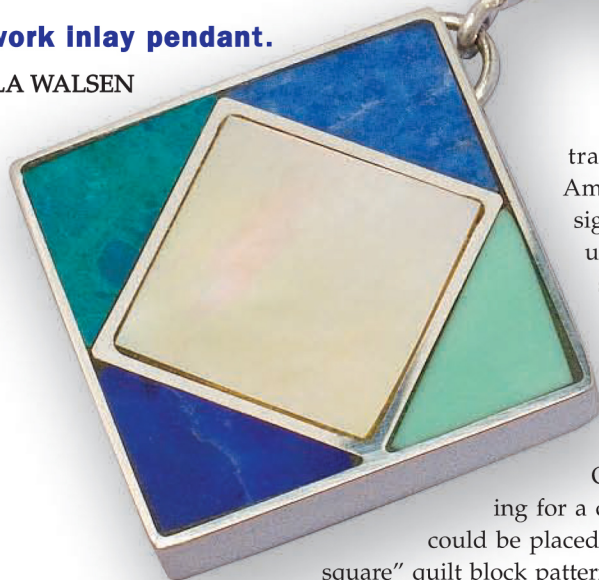


## Quilt Blocks in Stone

### Channel work inlay pendant.

BY PRISCILLA WALSEN



This multi-stone Quilt Block pendant is based on traditional channel work inlay that evolved in the American southwest during the last century. The design is based on the “square-in-a-square” pattern often used in traditional American quilting. A variety of stones can be used to create a colorful pendant, or you can use just one type of stone. The stones in this pendant are (clockwise from top): denim lapis, variscite, lapis, and chrysocolla. The mother-of-pearl in the center is enhanced by the blues and greens around it.

One day, while I was using some square silver tubing for a different project, I discovered that ½" square tubing could be placed inside ¾" square tubing to create the “square-in-a-square” quilt block pattern. I’ve since made hundreds of inlay pieces of various designs, using different sizes of square tubing. The only source I know for this material is Metalliferous in New York. A 1’ length of tubing can yield up to 48 settings, making it cost-effective, especially when you consider the time savings.

#### Skill level



### What you need

- Sterling silver sheet, 18-gauge
- Sterling silver square tubing: 18.75 x 18.75mm (¾" OD), .020" wall thickness (Metalliferous #STB422)
- Sterling silver square tubing: 12.5 x 12.5mm (½" OD), .020" wall thickness (Metalliferous #STB421)
- Sterling silver round jump ring, 20-gauge, 5mm. (for bail)
- Variety of rough stone material- all opaque and approximately the same hardness
- Jeweler’s saw frame & #2 saw blades
- Bur-Life®
- Bench pin
- Ultra-fine black Sharpie® marker
- Steel ruler
- Flat file (medium)
- 400-, 600- & 1200-grit emery papers
- Torch with medium tip
- Charcoal soldering block or white firebrick
- 3 nickels (soldering jig)
- Wire solder: hard, medium, and soft
- Small cutters (to cut the wire solder)
- White paste flux
- Small paintbrush (for flux)
- Solder pick
- Copper tongs
- Pickle pot with Sparex®
- Liquid dish soap
- Old soft toothbrush
- Vibratory or rotary tumbler
- Mixed stainless steel shot—pins removed
- Burnishing solution
- Dop pot or equivalent
- Alcohol lamp and denatured alcohol
- Electric mug warmer or equivalent—to heat the inlay setting for dopping
- Dopping wax
- ½" aluminum dop stick (or 4" length of wooden dowel)
- Dop stick holder (or equivalent)
- Scribe
- Lapidary saw
- Flat lapidary machine with 180-, 325-, 600-, 1200-, 3000-grit laps
- Polishing lap charged with 14,000-grit diamond compound
- Ultralap polishing disc (or a leather polishing lap with the appropriate polishing compound.
- Epoxy 330™
- Small disposable paper plates (for mixing epoxy)
- Wooden craft sticks
- Wooden toothpicks
- Acetone
- Cotton swabs
- Jewelry buffer and felt buff
- Zam® polishing compound
- Loupe
- Safety glasses
- Respirator with appropriate cartridges
- Waterproof apron

Photo of finished piece by Todd Murray; all other photos courtesy of the author.

The project was written with the assumption that you have experience cutting a stone slab, grinding stones on a flat lap, attaching a stone to a dop stick, and using a tumbler to finish or harden silver. You should know how to set-up and properly operate a lapidary saw and flat lapidary grinding machine.

