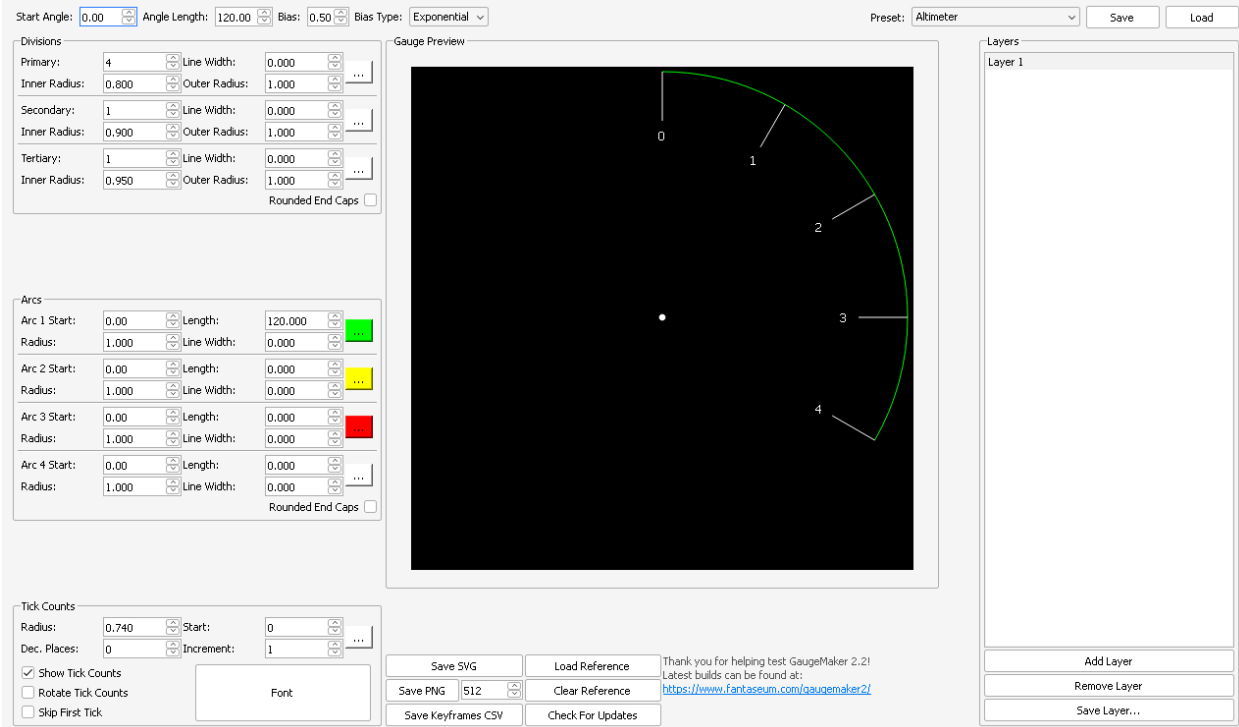




GaugeMaker 2.2.0 - User Manual

GaugeMaker is a specialized tool for creating gauge textures and layouts for use in simulation, vehicle displays, and cockpit instruments. Designed with precision and flexibility in mind, GaugeMaker lets users create layered, bias-adjusted tick and arc graphics, with export options for integration into real-time visual environments.

What's New in 2.2.0

- **Save Layer...:** Saving is now split into two buttons. **Save** writes your whole design, every layer in it, as one .gauge file. **Save Layer...**, next to the layer buttons, writes only the layer you are working on and opens in the Presets folder – so making a preset is one click, and multi-layer designs no longer clutter the preset drop-down.
- **Loading Adds Layers:** Loading a .gauge file, or picking one from the preset drop-down, now *adds* its layers to your design instead of replacing it, so you can build a gauge from several saved pieces. If the layer you are on has been modified, GaugeMaker asks whether to add the file as new layers, overwrite the current layer, or cancel.
- **Rename Layers:** Double-click a layer in the Layers panel, or select it and press F2, to rename it in place. Layer names are stored in the .gauge file and appear in the keyframe CSV.

- **New .gauge File Format:** The .gauge format has been rewritten and no longer breaks when Qt is updated – previously a file saved by one version could silently lose its tick font colour when opened by another. Your existing .gauge files still load normally. *Please note:* files saved by 2.2.0 cannot be opened by 2.1.6 or older. Old files open in 2.2.0 fine – it is only the other direction that does not work.
- **Corrected PNG Export:** PNG export now works at every size. Previously only exact multiples of 512 came out right: any size below 512 saved a blank image, and larger sizes drew the gauge at the wrong scale. The area behind the gauge is now reliably transparent as well.
- **Fractional Arcs and Tick Labels:** Arc widths, start angles and lengths keep their decimals instead of rounding to whole numbers, and the Dec. Places setting now actually changes the drawn tick labels.
- **Keyframe CSV Covers Every Layer:** The CSV now contains all layers with a Layer column naming each, rather than only one, and writes angles at full precision – they were previously rounded past 100 degrees, and values of a million or more came out in scientific notation.

