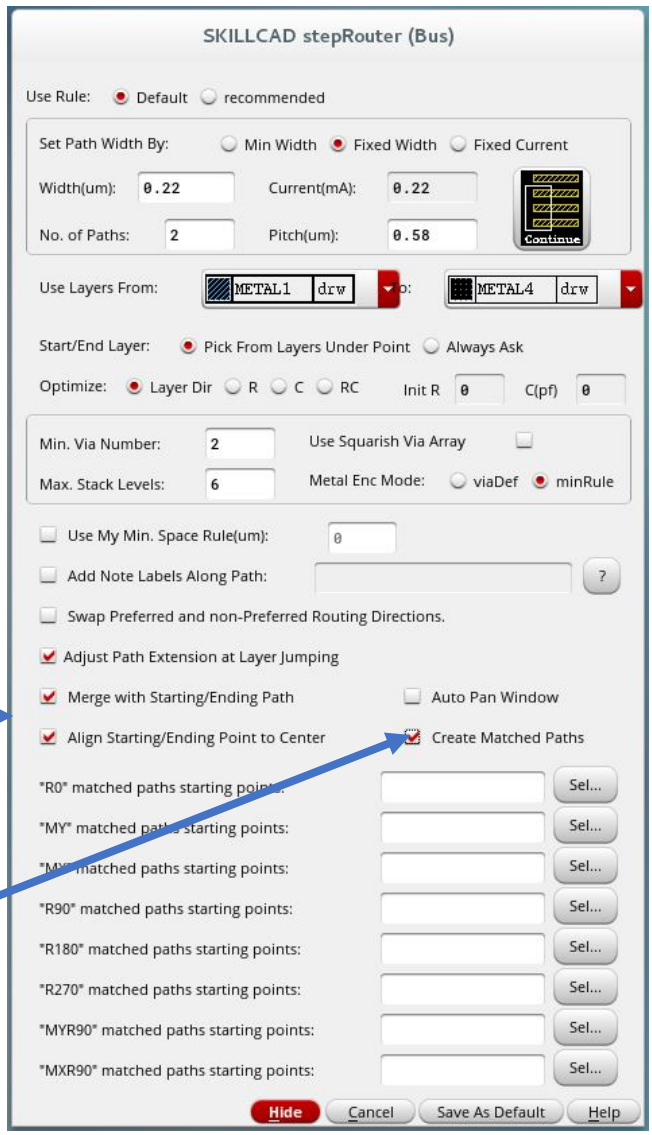
Creating a bus that automatically optimizes for layer direction, R, C, and RC.

Add labels along the bus routes.

Aligning the starting/ending points of the bus to the center of existing metals.

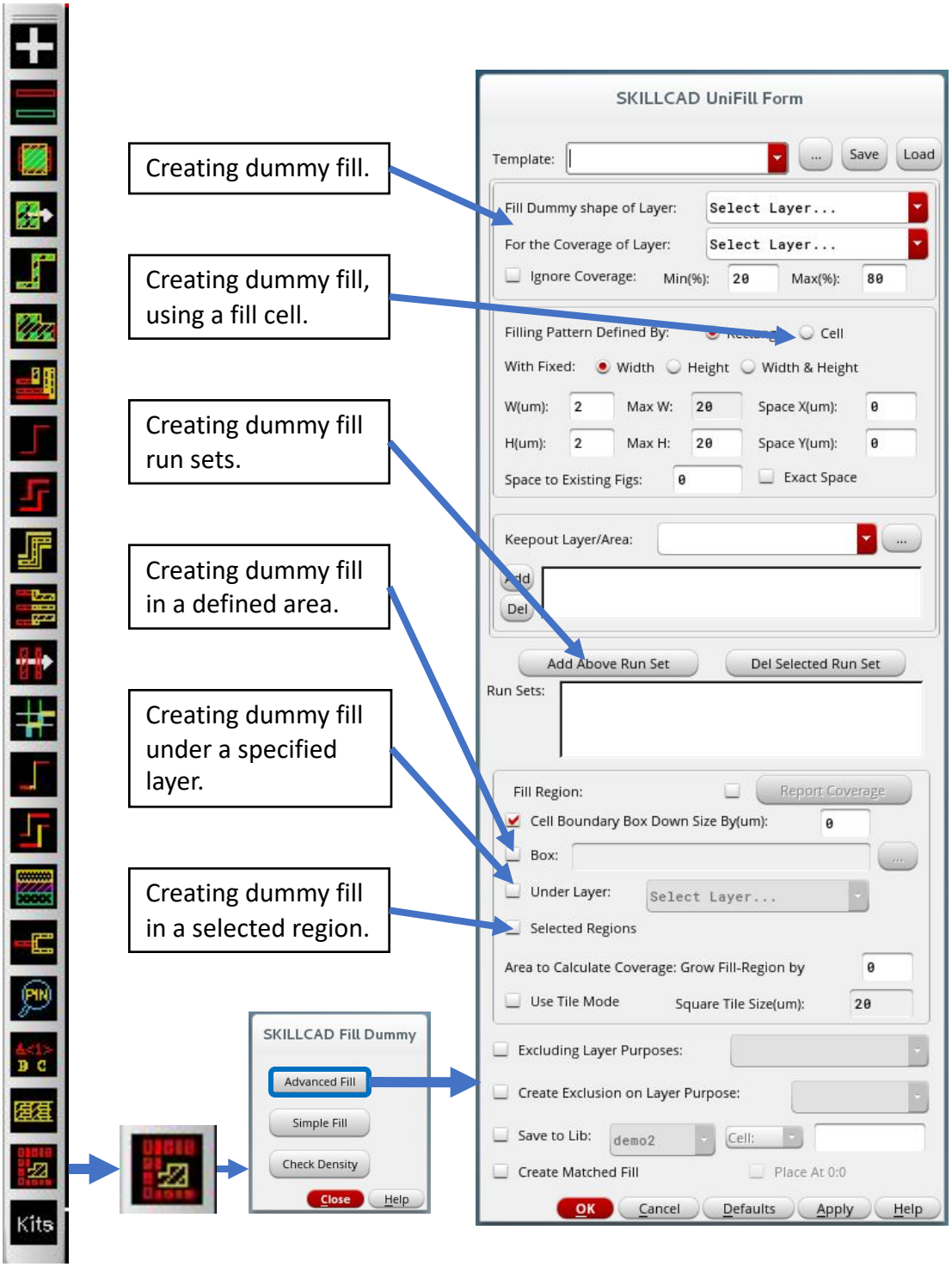


SKILLCAD Step Router Bus, Matched Bus

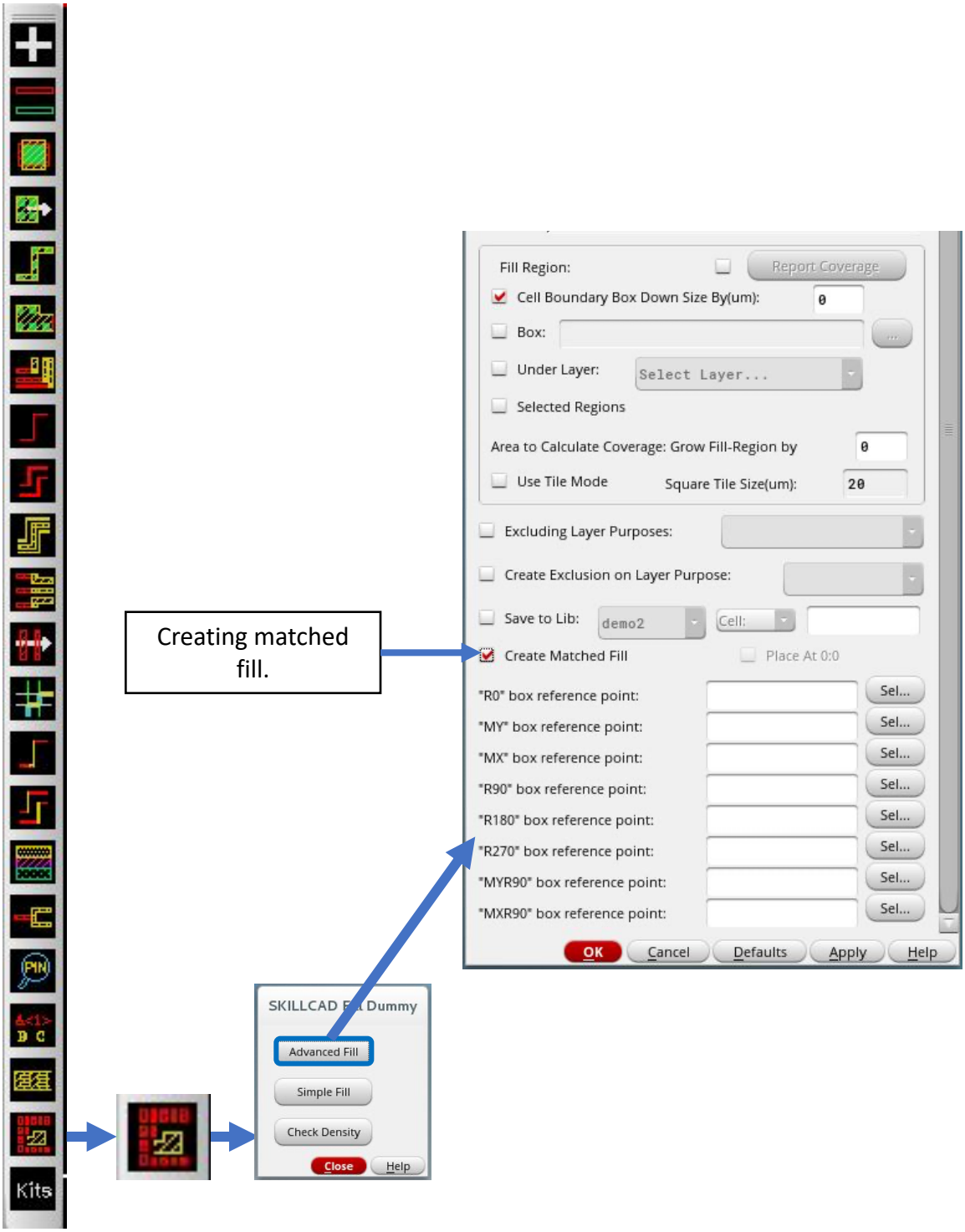


Creating matched bus routes.