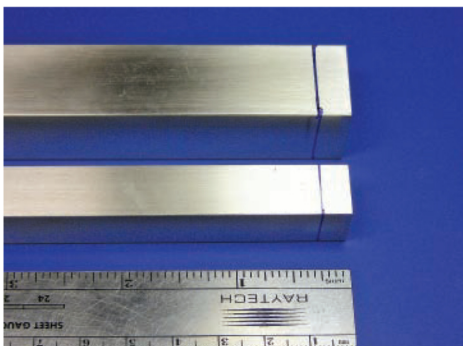
Always follow proper safety procedures when using equipment. Follow the manufacturer's instructions. This project includes the use of acids, chemical solutions, hot dop wax, a torch, alcohol lamps, abrasives, and machinery that could result in injury. Work in a well-ventilated area, and wear safety glasses. Tie long hair back. Avoid wearing loose clothing and jewelry. Wear a respirator (not a dust mask) when cutting or grinding stone or shell material. And finally, don't put your lapidary mud down the sink. It will clog up your plumbing like concrete.

### Fabrication

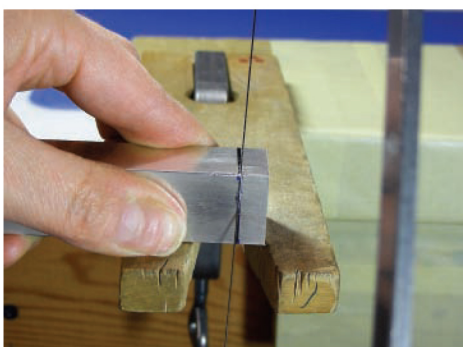
- 1 Cut a 1" x 1" square from 18-gauge sterling sheet using the jeweler's saw with a #2 saw blade. File the edges. Using 600-grit emery paper, sand both sides of the sterling sheet to remove scratches.

If you stamp your work, do that now.

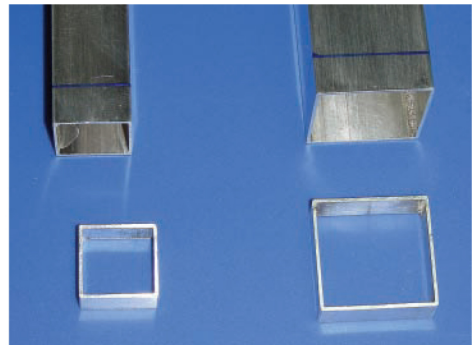
- 2 On the  $\frac{3}{4}$ " square tubing, draw a line  $\frac{1}{4}$ " from the end using the steel ruler and the ultra-fine Sharpie® marker. Repeat on the other three sides of the tubing. Repeat on the other piece.



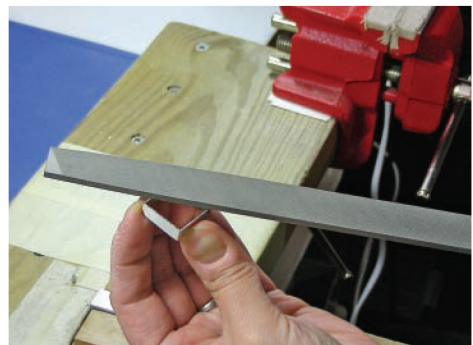
- 3 Lubricate the #2 saw blade with Bur-Life® or beeswax. Hold the tube on the bench pin, and saw it along the cutting lines. Use slow, controlled movements. Repeat with the other piece of tubing.



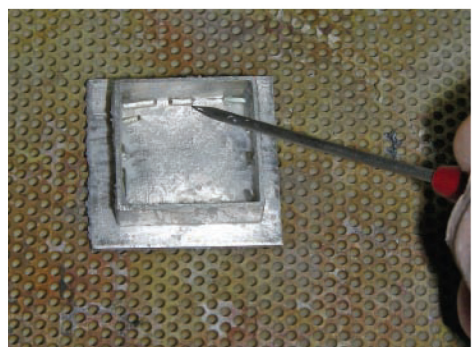
- 4 Cut another bezel from each of the two sizes of square tube to use as templates for your stones. These templates will save you a lot of time and they're easier to use than a ruler. Use the flat file to smooth the top and bottom edges. Make sure all sides of the tube templates are perpendicular to the bottom surface.



- 5 File the tube bezels for the inlay channels.



