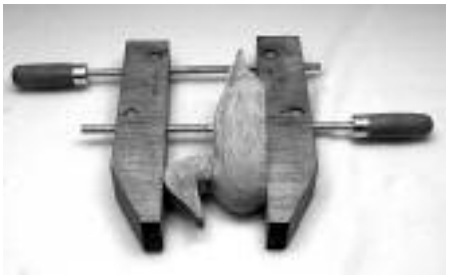
How To Carve



Step by Step Woodcarving

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Notice to Readers– *Since this manual was printed in 2003, we've made changes to the Foredom product line. The most significant was the introduction of our 1/6 HP Series SR motor at the end of 2005, which offered reversing capability and 33% more power than the motor that was first featured–the 1/8HP Series S. That change, along with some other minor ones to accessory items, is reflected in this digital version. If you see a bur in use for a particular project that we no longer carry, you can be sure that we have an equivalent in our line. The intent of the manual remains the same: it is an introduction to the world of woodcarving using a 3-project, step-by-step tutorial approach.*

Welcome to Foredom Power Carving.

Welcome to the growing number of Foredom users worldwide. I am confident that you will enjoy using your new Foredom power tool. By following the simple care and maintenance procedures described in the Owner's Manual and this How To Carve booklet, you should enjoy many years of trouble free use. Maintenance supplies and spare parts, if needed, are available through www.foredom.net. Foredom's complete line of flexible shaft power tools, handpieces, speed controls, and motor hangers can also be viewed at our website. You can download all of our equipment and accessories catalogs, as well.

I expect that you, like so many others, will find many uses for your new power tool. In addition to woodcarving, Foredom flex shafts are used for– furniture and antique repair and restoration, engine repair and modification, gunsmithing, modelmaking, crafts and home fix-up projects, jewelry making and repair, glass and metal engraving, stone carving…and much more.

Foredom offers one of the most comprehensive selections of top quality rotary power tool accessories for all these and many other applications. You can order them through your retailer. Or use the enclosed order form to order directly from us. We frequently add new accessories to our product line. Please check our website, www.foredom.net, for recent additions.

We have made flexible shaft power tools for over 80 years. We continue to hear from our customers about innovative and interesting ways that they use our power tools. We'd like to hear from you, too.

Sincerely,

Bill Nelson
President

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Introduction

Woodcarvers use Foredom® flexible shaft power tools to produce many different types of carvings–decoys, wildfowl, animal figures, human faces and figures, free form figures, walking sticks, relief carvings, kitchen spoons, furniture decorations and many others. Hand carving with knives and chisels is still very common and may be part of any carving project for fine details, but a Foredom power tool and the hundreds of accessories available to use with it can significantly reduce the time required to shape, detail, texture, and finish a piece. Woodcarving can be done as a creative hobby or craft to produce decorative pieces for your home or as a serious profession.

The purpose of this booklet is to give you some ideas for woodcarving projects and to familiarize you with how Foredom power tools and accessories can be used. Many other excellent projects, articles, and books on carving are available from publications such as Woodcarving Illustrated and others. We have listed just a few of these resources on page 27 of this booklet. There are also many local and regional carving clubs which offer classes and organize shows and exhibitions. You can find listings for them in the carving publications and at various websites.

Using your Foredom® Flex Shaft

Foredom flexible shaft power tools are versatile shop tools for power carving, grinding, sanding, cleaning, polishing, buffing, and more on virtually any material. Foredom flex shafts are made to professional standards and have been used for decades by manufacturers in industrial applications, by professional jewelry makers, and by professional and amateur woodcarvers. They are powerful and reliable tools that are more comfortable to use and operate on a continuous basis than hand-held grinders. Flex shafts require little maintenance and will provide you with many years of reliable operation.

Safety-

Wearing safety glasses or a face shield is the most important safety precaution for power carving.

If you are working with a small piece, secure it in a vise or use a leather glove or finger protectors to hold it.

A dust collection system and/or face respirator should also be used to prevent the inhalation of fine dust into your nose, throat and lungs. The dust collection system also helps to keep your home or shop clean and reduces dust in the atmosphere.

Always check the speed rating of the accessory you plan to use to be sure it is safe to use up to 18,000 rpm.

Loose clothing or jewelry can become entangled in a rotating bur. Do not wear neck ties, necklaces or bracelets when operating your Foredom tool. Also, be sure to tie back or secure long hair.

Please check the Owner's Manual for the complete listing of safety instructions. It is a very good idea to read the manual before using your Foredom tool so that you become familiar with its use and maintenance.

General Information

Foredom flexible shaft machines are the preferred tool of both professional and amateur carvers.

Flex shafts are easy to use, durable, and require only a little maintenance.

Flex shafts are powerful electric tools–there is no need for an air compressor as required by some systems.

Spare parts (shafts, sheaths, motor brushes) are readily available from your retailer or directly from Foredom at www.foredom.com.

Foredom flex shaft machines are available in a variety of models that have different power ratings from 1/6 to 1/3 horsepower. The 1/6 horsepower Series SR motor in the K.5240 Kit is Foredom's most popular general purpose motor.

Motor speed can be continuously adjusted with a foot pedal. Manual controls are also available.

There are more than twenty interchangeable handpieces in the Foredom line. Most carvers prefer the H.44T and H.28 because of their tapered grips and range of collet sizes.

Foredom offers a comprehensive selection of unique and high quality manufactured carving burs and other accessories. See catalog 350 for photographs and descriptions of all Foredom accessories.

Rotary accessories from Dremel®, Rotozip® and other manufacturers can also be used in Foredom handpieces.

K.5240 Kit Product Specifications

The **K.5240 Kit** includes products that are ideal for woodcarving, but they can also be used to accomplish many other tasks on metal, glass, acrylic, rubber, ceramics and more.

Series SR Motor

Permanently lubricated

Ball bearing

1/6 horsepower

Runs in forward and reverse

4 amps, 110-120 Volt, AC current only

Variable speed up to 18,000 rpm

Zinc die cast metal housing

FCT Speed Control

Solid state, electronic AC currently only

Low profile heavy duty plastic housing

Screw holes for mounting to wood or metal plate for added stability

44T Handpiece

Permanently lubricated

Heavy duty ball bearing

Collet-type chuck adaptable to larger size accessories

Includes 3 collets (1/4", 1/8" and 3/32") with 1/4" collet installed. Also metric collets and 1/16".

Comes with pin and wrench for changing collets & accessories

Assembly

Kit. K.5240 contains three basic components– a reversing motor (with flexible shaft in protective sheath), foot pedal, and handpiece. Assembly is very simple:

The flexible shaft and sheath come attached to the motor.

The removable handpiece also comes attached to the flexible shaft.

To connect the motor to the foot pedal, insert the 3-prong plug on the end of the motor power cord into the socket connector on the shorter power cord in the foot pedal.

With the motor Forward/Off/Reverse Switch in the "off" position, plug the 3-prong plug on the longer power cord from the foot control into a proper 3-wire electrical outlet.

The switch on the motor selects the rotational direction and turns the machine on & off (the foot pedal is used to vary speed).

The machine is now ready to operate.