SKILLCAD Advanced Fill

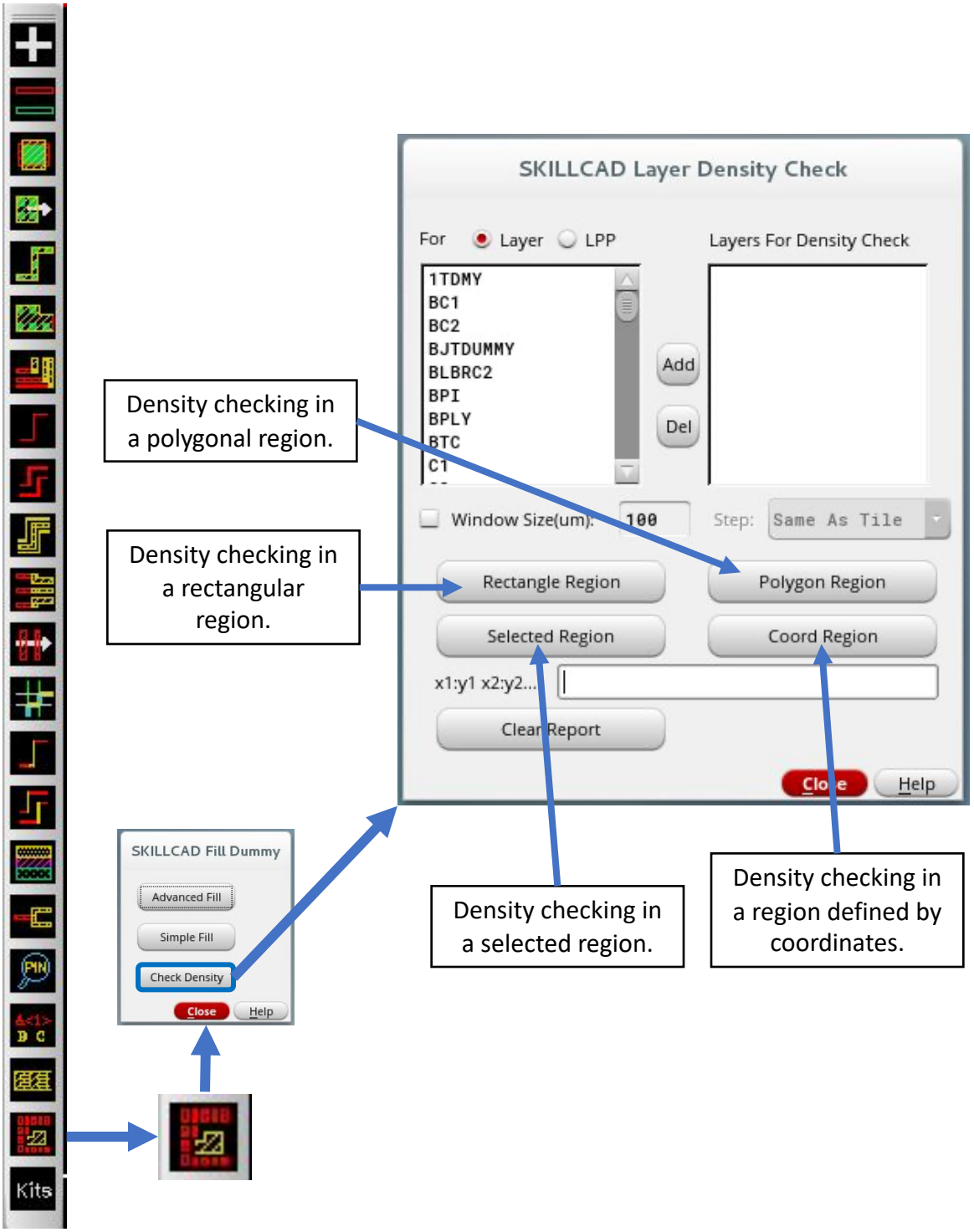


SKILLCAD Advanced Fill, Matched Fill

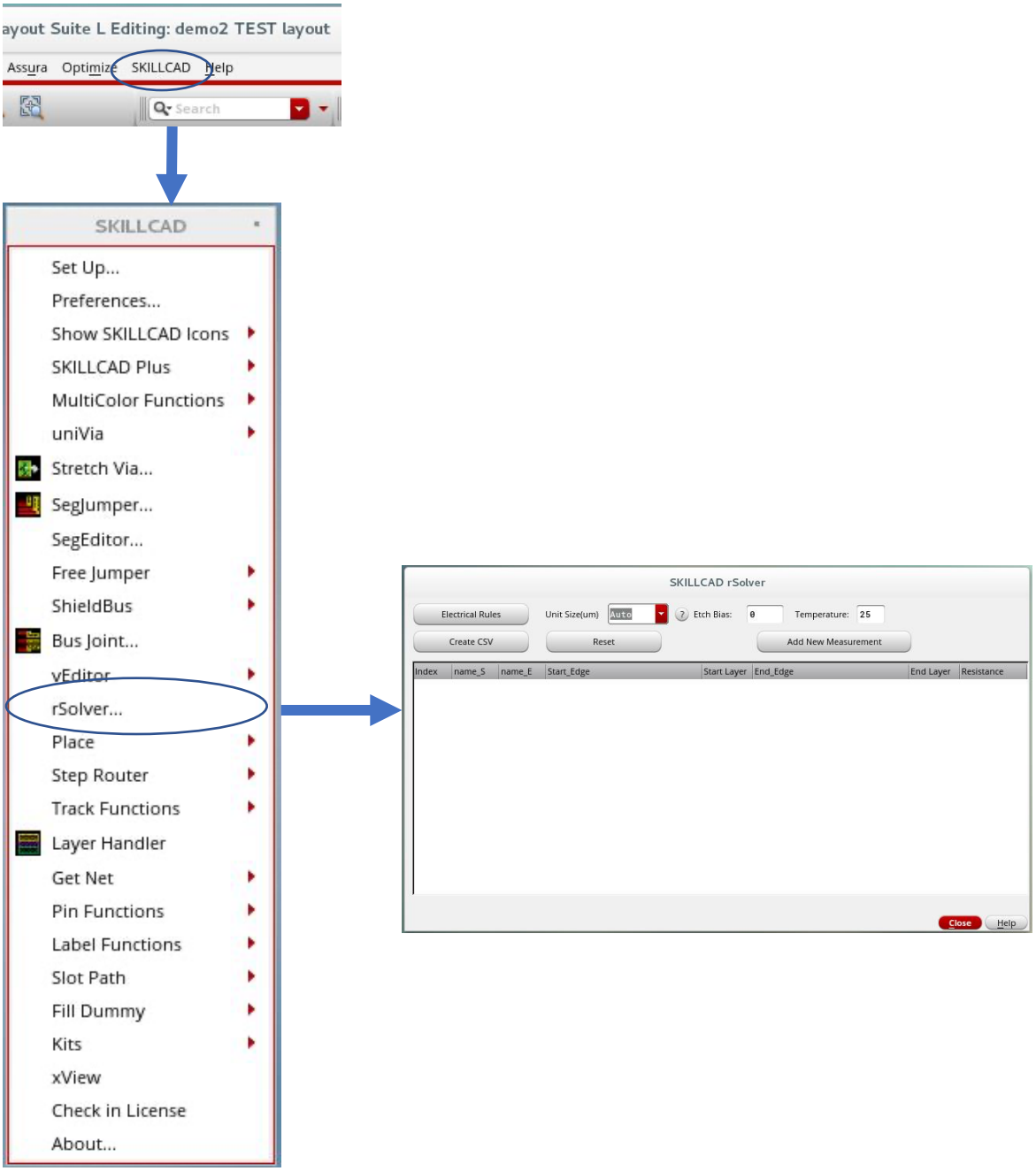


SKILLCAD Simple Fill

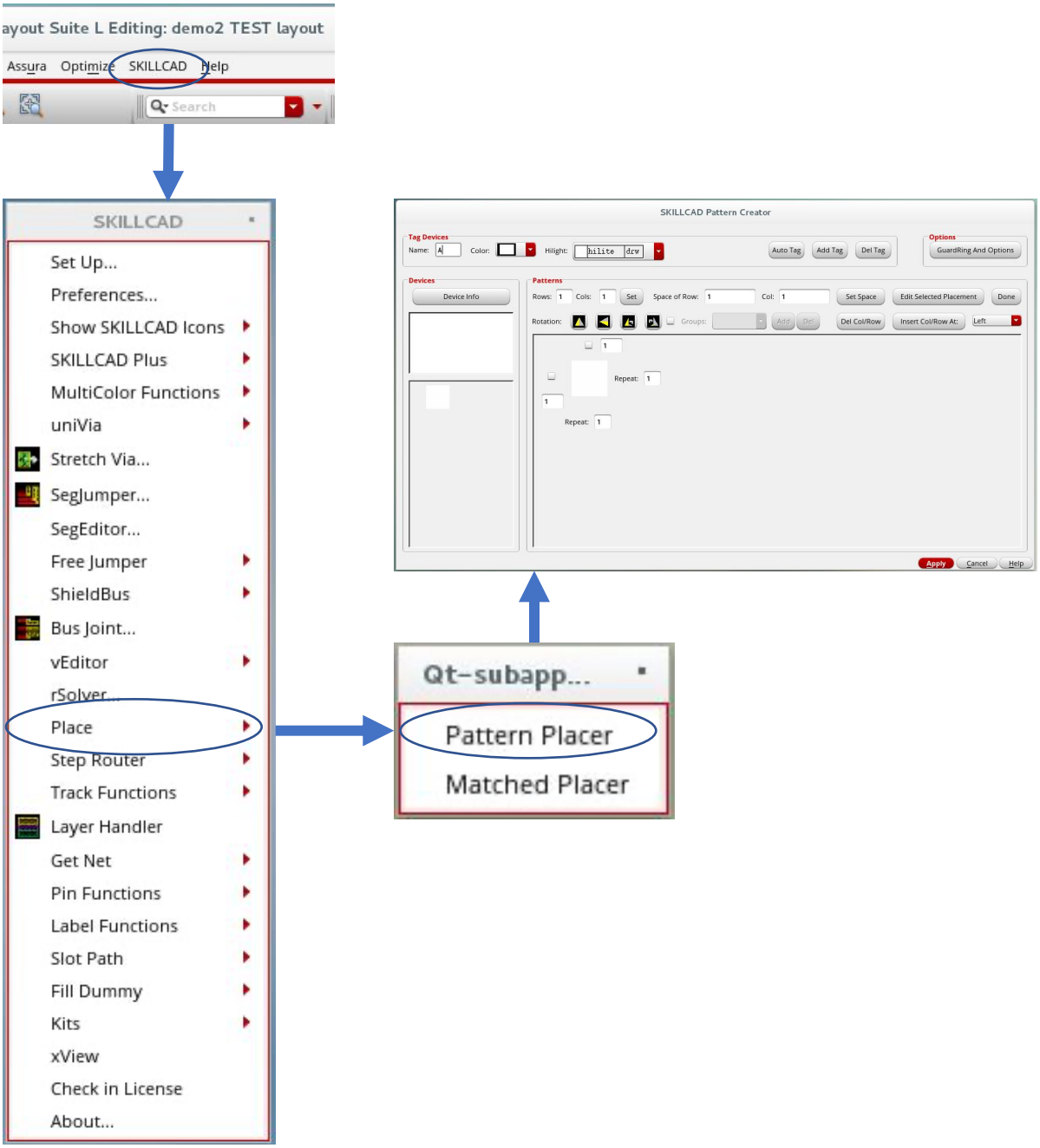
SKILLCAD Layer Density Check



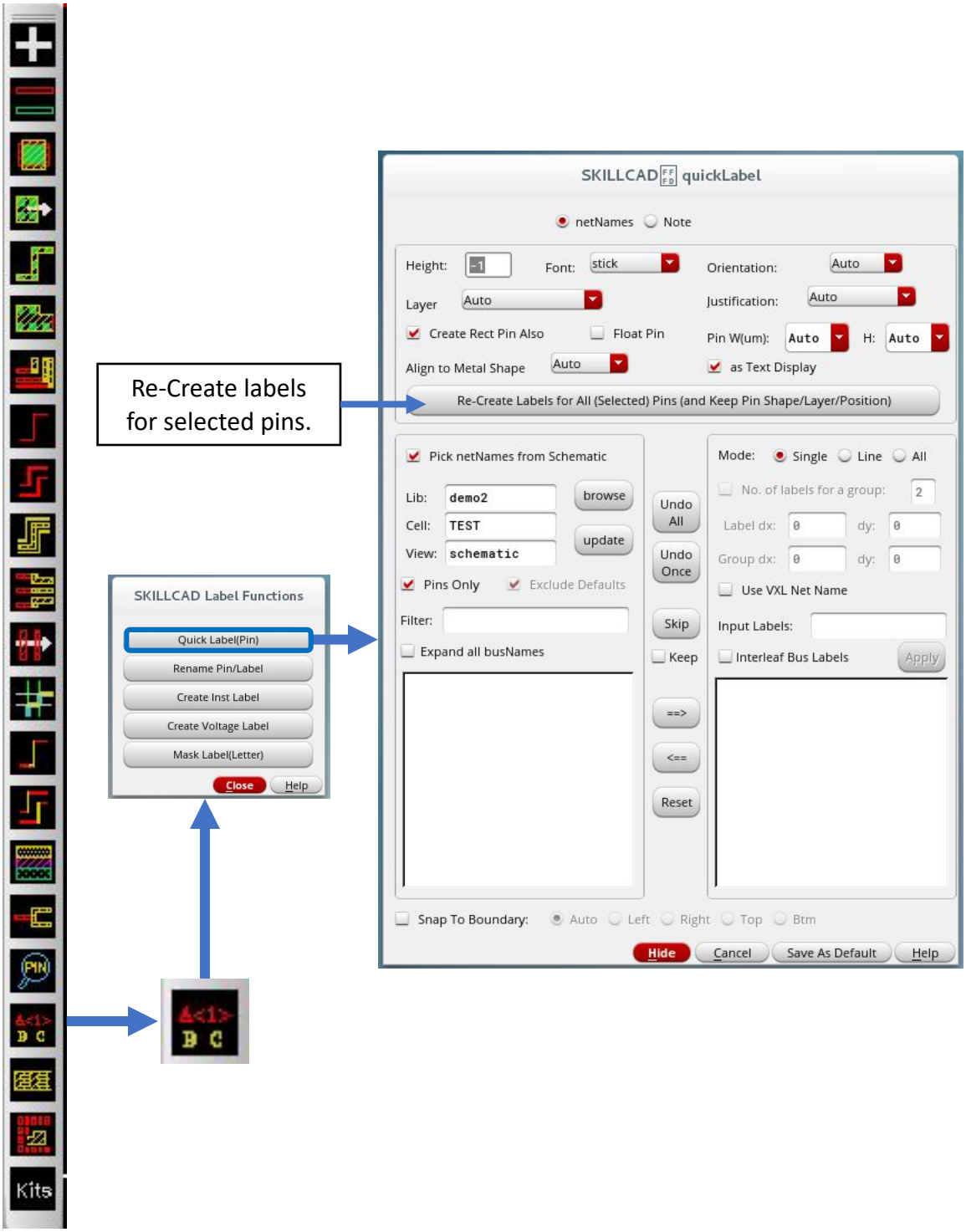
SKILLCAD rSolver



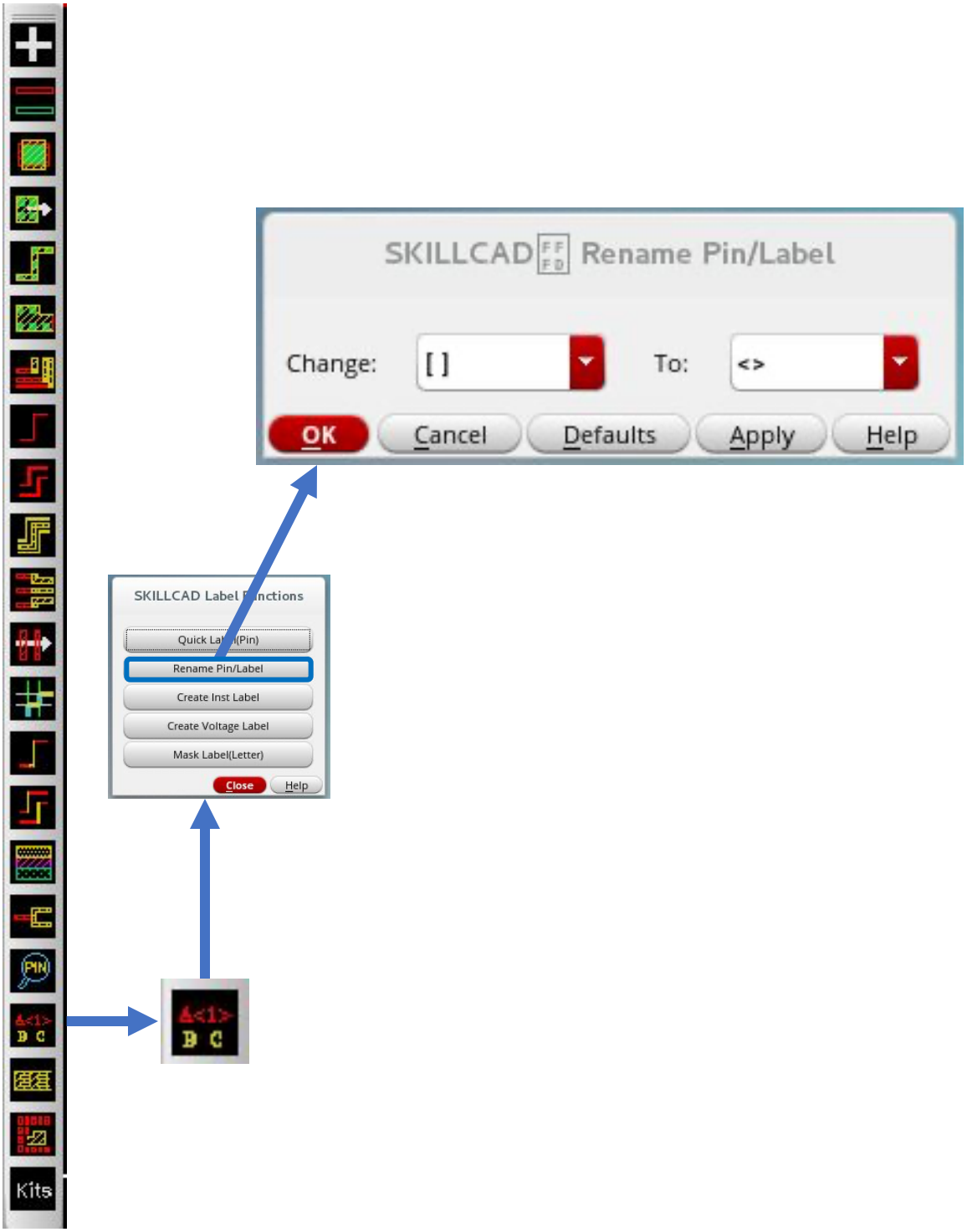
SKILLCAD Pattern Placer



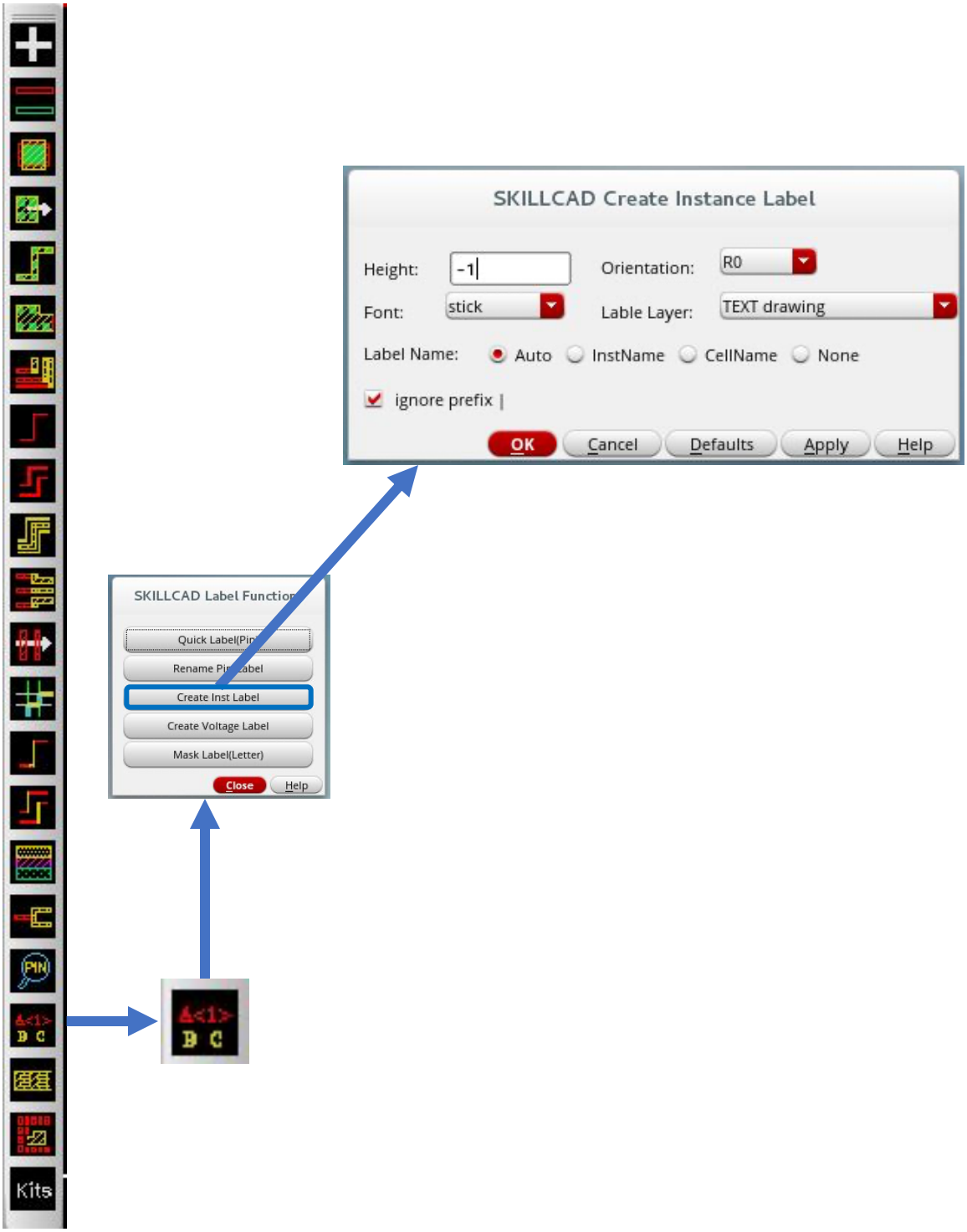
SKILLCAD Quick Label



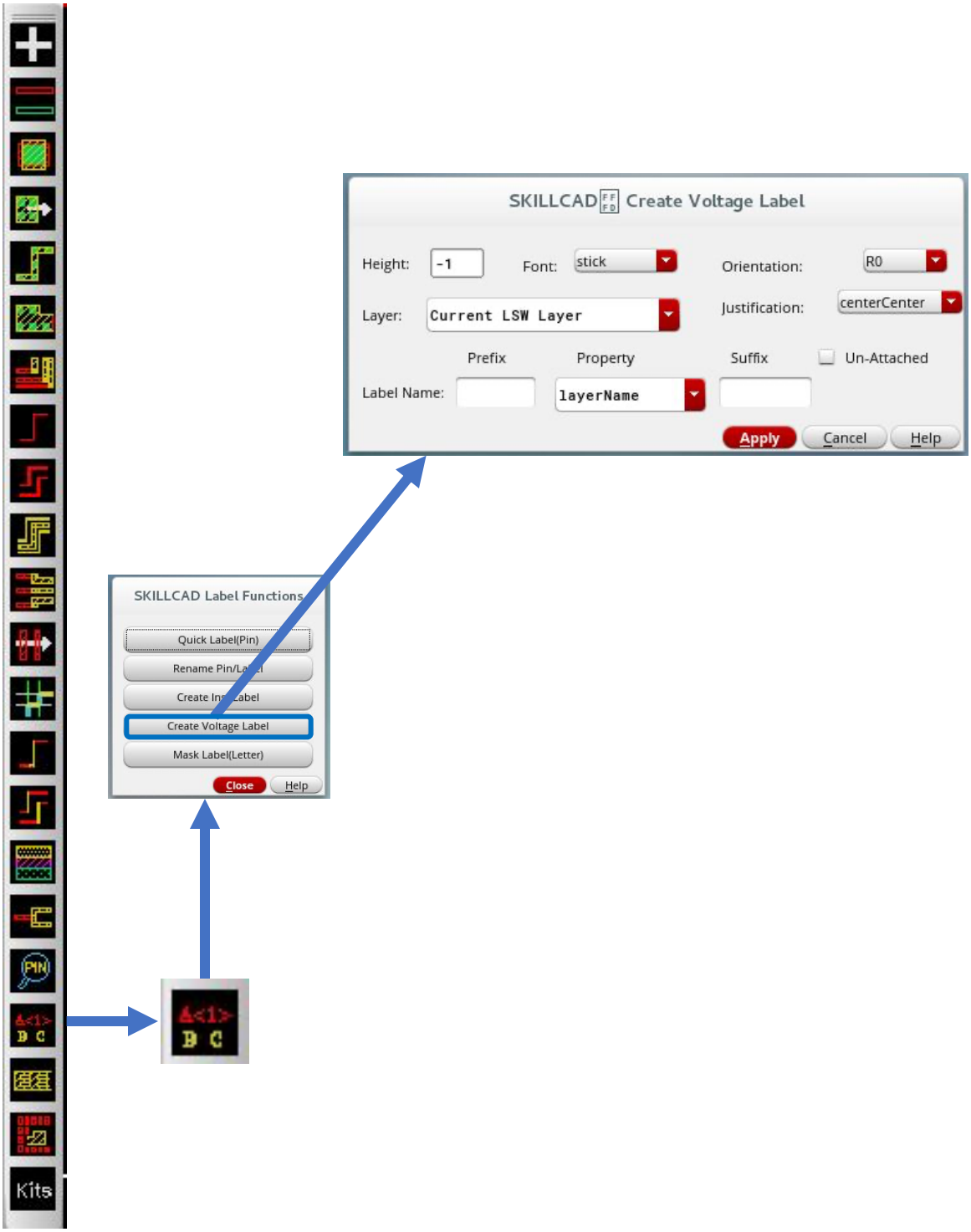
SKILLCAD Rename Pin/Label



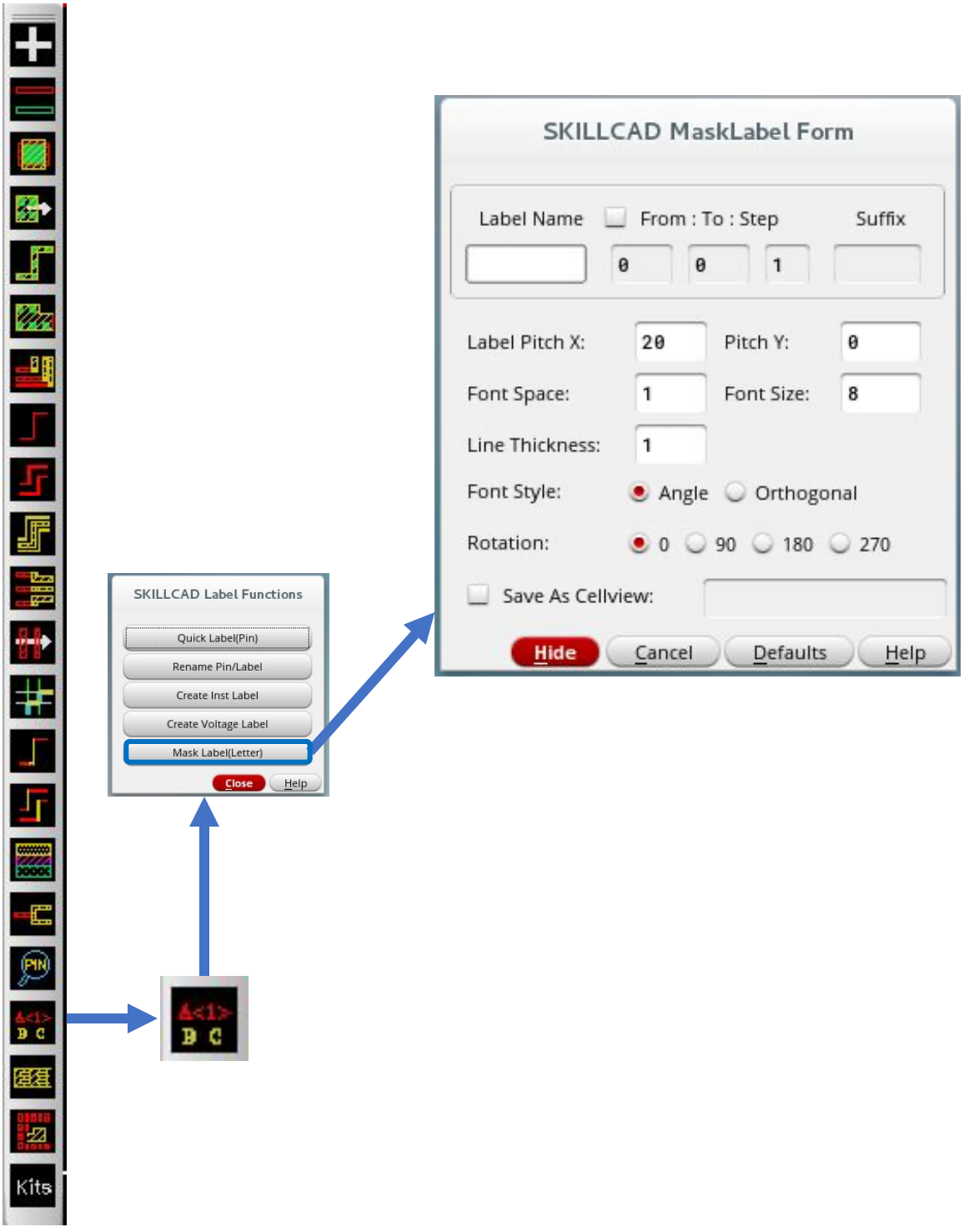
SKILLCAD Create Instance Labels



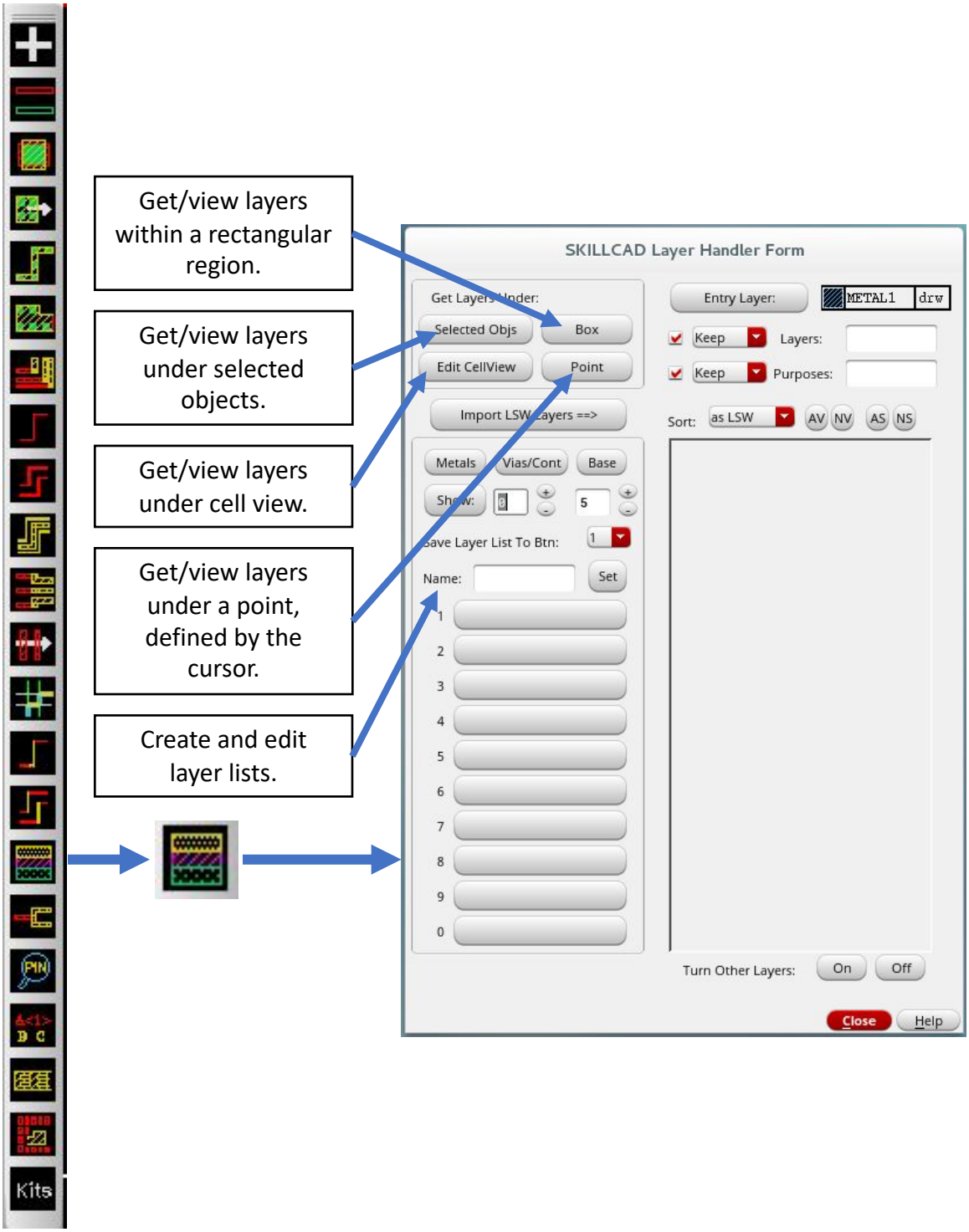
SKILLCAD Create Voltage Labels



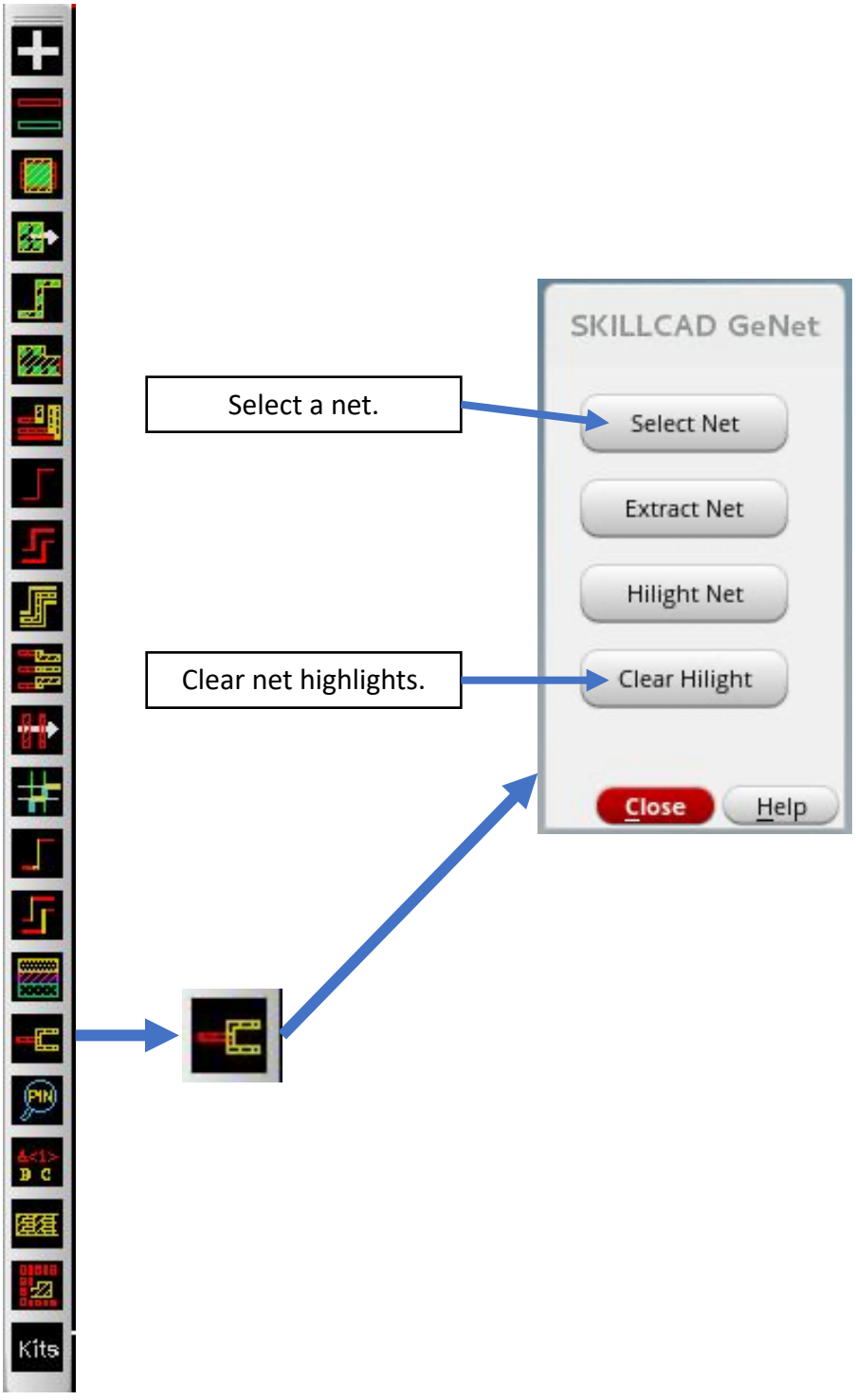
SKILLCAD Create Mask Labels



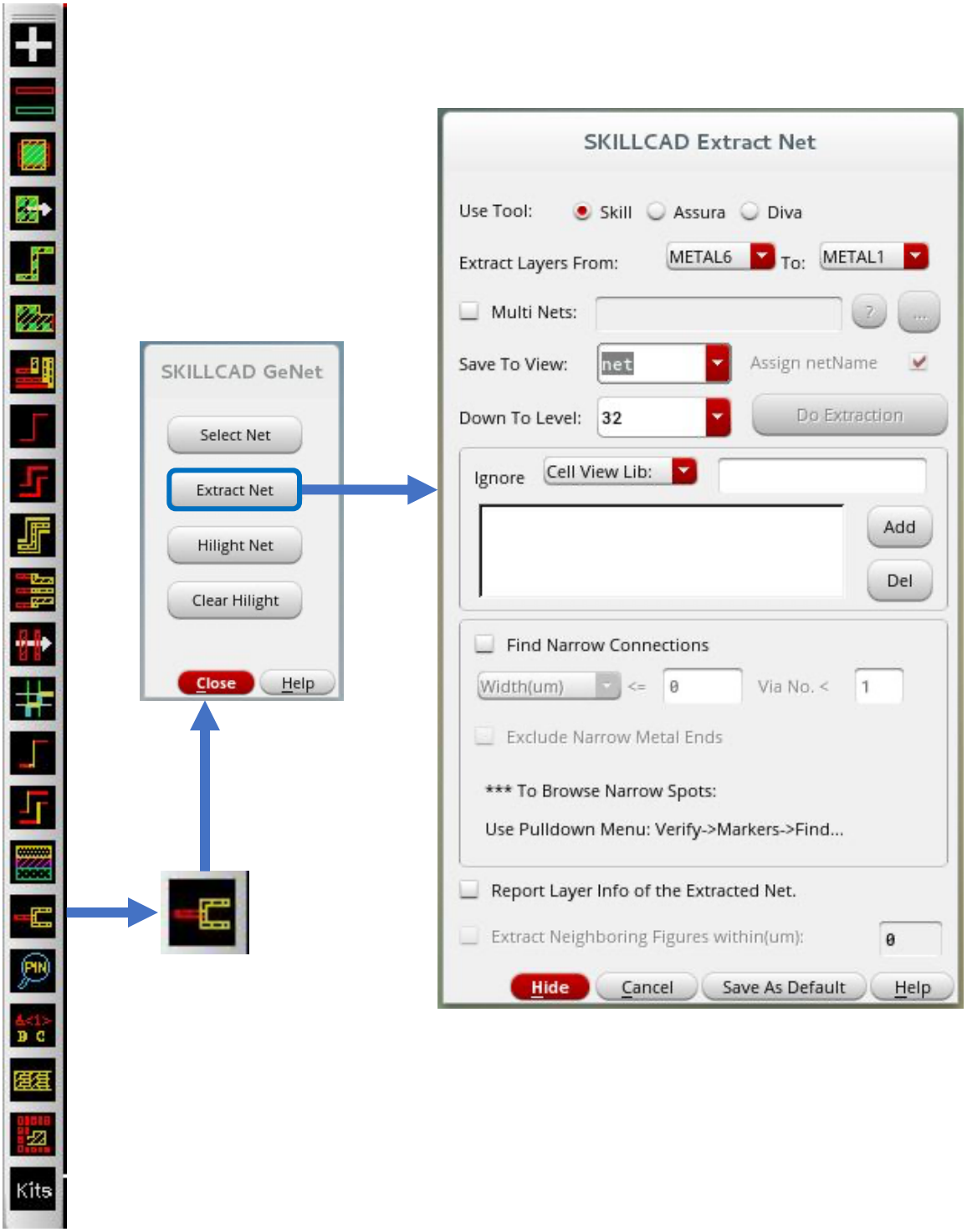
SKILLCAD Layer Handler



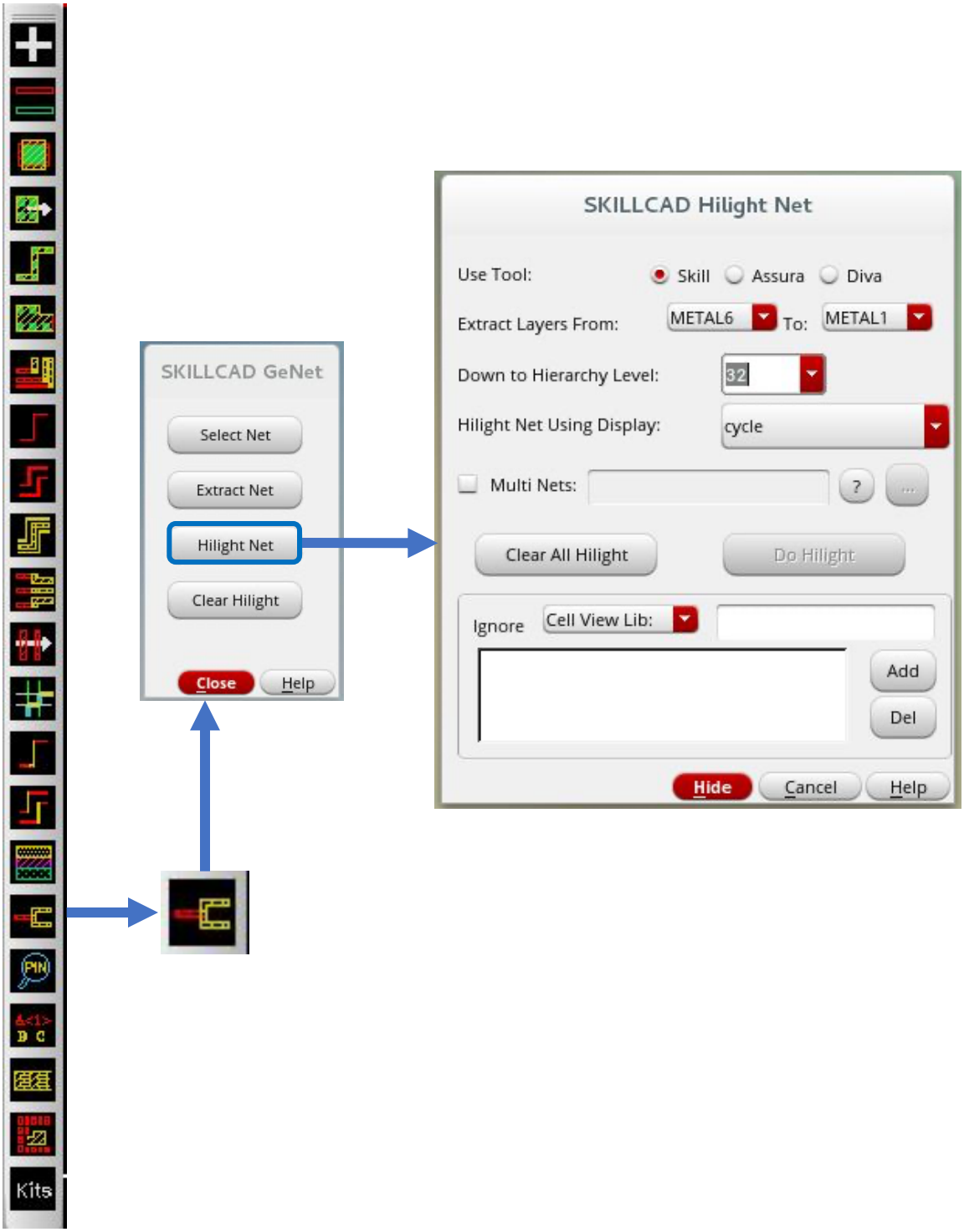
SKILLCAD Select Net, Clear Net Highlight



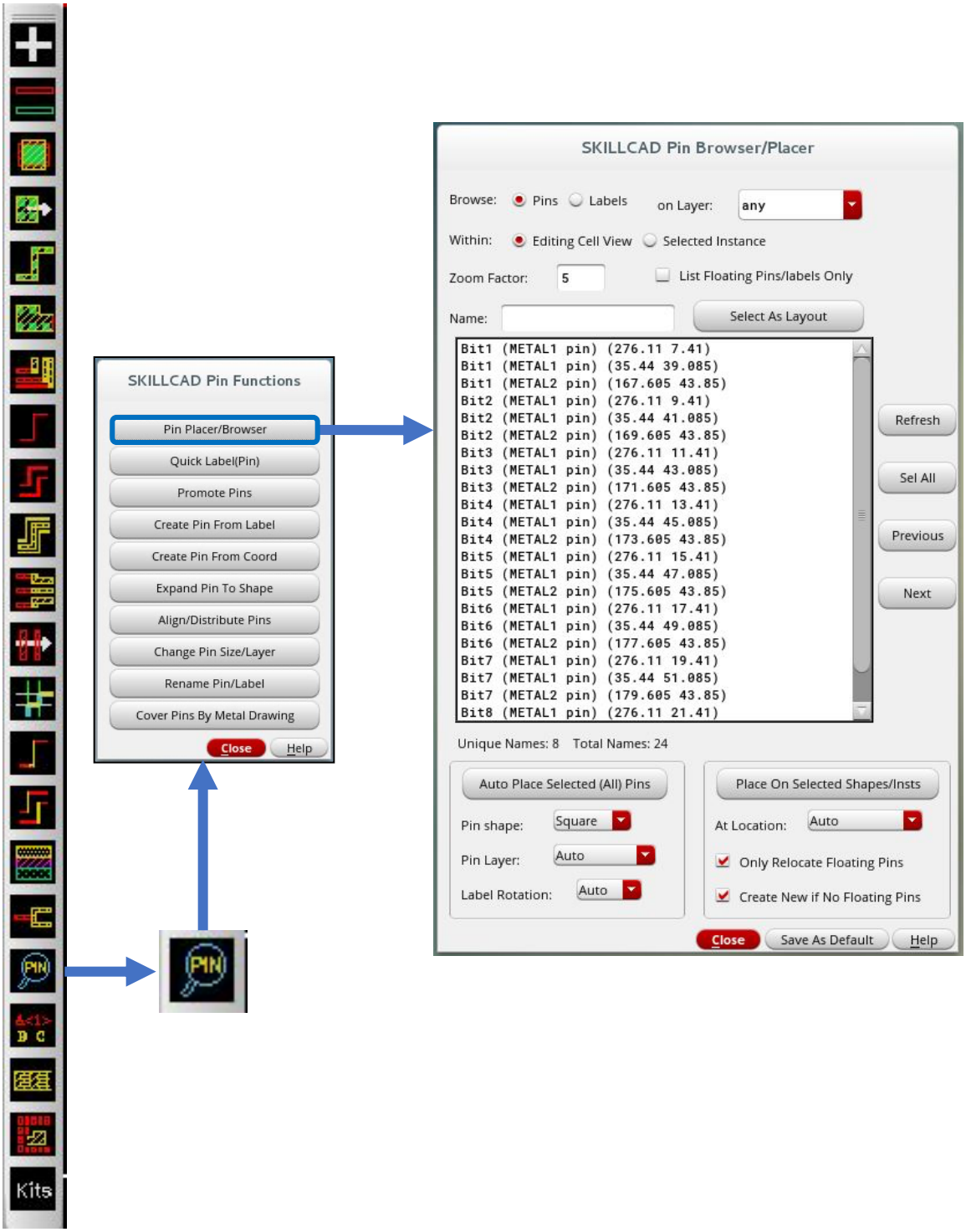
SKILLCAD Extracting a Net



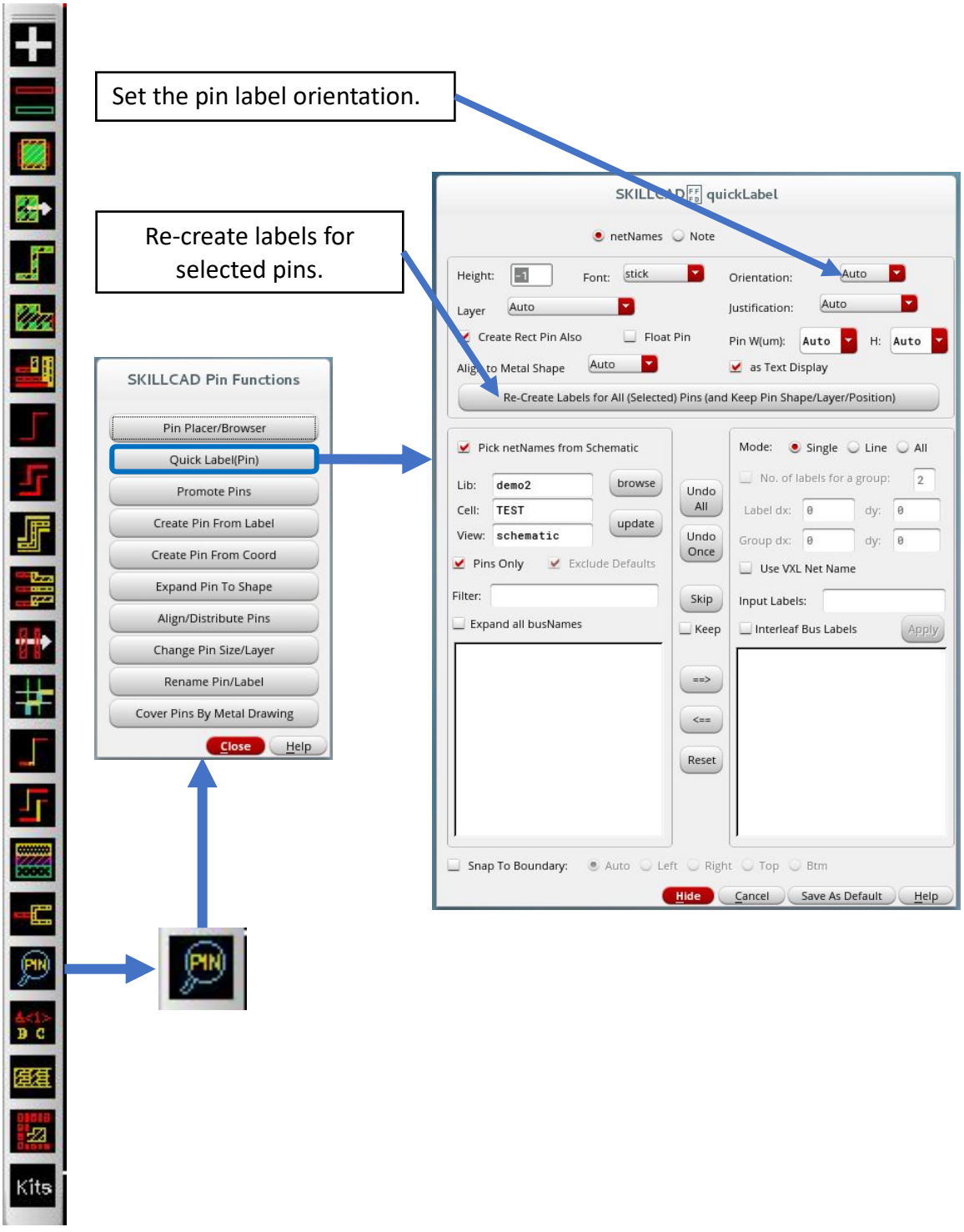
SKILLCAD Highlighting a Net



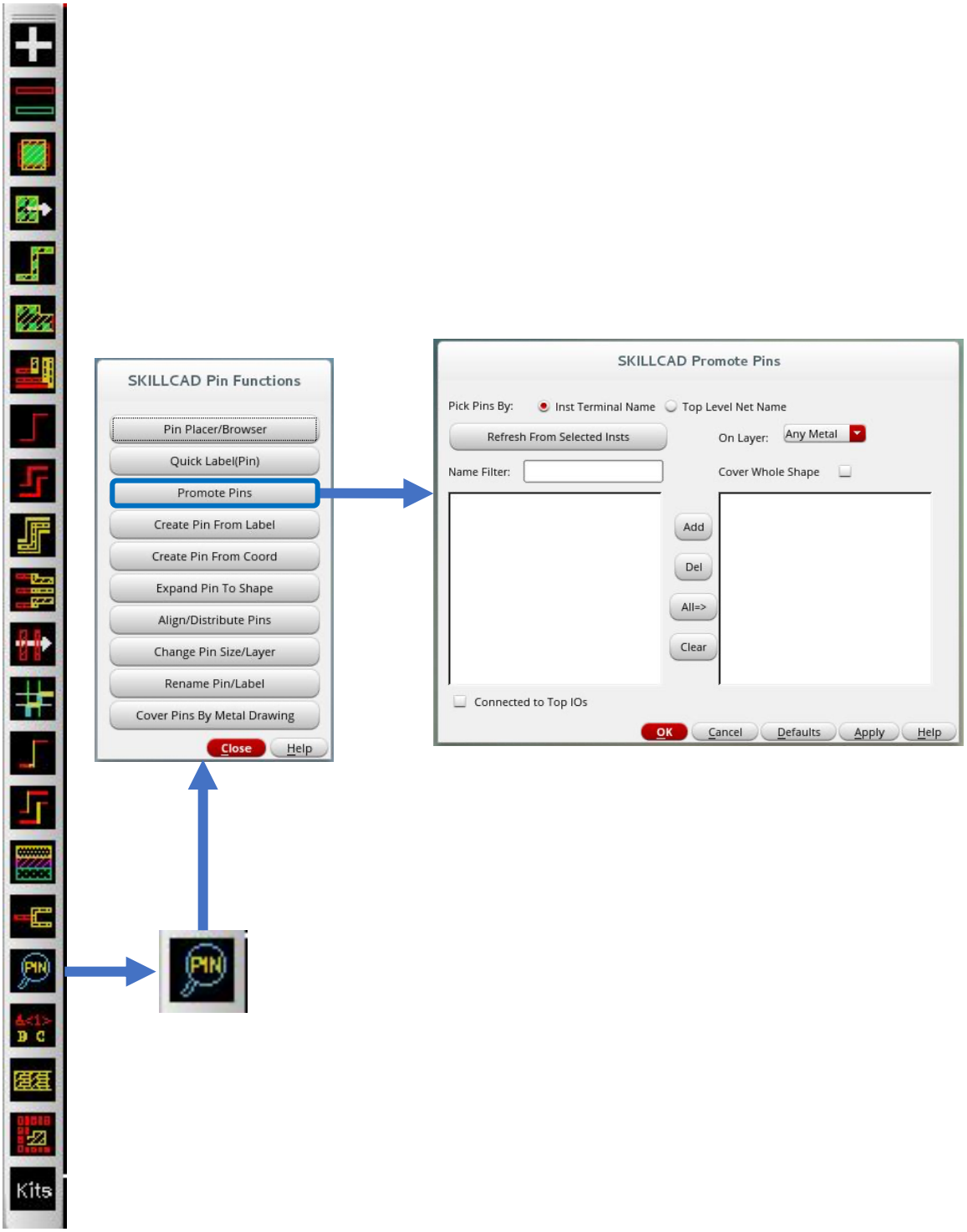
SKILLCAD Pin Placer/Browser



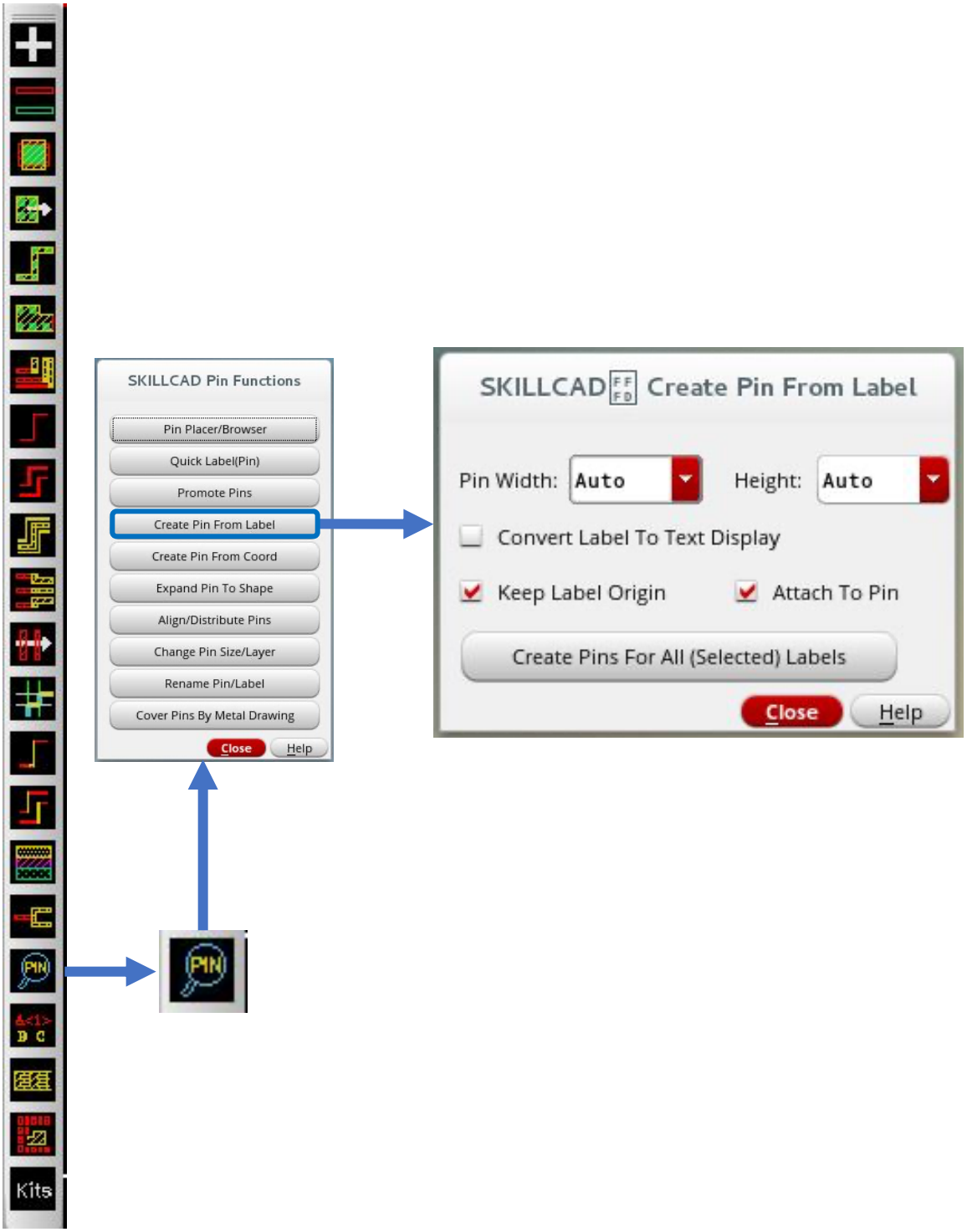
SKILLCAD Pin Label



SKILLCAD Promote Pins



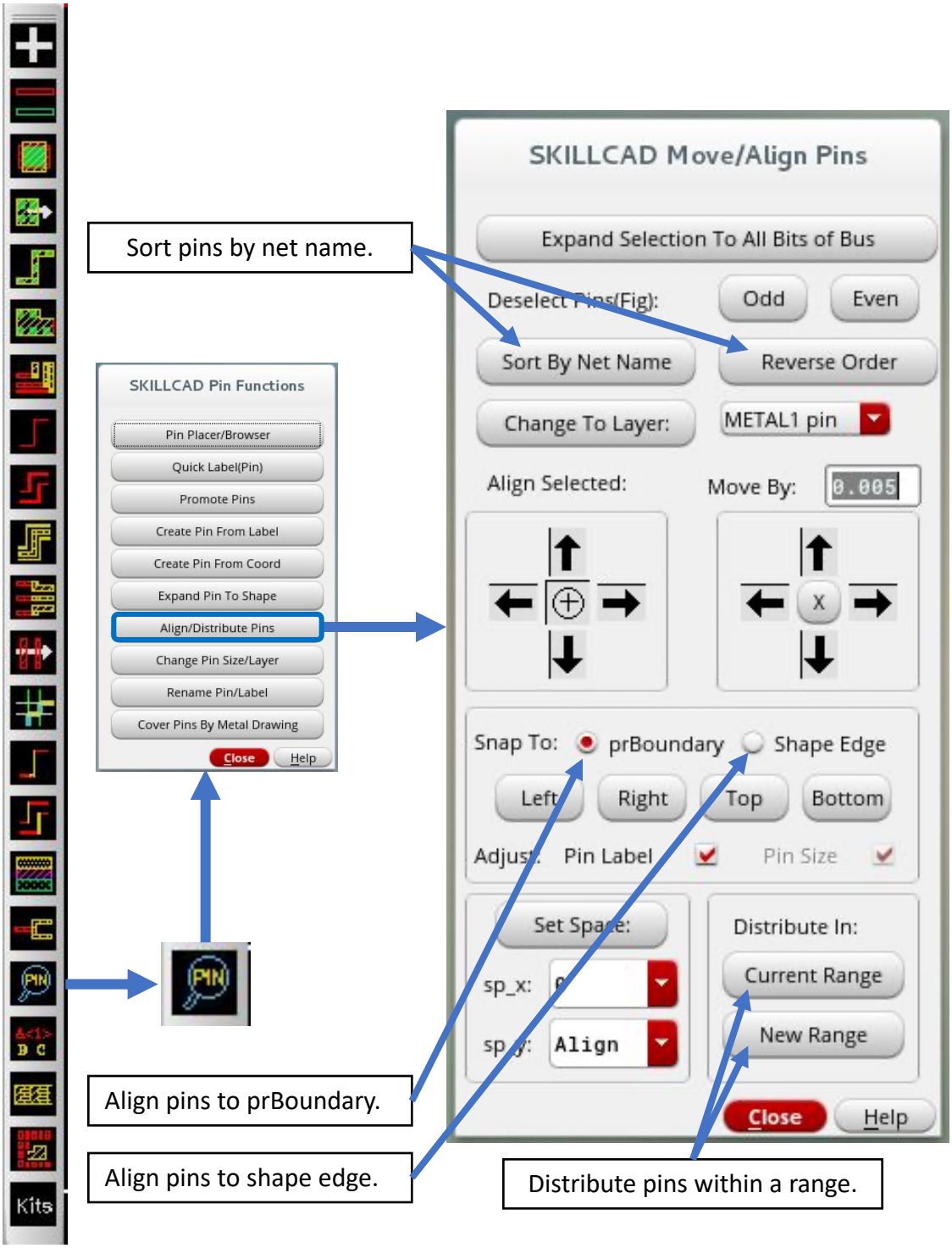
SKILLCAD Create Pin From Label



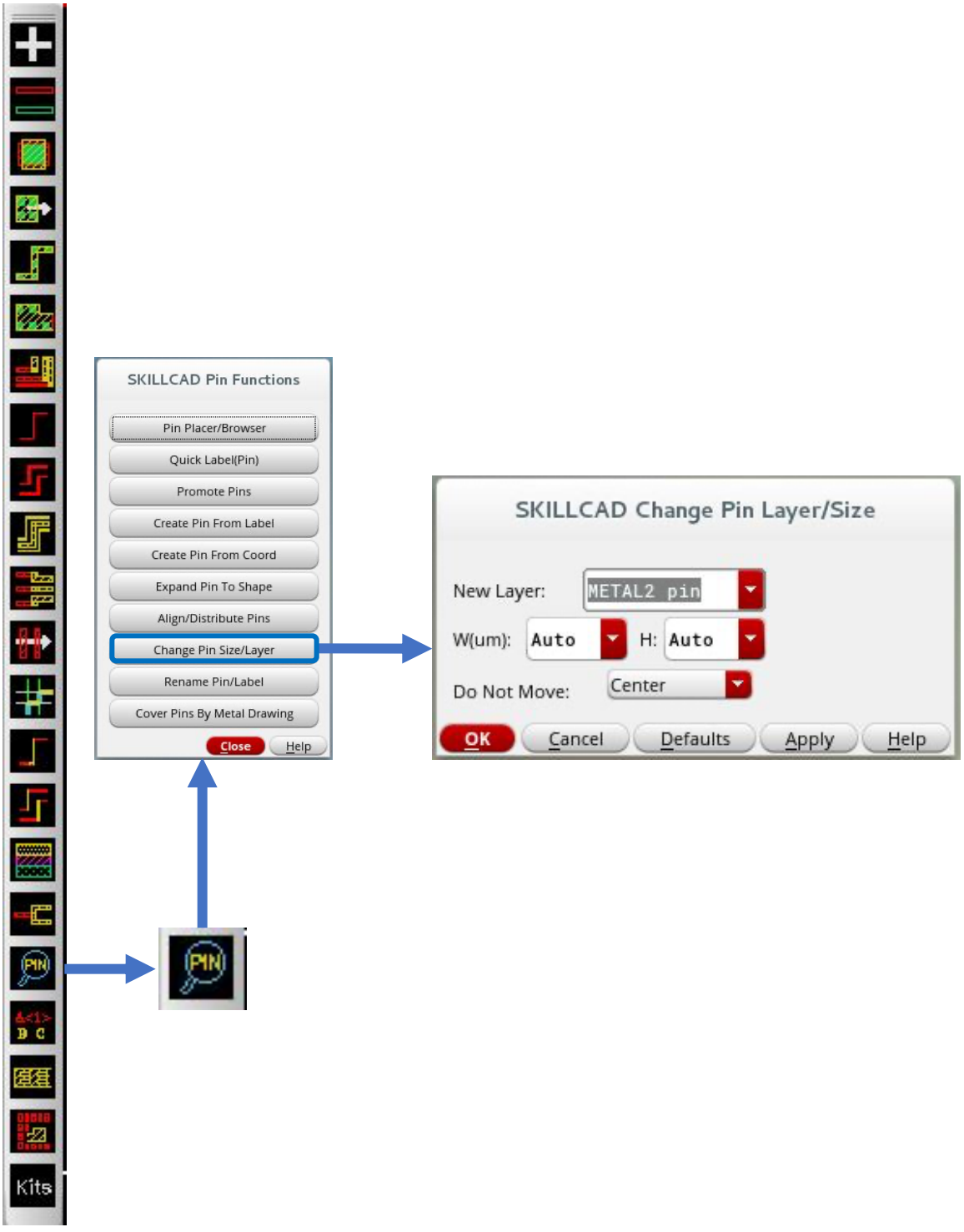
SKILLCAD Create Pin From Coordinates

SKILLCAD Expand Pin To Shape

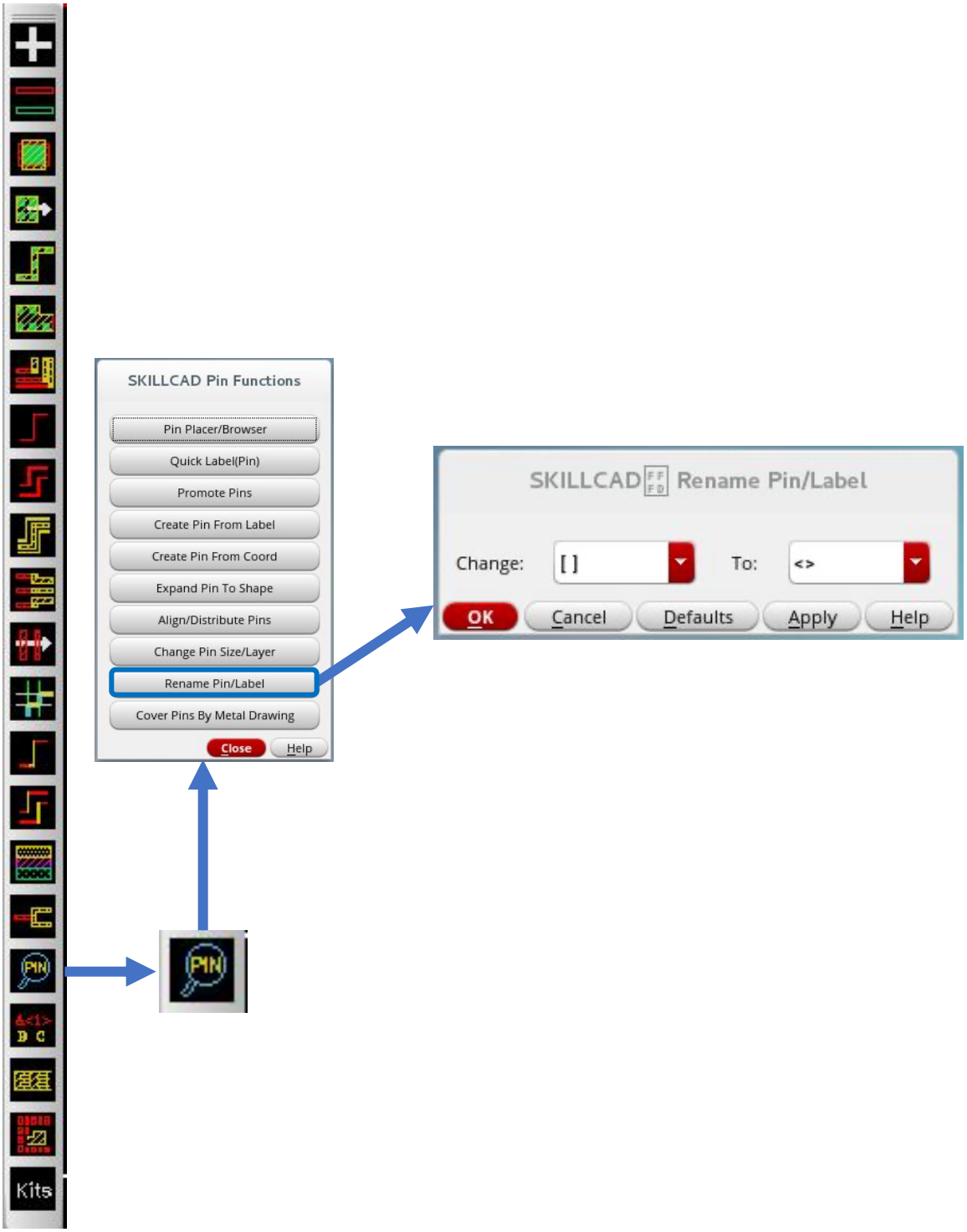
SKILLCAD Align/Distribute Pins



SKILLCAD Change Pin Size/Layer

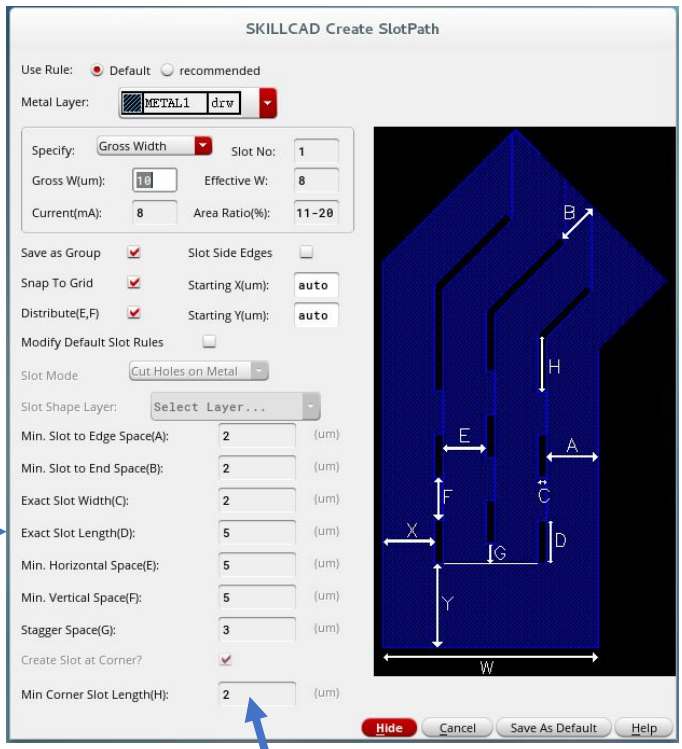


SKILLCAD Rename Pin/Label



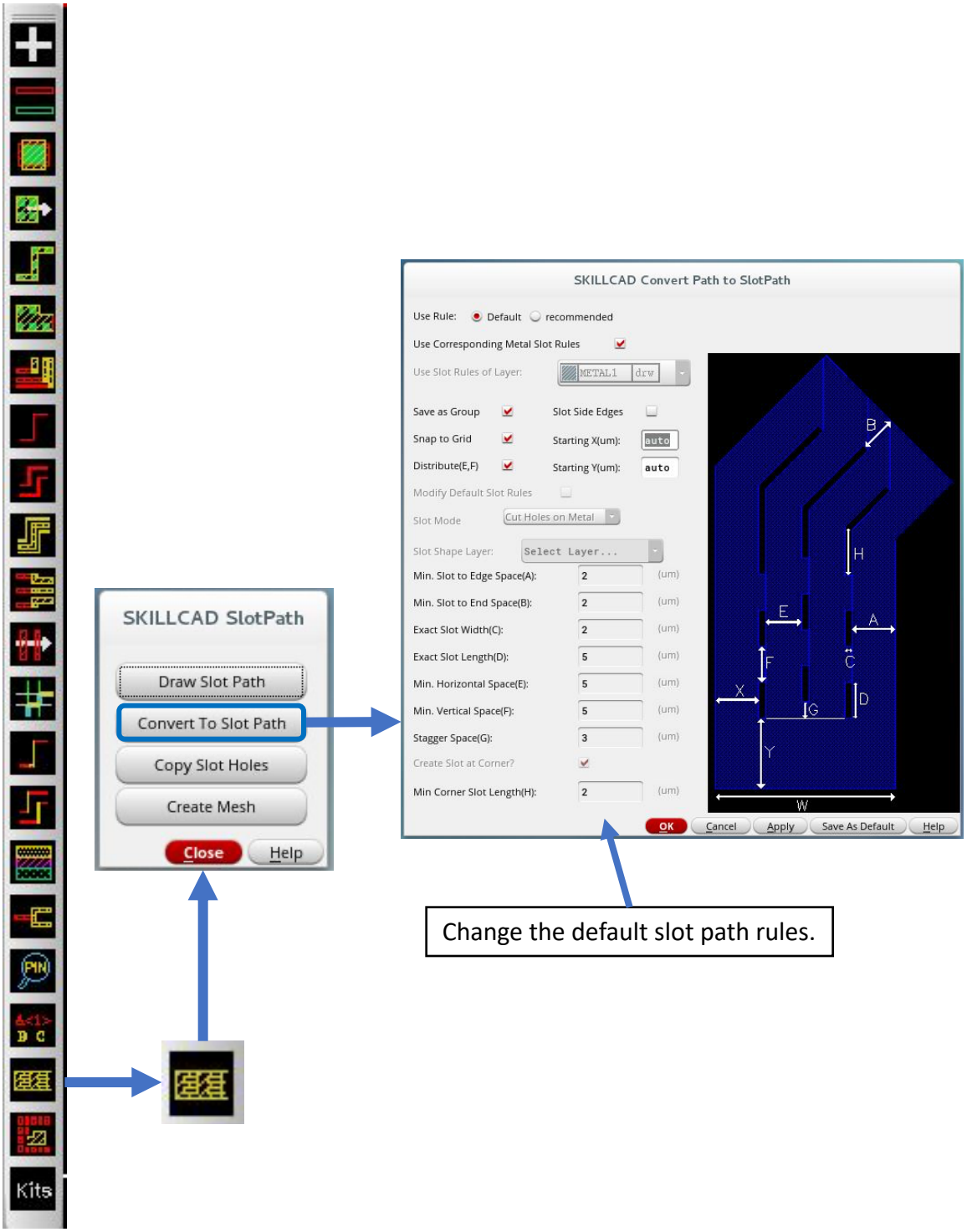
SKILLCAD Cover Pins With Drawing Purpose

SKILLCAD Creating A Slotted Path

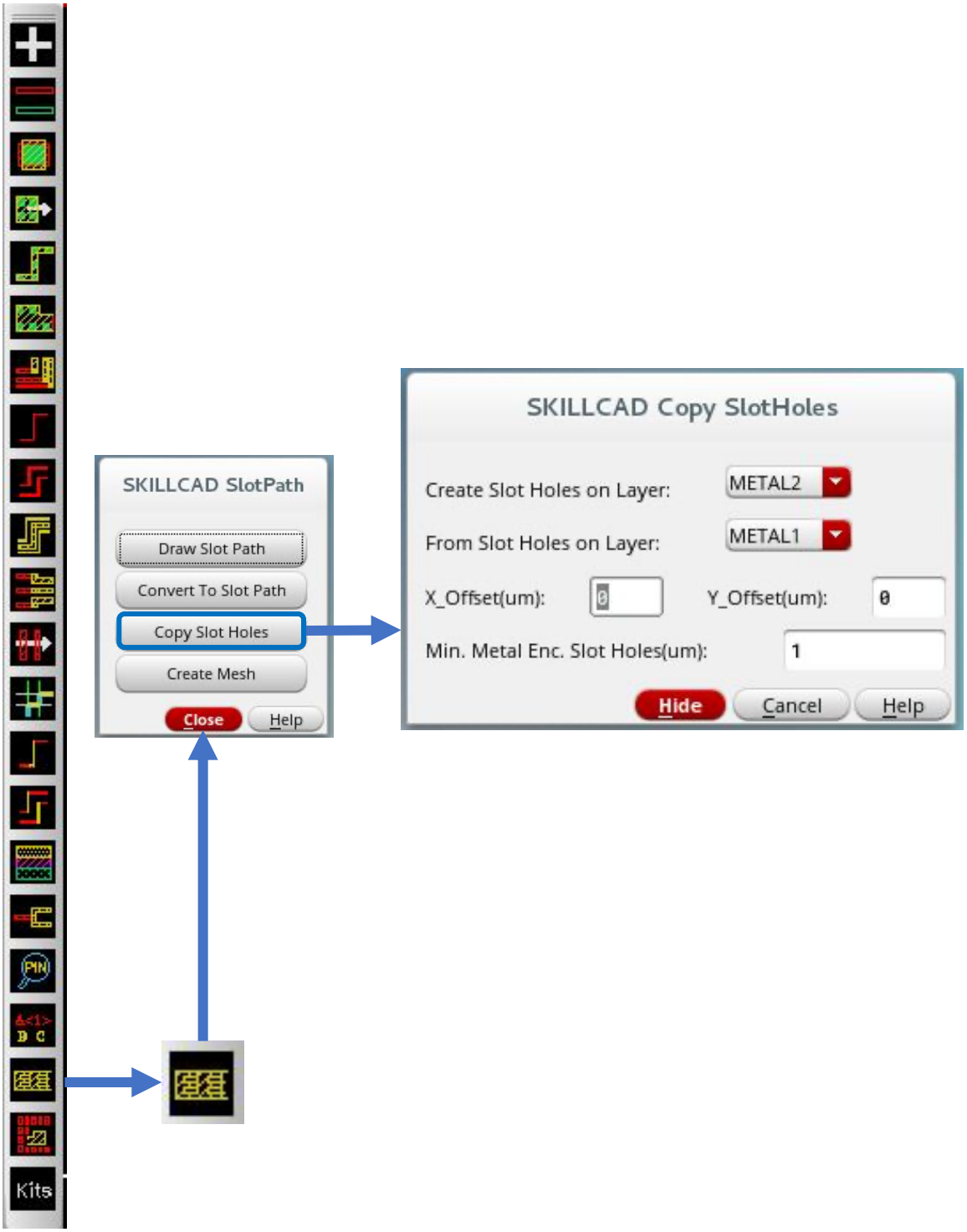


Change the default slot path rules.

