

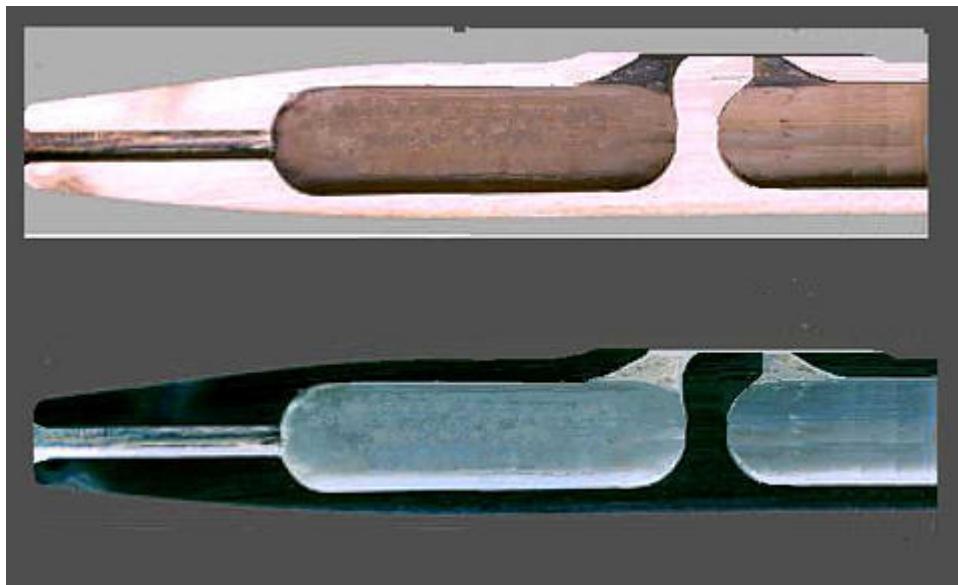


Fipple Designs - For Native American Flute

This web page shows shows details for the design of the fipple (splitting edge, sound edge) of a Native American Flute (NAF). First, here's a cut-away view of the inside of a NAF. This image was provided by Don from Spokane WA.



Here's another cut-away view and an X-ray of the upper part of a NAF. This image was provided by [Biker Joe](#).



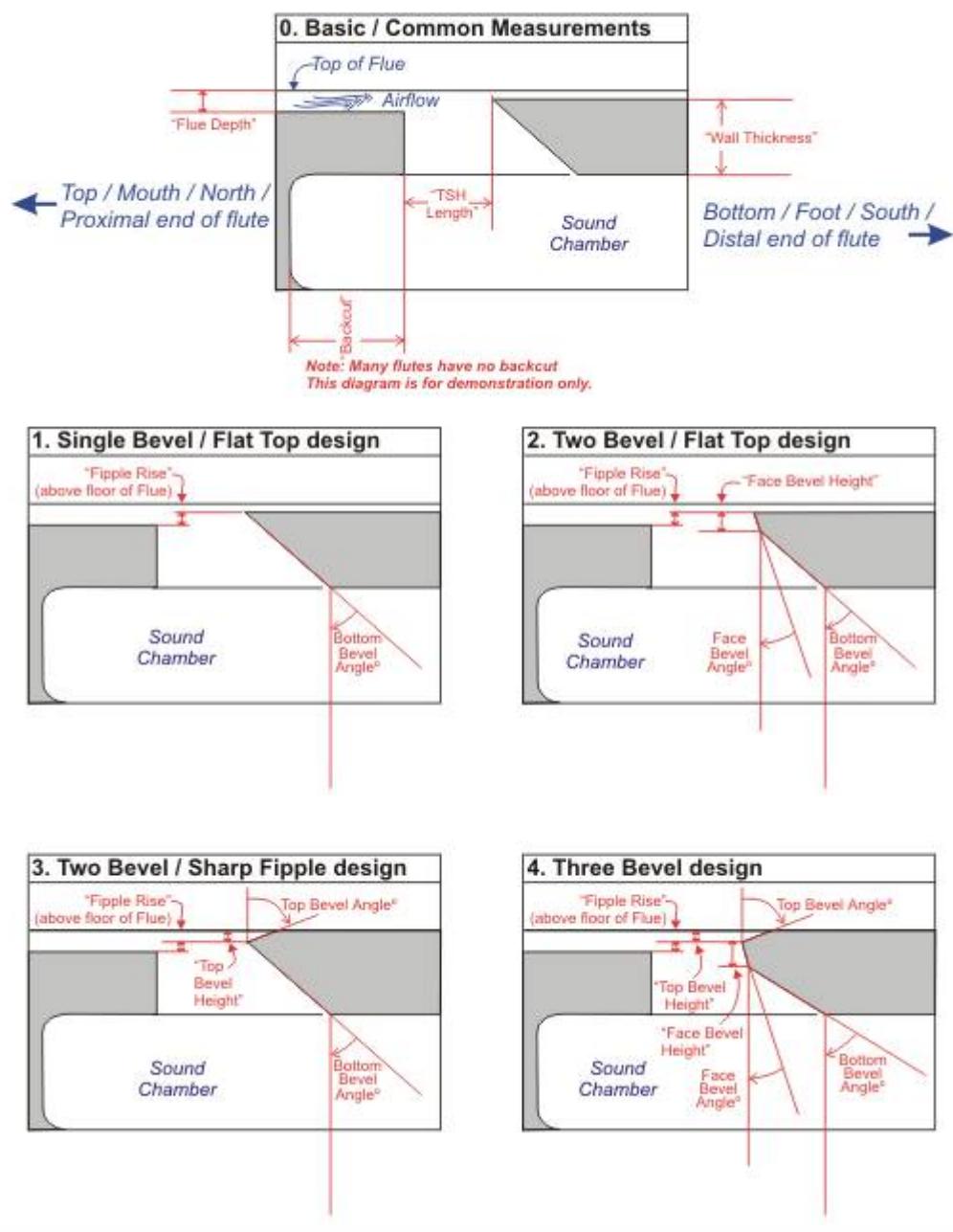
This diagram shows 4 basic designs for the NAF fipple. Click on one of the designs for a larger view.