Operating Tips

Your Foredom motor may be operated in a vertical or horizontal position, but it should not be enclosed or confined so as to restrict air circulation. **If the motor is hung up above a workbench, be sure it is fastened securely to the wall or motor hanger.** The motor may develop a high operating temperature (up to 100°F + ambient) after prolonged use, and it will be too hot to hold. This will not harm the motor which is designed to operate at this temperature for prolonged periods.

Do Not Bend at Tight Angle

Shafts and sheaths are stronger and last longer when they are used without sharp bends. If used at angles or loops, wear will occur at the points of greatest friction. When operating your power tools be careful not to bend the flexible shaft too much at either the handpiece or motor shaft connections. Excessive heat and wear will occur if the bend is too great.

Follow these guidelines for trouble-free use–
a 4" or larger radius, as shown to the right, should be maintained for shafts on all motors. In its normal curved position, Series SR flexible shaft machines can tolerate up to 12 lbs. of torque. There is no way to avoid ultimate wear and under normal conditions a flexible shaft machine may require several replacement shafts and sheaths during its life-time.

Do Not Force the Tool

Let the speed of the tool do the work. A light touch is always advised. Use extra caution when carving around an edge, *especially* when using Typhoon® or other aggressive burs. Applying excessive side pressure may cause the shank or shaft of any accessory to bend or break. It is also important to insert the shank or shaft of an accessory or mandrel into the collet or chuck of the handpiece as far as possible in order to provide proper support. The collet or chuck should also be securely tightened before use. Generally, slower speeds are used when greater control over the accessory is required for precise, delicate work. Higher speeds are used for carving (shaping and stock removal) buffing, cutting and polishing metals.

Begin with a light touch when applying an accessory to the work piece, and experiment with different angles for achieving the results you want.

Recommended Wood Types

Most carvers use basswood, tupelo and pine, as well as hardwoods such as butternut, walnut, mahogany, birch, maple and other native and exotic species for their projects. You can cut your own wood from large pieces or purchase smaller blocks that are available from mail order catalogs and lumber supply stores, at woodworking and woodcarving shows, and other sources.

Some native and exotic hardwoods may cause allergic reactions in selected individuals.

Using Rotary Accessories

Always let the speed of the tool do the work. Never force the tool to perform more aggressively than a firm but gentle application of the tool to the work piece. If a more aggressive performance is desired you should probably use a more aggressive or coarser grit bur.

In general, apply a lighter touch for high-speed work. Use a gentle application pressure when working wood to avoid burn marks.

Accessories packed in the AKWK53 Woodcarving Bur Set have different diameter shanks which need to be paired with the same size collet. It is easy to install and change handpiece accessories, see instructions below.

Changing Handpiece Collets

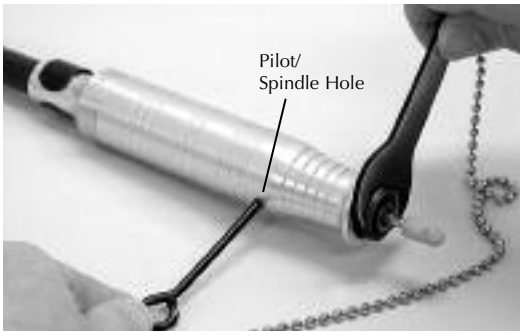
Insert pin provided into the pilot hole and through the spindle hole (turn spindle to align holes). Apply wrench and unscrew chuck nut by turning counterclockwise.

Remove chuck nut to expose collet.

Pull collet out of handpiece spindle.

Slip new collet in place and screw on chuck nut.

Caution: Never screw the chuck nut back on too tightly to avoid damaging the collet and to allow for bur insertion. Tightening an empty collet or inserting an accessory which is too small or too large may damage the collet.



Changing Accessories

Be sure the shank size of the accessory (3/32″, 1/8″, or 1/4″) is paired with the same size collet. Inserting an accessory which is too small or too large may damage the collet.

Insert pin provided into the pilot hole and through the spindle hole (turn spindle to align holes). Apply wrench and loosen chuck nut slightly by turning counter-clockwise.

Insert shank of accessory as far as it will go into collet.

Tighten chuck nut with wrench, keeping pin in pilot hole.

Test for a secure hold by pulling on accessory. Remove pin.

Bur Selection and General Guidelines

Foredom® offers a comprehensive assortment of rotary power tool accessories shown in Catalog 350 or at www.foredom.net. Accessories from Dremel®, RotoZip® and other manufacturers can also be used in your Foredom handpiece.

General categories of carving accessories:

1. Typhoon®Tungsten Carbide Burs with structurally aligned teeth provide rapid and aggressive wood removal. They last longer and do not load as quickly as other carbides. Typhoons are available in all three shank diameters- 1/4″, 1/8″, and 3/32″. The complete line includes many different shapes in various sizes and grits (i.e. coarse and fine). They can be used in both forward and reverse rotational directions.

2. Fluted burs–These are made with carbide or high speed steel. They cut like rotary files. The single cut burs have parallel rows and the double or cross-cut have crossed rows and leave a smoother finish. They are available in coarse, medium and fine grades. These burs **cannot** be used in the reverse direction.

3. Diamond Points–These accessories have diamond particles bonded to steel shapes. They are used for medium to fine carving and detailing. They produce a smooth finish on hard materials such as glass, steel, porcelain, acrylic, precious metals and wood. They are available with 3/32″ and 1/8″ shanks. These accessories are long lasting and come in various degrees of coarseness. They can be used in both forward and reverse rotational directions.

4. Texturing Stones–Texturing stones are made from a variety of materials, including ceramic, aluminum oxide, silicon carbide, or other abrasives. Foredom's unique CeramCut Blue® Stones have a ceramic and aluminum oxide abrasive grain structure that is superior in performance and life. They remove material faster, run cooler and maintain their shape and hold their cutting edge longer that most other abrasive stones. Our V Stones are made of self sharpening ceramic grain vitrified together with an extremely hard and durable porous bond. Although other abrasives may have a cheaper initial per piece cost, V Stones cost less per hour of use. Texturing stones are ideal for wood, porcelain, glass, cobalt, titanium, and other ferrous metals. In carving they are used to remove small amounts of wood and to make the detail and texturing used to replicate feathers, hair and fur. They can be used in both forward and reverse rotational directions.

5. Abrasive Bands and Discs–Ceramic Purple Abrasives are superior abrasives for sanding metals, plastics, wood and other materials. 3M's patented Cubitron™ ceramic aluminum oxide mineral sharpens itself with use. Once initial grinding wears the grain flat, it fractures along micro cracks and creates new cutting edges. Longer abrasive life — 2 to 4 times longer than traditional aluminum oxide bands and discs depending on grit. Available in 60, 80, 120, and 220 grit. Fast, cool stock removal. Scotch-Brite™ Radial Bristle Discs are a unique kind of abrasive that is superior to sandpaper, flap wheels, or other types of sanders, brushes, or abrasive wheels. Their flexible bristles can sand areas with detail, irregular, curved, or flat surfaces. Finer grits will not remove existing detail or texture. Coarser grits leave texture and/or remove material. Discs contain abrasive grain throughout –no compounds, rouges, or pastes are required! They can be used in both forward and reverse rotational directions.