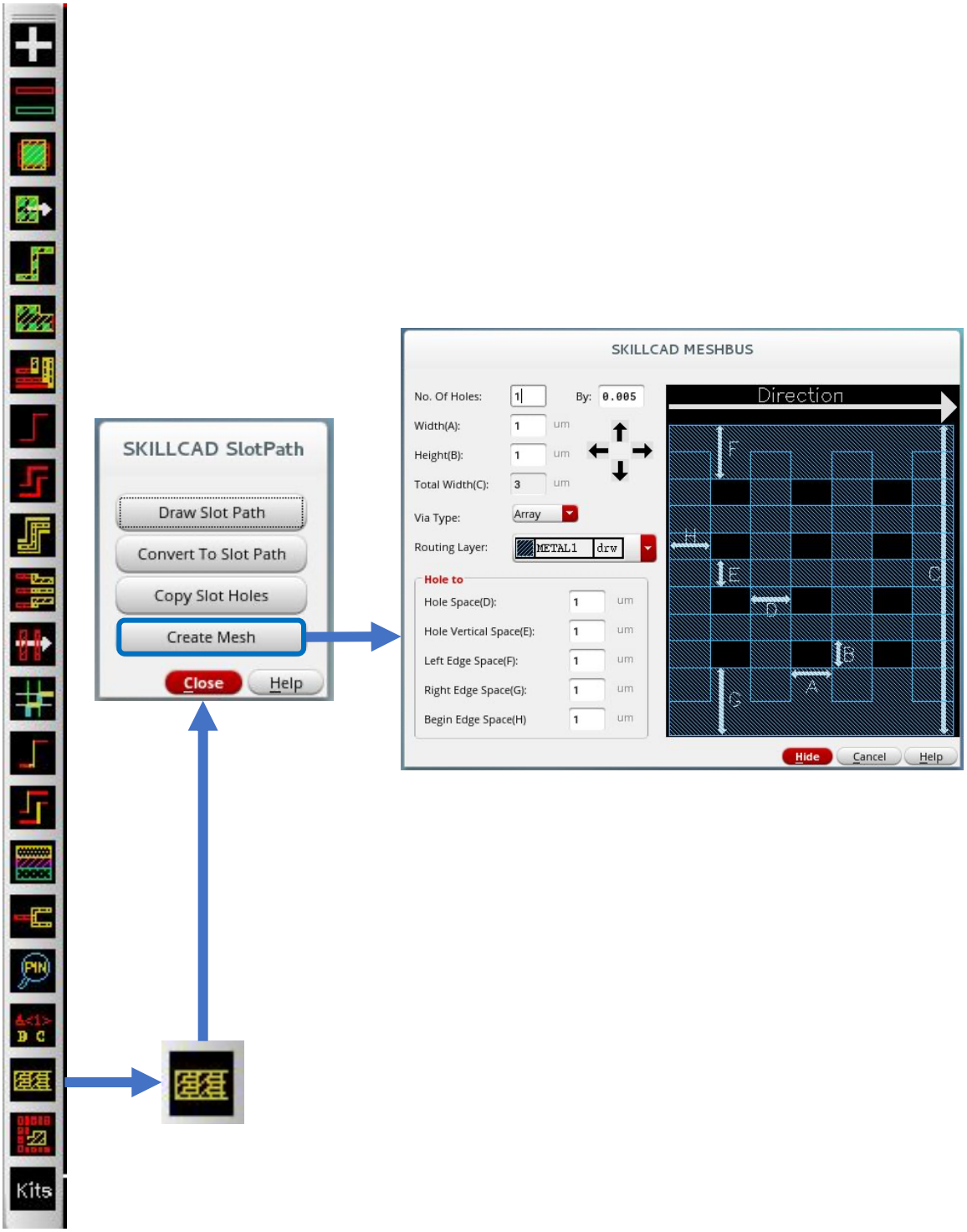
SKILLCAD Convert A Path To A Slotted Shape