- 6 Sand the top and bottom edges of each square tube bezel on 400-grit emery paper.
- 7 Clean and dry the back sheet and both tube bezels, so they are ready for soldering.
- 8 Flux the entire 18-gauge back sheet and place it on your soldering surface. Flux the larger  $\frac{3}{4}$ " tube bezel and place it in the center of the sterling back sheet. Place a piece of hard wire solder in each corner, and use larger pieces of hard wire solder on the sides. For this step, it is better to use more solder than usual, so there are no gaps between the tube bezel and the back sheet after soldering. Flux.

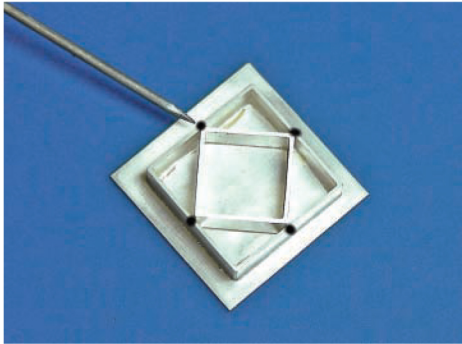




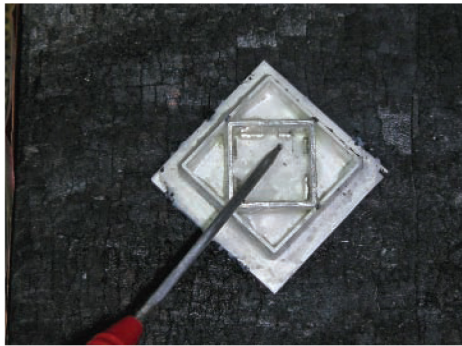
# STEP by STEP

- 9 Put on your safety glasses, and heat the back sheet until the solder flows around the bezel. Using copper tongs, quench the piece in water, and put it in the pickle for a few minutes. Rinse and dry.

- 10 Use the Sharpie® to make a dot in the center of each side on the top edge of the  $\frac{3}{4}$ " tube bezel. You will use the guide marks to align the  $\frac{1}{2}$ " tube bezel inside of it. To determine the center of the sides, measure  $\frac{3}{8}$ " from any corner.



- 11 Place the  $\frac{3}{4}$ " square tube setting on your soldering surface, face up. Flux the entire piece, and the  $\frac{1}{2}$ " square tube bezel. Make sure the guide marks are visible. Place the  $\frac{1}{2}$ " tube bezel inside the  $\frac{3}{4}$ " tube bezel, lining up each corner of the  $\frac{1}{2}$ " bezel with the dots on the  $\frac{3}{4}$ " bezel. Place medium wire solder along the inside of the  $\frac{1}{2}$ " square tube bezel.



- 12 Light the torch, and heat until the solder flows. Do not overheat the piece. Quench and pickle. Remove from the pickle, rinse and dry.

- 13 Saw around the outside of the setting to remove the excess sheet.



- 14 File the top edge of the setting smooth. When filing, remove as little silver as possible. All the sides should be the same height and perpendicular to the back. File off the excess back sheet so the sides and bottom are flush. Using 600-grit emery paper, sand the entire setting to remove all scratches. Wash and dry the setting.

- 15 Solder the 20-gauge sterling jump ring to create the bail. Flux the entire setting, and place it on your soldering surface—upside down. Use a stack of 3 nickels for a soldering jig. Heat until the solder flows. Quench, pickle, rinse, and dry.



- 16 Sand the setting with 1200-grit emery paper, to remove surface imperfections. Use the old toothbrush and dish soap with warm water to clean the setting. Rinse.

- 17 Do NOT skip this step. The setting must be hardened to achieve the best result. The metal is soft at this point, and if it is not hardened, it will grind away quickly, and it will lose its shape.

Set up the tumbler with mixed stainless steel shot with the pins removed, and burnishing solution. The pointed ends of the pins create a pitted finish on pieces that have little detail and flat surfaces. Tumble for 30 minutes and check the piece. Tumble for another hour or so. This hardens the metal enough so that it can stand up to the lapidary grinding. Do not tumble more than 2 hours. Remove from the tumbler, rinse, and dry.

- 18 I find attaching the bezel to a dop stick makes working much easier. Use a homemade dop pot, and an alcohol lamp to heat the wax. A mug warmer is perfect for heating the bezel.

