American Marquetry Society

Instructor Handbook

by Dave Peck

Version 1
Created: October 2008
With Adobe InDesign

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How to Use This Package

Welcome: This handbook is aimed at helping the person who has never taught marquetry. The hope is that it will give you the confidence to go ahead and teach. There are many ways to make marquetry and most of them will produce excellent results but given a short period of time for instruction you need to limit how much you will try to cover. Therefore, **teach the things you already know – go with your strength.** For example if you do your marquetry with a knife, teach knife cutting. If you use the fretsaw teach that.

Structure: The handbook is divided into three sections – 1. giving a demonstration, 2. teaching a class and 3. holding a workshop. If the students will not have hands on practice you are doing a demonstration; If there will be hands-on but the sessions will be short then we are talking about a series of classes; and if everything will be concentrated in a long session, say a day or two, then it's a workshop. General comments start each of these sections. The meat of the package is contained in the classes section but you can adapt this class info for a demo by eliminating the hands-on part or you can use the same info for a workshop, just move from one lesson to the next as the day goes along.

The lesson plans will help you decide the sequence in which items should be addressed. Recommended readings are included that you can use or suggest to your students.

The handouts are provided if you want to use them. Or you can make your own to more closely fit your technique.

To print any portion of this handbook it is simply a matter of checking the page numbers and selecting these numbers from your printer dialog box.

Follow-on topics list possible areas for further study/instruction. You can elect to teach only what you already know or you can challenge yourself – research and teach something new. It's a great way to learn.

If you have ideas on how this handbook can be improved we want to hear from you. If you write up an additional topic please send it in for addition to this package. Send comments to Dave Peck, 726 Road N, Redwood Valley, CA 95470, Tel: 707-485-7458, Email: TOdavejudypeck@comcast.net. (remove the TO before sending.)

Safety:

Although marquetry is a relatively safe activity we must be ever vigilant. The hand tools we use have the potential to cut us but if they do it's usually not serious. However, the general woodworking aspects of marquetry, such as cutting substrate on a table saw, require us to be knowledgeable of and follow good safety practices.

1. **A Clean Work Area**. Some of us are probably not as tidy as we might be. Our shop space is usually a compromise between the space we need and the space we have. We let things crowd in here and there. Suddenly we have a cluttered shop and a cluttered shop is an accident waiting to happen – be it tripping on something left on the floor (an extension cord) or not being able to finish a cut because something is in the way (a can of finish can spill if it is knocked onto the floor). A clean area makes marquetry a pleasure.
2. **Keep Tools Sharp**. A sharp tool, be it a knife or a saw blade, cuts smoothly. A dull blade cuts slowly and requires greater force. The greater the force the more apt you are to get hurt if something slips. Even dull blades cut flesh quite easily. The same goes for out-of-adjustment and broken tools. A few moments adjusting the throat plate on your table saw are nothing compared to the time that can be lost if you get a kickback.
3. **Wear Appropriate Safety Gear**. Eye shields, either goggles or a full face shield, should be worn whenever you are using power tools. A push stick is a lot better than your hand in close to a saw blade. Avoid loose fitting clothing that could get caught in a machine.
4. **Sanding dust** can be a serious problem. We tend to go ahead and sand without protection because we are only doing a little bit. Well a little now and a little then adds up pretty fast. The tiniest pieces of dust are the ones that do the damage. They go into the lungs and lodge down deep where they stay and over time cause trouble. What can you do to protect yourself. A. Wear a face mask. The inexpensive ones that are called comfort mask help a little but not much. A better mask will have two straps to hold it on better. B. Move the air away from your face. A fan placed behind you blowing the air and dust out an open door is a big help. If you place the fan so that it sucks the air away it needs to be an explosion proof vent fan.
5. **Sensitivity to wood and wood dust**. Over time you can become sensitive to certain woods and have an allergic reaction. Skin rash, hay fever, itching, etc. are possible reactions. If you are experiencing one or more of these problems it's time to figure out what is causing it. There is a good website listing toxic woods at: http://www.ci.Tucson.az.us/arthazards/wood2.html. If you don't have internet access send me a self addressed stamped envelope and I'll send you a copy of the list.
6. **Finishes** and other chemicals require special care. Keep them away from any source of ignition. Store them in a cool, dry place out of direct sunlight. Keep them off your hands. And skin. It's the solvents that can get into your system even through the skin. Some adhesives fit into this category. Plastic resins especially so read the labels on all finishes and adhesives and pay attention to what they say. And don't breathe the fumes. Here a cloth facemask is of no help. You need a respirator approved for the substance you are using.
7. **Dull and broken** knife blades should be wrapped before putting them in the trash.
8. **Small cuts** and splinters need to be treated with care. If they are not cleaned properly an infection can cut into your marquetry time.

Tips for Teaching Marquetry

Have Visual Display – Don’t just tell – show.

Make sure everyone can see

Have Handouts

Keep demo area clutter free – don't let clutter distract attention

Put items for each demo in its own plastic bag
Ditto for handouts for students

Cover what people need to look for when buying material.

Patience is essential. Some students will come to you with considerable woodworking experience. Others will have none.

Tell them what you are going to tell them - Overview.
Tell (and show) them what you told them you were going to tell them - Your demo.
Have them do what you told and showed them.

Section 1

How To Give a Good Demonstration

A demonstration differs from a class or workshop in that the audience does not get to do any hands-on activity. It's an excellent format for reaching a large audience to generate interest in marquetry. It also works well for smaller groups when time and resources are limited, for example at club meetings. Much of what follows applies to both types of situations and at the end specifics are given for two common situations.

Overall Considerations

1. First, think about who your audience will be. For example, at a club demo you will give more detail than you would at a woodworking show where your audience doesn't even know there is such a thing as marquetry. At the club demo you are conveying information. At a woodworking show you are grabbing the attention of passer-bys and creating interest in marquetry. (See the end of this article for specifics for the two extremes)

2. Decide what to demonstrate based on your audience and what you feel you can do well without worrying. It's best to choose something that you have done many times so that you feel confident in your ability; but don't let this stop you from showing a new method or a trick that you have recently learned or discovered.

3. Plan what materials and tools you will need to complete the demo. A good idea is to figure out what you need, put it in a box and go into another room. Then see if you can do the complete demo without going back into your workshop. It's well worthwhile to practice with a friend present. Having a live person listening really improves your concentration. It also gives you the opportunity for feedback. Keep track of how long it takes during practice and then add 50% for answering questions.

4. Get to the place where you will do the demo early and get set up so you can start on time. Getting there early allows time to move tables, replace light bulbs, etc.

5. Use a structured evaluation form to evaluate your performance. Have a few people, or the whole audience, fill it out. It can be helpful in pointing out ways to improve your demonstration skills. See attached evaluation form.

Creating interest in marquetry – large audience passing by at random. – your purpose is to attract attention –

1. Take showy veneers and make something simple that can be completed quickly. The flashy woods will attract attention and by having a quickly completed project you will dispel the idea that marquetry takes forever. Take enough materials that you can do the one project several times or several similar projects during your allotted time period.

2. Take some examples of your marquetry for display.

3. Be prepared for many questions. How do you say that? (referring to marquetry) is often heard. Where do you get your veneers? What wood is that? Can you do that with a sewing machine? Wouldn't it be easier with a laser. Etc..

4. Have follow up information ready to hand out to those who show an interest. For example, a list of references for further reading, a list of sources of supply and a contact point for yourself or your club. Also, have on hand

some AMS “Invitation to Join brochures”. Get them free from your club or from the AMS Membership Officer. Don’t put your handouts where everyone can grab them. You will go through a whole stack of handouts and get virtually no return.

Conveying information – small audience and a set start time – your purpose is to teach.

1. Plan your demo for a specific topic or method. There won’t be time to cover everything.

2. Practice your demo at home, preferably with a friend, to see how long it will take.

3. Format your demo in three steps.

a. Tell the audience what you're demonstrating. (a good time to show a finished item), Tell them that you will first verbally explain the steps and then you will actually cut the pieces, etc.

b. Verbally go through what your about to do. Highlight each step so those watching can quickly get a look at the entire process. This helps the audience tremendously in understanding what you are doing.

c. Physically do the cutting, gluing, etc., and explain the details.

4. Answer questions as they come up, especially the questions from people who don’t understand what you are presenting. If a question is “off topic” ask the person to repeat the question again at the end of the presentation. If the question will be answered later in your presentation let them know the answer is coming up later. If someone wants to explain “their way” suggest that you finish showing the demo and then they can tell how their method differs.

A checklist will help get you to the demo with everything you need. See next page.

Demonstrator Evaluation: Consider having your students evaluate what they thought of your demonstration. it will give you ideas for what you can do better next time. See Demonstrator Evaluation Form.

Checklist of what you need for a marquetry demonstration.

You will need to make additions and/or subtractions from this list according to the marquetry method(s) (knife cut, fretsaw, etc.) that you use.

*Cutting tool (knife, # 11 blades & sharpening stone, cutting mat (self healing) or fretsaw & extra blades, birdsmouth saw table
*Tape (your favorite)
*Veneer Saw
*Veneer Roller
*Transfer paper or carbon paper
*Stylus (Ballpoint pen that has run out of ink)
*Scissors
*Steel straight edge 12"
*Square (Carpenters)
*Mounting board (aka substrate) (1/8" - 3/4" plywood depending on size of picture)(Note: also used as a cutting board)
*Glue
*Glue spreader (Credit Card, brush, etc.)
*Sandpaper
*Tracing Paper
*Pencil (.5mm mechanical)
*Clamps (2)
*Nice selection of veneers
*Pattern(s) you will work on
*Examples of marquetry for display
*Books about marquetry
*Invitation to Join AMS brochures

DEMONSTRATOR EVALUATION

Demonstrator's Name _____
Demonstration Topic _____Demonstration Date _____

Please answer the following questions on a scale of 1 to 7, 1 being a low score and 7 being a high score. All forms will be returned to the demonstrator, so it is important to be both accurate and fair.

1. How knowledgeable and clear was the demonstrator on the topic covered?
   not very 1 2 3 5 6 7 very

2. Did the demonstrator speak loudly and clearly enough so that he/she could be understood?
   not at all 1 2 3 5 6 7 no problems hearing

3. How well did the demonstrator answer questions from the audience?
   not very well 1 2 3 5 6 7 very well

4. How well did the demonstrator manage dominating attendees?
   not very well 1 2 3 5 6 7 very well

5. Did the demonstrator get quickly to the subject and complete his/her program?
   no, he/she did not 1 2 3 5 6 7 yes, he/she did

6. Did the material covered in the demonstration fit the description in the program?
   no, it did not 1 2 3 5 6 7 yes it did

7. Did the demonstration proceed at an appropriate pace?
   way too fast/way too slow 1 2 3 5 6 7 proceeded at a very good pace

8. Did the demonstrator provide appropriate handouts? (circle one) Yes – No - Not Applicable
   were handouts clear, well written, understandable? no 1 2 3 5 6 7 yes

9. Was this demonstrator organized in preparation for his/her demonstration? e.g., tools sharp, veneer ready, jigs and other items readily available. ….
   not well prepared at all 1 2 3 5 6 7 very well prepared

10. Overall, how would you rate this demonstrator?
    poor 1 2 3 5 6 7 excellent

11. Specifically, what could the demonstrator do to improve his/her demonstration?

Section 2 - Teaching a Class

Teaching a "Marquetry Class".

A marquetry class differs from a demonstration because it has hands on activity for the students. It differs from a workshop in that it is broken into numerous short sessions rather than one long session.

You will have favorite ways to do your marquetry and it's best that you teach your way rather than trying to teach something that you are not familiar with. For example if you only use the knife then you may want to adjust these lesson plans to fit your style.

For this class we are planning 6 lessons each 2 (or 3) hours in length. Classes will normally be held on a weekly basis but variations are acceptable; every other week, twice weekly, daily, etc.

Items provided for each lesson:
1, A lesson plan
2. A pattern (in the handout)
3. A list of tools and materials
4. Recommended reading
5. A handout for the students
6. An alternate pattern (or take-home project)

Key decisions you have to make before you announce the class.

1. What day of the week and what time of day works best for you and what works best for your students?
2. Where will you teach? How many students will the facility accommodate?
3. Will you provide all the tools and materials or will the students buy/bring their own? (If you provide the tools and materials you have control – if the students bring their own you have to expect the unexpected!)
4. Do you need an assistant? You should be able to handle 4-6 students alone. More than that and you should find an assistant.
5. Who Pays? Are you charging a fee for your services? Who pays for the materials your students will use? If you are part of a club maybe the club can contribute the materials?
6. Will you require a textbook?
7. How will you advertise the class? Word of mouth? Within an existing group (social, living, hobby, etc.)? Via newspaper or radio?
8. Insurance? Marquetry is a relatively safe hobby. If you feel you need coverage beyond your homeowner's policy consider an umbrella policy. Only if you make a business out of marquetry would you need to consider business insurance.

Basic format for each lesson.

1. Introduction – Tell them what will be covered for the class period
2. Tell them how to do the project for the day – step by step.
3. Show them how to do the project.
4. Have them do the project

(I emphasize emphatically the importance of providing a framework so that the students know what's coming.; step 1 introduction and step 2 verbally tell how to do the project before step 3 where you show them how. They will learn much faster this way.)

Continued next page

Subjects are as follows:

Beginning marquetry

1. **Knife Cutting** (window method). Includes introduction, short history of marquetry, tools for marquetry and sources of supply. Project will be a refrigerator magnet. Include info on substrates and adhesives.
2. **Fretsaw cutting** (also About Veneers). Includes how veneers are made, flattened, stored and identified. A bookmark will be made using the pad method.
3. Fretsaw **a small picture** with a hand held fretsaw. Discuss various tape options.
4. **Stringers and borders** for the pattern made last session. Discuss veneer presses, abrasives and finishing techniques.
5. **Bevel cutting** (set of initials for a desk set). Marquetry books and societies.
6. **Bevel cutting project.** A small project that will solidify what was taught in the previous lesson.

Section 2 - Lesson 1

Lesson Plan #1 – Knife Cutting

What you will need:
Craft knife or scalpel / blades
Stone for sharpening
Ruler/ straight edge
Veneers (dark, med, light colors)
Tape – blue painters & veneer
Carbon or transfer paper & stylus
Cutting mat
Clamps
3/4 ply for clamping
waxed paper or plastic sheeting
newsprint
sandpaper (med and fine)
finish

Sequence for teaching:

1. Introduce yourself and show some of your marquetry.
2. Hand out and go over the Course Outline.
3. Go over today's schedule.
4. Have the students introduce themselves and tell why they are interested in marquetry.
5. Tell the students about the window method.
6. Show the students the window method.
7. Have the students cut the pattern.
8. Tell about gluing up.
9. Demo gluing up.
10. Have the students glue up their projects.
11. Go over tools for marquetry.
12. Go over sources of supply. (see AMS web page for current listing)
    a. Jewelers blades are separate.
    b. Show your favorite marquetry book – and others.
13. Inform about sources of information brief them on the AMS. Give them an application.
14. Talk about your favorite glue. Mention alternatives.
15. Show how to remove veneer tape. Have the students wait till the next day to remove their veneer tape.

