

Chrysalises Tools & Parts (1)

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Chrysalis I

For the left and right soundboards, polished and unpolished Delrin nut and Lexan shield assemblies.

$\frac{1}{16}$ in. \times $\frac{1}{2}$ in. stainless steel hitch pins (same as Chrysalis II).

$\frac{1}{8}$ in. \times $\frac{3}{4}$ in. stainless steel nut pins.

Machined $\frac{1}{4}$ -20 stainless steel coupling nuts.

Machined $\frac{1}{4}$ -20 stainless steel support screws.

Polished and coated oval head $\frac{1}{4}$ -20 brass machine screws (same as Chrysalis II).

8-32 stainless steel socket head set screws (same as Chrysalis II).

For $\#4 \times \frac{3}{8}$ in. stainless steel tuning gear mounting screws, shortened Phillips head screwdriver (same as Chrysalis II).

- One extra set of 32 machined aluminum and color-coded buttons (same as Chrysalis II).
- Stainless steel shim washers ($0.178 \times 0.123 \times 0.007$) and $4-40 \times \frac{3}{8}$ in. socket head cap screws used to fasten the buttons.

One extra stainless steel split shaft collar used to balance the Chrysalis wheel.

Polished and coated brass bracket wood screws.

Aluminum ferrules.

Various fasteners: stainless steel screws, nuts, and washers; and polished and unpolished Delrin flanges.



Chrysalises (2)

Chrysalis II

Two Delrin tubes used to align the axle through two soundboard center holes during assembly.

“Extruded Brass” by Prismatic Powders bridge color test piece.

For the left and right soundboards, polished and unpolished Delrin nut and Lexan shield assemblies.

$\frac{1}{16}$ in. \times $\frac{1}{2}$ in. stainless steel hitch pins (same as Chrysalis I).

$\frac{1}{8}$ in. \times 1 in. stainless steel nut pins.

#4 \times $\frac{3}{8}$ in. stainless steel tuning gear mounting screws; and shortened Phillips head screwdriver (same as Chrysalis I).

#2 \times $\frac{1}{4}$ in. stainless steel Lexan shield screws (same as Chrysalis I).

Polished and coated oval head $\frac{1}{4}$ -20 brass machine screws (same as Chrysalis I).

8-32 stainless steel socket head set screws (same as Chrysalis I).

- One extra set of 32 machined aluminum and color-coded buttons (same as Chrysalis I); plus 24 extra buttons.
- Stainless steel shim washers ($0.178 \times 0.123 \times 0.007$) and 4-40 \times $\frac{1}{2}$ in. socket head cap screws used to fasten the buttons.

One extra stainless steel split shaft collar used to balance the Chrysalis wheel.

Machined $\frac{1}{4}$ -20 stainless steel coupling nuts.

Aluminum ferrules.

Various fasteners: stainless steel screws, nuts, and washers; and polished and unpolished Delrin flanges.



Chrysalises (3)

Chrysalis I & II Gears and Tools

Grover tuning gears: #V97-18NA. 12 extra gears for the Left and Right Soundboards.

Clear “Super Lube” for lubricating tuning gear sprockets and tuning gear posts inside the ferrules.

Stringing tools:

Red piano understringing felt to prevent scratching the angled surfaces of bridge Rings B.

Custom Delrin stringing tool to compress coils at tuning gears and to straighten hitch pins at the bridges.

Felt-lined tuning gear crank.

Small precision pliers with dark blue handles.

Small wire cutters with light blue handles.

Modified and standard ratcheting and plain wrenches for various internal supports screw nuts.

Custom black slotted screwdriver for the brass screws of the 16 soundboard brackets.

Custom yellow Phillips screwdriver for tuning gear mounting screws.

Modified clear “screw starter” tool for polishing Delrin nuts on wet/dry paper.

Red $\frac{3}{32}$ in. ball-end hex driver for the 4-40 socket head cap screws that fasten the color-coded buttons.

Custom wood clamp for polishing Delrin nuts at buffing wheel.



Chrysalises (4)

Chrysalis I & II Extra Parts and Jigs

Four Chrysalis II (wide) and four Chrysalis I (narrow) extra Delrin brake pads covered with 2.0 mm thick black felt.

Brake pad fasteners: #8 brass countersunk finishing washers; 6-32 \times $\frac{5}{8}$ in. stainless steel flat head machine screws, lock washers, and cap nuts; #6 \times $\frac{3}{8}$ in. stainless steel flat head tapping screws, ground down to a length of \approx 0.315 in.

Chrysalis I and II — 1.0 in. diameter short axle with center point for locating bearings.

Chrysalis I — Nut pin location jig.

Chrysalis I and II — Lathe arbor for turning the edges of [aluminum buttons](#).

Chrysalis II — 1½ in. diameter soundboard center hole location plug with handle.

Chrysalis I and II — Lathe arbor for turning Lexan shields.

Chrysalis I — Delrin snap ring for locating flanges around Delrin spacers.

Chrysalis I and II — Two Lexan shield drilling and milling jigs.

Chrysalis I and II — One extra aluminum flange.

Chrysalis I and II — Four screw assemblies for picking up sprayed soundboards.

Chrysalis I and II — Extra #12 \times 1.0 in. stainless steel flat head tapping screws for rosewood spokes.

Chrysalis I and II — Experimental aluminum buttons and aluminum ferrules.



Chrysalises (5)

Chrysalis I & II Black Felt

This is a dense, high-quality 2.0 mm thick jet-black felt used to cover 16 redesigned Delrin brake pads on Chrysalis I and Chrysalis II. This color of this felt is called “Ink” and it is available from Creative Foam, formerly known as the Aetna Felt Corporation.