Carving a Spoon

If you are a beginner, or moving from hand to power carving, this is a good starting project. Any small block of basswood, tupelo or any other non-toxic hardwood will work, and you can expect to complete the carving within an afternoon's time. Use specially formulated "salad bowl finish" or "butcher block oil" to finish the spoons for use in the kitchen. Consider carving multiples of the spoon for a complete set. Remember to wear safety glasses and use a dust collection system, respirator or face mask to prevent the inhalation of dust particles. Typhoon® burs can cut very aggressively and until you are accustomed to using them wearing a leather glove or using a vise to firmly hold the wood is advised.

Suggested Supplies

Piece of hardwood such as basswood, maple, butternut, or birch sized to fit the dimension of your spoon–approximately 6″–12″ long x 2″–4″ wide x 2″–3″deep (for bowl)

Coping Saw or Scroll Saw

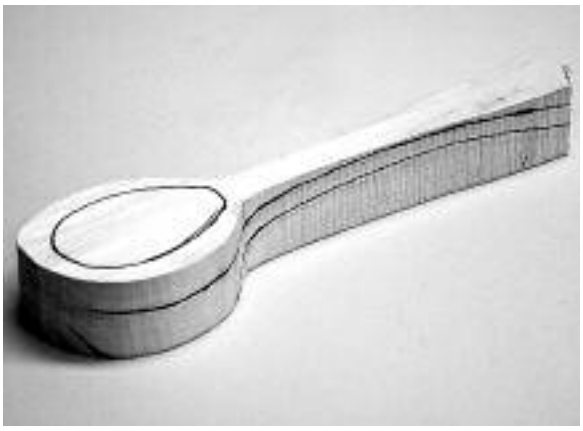
Pencil

Sandpaper in 100, 150 and 200 grits– cloth backed paper is recommended

000 Steel Wool Pad

Optional Items: Non-toxic finishes such as salad bowl or butcher block oil. Cooking oil may also be used but do not apply more than one coat since a build-up of cooking oil can turn rancid.

Rotary Accessory	Shaft Dia.	Part No.
Typhoon® Carbide Burs:		
Smooth Top Cylinder (fine)	1/4″	KB14533
Ball Nose (coarse)	1/4″	KB14716 or KB14712
CeramCut Blue® Stones:		
Ball Nose (coarse)	1/8″	CK8300 or
Ball Nose (coarse)	3/32″	CK300
Inverted Cone (fine)	1/8″	CK8322 or
Inverted Cone (fine)	3/32″	CK322
Split Sanding Mandrel	1/8″	M26 or
Split Sanding Mandrel	3/32″	M23



1 Experiment with drawing your own pattern, folding the paper helps to achieve symmetry. Cut the rough spoon shape with a coping saw or scroll or band saw. Sketch the location of the bowl and the handle of the spoon using a black felt pen or #2 soft lead pencil. A curved handle is more pleasing to the eye than a straight handle. However, either will work and be functional.

2 Use a blue smooth top cylinder Typhoon® bur to remove wood from the top of the handle and above the bowl of the spoon. Next, sketch the general shape of the bowl. It is best to keep the wood under the bottom handle for extra strength in the handle until the bowl is carved.

3 Remove wood from the bowl using either of the red ball nose Typhoon® burs. Remove wood in several steps rather than trying to remove the entire depth with one cut. Continue to remove wood until you have the overall shape and depth you desire for the bowl.

4 Using the blue cylinder Typhoon® bur to remove wood from underneath the handle to the line sketched in step 1.

5 Continue using the blue cylinder to round the edges of the bottom of the bowl. The bottom of the bowl should be rounded. Be careful not to cut through the bowl.

6 Use a ball nose CeramCut Blue® Stone to clean up the inside of the bowl. It can also be used to clean the rough cuts left by the Typhoon® on the handle and underside of the bowl.

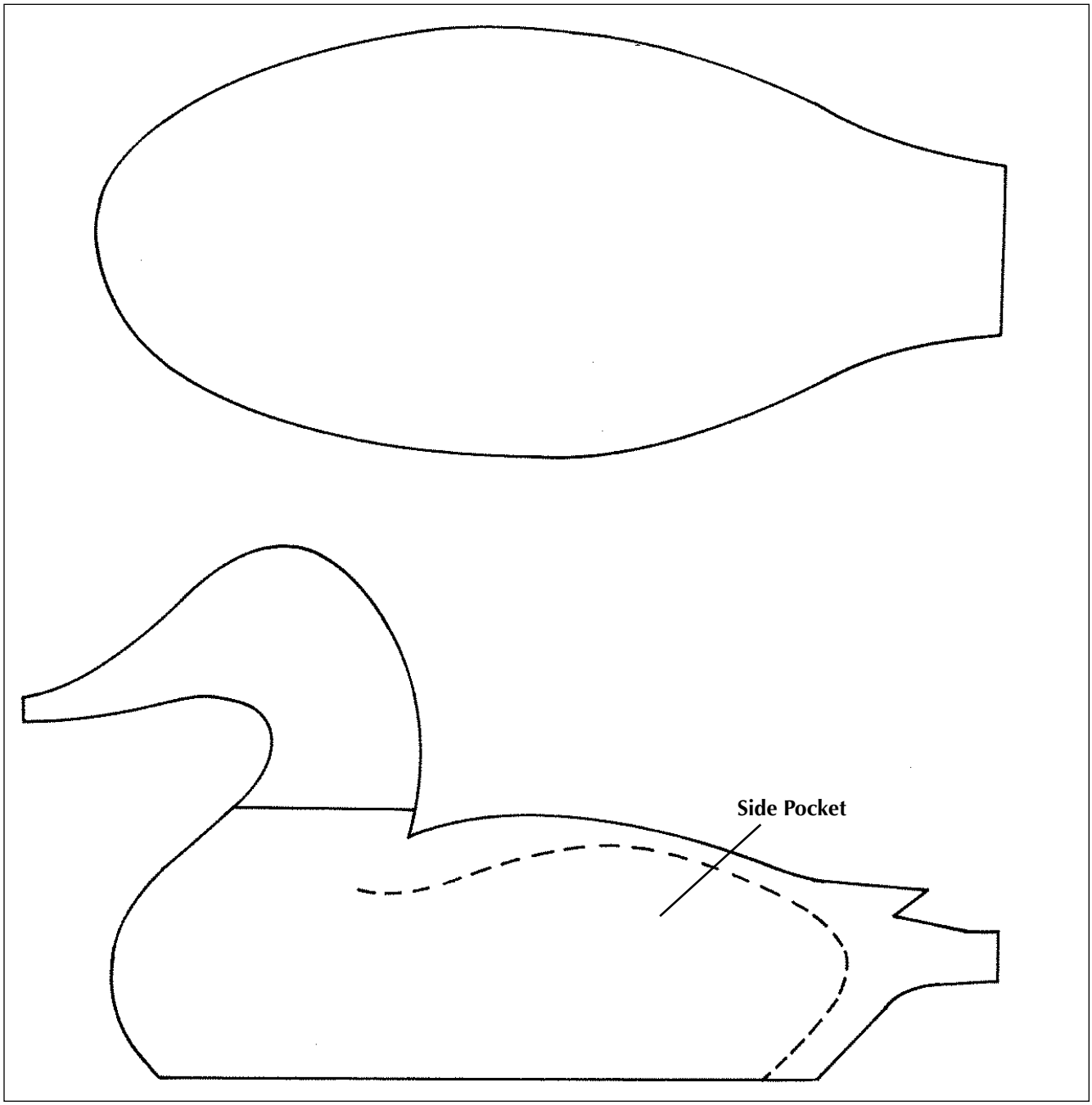
7 Next, use 100 grit sandpaper in a slotted sanding mandrel followed by 150 and 200 grit cloth-backed sandpaper for sanding the entire spoon. Use the supplied template to cut the sandpaper to the right size and fit and be sure to run the motor at low to medium speeds while sanding.