I prefer to use inexpensive aluminum dop sticks. You can also use a 4" piece of wooden dowel for a dop stick. You also



need a dop stick holder to hold it upright while you glue in the stones, and while the epoxy cures. I use a 2' x 4' piece of wood that has holes drilled halfway down into it. It's stable, portable, and inexpensive.

- 19 Attach the setting to a dop stick. Make sure the setting is securely attached, and the setting is perpendicular to the dop stick. It is important to leave the corners of the setting free of wax and visible, after the setting has been dopped. Measure the height of the setting at each corner. This ensures that the pendant face is parallel to the back sheet. Wax should not come close to the top of the setting, or it will get in the way when you grind the pendant face.



### Lapidary

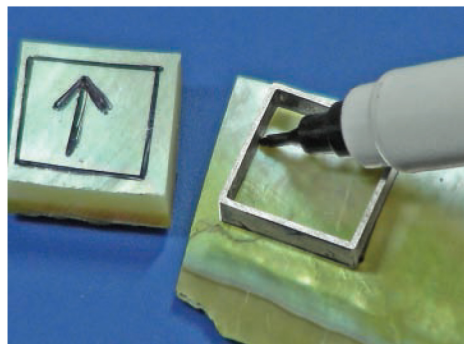
- 20 Select opaque stone materials that are all about the same hardness on the Mohs scale. Stones with a hardness of 3–6 work well for channel inlay. Don't use transparent stones. Rough material should be slabbed. The slabs must be slightly thicker than the depth of the inlay channels. Examine your rough stone and locate any fractures, inclusions, or parts of the stone you don't want to use. Use the Sharpie® to mark parts of the stone you want to avoid.

Put on your safety glasses. Using the lapidary saw, cut the rough material into slabs approximately 8mm (or  $\frac{3}{8}$ " ) thick. Slabs can be thicker, but not thinner. The slabs should be flat and smooth, so that they will lie flat in the inlay channels.

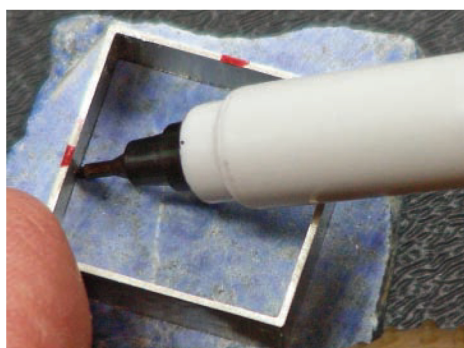


- 21 Draw the grinding lines for the center stone. Use the  $\frac{1}{2}$ " tube template (that you made in Step 4) and position it on the slab. Hold it securely in place. Use the Sharpie® and

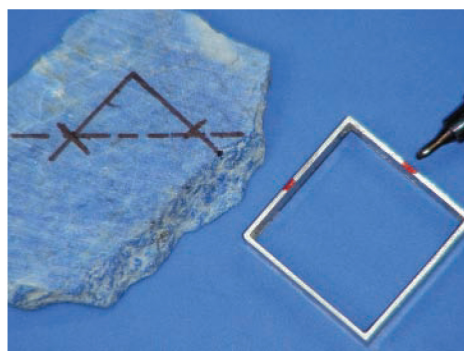
carefully draw a line on the slab around the inside of the template. Set this aside. If any of the grinding lines are inaccurate, use a cotton swab dipped in acetone to remove them, and redraw them.



- 22 Before drawing the grinding lines on the corner stones, make guide marks on the  $\frac{3}{4}$ " tube template (that you made in Step 4). These guide marks will indicate where to draw the grinding lines for the corner stones. Use the Sharpie® and place a dot on the top edge of one side of the  $\frac{3}{4}$ " tube template— $\frac{3}{8}$ " from one corner. Measure carefully. Repeat on the adjoining side. Position the  $\frac{3}{4}$ " square tube template on the slab, and hold the template securely in place. Carefully draw a line on the slab along the inside of the tube template, starting at one of the dots, and ending at the other. If any of the grinding lines are inaccurate, use the cotton swab dipped in acetone to remove, and redraw.

