Acoustic Violin Build Packet Print Packet

Generated: 2026-05-09

Packet folder: repo root (`.`)

File Map

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| `bom.csv` | Starter bill of materials with part categories, quantities, drawing refs, and notes. |

| `sourcing.csv` | Supplier/search tracker with specs, price/date fields, lead time, substitutes, and risks. |

| `cut-list.csv` | Rough/final stock sizes, material, grain/orientation, operations, yield, and offcuts. |

| `drawing-brief.md` | Manufacturing drawing and technical product sketch brief. |

| `assembly-manual.md` | Shop-facing sequence, tools, fixtures, safety, tuning, finishing, and maintenance notes. |

| `validation.csv` | Target/measured values, tolerance, environment, result, and tuning/build action log. |

| `supplier-rfq.md` | Supplier email/request-for-quote starter. |

| `visual-bom-brief.md` | Art direction for an image-forward visual BOM. |

| `wolfram-starter.wl` | Wolfram starter for physics, optimization, visualization, and validation. |

| `README.md` | Project artifact. |

| `photo-shotlist.md` | Project artifact. |

| `risks.md` | Project artifact. |

design.md

Project intent, catalog metadata, assumptions, and validation plan.

Acoustic Violin Design

Intent

Create an honest L2 acoustic violin packet that captures the standard setup geometry and the open engineering gaps before any claim of build readiness.

Readiness

L2 scaffold. Use for design review, drawing planning, and sourcing review. Do not treat this as a final luthiery method or validated arching plan.

Governing Model

Open strings use Mersenne-Taylor. Body response is not reduced to a simple closed-form model in this packet; arching, graduation, bridge, soundpost, and air/body modes must be validated empirically.

```text
f = (1 / (2 L)) * sqrt(T / mu)
```

Baseline Assumptions

Parameter	Baseline	Notes
Scale length	328 mm / 12.91 in	Standard violin vibrating length
Tuning	G3-D4-A4-E5	A4 = 440 Hz reference
String set	Standard 4-string violin set	Use published tensions
Body length	about 14 in / 356 mm	Exact outline TBD from drawing
Top/back	Spruce top, maple back	Graduation not finalized
Neck angle/projection	TBD from setup drawing	Critical to bridge height/action
Target total tension	about 45-55 lbf	Verify with selected string set

Tension And Setup Notes

- Fit bridge and soundpost under low tension, then bring strings up gradually.
- Check neck projection before final bridge height.
- Record action, bridge foot fit, soundpost location, and open-string pitch stability.

Known Gaps

- No arching/graduation map.
- No neck-set drawing.
- No soundpost/bridge fitting evidence.
- No live sourceability check.
- No acoustic measurements.

bom.csv

Starter bill of materials with part categories, quantities, drawing refs, and notes.

item	qty	unit	material_or_spec	estimated_cost_usd	notes
Top plate	1	ea	spruce violin top blank or prototype plate	90	Graduation TBD
Back plate	1	ea	maple back blank or prototype plate	110	One-piece or two-piece
Rib/lining/block stock	1	set	maple ribs, spruce blocks/linings	45	Bending method TBD
Neck blank	1	ea	maple violin neck blank	55	Scroll detail optional for prototype
Fingerboard	1	ea	ebony or composite violin fingerboard	35	Final scoop/setup TBD
Bridge blank	1	ea	violin bridge blank	12	Must be fitted to top
Soundpost	1	ea	spruce soundpost stock	5	Fit and position are validation items
Tailpiece/chinrest/endpin	1	set	standard violin fittings	45	Compatibility TBD
Pegs or tuners	4	ea	violin pegs or geared pegs	35	Pegbox geometry must match

| String set | 1 | set | standard violin G-D-A-E set with published tension | 45 | Tension evidence required |

| Finish/adhesive | 1 | lot | hide glue or prototype adhesive; varnish system TBD | 45 | Traditional methods TBD |

sourcing.csv

Supplier/search tracker with specs, price/date fields, lead time, substitutes, and risks.