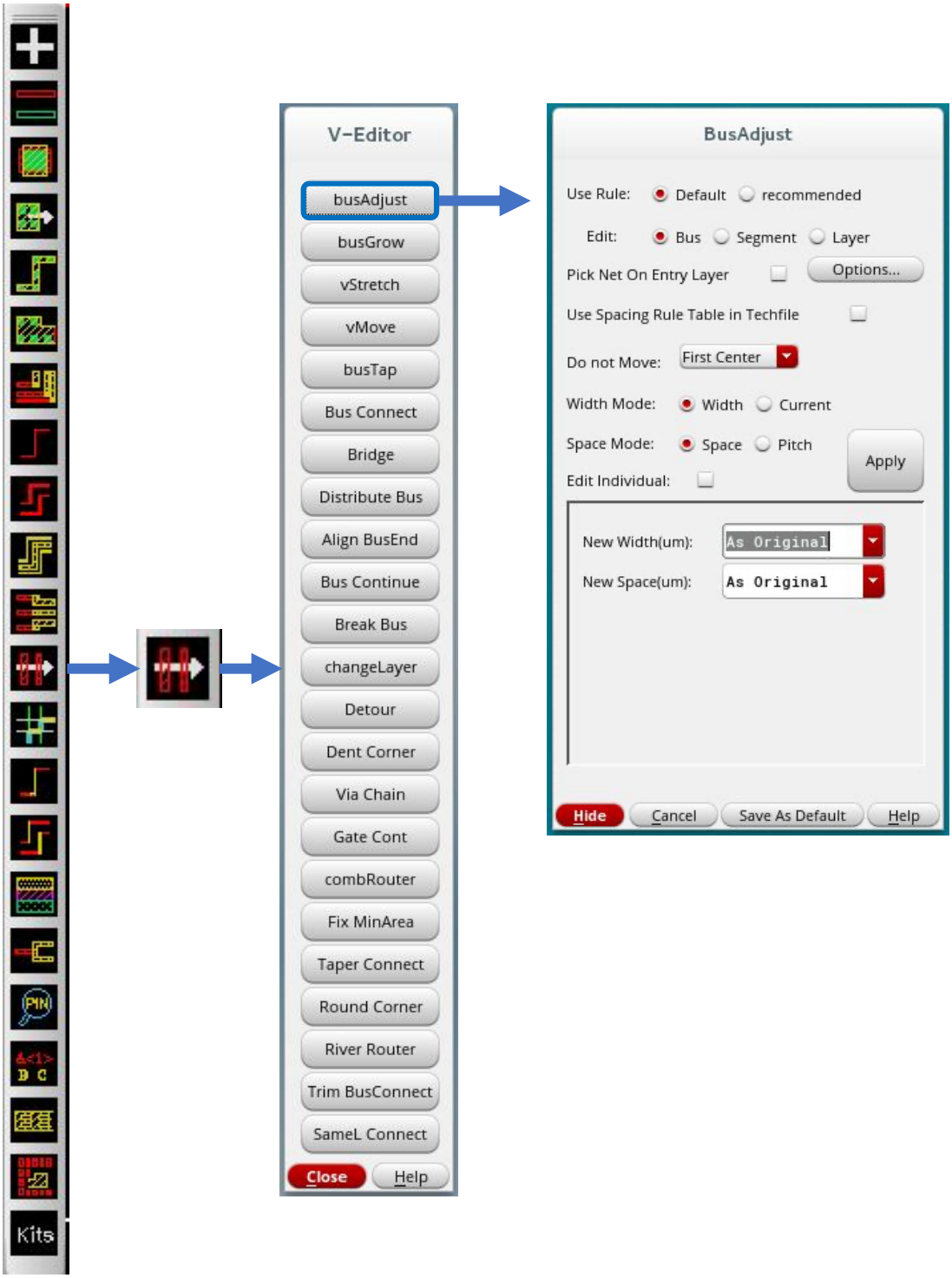
SKILLCAD Copy Slot Holes



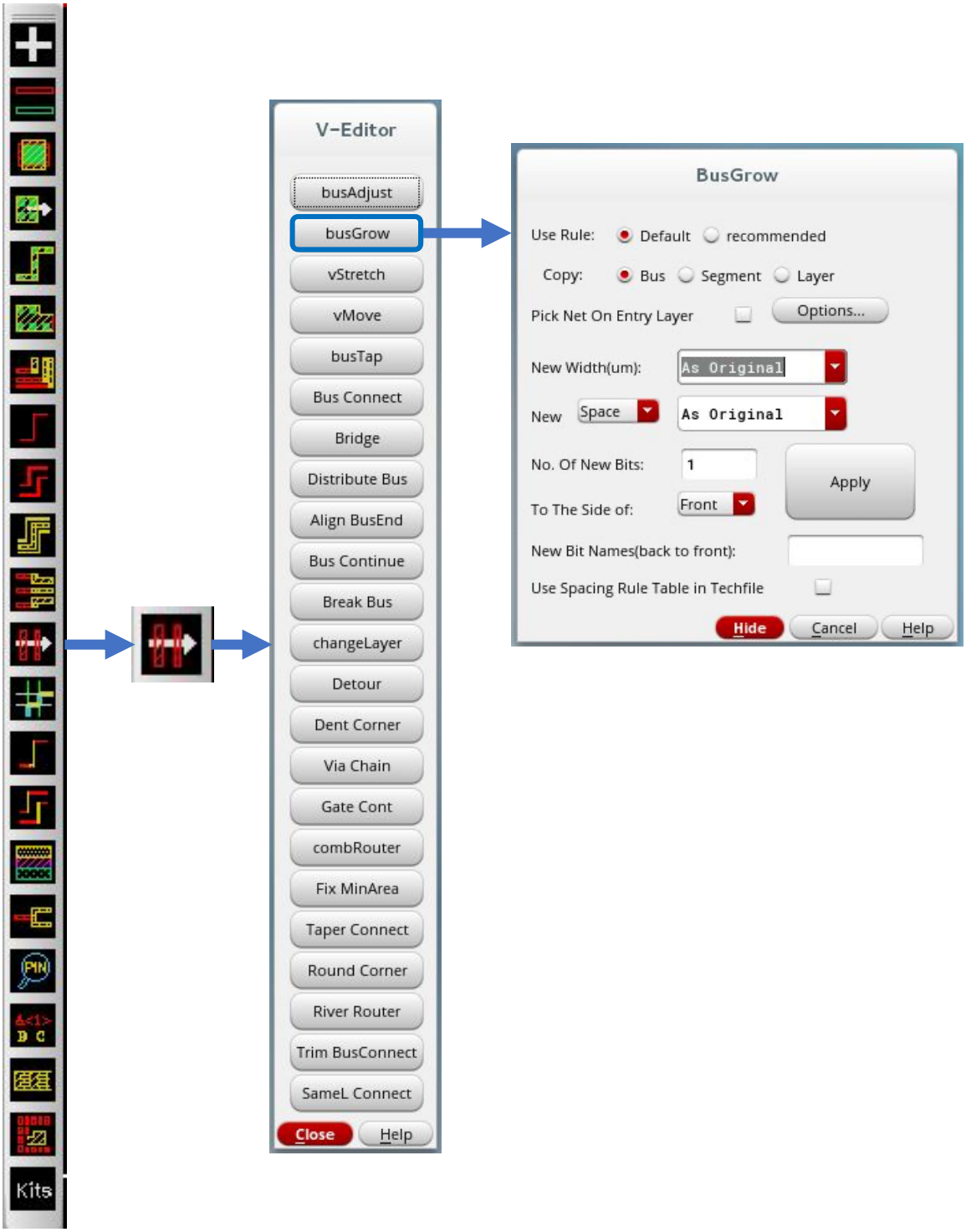
SKILLCAD Creating A Metal Mesh



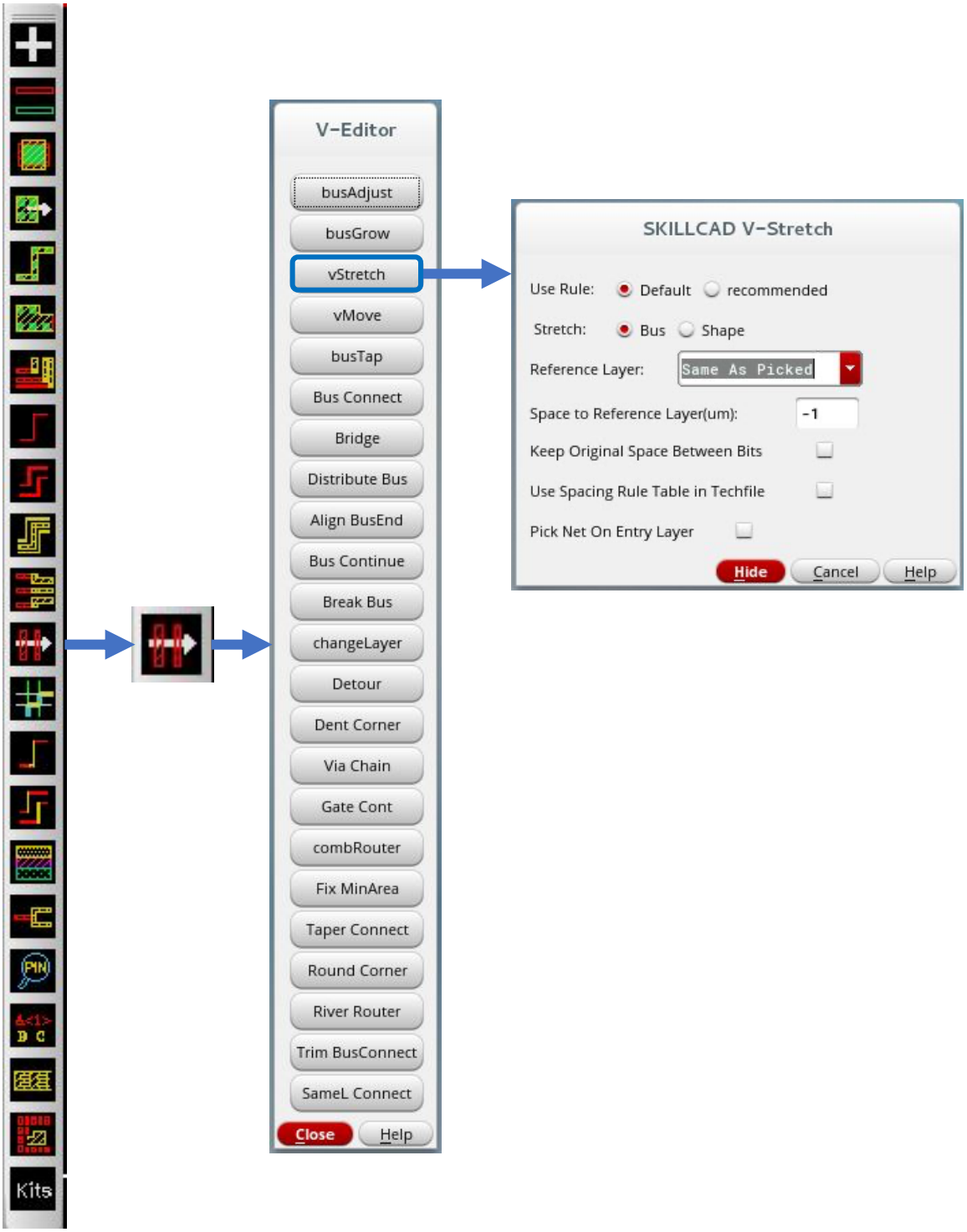
SKILLCAD V-Editor, Bus Adjust



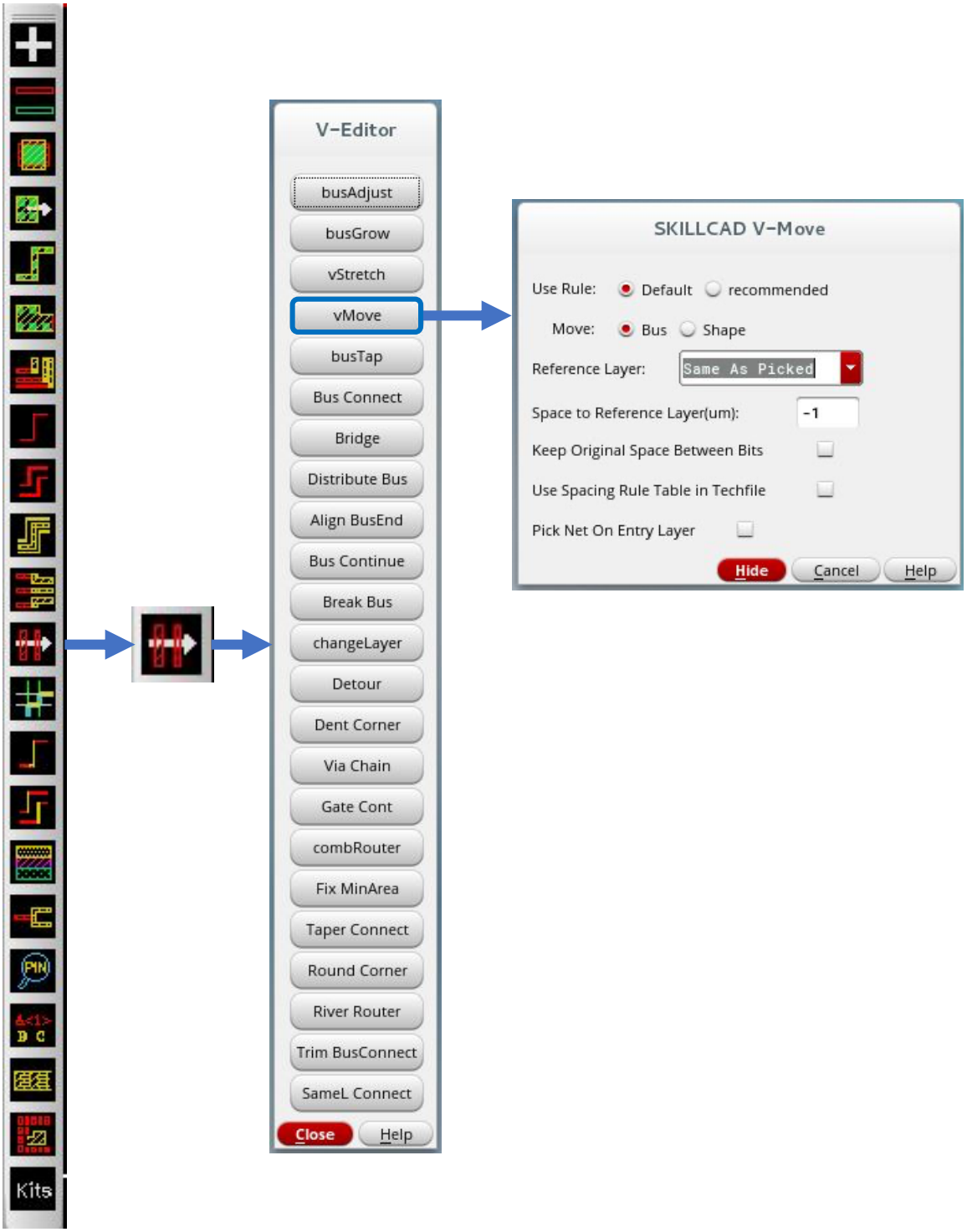
SKILLCAD V-Editor, Bus Grow



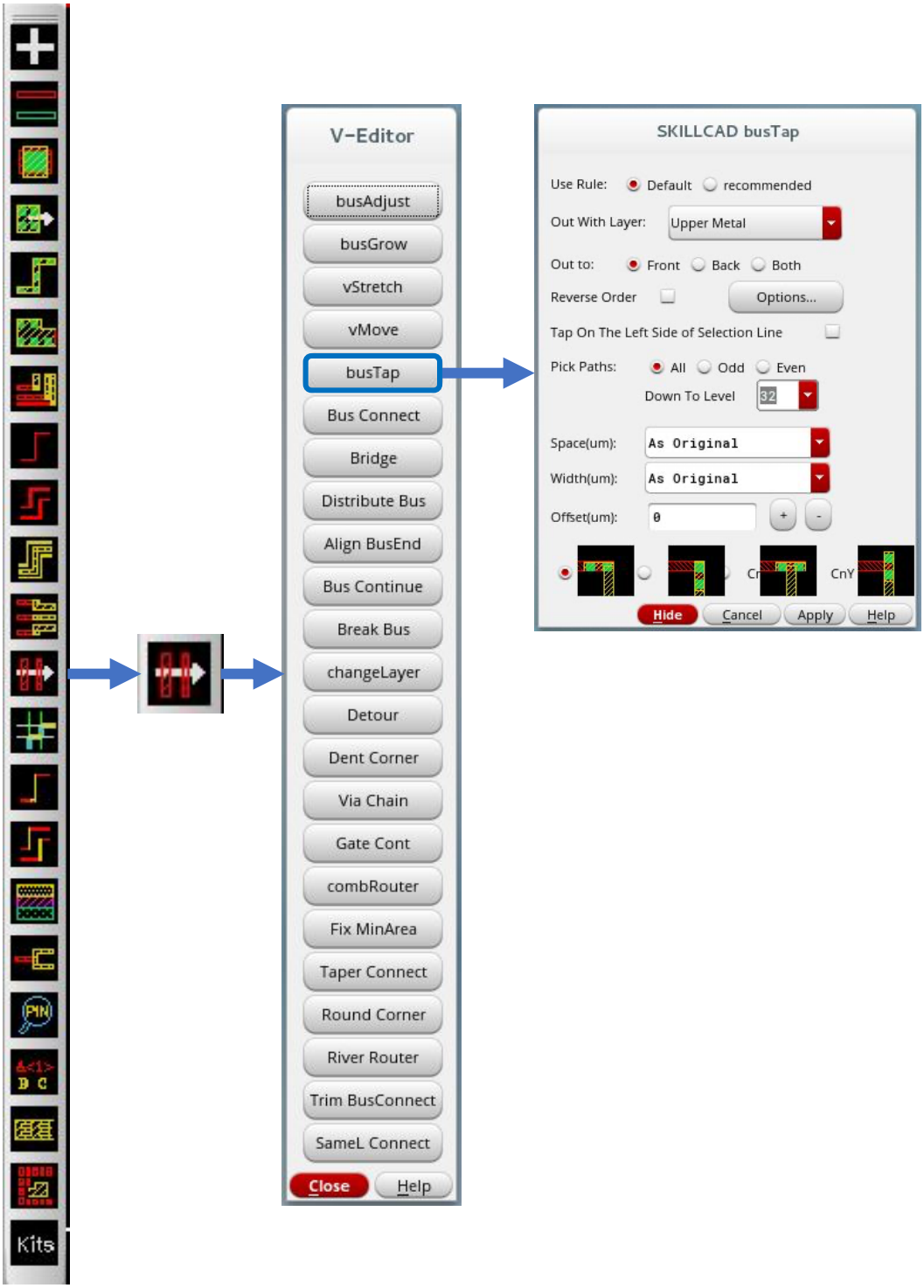
SKILLCAD V-Editor, V-Stretch



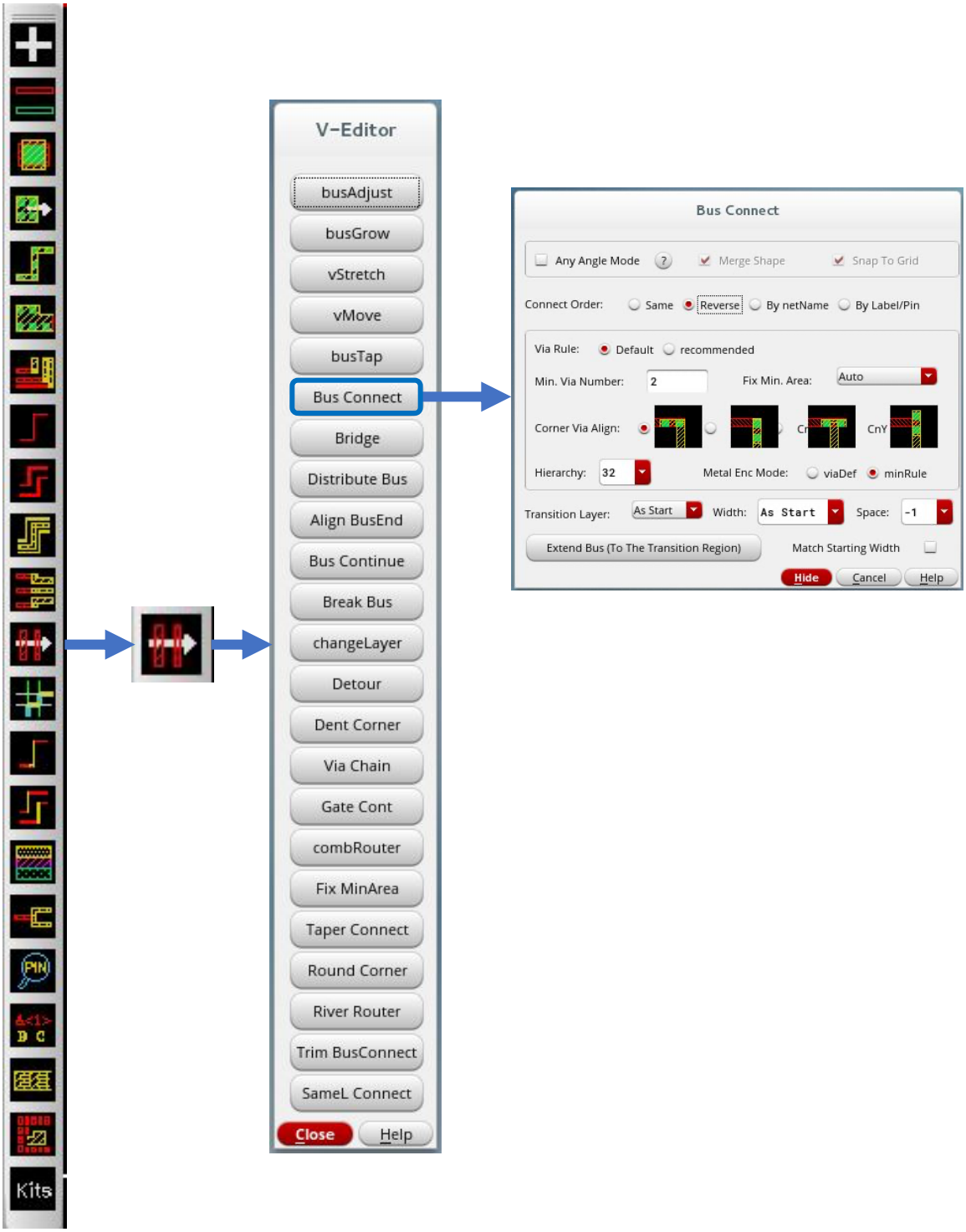
SKILLCAD V-Editor, V-Move



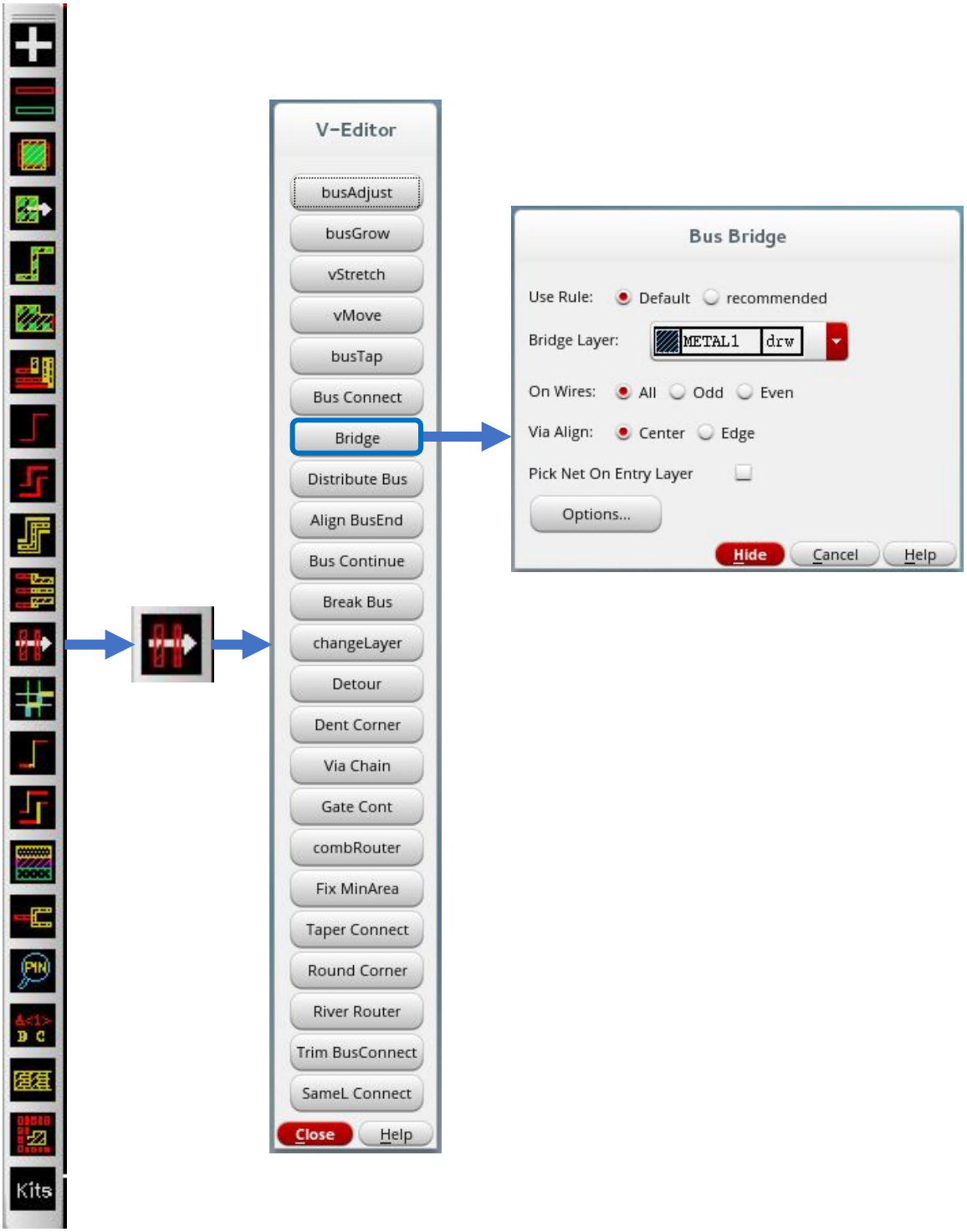
SKILLCAD V-Editor, Bus Tap



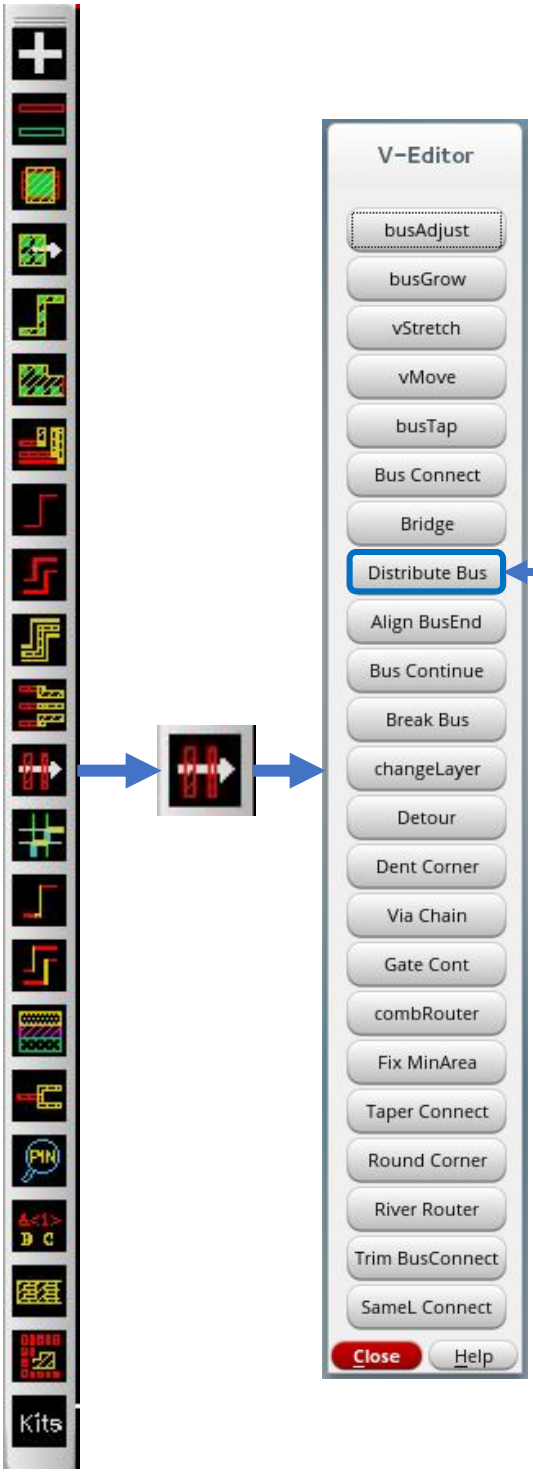
SKILLCAD V-Editor, Bus Connect



SKILLCAD V-Editor, Bus Bridge

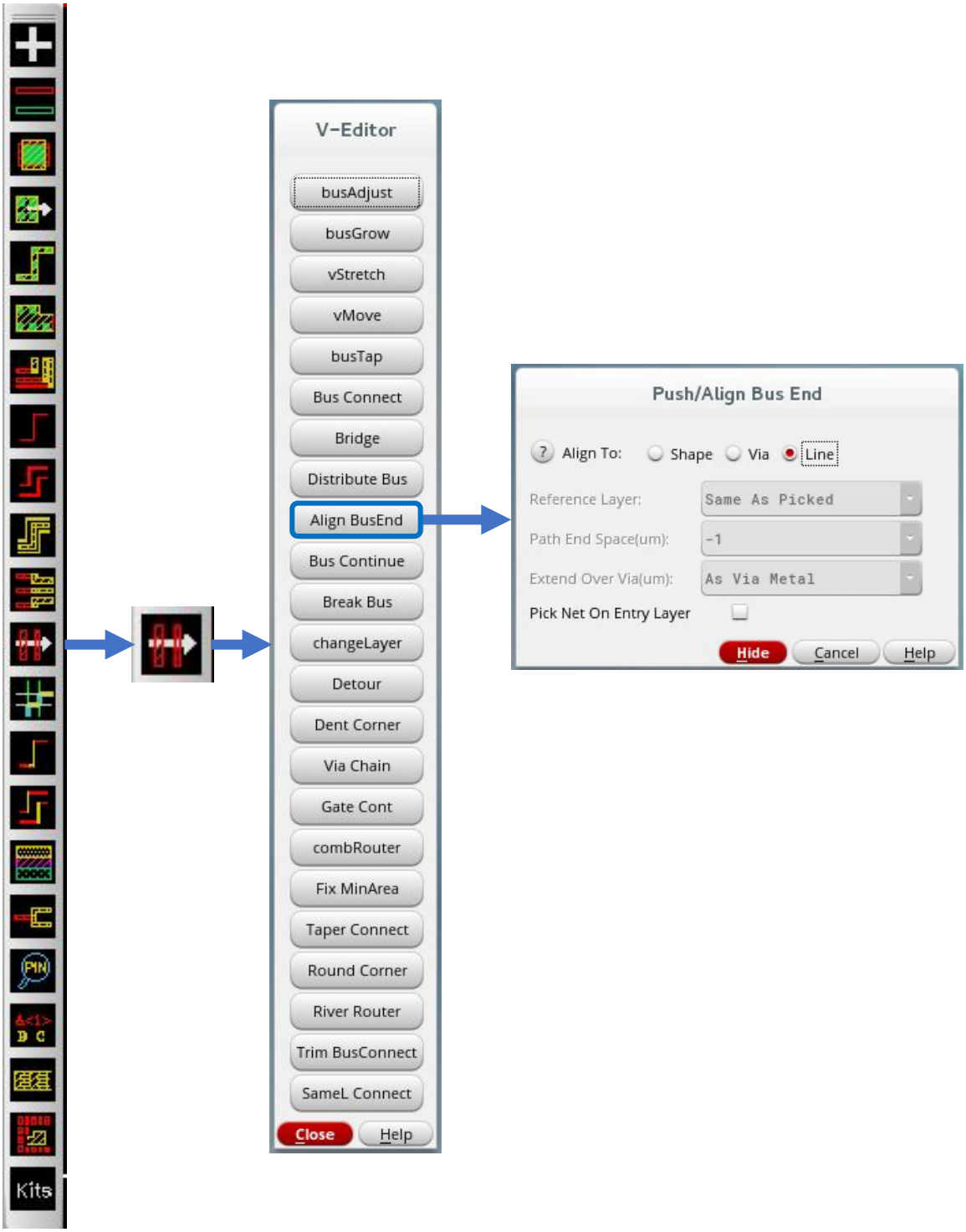


SKILLCAD V-Editor, Distribute Bus

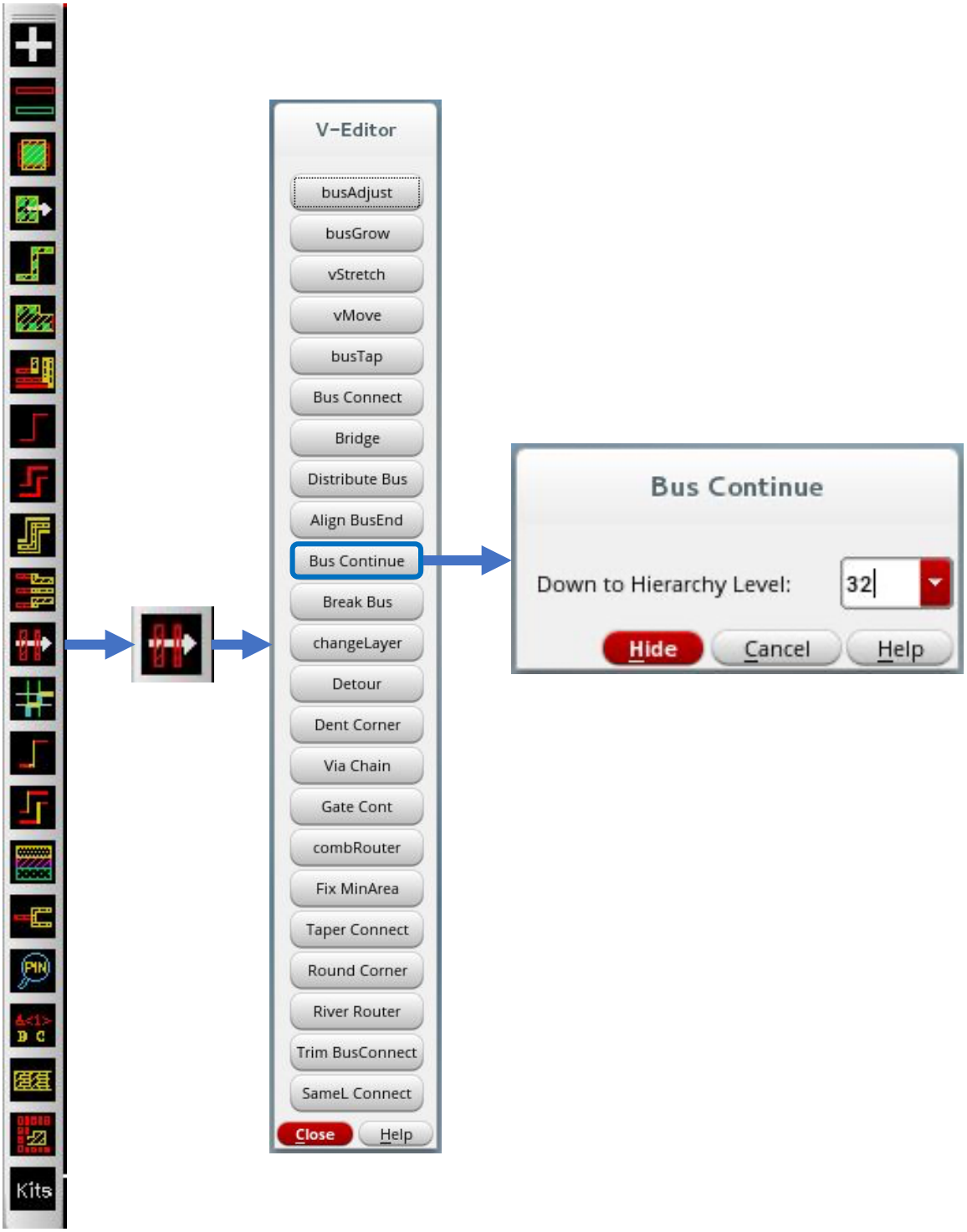


Evenly distributing bus metals (spacings) in a given area

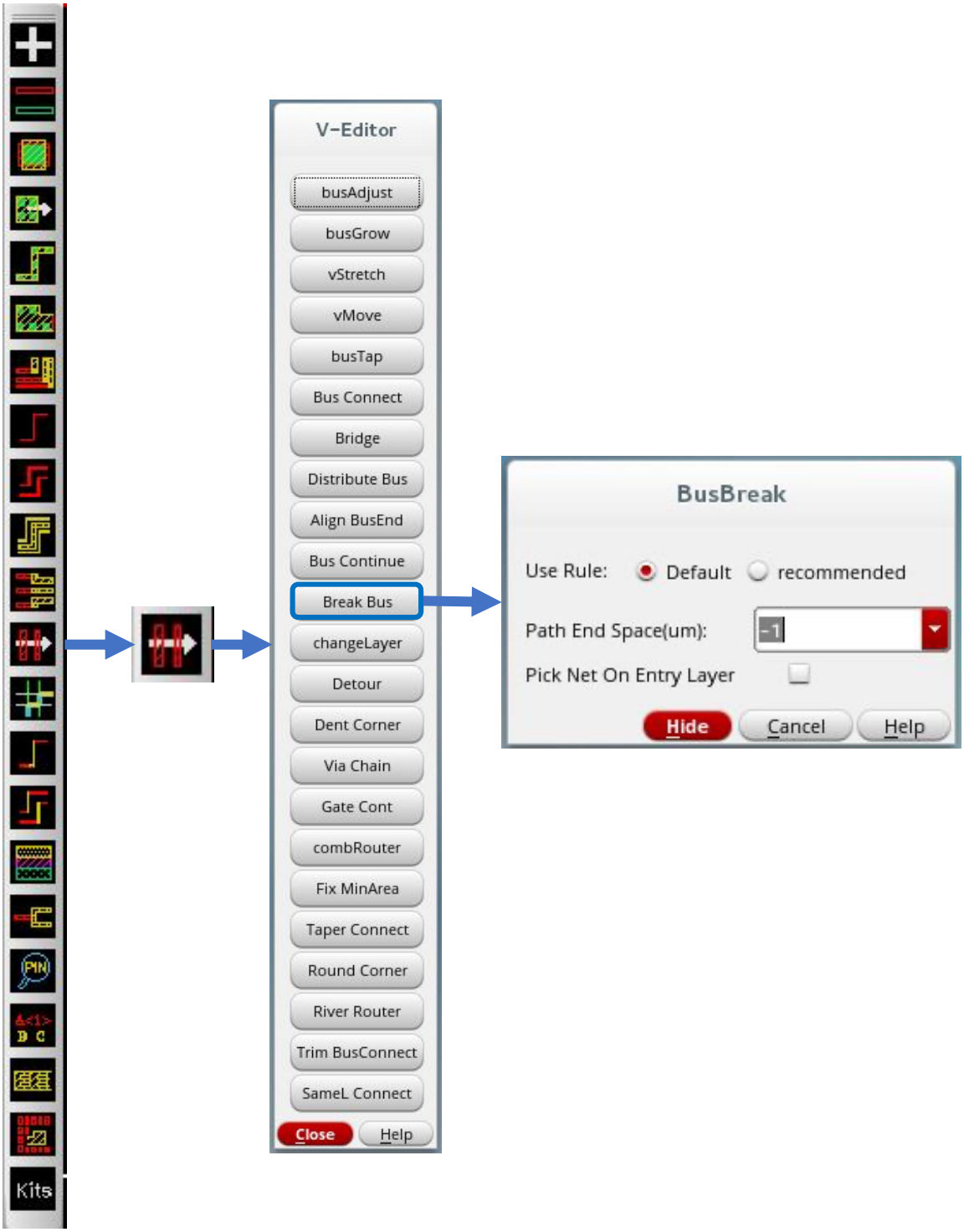
SKILLCAD V-Editor, Align Bus End



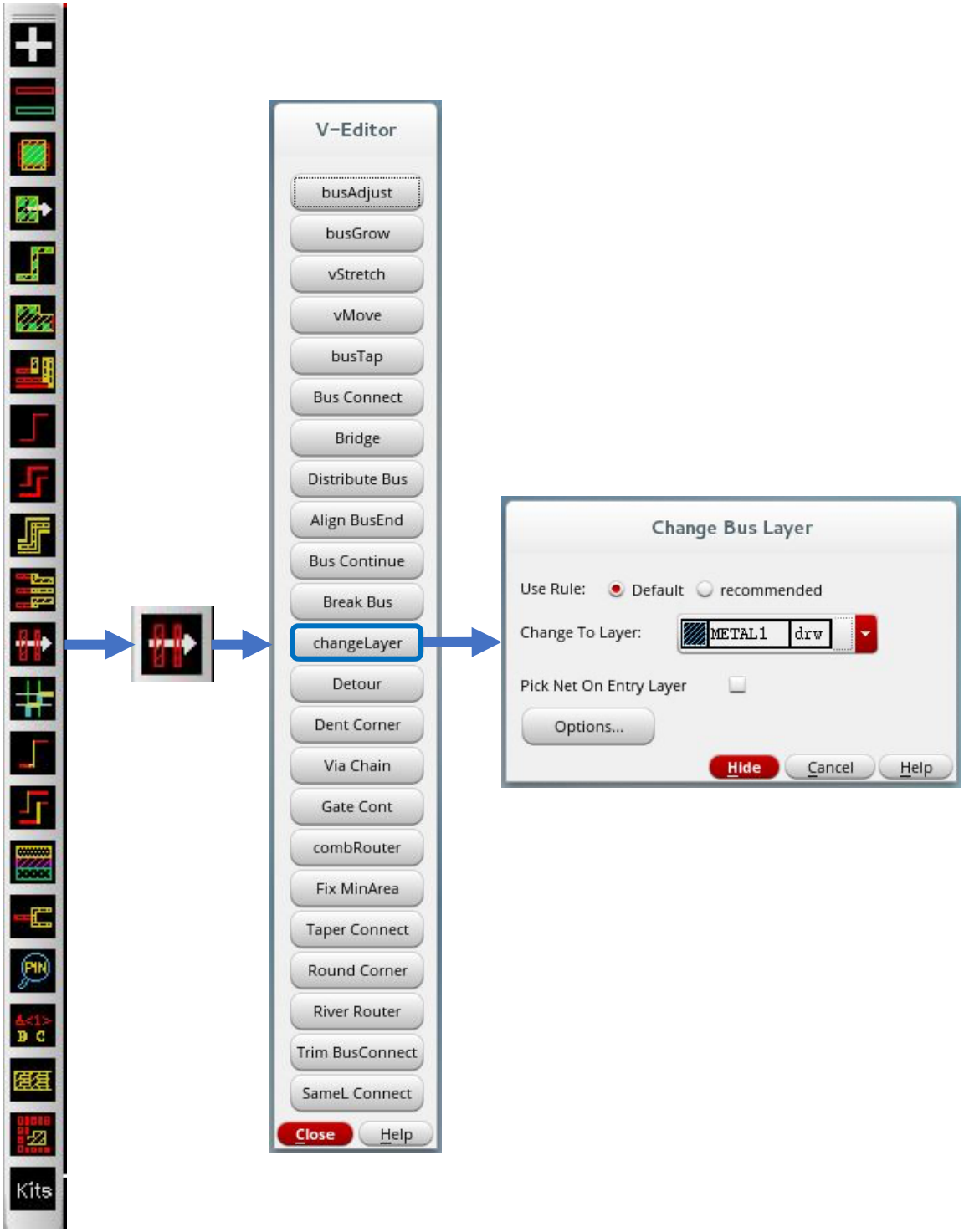
SKILLCAD V-Editor, Bus Continue



SKILLCAD V-Editor, Break Bus

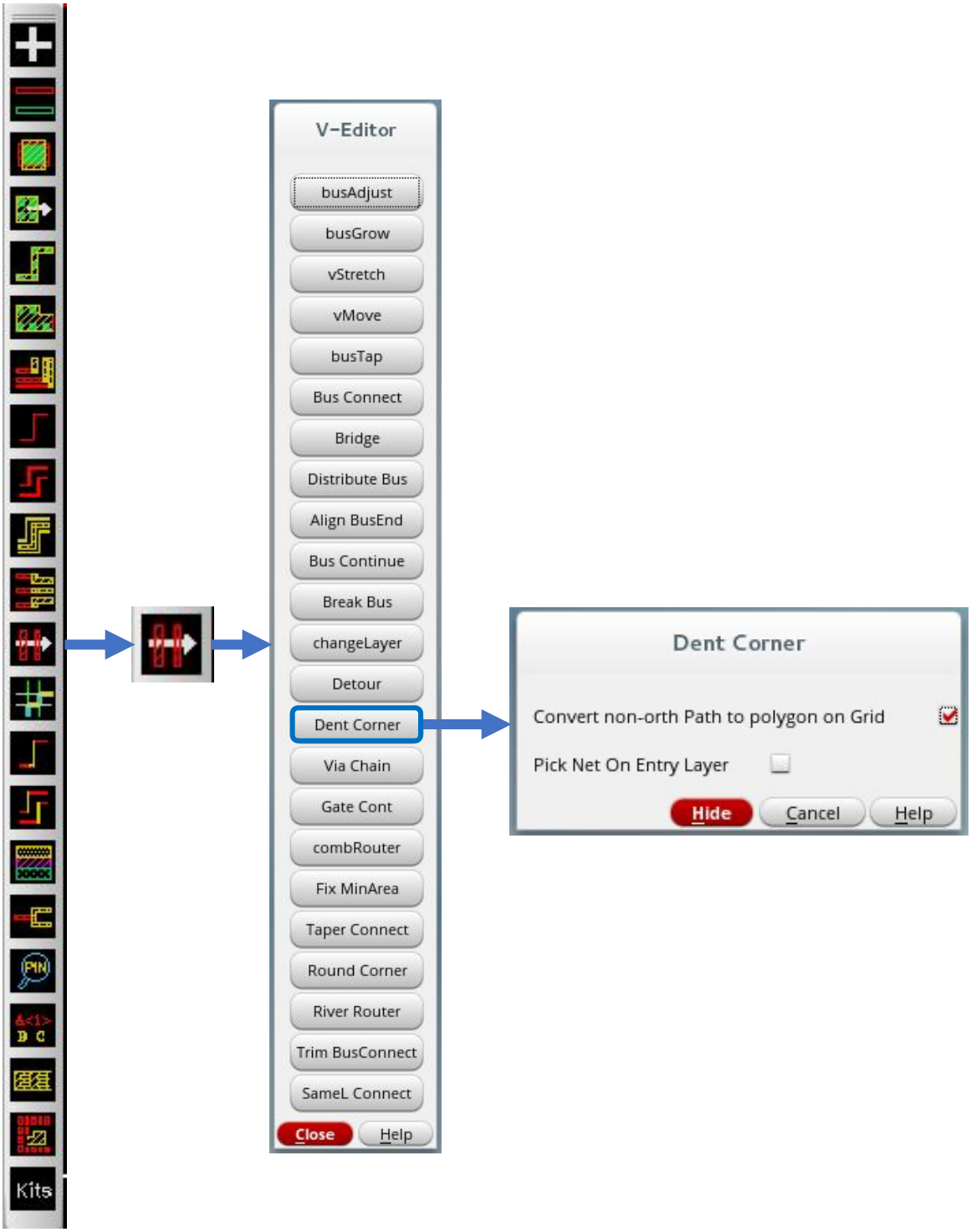


SKILLCAD V-Editor, Change Bus Layer

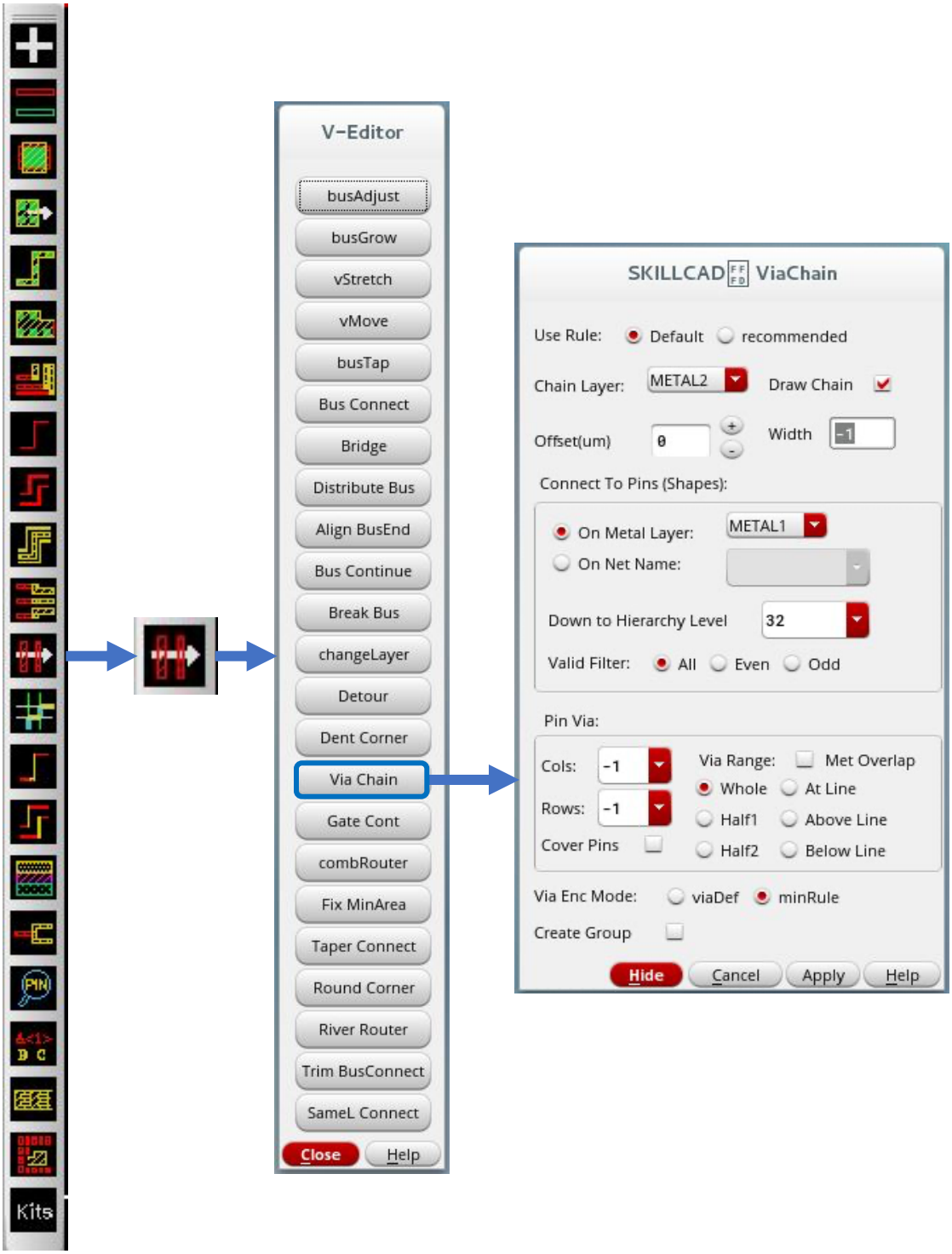


SKILLCAD V-Editor, Bus Detour

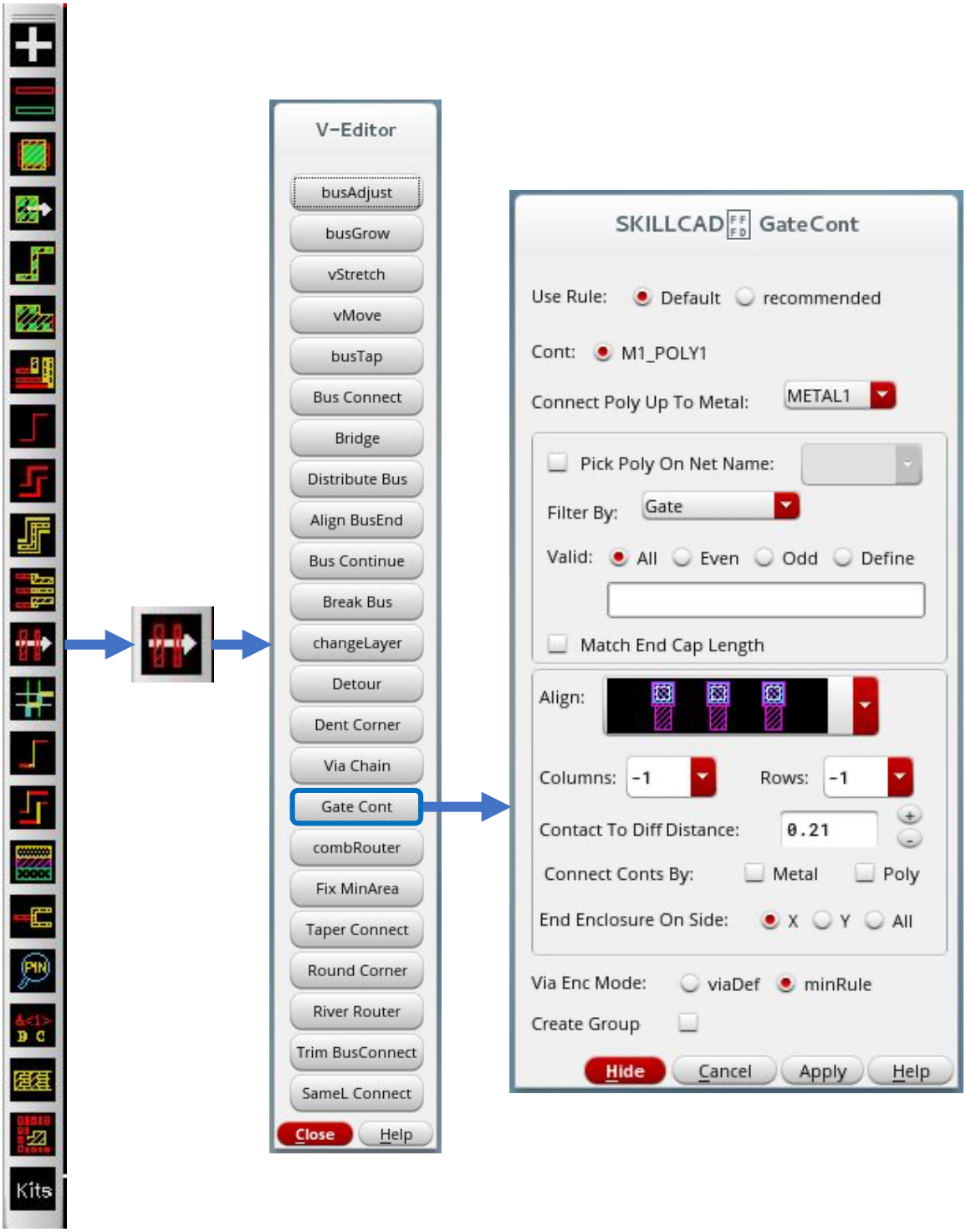
SKILLCAD V-Editor, Dent Corner



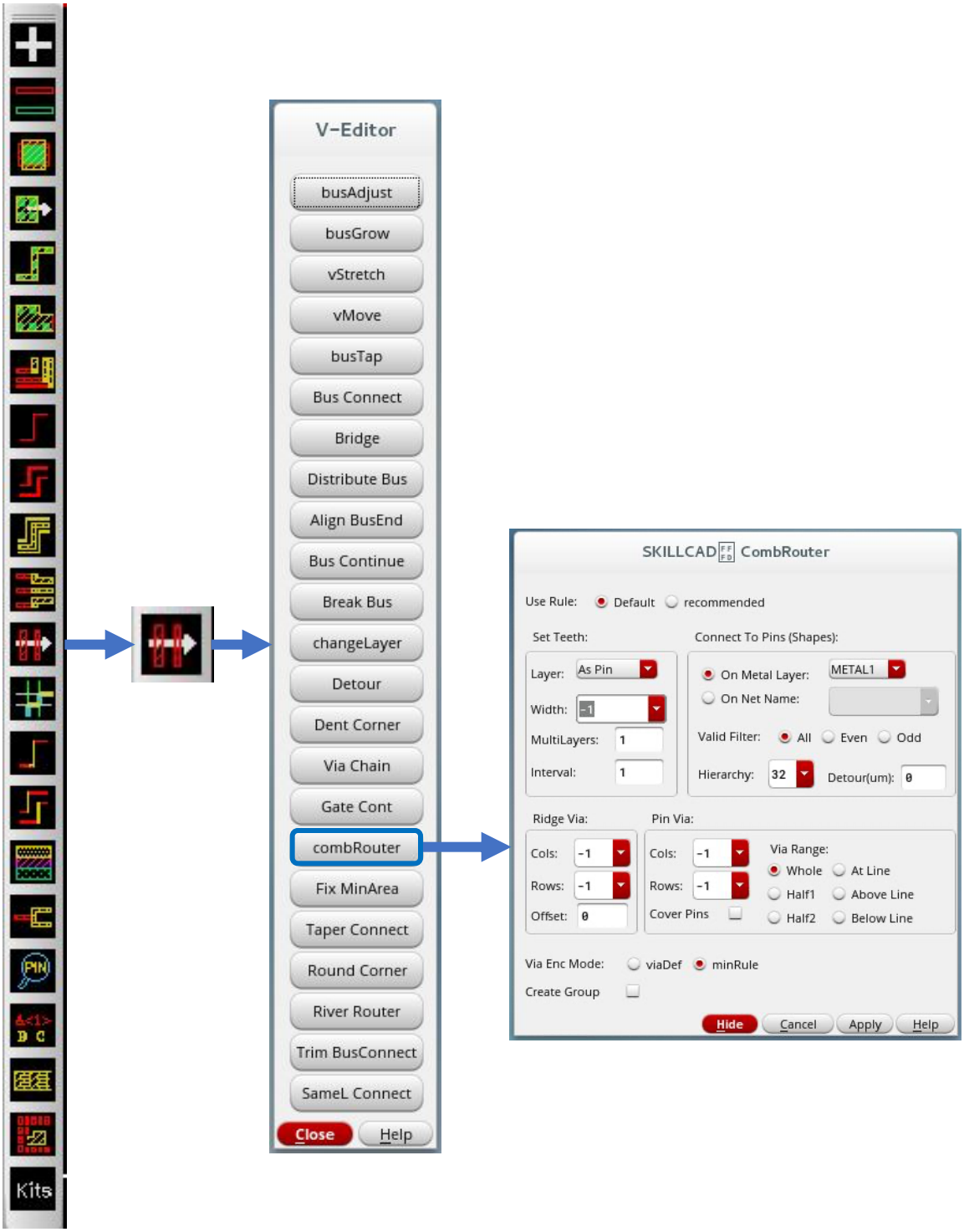
SKILLCAD V-Editor, Via Chain



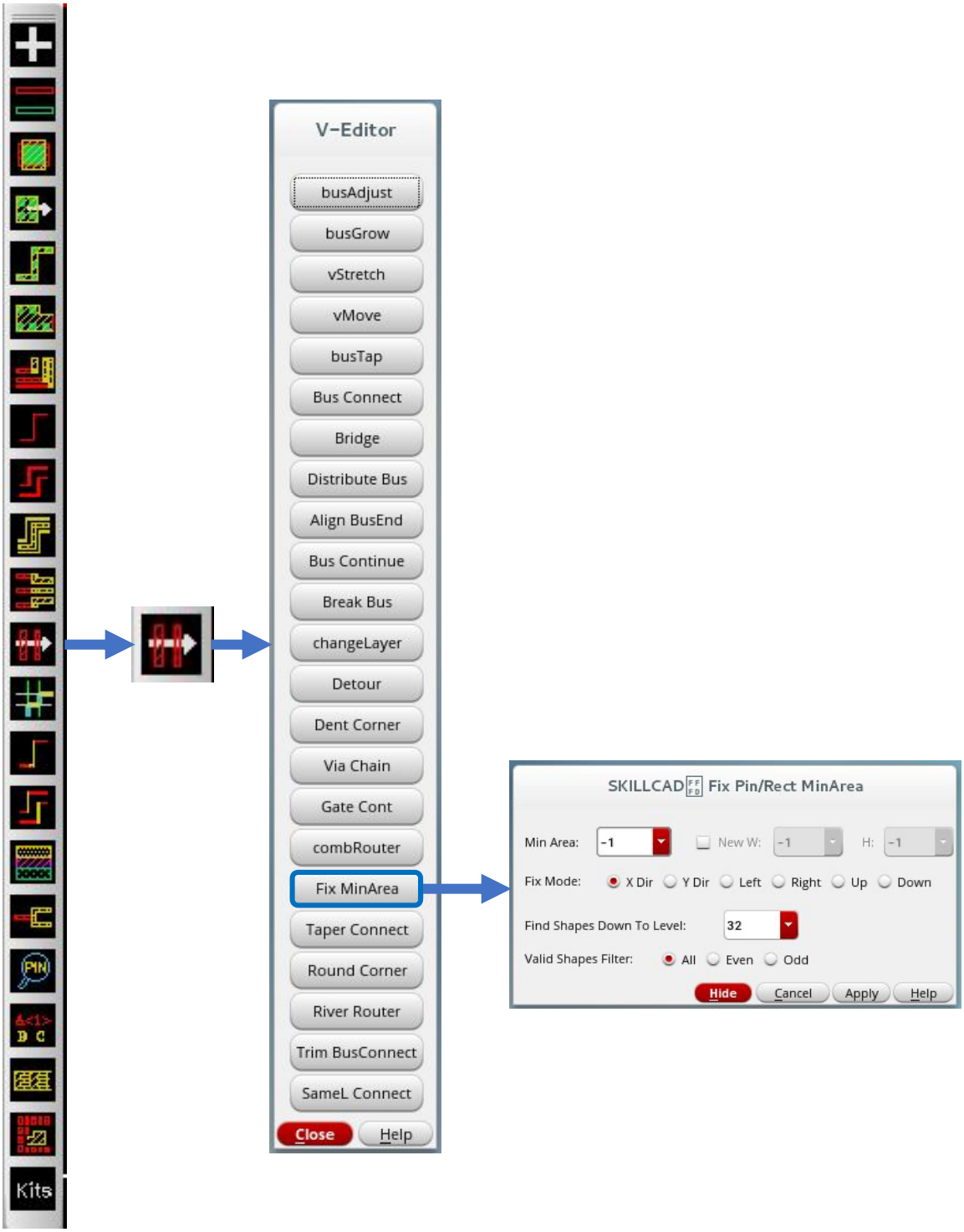
SKILLCAD V-Editor, Gate Contact



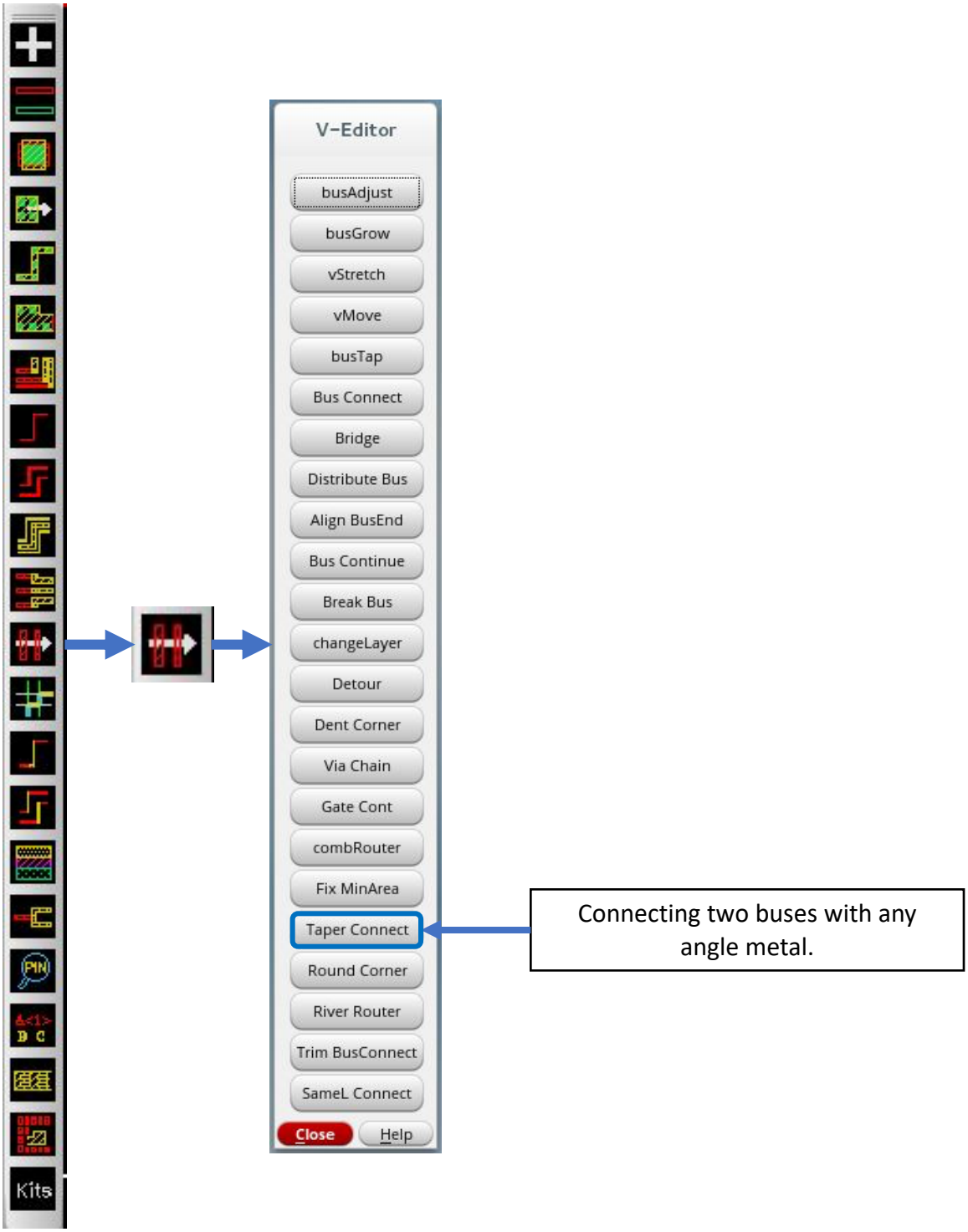
SKILLCAD V-Editor, Comb Router