Previously, in 2.1.6

- **Bias Type Selection:** Choose between *Exponential* and *Midpoint* algorithms for tick spacing.
 - **Update Checker:** GaugeMaker now checks for new versions when launched. If a newer version is available, a download link is presented.
 - **Biased Non-linear Gauges:** Create realistic analog-style layouts with non-uniform spacing using bias functions.
 - **Save Keyframe Angles as CSV:** Export a table of tick value and angle positions for use in animations or simulation logic.
 - **Layers Panel:** Easily manage multiple gauge layers, such as left/right fuel or duel needle applications.
 - **Reference Images:** Load a background image to help visually align and recreate real-world instruments.
 - **Preset Drop-down:** Save and load gauge templates quickly using the preset selector.
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Interface

When you launch GaugeMaker, the interface is split into the following sections:

Start Angle: 0.00 Angle Length: 120.00 Bias: 0.50 Bias Type: Exponential ▾

1. Division Settings (Top Left) - **Start Angle / Angle Length**: Set the beginning angle and sweep of your gauge in degrees. - **Bias**: Controls the distribution of tick marks across the arc. A value of 0.5 is linear. Values < 0.5 favor early placement; > 0.5 favor later placement. - **Bias Type**: Select from: - *Exponential* (traditional power curve bias) - *Midpoint* (symmetrical compression around a midpoint)

Divisions

Primary:	4	Line Width:	0.000	...
Inner Radius:	0.800	Outer Radius:	1.000	
Secondary:	1	Line Width:	0.000	...
Inner Radius:	0.900	Outer Radius:	1.000	
Tertiary:	1	Line Width:	0.000	...
Inner Radius:	0.950	Outer Radius:	1.000	

Rounded End Caps ☐

2. Divisions Panel Customize each tick group: - **Primary**: Major ticks (e.g., 10s) - **Secondary**: Minor ticks between primaries - **Tertiary**: Sub-ticks between minor ticks Each group has controls for count, line width, inner/outer radius, and its own colour (the small colour button at the right of each row). - **Rounded End Caps**: option for providing rounded ending to the start and end of tick marks.

Arcs

Arc 1 Start:	0.00	Length:	120.000	...
Radius:	1.000	Line Width:	0.000	
Arc 2 Start:	0.00	Length:	0.000	...
Radius:	1.000	Line Width:	0.000	
Arc 3 Start:	0.00	Length:	0.000	...
Radius:	1.000	Line Width:	0.000	
Arc 4 Start:	0.00	Length:	0.000	...
Radius:	1.000	Line Width:	0.000	

Rounded End Caps ☐

3. Arcs Panel You can draw up to 4 independent colored arcs: - **Start / Length**: Controls angular start and sweep - **Radius / Line Width**: Controls arc size and thickness - **Color Buttons**: Click to choose color. Useful for color zones (e.g., green/yellow/red bands) - **Rounded End Caps**: option for providing rounded ending to the start and end of the arcs.

Tick Counts

Radius:	0.740	Start:	0	...
Dec. Places:	0	Increment:	1	

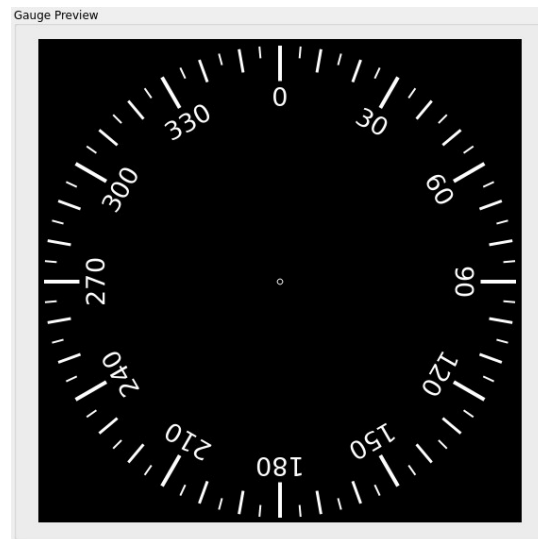
☒ Show Tick Counts
☐ Rotate Tick Counts
☐ Skip First Tick

Font

4. Tick Counts Panel - Radius: How far from center the numbers appear - **Start:** Value at first major tick - **Increment:** How much each major tick count increases - **Decimal Places:** How many decimals the labels are drawn with - **Colour:** The colour button sets the tick label colour - **Show / Rotate / Skip First:** Visual options. Rotate turns each number to line up with its tick angle, as on an HSI; Skip First omits the label on the first tick, which is what lets one layer continue the scale of another

