

ALEXANDRIA PHOENIX

[\[OVERVIEW \]](#)

Grasshopper components for the logic every project repeats: grids, attractor fields, transforms, culls and fabrication

v2.2 | Rhino 8 and 9 for Windows | alexandria.felipeharker.org

[\[WHAT IT IS \]](#)

Modular Grasshopper components for the logic that comes up on every project — grids in a region, attractor remaps, value-driven transforms, culls and previews — and a Rhino toolbar that sets up, dimensions and renders a model to one standard. Two packages, both from Rhino's Package Manager.

PACKAGE	ADDS
Alexandria Grasshopper Tools	The components, on the <i>Alexandria Phoenix</i> tab
Alexandria Rhino Tools	The <i>Alexandria Tools</i> toolbar and its commands, and the DM display modes

36

COMPONENTS

11

FAMILIES

8

TOOLBAR BUTTONS

4

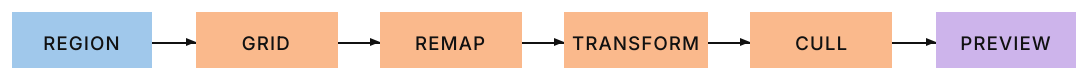
ANNOTATION
STYLES

4

DISPLAY MODES

[\[HOW IT WORKS \]](#)

Each component does one job. Chain them left to right.



Cells also feed Pattern and Fabricate. Document moves data in and out of Rhino.

[\[GET STARTED \]](#)

ADD THE FOLDER	Once per computer: paste the shared Alexandria packages folder into Rhino's Package Manager sources (<code>INSTALL.md</code> has the value).
INSTALL	Run <code>PackageManager</code> , search for <code>Alexandria</code> and install both packages, with automatic updates on.
RESTART	Rhino.
SET UP	Type <code>AlexandriaSetup</code> for the Alexandria Tools tab and the display modes.

The full documentation, with every component's ports, is at alexandria.felipeharker.org. Installing and updating are in `INSTALL.md`; the component, definition and drawing standards in `STANDARDS.md`.

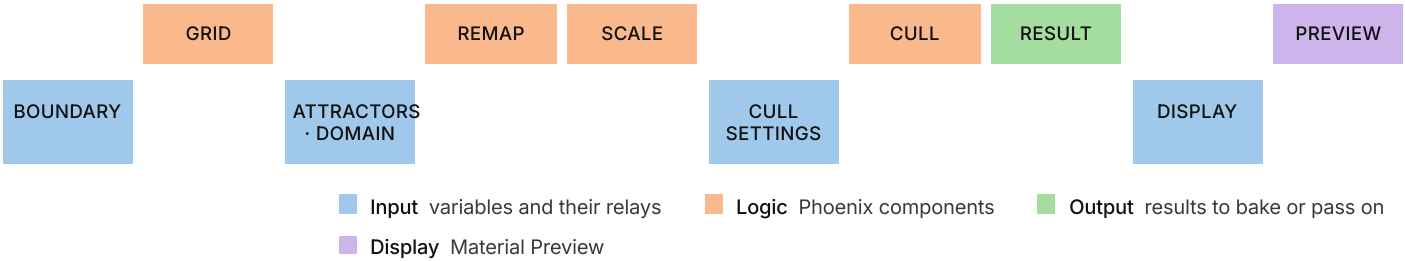
[COMPONENTS]

Every component on the *Alexandria Phoenix* tab, by family. Components that do the same job share the same inputs and outputs: any grid feeds any remap, transform, cull or pattern; any remap feeds Scale, Rotate, Offset and Cull.