The key in this sequence is to demonstrate & have the students do the cutting & glue up first so there will be time for the glue to set before the end of the allotted time.

Recommended Reading:

"The Marquetry Course" by Metcalfe & Apps, 2003
pp. 26-29 plus bottom of pages 30-31, about knife cutting
pp. 15-18 about gluing
pp. 8-10 about tools for knife cutting

Continued next page

pp. 15 about tape

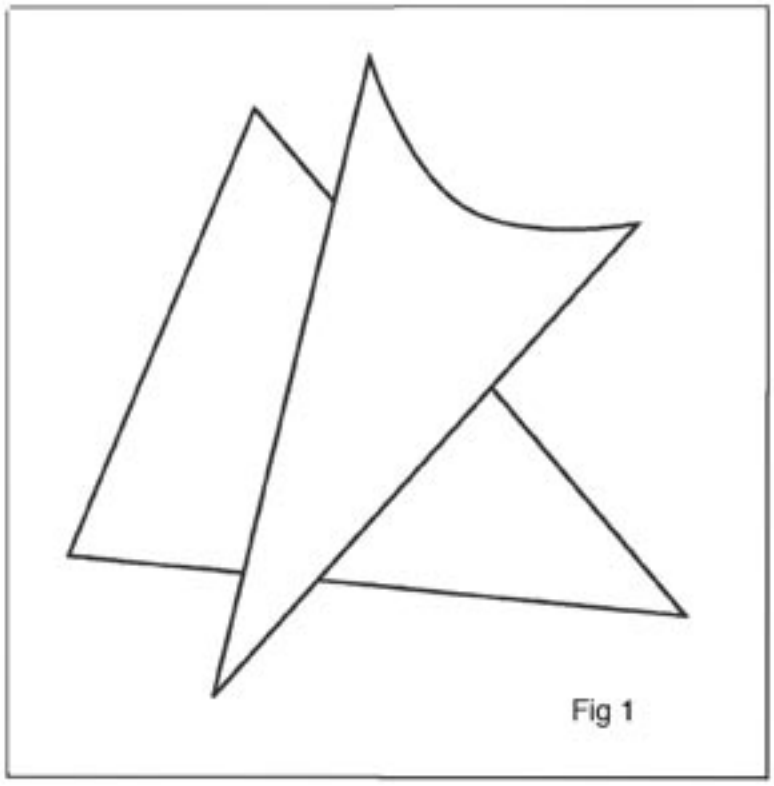
“Simple Marquetry” by Burton, 2001
pp. 43-47 about grounds/substrates

“The Marquetry Manual” by Lincoln, 1989
pp. 68-76 about knife cutting
pp. 59-67 about tools for knife cutting.

Lesson 1/Knife Cut – Refrigerator Magnet

Using the Window Method

By Dave Peck



The Window Method

This knife cutting technique has been used for hand cutting of marquetry pictures for hundreds of years. The name window method derives from the simple process of cutting a hole in a veneer and using this "window" as a viewer, and as a template for cutting the veneer that will fill the hole.

Let's Get Started

A self healing mat or a piece of vinyl tile, will protect the table as you work. In a pinch an old magazine suffice. Plywood is fine but hard surfaces such as Formica or hardboard will break the tip of the knife blade. (see sharpening sidebar.)

The first task is to cut out a 4" square of veneer from a larger sheet of veneer. This will be the background veneer. I suggest the dark wood as the background but the choice is yours. For this cut (and most others) hold the knife square to the work on a left to right basis. Lean the knife about 45 degrees in the direction of cut (toward you). Take light cuts making 3 to 5 passes to sever the wood. If you make a single heavy cut the wood may split, especially along the edge. For these straight cuts you will want to hold a metal ruler, or similar straight edge, along the line and use its edge as a guide. (Photo 1) Watch where you put your fingers! If you hold them too close to the working edge of the ruler you will get cut. Turn the work so that you can cut with a natural pull motion.

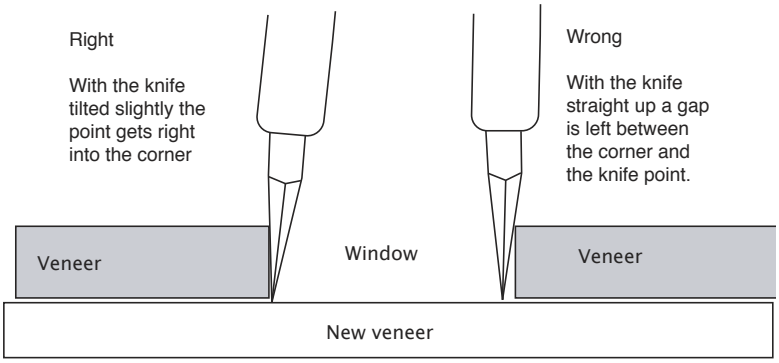

Photo 1

Make the First Triangle

Now that we have the veneer square we want to start making our design. We are going to cut a hole in the veneer and use that hole as a window to see what the next piece of veneer will look like. You can move the new piece around under the window and see exactly how it will look. If we don't like the way the grain is lining up you can move it. This allows you to take advantage of some special aspect of the wood, for example, a mineral streak or the division between heartwood and sapwood.

Use the pattern, transfer/carbon paper and stylus to mark the two triangles on your veneer square. Cut out the foremost triangle using the knife. Use a straight edge for the straight lines and freehand the curve. The tighter the curve the more vertical the knife is held. In the tight corners a stabbing motion is best. Again – take several light cuts rather than one heavy cut that ruins the project. Pay close attention not to over-cut at the corners. Remove the cut out piece and place your contrasting veneer **behind** the hole, move it around till you like the grain alignment and tape the two together. Two small pieces of blue masking tape should do. Use your knife to mark the size of the insert. In this case we will not be holding the knife straight up on a left to right basis. Point the tip of the

blade into the corner. This will make the piece you are cutting exactly fit the hole (see Fig 2). I'm right handed so I work to the left side of the opening and turn the work so that I'm always in a comfortable position to make the cuts. Once the new piece is marked remove the tape holding it in place. Lay the new piece on the cutting mat and cut the piece as before; that is with the knife held straight up on a left to right basis. Sometimes it's hard to see where you have marked. A little chalk dust of a contrasting color rubbed on the area and blown off will usually make the line stand out. Finish cutting out the insert. When the piece if free, place it in the hole. If you have done a good job it will fit nicely. If not sand to fit. If the insert is way too small make another. Tape the pieces together with veneer tape.



Cut the Second Triangle

Now it's time to cut the background triangle. Can you see it through the veneer tape? If not remark. Cut out the two windows, one on each side of the first triangle. Once you have the holes cut put the contrasting wood behind the holes so that it covers both holes, move it around till you like the look, tape it in place and mark the pieces with the point of the knife blade as before. Remember to tilt the knife just a little so the point goes into the corner. Once the pieces are marked remove the veneer from behind the window and finish cutting with the knife vertical on a right to left basis. Check the fit and tape it in position with veneer tape.

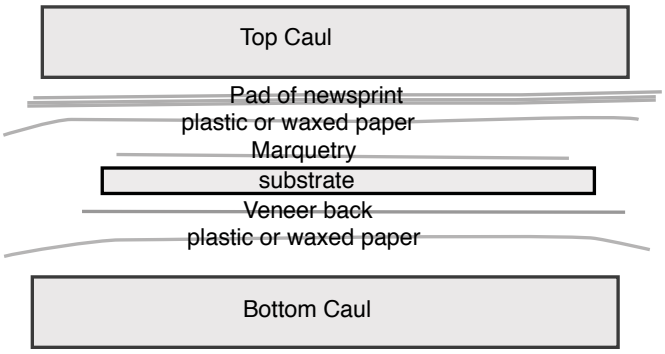


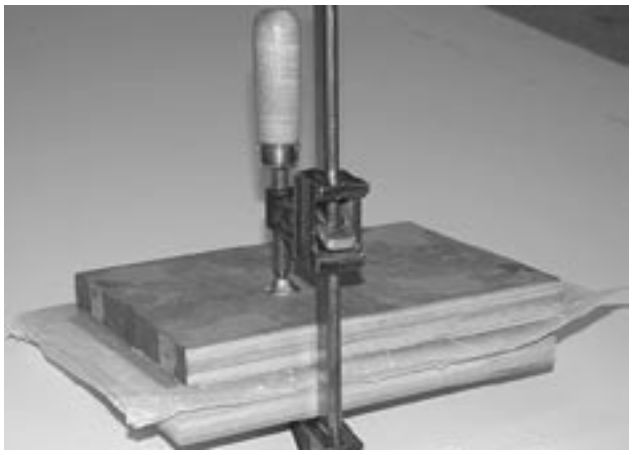
Fig 3

By using a single piece of veneer for both holes the grain aligns giving the appearance that this new addition is a single element of the design. By cutting these two pieces from the same piece of wood they will look like a single triangle.

Note: You could cut the back triangle first just as easily. It's a matter of personal preference.

Gluing

We will glue the completed assembly to a sheet of 1/8" or 1/4" plywood, (or a similar) substrate that is 4 inches square. We also need a sheet of veneer to go on the back that is just over 4" square. If we don't veneer the back there will be an imbalance and the completed piece may warp. With veneer on the back as well as the front balance is achieved and the work stays flat. Plywood always comes in odd number of layers. (All of our work, regardless of size, will need to follow this principle when it is glued up.) See Fig 3 for the layers that will go into the veneer press. This is a small project so a single clamp will work. You need two small sheets of 3/4" plywood for use as cauls, and a sheet of plastic film. Place one of the sheets of plywood down, place the plastic sheet on top of it with one edge even with the edge of the plywood, center the backing veneer on the plywood caul. Spread white glue (a small brush works well for this size project) on one side of the substrate, place it glue side down onto the backing veneer. Spread glue the front of the substrate and place the assembled triangle design in place. Fold the plastic over the front of the design, place a pad of newsprint (6-12 sheets thick) on top and finally place the top caul in place, Clamp the group together (photo 2).



The pad of newsprint will compensate for any difference in veneer thickness. If your clamp won't reach the center of the project use two clamps. Leave the assembly clamped up for the time suggested by the glue manufacturer – about 1 hour for yellow glue.

The question of how much glue to use is always a problem for the beginner. Use too little and the veneer may come loose. Use too much and it will seep out through the pores of the wood and spread across the face of the work. When using white or yellow glue I aim to cover the substrate with glue but not so much that I can no longer see the wood grain through the glue.

Final Steps

After the glue has dried, overnight is best, **remove the veneer tape**. You have two choices. You can sand it off or you can wet it and peel it off. I prefer to use the wet method. Moisten the tape with a wet cloth or paper towel. A moistener used for wetting stamps or envelopes works well. Wet the tape, let it sit for about a minute, re-wet and let it sit another minute, then scrape the tape off with a plastic putty knife or peel it off with your fingers. Where the tape is doubled you will probably have to apply water again. If it's not quite wet enough, re-wet and wait another minute.

To **check that everything was well glued** feel all over the work with your fingertips. (photo 3) You will be surprised at how much you can tell. The slightest hump may indicate the glue didn't stick. Tap these areas with a fingernail. If they sound hollow, that's a sign the glue didn't stick in that area. Set a household iron to the wool setting and heat the problem spot. Keep pressure on the spot by rubbing it with a roller or the corner of a piece of wood as it cools. If you still have a "bubble" then you will have to split the veneer with a knife, insert glue and re-clamp.

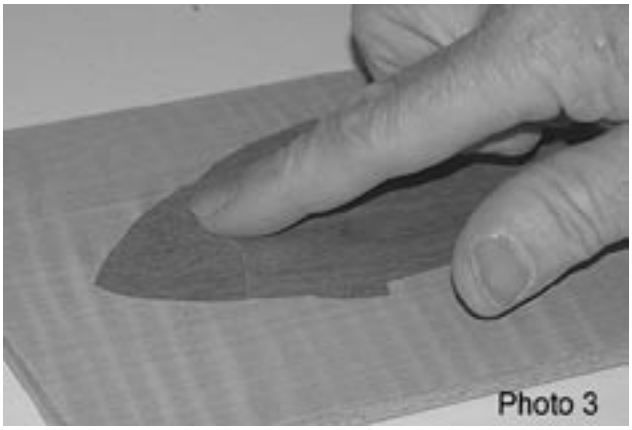


Photo 3

Hand **sand** starting with 100 grit sandpaper, the 150 grit and finally 220 grit. Round over the edges just a little. Optional: paint the edges with acrylic paint.

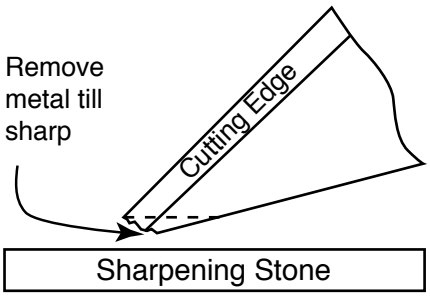
A can of **spray finish** will be an easy way to provide a protective coating and to bring out the color and beauty of the wood. Give it two coats of finish (I prefer lacquer based finishes because they dry quickly).

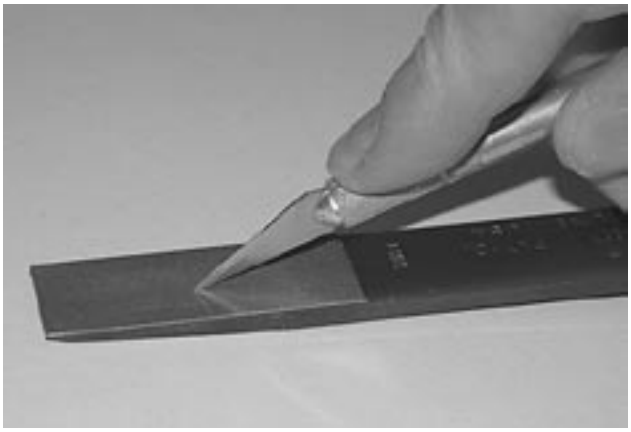
Glue on either two round or one strip **magnet** and the project is finished. A thick CA (super) glue is my first choice or epoxy would be my second choice for gluing on the magnet.

Is Your Knife Sharp?