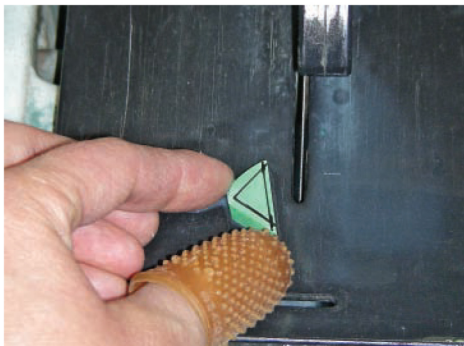


- 23 Set aside the  $\frac{3}{4}$ " square tube template. On the stone, draw a small hatch mark across each of the marker lines—9mm from the corner. Use these hatch marks to draw the third side of the triangle. With the steel ruler, draw a line on the slab to connect the two marks. Repeat for the other three corner stones.

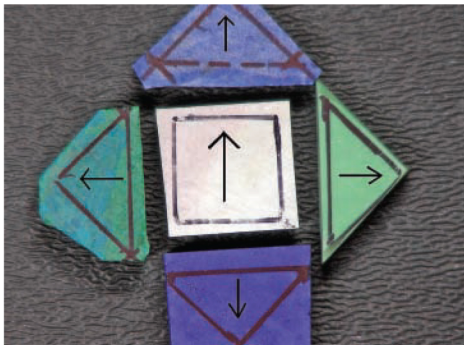




- 24** Using the lapidary saw, trim all five stone pieces, leaving  $\frac{1}{8}$ "– $\frac{1}{4}$ " of stone material remaining outside the grinding lines. The extra material is useful, in case you grind too much from one side, or grind the stone at an undesirable angle. Examine each stone, and make sure there are no visible fractures, inclusions, or chips. The slabs should be flat and smooth. If the material is questionable, don't use it. Cut a new piece of stone instead. Verify that you can clearly see all of the grinding lines. If not, redraw the lines so you can see them.

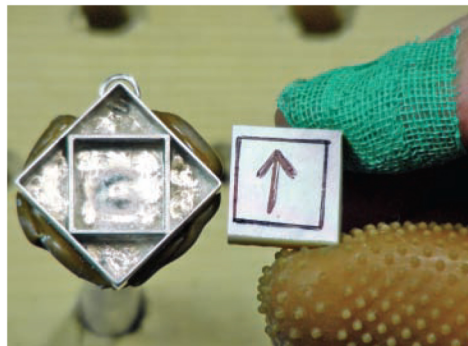


- 25** Decide which stones will go into each of the corner inlay channels. Don't change the location of a corner stone, after it has been cut and fits into a specific channel. A stone that fits perfectly in one corner channel will not fit perfectly in another. To get the best possible fit, always orient the stones in the channels the same way. To keep the stones correctly oriented, draw arrows on them using the Sharpie®. On the center stone, draw an arrow pointing up. This arrow will point toward the jump ring on the back, when the stone is fitted in place. On all of the triangular corner stones, draw an arrow pointing to the corner. The arrows will prevent you from accidentally flipping the stone upside-down while you are grinding and fitting it. The marker lines will be ground off later.

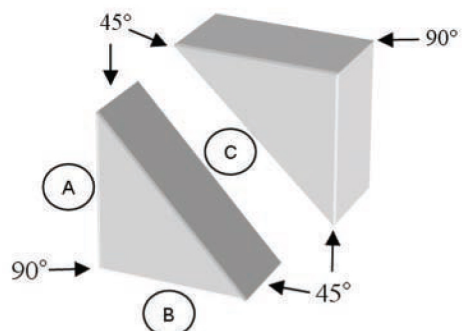


- 26** Set up the flat lapidary machine with the water drip system. Use the 180-mesh disc. Follow the manufacturer's directions for operating your lapidary equipment. Examine the setting and make sure all the channels are clean. Work with the center stone first. Hold it firmly, and grind each side of the stone up to the marker lines. Change from side to side as you grind. Grind a little bit at a time. As long as you

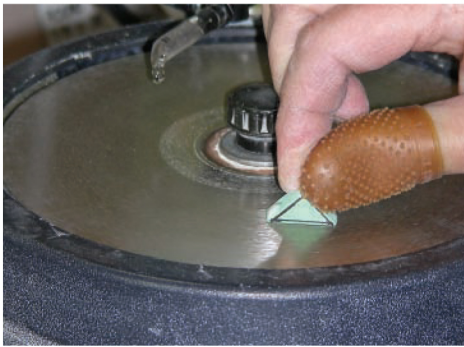
can see all the grinding lines on a stone, the stone will be larger than the inlay channel if grinding lines are accurate. Once the grinding lines start to disappear, the stone is close to the correct size. Stop often, and try to fit the stone into the center channel. Be gentle, don't force a stone into the channel so that it gets stuck. Keep the sides of the stone perpendicular to the bottom. When fitting the center stone, make sure the arrow on the stone always points up toward the jump ring. The stone needs to fit as close to the sides of the channel as possible. Continue grinding the center stone until you have an exact fit.



