

Summer  
2008 revision

# Oboe Reed Class I

– by Elaine Douvas and Linda Strommen –

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## I. Introduction

## II. A Guiding Philosophy of Oboe Reed Making.

- #1 We are aiming for a professional-sized tone, which has breadth, clarity, ring, ease of attack, depth and resonance as well as stable pitch. To get this, the reed must be open enough and the reed must allow the mouth to be open. Closing the mouth squelches the ring and the dynamic range, and it interferes with the attack. It also makes the pitch sharp, and the tone sounds as though it is going to quit on diminuendos.
- #2 The reed must suit the oboe and you. If you are playing a new Loree, do not fear a C# crow. An older instrument, with a bore enlarged by swabbing, or other brands, may be sharper, and therefore needs a lower pitched reed.
- #3 Make the reed do as much as possible on its own, creating less work for the player (i.e. less pitch adjustment, less concern over attacks, less gathering and outlining of the tone). Do not help the reed sound good while testing it. However, focus and air compression are essential for a resonant, layered tone. Passive blowing is not the aim. (A healthy philosophy of tone production is vital for healthy reed making.)
- #4 Aim for “efficiency” – a lot of tone for little effort.
- #5 There are different reeds for different needs. If the job involves power, the reed will have to do some of this (you cannot just blow harder on a closed, limited reed). Remember that “loud” is not the same as “big.” A “big” tone is also “broad,” as opposed to “pointed” or “cutting through.”
- #6 Neatness and an eye for symmetry are prerequisites for good reed-making.
- #7 Make reeds for what they do, not for what they look like. In other words, have a system of objective reed tests, rather than a set of definite measurements
- #8 Pitch stability and flexibility are both needed. Too much of one may result in not enough of the other.
- #9 The reed must have a “pitch floor.” With a normal embouchure, focus, air compression, and no lips trying to cover up the tip of the reed, there is a point below which the reed cannot drop. The high notes must hold themselves up. The only way to play reliably in tune is to play to the bottom of the reed. It must have a built-in safety net (with pitch stability).
- #10 The sides of the reed must press very tightly against each other all the way to the end of the tip. When you tie the reed, clip it open, and set the overlap, you should have to “try to work the plaque in.” None of the reed tests will work on a loose-sided reed because you will always need to hold it together with your embouchure.
- #11 To make fine reeds, one needs to use good equipment – i.e. a sharp knife, good cane, a ~~balanced~~ gouge, with a shaper tip that compliments these. Symmetrical
- #12 Learn to make reeds quickly or you will ruin your life. However, do not give yourself credit for making a reed quickly if it is not of high quality.

### III. Qualities Desired in a Reed

- A. Demonstration of the qualities desired with excerpts from the oboe repertoire
- B. The use of reed and playing tests for objective critique (See "The Use of Objective Tests" grid)  
(*DEMO – A Soaked Reed*)

(The Test → What it Shows → Where to Scrape)

#### – TESTS ON THE REED ALONE – (*DEMO – 3-second reed test with analysis*)

##### **ASPIRATED ATTACKS (*DEMO*) → Response → Tip**

1. Blow lightly into the reed using your regular playing position.
2. There should be a response with a slight delay due to resistance (cushion, but not fight). You must have something to blow against.

##### **PEEP IN PLAYING POSITION (*DEMO*) → Resistance, Quality of Tone, Pitch of the High Notes → Contrast between Tip and Plateau [Transition]**

1. Place reed in your normal playing position and articulate on one wind at a full dynamic while playing to the pitch floor. Listen for quality of tone, resistance factor and pitch.
2. The reed should consistently play at C. Trying to play B should feel foreign to you. The peep in playing position should be no more than a half step from the thread crow.

##### **GLISSANDO TEST (*DEMO*) → Stability vs. Flexibility [Pitch of High Notes] → Length of the Tip at the Center and the Sides and Concavity at the Base of the Tip**

1. Begin with the "peep in playing position." Use a normal playing embouchure and focus. Move the reed out of the mouth to produce a glissando down.
2. The pitch should glissando a minor third. More is too flexible, and less than a minor third is not flexible enough.