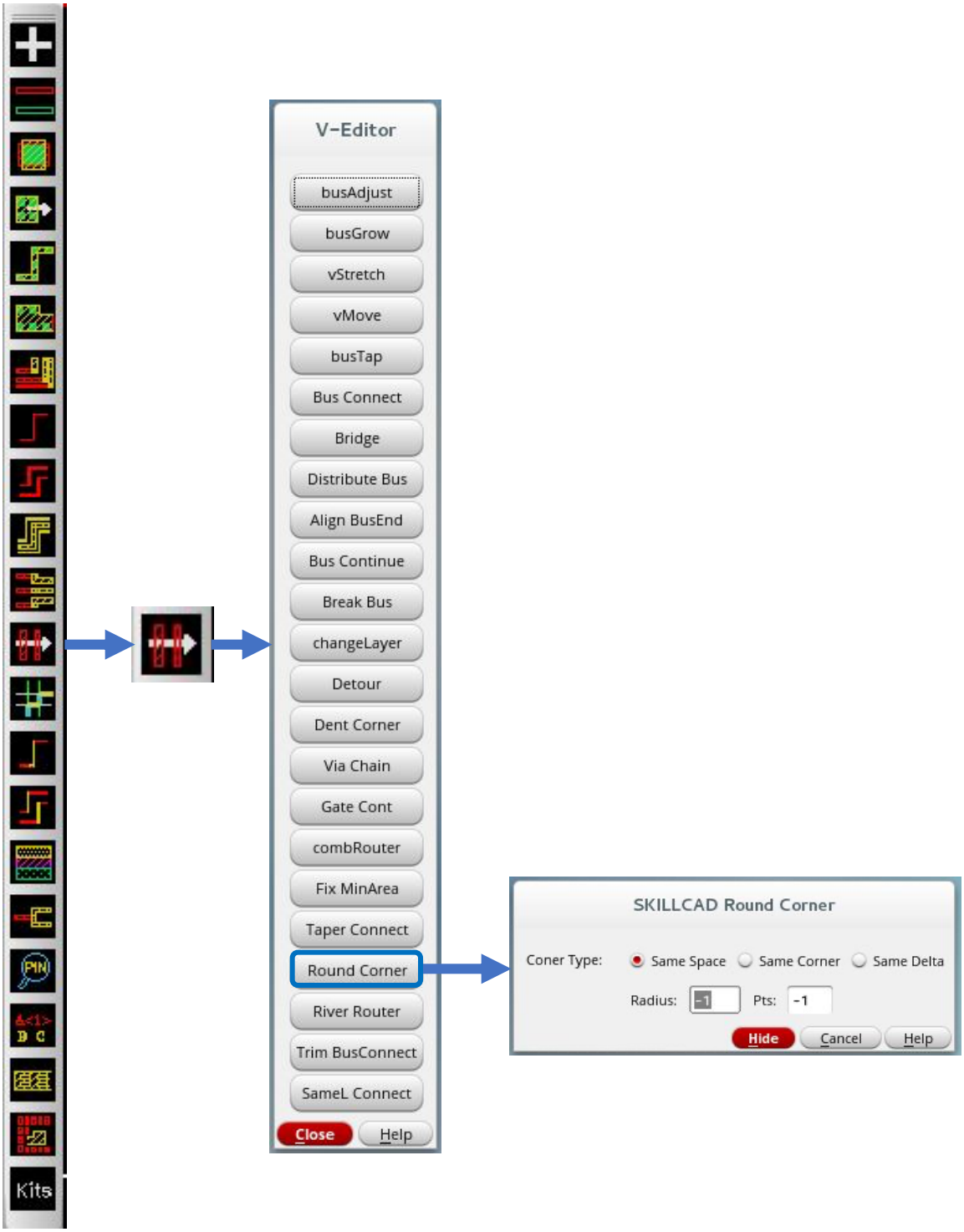
SKILLCAD V-Editor, Fix Minimum Area



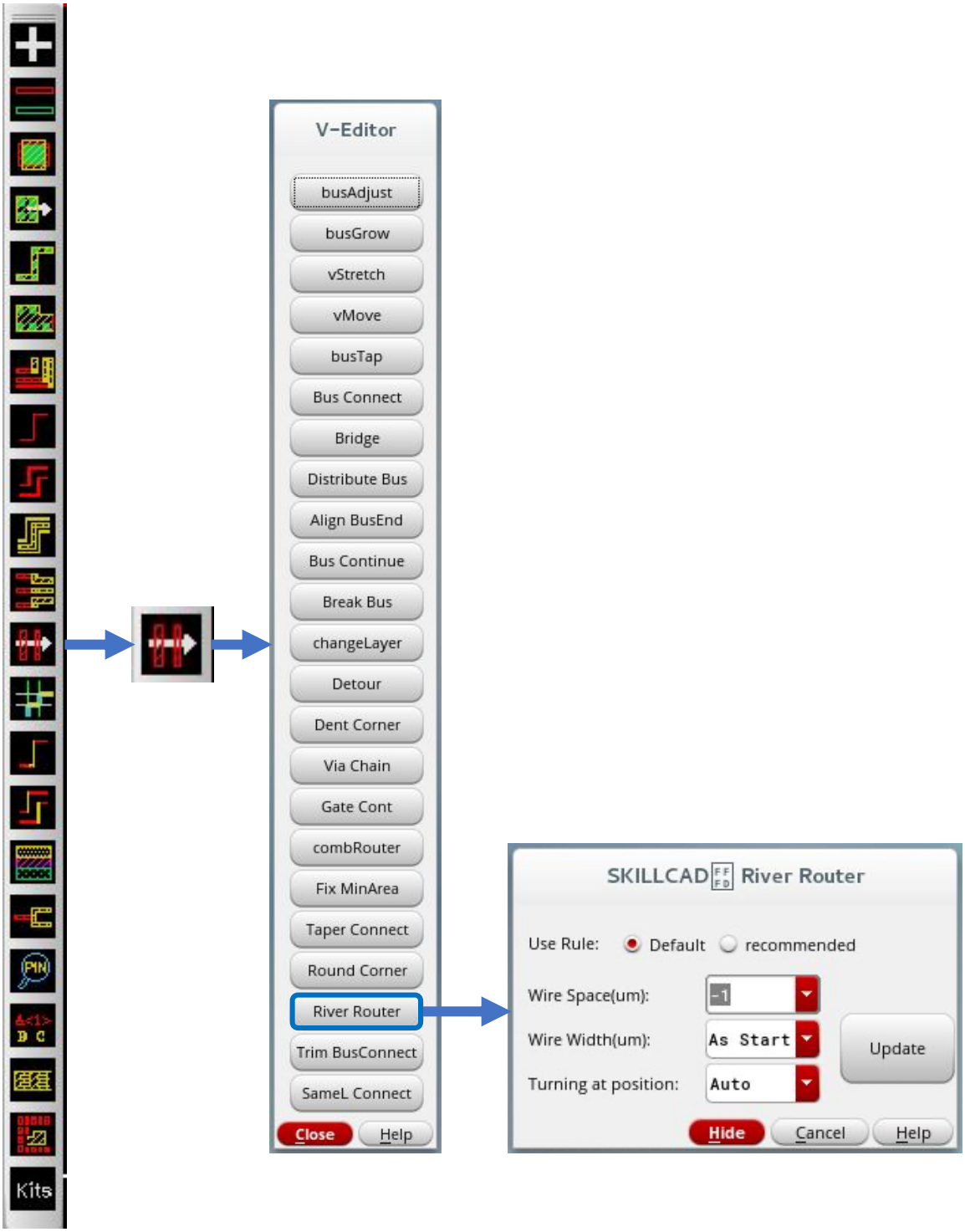
SKILLCAD V-Editor, Taper Connect



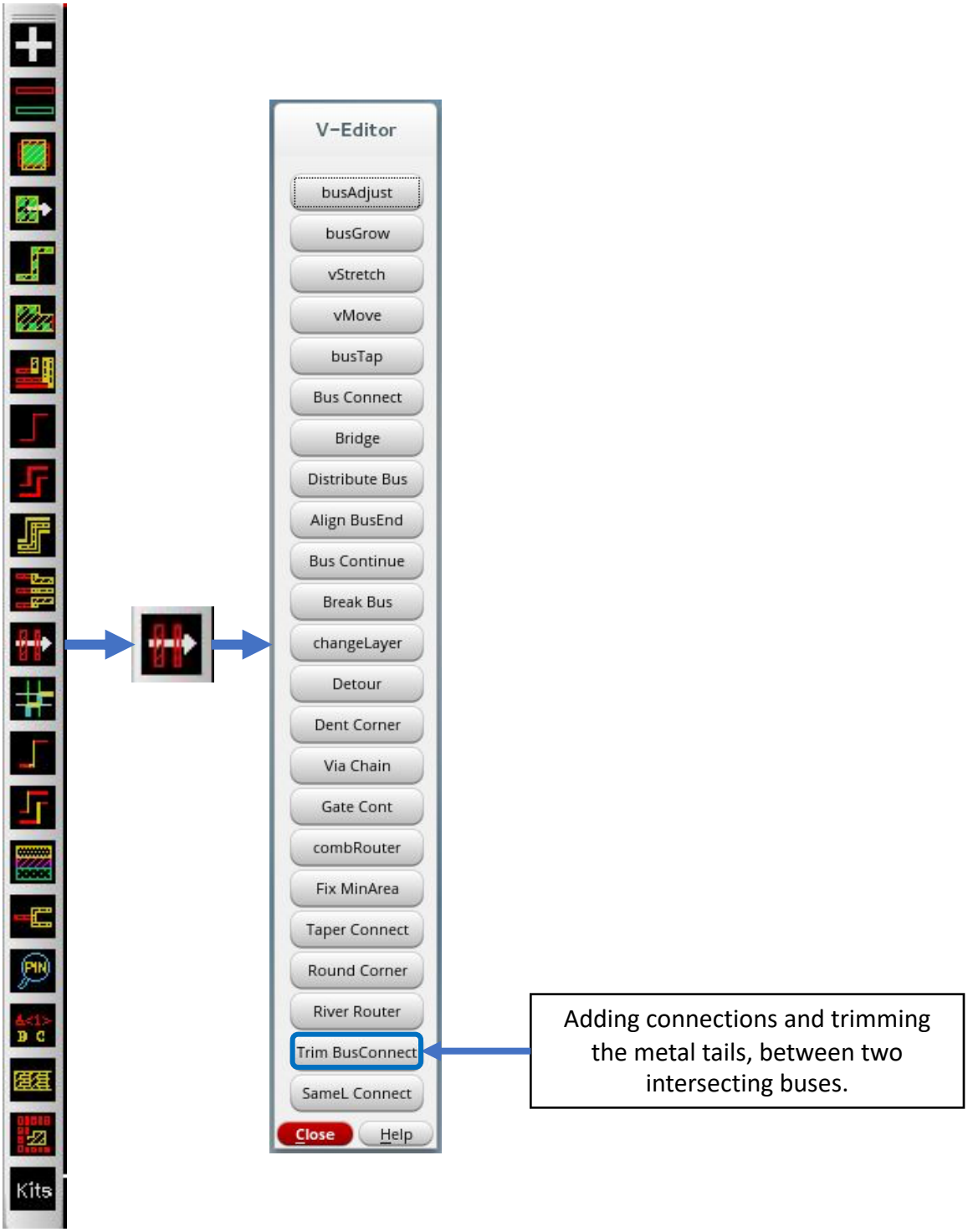
SKILLCAD V-Editor, Round Corner



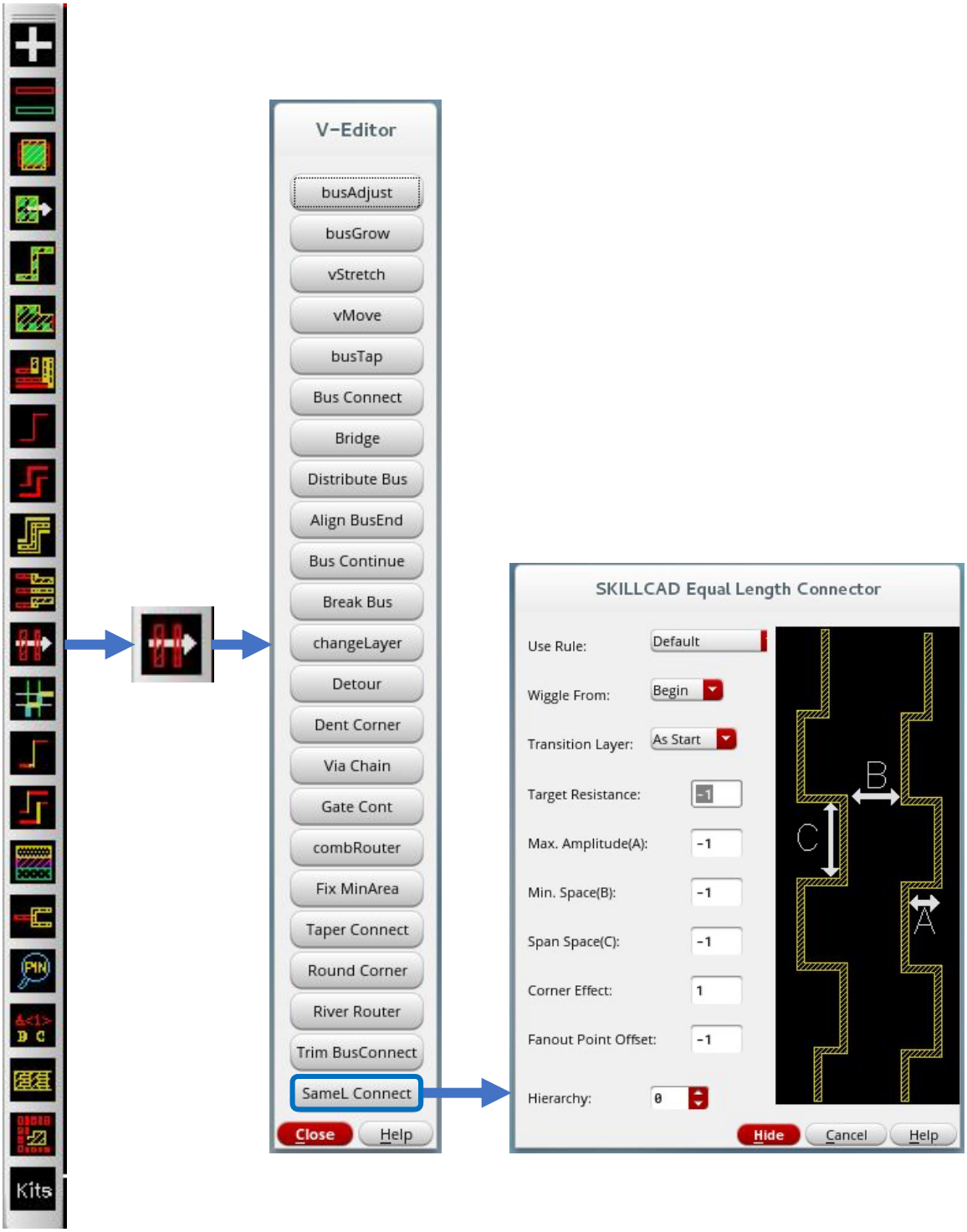
SKILLCAD V-Editor, River Router



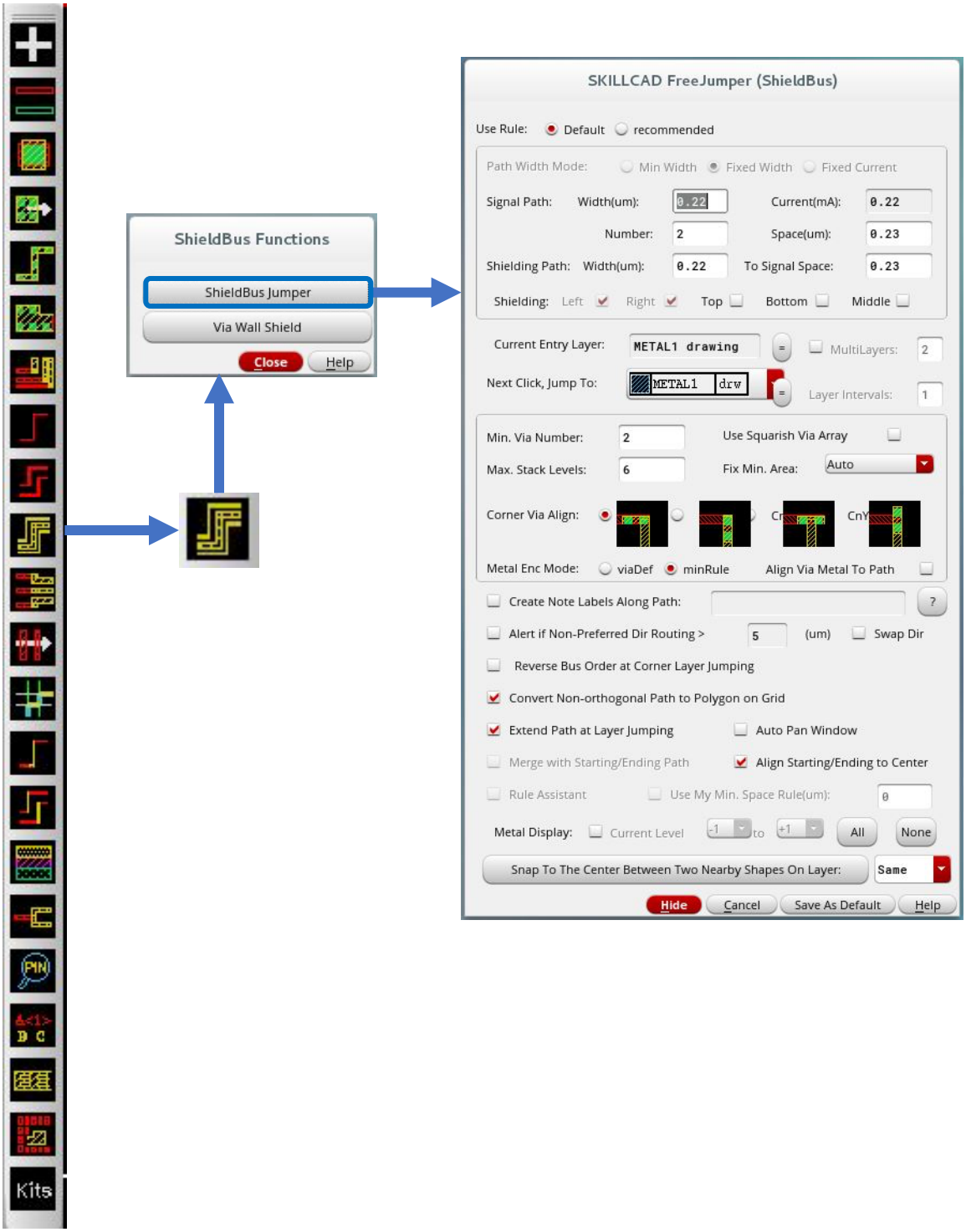
SKILLCAD V-Editor, Trim Bus Connect



SKILLCAD V-Editor, Equal Length Connector

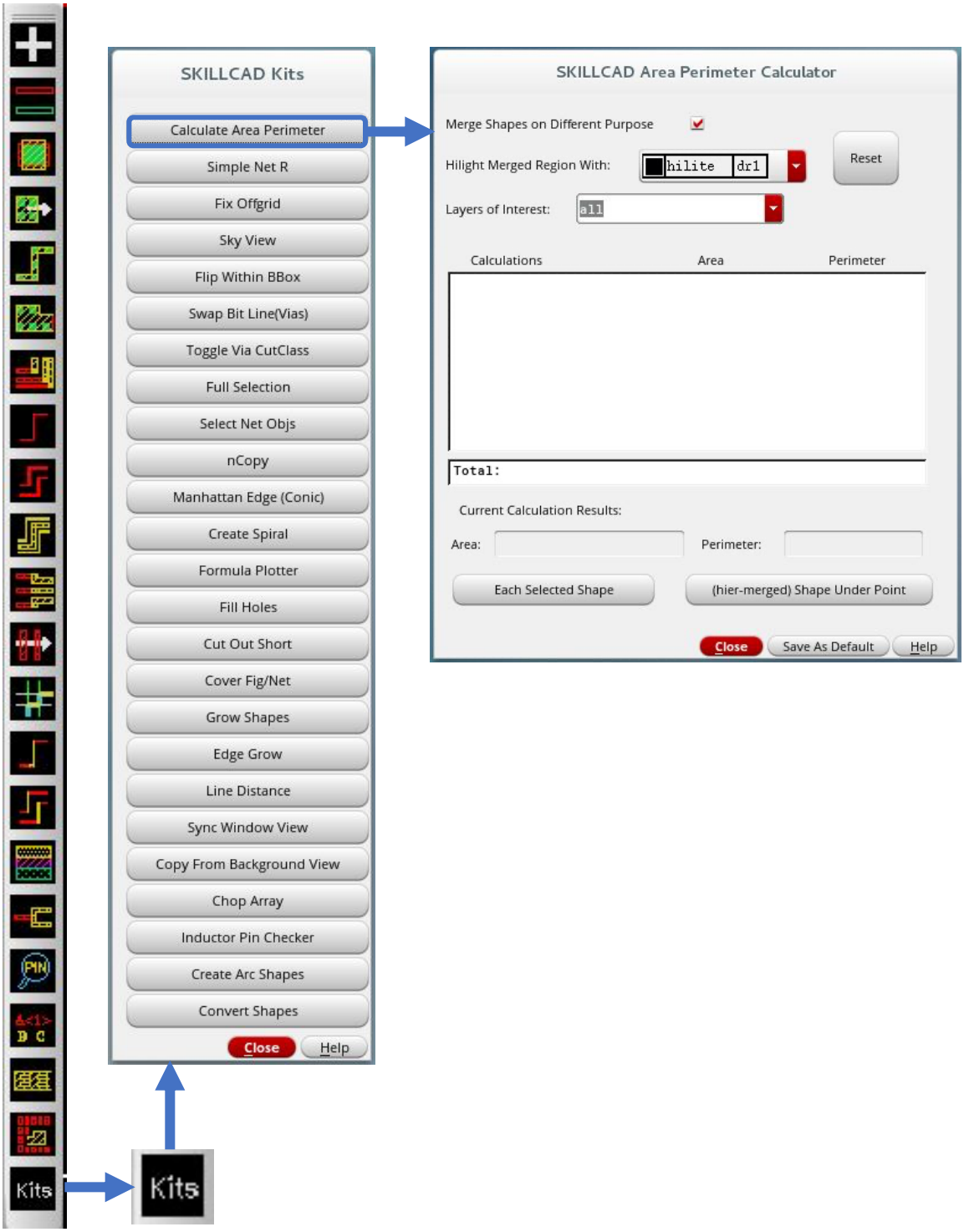


SKILLCAD Create A Shielded Bus

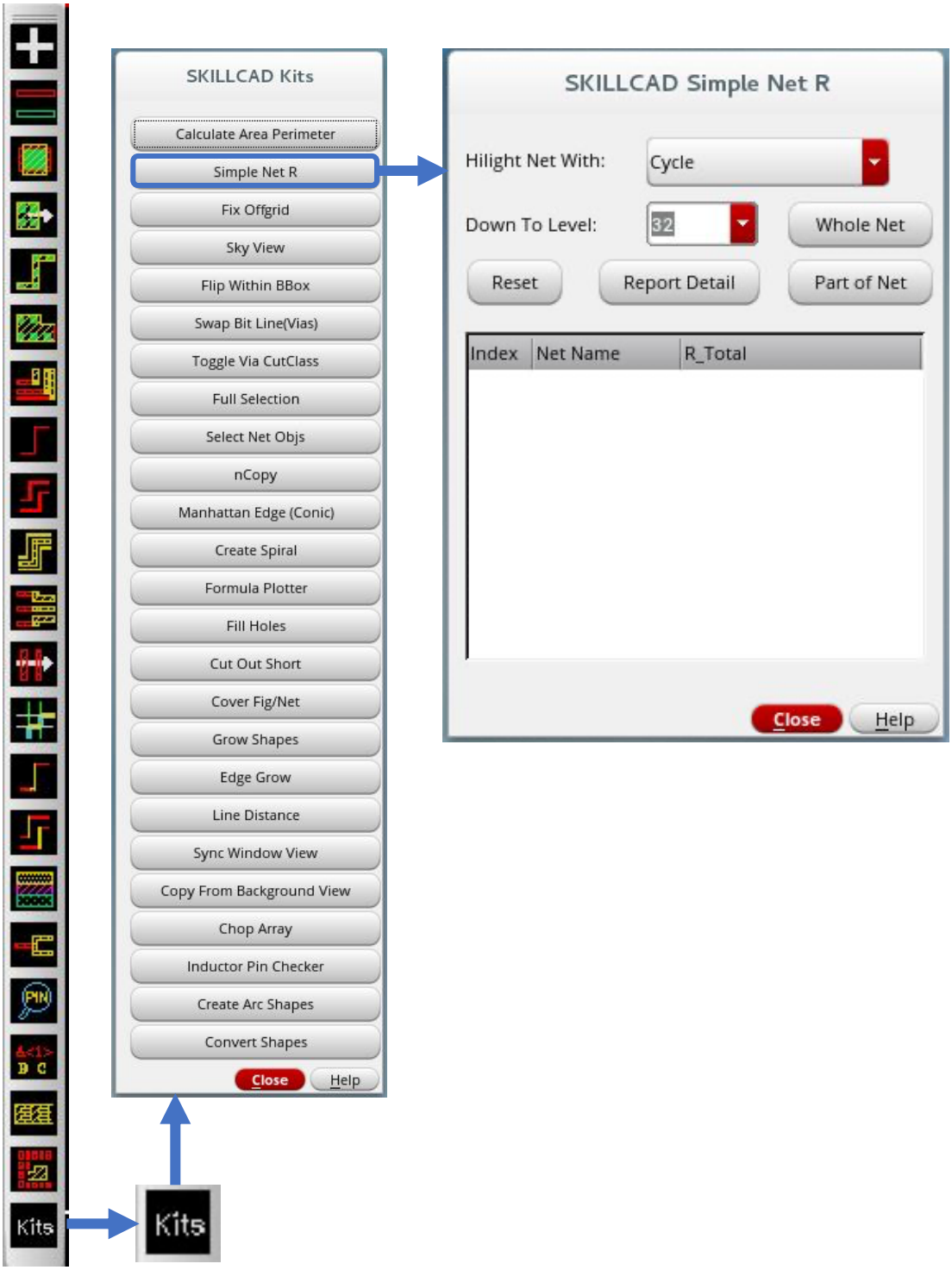


SKILLCAD Create A Via Wall Shield

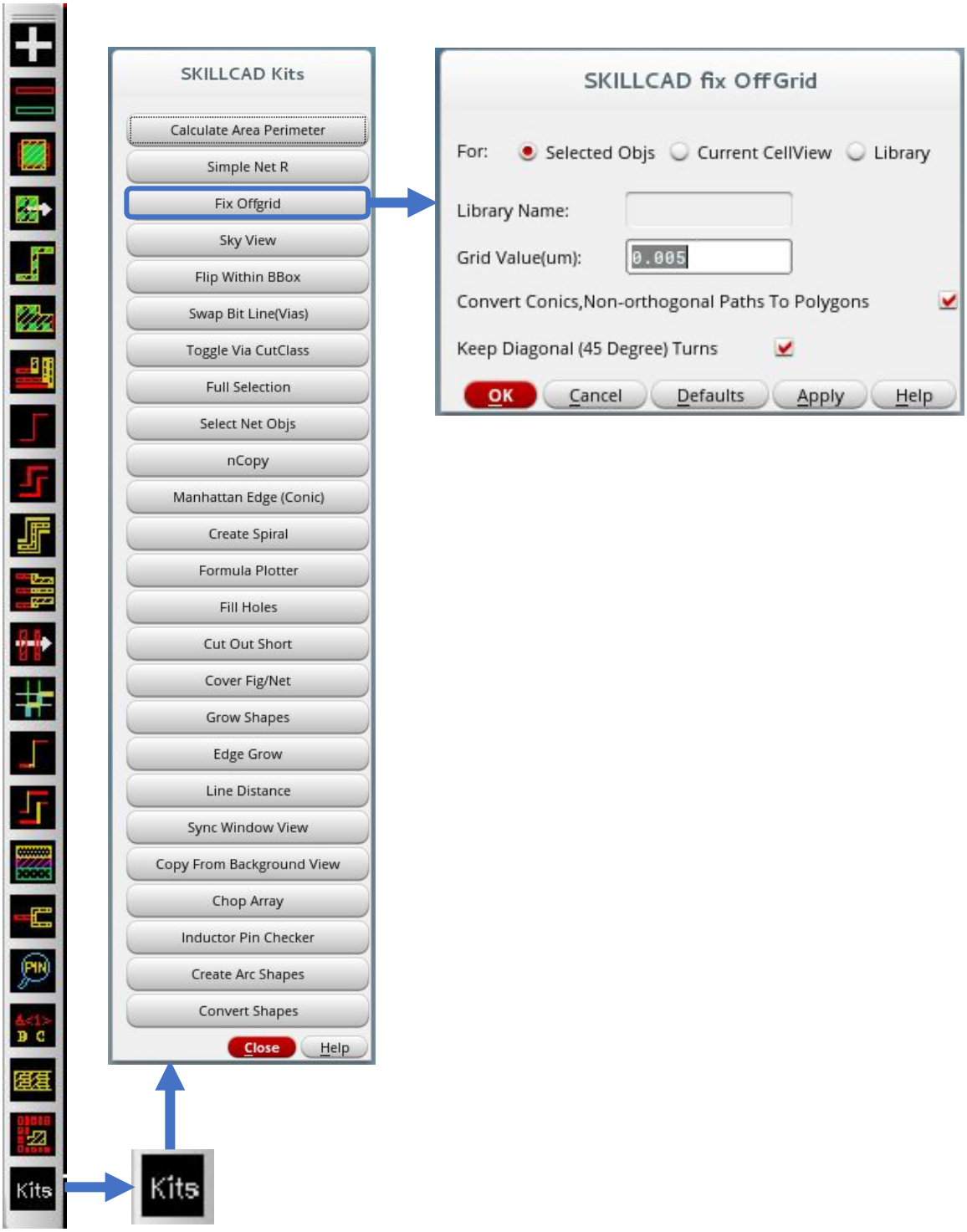
SKILLCAD Kits, Area/Perimeter Calculator



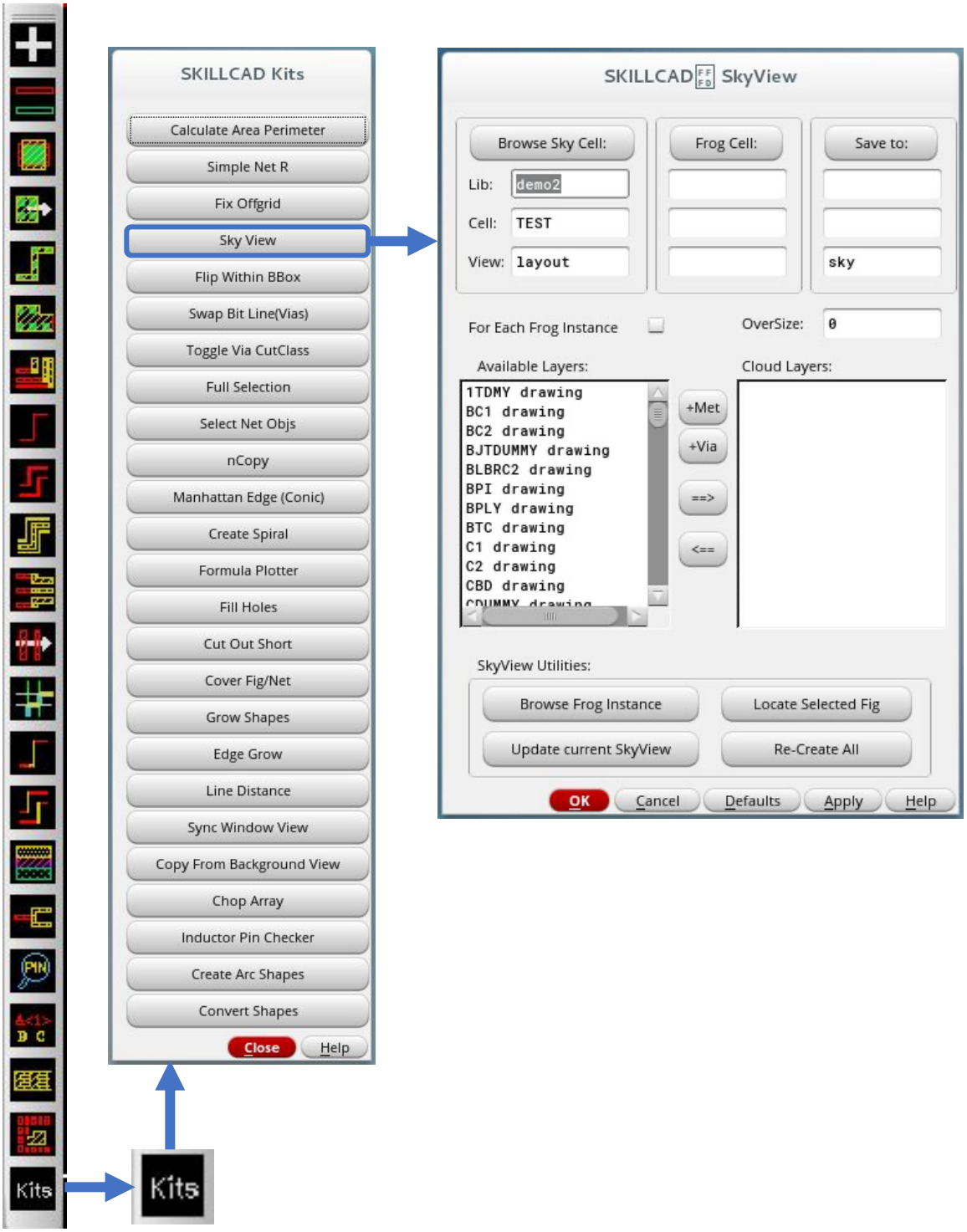
SKILLCAD Kits, Simple Net Resistance



SKILLCAD Kits, Fix Off Grid

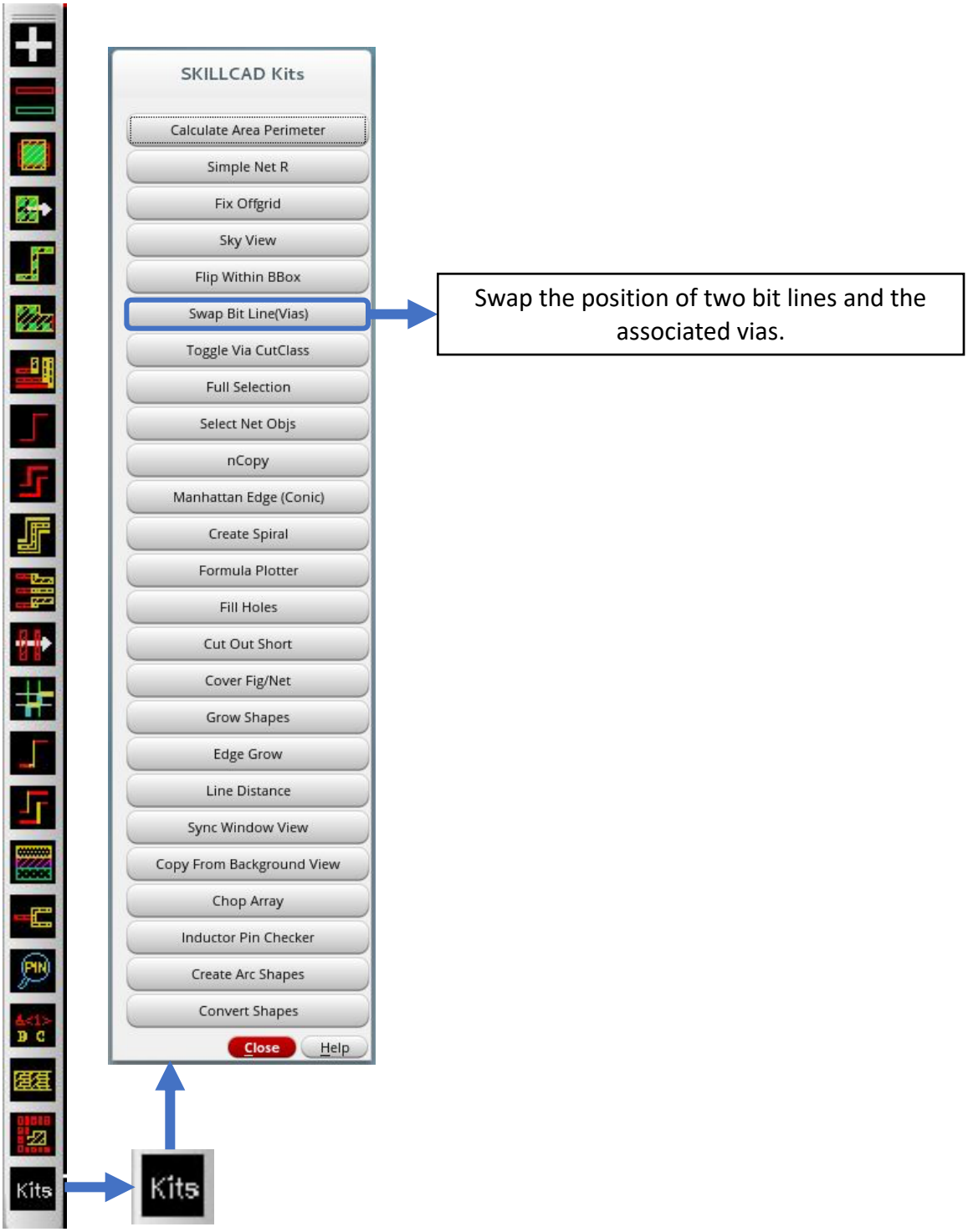


SKILLCAD Kits, Sky View

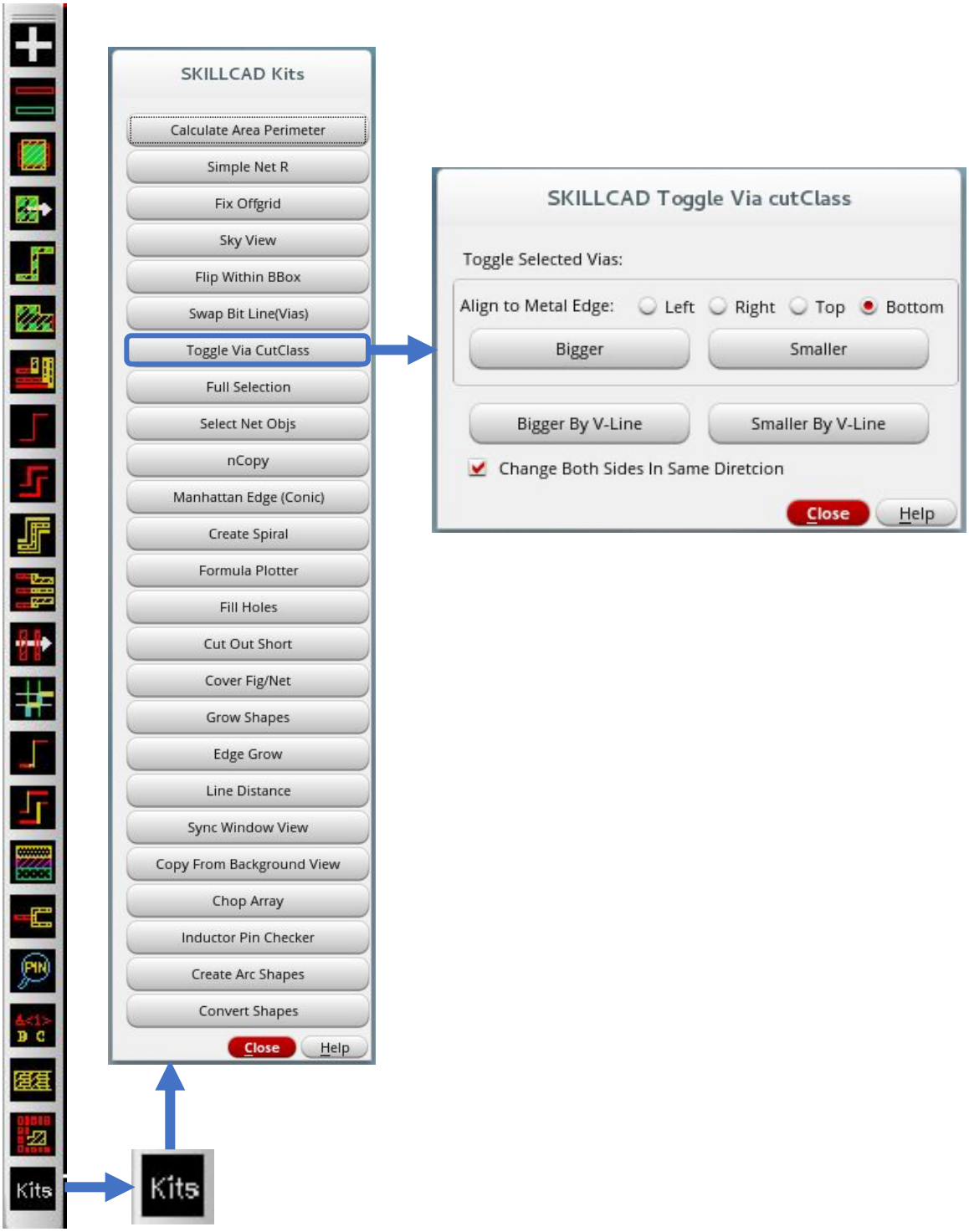


SKILLCAD Kits, Flip Within A Bounding Box

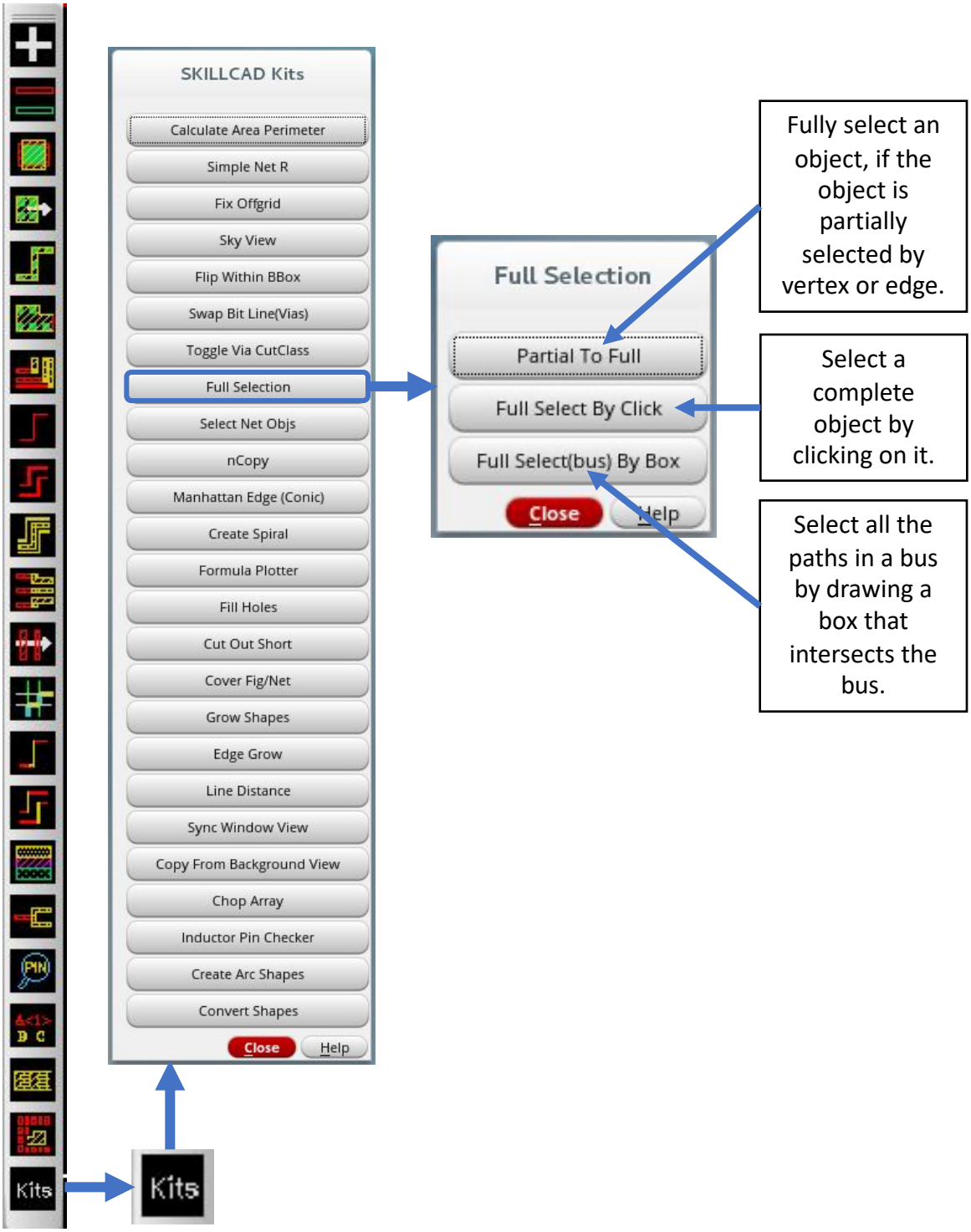
SKILLCAD Kits, Swap Bit Lines



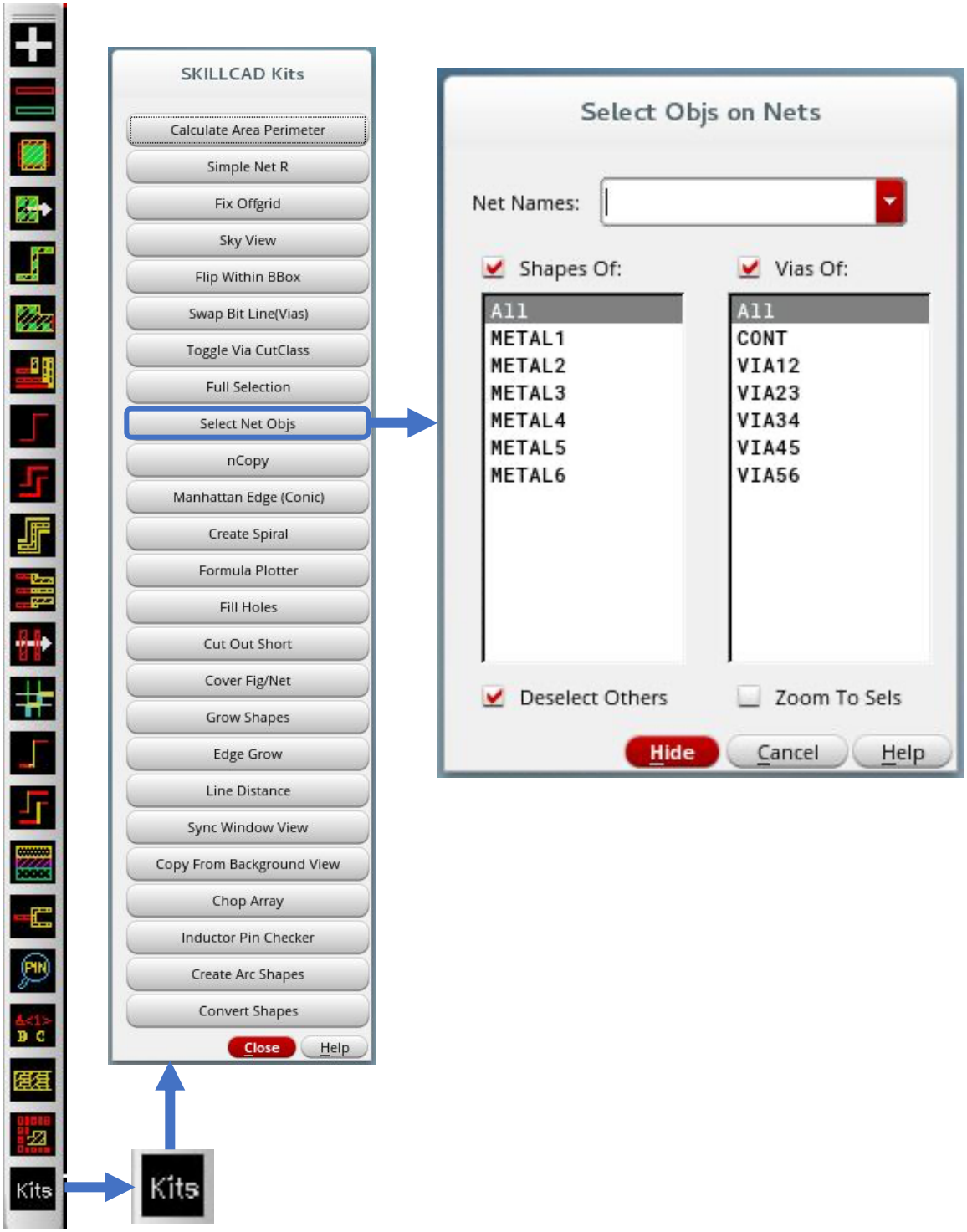
SKILLCAD Kits, Toggle Via Cut Class



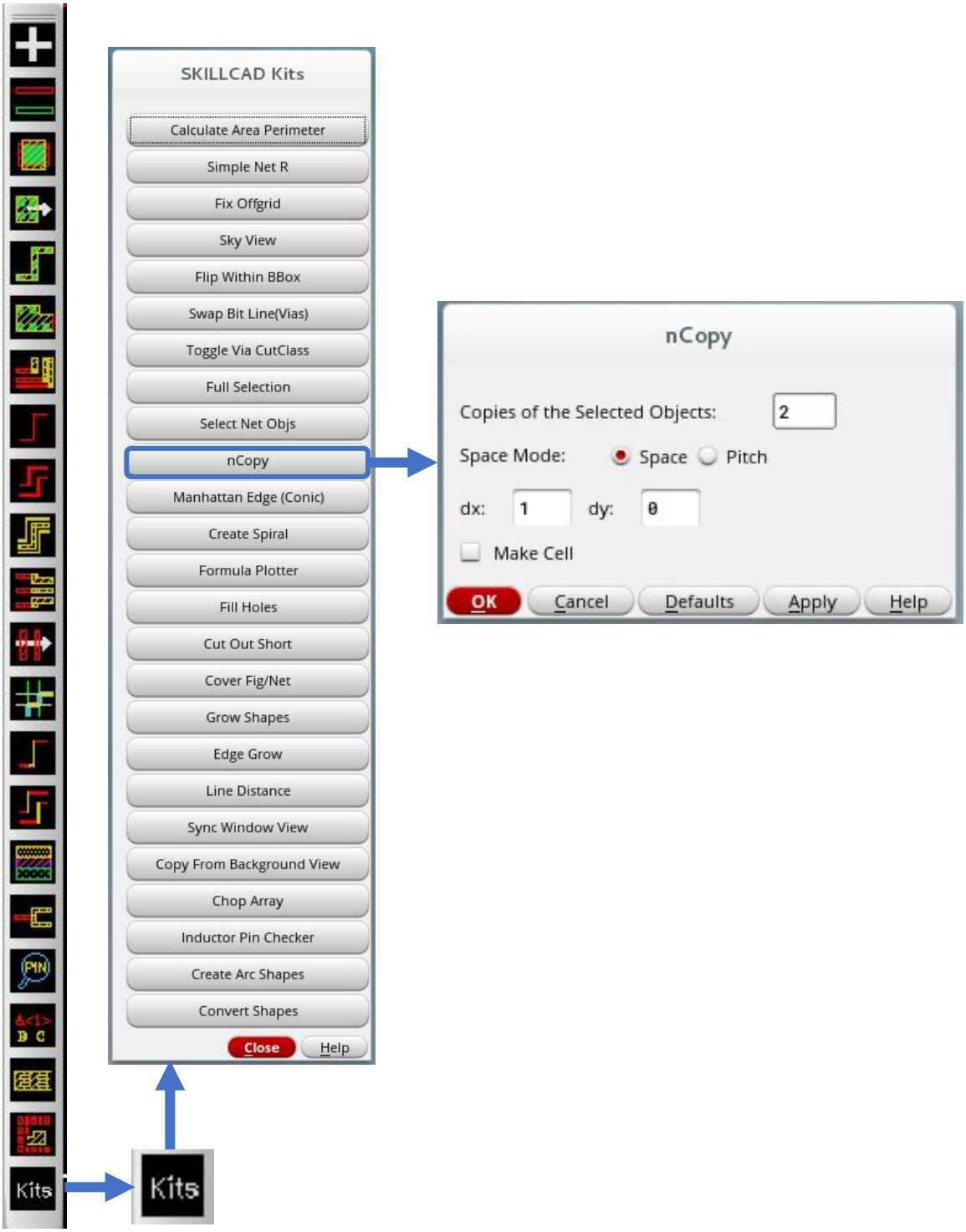
SKILLCAD Kits, Full Selection



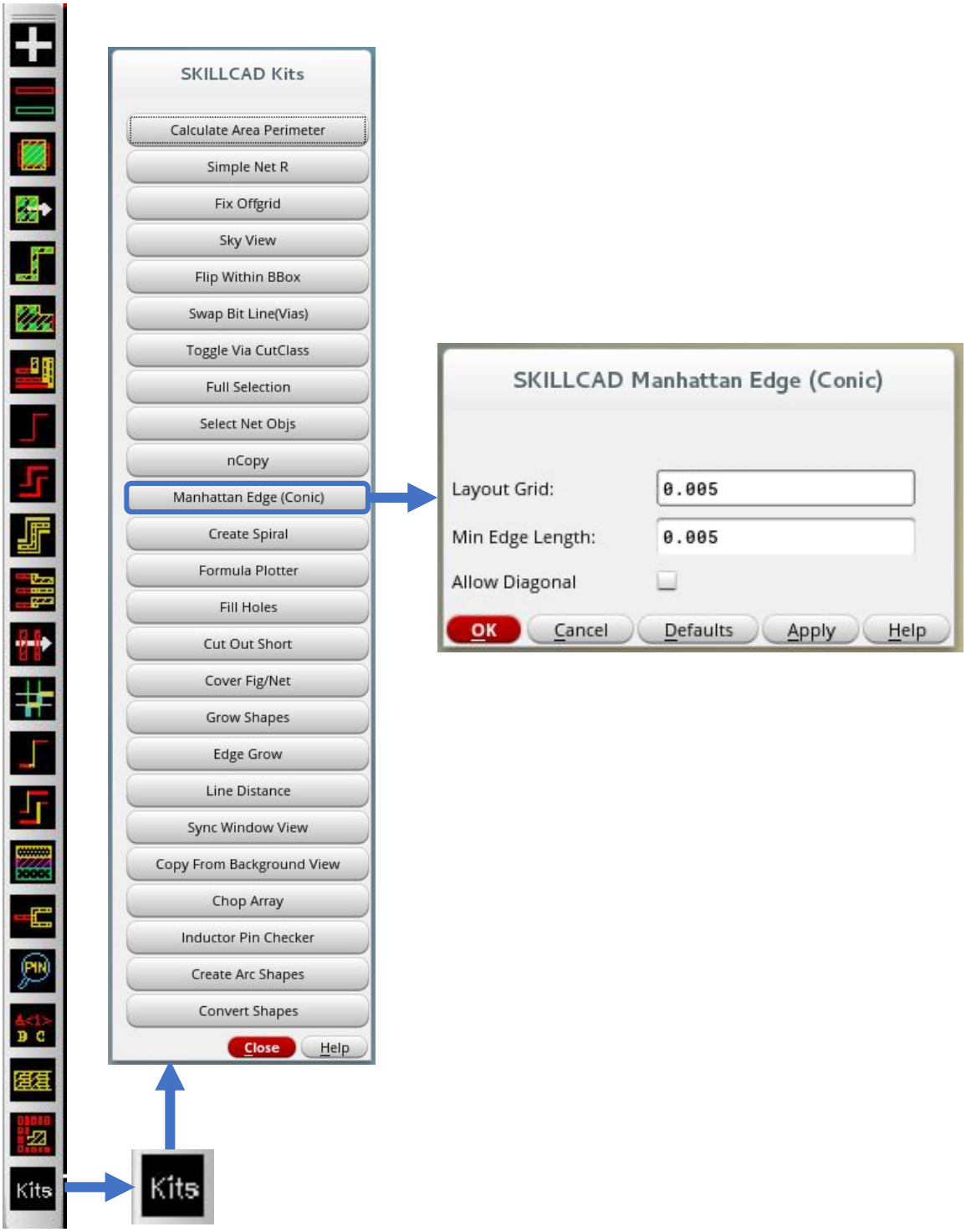
SKILLCAD Kits, Select Objects On Nets



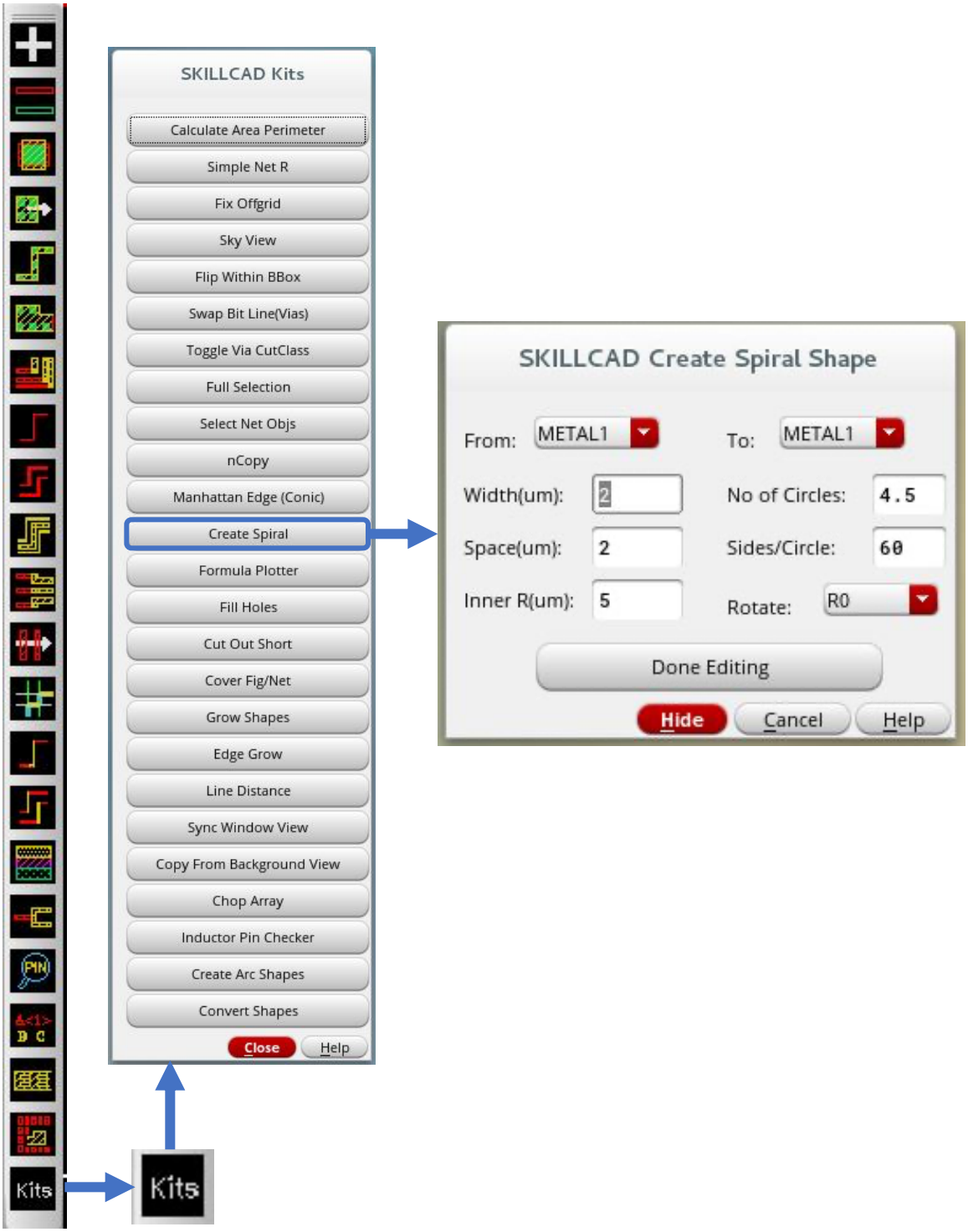
SKILLCAD Kits, Making Multiple Copies



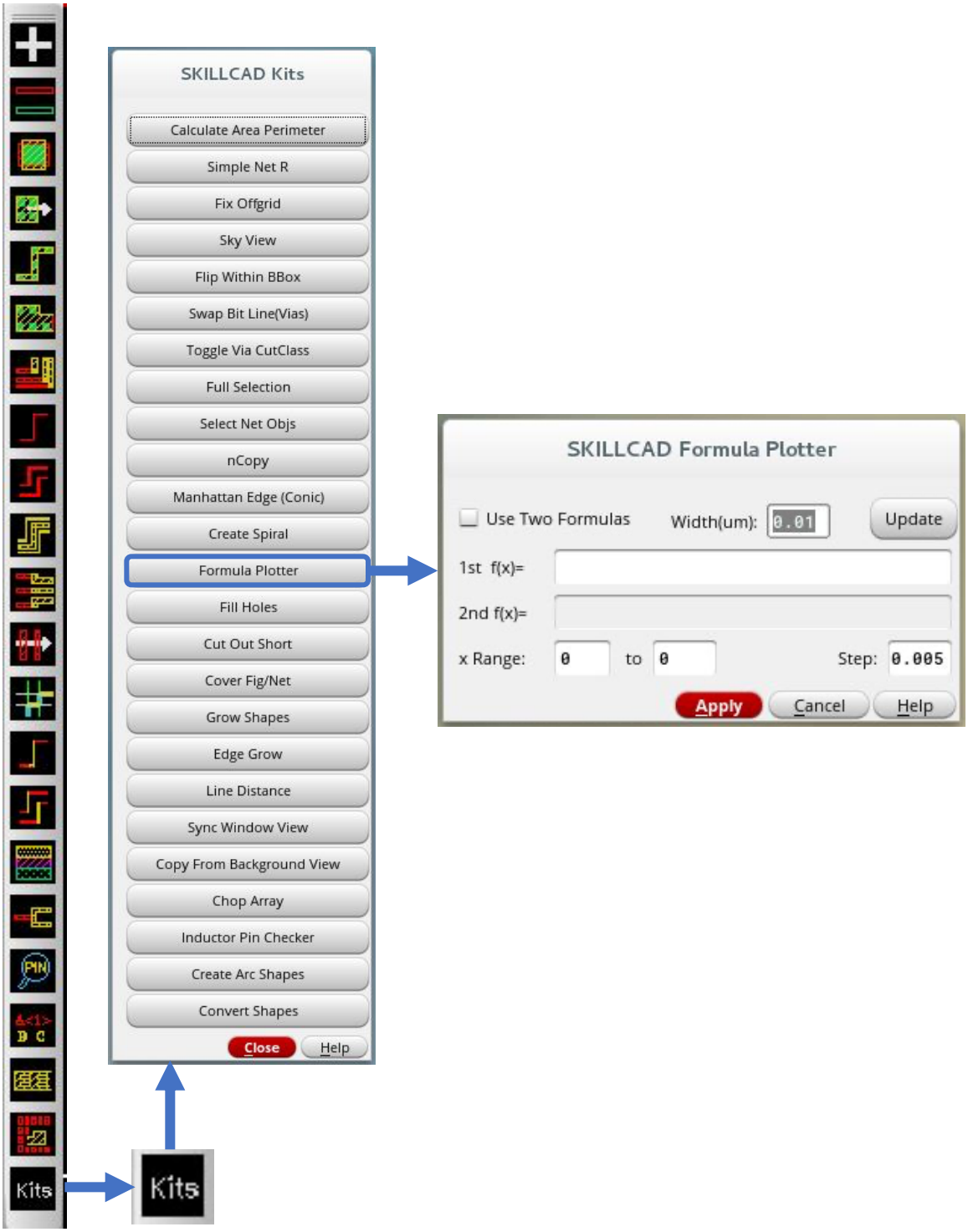
SKILLCAD Kits, Creating A Manhattan Edge Shape