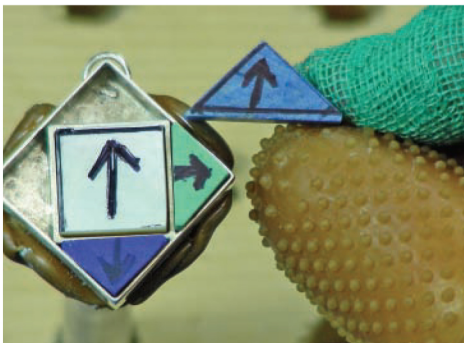
- 27** To grind the corner stones accurately, it helps to remember some key points: Keep the sides of the stones perpendicular to the bottom. All of the corners are either  $45^\circ$  or  $90^\circ$  angles. Avoid flattening the tips of the  $45^\circ$  corners. The four corner channels are approximately 9mm x 9mm x 12mm each. The diagram below shows what shape the corner stones should be when grinding is completed.



Grind the two shorter sides first—sides A and B. Focus on grinding the two sides to form a 90° angle. Grind these two sides of the stone up to (but not past) the marker lines. Stop often, and check the size and the shape of the stone by frequently and gently fitting it into the channel. Pay attention to the orientation arrow on the stone. Keep the sides perpendicular to the bottom. Once you come close to the grinding lines on sides A and B, start grinding side C. Remember—as long as you can see all the grinding lines on a stone, the stone will be larger than the inlay channel. Continue grinding all sides of the stone, until you have an exact fit.



- 28** Repeat this step for the three remaining corner stones. After you finish grinding and fitting all of the stones, clean them with denatured alcohol. Don't remove the orientation arrows. If you can't see them, redraw them. Set the stones aside.

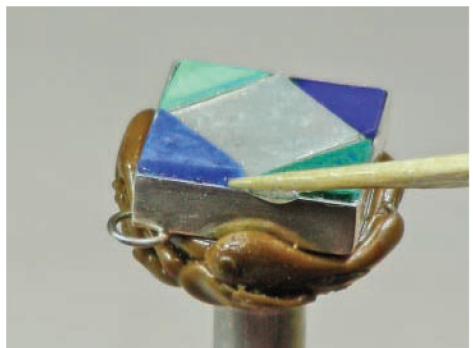


- 29** Using a scribe, scratch the bottom surface of all the inlay channels. Since the channels were burnished in the tumbler, the bottom surface needs to be scratched up, to help the epoxy adhere to the silver. Don't scratch the sides of the channels. Clean the inlay channels with denatured alcohol.



- 30** Place the dopped inlay setting into the dop stick holder. Mix the epoxy on a paper plate with a wooden craft stick. Starting with the center stone, put some epoxy in the center channel. Using a toothpick, spread it over the entire bottom surface. Use enough epoxy, so that some of it comes all the way up the sides of the inlay channel when you press in the stone. Pay attention to the orientation arrow, making sure the arrow on the center stone points toward the jump ring. Gently press the stone down into the channel, keeping the bottom of the stone parallel to the bottom of the channel. The tops of the stones should rise above the top edge of the inlay channels. If there is excess epoxy on the sides of the setting, clean it off with a cotton swab dipped in acetone. Try not to get any acetone on the top of the stones, or on the dop wax.

- 31** Repeat this process for each of the corner stones. When finished, make sure the epoxy came up to the top of all the stones in the channels. You want a seal along all the sides of every stone, including the center stone. If needed, spread a tiny amount of epoxy all around the edges. Clean off any excess epoxy on the sides of the setting. Set the dop stick upright in the dop stick holder. Put it in a warm place until the epoxy has cured, overnight is best.





- 32** Use the flat lapidary machine with a 180-mesh disc. Turn the dop stick over, and carefully grind the face. Keep the pendant face parallel to the grinding disc. Use firm pressure, but don't push the piece down on the discs while you are grinding. Let the abrasive do the work. Stop and check the surface often. Grind the stones until you just touch the top of the silver setting with the disc. In this step, try to remove all the stone material above the top of the setting. Rinse the setting before proceeding to the next sanding disc, to prevent the contamination of your discs.