##### **THREAD CROW (*DEMO*) → Pitch and Depth → Back [Concavity at the Base of the Tip, Junction of the Tip and Plateau]**

1. Crow the reed without forming an embouchure, putting it in the mouth up to the string. Begin crowing softly and bring the lower crow in as you concentrate the air. As you increase the air speed, the reed should have a two octave C or C# crow, depending upon the pitch of the oboe. *overall length gives (or D)*
2. The high octave should speak easily, with the second octave entering later as you use more air. This shows a measure of resistance.

↑  
speed

by arching  
up the  
back of  
the  
tongue

**– TESTS ON THE OBOE –**

*aspirated*

**HIGH C AND ~~LOW D~~ (DEMO) → RESPONSE (CUSHION VS. FIGHT) → TIP**

1. With normal embouchure (no biting) and weak wind, while voicing the reed down, aspirate a High C and ~~low D~~. Then, repeatedly articulate a high C lightly.
2. The reed should speak with little or no delay and there should be no possible flatness.
3. CORRESPONDING TEST ON THE REED ALONE: Aspirated attacks in playing position.

**HIGH A, Bb, B, AND C (DEMO) → RESISTANCE, QUALITY OF TONE, PITCH OF HIGH NOTES → CONTRAST BETWEEN TIP AND PLATEAU (TRANSITION)**

1. Articulate high A, Bb, B, and C repeatedly on one wind at a loud dynamic. Then do the same with weak wind. Listen for tone outline and pitch floor.
2. Qualities these notes should possess:
  - Depth, roundness, breadth and clarity of the tone.
  - Stability – they should be up to pitch enough to voice down in the throat.
  - Not scattered, spitty, weak, jammed, or bitten up.
3. CORRESPONDING TEST ON THE REED ALONE: Peep in playing position.

**OCTAVE SLURS (DEMO) → STABILITY VS. FLEXIBILITY → LENGTH OF TIP AT THE CENTER AND THE SIDES AND CONCAVITY AT THE BASE OF THE TIP**

1. Play low A with a deep tone. Press and release the side octave key. Test A, Bb, B, and C.
2. Do not change your embouchure. Let the high notes sound as flat as possible. The reed should have a stable pitch floor. A slight imperfection is acceptable, since in the course of normal playing slightly more of the reed and lips are in the mouth when playing in the high register.
3. Loose or flat reeds will not pass the test.
4. CORRESPONDING TEST ON THE REED ALONE: A glissando down beginning with the peep in playing position.

**OCTAVE E, F, F#, AND G (DEMO) → PITCH AND DEPTH → BACK (CORNERS OF TIP, JUNCTION OF TIP AND PLATEAU)**

1. Articulate the flattest notes on your oboe (probably octave E, F, F#, and G, or middle C) repeatedly, both at a loud dynamic and soft dynamic, on one wind.
2. The pitch should be up and should neither drop down nor jump up with strong tonguing.
3. CORRESPONDING TEST ON THE REED ALONE: Crow at the thread.

and aspirated low D

**LOW A TO LOW G (DEMO) → DEPTH (LOW-NOTE EXTENSION) → AMOUNT OF OPENING; CORNERS OF TIP, JUNCTION OF TIP AND PLATEAU, CHANNELS OF THE BACK**

1. Low G should sound deeper than Low A without changing the embouchure.
2. For action and efficiency (more tone for less effort), the profile of the entrance into the tip should have concavity, an "S" shape (like the slope into the neck of a bottle) rather than a "pencil tip" (straight).
3. CORRESPONDING TEST ON THE REED ALONE: Crow at the thread (same as above).

C. Parts of the reed defined with basic proportional guidelines (what to look for in a reed)

(See reed diagram)

(DEMO – Show a finished reed)

Measurements and proportions are not fixed but can serve as a point of departure for individual reed preferences. Consider the following basic measurements of a finished reed as a possible point of departure (See diagram):

- Entire reed length = 69.5-70mm (depending upon the pitch of one's oboe and the staple length)
- Tip length = 1.0-1.5mm in the middle, 3mm on the sides
- Transition (ramp) length = 0.5-1mm
- Bark between back and string = 6mm or ¼ in.