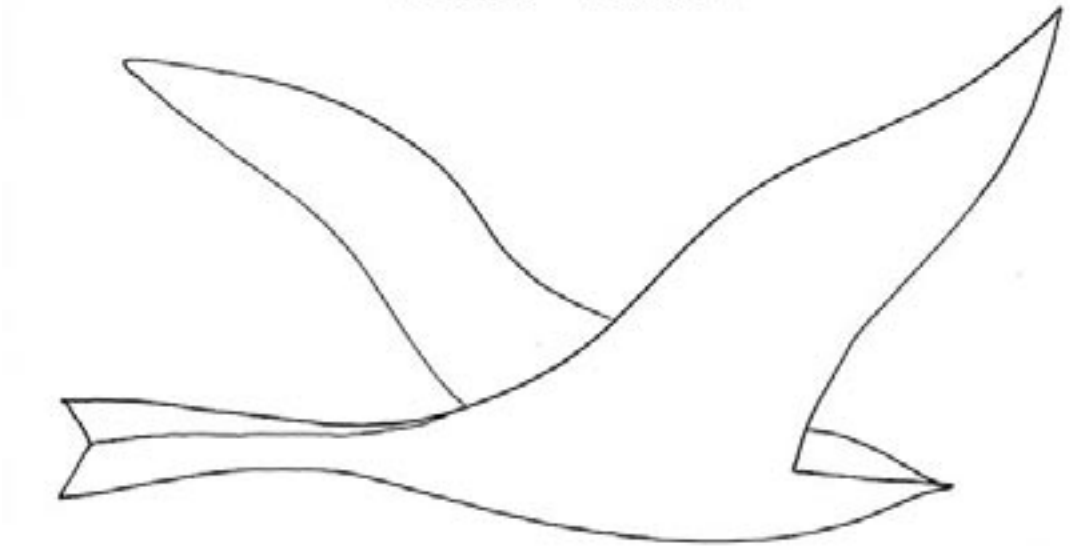
Test it by touching a small piece of veneer. If the knife is sharp it will pick up the veneer. If it does not pick up the scrap of veneer with just a light touch then it is time to sharpen.

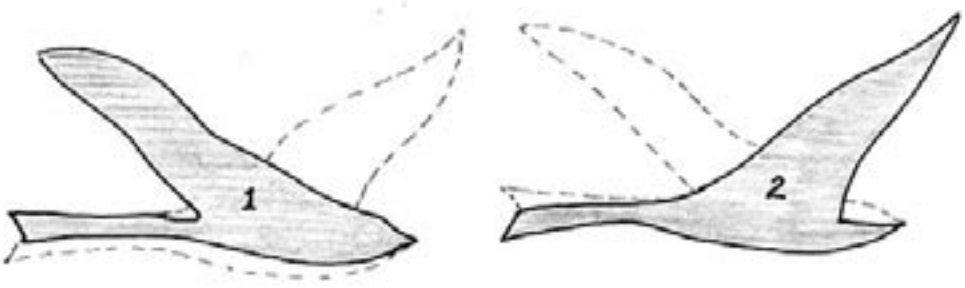
Place the knife on a medium or fine sharpener (any of the flat kinds will do) with the cutting edge facing UP. You are going to be taking material off the back of the blade. Bring the handle down to a low angle, see photo, and rub forward and back with light pressure until a new point is formed. Test and repeat again if necessary.





Lesson 1 – Pattern 2





Sample
Course Outline

Marquetry Class
Instructor – *Your Name*
Place - *Classroom 5, Building 301*
123 W 38th Ave
Ukiah, CA

Note: Items in italic will need to be set to your schedule, place, etc. Recommended reading may be added if you wish.

Day 1 – *May 7, 7pm*
Knife Cutting
- Tools for knife cutting
- Knife cutting
- Sources of Supply & Information

Day 2 – *May 14, 7pm*
Pad Method with fretsaw
- Tools for fretsaw
- Making the pad
- Cutting
- About Veneer

Day 3 – *May 21, 7pm*
Double Cut with Fret or Scroll Saw
- Where to start
- One piece at a time
- Registration
- Selecting veneer

Day 4 - *May 28, 7pm*
Add a border
- Square up
- Cut strips & miters
- Mounting & finishing

Day 5 - *June 4, 7pm*
Bevel Cutting
- Perfect fit
- Set the angle
- Which way to go

Day 6 - *June 11, 7pm*
Bevel Cutting Project
- Simple project
- Apply what you have learned
- Emphasize over-cutting and veneer selection

Contact me at: *Give your contact info*.

Section 2 - Lesson 2

Lesson Plan #2 – Pad Method

What you will need: See handout.
For this lesson we will be using "laminating film" to get the project finished in 2 or 3 hours. You can find it at most office supply stores. Avery is the expensive brand name. Many stores have a bulk box where you can buy as many sheets as you need.

Sequence for teaching:

1. Take questions that have come up since Lesson 1.
2. Outline what will be covered today.
3. Tell how to use the fretsaw, then show how to cut with the fretsaw
    a. Saw blades, where to get them and which way the teeth go.
    b. A slot rather than a wide hole gives better support of the veneer.
4. Show how to make a Pad.
    a. Start with a pattern that takes three veneers.
5. Show how to cut the pattern one piece at a time.
6. Show how to reassemble the pieces.
7. Show how to use the laminating film.
8. Have the students cut and laminate the bookmark.
9. Close with how veneers are made
    a. Explain various cuts.
    b. Tell where to buy veneer
    c. Describe how to store veneer.

Recommended Reading:

"The Marquetry Course" by Metcalfe & Apps, 2003
pp. 10-11 about tools for fretsaw
pp. 30-35 about pad method
pp. 22-25 about how veneers are made

"Simple Marquetry" by Burton, 2001
pp. 31-33 about fretsaw cutting
pp. 10-18 about how veneers are made

"The Marquetry Manual" by Lincoln, 1989
pp. 92-97 about scroll saw marquetry

Lesson 2 – Pad Method
Redwood Tree Bookmarks

By Dave Peck

The pad method is an excellent way to learn to use the fretsaw. You use sheets of veneer all the same size, make a pad, cut your pattern and reassemble the pieces. When finished you have as many finished items as you started with pieces of veneer only now your design is incorporated into each piece. There is no waste.

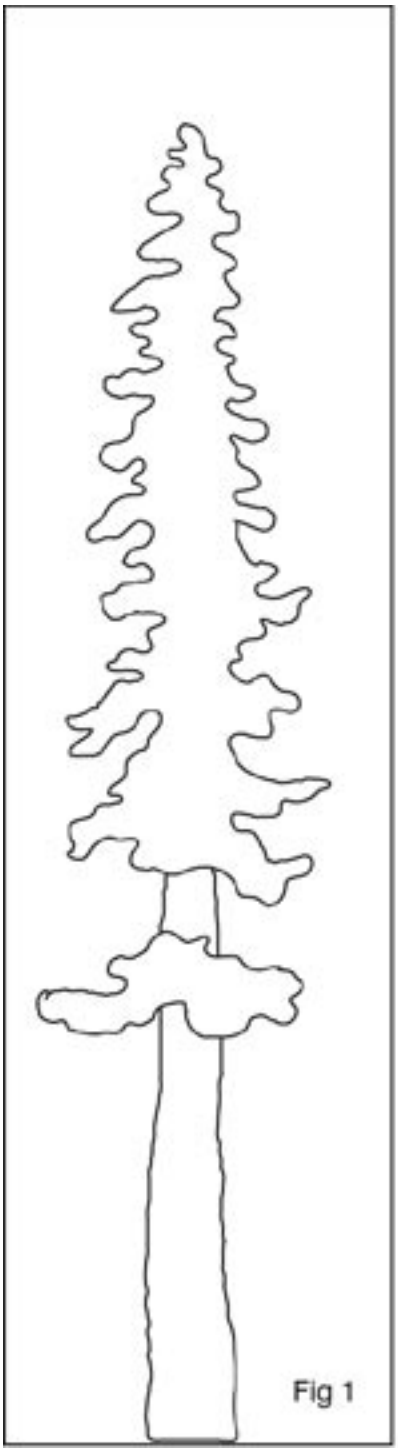


Fig 1

This **redwood tree bookmark project** is simple but it gives a good feel for using the fretsaw for the pad method and in the end you have three bookmarks rather than a bunch of practice scrap. Fig 1. The fretsaw has distinct advantages over the knife for cutting thick veneers, hard veneers and stacks of veneer so it's a tool you definitely need to learn to use. Straight lines may be best done with a knife and straight edge but when it comes to complex curved lines there is nothing better than the fretsaw. A tulip pattern is included at the end of this article if you want to start with something simpler than the redwood tree. (Fig 13)

You will need: Veneers (3 different - one light, one dark and one medium color), a veneer saw, fretsaw, jeweler's blades (4/0 for beginners, 5/0 or 6/0 for more experienced), metal ruler, square, drafting tape, tracing paper, transfer paper, a stylus, and self-adhesive laminating sheets. You will find the laminating sheets in office supply stores. You will also need a board with a slot in it will serve as a saw table. Fig 2 shows an easily made fretsaw table for vertical sawing. The advantage of this saw table is the clamp does not get in the way. An alternative is a longer flat board where the clamp can be placed back out of the way.

About veneers: The three veneers for this project need to be nearly the same thickness because you won't be doing any sanding. The location in the world where a veneer is made influences how thick it will be; if it's from Africa or Europe it will be close to 1/40 of an inch thick, if cut in America, it may be 1/32" thick. It depends on how the mill has its

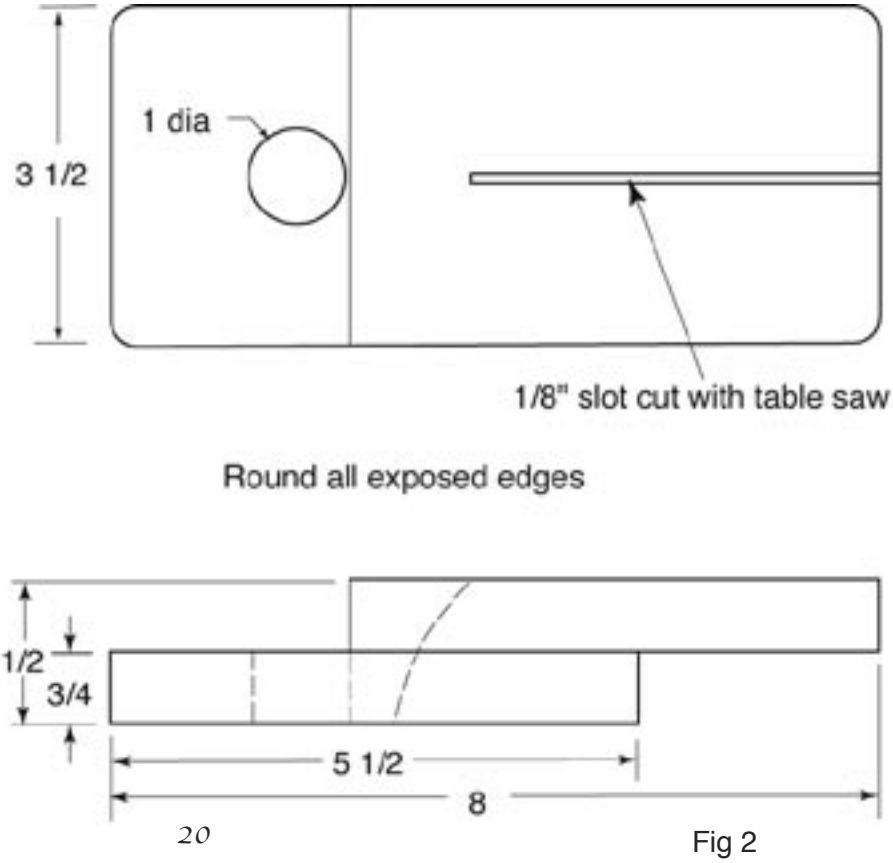


Fig 2

equipment set the day your veneer was cut. Expect some variation. Some woods may be even thicker or thinner so it pays to check. If there is a noticeable difference in the thickness of the veneers you have two choices; you can sand the thicker one till it's the right thickness or you can select another veneer. I like the second option.

Cutting order

Make a pad: Cut the veneer into 1-7/8" x 7.5" pieces. The reason for cutting slightly less than 2" is so the bookmarks can be completed using just one sheet of laminating paper. If the veneer doesn't already have one edge that is straight, use a metal ruler as a guide (see Fig. 3) and cut one edge straight. This can

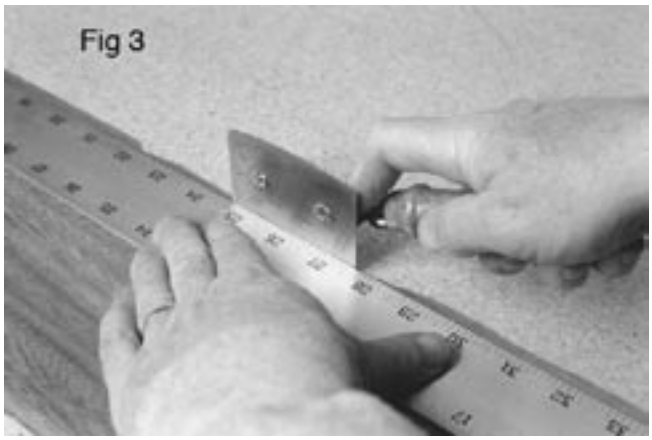


Fig 3

be done with the knife but I think it is best done with the veneer saw. Make long easy pull strokes. Four or five strokes should sever the wood. Mark off the 2" inch width by placing a mark near each end of the strip. Place the saw on one of these marks, slide the ruler up against the saw and then position the far end on the other mark. The cut is with the grain of the wood so a pull stroke is all you will need to use. The end cuts are next. Mark them with a pencil and square. Now you will be cutting cross-grain. For cross-grain cuts the wood has a tendency to split out as the cut is finished especially in ring porous or very dry woods (see Fig. 4). To prevent this make 4 or 5 push strokes with the handle held low on the first inch or so of the near edge before making the pull strokes that finish the cut. Even though the veneer saw cuts best on the pull stroke it has a curved blade and will cut in either direction.

The Waster: Cut two pieces of paperboard (breakfast cereal boxes are good) or foam board (aka sturdy board) the same size as the veneer. This paperboard/foam board will be used as a waster to

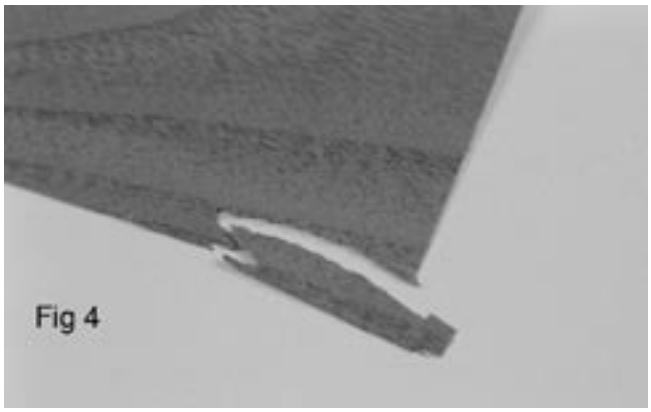


Fig 4

support the veneer and reduce the possibility that a small cross grain piece will break off. The paperboard backing is called a waster because in the old days a sheet of veneer was wasted for this purpose. We are going to use a waster on both the top and bottom of the pad. Tape the assembly together along the edges with drafting tape (see Fig. 5). Use a spray adhesive to glue the pattern to the top of the pad. Spray only the back of the pattern and let it dry for a few seconds before attaching the pattern to the pad.


Fig 5

Clamp **the saw table** to the edge of your work bench and bring up a chair or stool(see Fig. 7). Move around till you feel you can saw without bumping into something, like your knee. Change chairs if the height isn't right. This project can be finished quickly but for larger projects it's imperative that you feel comfortable.