Fipple Designs

Designs for the "fipple" of a Native American Flute (aka "splitting edge", "sound edge", "languid lip" (Ken Light)).

- Clint Goss, August 5, 2002

Copyright by Clint Goss © All Rights Reserved.



Notes:

1. The terms "*Top*", "*North end*", "*Mouth end*", and "*Proximal*" all mean the end of the flute you blow in. The terms "*Bottom*", "*South end*", "*Foot*", and "*Distal*" are all used for the other end.
2. "TSH" stands for "True Sound Hole".
3. The measurement "Flue Depth" in these diagrams is made at the location nearest the TSH. In many cases, the flue does not have a constant depth along its length. The depth of many flues decreases as it nears the TSH.
4. Diagram **0. Basic / Common Measurements** shows dimensions that are common to all the designs.
5. The shape of the flue can be achieved in a number of ways, which are not reflected in these diagrams. The flue can be:
 - cut into the body of the flute,
 - cut into the bird (also called "totem", "fetish", or "block"),
 - formed with a spacer plate, or
 - some combination of these designs.
6. If the top (proximal) edge of the TSH lines up with the top of the sound chamber, the "backcut" measurement is zero. Many flutes are constructed with no backcut.
7. The measurement "TSH Length" is always between the top (proximal edge) of the TSH and the face or edge at the bottom (distal end) of the TSH.
8. The Bottom Bevel Angle and Face Bevel Angle are smaller for angles that are more "vertical". They both increase as the amount of wood that is "undercut" increases. This is the reverse of the way that Russ A. Wolf measures these angles in his excellent reference *Flute Shop: A guide to Crafting the Native American Style Flute*.
9. Measurements of the height of the Top, Face, and Bottom bevels are always done perpendicular to the floor of the flute. They are not done in line with the bevel.

Web site by [Clint Goss](#) - Last updated February 5, 2005.

2005 Flute Class

Fundamental Varies as Diameter: Length of bore measured from splitting edge (TSH) to the end of flute: 18:1 i.e. 0.5" diameter bore X 18 = $\frac{3}{4}$ " I.D. => key of G#, A, A# 9" bore length; $0.875 \times 18 = 15.75$ " bore length, etc.

7/8" I.D. => Key of F, F#, G

1" I.D. => Key of D, D#, E

1 1/2" I.D. => Key of A

Started with routered half blanks of curly maple.

- Sand bore smooth. Don't sand rails. Clean off sawdust.



North

↑ True Sound hole

South

Mouth end of flute is north end. Finger holes are numbered from the south (being #1).