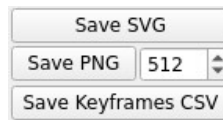
5. Font Picker - Choose the face, size and style (bold/italic) for tick labels. The font is stored in the .gauge file field by field, so it survives moving a file between machines and Qt versions

Gauge Preview (Center Panel)



- The live rendered preview of your gauge
 - Includes a centre marker showing the default centre of rotation for needles. Unlike the background and reference image, this marker *is* drawn into exported PNG and SVG files on purpose, so you can snap needles and decorations to the exact pivot
 - Background is black, but is not saved with the output
 - If a reference image is loaded (see below), it will also not be saved with the output
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Output Controls (Bottom Panel)



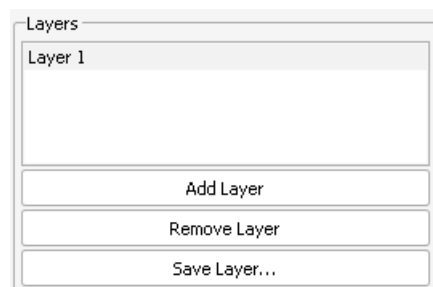
- **Save SVG / PNG:** Exports the gauge as a scalable vector or raster image. The output is always square, and the size box (default 512) sets the size of *both* – for PNG it is the pixel resolution, and for SVG it sets the document size and view box, though the artwork stays resolution-independent either way. The black preview background and any reference image are never included; the centre marker deliberately *is*, so you can line needles up to the pivot
 - **Save Keyframes CSV:** Exports the value and angle of every primary tick, for animation reference or driving a needle. The file covers *every layer* in the design under a Layer, Tick, Angle header, so a multi-layer gauge produces one complete table. Angles are written at full precision rather than rounded, since the column positions a real needle
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Preset Options (Top Right)



- **Preset Menu:** Load saved gauge templates from Presets folder
 - **Save / Load:** Save writes the whole design (every layer) to a .gauge file; Load inserts a .gauge file's layers into the design you already have. To save a single layer as a preset, use Save Layer... in the Layers panel
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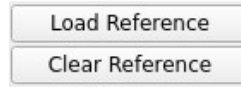
Layers Panel (Right)



- Supports multiple overlay layers (e.g., fuel L/R, dual needles)
- Use “Add Layer” to create a new one
- “Remove Layer” deletes selected
- “Save Layer...” writes just the selected layer as a .gauge file, opening in the Presets folder so it becomes a preset

- Double-click a layer, or select it and press F2, to rename it. Names are saved with the gauge and label the columns in the keyframe CSV
 - The last remaining layer cannot be removed
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Reference Image Tools



- **Load Reference:** Load a background image (e.g., real gauge photo). Image needs to be 512x512px png with reference gauge centered
 - **Clear Reference:** Remove it from the preview
 - Great for tracing real instruments
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How to Create a Gauge (Step-by-Step)

1. Set the Division Geometry

- o Define the **Start Angle** (e.g., 90° for the 3 o'clock position) and **Angle Length** (e.g., 120°). You can use negative values to start the gauge counter clockwise of top of gauge, and you can use negative angle lengths to make the gauge progress counter clockwise.
- o Adjust **Bias** and **Bias Type** to control tick spacing.

2. Configure Divisions

- o Choose the number of **Primary** ticks.
- o If needed, set **Secondary** and **Tertiary** ticks for more granularity.
- o Adjust line widths and radii to control spacing and thickness of tick marks.

3. Style Your Gauge with Arcs

- o Use the **Arcs Panel** to create colored zones (e.g., green for safe, red for warning).
- o Assign each arc a radius, start angle, and sweep using same ranges as the gauge start and angle length.

4. Add Tick Labels

- o Use the **Tick Counts** section to set a starting value and increment.
- o Choose display options like decimal places and font rotation. For font rotation, this causes the numbers to rotate to line up with the tick angle (similar to an HSI).

5. Preview and Adjust

- o View your layout in the **Gauge Preview** window.
- o Adjust parameters to get the look and layout you need.

6. Use Reference Image (Optional)

- o Load a reference photo to help match the gauge visually.
- o This is great for replicating real-world instrument panels.

7. Work with Layers (Optional)

- o Add multiple layers to draw different gauge elements in the same workspace. Useful if you have multiple scales or ranges (subsequent layers should use **Skip First Tick** option to continue previous layer gauge).
- o Select and edit layers independently.
- o Selecting a Preset, or loading a .gauge file, adds its layers to your design rather than replacing what you have. If the layer you are on has been modified, GaugeMaker asks whether to add the file as new layers, overwrite the current layer, or cancel.