Select a **jeweler's blade** (beginners should start with a 5/0 blade if you have one) and put it in the fretsaw with the teeth pointing down. It's hard to see the tiny teeth on a jeweler's blade. Pull the blade between the

Fig 6

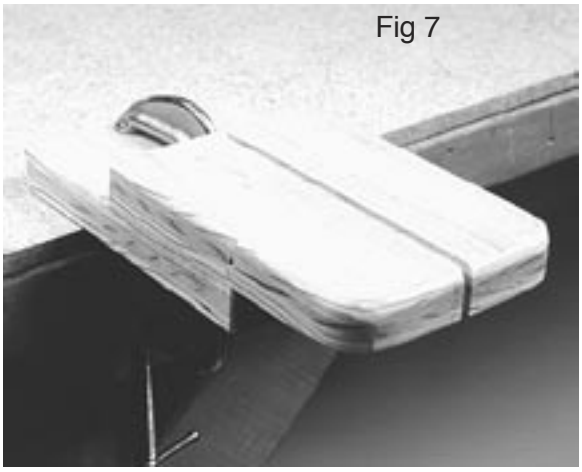


Fig 7

pads of your index finger and thumb. The increased drag in one direction will tell you which way the teeth are pointing. You want tension on the blade. After tightening one end, squeeze the saw frame together about 1/4 to 1/2 inch with one hand, and slide the blade into position and tighten the second clamp with the other (see Fig. 8). If your fingers are not long enough to span the width of the saw frame, drill a hole in the saw table and place the handle in this hole. Press down on the top of the frame with one hand and tighten the clamp with the other.

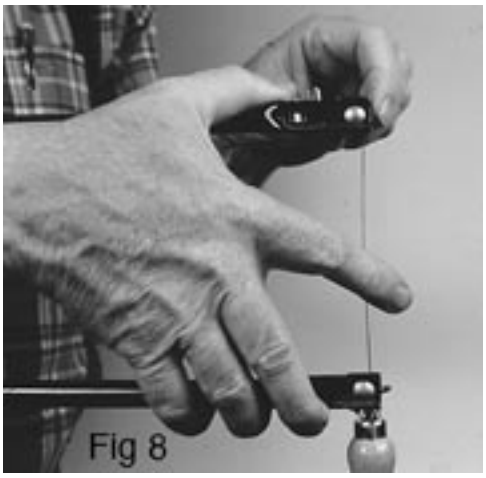


Fig 8

Make the cuts: Start by sawing out the lower part of the tree trunk. Keep your fingers in close to the saw blade to act as a hold-down (see Fig. 9). The finger behind the blade is kept the closest. If you don't hold the work down it will jump up on each upward stroke of the blade. The speed (number of strokes per minute) can vary according to what feels right to you. One stroke per second is a good speed to start. You will speed up from there to your natural rhythm. It is important to keep the saw vertical. If you don't the pieces will not fit properly. There is no need to force the saw into the wood. Just let the cutting action move the blade forward. When you have the lower part of the tree trunk cut out, set it aside where it won't get lost! A plain sheet of paper or paperboard works well. Experience has taught me how easily a small piece can be jostled or bumped and then just disappear.

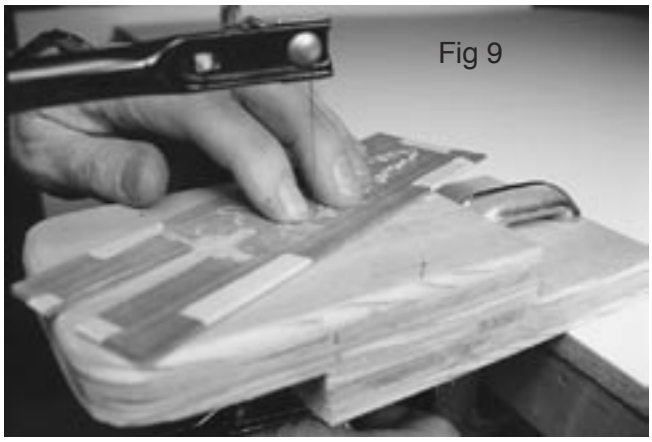


Fig 9

Cut the lower branch next, follow with the upper portion of the trunk and finally the top portion of the tree. As you come to sharp corners use your hold-down hand to turn the wood. Slow your stroke slightly but keep the saw moving. If you stop the saw and then turn the wood the blade will bind and cause problems. Don't worry, it won't be long till you can go round a corner with only a slight reduction in speed. Assemble pieces: When all the parts are cut, lay them out on the table and interchange the pieces for the best contrast. Place a small strip of drafting tape on each one to help hold it together as you move it to the laminating sheet.

Cut a sheet of **self-adhesive laminating film** in half so they will cover the three bookmarks laid side to side and still have a little extra (6" x 8" will do). Peel the protective backing off one of the sheets and lay it down sticky side up. Place the three bookmarks on the film, side by side with the drafting tape up (see Fig. 10). Press the bookmarks to the laminating sheet with your fingers. Remove the drafting tape. Remove

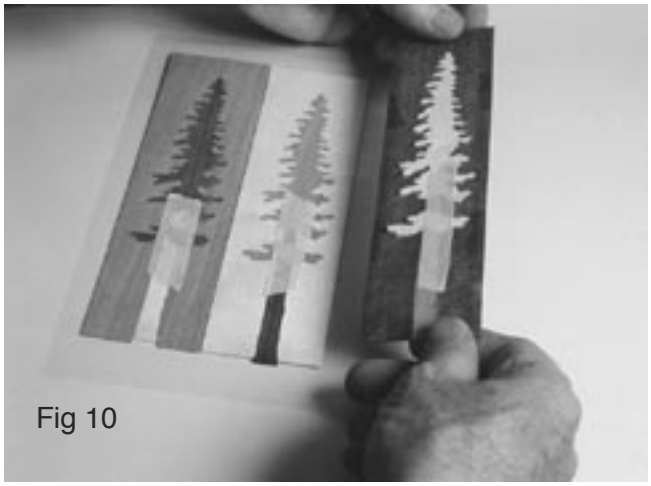


Fig 10

Fig 11

the protective backing from the second sheet of laminating film and place it on the top of the veneers. Spread the film across the veneer with the heal of your hand. Follow this with pressure from the edge of a board or from a roller (see Fig. 11).

Use your craft knife to trim around each bookmark. Soften the corners by trimming off just a little and the project is complete (see Fig. 12).

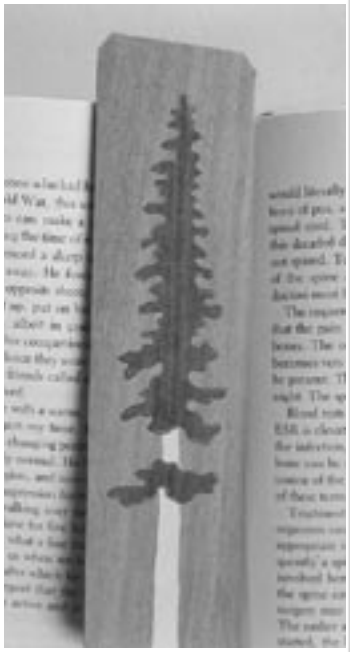


Fig 12

Fig 13

Here's a simple pattern I got from Gerry Laddusaw

Sharpening a Veneer Saw

When you buy a veneer saw it's not sharp. It will cut but it will not cut well. What you need to do is bevel one side of the blade so that it cuts almost like a knife. See Fig 1. The bevel goes on the side away from the straight-edge. Another way to say this is the bevel goes on the handle side of the blade. This allows you to cut multiple pieces of veneer at the same time and all will be the same size. I've seen various bevel angles used, 15 to 30 degrees are popular. The finer the angle the quicker the saw will dull.

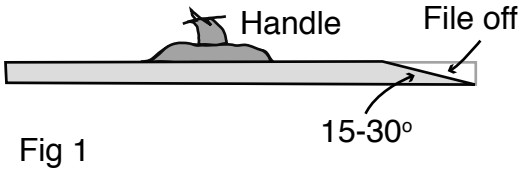


Fig 1

Several tools will work to sharpen the saw, a file, a stone, sandpaper, etc. (Fig 2 and 3) show sharpening with the handle still attached or with the handle removed. The thing to watch is that you don't over-sharpen and wear the tip off of the teeth.

Fig 2

Once the tip of the teeth are worn off it is time to rotate the saw blade (or you can reshape the teeth with a saw file).

Fig 3

When you finish creating the bevel there will be a burr on the flat side of the blade. Remove it with a fine stone. (Fig 4.) Keep the stone flat against the flat surface. You will be able to re-sharpen several times before rotating the saw blade or refilling the teeth.

Fig 4

Section 2 - Lesson 3

Lesson Plan #3 – Double Cutting

What you will need: See handout.

Sequence for teaching:

1. Ask for questions from previous sessions.
2. Show example of a marquetry in progress.
3. Emphasize the importance of starting with the background and adding one piece at a time coming forward.
4. Show how to trace the picture onto tracing paper.
5. Have the students trace the pattern onto tracing paper.
6. Show how to make registration marks so the pattern can be put back into the same position for each piece as it is added.
7. Have the students make registration marks.
8. Talk about selecting veneers for the picture and provide appropriate veneers to the students.
9. Show how to add the piece for the moon, tape it in place temporarily and use the registration marks with transfer paper to mark the moon. Emphasize having extra wood behind the mountain (i.e. overcutting).
10. Have the students add the moon and cut it out discarding the waste and inserting/taping the moon into position.
11. Have the students add the mountain, row of trees and foreground.
12. Show how to make a hole and thread the blade through the hole for cutting the tree.
13. Have the students put in the tree.
14. Show how to fill any gaps with a glue/sanding dust mixture.
15. Have the students fill the backs of their pictures.
16. Place pictures between flat surfaces with waxed paper so that they will remain flat while they dry.
17. Wait for the next lesson to add a border.

Recommended Reading:

"The Marquetry Manual" by Lincoln, 1989
pp. 117-121 about double cutting

Lesson 3/Fretsaw Project

Double Cut Method/Level Saw Table

by Dave Peck

Tools and Materials

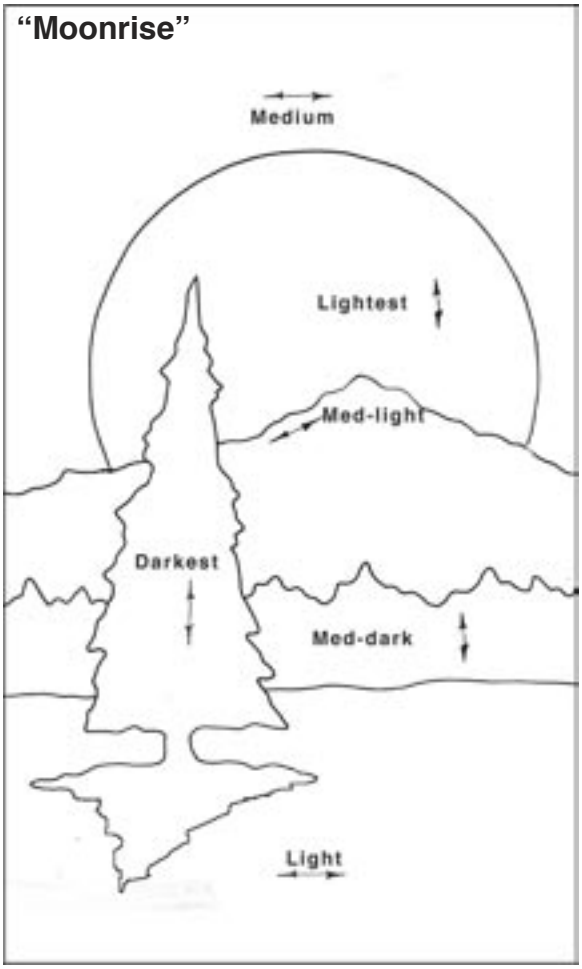
From Catalog or Specialty Store:

- Veneers in an assortment of shades. When ordering veneers, there is usually a minimum of 3 sq. ft. per species. Some outlets offer assorted packages.
- 12" Fretsaw
- One dozen #5/0 Jewelers Blades. The saw will come with #2/0 blades but I recommend you try the 5/0 first. If you break too many then go to the 2/0. Expect to break a few.
- Veneer Saw (Optional)

From around the house or from local store:

- Craft Knife (Exacto #1 w/ #11 blades)
- Level sawing table
- White or Yellow Glue
- A wood or hard rubber roller (wallpaper roller)
- Magic Transparent or blue masking tape
- Pencil
- Tracing paper
- Transfer or Carbon paper
- A push pin or veneer pin
- Sanding dust
- Waxed paper
- Hardwood plywood the size of the final picture

Introduction



This is our third lesson. It introduces the double cut. It's called double-cut, because you place two pieces of veneer together and cut with a single saw cut. A perfect fit is guaranteed because both pieces are cut at the same time. The disadvantage, if you can call one, is that you only make one picture at a time unlike the pad method where you made as many pictures as you have layers in the pad. There is a bright side to making just one picture at a time – You pick exactly what each piece will look like. The result is a much higher quality piece of marquetry. The "Moonrise" is a good pattern to start with. It is simple enough to easily cut while at the same time includes techniques that you will be using on more complex pictures. In Lesson 2 you learned to handle the fretsaw so let's jump right to making the picture.

Beginning the Picture

First transfer (trace) the pattern onto tracing paper. Tracing paper is tough so you can erase if need be and it's translucent so you can see through it both to see your registration marks (see Photo 5) and see if your next piece covers the needed area. The pattern is 3" x 5". It's a good size to start with, but you can adjust the size if you wish. Select the veneer you will use for the picture.

Find 6 veneers spread out between light and dark (Photo 1). Select the third darkest veneer for the sky. It should be a little larger (1/4" to 1/2" larger on all sides than the finished piece in the pattern). Use scissors, a knife or a veneer saw to cut the piece to the needed size. Place the traced pattern over the veneer you will use for the sky. Make sure the grain direction corresponds with the arrows on the pattern.

Photo 1

Use a pencil and put X marks in the top corners of the sky piece (place the Xs on small white paper squares if the wood is dark and the Xs would be hard to see). Place the pattern on this piece and trace the X's onto the pattern. These X's, called registration marks, make it possible to put the pattern back in position each time you add an additional part to the picture (Photo 2). Rough-cut a piece of your lightest color veneer so it's just a little larger than the moon. Put the new piece of veneer on top of the sky leaving the room to see the registration marks. Place the pattern on the registration marks. Adjust this new piece of veneer so that the whole moon is covered and there is a little extra at the bottom. Temporarily tape the new piece to the sky. Blue painters tape is good. Two or three pieces of tape should do the job. Lay transfer paper or carbon paper over the moon veneer leaving room to see the registration marks. Line up the pattern with the X's and trace the moon (Photo 3). Now place a waster behind the assembly. I use a paperboard waster like that found in breakfast cereal boxes. This helps keep small pieces from breaking loose and falling on the floor.