SKILLCAD Kits, Creating A Spiral Shape

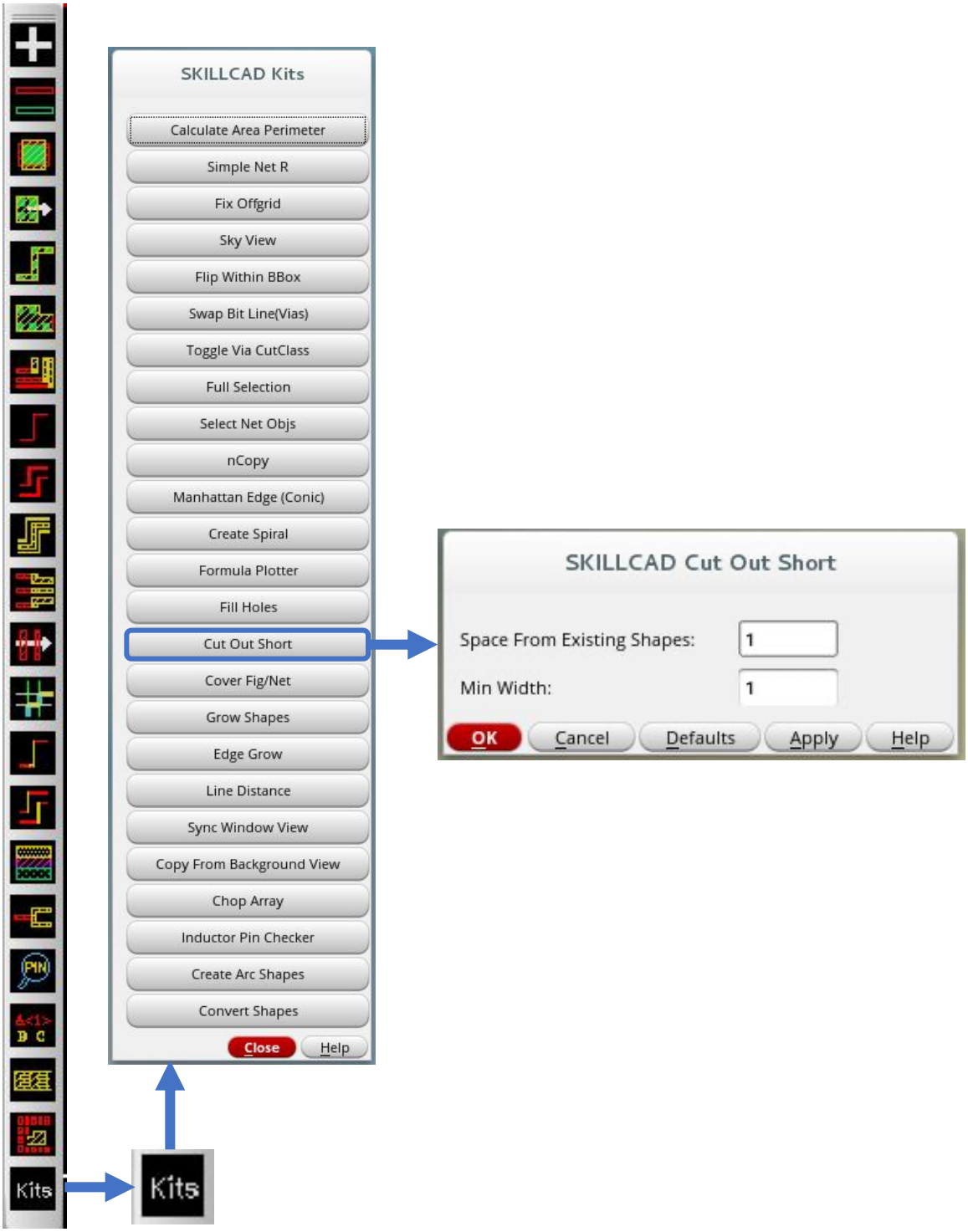


SKILLCAD Kits, Creating Shapes By Equations

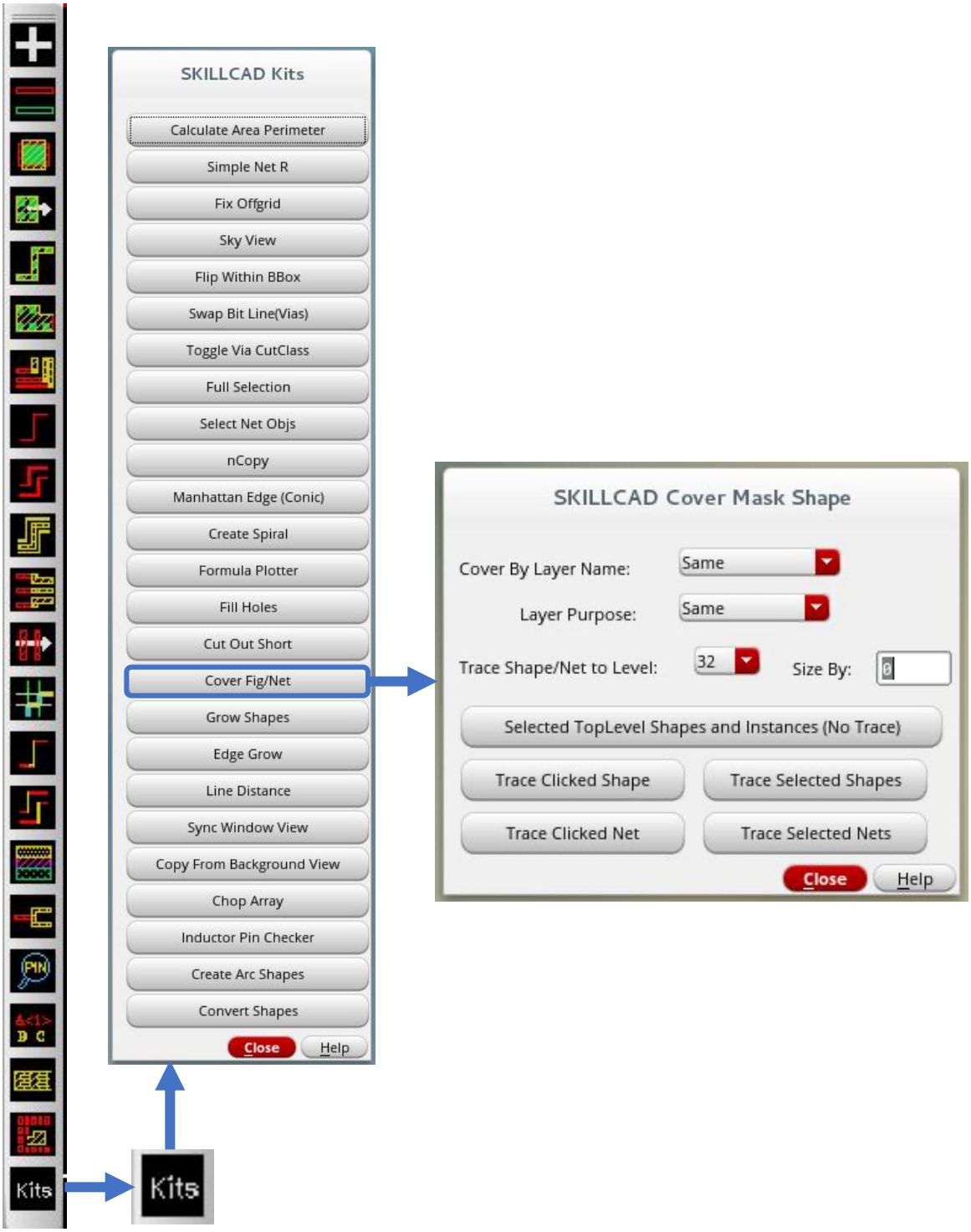


SKILLCAD Kits, Filling Holes In Shapes

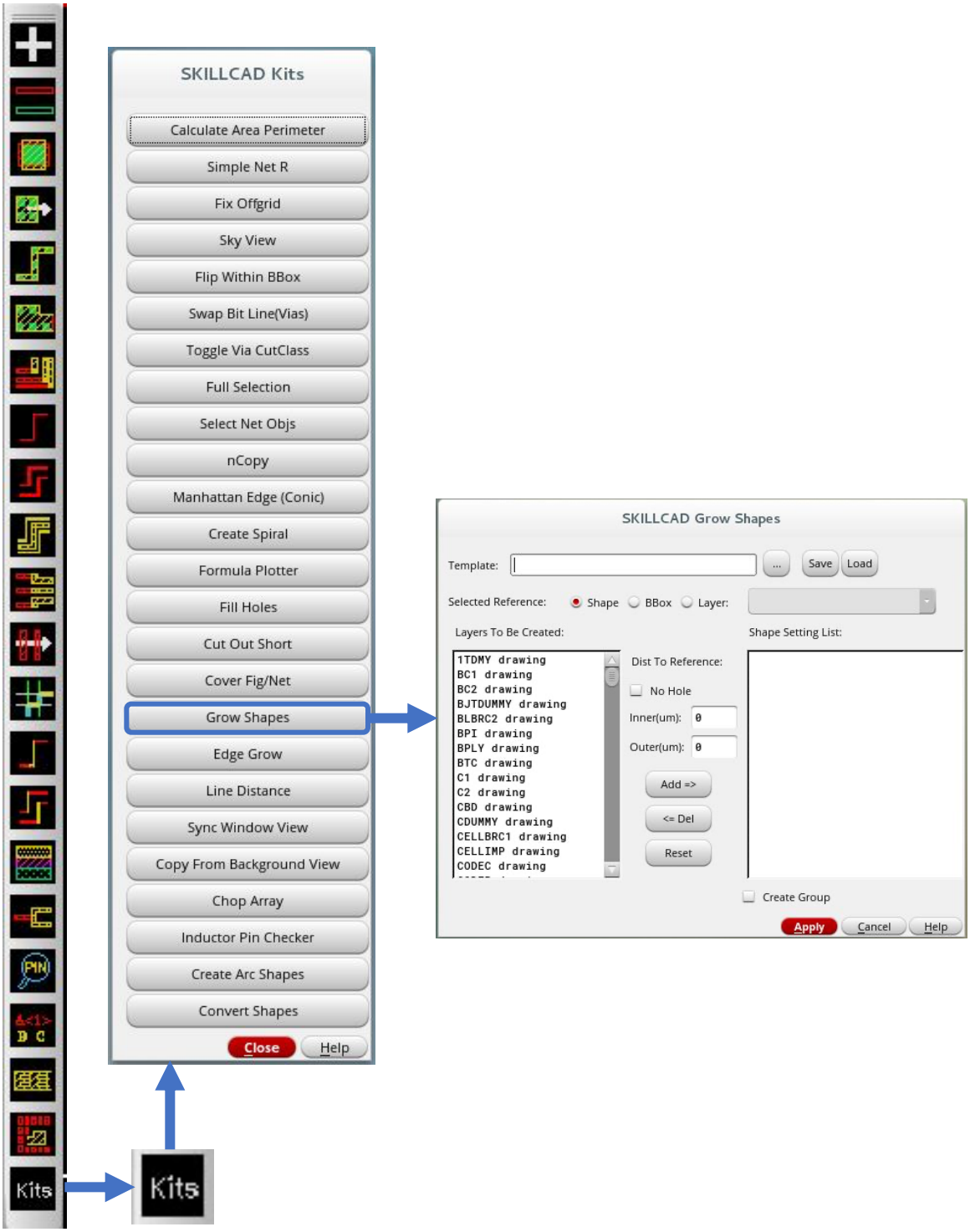
SKILLCAD Kits, Cutting Out Overlapping Shapes



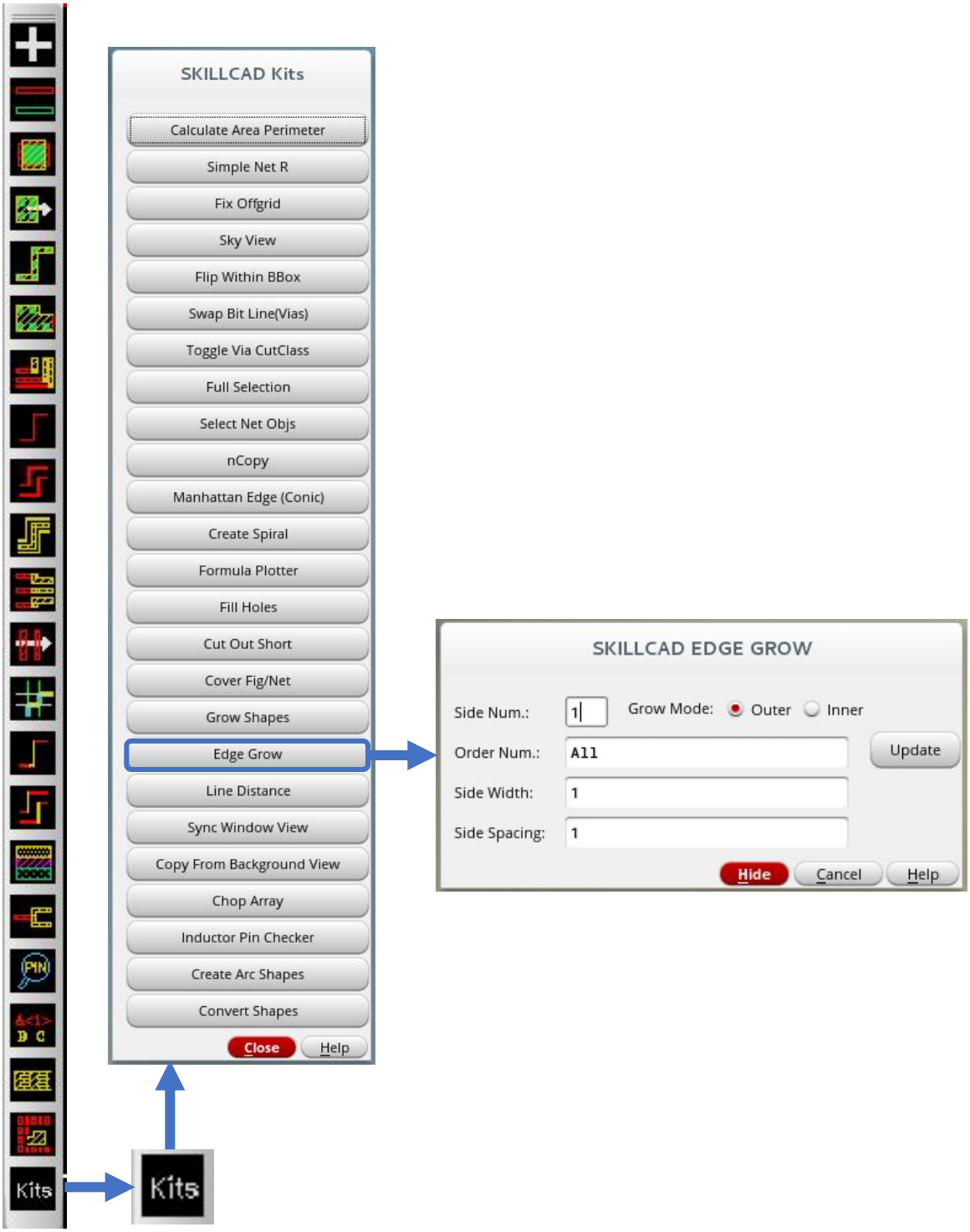
SKILLCAD Kits, Cover Mask Shape



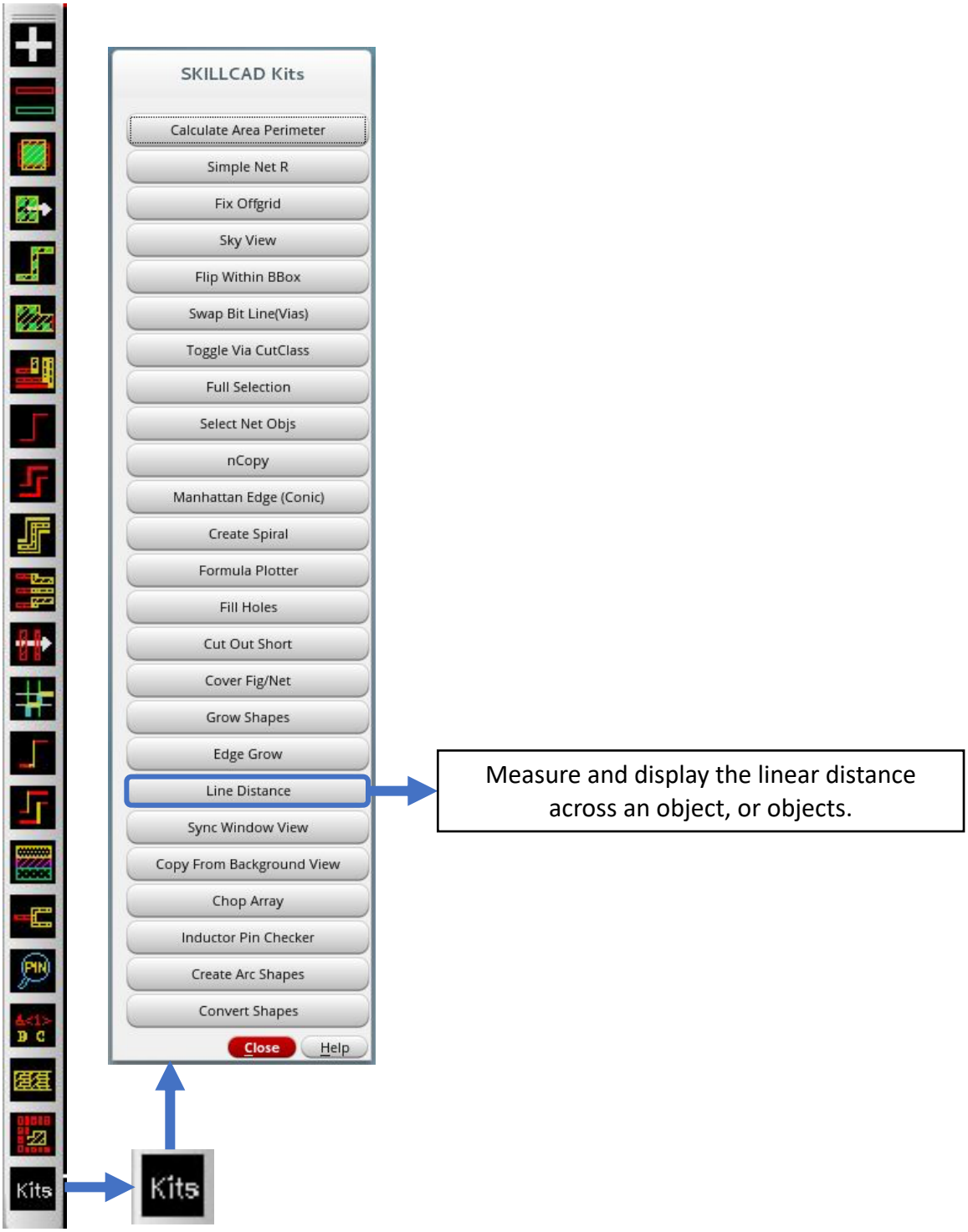
SKILLCAD Kits, Growing Shapes From Existing Shapes



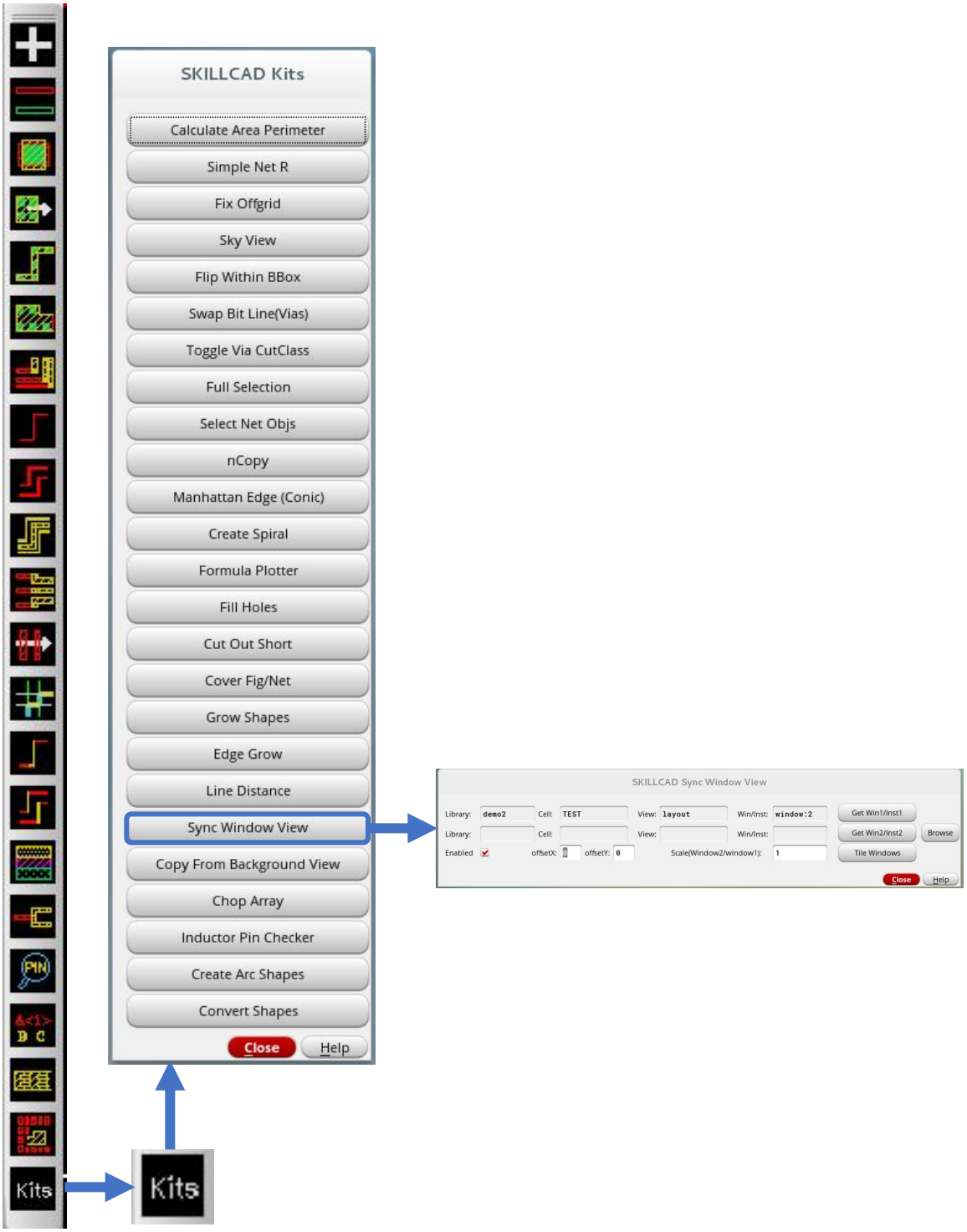
SKILLCAD Kits, Growing Shapes From Existing Edges



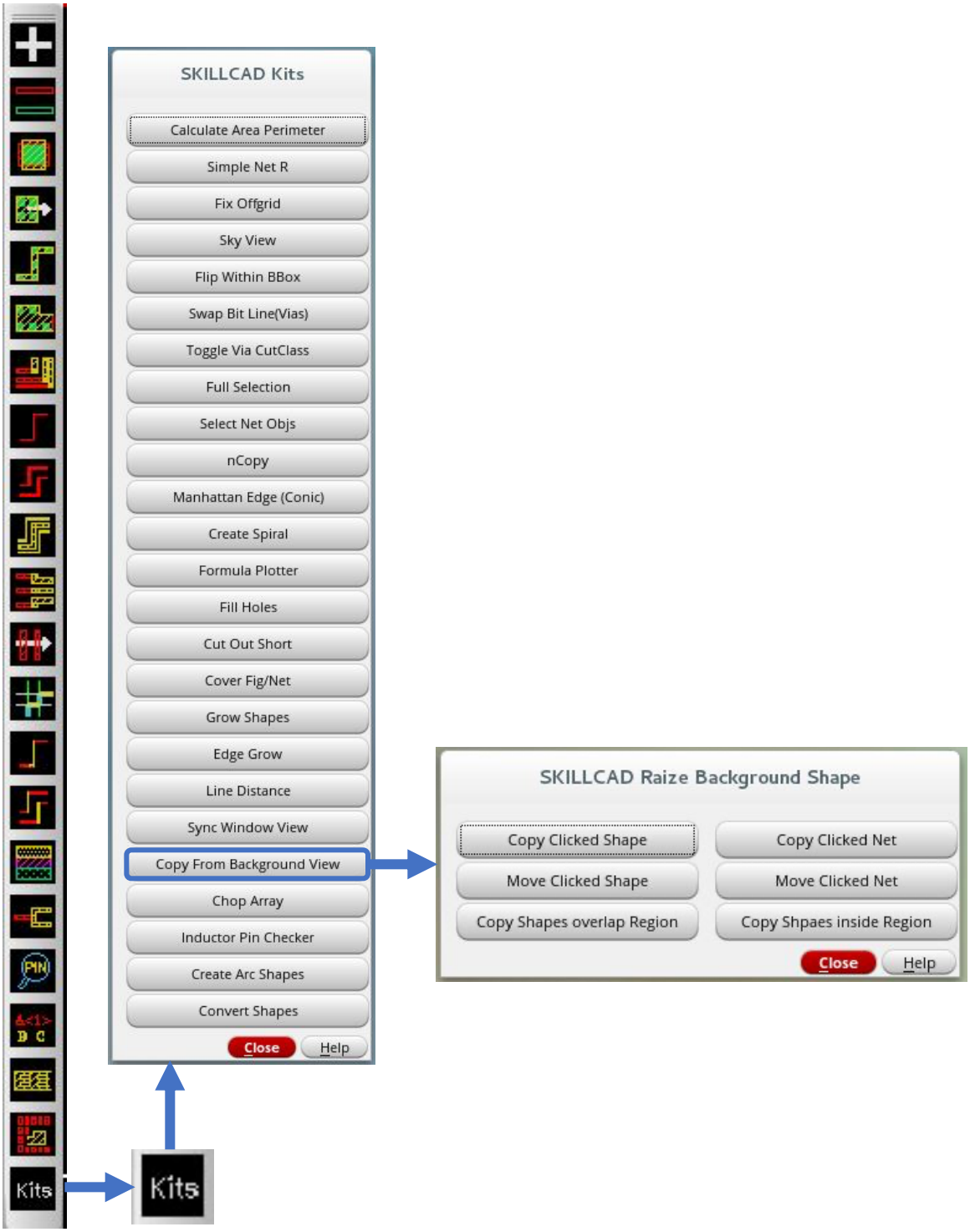
SKILLCAD Kits, Measuring Linear Distance



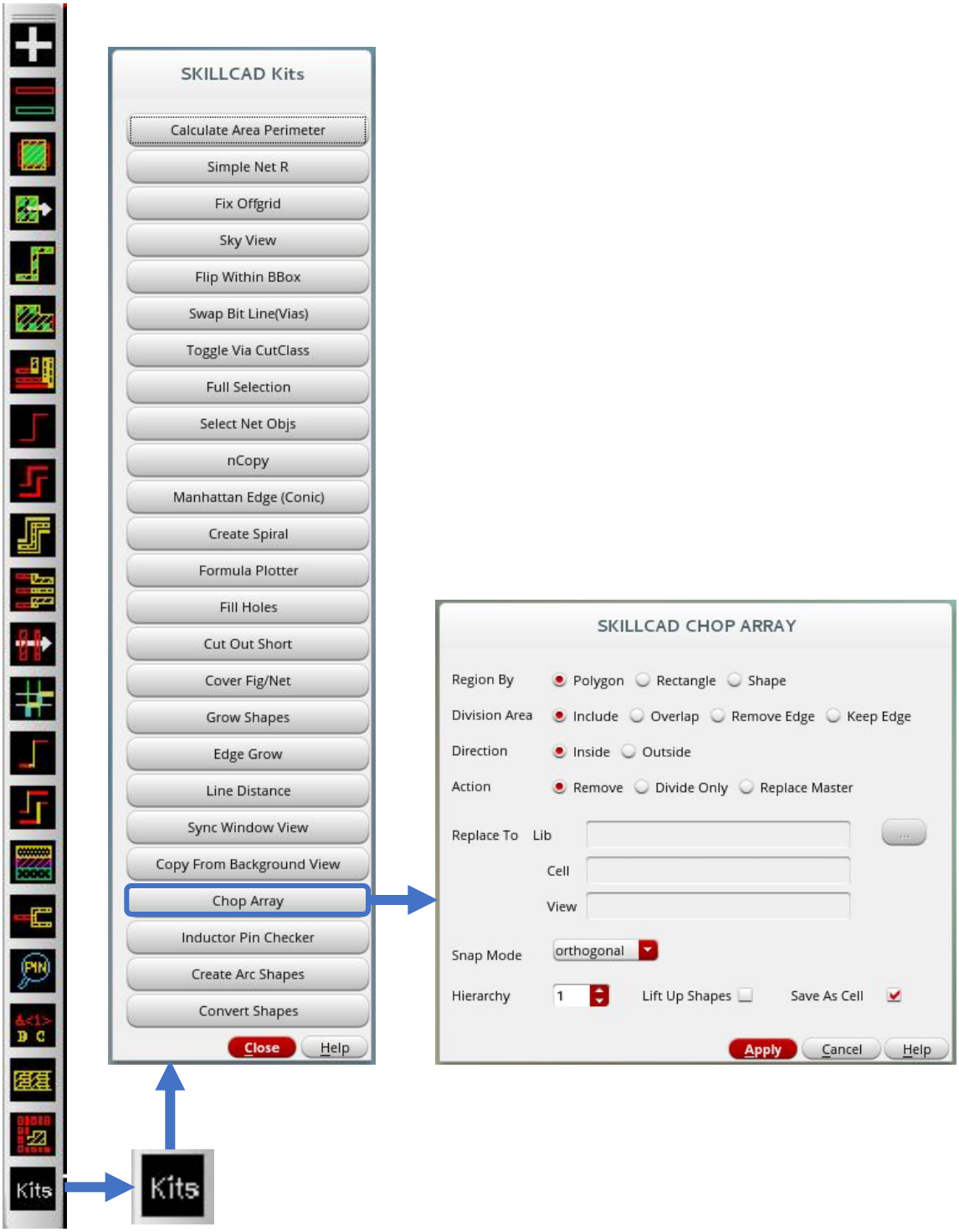
SKILLCAD Kits, Syncing Window Views



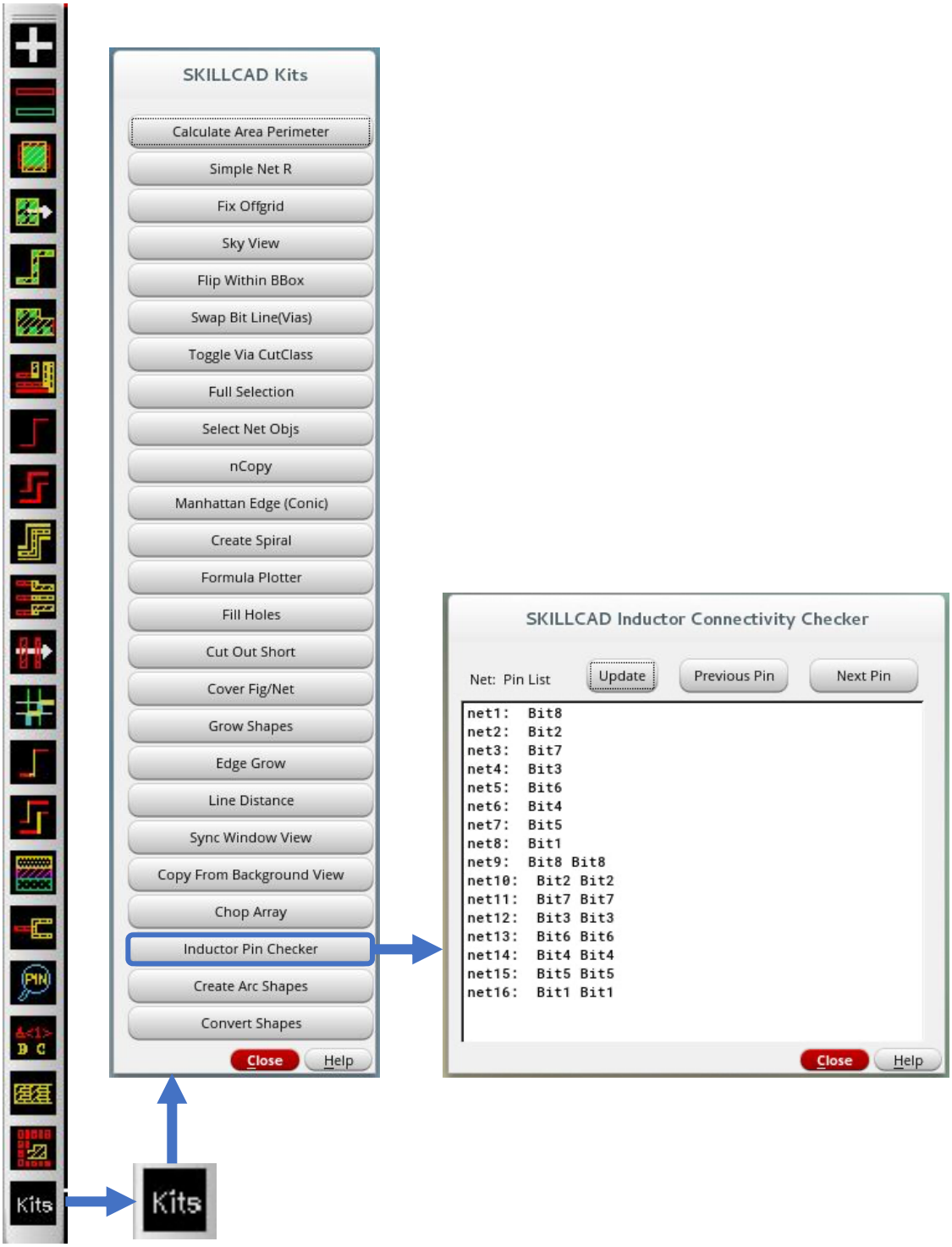
SKILLCAD Kits, Copying From A Background View



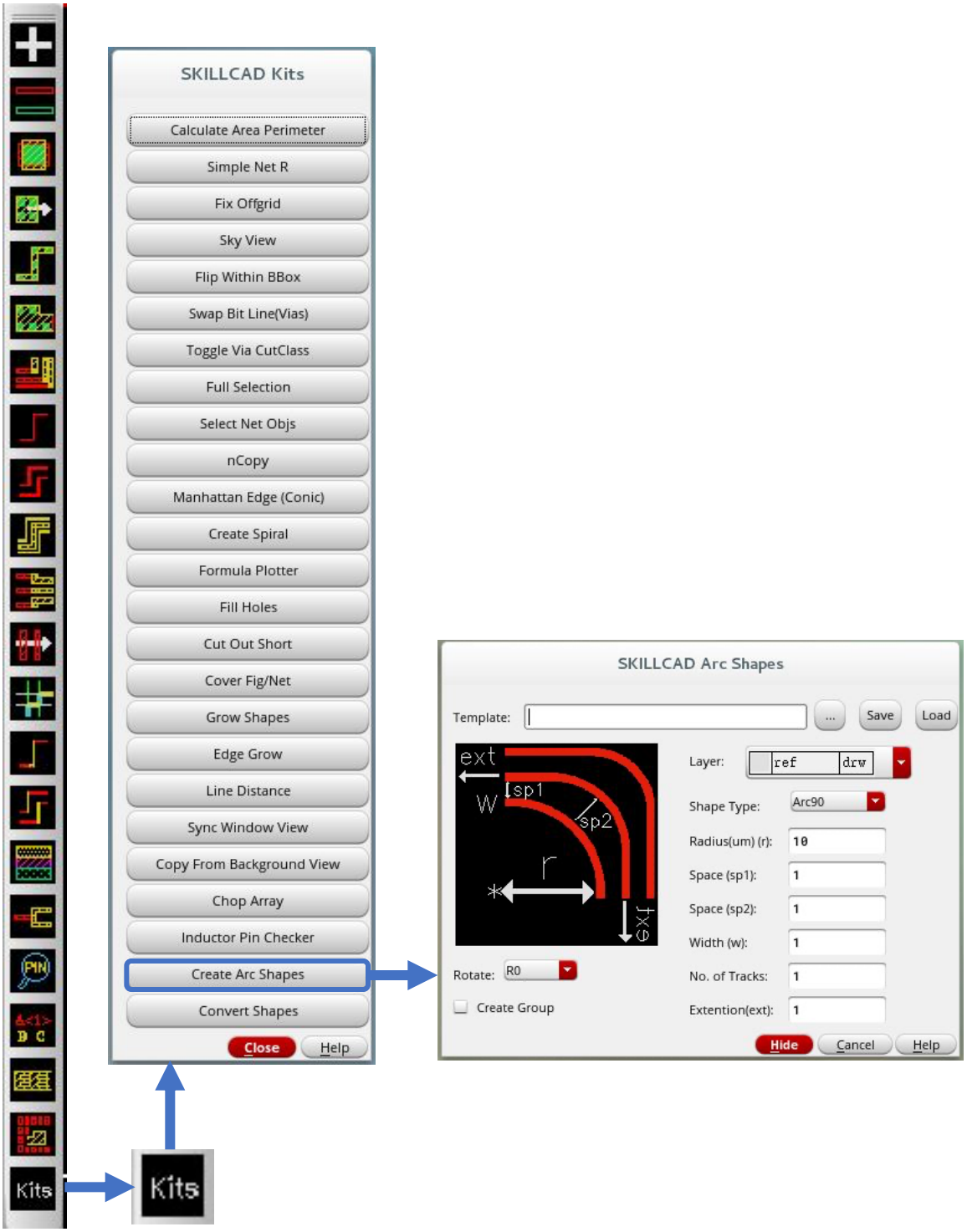
SKILLCAD Kits, Chopping An Existing Array