Grid	7	Cull	1
 Square Grid in Region <code>SqGrid</code> Square cells, centred on a closed planar region and trimmed to it		 Percent Cull <code>PctCull</code> Randomly removes a share of the items on one side of a value threshold	
 Hex Grid in Region <code>HexGrid</code> Pointy-top hexagons, centred and trimmed the same way		Pattern	2
 Rectangle Grid in Region <code>RectGrid</code> Rectangular cells		 Lattice Pattern <code>Lattice</code> A chord lattice inside every cell, picked with one index	
 Triangle Grid in Region <code>TriGrid</code> Equilateral triangles in alternating rows		 Voronoi Pattern <code>VoroPatt</code> A Voronoi subdivision of every cell, picked with one index	
 Diamond Grid in Region <code>DiaGrid</code> Interlocking diamonds		Fabricate	4
 Brick Grid in Region <code>BrickGrid</code> Running-bond courses with an adjustable shift		 Fold Cells <code>Fold</code> Folds cells up along creases into flaps, wedges or pyramids	
 Panel Grid in Region <code>PanelGrid</code> Exact-size panels with closers at the edges and open joints		 Unfold <code>Unfold</code> Flattens folded geometry into cut and score lines	
Voronoi	4	 Panel Tabs <code>PanelTabs</code> Flat blank of a folded panel: face, folds and tabs, plus creases	
 Attractor Seeds <code>AttrSeeds</code> One seed per cell, pulled from its centroid toward attractor curves		 Frame Slots <code>FrameSlots</code> The frame slots that line up with Panel Tabs	
 Jitter Seeds <code>JitSeeds</code> One seed per cell, at a random point inside it		Geometry	2
 Scatter Seeds <code>ScatSeeds</code> Evenly scattered random seeds in a region, optionally pulled toward curves		 Region Trim <code>Trim</code> Splits curves into what lies inside and outside a region, keeping closed curves closed	
 Voronoi in Region <code>VoroRegion</code> Voronoi cells from any seeds, trimmed to a region		 Plane Bounds <code>Bounds</code> Bounding rectangle and box square to any plane, for stock sizes	
Remap	7	Display	1
 Point Remap <code>PtRemap</code> Distance to the nearest attractor point, remapped to a domain		 Material Preview <code>Preview</code> Shaded preview in a chosen colour and opacity	
 Curve Remap <code>CrvRemap</code> Distance to the nearest attractor curve, remapped to a domain		Document	4
 Image Remap <code>ImgRemap</code> Image brightness under each item, remapped to a domain		 Layer Geometry <code>LayerGeo</code> Live geometry from a Rhino layer, updating as the layer changes	
 Random Values <code>RandVal</code> One seeded random value per item		 Bake to Layer <code>Bake</code> Bakes branches onto named, coloured layers, replacing on each press	
 Value Remap <code>ValRemap</code> Any number list remapped to a domain		 Export Parameters <code>ParamOut</code> Writes the canvas's inputs to a CSV, one section per variant	
 Blend Values <code>BlendVal</code> Two value fields combined by average, min, max or multiply		 Apply Parameters <code>ParamIn</code> Sets the canvas's inputs from that CSV	
 Step Values <code>StepVal</code> Values snapped to a step, with a type index per distinct size		Utility	1
Transform	3	 Feet Inches <code>FtIn</code> Lengths as architectural feet and inches	
 Scale by Values <code>ScaleVal</code> Scales each item about its own centroid by its matching value			
 Rotate by Values <code>RotateVal</code> Rotates each item about its own centroid by its matching angle			
 Offset by Values <code>OffsetVal</code> Insets or grows each closed curve by its matching distance			

[TEMPLATE]

alexandria_phoenix_master_v1.0.gh , with its .3dm , shows the layout every definition follows. Logic runs along the top; each input group sits below the stage it feeds, so wires only travel up and to the right.



[SHARED PORTS]

Components that do the same job take and give the same things, so any one swaps for another.

PORT	CARRIES
Region	A closed planar curve to fill
Cells	Closed curves from any grid
Geometry	Anything to measure, move or cull
Values	One number per item
Domain	The range values are remapped to

[RULES]

RULE	WHY
Every variable feeds a typed relay in its group	Swap a variable, rewire one point
Logic outputs pass through relays too	Swap a component, rewire one point
Groups get short names and a role colour	Readable at a glance
Only Display components preview	The viewport shows what matters
No panels or notes	The layout explains itself
One Rhino layer per referenced input	Inputs are easy to find and replace

[SHOWCASE]

Below the template, the master runs every component in its simplest form, one titled row per sample, each on its own tile in the .3dm . Its parameters CSV holds two variants, Default and Dense : set Section and press Apply to switch.

[ALEXANDRIA TOOLS]

A Rhino toolbar for drawing and rendering, from the *Alexandria Rhino Tools* package.

BUTTON	DOES
 Alexandria Setup	Adds this tab and installs the DM display modes.
 Populate Model	The standard layers, the annotation styles, the render backdrop (wall, ground, scale figure) and the world light.
 Set Material	Plaster materials in their display colours, <code>MAT_1</code> , <code>MAT_2</code> ..., on the sublayers of a layer you choose.
 Day Render	V-Ray's bright, neutral studio day, with <code>DESIGN::ILLUMS</code> unlit.
 Night Render	A dim, neutral night where the lit sign faces on <code>DESIGN::ILLUMS</code> carry the image.
 Standard Dimension	Left click: a dimension. Right click: a leader. Both in the Alexandria styles, on the annotation layers.
 Populate Detail	Adds a sign detail's 2D drawing from the detail library where you click.
 Save as Rhino 7	Writes <code><name>_r7.3dm</code> next to the model; the open model keeps its name and path.
 Save as Rhino 8	Writes <code><name>_r8.3dm</code> next to the model; the open model keeps its name and path.

The render buttons switch only the lighting on `DESIGN::ILLUMS`; other materials and lights stay as they are. They need V-Ray for Rhino.

[DRAWINGS]

Annotation is Oswald, in capitals: dimensions on `DETAILS::ANNOTATIONS::DIMENSIONS`, leaders, notes and titles on `DETAILS::ANNOTATIONS::CALLOUTS`. Sizes are paper inches at 3" = 1'-0" by default.

STYLE	SHAPE
Alexandria Dimension	1/8" text, feet and inches to 1/16", centred on the line, no arrowheads
Alexandria Leader	0.1375" text on a horizontal landing, a dot at the tip
Alexandria Text	0.1375" text, top left aligned
Alexandria Title	3/16" Oswald Bold, centred

DISPLAY MODE	BACKGROUND	LOOK
DM-WORKING	White	Off-white shading, dark grey edges, grid and axes
DM-AUTOCAD	Dark slate	DM-WORKING's shading on a CAD-style background
DM-DIAGRAM	White	Flat mid-grey with one light, thin dark edges
DM-DIAGRAM-SHADOW	White	Flat white with hard shadows on a shadow-only ground

RENDER SETTING	DAY	NIGHT
Environment (background, GI, reflections)	× 1	× 0.05
World light, sun, ground plane	0.0625, off, off	Same