Some think that you will contaminate the flat laps with the silver by using this method. I have never had a problem with any of my laps—diamond or silicon carbide. I don't get tiny pieces of silver embedded in the stone. I believe that hardening the setting has a lot to do with this, but I could be mistaken. I'm also careful not to grind away silver using the 180-mesh disc.

- 33** Put the 325-grit disc on the flat lap. Grind the face smooth to remove the scratches left by the previous disc. Use firm pressure, but do not push the piece down while you are grinding. As you are working, periodically stop and measure the height of the sides at each corner. All the corners of the pendant should be the same height. If you have "over-ground" one corner, you should try to equalize the piece before proceeding to the next sanding disc. As you work, you will notice a thin sliver of silver curling over the outside edge of the piece. The edge of the setting has been pushed down by the grinding process. You can usually just pull it off gently. If it doesn't come off easily, just continue grinding a lit-



tle, and it will eventually come off. If the setting was properly hardened in the tumbler, a minimal amount of silver should come off. Rinse the setting before proceeding to the next grinding disc.

- 34** Put the 600-grit disc on the flat lap. Grind the face smooth, removing all the scratches created by the previous disc. Stop often and measure the height of each corner to verify the pendant sides are square to the top. When you are finished using the 600-grit disc, the shape should be completed. Rinse the setting.
- 35** Put the 1200-mesh disc on the flat lap. Sand the face of the piece until all visible scratches are removed. The 1200-mesh disc is a smoothing disc, and shouldn't be used to try to shape the piece. The stones should now have a slight sheen. Use a loupe to check the surface of the piece before proceeding to a polishing disc. Rinse the setting.



- 36** Repeat Step 35 using a 3000-mesh disc. You can skip this disc, but the final finish is better if you use it.
- 37** Place a polishing pad on the flat lap that has been charged with 14,000-mesh diamond compound. Polish the face of the piece until the stones have a high shine. Use the loupe to check the surface before proceeding to the next step. Wash the setting with warm soapy water.
- 38** Put the Ultralap™ polishing disc (or a leather pad with the appropriate polishing compound) on the flat lap. Polish the piece until you have the desired finish on the stones. Use a loupe to check the surface of the piece. Rinse it when you're finished.

- 39** Place the dop stick with the pendant attached, into the freezer for 2–3 minutes. This makes it easier to remove the pendant. The dop wax and the silver have different rates of expansion, and this allows the setting to come off cleanly. Remove the piece from the freezer, and using your hands, pop the pendant off the dop stick. If it doesn't come off easily, put it back in the freezer for a couple of minutes. I can usually use my fingers to remove the pendant and most of

the wax. The photo below shows the small amount of dop wax left on the piece after removing it from the stick.



**40** To remove the remaining dop wax and any unwanted epoxy, rub a cotton swab dipped in acetone on the wax. This may take a few minutes. When all the wax has been removed, wash the pendant in warm, soapy water.

**41** Polish the back and sides of the pendant on a jewelry buffer with a felt buff and Zam<sup>®</sup> polishing compound. Make sure the pendant is dry before you start. Usually the pendant's face won't need to be polished again, but you can if you like. Make sure Zam<sup>®</sup> can be used on the stones before you do this. Be careful if you use a muslin buff, as it tends to round the edges. Wash the pendant in soapy water to remove the polishing compound.

**42** Attach a bail, or another jump ring to the jump ring on the back of the pendant, and attach it to a chain. Your quilt block in stone is ready to wear! ♦

The following information was from 2006.

Lapidary and silversmith artist Priscilla Walsen uses both traditional and modern methods to create each piece of jewelry. The process of working with the gemstones—finding ways to show off the patterns and colors of the stones—really inspires her. Priscilla works from her studio in ~~Montross, Colorado~~. She first got into jewelry making years ago, when she took classes in high school. In 1997, she started her own handmade jewelry business called SilverWear. Priscilla's jewelry has been shown in galleries in Colorado and Montana, and through private trunk shows. She also enjoys teaching how to create inlay jewelry. Priscilla is a certified PMC<sup>®</sup> Artisan by the PMC<sup>®</sup> Guild and she received her B.A. from Princeton University. Contact her at ~~priscilla@central.com or by calling 800-697-9685~~.



Contact Information:

[info@silverwearjewelry.com](mailto:info@silverwearjewelry.com)

[www.silverwearjewelry.com](http://www.silverwearjewelry.com)

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