Chrysalises (6)

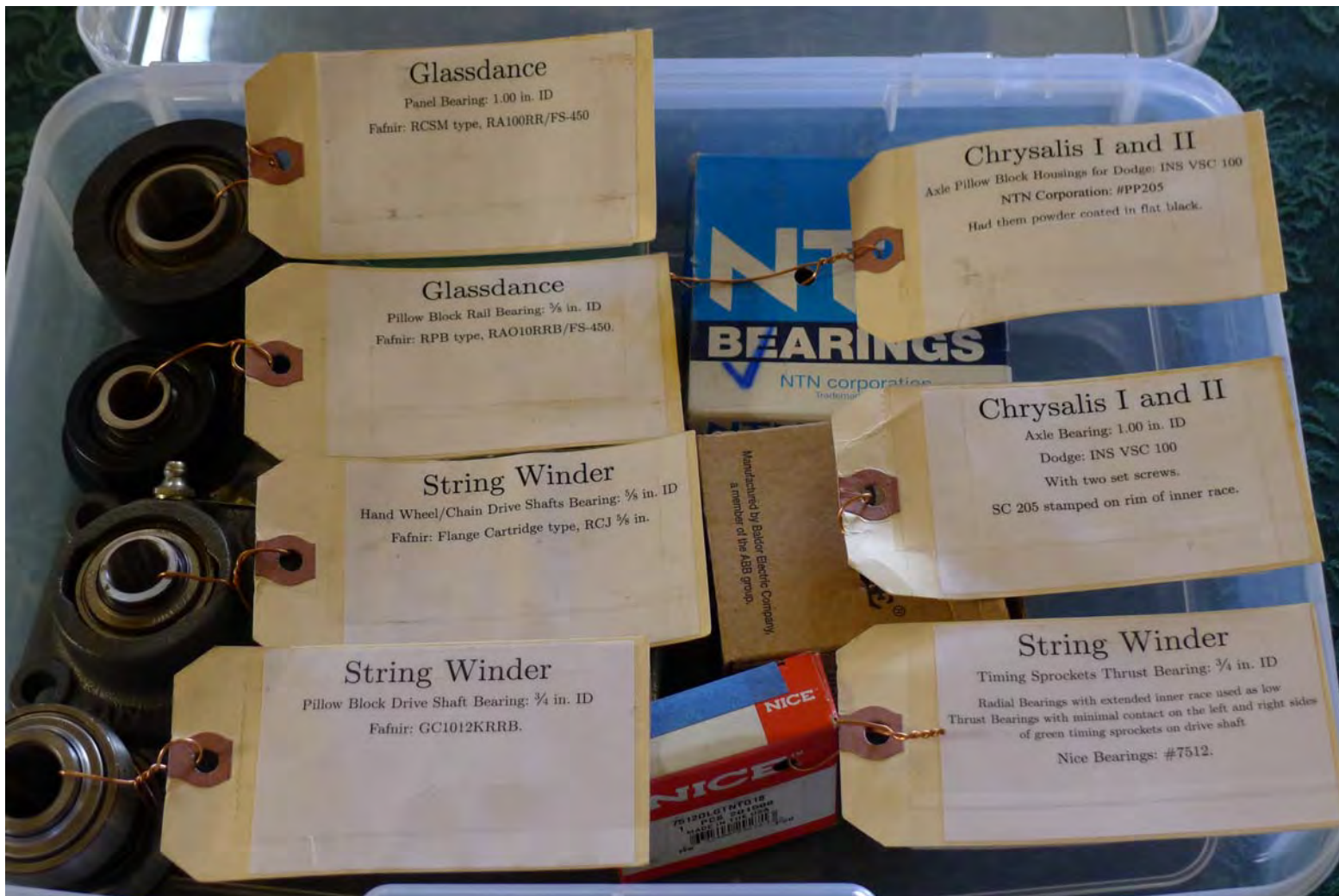
Chrysalis II

These scraps of quarter-sawn Sitka spruce are remnants from making the soundboards and ribs of Chrysalis II. They can be used to repair the soundboards of Chrysalis I, Chrysalis II, Harmonic/Melodic Canon, Bass Canon, and Just Keys. (Many smaller remnants not in photo.)



Ball Bearings

Chrysalises, Glassdance, and String Winder



Instrument Building Jigs & Extra Parts (1) ⁻⁹⁻

Chrysalis II, Glassdance, Canons, Bass Marimba

Honduras rosewood spoke for Chrysalis II.

Glassdance aluminum stem roller to check the runout of Sasaki crystal brandy snifters. When used with a surface gauge, this tool enables a tuner to verify an even removal of material from the rims of the glasses.
See [Glassdance_Components_Manual-1.pdf](#), p. 23.

Bass Canon and Harmonic/Melodic Canon jig for drilling aluminum plates.

One Chrysalis I soundboard spacer.

Chrysalis I and II jigs for drilling *blind pilot holes* into felt-covered brake pads; holes for #6 tapping screws ≈ 0.315 in. long.

Chrysalis I and II jig for grinding down thirteen $\#6 \times \frac{3}{8}$ in. flat head brake pad tapping screws to a length of ≈ 0.315 in.

Bass Marimba saddle jig for drilling holes into the upper aluminum tube rails; holes used to attach nut plates.

Bass Marimba jig for drilling holes into steel nut plates. Nut plates also used to secure linear bearing support rail sections on the String Winder.

Not in photo:

Chrysalis I and II jigs for bending the ends of brass (gold powder coated) soundboard brackets to 90° .

One grey modified plastic tube used as a jig for filing a slot into a maple dowel on the stand of Chrysalis I.

Two Honduras rosewood spokes.

Two extra Chrysalis I aluminum caster blocks.