8 Add designs to the sanded spoon using CeramCut Blue® Stones–either the inverted cone or tapered cylinder. Finally, sand by hand using 200 grit sandpaper followed by 000 steel wool. The spoon is now ready for a non-toxic finish such as salad bowl finish or butcher block oil.

Canvasback Duck

We selected butternut for this project. Butternut is the wood of choice for many carvers because it is relatively easy to carve and its warm, rich grain enhances the beauty of any carving. The canvasback duck is found throughout the United States and Canada. It spends winters in tidal waters of the ocean rather than in fresh water. The canvasback breeds in central Alaska and in the prairie pothole regions of the United States and Canada. It is a heavy-bodied duck that is easily recognized by its distinctive head and bill profile. Similar to most waterfowl, the male is more brightly colored than the female.

This project first appeared in ***The Art of Stylized Woodcarving*** and is reprinted here with the permission of the authors, Chuck Solomon & Dave Hamilton, and the publisher, Fox Chapel Publishing Co. Inc.



Canvasback pattern. Use a copy machine to scale this pattern to the size you need. The canvasback carved for this project was about eight inches from tail to bill.

Suggested Supplies

Block of basswood, butternut or other hardwood– approximately 2¼″ x 6¾″ x 4″

Coping Saw or Scroll Saw

Pencil and Felt Tip Marker

Sandpaper in 100, 150 and 220 grits– cloth backed paper is recommended

000 Steel Wool Pad

Drill and 1/8″ Drill Bit

Dowel Pin–1/8 diameter

Ruler

Hot Glue

Popsicle Stick or Wooden Craft Stick

Finishes– Tung Oil, Danish Oil or Deft semi-gloss

Rotary Accessory	Shaft Dia.	Part No.
Typhoon® Carbide Burs		
Cylinder (coarse)	1/4″	KB14522 or
Smooth Top Cylinder (fine)	1/4″	KB14533
Sphere (coarse)	1/4″	KB14395 or
Ball Nose (coarse)	1/4″	KB14716 or
		KB14712
Sanding Sleeve (coarse)	1/4″	KB43535-
Change: Substitute Smooth Cut Cylinder KB14544		
Sphere (fine)	1/4″	KB14313 or
Ball Nose (fine)	1/8″	KB18715
Flame (fine)	1/8″	KB18915 or

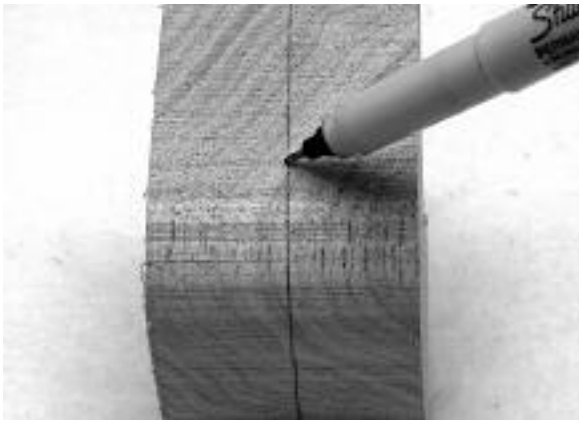
Rotary Accessory	Shaft Dia.	Part No.
CeramCut Blue® Stones		
Inverted Cone (fine)	1/8″	CK8322 or
Inverted Cone (fine)	3/32″	CK322
Diamond Point		
Flame	3/32″	PD22, PD12 or
Smooth Top Cylinder	3/32″	PD15
Sanding Rolls (coarse, med., fine)	CRL4C, CRLM, CRLF	
Split Sanding Mandrel	1/8″	M26 or
Split Sanding Mandrel	3/32″	M23

1 Photocopy the pattern at 100% of its original size, then trace the side and top body profiles to a 2¼″ x 6¾″ x 4″ block of butternut or other hardwood of your choice. Next, trace the side profile of the head to a 2½″ x 3⅝″ x 1⅝″ block of butternut.

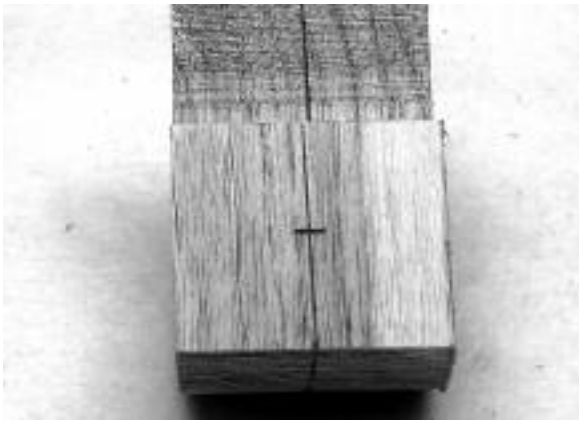
2 Cut the blanks out using a bandsaw or a coping saw. Cut the top body profile first. Temporarily glue the side pieces back on the blank using a small drop of hot glue. This will keep the edges of the blank square when cutting the side profile. Cut the side profile; then pry the top and bottom pieces from the body and scrape off any glue. Cut the side profile for the head. Save the excess wood.

3 Use a soft lead pencil or felt tip pen and draw a centerline. Also, measure and mark the center point of the line in the neck area.

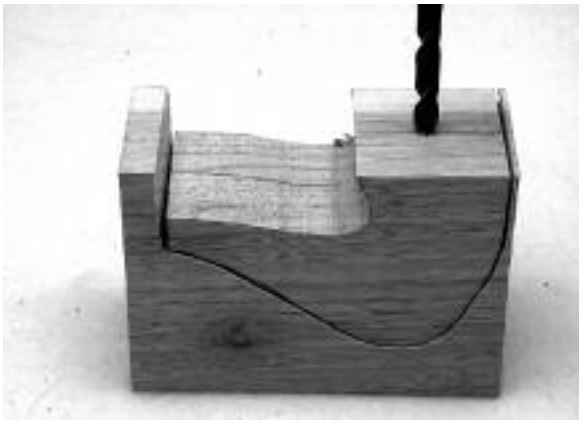
4 Drill a hole at the center point measured in the previous step. Use a 1/8″ drill bit and drill a hole approximately 1¼″ deep.