SKILLCAD Kits, Checking Inductor Connectivity



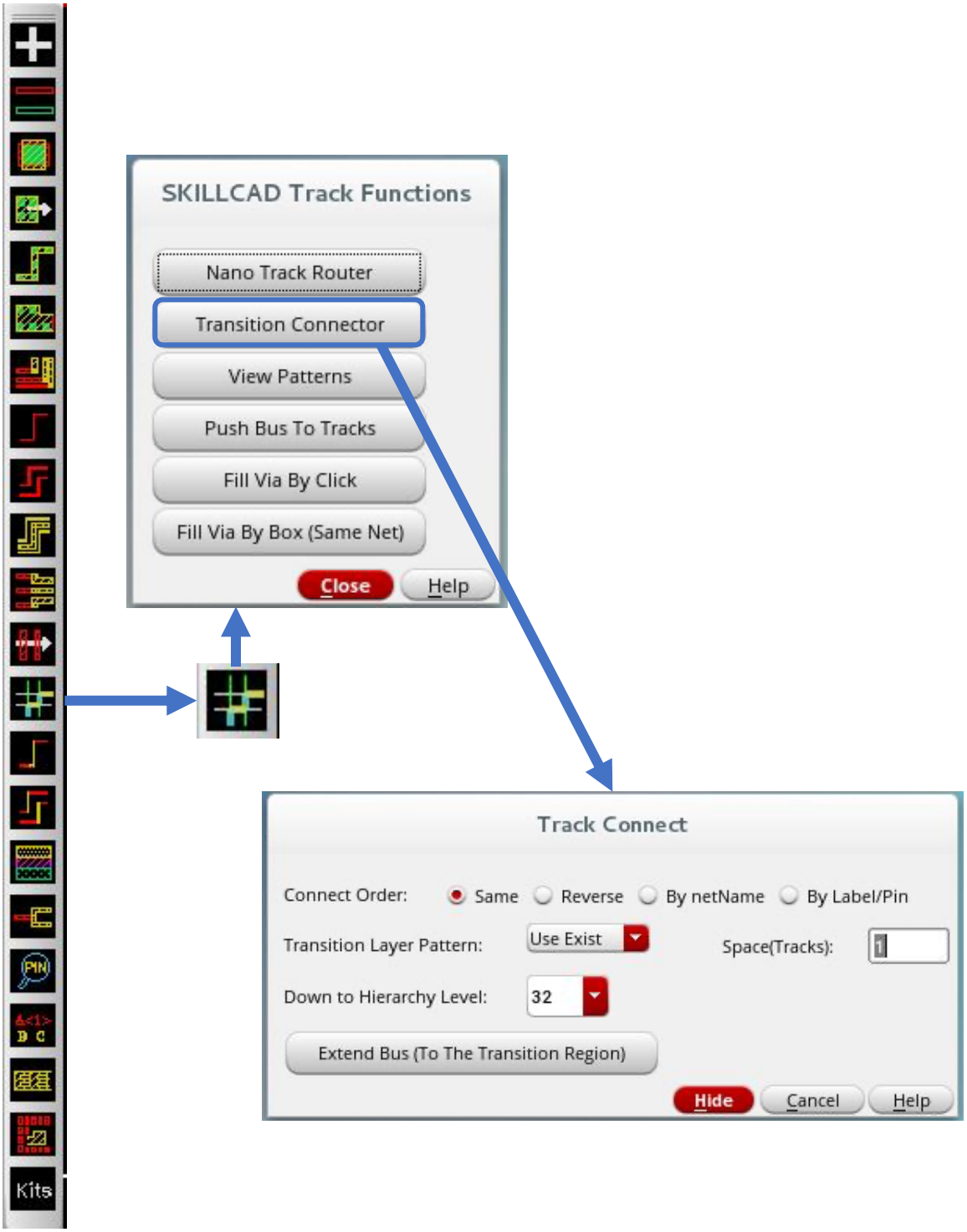
SKILLCAD Kits, Creating Arc Shapes



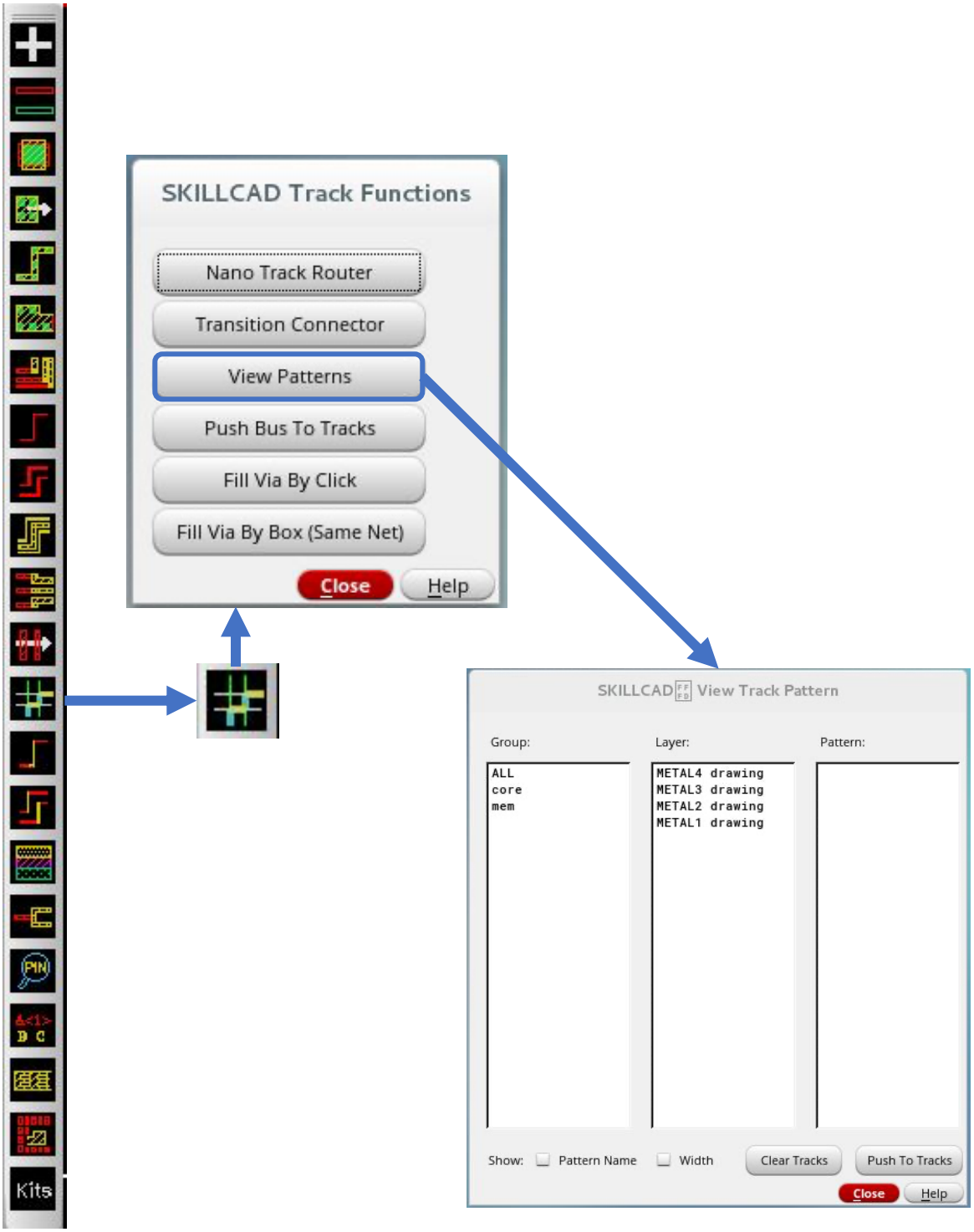
SKILLCAD Kits, Converting Objects

SKILLCAD Track Functions

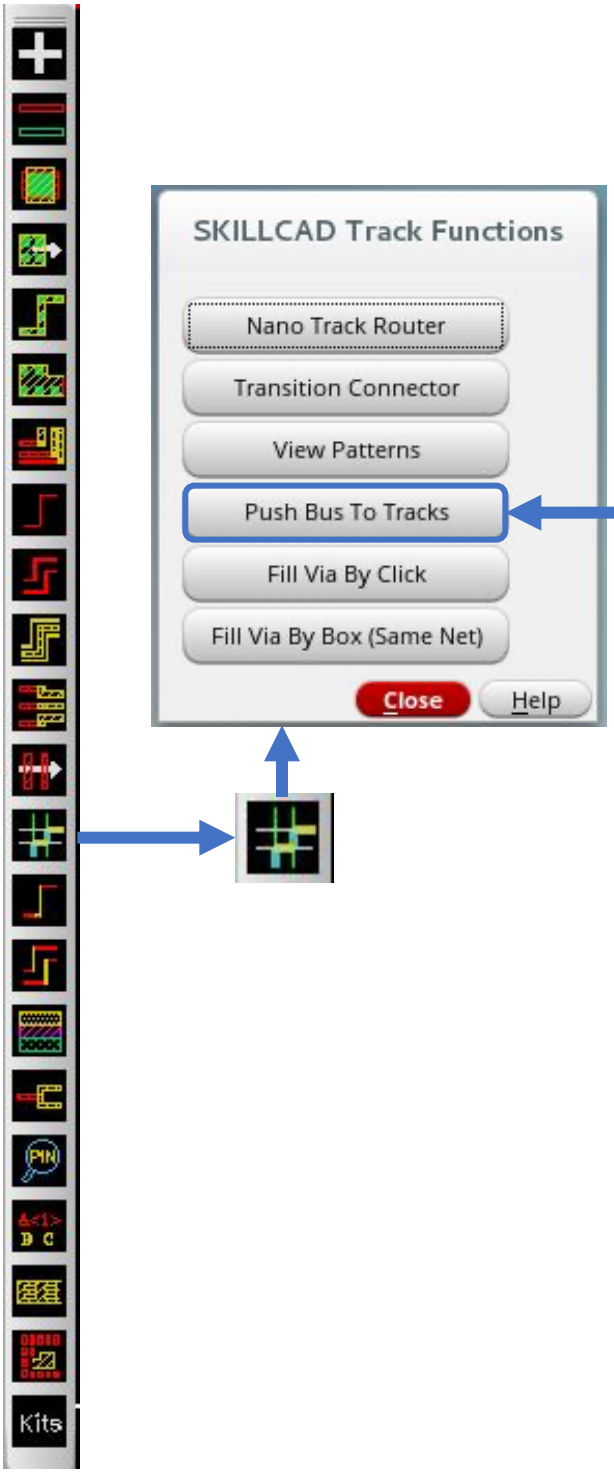
SKILLCAD Track Transition Connector



SKILLCAD View Track Patterns

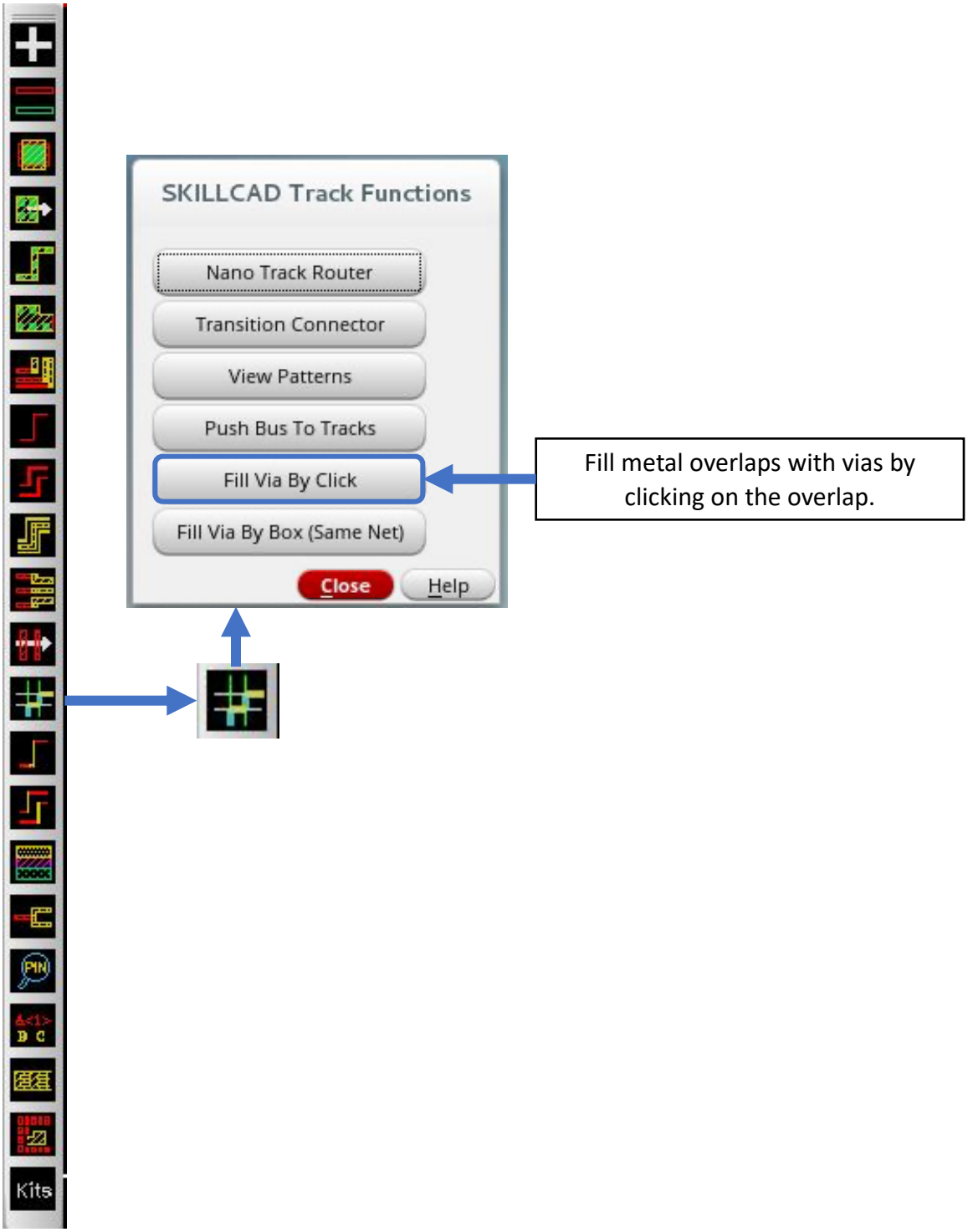


SKILLCAD Pushing Bus Metals To The Track Patterns

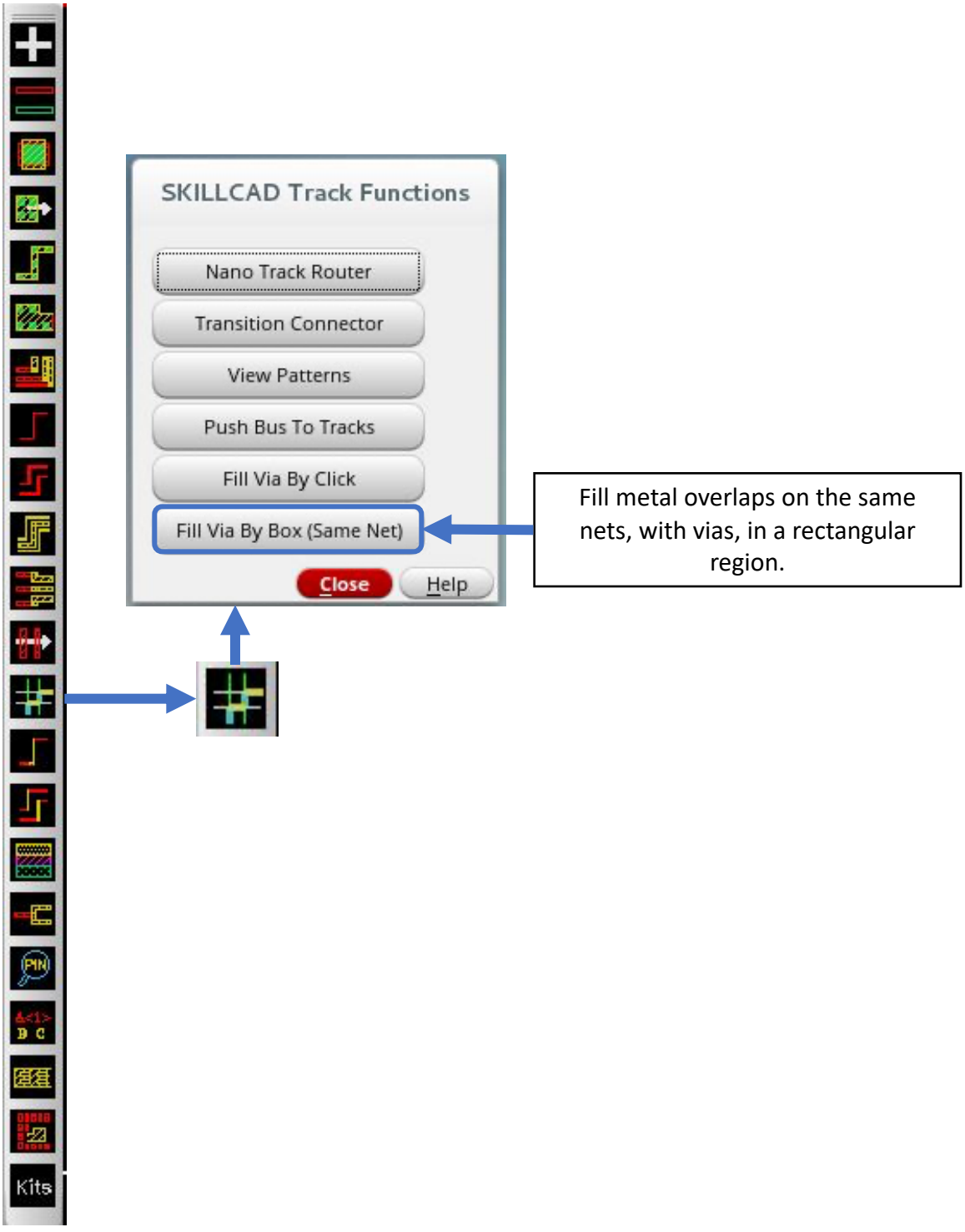


Push bus metals to the track patterns.

SKILLCAD Click To Fill Metal Overlaps With Vias

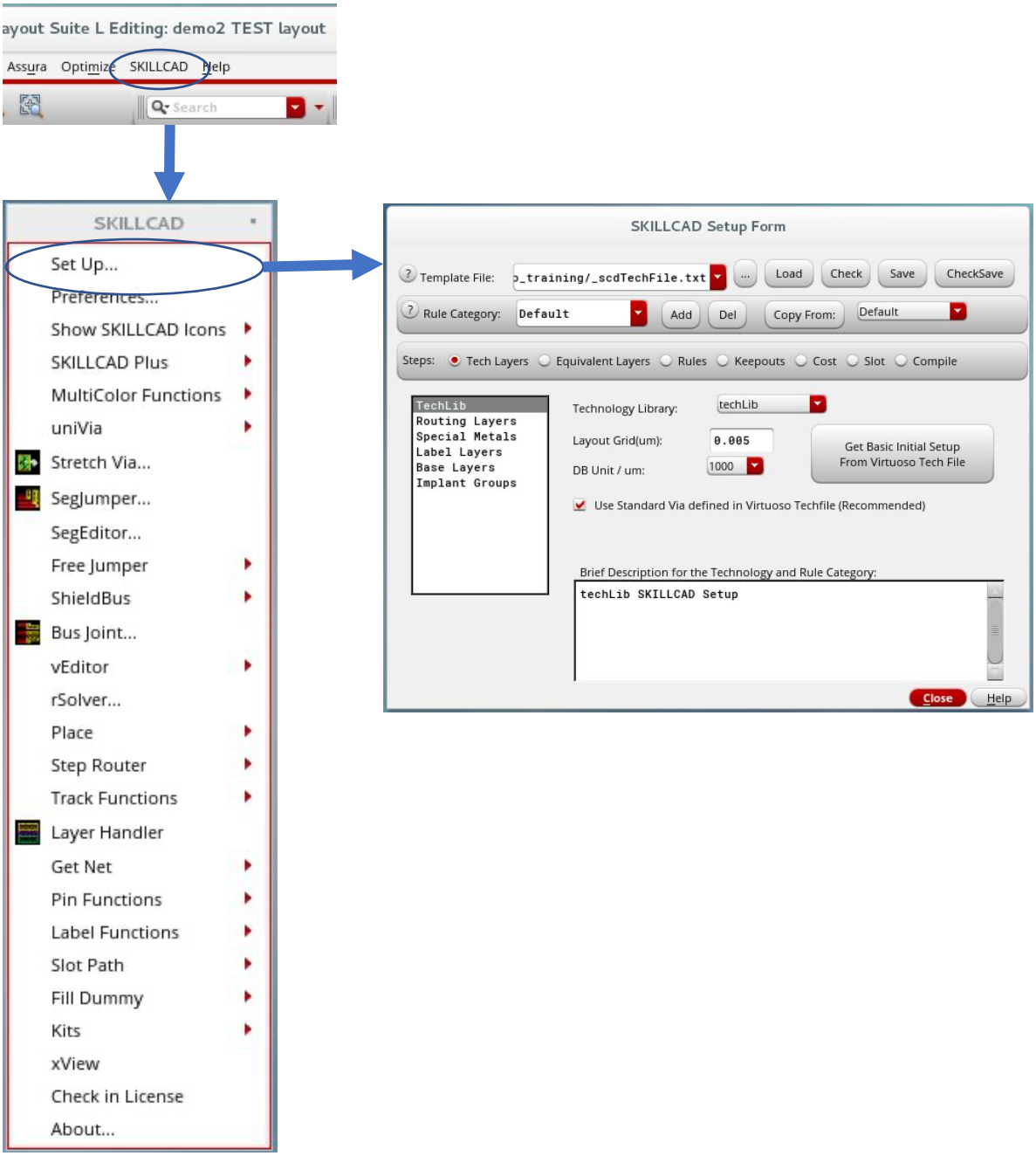


SKILLCAD Fill Metal Overlaps On Same Net, With Vias

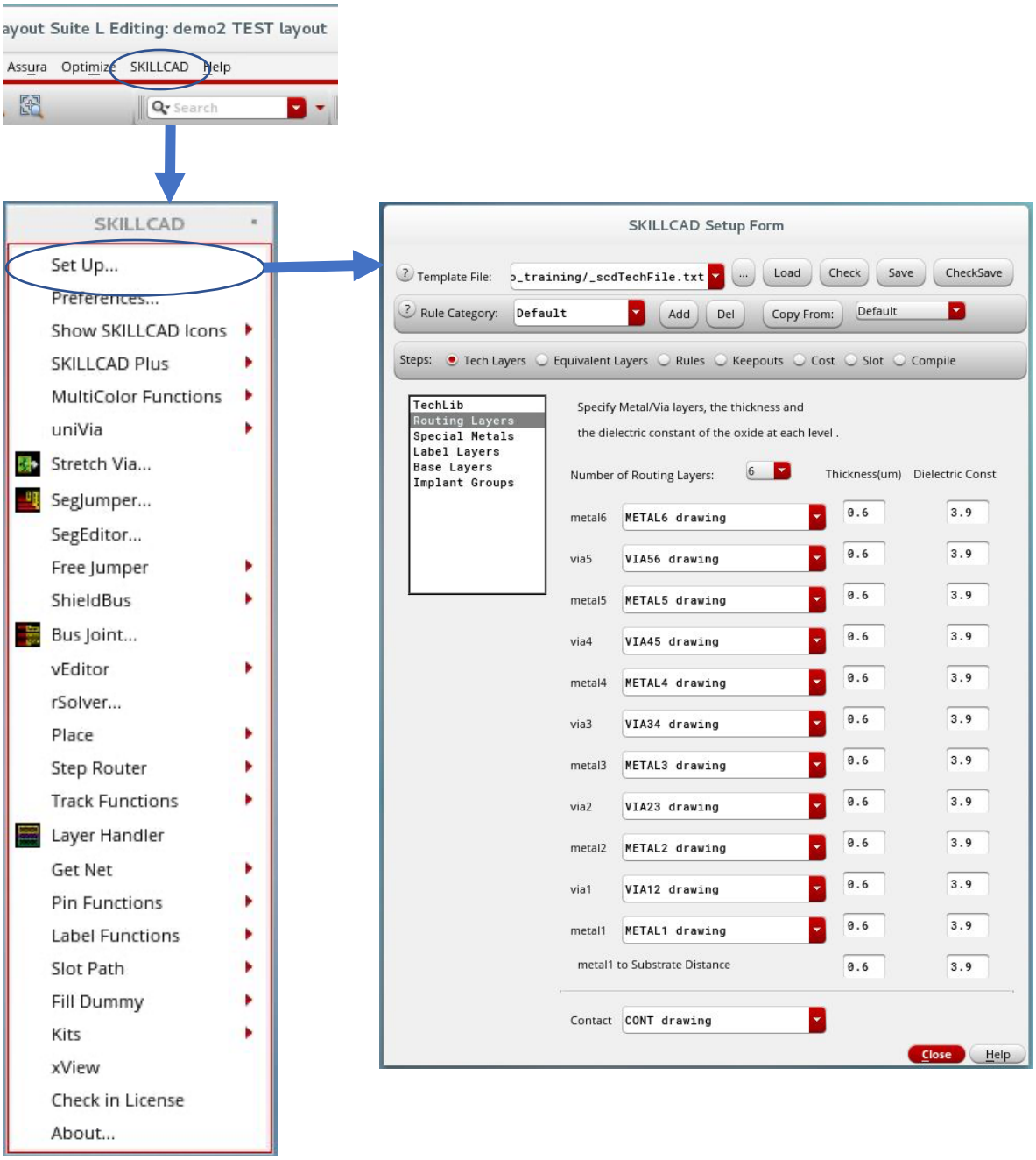


Fill metal overlaps on the same nets, with vias, in a rectangular region.

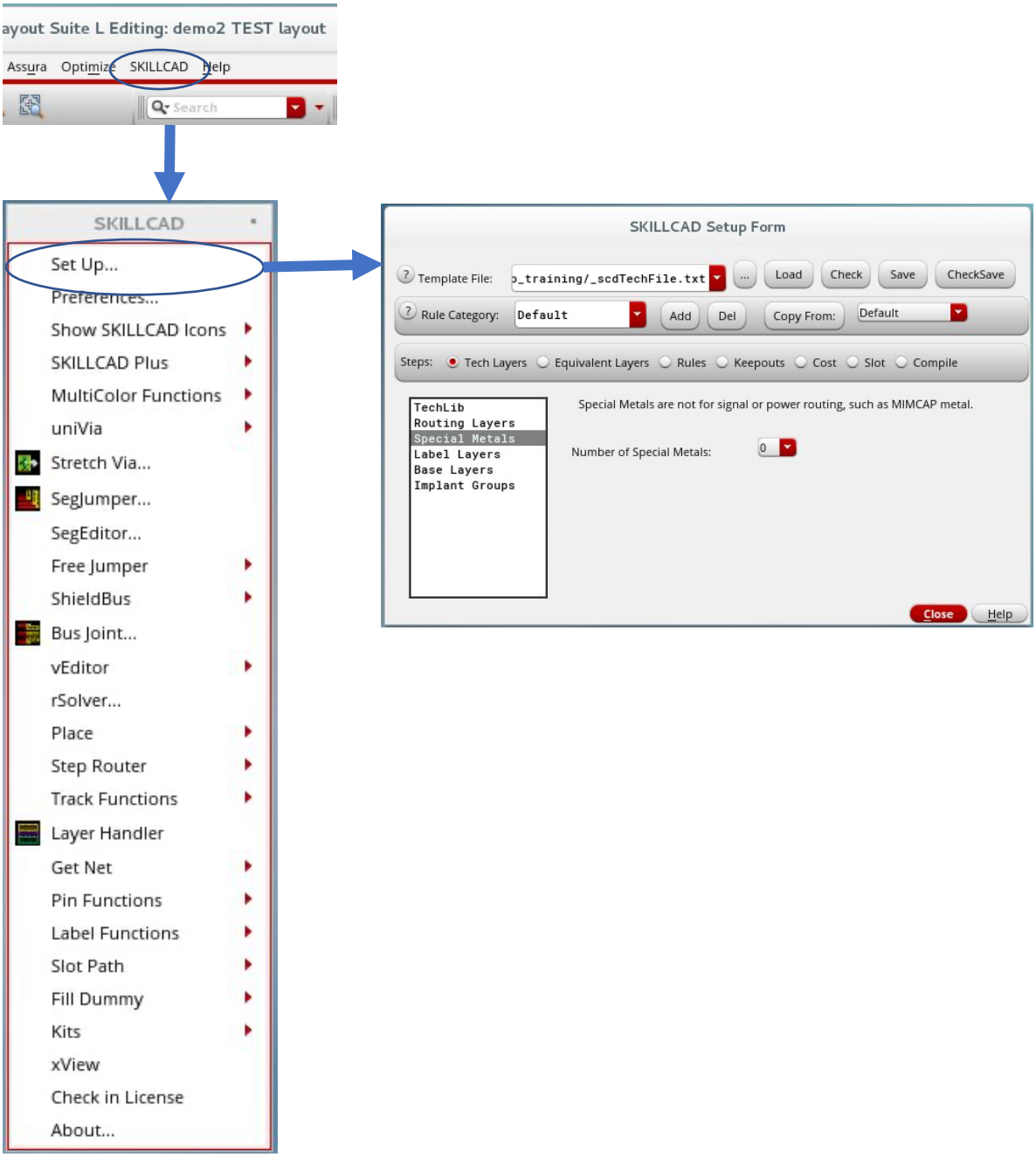
SKILLCAD Setup Technology Library



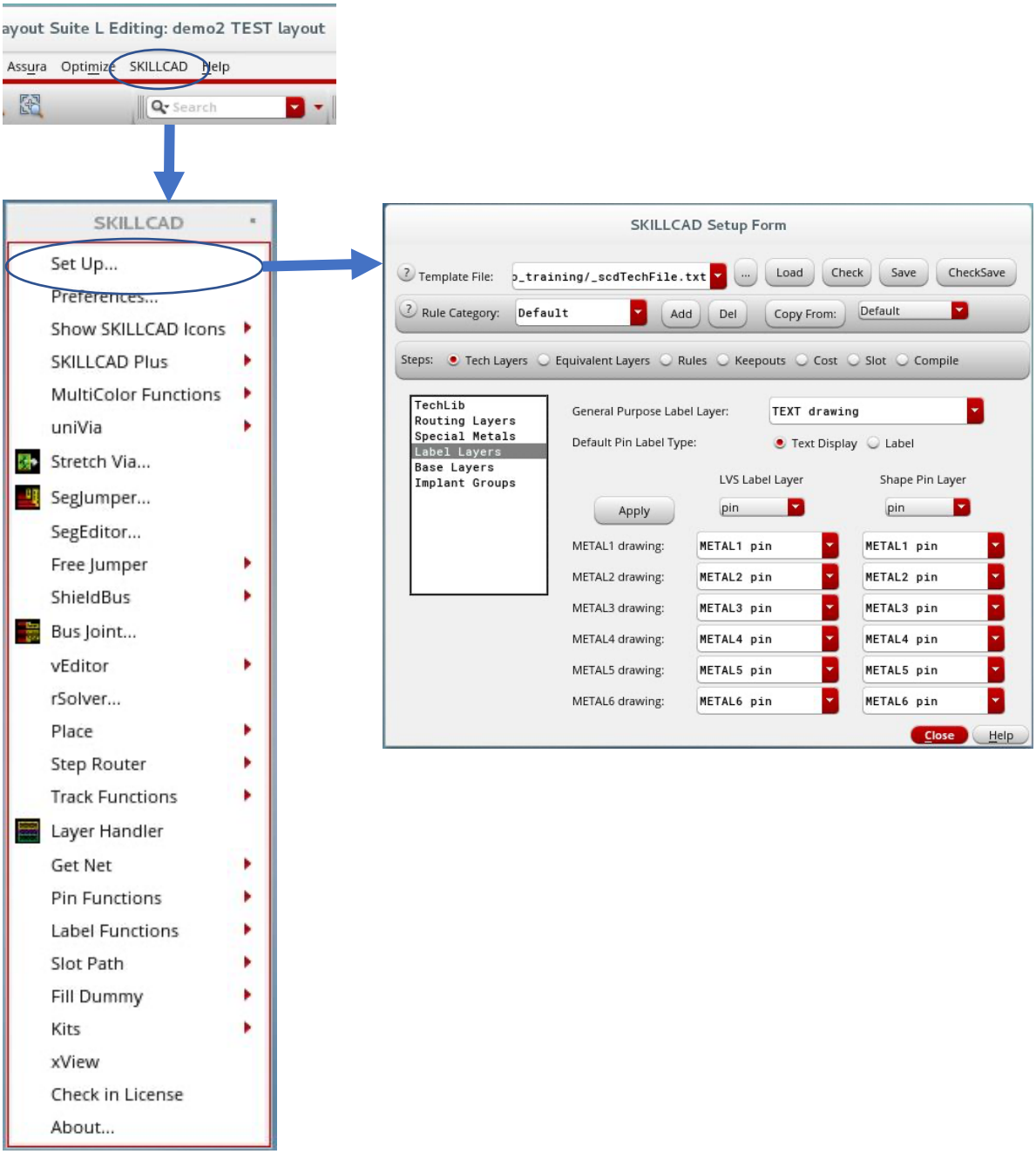
SKILLCAD Setup Routing Layers



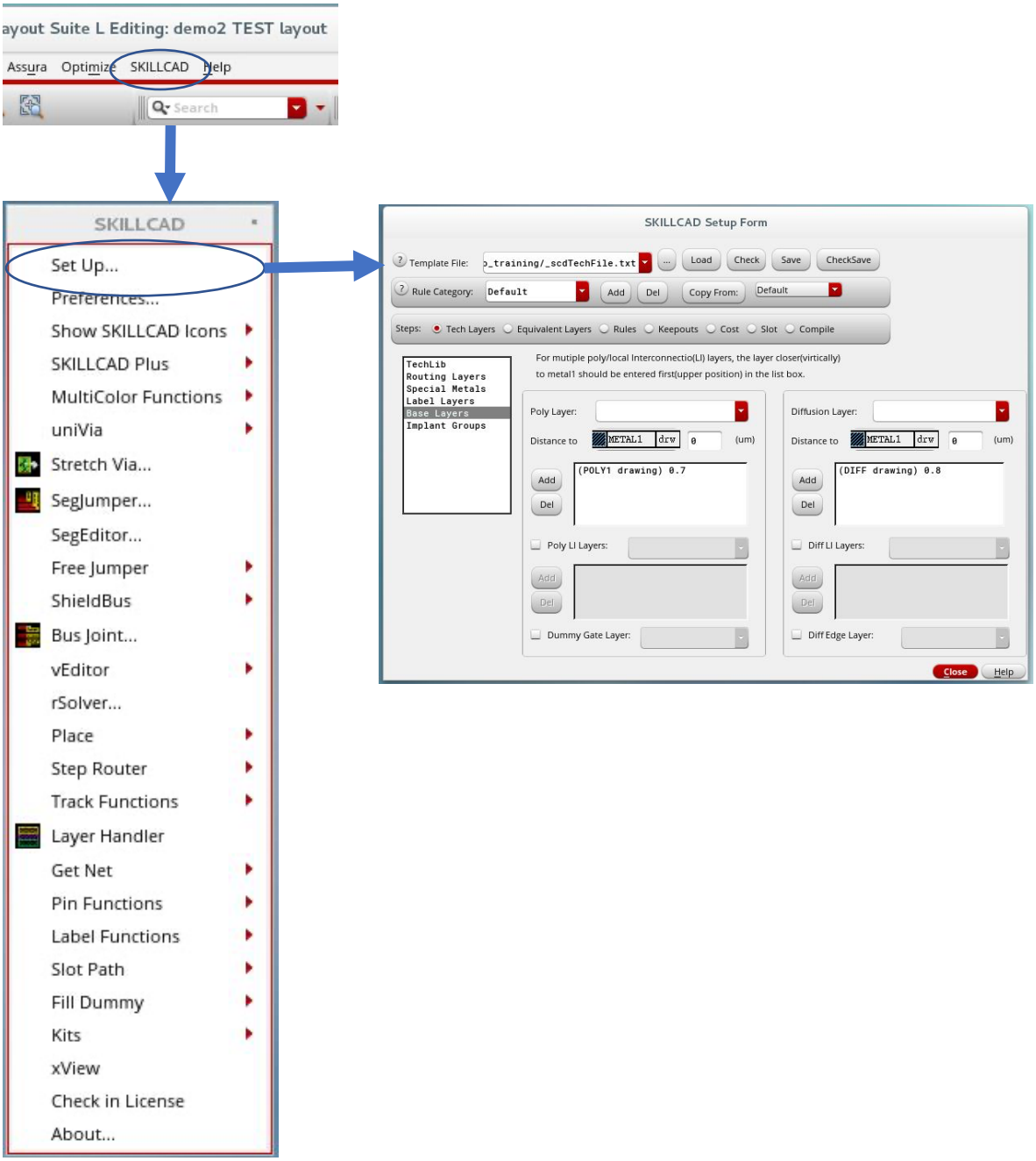
SKILLCAD Setup Special Metals



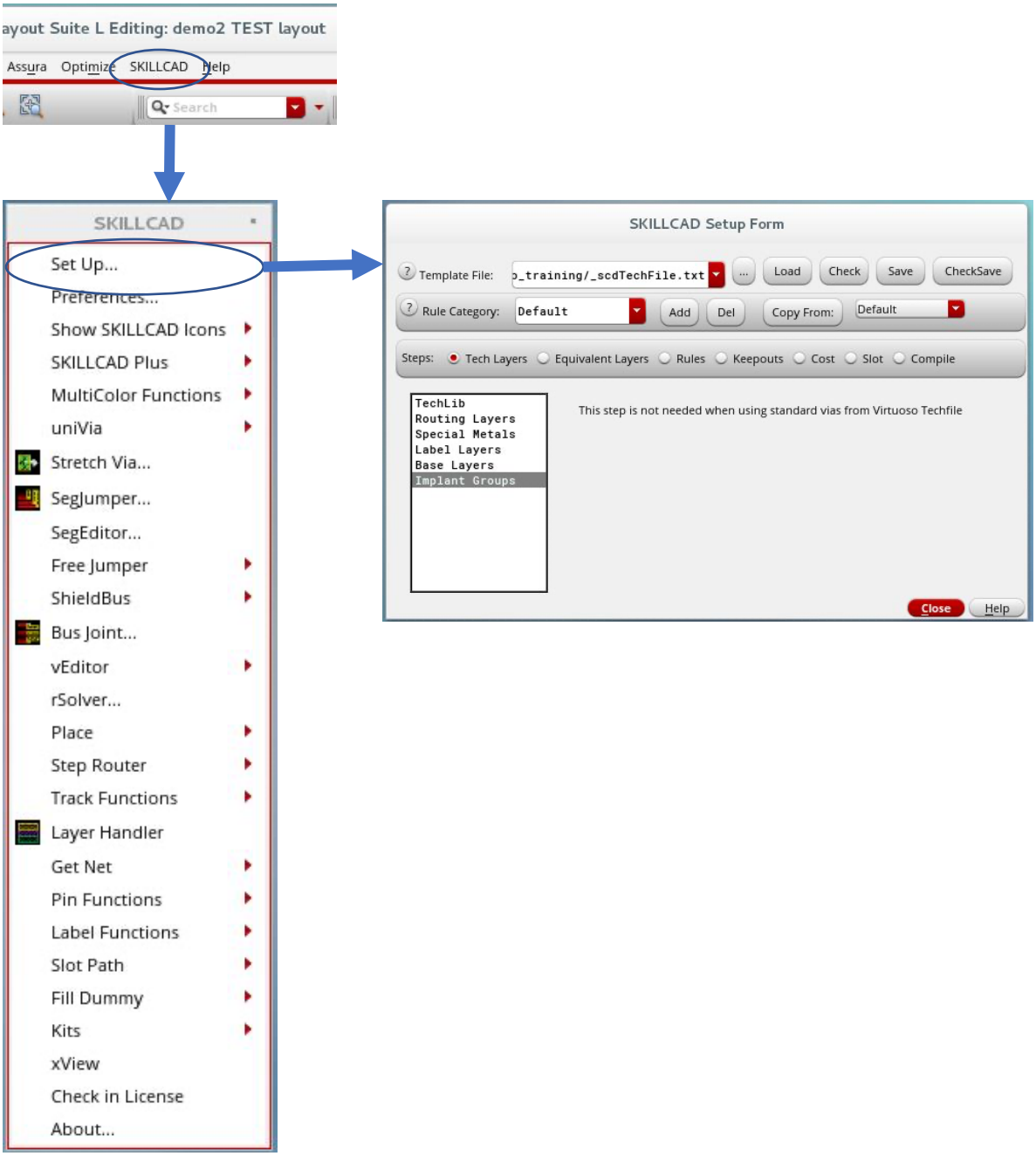
SKILLCAD Setup LVS Labels, Pin Layers



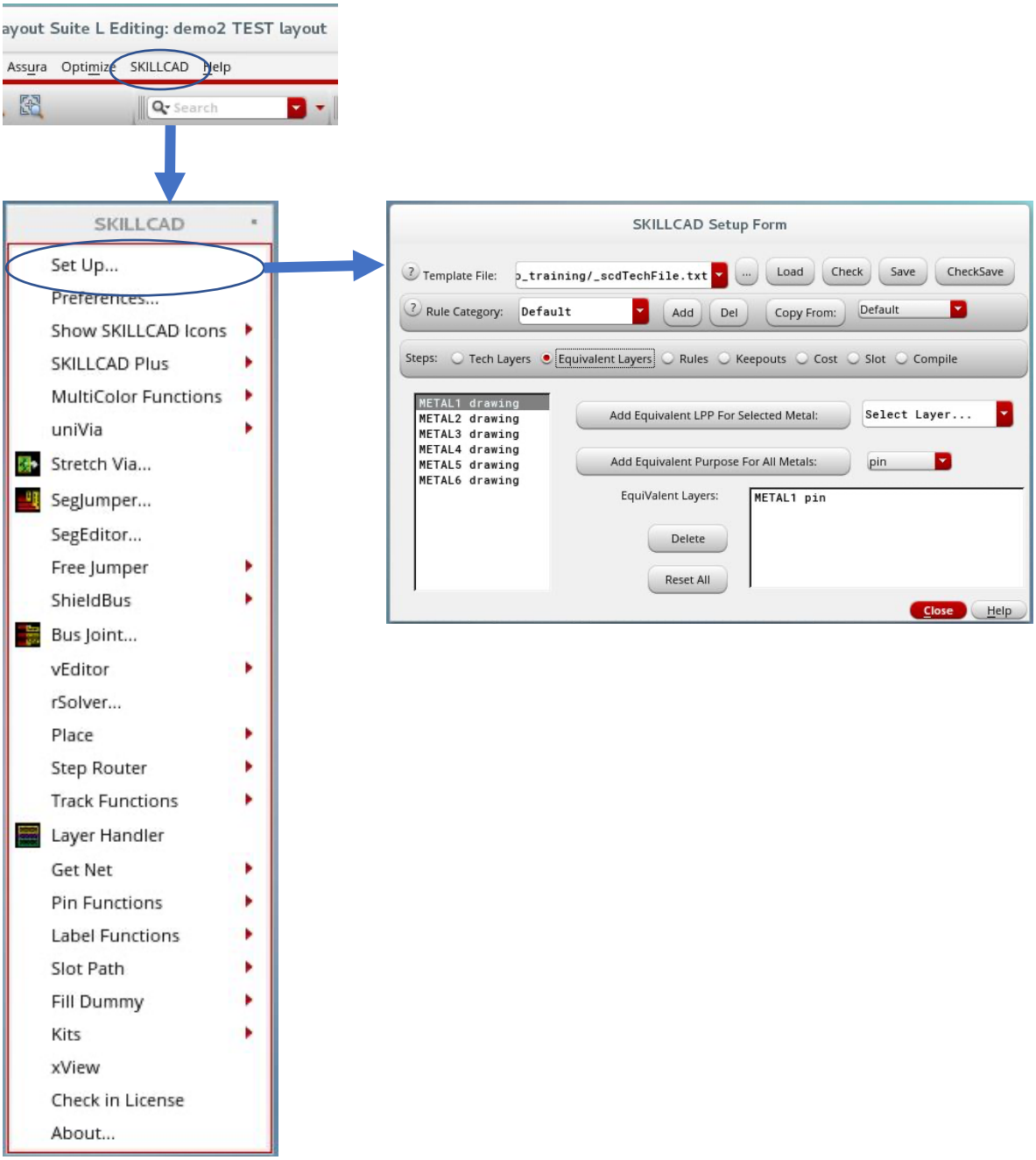
SKILLCAD Setup Base Layers



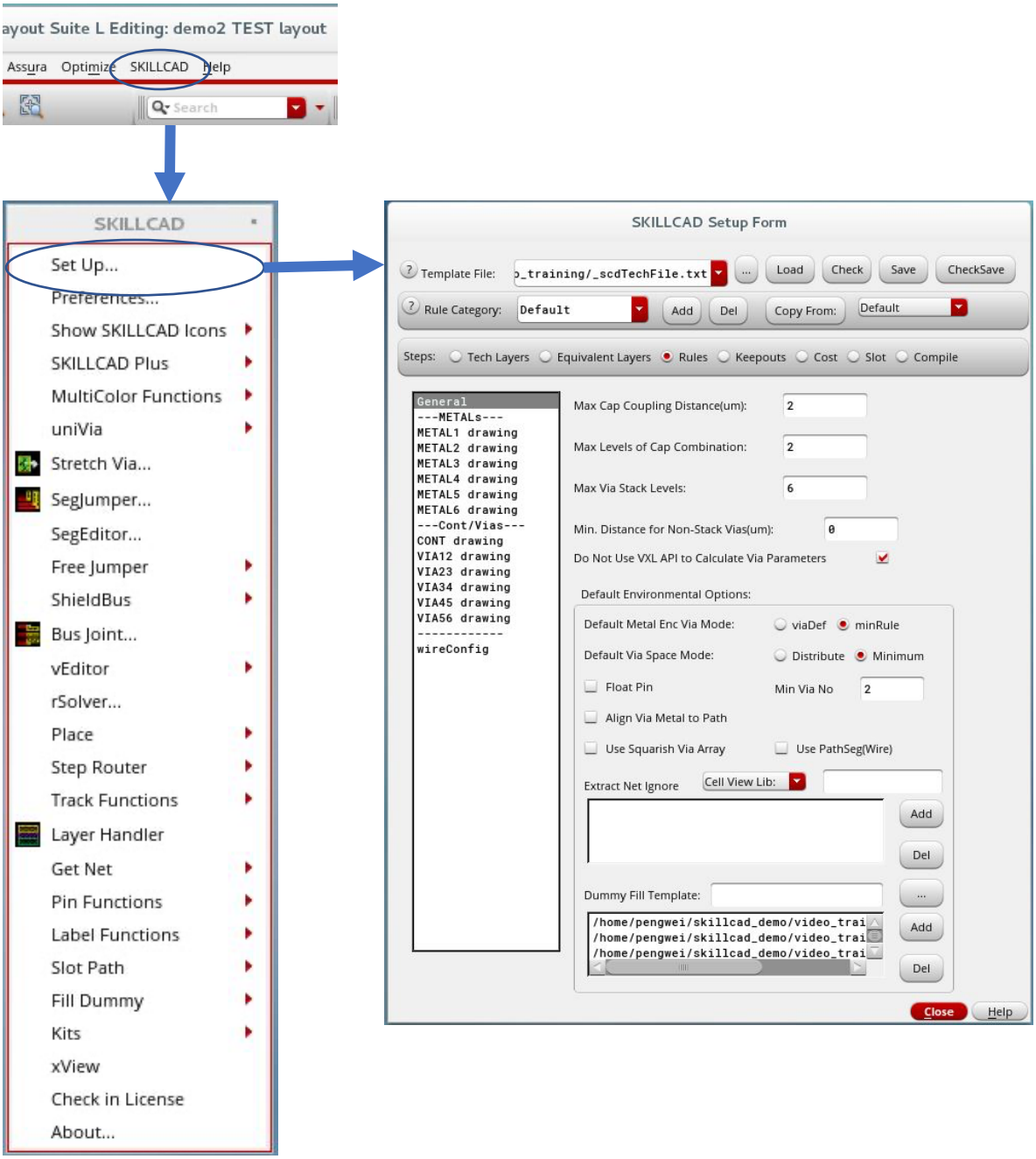
SKILLCAD Setup Implant Groups



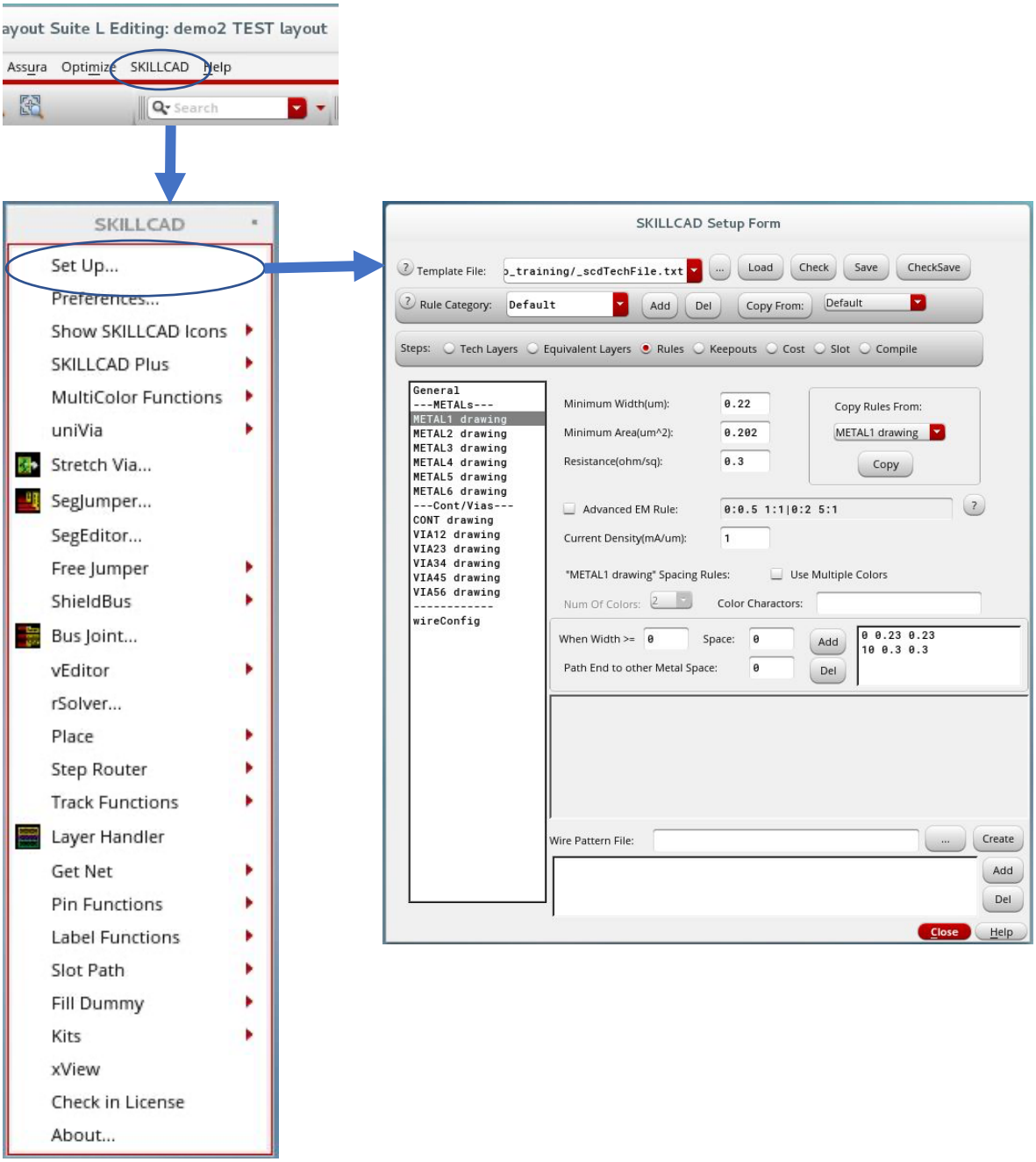
SKILLCAD Setup Equivalent Layers



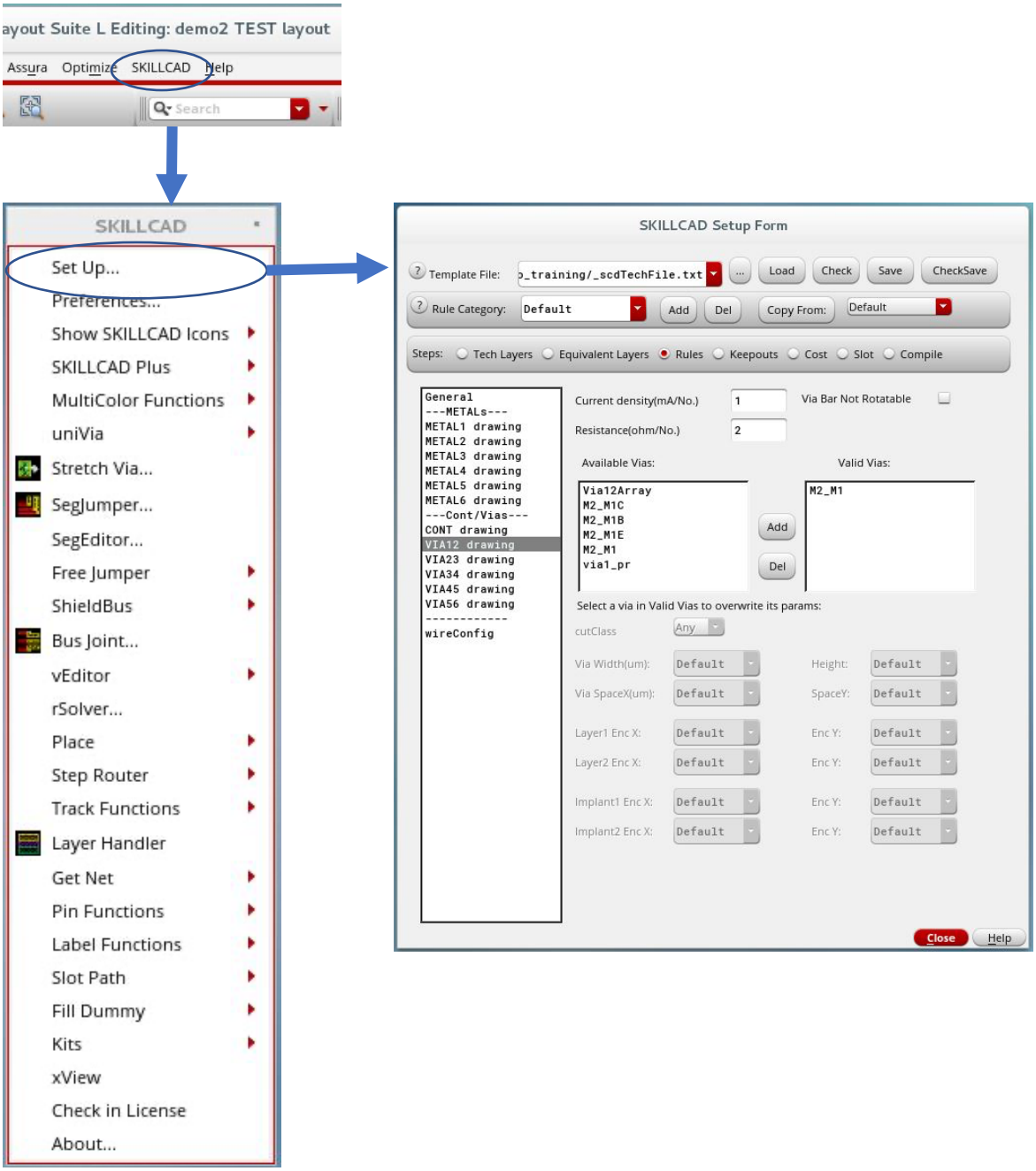
SKILLCAD Setup General Metal/Via Rules



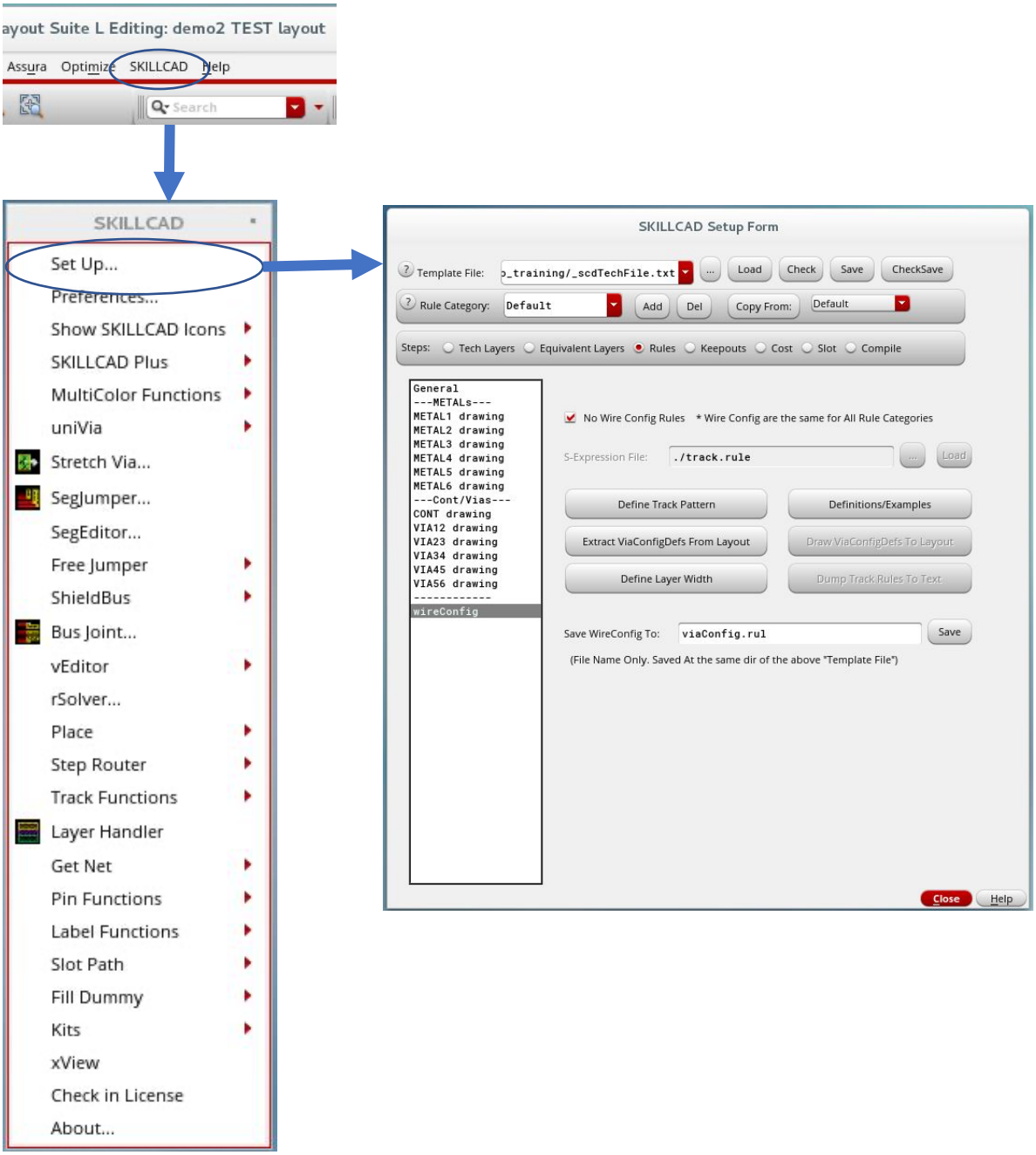
SKILLCAD Setup Individual Metal Layer Rules