| item | required_spec | search_terms | supplier_candidates | date_checked | unit_price_usd | lead_time | substitution_risk | notes |

| --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Violin strings | 4/4 violin set with published tensions | 4/4 violin strings tension chart | string manufacturers; music suppliers | TBD | TBD | TBD | Low | Use actual tension values |

| Bridge blank | 4/4 violin bridge blank | violin bridge blank 4/4 | luthier suppliers | TBD | TBD | TBD | Low | Quality affects setup |

| Soundpost stock | straight spruce soundpost dowel | violin soundpost stock spruce | luthier suppliers | TBD | TBD | TBD | Low | Fit is more important than cost |

| Tonewood plates | spruce top and maple back suitable for violin | violin tonewood spruce top maple back | luthier tonewood suppliers | TBD | TBD | TBD | Medium | Prototype may use lower grade |

| Fittings | tailpiece, chinrest, endpin, pegs/geared pegs | violin fittings set 4/4 | luthier suppliers; music suppliers | TBD | TBD | TBD | Medium | Peg/tuner choice affects pegbox |

cut-list.csv

Rough/final stock sizes, material, grain/orientation, operations, yield, and offcuts.

| part | qty | rough_dimensions_in | final_dimensions_in | material | grain_or_orientation | operation | notes | |

| --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Top plate | 1 | 0.75 x 8.5 x 15.0 | arched/graduated TBD | spruce | quarter-sawn centerline | join, carve/CNC, graduate | Arching map required | |

| Back plate | 1 | 0.75 x 8.5 x 15.0 | arched/graduated TBD | maple | quarter-sawn centerline | join, carve/CNC, graduate | Graduation TBD | |

| Ribs | 6 | 0.060 x 1.5 x variable | profile TBD | maple | long grain lengthwise | bend or laminate | Mold required | |

| Blocks/linings | 1 | set | TBD | TBD | spruce/willow/lining stock | stable | shape and glue | Corner block plan TBD |

| Neck | 1 | 2.0 x 2.5 x 11.0 | violin neck profile TBD | maple | quarter grain preferred | saw, carve, fit | Projection critical | |

| Fingerboard | 1 | 0.35 x 1.75 x 11.0 | scoop/profile TBD | ebony/composite | long grain | plane and fit | Final setup after neck set | |

drawing-brief.md

Manufacturing drawing and technical product sketch brief.

Acoustic Violin Drawing Brief

Required first drawings:

- Full outline with centerline, f-hole placeholders, bridge line, and stop.

- Side setup drawing with nut, fingerboard projection, bridge, and tailpiece.

- Plate arching/graduation placeholder map with TBDs visible.

- Rib garland and block layout.

- Neck/pegbox/fingerboard interface detail.

assembly-manual.md

Shop-facing sequence, tools, fixtures, safety, tuning, finishing, and maintenance notes.

Acoustic Violin Assembly Manual

1. Choose the outline, arching, and graduation references before cutting.

2. Prepare plates, ribs, blocks, linings, neck, and fingerboard.

3. Build the rib garland on a mold or documented fixture.

4. Carve or CNC rough plates, then hand-finish critical arching and graduation.

5. Close the body with reversible or documented adhesive.

6. Fit neck angle/projection before final fingerboard work.

7. Fit pegs/tuners, nut, bridge, soundpost, tailpiece, and strings.

8. Bring strings to pitch gradually and log setup measurements.

Safety: string and bridge forces are lower than a harp but still require eye

protection and careful first pitch-up.

validation.csv

Target/measured values, tolerance, environment, result, and tuning/build action log.