#### IV. Loose-Sided or Flat Reeds

A. Possible side effects of playing on loose-sided or flat reeds

1. You are forced to jam air, and/or bite, which produces too much pressure in the tone (results in a glaring, pointed, or edgy tone).
2. A scale that is not true to itself, or has false colors.
3. Lumpy lines that are difficult to sustain.
4. You play sharp from biting, especially in the high notes and at the ends of diminuendi.
5. Choppy, wobbly, or absent vibrato.
6. Fatigue and lack of embouchure control.
7. You are unable to play at the bottom of the tone, therefore limiting depth.
8. It is impossible to slur downward because biting and letting down cannot coexist.
9. You tighten your hands and body, or tighten your tongue, which hurts articulation – quality and speed.

B. Major causes of loose sides

1. Cane choice: Avoid sway-backed or twisted cane when viewing the cane with the bark side up. Slightly bowed cane is okay, unless the ends of the gouged cane are therefore too thin. When viewing the cane from the bark side down, avoid "frowning" pieces of cane or cane that twists. Cane that comes up at the ends slightly, or "smiles," is okay.  
*(DEMO Gouged cane and diameter gauge)*
2. A dull knife. The knife should lift, rather than compress, the cane. Also, try to spend as little time as possible with the plaque in the reed. Scrape the back without the plaque.
3. The shaper tip is poorly designed, worn at the sides, or tapers in at the top under the ears.
4. The cane is twisted on the tube, or the overlap is not established properly. For a proper overlap, the back blade should protrude on the left on both sides, for right-handed tying. (See "Tying and Setting the Overlap.")
5. A mismatch of shaper tip, tie length, and size of staple (smaller tubes need to be tied longer). As you tie, the sides of the reed should close one or two turns before the thread reaches the top of the tube. If the reed is tied too short, there will be too much cane crammed onto the tube at the throat. The leverage will hold the reed open at the top.
6. The reed is tied over the tube, even a half a turn.
7. The blank was allowed to dry before being clipped open.
8. The ears were not trimmed away properly before tying. A small piece of cane can stick out into the overlap and hold the blades apart.
9. The reed has been manually pinched open to increase the size of the opening.
10. The ends of the shaped cane were beveled before tying. This hurts the leverage of the blades aiming toward one another.
11. The shaped cane was allowed to dry before being tied.
12. A contoured plaque, or the use of a plaque that is worn on the sides. Avoid inserting the plaque too far in the reed or pulling the tip back on the plaque. *of the overlap*
13. A corner has accidentally been cut off, especially if it is on the inside ~~blade~~. This automatically gives loose sides.

14. Working on a reed for too long:

### THE 20-MINUTE REED

- i. Learn to make reeds quickly, 1) so that you don't ruin your life, 2) because there is a freshness and vibrancy that only comes from a new reed, and 3) so that you can eliminate bad cane without wasting too much time.
- ii. Never work for more than 30 minutes on a reed. The cane will over-soak, encouraging you to over-scrape, and the plaque will loosen the sides of the reed.
- iii. Practice making a 20-minute reed every day, separately from your "real" reed-making time. Use your worst cane and consider it scraping practice. Aim for response and comfortable over-all blowing weight. Take ten minutes to measure, record observations, shape and tie; five minutes to get it going with a lot of vibration; and five minutes to tone it down by carefully evening the corners and sides of the tip and clipping.
- iv. You may need to rework a new reed the next day once it has settled (i.e. clip, rework the tip and transition, etc).

15. It could be the gouge, but do not blame the gouge unless you are sure it is nothing else.

16. pulling too tight on the string = (string breaks)

## V. Reed Making Techniques and Equipment

### A. Selecting cane

1. By the time you have a shaped piece of cane, the reed is 70% finished. Quality of cane, excellence of gouge and a complementary shaper tip constitute the 70%. Therefore, the selecting process is extremely important.
2. Use cane that is hard but not rigid or brittle. Soft cane does not last long, and lacks efficiency (the ability to produce a lot of tone with minimal effort).