5 Draw a centerline around the entire head using a soft lead pencil.

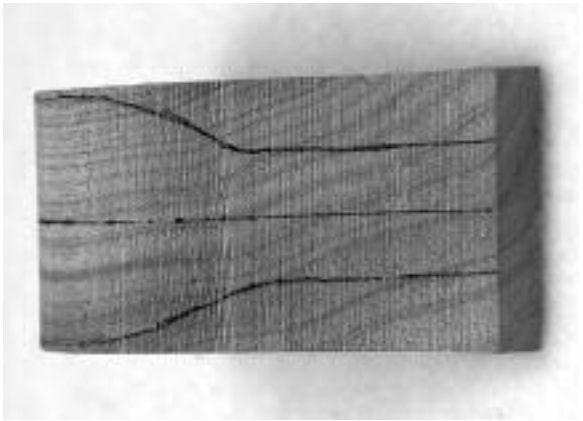


6 Measure the line on the bottom of the neck and mark the mid-point.



7 Place the head back into the block that was saved in Step 2. This block allows the head to remain "square." Drill a hole at the center point. Use a 1/8" drill bit and drill a hole approximately 1¼" deep. It is best to use a drill press (if you have one) for this step.

8 Insert a 1/8" dowel into the hole in the head and then into the hole in the body. Rotate the head to the direction you want. Draw a line around the body where the neck will join the body. This line is a general guide. Do not cut into this line until later.



9 Sketch the lines for the bill. We measured 3/8" on both sides of the centerline. Leave plenty of wood to allow for the reduction of the bill during a later step.

10 Use a soft lead pencil to sketch a cheek pouch. Use the pattern for a reference.

11 Use a 1/4″ shank Typhoon® cylinder or the flat side of a large Typhoon ball nose to remove wood from the bill. Maintain the width of the bill at 3/8″ Do not round the bill at this step.

12 Remove wood around the cheek pouch using a 1/4″ shank Typhoon® sphere or ball nose. Maintain the cut outside of the line.

13 Round the head and neck using the same bur. Remember there are no square birds or mammals in nature.

14 Move to the body and continue to remove wood from the lower neck using the 1/4″ shank Typhoon® sphere or ball nose.

15 Sketch the side-pockets on the body.

16 Remove wood around the side-pocket lay-out lines using a 1/4″ shank Typhoon® sphere or ball nose.

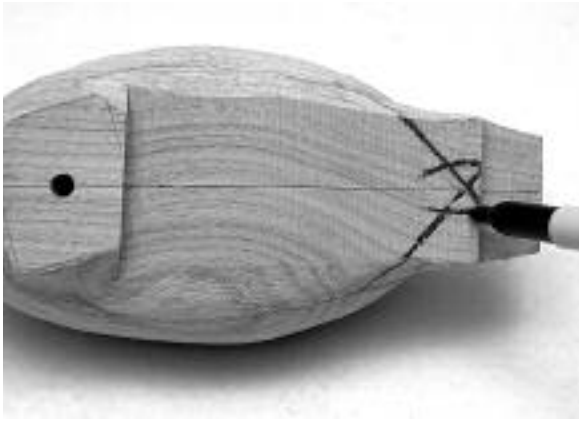
17 Round the back to the side-pocket using a 1/4″ shank Typhoon® cylinder or sanding sleeve. Maintain a slight curve.

18 Round the side of the body. The high point on the side is about 3/16″ wide and is at about the middle of the side. From the high point, the side generally rounds to the base and to the side-pocket layout line.

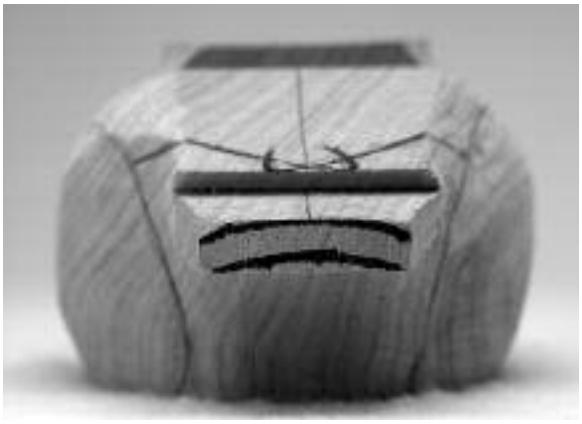
19 Round the area around the chest and neck by removing wood using a 1/4″ shank Typhoon® cylinder or sanding sleeve.

20 Round the rump using the same Typhoon® sleeve or cylinder.

21 Re-sketch the side pockets using a soft lead pencil or felt tip pen.



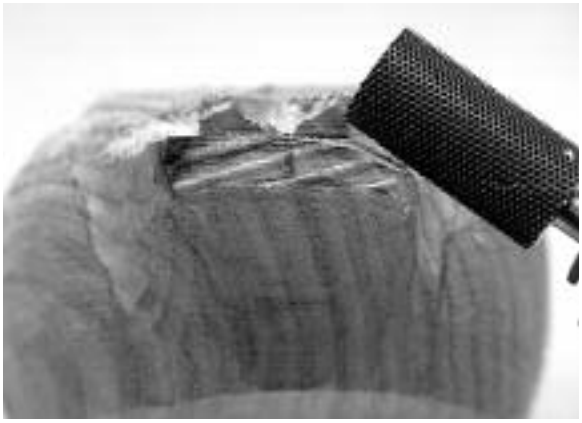
22 Sketch the primaries and tertials. Refer to a pattern or a book of duck reference materials.



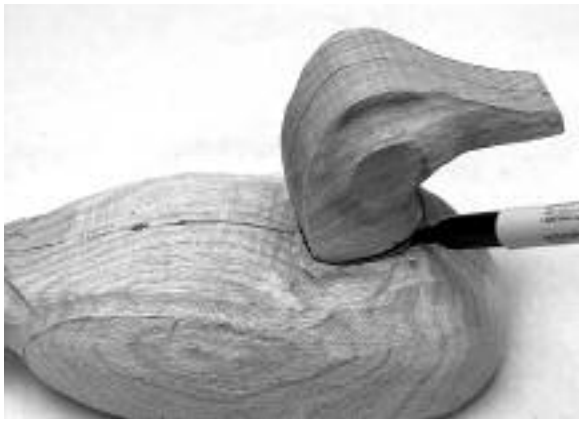
23 Sketch the convex shape of the end of the tail.

24 Make a stop cut from the side pocket to the end of the primary feathers using a 1/4″ shank Typhoon® sleeve or smooth end cylinder.

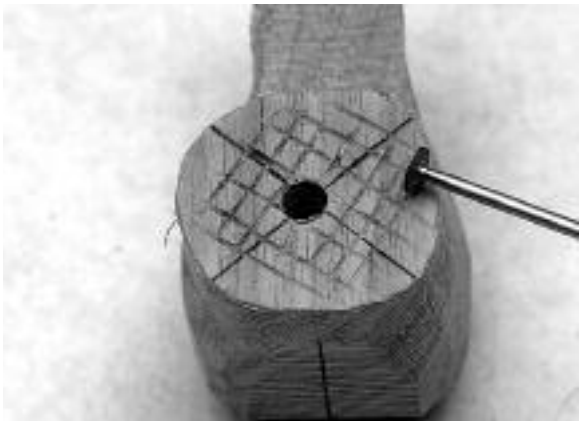
25 Use a blue 1/4″ shank Typhoon® sphere or 1/8″ shank ball nose to redefine the side pockets.