| check_id | area | target | method | tolerance | measured | result | action |

| --- | --- | --- | --- | --- | --- | --- | --- |

| VAL-001 | Scale length | 328 mm / 12.91 in vibrating length | measure nut to bridge | +/- 1 mm | TBD | TBD | Reset bridge/nut position |

| VAL-002 | String tension | within selected set published range | manufacturer chart | within published range | TBD | TBD | Change string set |

| VAL-003 | Neck projection | setup-compatible bridge height | straightedge to bridge line | target TBD | TBD | TBD | Reset neck or bridge plan |

| VAL-004 | Action | playable G/E string height | measure at fingerboard end | target TBD | TBD | TBD | Adjust bridge/fingerboard |

| VAL-005 | Bridge fit | full foot contact on top | visual light-gap check | no visible gap | TBD | TBD | Refit bridge |

| VAL-006 | Soundpost fit | stable post without crushing top/back | inspection and tone test | no slipping/buzzing | TBD | TBD | Refit/reposition |

supplier-rfq.md

Supplier email/request-for-quote starter.

Supplier RFQ Draft

Hello,

Please quote materials for a 4/4 acoustic violin prototype: spruce top blank,
maple back/neck/rib stock, bridge blank, soundpost stock, standard fittings,
and a 4-string set with published tension data.

Please include dimensions, grade, unit price, minimum order quantity, lead time,
and substitution options.

visual-bom-brief.md

Art direction for an image-forward visual BOM.

Visual BOM Brief

Show the violin as assembled and as an exploded plate/rib/neck/fittings view.
Call out top, back, ribs, blocks, linings, neck, fingerboard, bridge, soundpost,
tailpiece, chinrest, pegs/tuners, strings, adhesive, and finish.

wolfram-starter.wl

Wolfram starter for physics, optimization, visualization, and validation.

```wolfram
(* Acoustic violin open-string starter. Values are first-pass assumptions. *)
ClearAll["Global`*"];
a4 = 440;
```

```
freqFromMidi[m_] := a4*2^((m - 69)/12);

scaleLengthIn = 12.91;

tuning = <|"G3" -> 55, "D4" -> 62, "A4" -> 69, "E5" -> 76|>;

Dataset[

KeyValueMap[

<|"string" -> #1, "frequencyHz" -> N[freqFromMidi[#2]],

"scaleLengthIn" -> scaleLengthIn|> &,

tuning

]

]
```

README.md

Project artifact.

Acoustic Violin

Engineering documentation and parametric design table for the acoustic violin -

traditional construction reference and stave-built explorations.

Part of the [tonykoop/instrument-maker](https://github.com/tonykoop/instrument-maker) catalogue.

Readiness

L2 scaffold. This repo now includes root-mode build packet documentation for a

4-string acoustic violin reference build. It is not L3 because arching,

graduation, neck-set, soundpost, bridge setup, CAD/render evidence, and measured

prototype validation are not complete.

Packet Contents

- `design.md` - acoustic violin baseline and bowed-string assumptions.
- `bom.csv`, `sourcing.csv`, `cut-list.csv`, `validation.csv` - packet tables.
- `assembly-manual.md`, `risks.md`, `photo-shotlist.md` - build and review aids.
- `drawing-brief.md`, `drawings/README.md`, `cad/README.md`, `wolfram-starter.wl`, `wolfram/README.md` - starter technical artifacts.

String-Scale Assumptions

Baseline: 4 strings, G3-D4-A4-E5, 328 mm / 12.91 in vibrating length, standard violin string set, and total tension verified against the manufacturer chart before first pitch-up.

License

photo-shotlist.md

Project artifact.

Photo Shotlist

- Plate blanks with grain orientation.
- Rib mold or garland setup.
- Arching/graduation checks.
- Neck projection straightedge before glue.
- Bridge foot fit and soundpost fit.
- First string-up with action and tuner readings.

risks.md

Project artifact.

Acoustic Violin Risks

- Arching and graduation are not validated and can dominate tone and structure.
- Neck projection errors can make the instrument unplayable.
- Soundpost and bridge fitting require care; poor fit can damage the top.
- Live sourcing and price checks are still missing.
- Remain at L2 until setup, CAD, and measured acoustic evidence exist.