#### **SIGNS OF SOFTNESS WHEN LOOKING AT CANE**

- i. The bark is pale, white or dull.
- ii. The bark has grooves or corrugations.
- iii. The cane has little white flecks that look like air pockets
- iv. The inside of the gouge is stringy and holey (shredded wheat)

#### **(DEMO)**

Note: Cane with "purple markings" is soft, but often very dense. It can make a nice reed quickly, but it may not last long.

3. Use thick-walled cane (the planed cane should have little or no groove in it). This cane tends to be denser, and will have closer grains in the tip of the reed. **(DEMO Tubes of Cane)**
4. The diameter you choose must suit your gouging machine. But in general, the cane diameter must be small enough to give enough opening. It must be consistent in diameter and straightness, for the entire three inches. Try 10mm diameter (although it depends on your gouge). If you put cane with too small a diameter in your gouger, the sides of the gouged cane may come out too thin. Remember that you cannot measure the diameter of cane after it has been gouged.

5. Your radius gauge should have rounded slots, about 1/3 of a circle (rather than square or V-shaped). These are available from John Ferrillo. If you own a ½ circle radius gauge, consider making the slots shallower by using a mill bastard file or grinding wheel. Only the portion of the tube that you are going to use should fit in the slot. (*DEMO Radius gauge*)

#### B. Preparing the cane for gouging

1. Avoid using a cane splitter. Cane is usually oval-shaped or triangular, rather than round. Use a single-edge razor blade and choose the section of the tube that has the correct diameter for a full three inches. This can greatly affect the opening of the reed and general gouging results.
2. Your guillotine should not split or crack the cane. The Gilbert machine is excellent for this. For a machine with an adjustable length, the Jeanne is a quality choice.
3. Avoid using a pre-gouger to plane your cane. Use a planing board (which is currently available from John Ferrillo). (*DEMO Planing board*) Planed cane should measure 7.5mm across. Anything more than 8mm will prevent the gouge from finishing. To get narrower cane, place tape in the bed of the planing board.
4. Use a 1-inch wide trimming plane to narrow the cane ends symmetrically before gouging. (*DEMO 1-inch planer*)  
(*DEMO Process: Razor blade, tube cane, radius gauge, guillotine, old knife, planer*)

#### C. Soaking the Cane

1. Planed cane should soak in bath-temperature water for 30-45 minutes before gouging.
2. Soaking time for a gouged piece of cane depends on the hardness of the cane, thickness of the gouge, and the humidity of your geographic area.
3. Hard cane (already gouged) should soak 25-35 minutes in bath-temperature water before folding. Softer cane may soak in 15 minutes.

#### D. Gouging, with Guiding Measurements

1. Proper care of your gouging machine
  - a. Avoid unnecessary travel.
  - b. Always pack it in bubble wrap and immobilize the carriage when transporting it.
  - c. Keep oiled cotton under the blade when not in use.
  - d. Cover all the steel parts with oil after every use and keep clean of shavings.
2. Selecting and setting up your gouging machine
  - a. When using a “double-radius” gouger (one that gouges more on the side closest to the rod than it does on the other side), the cane must be turned around and gouged in both directions approximately every 5 strokes. Without this, your gouge will not be truly symmetrical.
  - b. A moveable bed for the flexibility to change the center/sides relationship is advisable. Avoid Ross, Bhosys, and Gilbert machines if you want the ability to move the bed.
  - c. An 11mm bed and a 12mm guide are preferred.

- d. Make sure it is impossible for the blade to hit the cane clips. Add bumper cork if necessary.
  - e. Enough blade should be showing so that the shreds of cane are .07mm thick (and never thicker than .10mm).
3. After gouging, the cane should be measured to test for consistency. Gouged cane should have the thickest measurement in the center (i.e. .60mm) and be consistent end to end. The measurements should drop symmetrically toward the sides to .48mm, when measured just under the ears on shaped cane as close to the edge as possible.
  4. Avoid gouge measurements that are *less* than .10mm difference from the middle to the sides. Also avoid a difference of *more* than 0.14mm. If the sides are too thin in the gouge, the tone will be hard, metallic, and shallow. The gouge should put the reed in the best position between the bark and the pulp. The bark gives strength while the pulp gives soft texture.
  5. Gouged and soaked cane should be tested for hardness and symmetry. When bent over your finger, it should resist folding in the middle and should crease slightly at the edges directly across from each other. (*DEMO Gouged piece of cane*)