26 Remove wood from the tail and taper the tail to the primaries and tertials using a 1/4″ shank Typhoon® sleeve or smooth end cylinder.



27 Insert a 1/8″ dowel in the bottom of the head. Place the head on the body. Check the alignment and re-sketch a line around the areas where the head will be placed on the body.

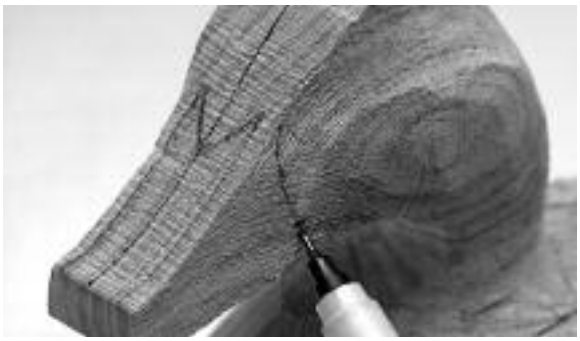


28 Cut grooves in the bottom of the head using a CeramCut Blue® inverted cone or a diamond wheel. These grooves will provide a better surface for the glue to adhere and make a stronger bond between the head and body.

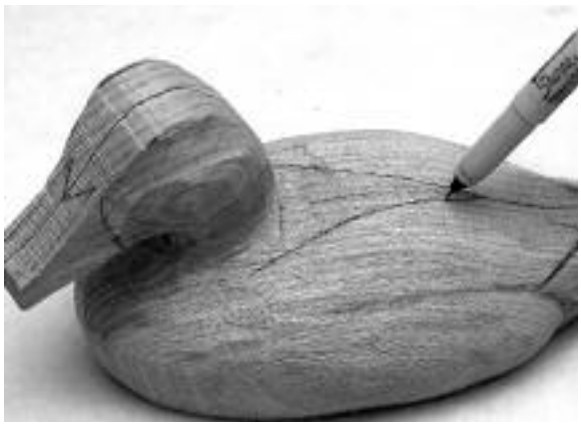
29 Add Elmer's or Weldwood yellow glue to the bottom of the head and smooth it across the surface of the neck using a wooden craft stick. Next, insert the dowel into the hole.

30 Place body and head into a wood clamp or wood vise. Leave the joined head and body in the clamp overnight or for at least 10 hours.

31 This photo shows the body with head attached.



32 Re-sketch the bill. It is 1/2″ wide and 1⅜″ from the base of the bill to the tip on the upper jaw or upper mandible. The lower jaw or lower mandible is 1¼″ from the base of the bill to the tip. The top of the head is approximately 1⅛″ wide. The widest point of the head is below and behind the eye, approximately 1⅜″.



33 Sketch the shoulder line and groove in the center of the back. It should be about 2–2½″ wide at the back of the neck and narrow to a "v" about 2¼″ behind the neck.

34 Remove wood from the bill using a 1/4″ shank Typhoon® cylinder or sleeve. Taper from the top of the bill to the side of the lower jaw.

35 Refine the cheek pouch and eye canal using the same Typhoon® cylinder or sleeve.

36 Remove wood from the front and back of the neck and the "v" on the back using a Typhoon® flame.

37 Re-sketch the bill, refine the taper, and round the tip of bill using a 1/4" shank blue Typhoon® cylinder or sleeve.

38 Round the sharp edge on the top of the head using the same Typhoon® sleeve or cylinder.

39 Remove wood from under the front one-third of bill using the same sleeve or cylinder. This cut creates the uplift near the tip of the bill.

40 Use the same sleeve or cylinder to round the back to the "v" and to the side pocket on each side.

41 Remove wood from under the tail and contour from the rump to the tail using the same Typhoon® sleeve or cylinder.

42 Use a smooth end diamond cylinder or a flame to make a slight "v" on the top of the base of the bill.

43 Refine the stop cut at the primaries and the tertials using a smooth end diamond cylinder or flame.

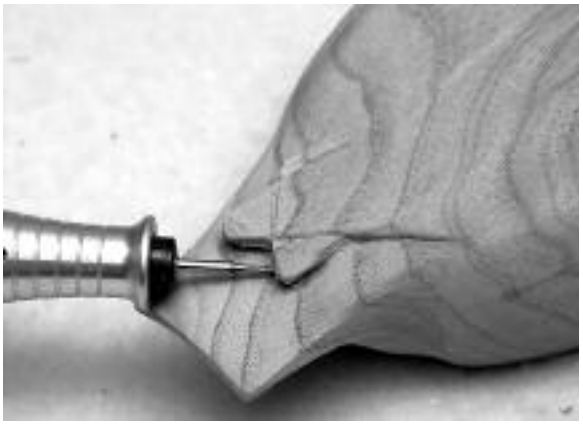
44 Use a split sanding mandrel with 120-grit cloth backed sandpaper or a sanding roll to remove the wood and scratches left by the Typhoon® burs. This step will be repeated again later.

45 Lay the sanding accessory on its side to refine and maintain the canals for the side pockets, the middle of back and the cheek pouch, including the eye canal.

46 Use a split sanding mandrel with 150-grit cloth backed sandpaper or a sanding roll to remove wood and shape the area under and behind the neck. Use a sanding mandrel to reach the area where the neck and body join and under the chin.

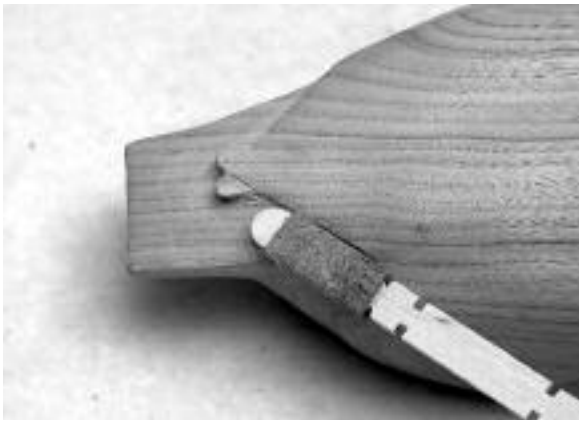
47 Re-sketch the primary feathers. Straighten the line between the tertials and the primaries using a CeramCut Blue® wheel, inverted cone or a diamond wheel.

48 Next, remove wood under the primaries and cut a line depicting one primary as overlaying the other using a CeramCut Blue® inverted cone, diamond wheel or diamond flame.



49 Undercut the primary feathers and clean up any saw marks using a diamond flame.

50 Use a a split sanding mandrel with 220-grit cloth backed sandpaper or a sanding roll to do a final shaping and to clean the entire body.



51 Wrap 220-grit sandpaper on a wooden craft or popsicle stick and sand under the primaries and the stop cut between the tertials and rump. Also, hand sand behind the neck, under the chin, and in any other area that isn't smooth and clean if needed.