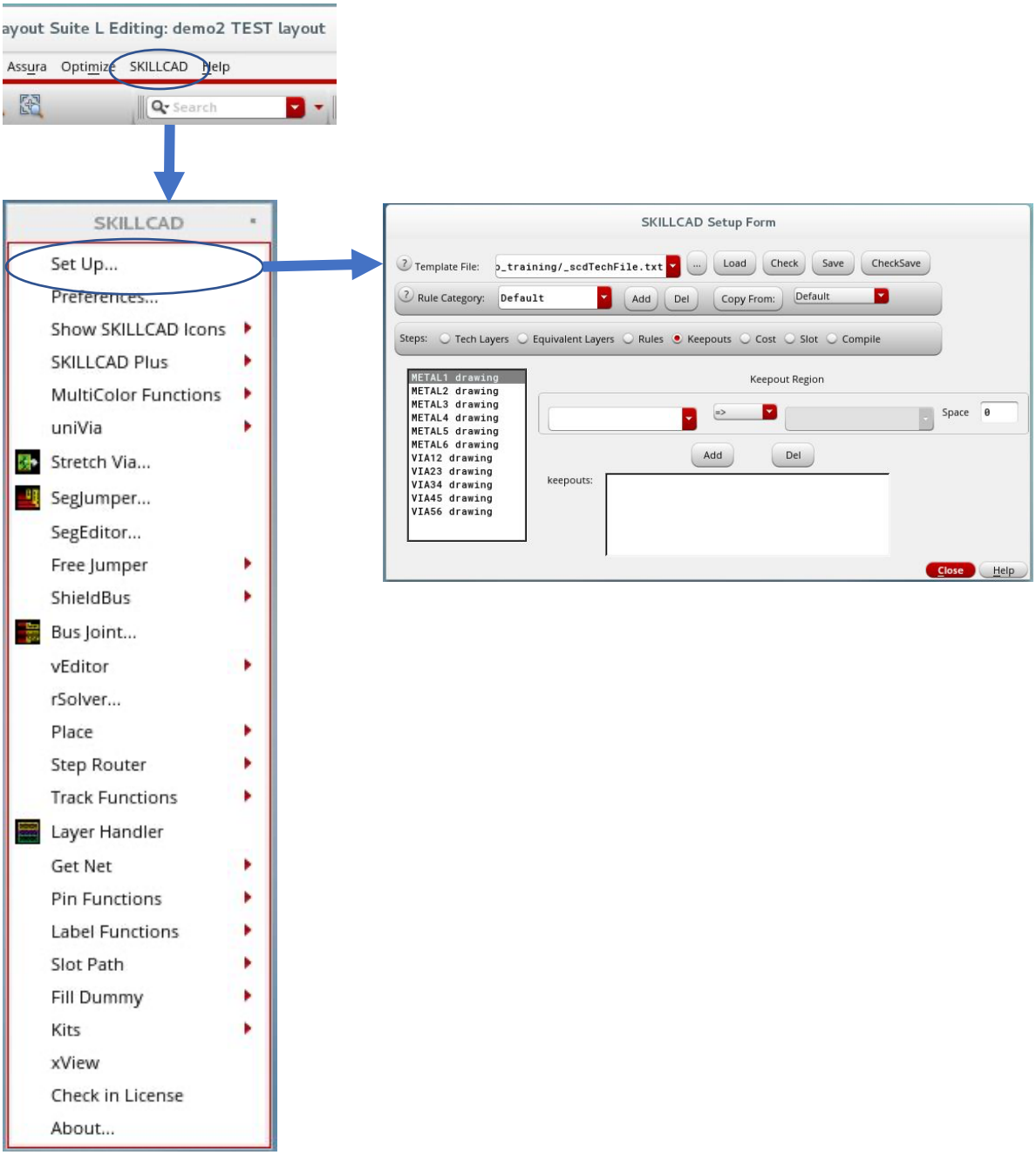
SKILLCAD Setup Contact And Via Rules



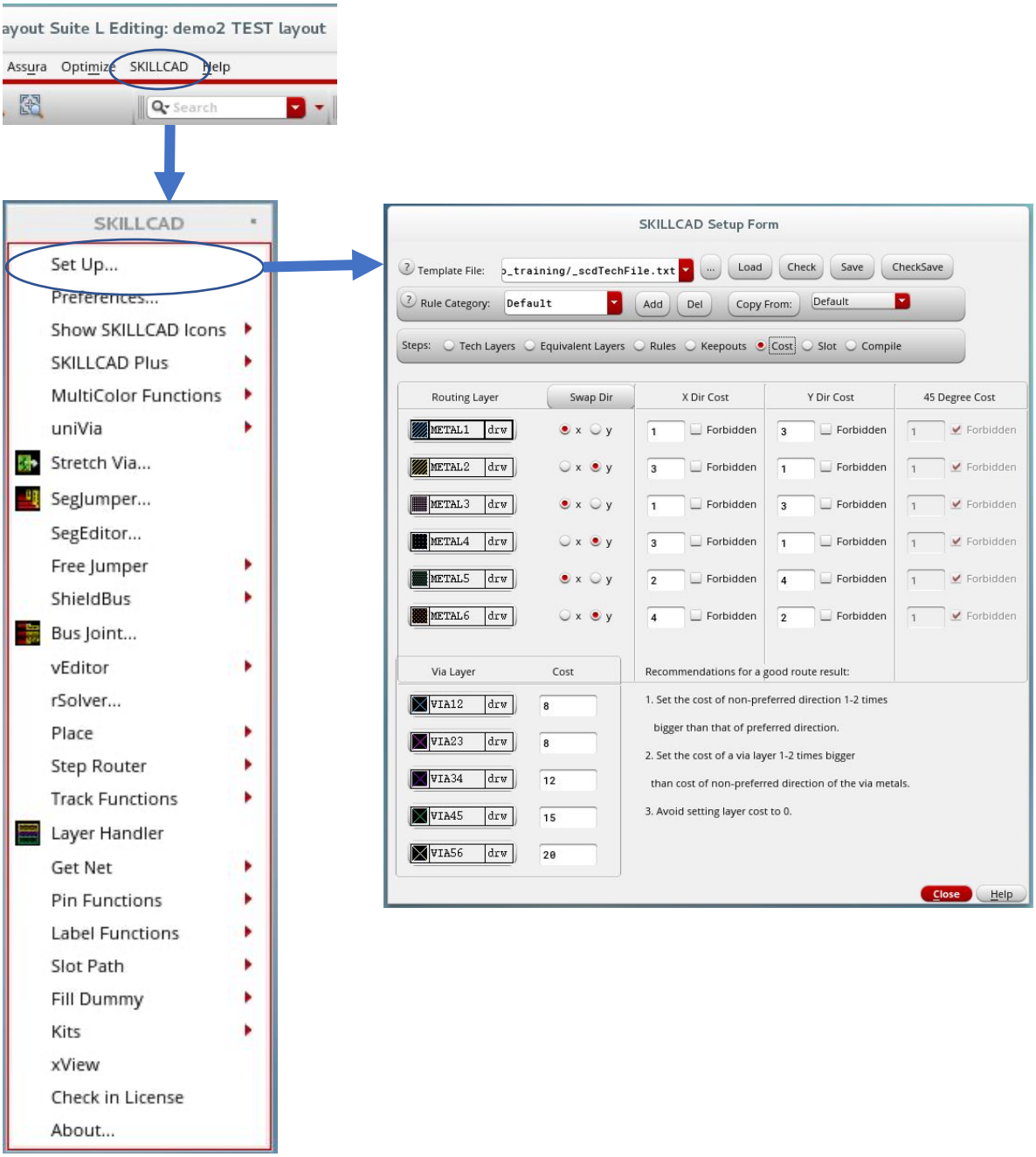
SKILLCAD Setup Wire Configuration Rules (Nano Router)



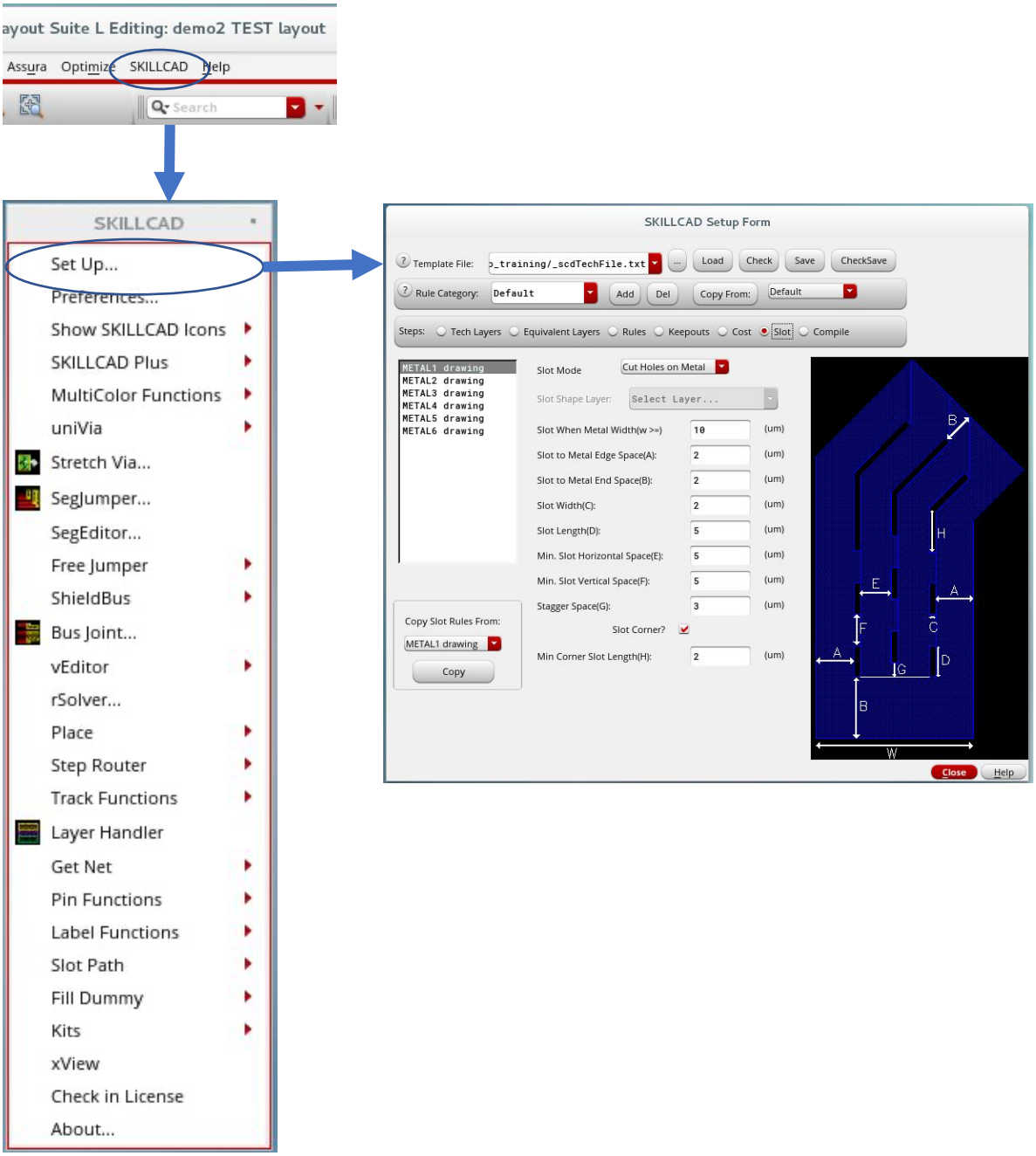
SKILLCAD Setup Metal And Via Keepout Regions



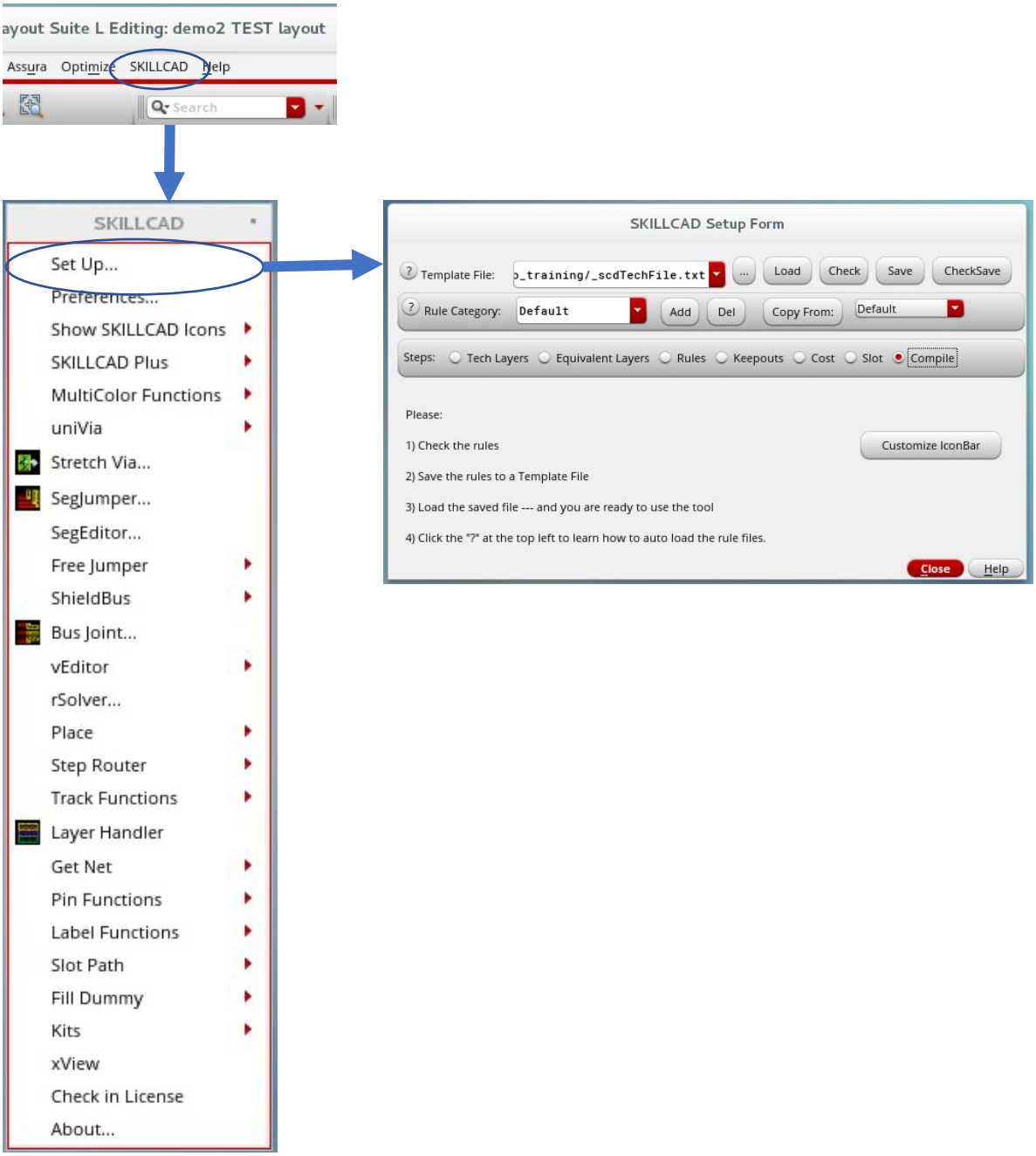
SKILLCAD Define Metal Direction And Via Costs



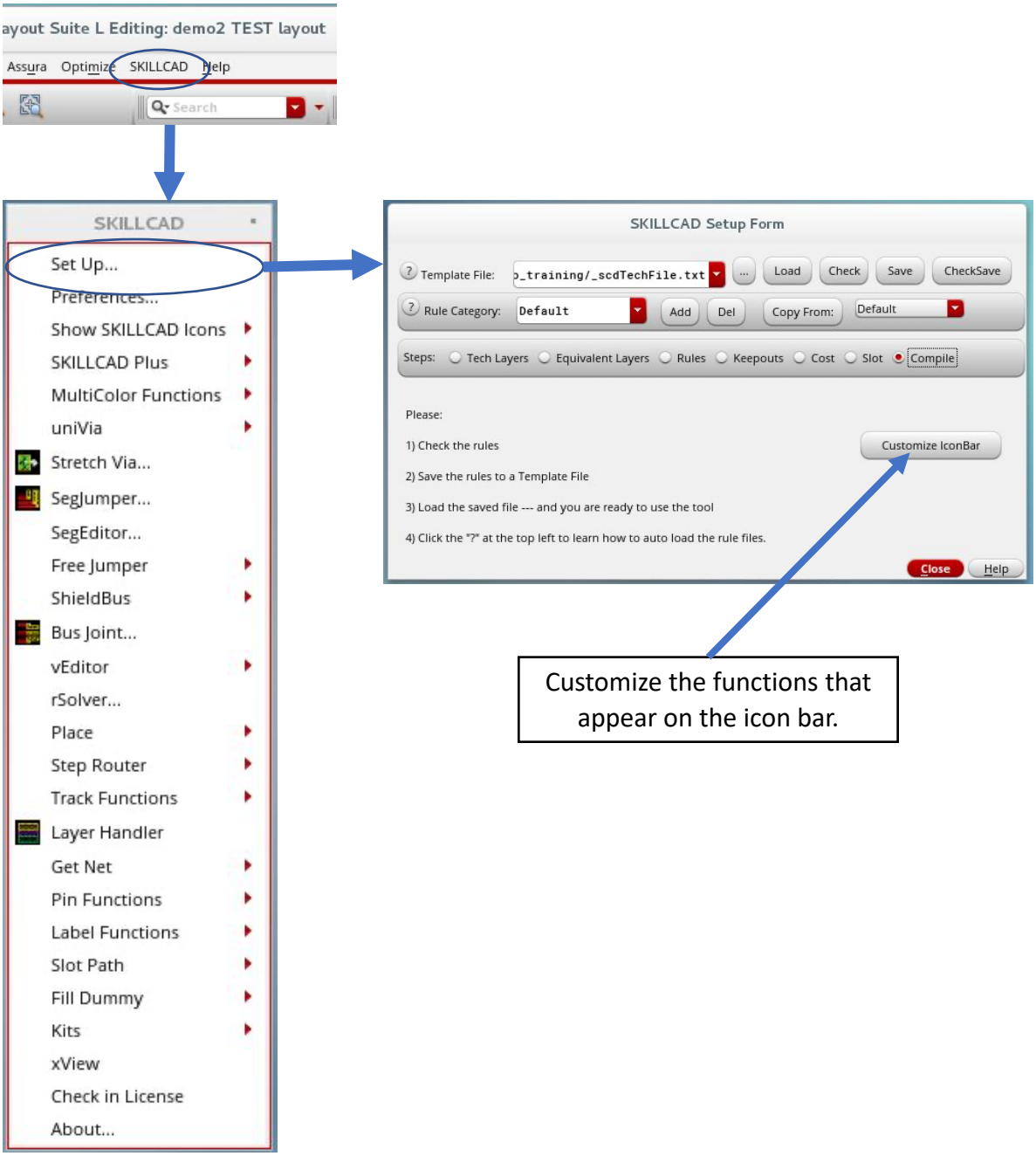
SKILLCAD Setup Metal Slotting Parameters



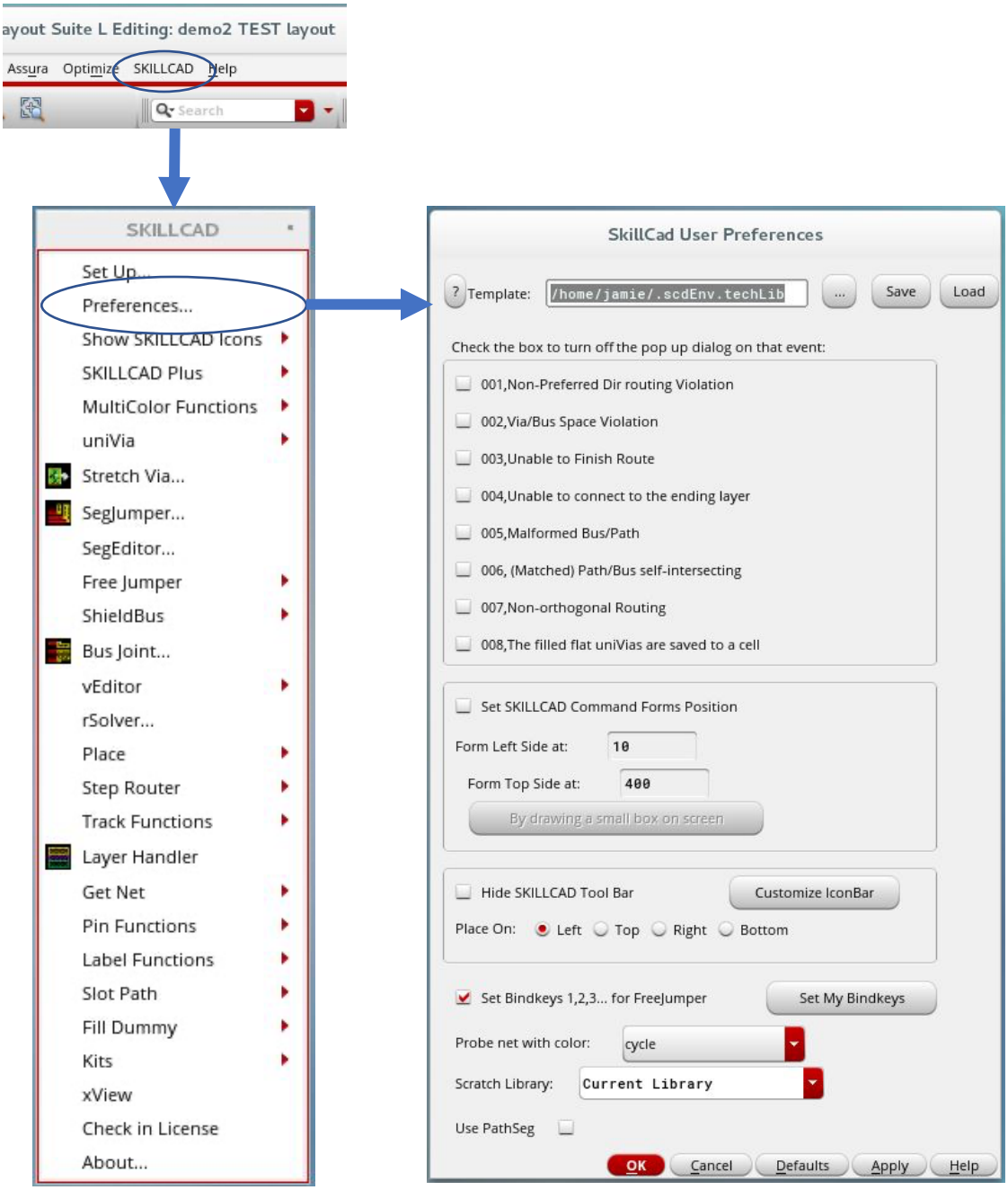
SKILLCAD Compiling The Setup File



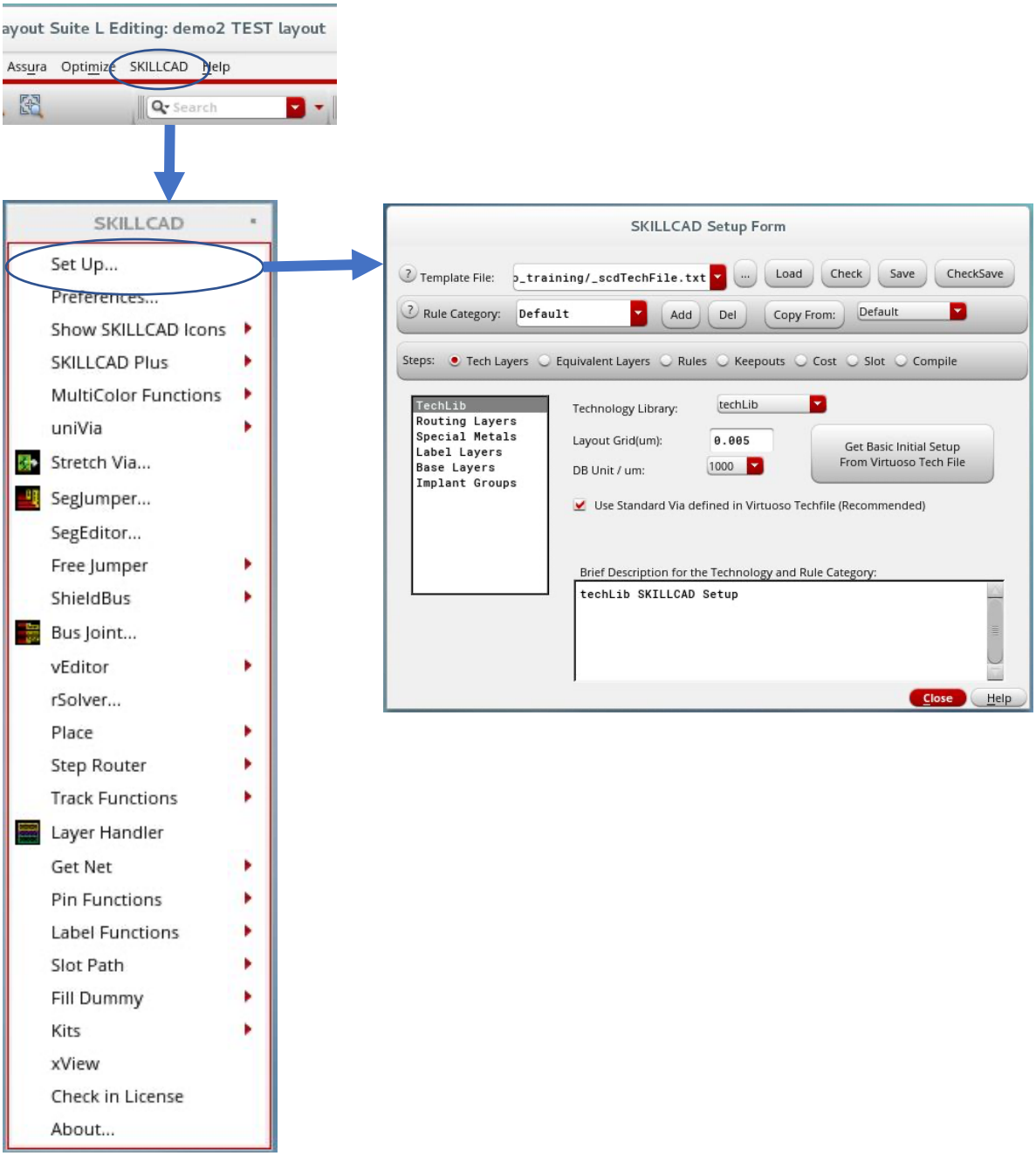
SKILLCAD Customizing The Icon Bar



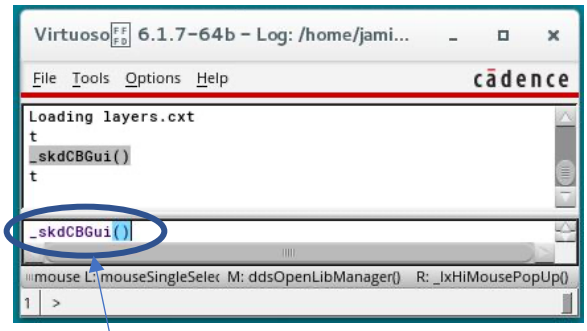
SKILLCAD Setting Up User Preferences



SKILLCAD Complete Setup

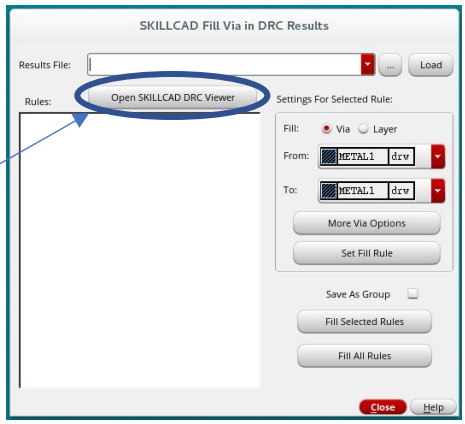


SKILLCAD DRC Viewer

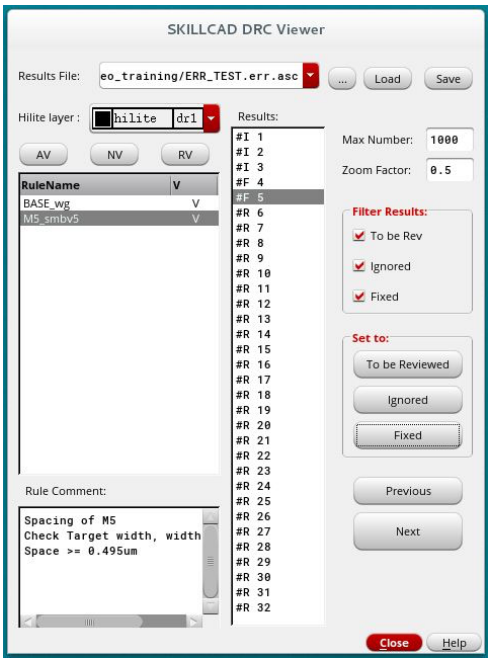


Type _skdCBGui() on the command line in the CIW.

This bring up the SKILLCAD Fill Via in DRC Results form.

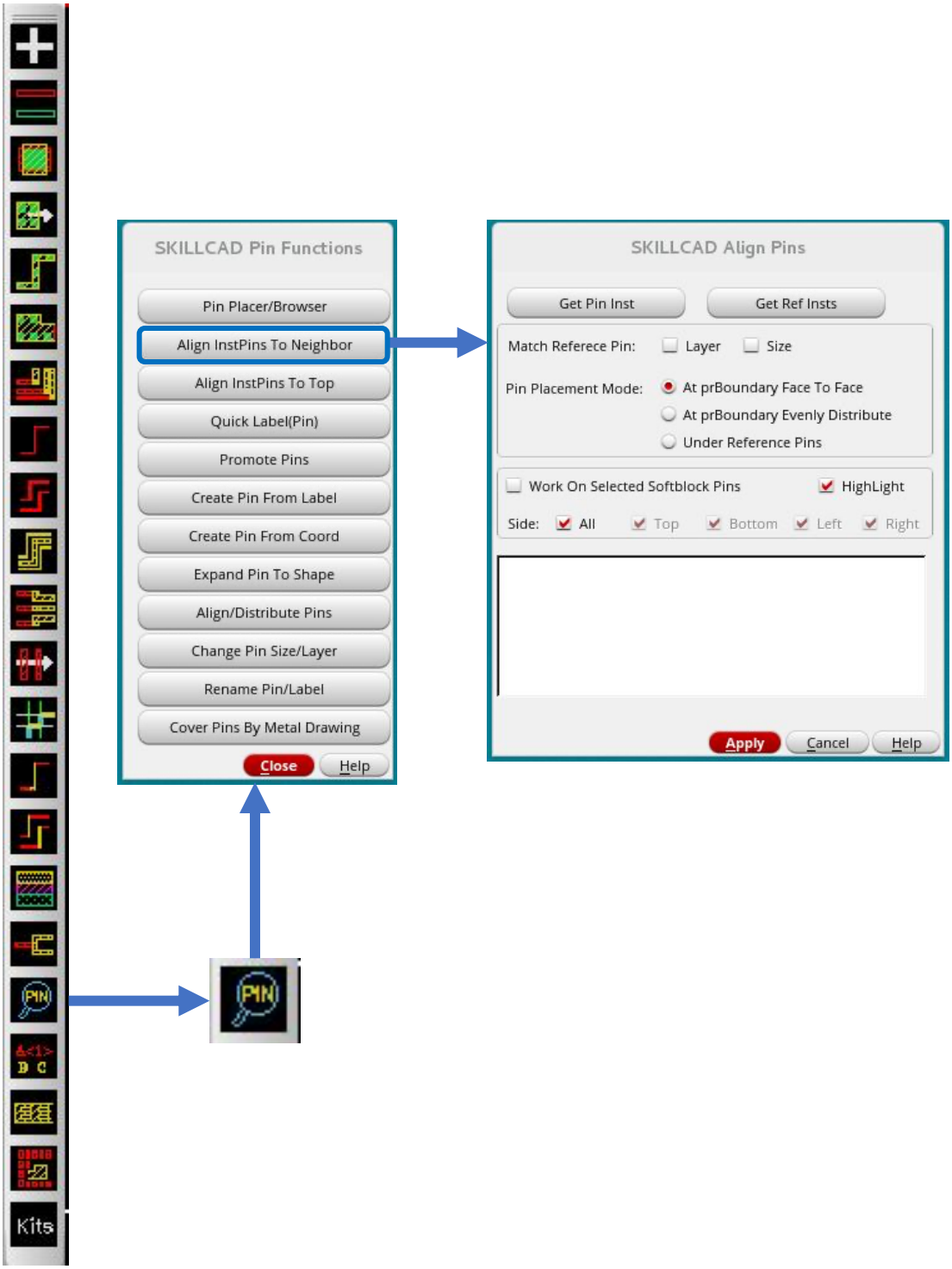


Click on Open SKILLCAD DRC Viewer.

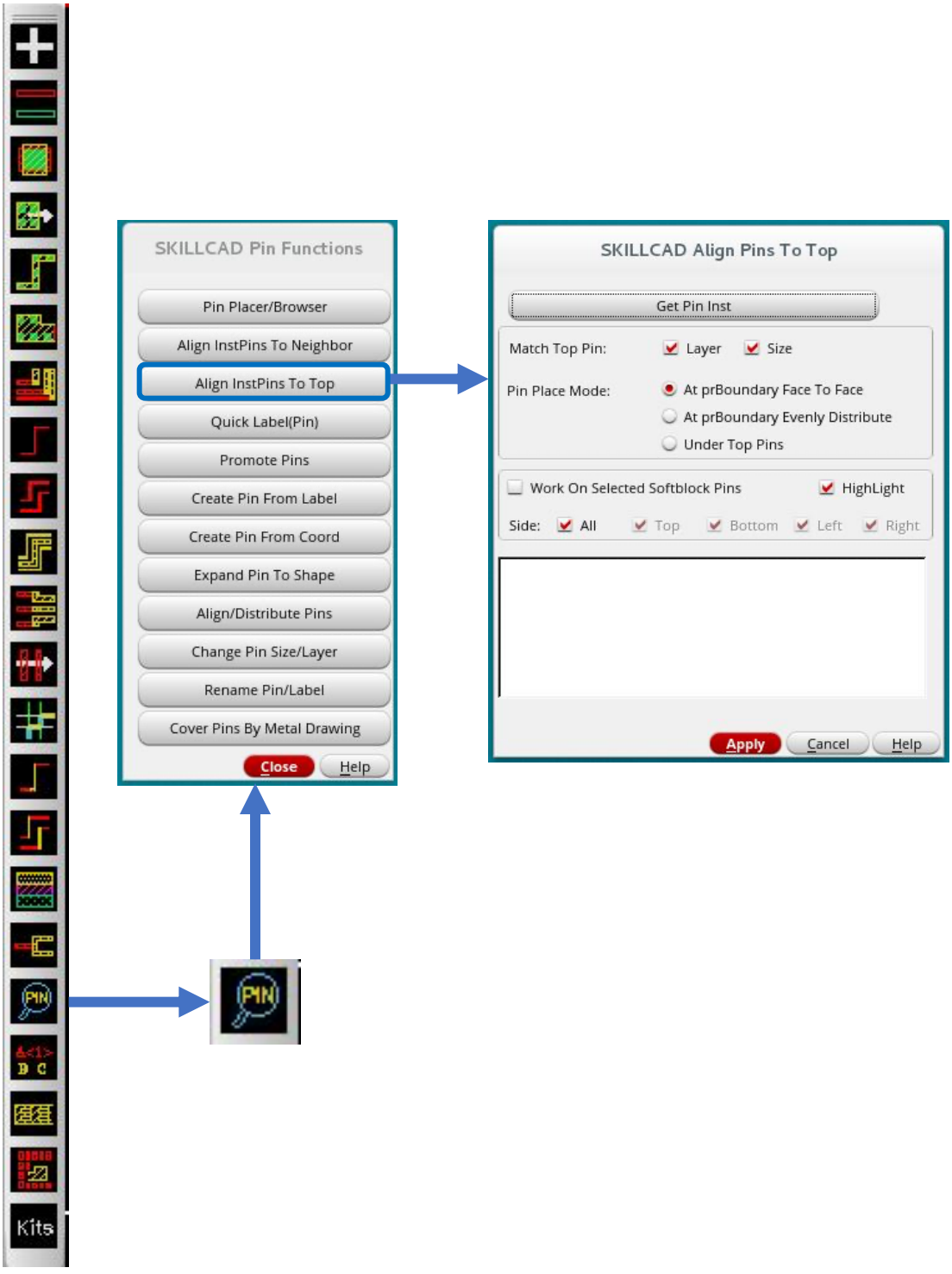


This brings up the SKILLCAD DRC Viewer form.

SKILLCAD Align Instance Pins to Neighbor



SKILLCAD Align Instance Pins to Top

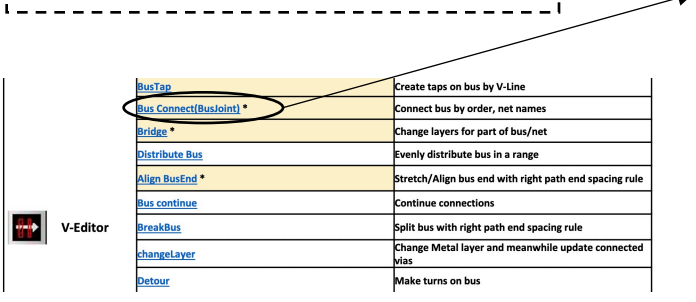


How To Use The SKILLCAD Index Guide

The SKILLCAD Index Guide was developed to help designers to know what SKILLCAD Commands are available and where to find the commands on the SKILLCAD tool bar or menu. It also contains a brief description of the commands, indicates which commands are most often used by layout designers, and which commands should work completely or partially in advanced nodes (N10, N7, N5, etc.). The most useful commands are highlighted in yellow, and the commands that can be used in advanced nodes are designated with an Asterix (*). Each indexed and linked command also calls a page containing links for all the available training materials for that command (PDF, Word Document or PowerPoint Presentation, and video). These are the same training materials available from the SKILLCAD Topical Guide. A link on the first page of the Index Guide will call the Topical Guide. Both guides are available to help a designer know how to use the SKILLCAD functions.

To use the Index Guide, just click on the SKILLCAD command in the index pages. The command link will call the page showing where the command is found on the SKILLCAD tool bar or menu, and what the next level menu or form contains. This page also contains links to the training materials and video. In a few cases, a command will be listed in the index pages, but is not yet linked to another page. This is usually a new command that does not yet have training materials. The index section on SKILLCAD Setup contains training materials for setting up the technology file, used by the SKILLCAD tools.

Example: Select Bus Connect(BusJoint) in the guide. This will take you to the page showing how to access the command, as well as links to the training materials.



V-Editor		
	BusTap	Create taps on bus by V-Line
	Bus Connect(BusJoint) *	Connect bus by order, net names
	Bridge *	Change layers for part of bus/net
	Distribute Bus	Evenly distribute bus in a range
	Align BusEnd *	Stretch/Align bus end with right path end spacing rule
	Bus continue	Continue connections
	BreakBus	Split bus with right path end spacing rule
	changeLayer	Change Metal layer and meanwhile update connected vias
	Detour	Make turns on bus