#### E. Folding and Shaping

1. Before scoring and folding the gouged cane, remove the bark from the center of the cane on an easel. This prevents hard cane from cracking. Do not bevel the ends of the cane that will be under the string.
2. Your shaper tip should have close-to-parallel sides.
  - a. Parallel sides hold up high notes and provide depth of tone.
  - b. However, sides need some flare in order for the reed to grab the plaque. The amount of flare greatly influences whether the sides of the reed hold themselves together all the way to the tip.
  - c. Choice of a shaper tip is individual, dependent upon your gouge, oboe, and embouchure.
3. Do not shape holding the razor blade at a diagonal. We want bark all the way to the edge, to avoid wearing down the edges of the shaper tip. (*DEMO*)
4. Check the shaped cane with a micrometer to verify that the gouge is centered. Check the thickness and equality of the very edges (all four sides), just under the ears. Also check measurements where the cane exits the tube. The more symmetrical the four quadrants, the more balanced the reed will feel. (*See diagram*)
5. Record information in a reed log (i.e. the cane source, diameter, shaper tip, tie length, staple, and measurements of the cane). (*DEMO*)

#### F. Tying and Setting the Overlap

1. The overlap is important because you will get a tighter seal between the blades by tying a line into a plane, rather than by trying to align two lines. More overlap can also be used to raise the pitch, if necessary.
2. To set the overlap, make sure that the handle and the tip of the mandrel line up. Avoid round-handled mandrels. (*DEMO Mandel, tube, and shaped piece of cane*)



3. Tie “right-handed”, i.e. overhand with the thread in your right hand or underhand with the thread in your left hand. Begin tying five to six ~~winds~~ <sup>turns of string</sup> before the end of the tube.
4. Torque the cane slightly on the tube. Tie at “16-of” and “14-after” if you are looking from the reed down to the handle (“14-of” and “16-after” if you view it from the handle up toward the cane). (See diagram)
5. Do not slide the blades over each other while tying – the rotation of the cane on the tube will accomplish the overlap.
6. Clip the tip open and click the overlap into place, with the back blade protruding on the left. (DEMO Reed)
7. If the cane cracks under the string on one blade while tying, crack the other blade with a razor blade. This encourages a symmetrical opening. Also observe whether it cracked in the middle which would be a sign of symmetry in the gouge.
8. Note that staples can affect the tone, stability, and pitch placement. Use 46 or 47mm tubes, depending upon the pitch of your oboe. The tubes should be big enough (try new Loree AK, or Stevens “#2 Football” or #3). Look for oval openings without irregularities in the metal. Also, clean your tubes before re-use. Avoid round-handled mandrels. Nielsen American Large Mandrel, Loree or RDG are recommended.

#### G. Scraping

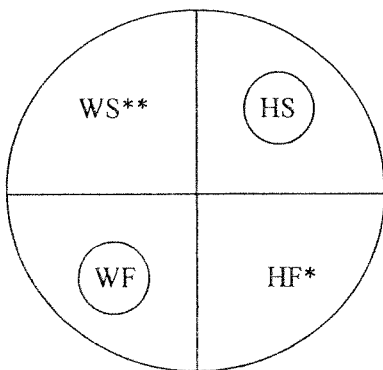
1. Start the scraping process by taking off all of the bark evenly, without an overall architecture.
2. Thin the very corners of the tip to help deepen the tone of middle C and low G.
3. It is possible to over-scrape the tip. If a tip is too thin, it will be weak and ~~the reed will droop~~.
4. Do not feather or bevel the entire width of the tip onto the plaque. Indeed, never scrape the middle of the tip directly onto the plaque. This drops the pitch of the high notes and makes the tone sound frayed. The middle of the tip should be thicker than the sides. It is best to finish with a small clip for clarity and outline of tone.
5. There must be concavity at the base of the tip when viewed in profile. This holds up the high notes, gives action and efficiency, depth and response.
6. The plateau should be an even reduction of the gouge. Do not scrape the plateau like the back (no spine and channels). Also, do not make concavity within the plateau. That is, do not make ridges at the top and the bottom.
7. A thick-sided gouge allows one to scrape away the hard-sounding bark to get a velvety sound while maintaining <sup>enough</sup> an opening.
8. An excellent test for the hardness of the plateau and the flexibility and symmetry of the sides is to insert the plaque, look into the reed’s opening and close the reed gently on the plaque. The sides should close before the middle, the middle should never feel rubbery, and you should try to fix any asymmetry of the sides with your knife. (Scrape any quadrant that does not match the others.) (DEMO “Close-on-the-plaque” test with reed, plaque)