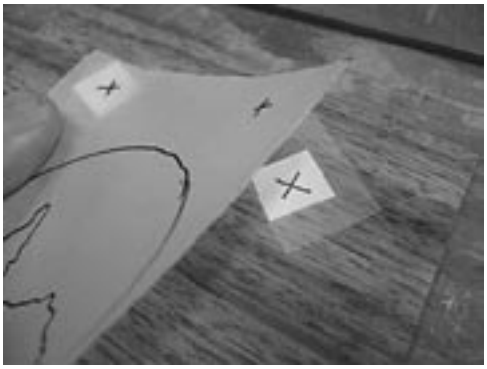


Photo 2

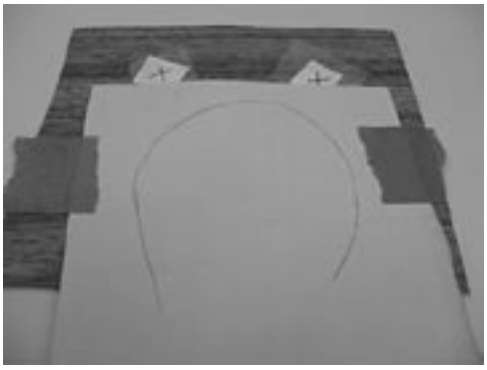


Photo 3

Sawing

The saw table is called a Bird's Mouth because it looks like the beak of a bird with his mouth open. Size isn't critical. Round off all corners. Clamp the bird's mouth to the table so that the apex of the slot is one inch from the table. Make sure the clamp is far enough back so it doesn't interfere with turning the veneers you are cutting. Move the assembled moon and sky pieces onto the bird's mouth and you are ready to cut. Saw at the apex of the slot so that the veneer you are cutting is supported closely by the single saw kerf.
You will start the cut at either end where the moon disappears behind the mountain. Short strokes (about 3/4") with very little forward pressure work best. Try to move the work into the saw rather than moving the saw into the work. Set up a rhythm. One to two strokes per second is a good place to start. Later when you cut sharp corners, slow down a bit and take shorter strokes – but keep the saw moving! Otherwise the blade will bind and may break. Try to keep the saw blade as deep in the slot as possible without cutting too much into the bird's mouth. Practice helps. It's also a good idea to keep the floor under the table clean so that if any small cross-grain pieces break off, you'll be able to find them and tape them back in place. Once you have the moon cut, tape it in its proper location with the tape on the face of the picture (Photo 4). I use Scotch Magic Transparent tape.

Photo 4

Follow the same procedure for the mountain. Note: you started with the sky which is the most distant part of the picture and then added the moon which the next most distant. Now we are adding the mountain. It is in front of the moon but behind the row of trees. In other words start with what is farthest away and work forward. Once you have the mountain installed do the row of trees and finally the snowey foreground. We're saving the tree till last to demonstrate how to insert a piece into the middle of a picture or into the middle of another piece.

When the rest of the picture is complete put the veneer for the foreground tree in position, tape it down and trace the outline. The tree, with its shadow, is now an island in the middle of the picture. Don't make a saw cut from the edge. Instead, use a push pen (or a small drill) to make a small hole at an interior corner of the traced line (Photo 6). Pace the pinhole in the darkest veneer available . Remove one end of the saw blade from the saw frame, thread the blade through the hole (Photo 7), and clamp it back in the frame. It helps to rest the saw frame and the unfinished picture on the bird's mouth while reattaching the saw blade. Cut out the tree, unclamp and remove the blade, tape the tree in position, and you have completed the sawing.

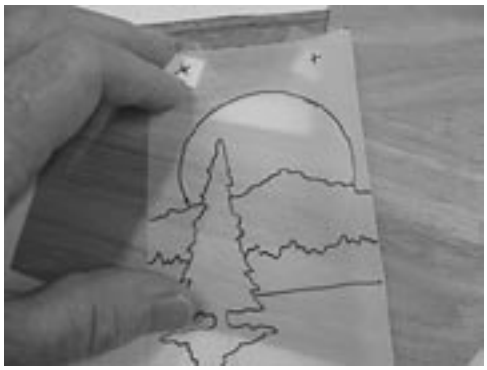


Photo 5

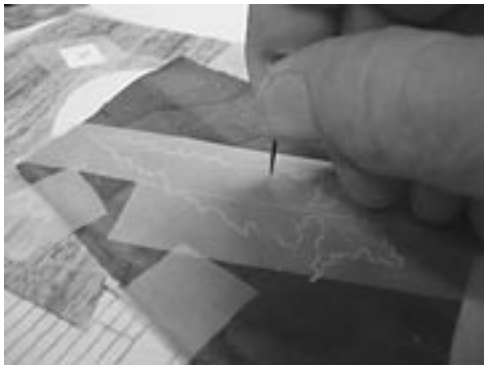


Photo 6

Fill the gaps

The joints between the pieces will have small gaps about the size of the saw blade. (Later when you are doing "bevel" double-cut work this won't be a problem but for now we need to fill these gaps.) Use a mixture of sanding dust and white glue. I like to make the mixture thick enough so that a peak comes up when I remove the stirring stick but it flattens out within a few seconds. Spread this mixture over the back of the picture with a putty knife, forcing it into the cracks, and scrape off any excess (Photo 8). Cover the glued surface with waxed paper and weight it down under a flat board with a medium weight on top. (Photo 9) so that it stays flat while the glue dries. The next day, sand the back of the picture with course sandpaper to remove any lumps and insure it's flat. Keep the picture under a flat board till you are ready to proceed with the border be it an hour or several days.

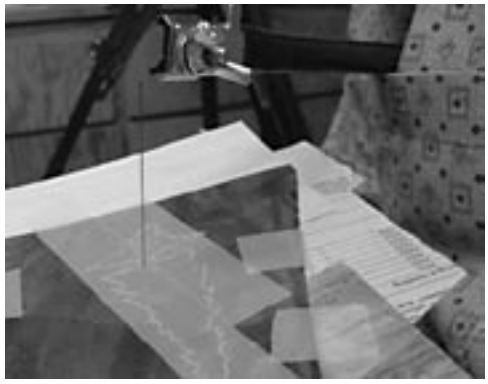


Photo 7

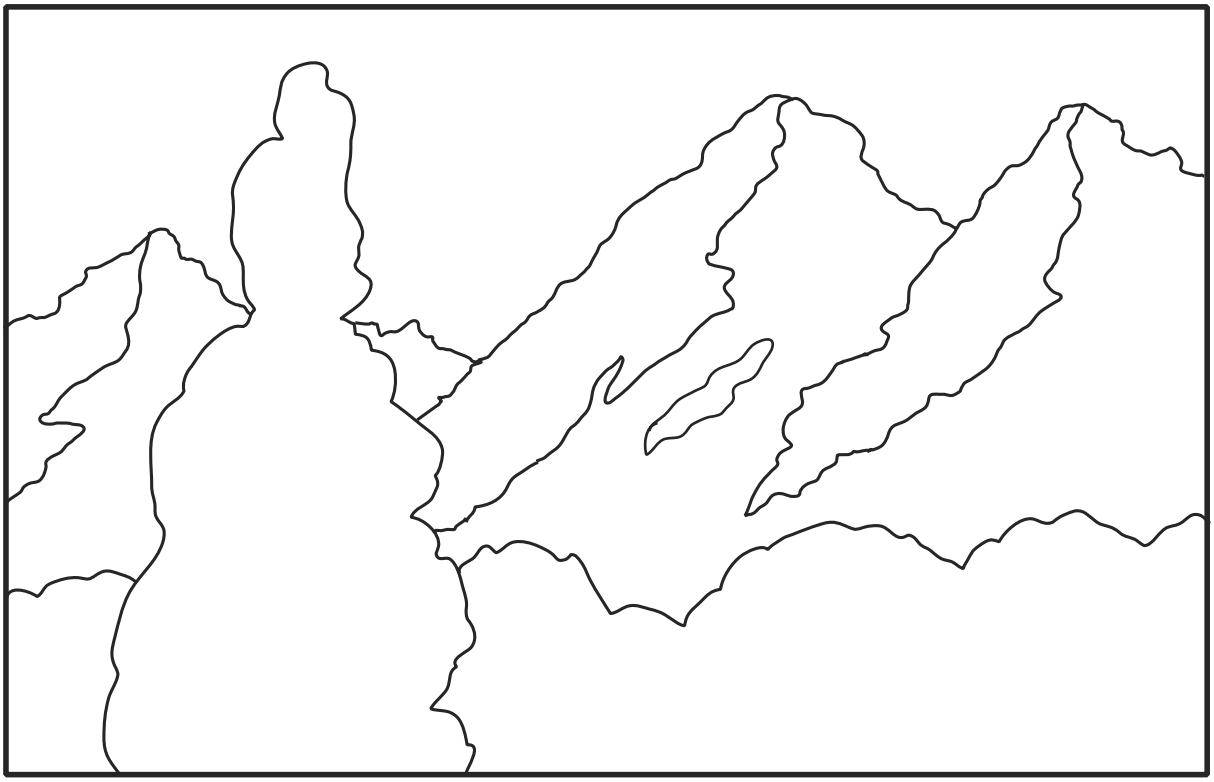
Photo 8

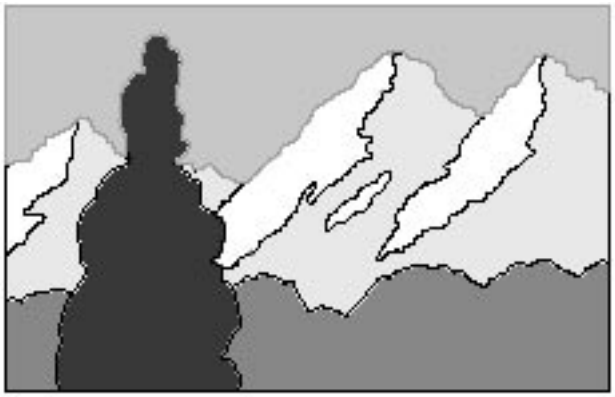
Photo 9

Continued next lesson

This is where we are going to stop this lesson. In the next lesson we will put a frame around the picture with perfect miters and then we will glue the picture to a substrate.

Lesson 3 – Pattern 2





Section 2 - Lesson 4

Lesson Plan #4 – Add a Border

What will you need: See Lesson 4 handout, pg. 1.

Sequence for Teaching

1. Ask for questions about previous material.
2. Give an overview of today's lesson.
3. Square up the picture.
4. Cut the borders, edge strips and back.
5. Attach the borders with tape. Leave overlap on the corners.
6. Cut the miters and tape on the face.
7. Have the students cut their borders.
8. Have the students tape in place and cut miters.
9. Demo gluing on the edges
10. For sanding emphasize keeping sander flat on the surface. Only round the corners to break the sharpness when you get to 220 or 320 paper. Don't oversand.
11. Demo sanding.
12. Demo your favorite finish.

Recommended Reading:

"The Marquetry Course" by Metcalfe & Apps, 2003
pp. 91-101 about borders
pp. 102-105 about sanding
pp. 106-107 about finishing

"Simple Marquetry" by Burton, 2001
pp. 57-61 about presses

"The Marquetry Manual" by Lincoln, 1989
pp. 49 about presses

Lesson 4

Add a Border

by Dave Peck

Tools & Materials

*A completed marquetry ready for framing
*Veneer for narrow border
*Veneer for wide border, edges and back
*Tape
*Craft Knife
*Ruler/Straight edge
*Cutting Mat
*Square
*Glue (PVA)

Introduction

In this forth lesson we will put a border around the picture we made in lesson 3. It is a simple border but it can be used in several ways. It can be the final border, usually with a narrow inside border or it can be a single border and the marquetry is then placed in a picture frame. Either way the procedure for making tight miters is the same.

Square Up

When you finish cutting the marquetry the edges will be ragged so the first thing is to square up the picture. Make these cuts from the back of the marquetry. The knife (or saw) will displace less material at the tip. Therefore it's best to cut from the back. Use the pattern (upside down) to mark where one long edge should be. Use a straight edge and cut the waste away with a knife or veneer saw. The veneer may break away as the cut nears the edge so use light cuts. Once you have the first edge straight, measure across the width of the picture at two places, one near each end. This allows you to cut the second long side parallel to the first. After the long sides are cut, use a carpenters square (or similar device) to mark the ends. You can double check that the sides are in fact parallel by marking the end using one side of the picture as a base and then moving the square to the opposite side. If the mark you made does not line up you know you didn't get the long sides parallel (Fig 1). Once the marquetry is square it's time to apply the stringer and border.

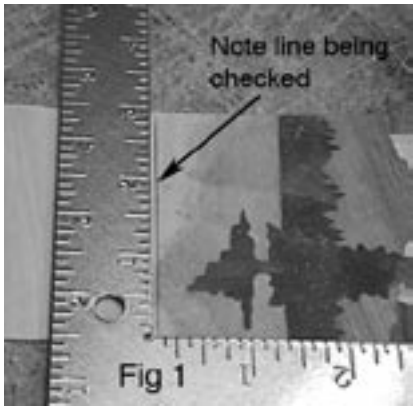


Fig 1

Cut Border Pieces

For this small picture we will cut four 1/8 inch wide strips of a light colored wood, holly or maple both work well, for the narrow inside border (I call them stringers), and four 1" strips of the wood you want for your border. Fig 2 shows one way to get parallel strips. The key here is to butt the veneer up against a stationary (clamped or glued) straight edge, put equal thickness blocks at both ends and place a second straight edge against the blocks holding pressure against the blocks as you cut the veneer. Make the strips parallel to the grain of the wood. When selecting veneer for the border choose wood with straight grain. Grain that is curved or uneven makes the picture look like it's not square. Check that the strips have parallel edges (i.e. make sure the strips are the same width at both ends). You will want the edges and back of the picture to be of the same wood as the border so this is a good time to also cut the veneer for the back of the picture and edges. Make all the parts one inch longer than the final size of the picture so that you have extra sticking out at the ends. Use sand-paper to get rid of any rough-ness on the edges.