- seal bore with two coats of shellac.
- Smooth with fine Liberon steel wool.
- Mark location of rails on top of blank
- Mark location of front slot, 1/8" x 1/2" wide on top of blank starting above point where router bit stopped and channel flattens (bottom of ski slope). True sound hole
- Northern sound hole 1/4-5/16" x 1/2", center on bore from true center, closest to mouth hole
- Sound holes are usually 1/2 of bore diameter.

Sharpen chisel on automotive grit wheel then finish with rouge on leather wheel.
For sharpening tips see Scareysharp.com

- Use 1/8" end mill to cut slot, mounted on Dremel \$29 or Proxon \$39 router attachment.

Use cross slide vise to hold flute steady.

- Form underside cut ramp for true sound hole (cutting edge) with 12 mm chisel to a 32-45 degree angle . Should be about 1/16" thick leading edge. Wiggle chisel side to side, edge should be uniform thinckness and level .

On back slot, closest to mouth smooth with emory cloth.

Small machinists files, spring clamps, 12 mm chisel, knife edge chisel, 90 degree chisel And machinists file, and Roll of stick on grit paper.

Stick grit paper to top of saw table to flatten rails.

- Make a glue clean-up dowel by wrapping a clean 2" wide cloth around dowel.

Gluing

Find dead center of bore with center finding ruler, mark on top and closed end
Clean rails.

- Spread thin film of Tight Bond II extend
- Join halves, slide back and forth a couple times
- Check alignment north and south, and clamp with six spring clamps
- Use clean-up dowel to wipe up excess glue from inside diameter

Lathe

Drill 1/16 pilot hole at dead center in end of flute or use lathe tailstock center.

Put cone shaped metal or wood end center in open end of blank and mount on lathe with north end at lathe right or chuck end. Tighten end stock for moderate tightness having care in not using too much pressure which will crack the blank.

- Start with very sharp bowl gouge taking very little off at first. Test for trueness of Mounting.
- Mark off flue area and don't round
- Cut to a wall thickness of 1/8" to 3/16" from open end in about 2" from north. Stop and protect cut end with three wraps of nylon tape. This should prevent cracking.
- The depth of this cut will act as a guide for rounding the rest of the shaft.
- Continue to round blank measuring O.D. with calipers, especially at area of future finger holes.
- If shaft gets whippy be ready to support back of shaft at the middle of blank with open hand.

- Don't lathe 'bird nest' area to 2" behind rear sound slot.
- Use skewer chisel to shape mouth piece.
- Sand shaft smooth.
- Remove from lathe.
- Drill out mouth hole to 3/8".

Planning a Blank

Make a fixture to mount blank.

- A cone shaped support bolted to a wood 'bookend' clamped to bench for the open end.
- A similar 'bookend' with a metal 3/16" diameter pin clamped to bench at other end of blank.

Mark dead center of mouth piece. Drill a 3/8" hole into sac area.

Mark of birds nest area: 3/16 on each side for rail, 1" ahead of top slot, and 2" behind bottom slot.

Mark off faces of sides by thirds (1/2" wide strips for a 1 1/2" blank).

Mark off open end for a 3/16 " thick tube wall.

-Use block plane or spoke shave to cut down corners evenly.

- Round off with plane shave and sandpaper.

- Taper and shape mouth piece.

Router

Router birds nest flue 32/1000" deep with an end mill. This is the area between the slots. Router exit flue or air runout (area below/south of the true sound hole) to a 12/1000"-14/1000" depth.

Tuning

If you want an E flute and the chromatic tuner indicates the flute is low you can tune to an E by shortening it 1/8 inch at a time. Either cut off a small piece at the bottom or drill a hole in the side. You want to be a bit high (above) an E before you drill the finger holes.

The following applies to flutes one inch bore (inch inside diameter) and smaller.

Mark the centerline of the very top of the flute. Measure from the lower edge of the true sound hole to the bottom end of the flute. Make a mark one half of this distance on top of the flute.

- For larger sound holes drill the third hole 1/2 to 3/4 inch south of the half way mark.start
- For smaller hands drop 1/2 inch below the half way mark drill smaller holes.
- Space holes 1 1/8 inches apart. Mark for six equally spaced holes.