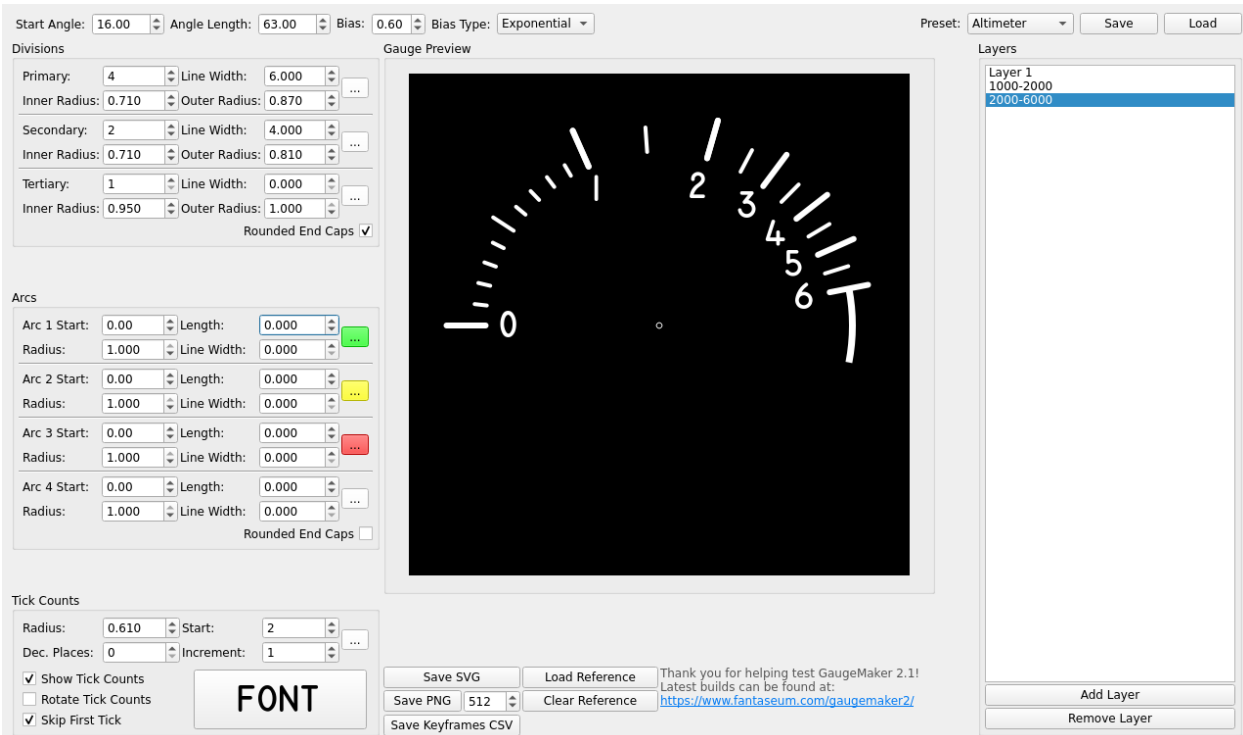
Loading into a freshly opened GaugeMaker simply fills in the empty first layer.

- o Use **Save Layer...** to write just the current layer as a .gauge file – it opens in the Presets folder, which is what makes it appear in the preset drop-down. Use **Save** to write the whole design, all layers together; that dialog deliberately opens outside Presets so complete designs do not fill up the drop-down.

8. Save and Export

- o **Save SVG/PNG** for use in textures or documentation.
- o **Save Keyframes CSV** to export angle/value data for sim and animation usage.
- o Use **Presets** to save and reload commonly used configurations. These .gauge files can be shared.

Example Output (Three Layers for top portion of VSI)



Gauge Example - Demonstrates using multiple layers to create a complex VSI instrument. This shows the top portion with a linear scale for 0 to 2000fpm, and the third layer shows a biased scale for 2000-6000fpm. There is an arc at the end that would line up with a corresponding lower section made using three more layers.

Tips & Tricks

- Save a png with everything white, add a black background in your graphics application and use this as a mask in 3d texturing programs such as Substance Painter.
 - Cleaver use of layers with different scales and biases can create complex gauges such as a VSI.
 - Use background reference images to precisely recreate existing instruments.
 - Export SVG for highest-quality scalable output. The SVG files will open as a single group, and will need to be ungrouped if you want to edit the individual components.
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Version Checking

GaugeMaker 2.2.0 automatically checks for updates when launched. If a newer version is found, a link to download the update is displayed.

Credits & Support

Application developed by Robbie Powell of Fantaseum and FliteAdvantage.

Website: <https://fantaseum.com/gaugemaker2>

Airplanes: <https://fliteadvantage.com>

Thank you for using GaugeMaker!