52 Use 000 steel wool on the entire body. Finish with tung oil, Danish oil or deft semigloss on the completed carving. Add several coats, allowing drying time between coats. Use 000 steel wool to lightly rub down each coat before a new coat is added.

Carving a Hummingbird Pin

Don't be fooled in thinking that the very small size of this bird equates to quick and easy carving. This is actually a more challenging project because of the fine work required to give the bird dimension, detail and texture. Remember to wear safety glasses, protect your hand by using a vise or wearing a leather glove to hold the carving as you work. Use a dust collection system, respirator or face mask to prevent the inhalation of dust particles.

Suggested Supplies

Piece of hardwood such as basswood, maple, or walnut–approximately 3″ x 3″ x 1/4″

Coping Saw or Scroll Saw

Pencil

Sandpaper in 100, 150 and 220 grits– cloth backed paper is recommended

Knife or Exacto Knife

000 Steel Wool Pad

5 Minute Epoxy

Penetrating Super Glue

2 Wooden Toothpicks

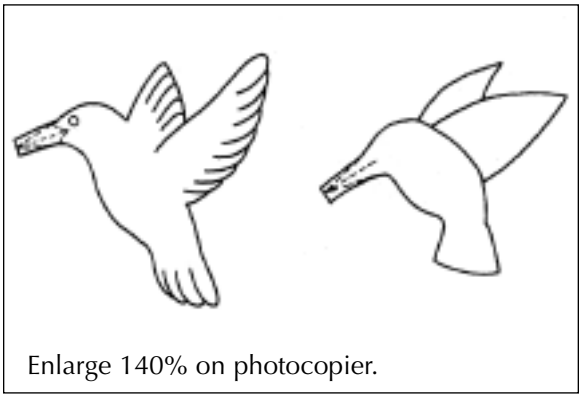
Pin Back (available at arts & crafts supply shops)

Wood Putty or Plastic Wood

Sanding Sealer, Deft, or 50/50 Mix of Lacquer & Thinner

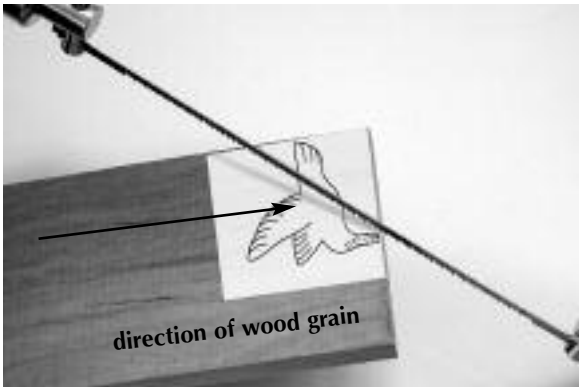
Optional Items: For painted Hummingbirds– Acrylic paints in your choice of colors and brushes, and Gesso (a white paint primer). Woodburner with 5/32″ knife tip. 1mm black glass eye

Rotary Accessory	**Shaft Dia.**	**Part No.**
Diamond Point (cylinder)	3/32″	PD15 or
Diamond Point (flame)	3/32″	PD22 or
Ruby Carver (flame)	3/32″	RC20
Typhoon® Carbide Bur		
Ball Nose (fine)	1/8″	KB18715
CeramCut Blue® Stones		
Inverted Cone (fine)	1/8″	CK8322 or
Inverted Cone (fine)	3/32″	CK322
Flat top Cylinder (fine)	1/8″	CK8352 or
Flat top Cylinder (fine)	3/32″	CK352
Bristle Brush	3/32″	MB2 or
	1/8″	MB238



Enlarge 140% on photocopier.

1 Begin by transferring the pattern on the left to 2½″ x 2½″ x 1/4″ piece of basswood. (The pattern on the right is for a stylized pin and should be transferred to walnut or another hardwood.) Make sure the hummingbird bill is parallel to the grain of the wood, as indicated by the arrow.



2 Carefully cut around the pattern with a coping or scroll saw.

3 Make a stopcut as indicated by the black arrows on the front and back of the pin with a flame shaped diamond or ruby carver. This will keep subsequent cuts from cutting into the body of the hummingbird. Remove wood from the tip of the wings to the stopcuts. On the front of the pin, the highest point of the bottom wing is the tip of the outermost primary feather. The lowest point is the tip of the secondary nearest the body. You should have a slight bevel from the body to the outer wing. The top wing is cut deeper than the bottom wing. This gives the impression that the wings are on each side of the body.

4 Remove a small amount of wood from the top wing using a ball nose blue Typhoon®. This cut is only about 1/4″ from the body toward the wing tip. The purpose of this cut is to indicate a separation between the two wings. The wing can now be tapered and shaped to final form using the same Typhoon® bur followed by the diamond point or ruby carver.

5 Define the tail using the ball nose Typhoon® bur. The tail should be thinned at the base and dorsal side and tapered toward the center tail feather. This cut should start to define the area between the tail and the lower belly. Next, round the front of the belly and chest.

6 Round the area under the chin (gorget) and the bill using your choice of bur. The cheek pouch, eye and bill can be sketched on the pattern with a soft lead pencil and then shaped with the flame shaped ruby carver. Define the area between the neck and head and round the area between the body and wings.

7 Sand the entire pin to shape using 120 grit sandpaper followed by 150 and 220 grits. A cloth-backed sandpaper works great for this step.

8 After the sanding is complete, resketch the cheek pouch, eye and bill, and sketch in the primary and secondary feathers with a soft lead pencil. I usually place eight to ten total feathers on the bottom wing and four to six on the upper. There is no need to sketch feathers on the back side of the pin.

9 Separate the upper and lower mandible on the bill and the bill from the head by using your inverted cone shaped CeramCut Blue® Stone or a woodburner with a 5/32″ knife tip. (A woodburner can provide finer more precise detail but is not required as long as you are careful in applying your carving strokes.) Use a light touch with the top edge of the inverted cone to make a thin, sharp, and shallow groove separating the upper and lower mandibles on the bill and the bill from the head. Strengthen the bill by applying a few drops of penetrating super glue. Now remove some wood between the gorget and the body, to better define this area. Next, decide on the type of eye you are going to use–a 2mm black glass eye or a ball of plastic wood to be painted or finished later. Drill out a small eye hole with the ruby carver.