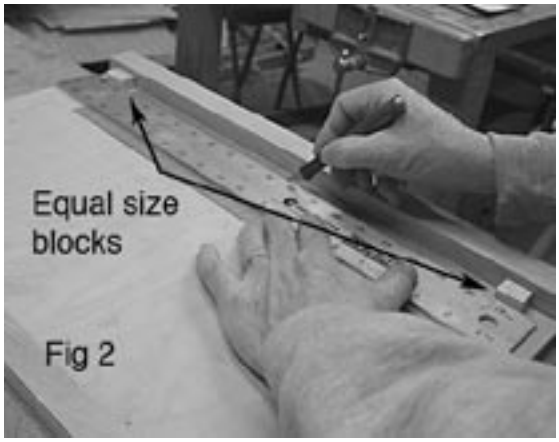
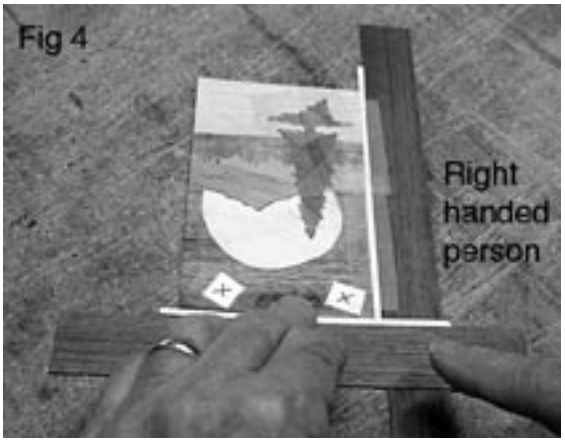


Fig 2

Attach the Borders

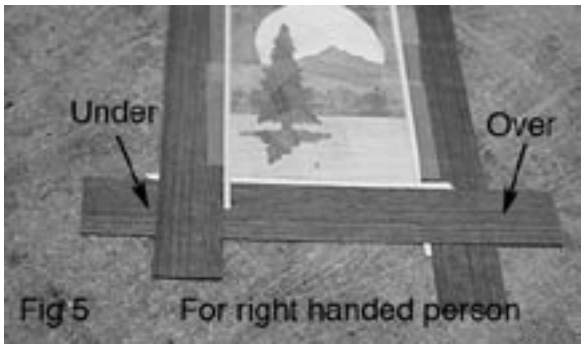
Lay the picture face up on the work-bench. Place a 1/8" stringer piece against the edge of the picture nearest to you. Place a 1 inch border piece against the stringer and make sure you have everything centered. Hold the border and stringer in place firmly with one hand and use a short piece of tape to affix both strips to the picture at one end. Work your way along the side using short (approximately. 2-3") pieces of tape. I'm using Scotch Magic Transparent

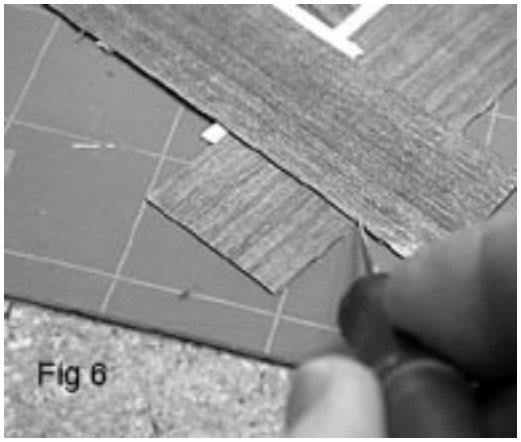
tape in these photos. (Fig 3) When you have the pieces completely taped to the marquetry, turn the picture 1/4 turn so that the strips you just attached are to the right side (left if you are left handed) (see Fig 4). Add the new pieces to the near edge of the picture so the overlap is under your working hand (i.e. turn the marquetry counter clockwise if you are right handed and clockwise if you are left handed). This is important because it arranges the veneers in a natural position to be cut off with the knife at a slight angle insuring a tight fit. (This will be explained in more detail later.) Repeat for the third and forth sides. Note that on the last side the last stringer and border go on top of the third strips but under the first. (Fig 5) It's important to follow this sequence to get a tight miter joint.

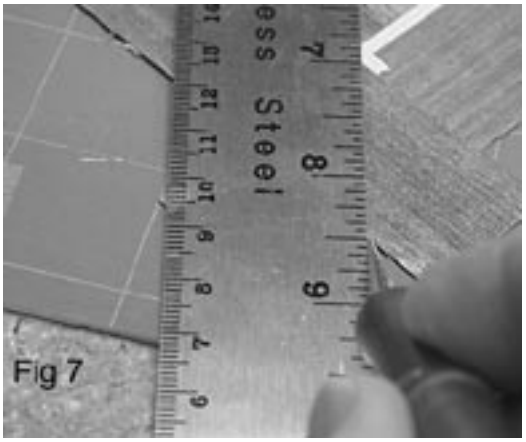


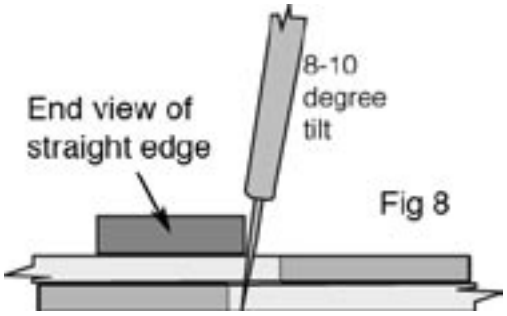
Cut the Miters

Turn the picture over onto its face and cut from the back. Place the knife in the corner made by the overlapping borders. (Fig 6). Place a straight edge against the knife and lign it up on the inside corner where the two stringers meet (see Fig 7). Hold the straight edge in place firmly. Let the knife tilt to the right (left for left handed individuals) about 8 to 10 degrees, rather than straight up (see Fig 8 - In this drawing you are looking at a 45 degree angle to see an end view of the miter.). Use several light cuts especially as you reach the outside of the border.Tape the newly made joints. Inspect for defects and your border is complete. (Fig 9)

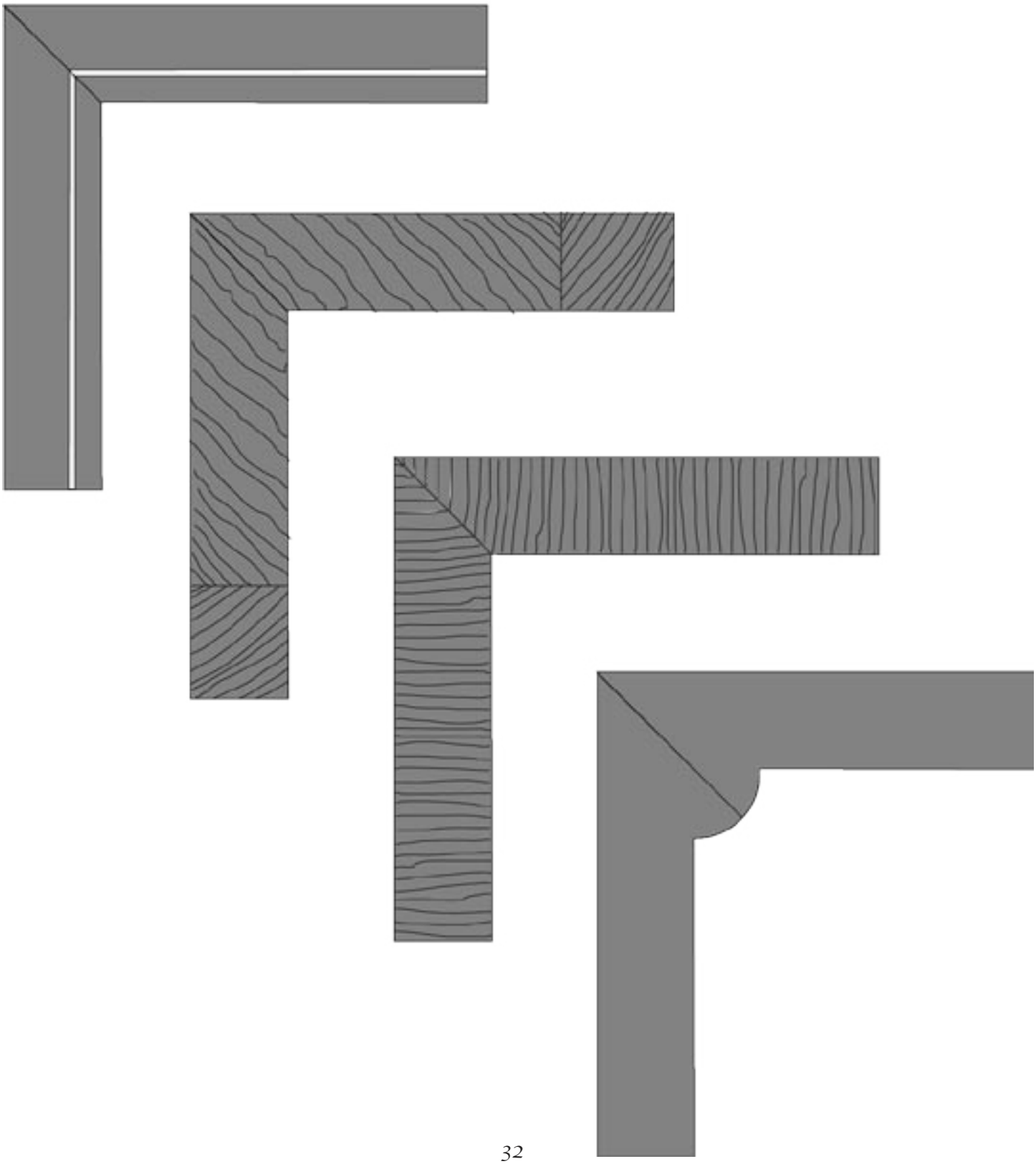








Lesson 4 - Pattern 2 - Border alternatives



Section 2 - Lesson 5

Lesson Plan #5 – Bevel Cutting

What will you need: See Lesson 5 handout, pg. 1.

Sequence for Teaching

1. Ask for questions about previous lesson.
2. Outline what you will be teaching today.
3. Go over advantages and disadvantages of bevel cutting.
4. Remind the students that they get a good fit even if they miss the line with the double bevel method.
5. Show how to make a pad with waster (preferably paperboard from cereal box).
6. Show how to set the angle. (trial and error) Do another with the wrong angle. Refer those who want to do it mathematically to the handout.
7. Demonstrate how to determine which way to go – clockwise/counterclockwise.
8. Make the two cuts for the letter D. Again go over which way to go for both the inside and the outside of the D.
9. Show the tight fit of the intended pieces and also show how loose the scrap pieces are.
10. Have the students give it a try.

Recommended Reading:

"The Art of Marquetry" by Stevens, 1997
pp. 19-21 about bevel cutting

"The Marquetry Manual" by Lincoln, 1989
pp. 103-106 about bevel cutting

Lesson 5
Double Bevel Method

By Dave Peck

The double bevel method's claim to fame is that you get a perfect fit. There is no gap between the pieces. It's also faster than knife cutting for most people. You only make one picture at a time and that too is an advantage if your aim is to make the best possible picture. If you want volume then use the classic or the pad method.

How do you get this perfect fit? You cut through two pieces of veneer (that's the double part) at an angle (that's the bevel part) creating a tapered piece and a tapered hole (think cork in a bottle). See Fig 1. Set the

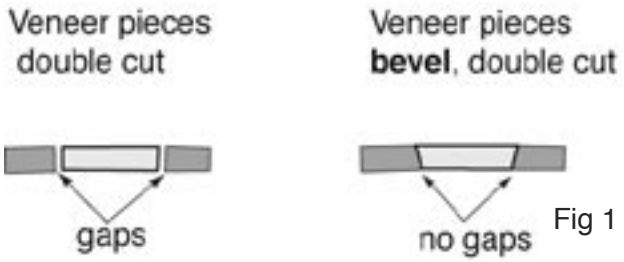


Fig 1

angle correctly for the thickness of the saw blade and the thickness of the veneer and you get a perfect fit.

What you will need

This is a fretsaw or scrollsaw project. The sidebar shows the tools and materials you will need. For those of you who use a handheld fretsaw you will need to make your own saw table. Several books show how to make a table. I've included my rendition at the end of this article (Fig 6). If you are buying a scroll saw get one that will allow the table to be tilted (or the saw tilted and the table stays level). Which side of the saw table to lower depends on which hand you use to hold the fretsaw. If you hold the saw in your right hand, I find it is best to have the table tilted with the low side on the left, facing the hand that will be holding down the work. If you hold the saw in your left hand, tilt the table to the right. A table tilted 12 1/2 degrees is a good starting point because it will work for commercially produced veneers and jewelers blades in the 4/0 to 6/0 range. However, there are times when 12.5 degrees will not produce a tight fit.

Tools and Materials

- Veneers – one light, one dark.
- Fretsaw or Scrollsaw
- Jewelers Blades. #5/0 is suggested
- Scissors
- Tape - Magic Transparent or blue masking tape
- Bevel sawing table if you use a fretsaw
- White or Yellow Glue
- Pencil
- Tracing paper
- Transfer or Carbon paper
- Stylus
- A push pin or veneer pin
- Paperboard for waster

To get a perfect fit

There are three variables you need to consider for an exact fit; 1. The thickness of the saw kerf, 2. The thickness of the veneer you are cutting and, 3. The angle of the saw table. If you are using thick veneers or a very thin saw blade the angle may need to be decreased. Conversely if you are using a very thick saw blade or very thin veneer the angle may need to be increased. The precise angle can be worked out mathematically (see Fig 7 at the end of this article). It's much simpler to cut a test piece. If the fit isn't good, make adjustments. If it's too tight you have a choice of actions you can take: 1. decrease the angle of cut , 2. use a thicker blade or 3. use thinner veneer. If the fit is too loose you can: A. increase the angle of cut, B. use a thinner blade, or C. use a thicker veneer. In reality you have only one choice most of the time. You have already selected the veneer you want to use and you have a favorite saw blade size. This leaves the angle of cut as your primary means of adjusting the fit. Increase the angle for a tighter fit and reduce the angle for a looser fit.

For An Exact Fit

Consider
Blade thickness
Veneer Thickness

To determine
Bevel Needed

Practice Project

For practice let's make the letter D (See Fig 2 below). Here we want a light D on a dark

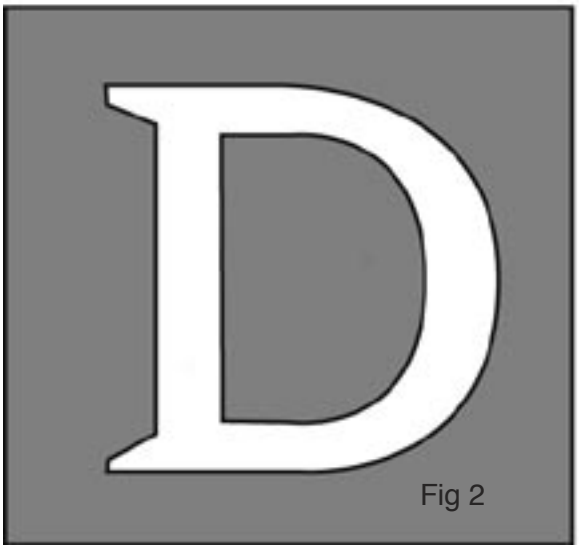


Fig 2

background. Cut two, 4 inch squares of veneer. One from light colored veneer and one from dark. Here is a good place to try cutting veneer with a pair of scissors. Also cut a piece of paperboard (cereal boxes are a good source) 4 inches square. The paperboard provides support and keeps small pieces from chipping off the veneer while you are working. Temporarily tape the veneer and paperboard together with two or three pieces of tape.

Fig 3

Put the paperboard on the bottom, the dark veneer in the middle and the light veneer on top (Fig 3). Trace or sketch the D onto the top veneer. Use a push pin (or a very small drill) to make a hole through all three layers at one of the corners on

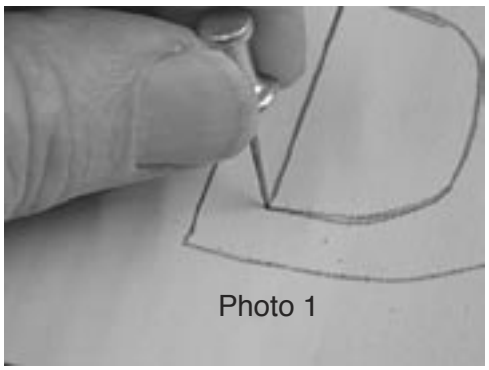


Photo 1

the inside of the D (Photo 1). Un-clamp one end of the saw blade on your fret saw (or scroll saw), insert the blade through the hole and re-clamp. That's easy to say but the first time you try it, it will be tricky. I like to loosen the top clamp on the saw frame, insert the blade through the hole and slide the veneer all the way to the bottom. Then I hold the saw frame against a small V notch in the saw table and re-clamp (Photo 2).