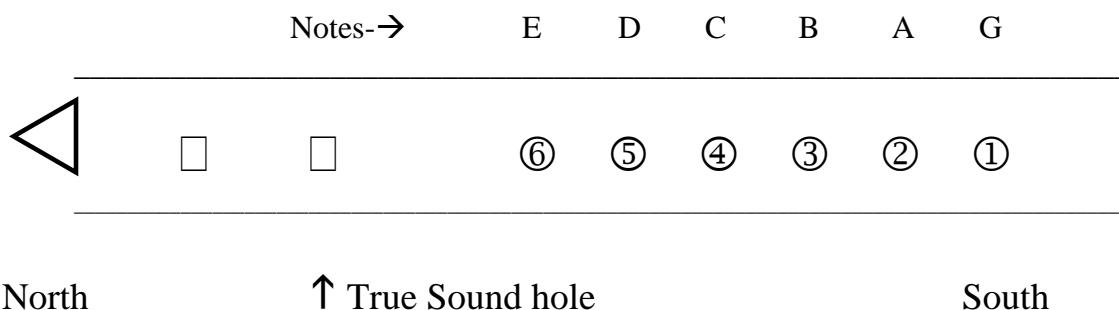
- Drill six holes at 3/16 inch dia.
- Clean the bore using a dowel rod with sticky sand paper wrapped around it.

Seal sac hole with three coats of shellac. Clean up with denatured alcohol if necessary.

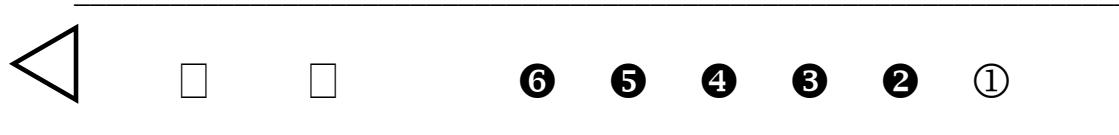
The following tuning is for an E (fundamental) flute

For a flute in the key of E the six sound hole notes are;

TSH E D C B A G

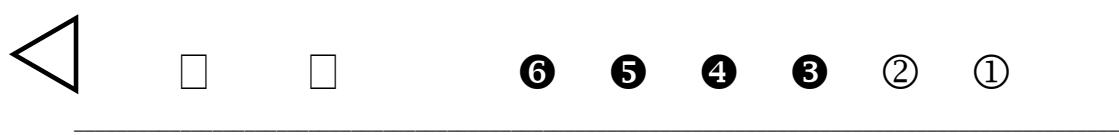


Clean up the six drilled holes from the top and underneath. Remove all bore boogers and hanging chads.



Cover all holes except the bottom hole, #1 open;

- Note should be a G (-30 on chromatic tuner scale)
- If tone is below G -30, ream out or open sixth hole a bit
- As an alternative you can under cut the hole from the mouth piece side



Cover all holes but the last two, #1 &2 open;

- Note should be an A, -30, if lower open up 2nd hole



Cover all holes but the last three #1,2 &3 open;

- Note should be B,-30, but if A# open up 3rd hole with reamer.



Cover up top two holes and 3rd hole to tune fourth hole.

- Should be a C, -30 is O.K., if lower open up 4th hole

For top two holes be very careful and open up in smaller increments.



Cover up sixth and fourth holes to tune fifth hole.

- Should be D.



Cover the fourth hole to tune the sixth.

- Should be tuned to E.

Now go back and check the tuning of the lower holes. Flute should be an E when all holes are covered.

If the tone goes over the desired note the hole is too big and should be plugged and redrilled.

If flute sound is weak or screechy not on key, at first measure and round/smooth sac hole slot and add a slight 45 degree angle to bottom front edge of bird.

Finish flute with three coats of shellac.

Dry and buff with fine steel wool.

Add one coat of paraffin oil, let dry.

Buff with crushed pummis.

Final buff with rotten rock powder.

www.flutopedia.com

www.flutekey.com

www.nativewoodworking.com

www.nativeamerican flute woodworking.com

www.cherrycows.com Keith Stanford – Flute Making Manual & Shop Booklet

www.oregonflutestore.com Bill Hughes Flute Making DVD, Vol. 1 & 2

Fundamental Note

	C	C#	D	D#	E	F	F#	G	G#	A	Bъ	B	
Finger Holes	1	D#	E	F	F#	G	G#	A	Bъ	B	C	C#	D
	2	F	F#	G	G#	A	Bъ	B	C	C#	D	D#	E
	3	G	G#	A	Bъ	B	C	C#	D	D#	E	F	F#
	4	G#	A	Bъ	B	C	C#	D	D#	E	F	F#	G
	5	Bъ	B	C	C#	D	D#	E	F	F#	G	G#	A
	6	C	C#	D	D#	E	F	F#	G	G#	A	Bъ	B

For more information:

Richard Hodgin,

friendshipflutes@msn.com