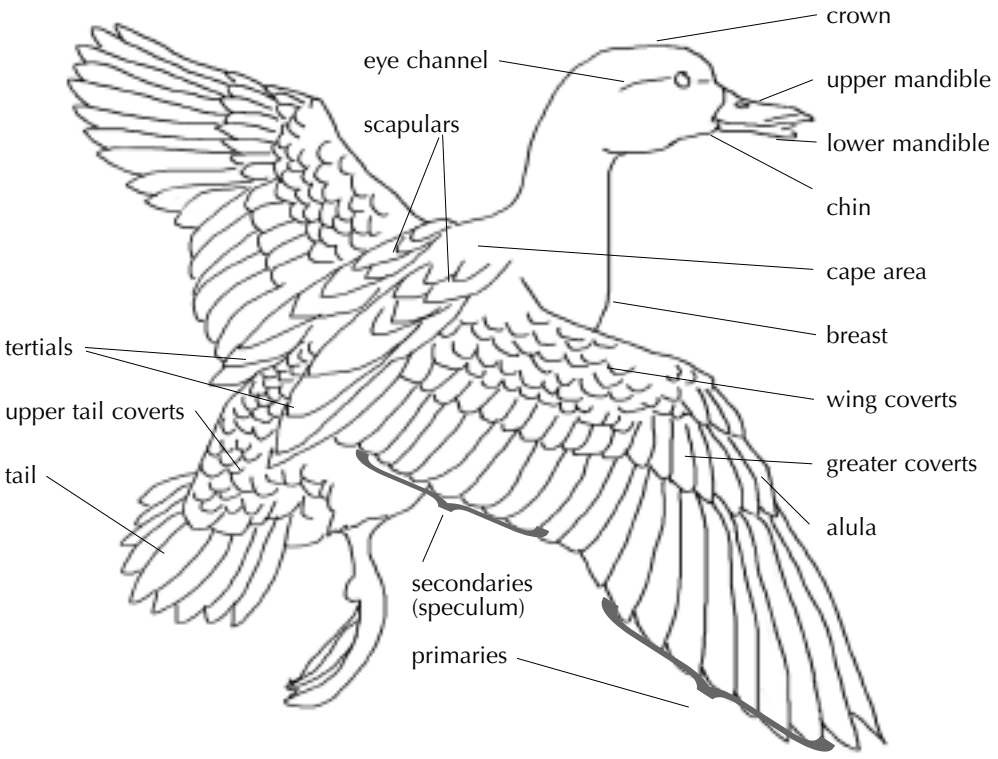
10 Relieve the wing and tail feathers with a stop cut using a small cylinder shape CeramCut Blue® Stone or flame shaped diamond point. Feather relief creates the impression of depth in the feathers. Relieve (remove material) above the pencil or burn line on the top wing and below the pencil or burn line on the bottom wing.

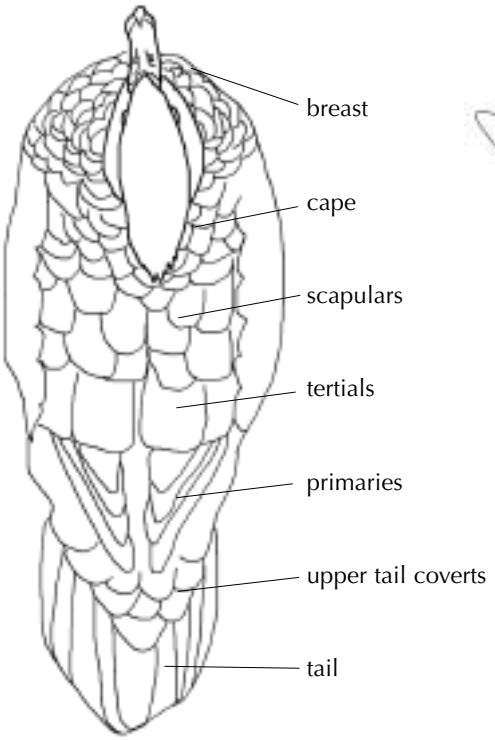
11 Carefully and lightly groove the individual barbs on each primary, secondary, and tail feather with the top corner edge of the inverted cone shaped CeramCut Blue® Stone or burn them with a woodburner with a 5/32" knife tip. Brush and clean the entire piece with a stiff toothbrush, soft rotary brush, or 000 steel wool. Brush in the direction of the barb lines. Next place a small amount of plastic wood in the eye hole and insert the 2mm eye, black glass bead or a hardened plastic wood ball. After the eye has dried (approximately 30 minutes), seal the pin with a 50/50 mixture of lacquer thinner and sanding sealer or Deft. Let the pin dry for 30 minutes and rebrush with the 000 steel wool or soft rotary brush or toothbrush.

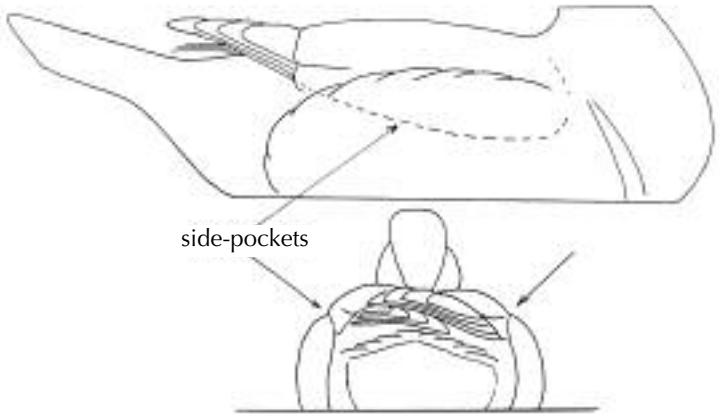
12 Paint the entire pin with a water-based primer and finish with acrylic paints in the color pattern of your choice. If you prefer the look of natural wood for your hummingbird bird, finish with tung oil, Danish oil or deft semigloss on the completed carving. Add several coats, allowing drying time between coats. Use 000 steel wool to lightly rub down each coat before a new coat is added.

Finally, glue the pin back onto the back side of the hummingbird body. You should rough up the area with sandpaper where the pin back will go. Use a strong 2-part epoxy for gluing.

Terminology







Recommended Publications

Magazines:

Carving Magazine, published four times per year by SAll American Crafts, Inc., 243 Newton-Sparta Road, Newton, NJ 07860, Tel.: 973-383-8080

Chip Chats, published bi-monthly by National Wood Carvers Assocation, 7424 Miami Ave., Cincinnati, OH 45243, Tel.: 513-561-0627

Wildfowl Art, published bi-annually by Ward Museum of Wildfowl Art, 909 S. Schumaker Drive, Salisbury, MD 21804, Tel.: 410-742-4988

Wildfowl Carving Magazine, published four times per year by Stackpole Publications, 1300 Market Street, Suite 202, Lemoyne, PA 17043-1420, Tel.: 717-234-5091

Wood Carving Illustrated, published four times per year by Fox Chapel Publishing Co., 1970 Broad Street, East Petersburg, PA 17520, Tel.: 717-560-4703

Books:

Badger, C.J. 1997, ***Carving and Painting a Red-Tailed Hawk with Floyd Schloz***, Stackpole Books, Mechanicsburg, PA.

Badger, C. J. 1997, ***Carving and Painting a Black Capped Chickadee with Ernest Muehlmatt***, Stackpole Books, Mechanicsburg, PA.

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Marsh, W. 2001, ***Carving Realistic Flowers in Wood***, Fox Chapel Publishing Co. Inc., East Petersburg, PA.

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Russell, Frank C, 1989, ***Carving Vermont Folk Figures***, Fox Chapel Publishing Co. Inc., East Petersburg, PA.

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Schroeder, R. and Sprankle, 1985, ***Waterfowl Carving with J.D. Sprankle***, Stackpole Books, Mechanicsburg, PA.

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