Photo 2


Photo 3

A hole in the saw table will be helpful for those with small hands (Photo 3). Once the blade is re-clamped it's time to start sawing but before we do we need to make sure we cut in the correct direction.

One right way

Go the correct way and you eliminate the saw kerf and the piece fits perfect. Go the wrong way and you double the size of the kerf. Many books list a set of conditions and say go clockwise or counterclockwise The box (Fig 4) at the top of the next page is a typical instruction on which way to go.

I personally subscribe to: "If the new piece goes down keep it on the downhill side of the saw blade" and "If the new piece comes up keep it on the uphill side of the saw blade" .

The instructions that follow will give you a feel for how this works. The nice thing about the downhill-uphill rule is that it works no matter which way the table is tilted or whether you are cutting toward or away from yourself (Fig 5 on the next page).

Now let's do it. We want a light D on a dark background. The lightest wood is on top of our stack

Which way to go?

Teeth Pointing :	Table Angled Down on:	New Piece to Be Inserted from:	Cut:
Away from operator	Left	Below	Counterclockwise
Away from operator	Left	Above	Clockwise
Away from operator	Right	Below	Clockwise
Away from operator	Right	Above	Counterclockwise
Toward operator	Left	Below	Clockwise
Toward operator	Left	Above	Counterclockwise
Toward operator	Right	Below	Counterclockwise
Toward operator	Right	Above	Clockwise

Fig 4

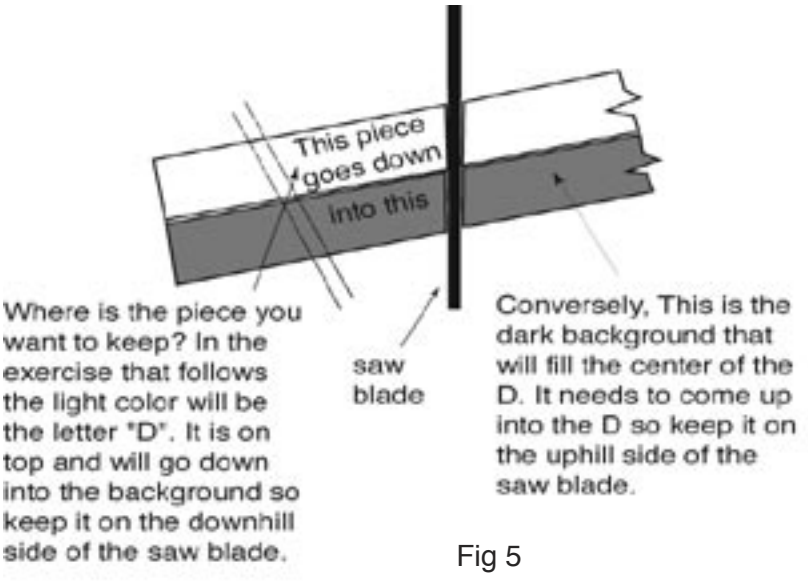


Fig 5

and the dark below. We want the center of the D to be dark so we want the dark piece to come up, therefore we keep it on the uphill side of the saw blade (If you have a saw where the table stays flat and the saw tilts you need to use your imagination).

Saw around the inside of the D. The table is at an angle but the saw is kept straight up and down. Repeat, the saw is kept straight up and down. The hand holding down the veneer is the one that positions the work before the saw blade and makes sure there is light pressure against the blade. Keep your fingers in close to the blade (Photo 4) Use short strokes. Slow up on the sharp corners but keep the blade moving. If you don't the blade may bind and the work will want to jump up and down. When you finish the cut you have to un-clamp the blade to remove the saw from the work. Place the center pieces of the D aside where they won't get lost.

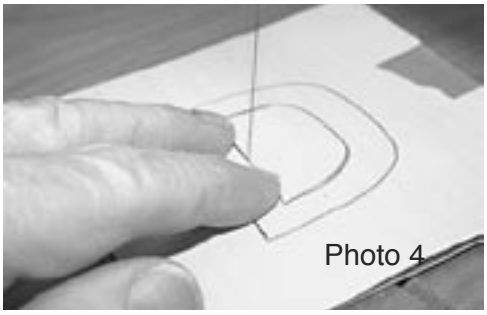


Photo 4

Make a hole in the outside outline of the D. Again a corner is best. Insert the saw blade and clamp it. Now we want the light colored wood to fit down into the dark background so we keep the D on the downhill side of the saw blade. Finish the cut and remove the saw blade.

Now it's assembly time. Put the D into the background from the top and put the center of the D in from the bottom. Both will fit perfectly. Tape the D in place on the face. Try the waste pieces. See how the saw kerf was doubled.

Finally we are to the point where we can put this information into making a piece of marquetry.

Coming in the next lesson.

An Easy Picture for Double Bevel

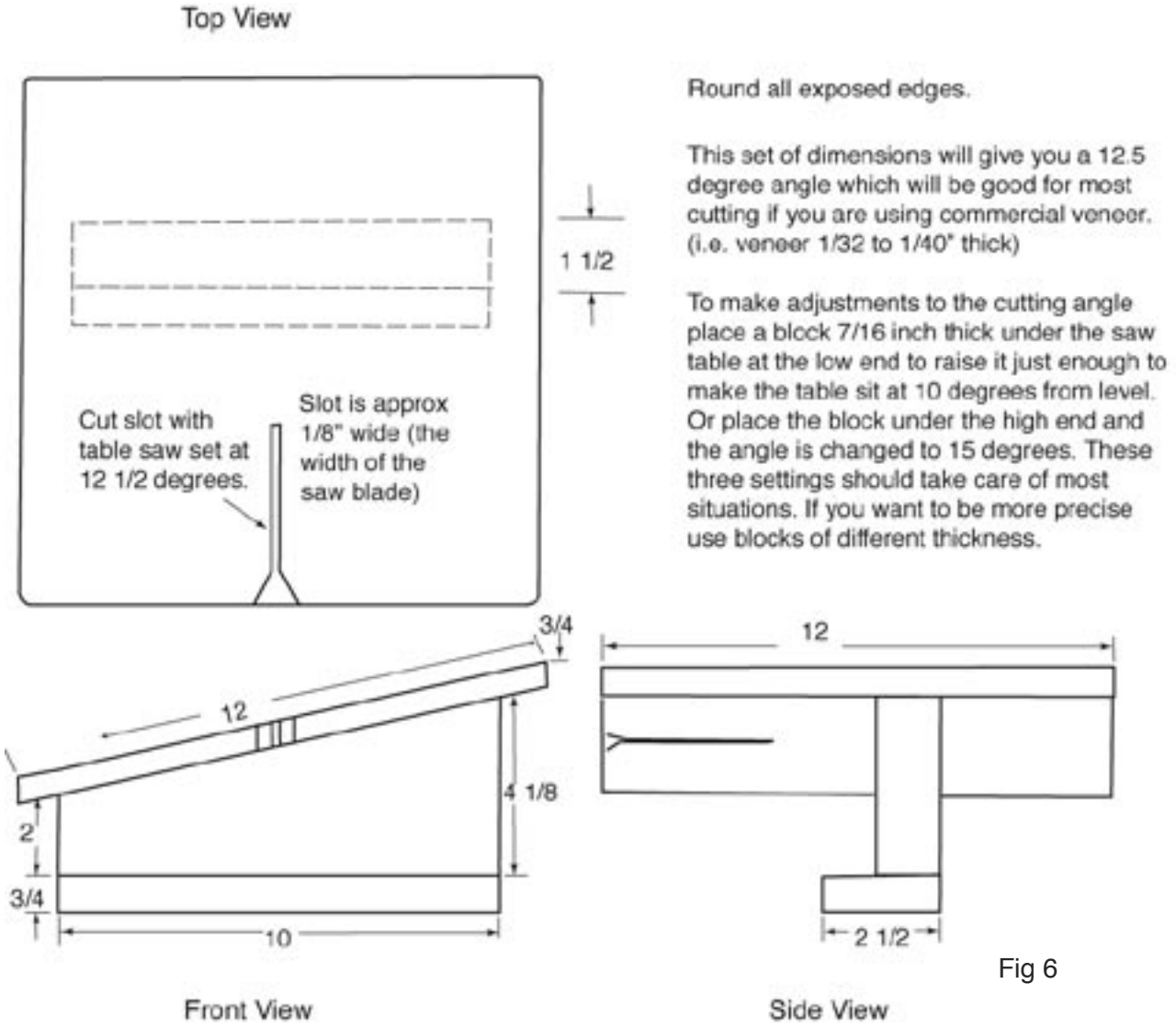


Fig 6

Find Cutting Angle Using Calculator

Using a calculator with trig functions and a micrometer you can calculate the exact angle for any blade and veneer thickness combination.

Here is the formula. Angle (Ø) = sin-1 (t/w)

Spelled out that says the angle (from level) for the table equals "inverse sine" (Sin-1) of "t" (the thickness of saw blade) divided by "w" (the thickness of the veneer that is being cut). For the blade thickness use the actual thickness of the blade where the teeth are located. This is where the calipers come into play. The thickness listed on the package of blades usually refers to the material used to make the blade. It doesn't include the set of the teeth. Use the micrometer to determine the true width of the saw kerf. Measure the thickness of your veneer. Make sure you are using the same unit of measure you used for the blade thickness; usually in thousandths.

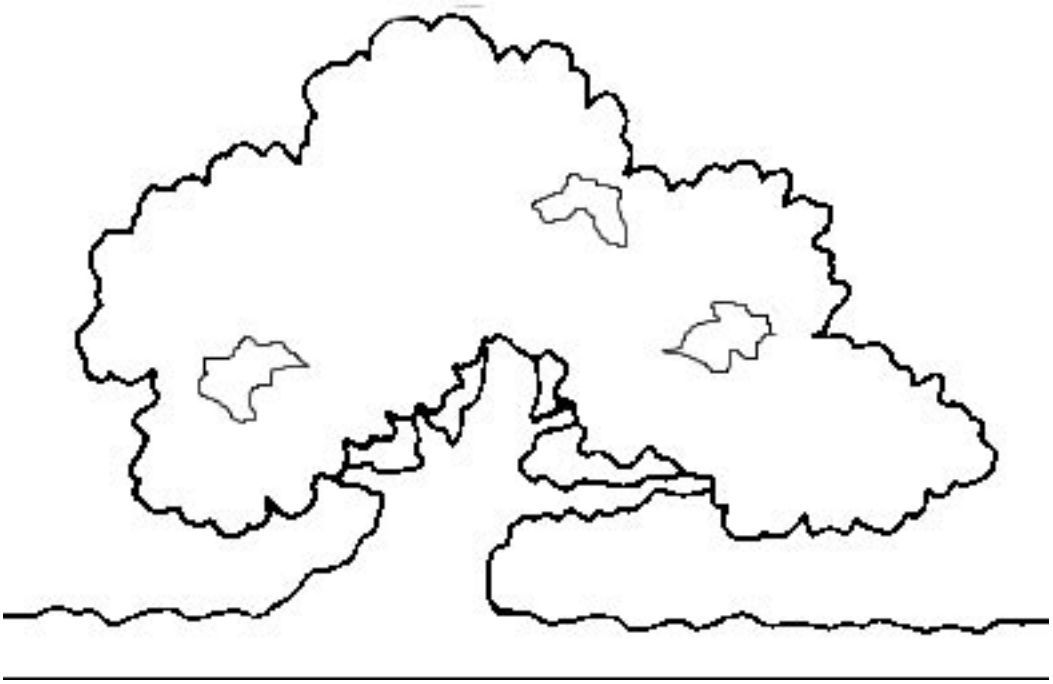
To find the correct angle, divide the thickness of the blade by the thickness of the veneer. Then apply sin-1. This is where the $10 investment in the calculator with trigonometry functions pays off. Just hit the shift key (or 2nd function) and the sin key. The result is the angle at which you need to set the table.

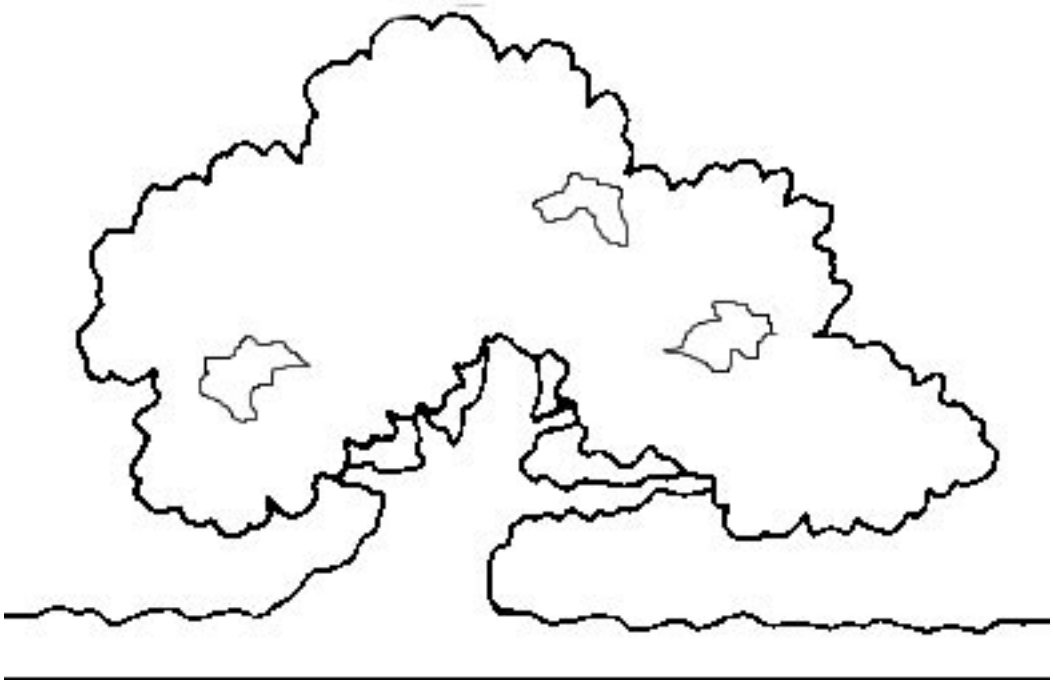
Here is an example. A 4/0 blade is .009" wide.

The veneer for this example is .025" thick. Therefore, divide .009 by .025 = .36. Apply sin-1 by hitting the shift key and then the sin key = 21°. (I bet it surprised you that the number is that high!

Fig 7

Lesson 5 – Pattern 2





Note that the sky holes around the branches do not require making a hole and threading the saw blade if you cut the tree trunk into the sky first. Cut in the foliage last. Here you will need to make three holes to make the sky holes in the foliage.

Section 2 - Lesson 6

Lesson Plan #6 – Bevel Cutting Project

What will you need: See lesson 5 handout, page 1. Plus 6 veneers spread from light to dark.

Sequence for Teaching:

1. Ask for questions about previous lesson.
2. Give overview of today's activities.
3. Emphasize that we are adding one piece at a time starting with what is farthest back.
4. Trace the pattern
5. Select the sky veneer.
6. Register the pattern so it can be put back in the same place.
7. Select the piece for the mountain. It can go either on top or behind the sky piece.
8. Register the pattern, put transfer paper in place and transfer the line from the pattern to the wood.
9. Which way to cut depends on where the new piece is located (on top or behind) and which way the saw table is tilted. If the new piece is on top keep the saw on the uphill side of the blade. If the new piece is behind keep the new piece on the uphill side of the saw blade.
10. Select the next piece and repeat steps 7-9 above.
11. Note that two parts of the trunk are cut oversize (top and bottom).
12. If the students are ready to go turn them loose on the project.
13. If the students are not ready repeat for shadow, ground and tree foliage.

Recommended Reading:

"The Art of Marquetry" by Stevens, 1997
pp. 19-21 about bevel cutting

"The Marquetry Manual" by Lincoln, 1989
pp. 103-106 about bevel cutting

Lesson 6
An Easy Picture for Double-Bevel

by Dave Peck

This lesson builds on Lesson 5 so if you haven't gone through lesson 5 you should do it first and then come back to this lesson.

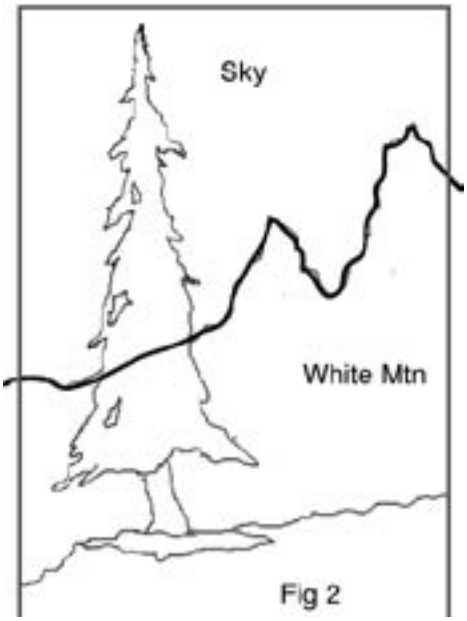
This is a simple picture that incorporates the basic concepts of double bevel work and will prepare you for more complex pieces.

In double bevel work **we add one piece of veneer at a time**. We start with the piece farthest away, the sky in this case, and work forward. By starting at the back we can cut complete pieces rather than pieces hiding behind something else. For example if we cut the tree in first we would have two pieces of mountain to add later. If we cut the mountain before the tree we only have to cut one piece in for the mountain. Additionally we eliminate the need for precise registration where the mountain meets the tree.

Start by tracing the pattern from the bottom of this page onto tracing paper. Tracing paper is good because when you hold a piece of veneer under the pattern you can see just enough of the wood grain to decide on a good orientation for the piece.

Select six woods from light to dark. To correspond with the values shown in Fig 1. The second lightest wood will be the sky. Place the tracing on the sky piece. Move it around. Look for where the grain of the wood looks most like a sky. Once you fine the "best" spot make registration marks so you can come back to that same spot as each piece is added to the picture. With the pattern registered, slide your lightest wood (representing snow covered mountains) between the pattern and the sky piece. Move it around till you like how it looks. Make sure it covers all the white areas, top, bottom and sides, and temporarily tape it into position on the sky piece. Two, or maybe three, pieces of tape should be sufficient.

Put transfer paper over the new piece. Check that the pattern is on the registration marks and **use a stylus to transfer the line you will be cutting from the pattern to the wood** (Fig 2). For marking on light woods a red transfer paper or a black carbon work well.



(Avoid blue carbons – they tend to bleed into the wood when the finish is applied.) A ball point pen that has run out of ink makes a good stylus. Tape a paperboard waster behind the veneers and it's time to make the cut.

We don't have to make a hole and thread the saw blade for this cut but we have to make a decision on which way to cut the line – from the right or from the left. Make the correct choice and you eliminate the saw kerf. Make the wrong choice and you double the saw kerf. To make this decision I ask myself, "Which way does the piece I'm adding go into the picture? If it goes down into the picture (the sky in this case) keep it on the down side of the saw blade. If it's being added behind and will come up into the picture keep it on the uphill side of the blade. In this case the new white veneer is on top so it will go down into the sky. Keep the mountain on the downhill side of the saw blade. Once you complete the cut, position the mountain and sky pieces together and tape the mountain to the sky piece with veneer tape. Discard the waste pieces and you are ready to add the next piece.

But which piece? The foreground is clearly closer than the tree but what part of the tree is hidden by other parts of the tree. There is foliage covering the trunk so the trunk is want we want to add next. We are going to make an over-cut as we add this piece. (Fig 3) Note that there are two parts of the trunk that are cut oversize. Just as we insured that the white of the mountain was oversize at the bottom we make sure that the trunk is larger than the final size at the bottom. We also make it oversize at the top where it will meet the foliage. By over cutting these areas we make it easier to get an exact fit when we add additional pieces later. We will put the new veneer on top again, transfer the line, use white or yellow transfer paper this time so that it shows up well on the darker veneer, cut out the trunk and tape it into position.

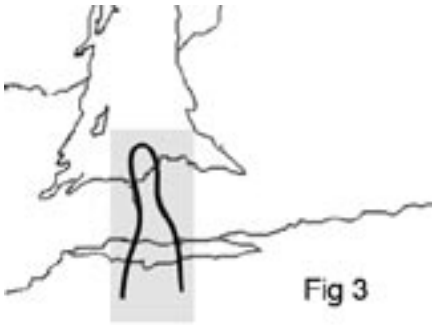


Fig 3

After cutting the tree trunk we again have a choice to make. Do we want to add the foliage or the shadow next? It could be either. Let's do the shadow. We will save the foliage till last. Add the shadow just as we added the mountain. **Notice that the cut enters in the area that will eventually be foreground**. It's not until you get to where the shadow touches the mountain that you will be cutting on the pattern line. (Fig 4) Think of this as over cutting the mountain. It's the same thing as you exit the shadow area and exit the opposite side of the picture, over cut the mountain.

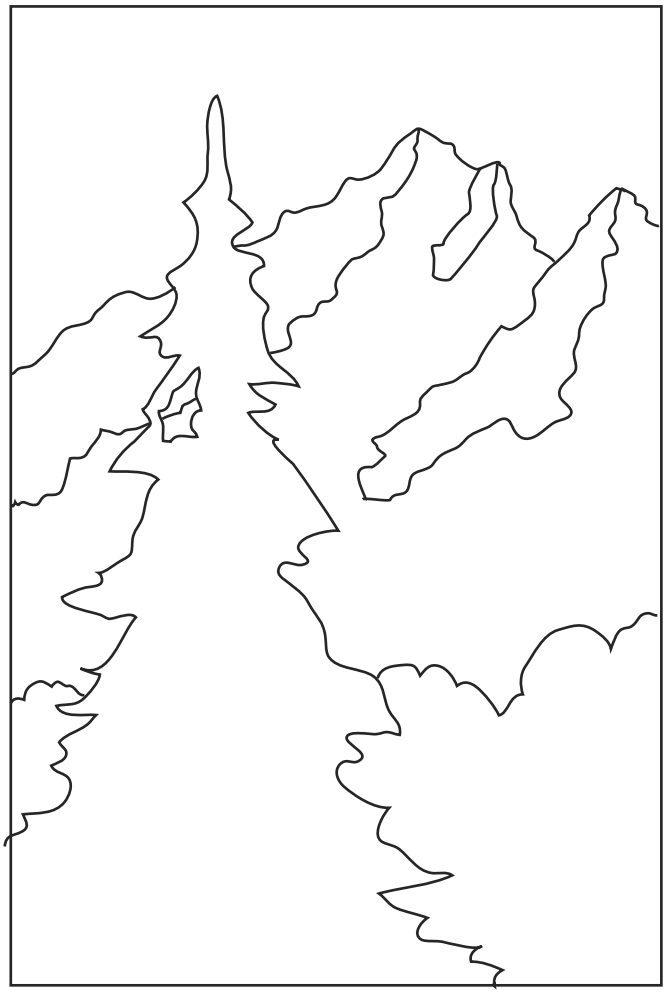

Fig 4

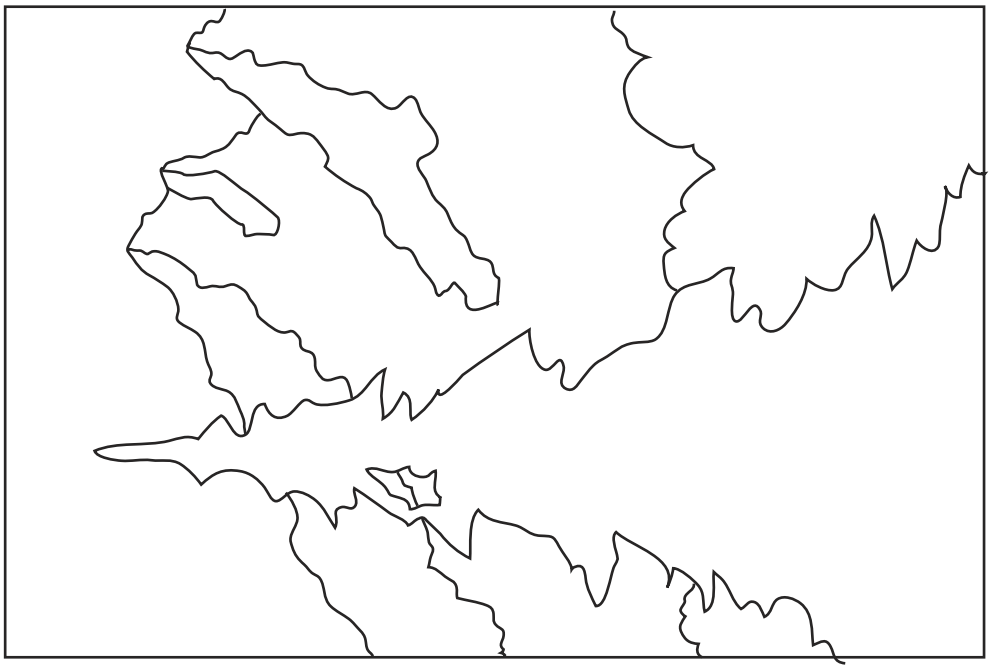
With the shadow piece taped in place add the foreground veneer **behind** the picture. This time we are going to bring the new piece up from behind. **The advantage here is that we will transfer the cutting line onto the face of the picture and we will be able to see exactly where the mountain, shadow and foreground all come together on each side of the tree**. If we put the new piece on top it hides the mountains and shadow veneers and we have to trust the registration to be exact. By bringing the new piece up we can see exactly what is going to happen. Tape the new piece in place with two or three small pieces of tape. Tape a piece of paperboard behind the assembly to act as a waster and give support to the veneers you will be keeping. Keep the new piece, the foreground, on the up side of the saw blade this time. Tape the foreground in place and you are ready for the last piece, the tree's foliage with its "sky holes."

What's a sky hole? It's the openings in the leaves/needles where you can see through to the background. There is no need to cut in the foliage first and then come back and cut in the sky holes. We can do it all at once. Put the tree veneer on top of the picture and tape it into place temporarily. Use the registration marks to line up the pattern and transfer the outline of the foliage and the sky holes. Now **cut out the sky holes first**. The background is what shows through the holes so bring bring it up into the foliage. When all three of the sky holes are done then cut around the outline of the tree to finish the picture.

Follow the instructions in Lessons 3 & 4 to finish up the picture.

Lesson 6 – Pattern 2





Section 3 - Workshop

Holding a Workshop

By Dave Peck

Workshops are fun. Get several people together and have a ball making marquetry projects, talking about different veneers, seeing how others do things and just enjoying the company. The workshop can be aimed at the beginner or you may want more advanced activities for the more experienced. A workshop designed for children or teenagers is an excellent way to introduce marquetry to young people.

The difference between a class and a workshop is generally a matter of length. A class may be from 1 to 3 hours long while a workshop may be a half-day to three or even more days. Once you have decided to hold a workshop, following checklist will help you make your plans.

<u>2-4 months in advance</u>

A. Decide on your workshop content. What level of instruction, tool emphasis (knife vs. fretsaw, etc., etc.?
B. How much will it cost to put on the program? Decide cost paid by students. Include cost of materials, supplies, and overhead such as renting tables. Is lunch included in the cost?
C. Assuming you will be the teacher do you need someone to assist (a gofer)? If you are not going to be the teacher make arrangements with the person who will be teaching (you can be the gofer). Discuss with the teacher all aspects of the workshop including, make-up of the students, who provides materials and handouts. Ask the teacher for a short biography
D. Who has the equipment needed for the workshop or do you ask the students to bring their own tools?
E. Where will the workshop be held? Make sure this is a firm commitment. Does the venue have workbenches or will you need to bring in tables? How many students can the facility accommodate? Unless you have unlimited space you should require pre-registration.
F. Will you need to advertise to find students? If you have enough sign up from within your club that's great. Should you need to find additional students consider announcements at local woodworking clubs? An advertisement in a newspaper will cost but it may reach someone who would not have found out about your workshop any other way.

Pull your car out and put tables in your garage. This photo shows a group of NorCal Marquetarians working hard during a workshop.

<u>1 month before</u>

A. Develop handouts for students. Make a critique form for the students to fill out at the end of the workshop that will help you make improvements in your next workshop.
B. Check equipment and supplies. If you will have a large audience consider getting a microphone so that everyone can hear.

C. If someone else will be the instructor check with teacher.
D. Provide students with a handout showing location, times, & what to bring. This can be done by email, mail or handed out during a club meeting. A good map will save you from having students straggle in late. If it's very far put signs between the parking lot and the classroom.
E. Assign jobs to your assistants. Possibilities include bring refreshments, specific equipment, materials and any special needs.

2 days before

A. Double check with those who have jobs to do.
B. Double check that all needed equipment is available. Check that it actually works.

1 day before

A. If possible set up room, worktables, etc.

Day of workshop

A. Arrive early and open the facility. Set up if necessary. There's always something that needs to be done.
B. Have an attendance sheet showing who has paid. If any haven't paid collect fee.
C. Watch that the program is progressing as scheduled. Arrange for a person to signal you when a certain amount of time has passed.
D. Have students fill out the critique.
E. Suggest additional projects for the students who want to continue doing marquetry.

After Workshop Closes

A. Collect attendance and critique forms.
B. Talk with your assistants to see what they thought went well and what could be improved upon.

Section 4 - Follow-up

Additional Topics you may be interested in learning / teaching.

History of Marquetry
About Veneers
Sand Shading
Inlay
Fragmentation
Cutting in an assembly
Fine lines
Parquetry
Veneer matching
Scroll saws for marquetry.
How are jeweler's saw blades made?
How is veneer made?
Beginners guide to buying veneer
What type of tape should I use?
Registration is the key to accurate cutting.
What makes a good stylus (tool to transfer your pattern to the wood)?
Glues are sticky.
Presses come in many flavors.
The Classic method
Vriz
Creating Patterns
Applied marquetry
Changing Veneer colors
Bleaching veneer
Harewood
Spaulting veneer