## H. Clipping

1. Your chopping block should be filed regularly with a mill bastard file (and then sanded) to eliminate grooves.
2. Clip your reeds at an angle and play with the long blade on top. This keeps your upper lip from making contact with the tip of the reed.

## I. The Reed in Progress

*This diagram will help you to determine if a reed has potential at any given stage.*



W = WEAK      H = HARD  
F = FLAT      S = SHARP

HARD and SHARP is a necessary condition to allow you to scrape.

WEAK and FLAT reeds can often be corrected by clipping.

\* HARD AND FLAT REEDS ARE HOPELESS unless:

- The reed is over-soaked and is, therefore, too open.  
It may close as a result of scraping and then come up to pitch.
- There is too little definition at the base of the tip.  
The plateau must not make an incursion on the tip.  
Define the base of the tip and check the profile view for the "bottleneck" concavity.

\*\* WEAK AND SHARP REEDS ARE HOPELESS

There are several reasons for a WEAK and SHARP reed:

- The reed is old
- It is too closed
- It is tied over the tube
- The blades have too much overlap
- The gouge is too thin
- The cane is too soft

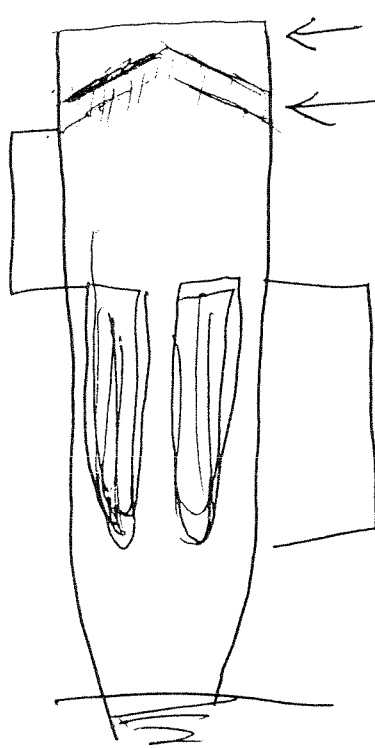
## J. Drying Reeds

1. Your reeds should dry with the same opening they had when wet.
2. If the reed dries too quickly (if you leave it out on your reed desk), it could develop a warped, irregular opening.
3. If the reed dries too slowly (in an air-tight reed case), it can crack. Reeds are at their most fragile point while drying.

# Parts of the reed:

by Douvas

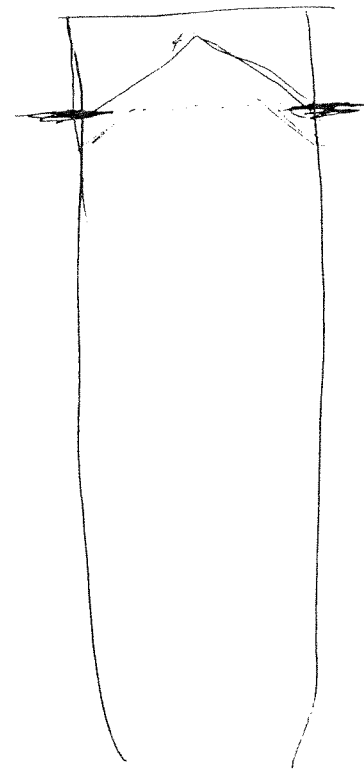
plateau:  
the main  
strength of  
the reed



← Tip

← Inception of the  
Tip (ramp, transition, steps)

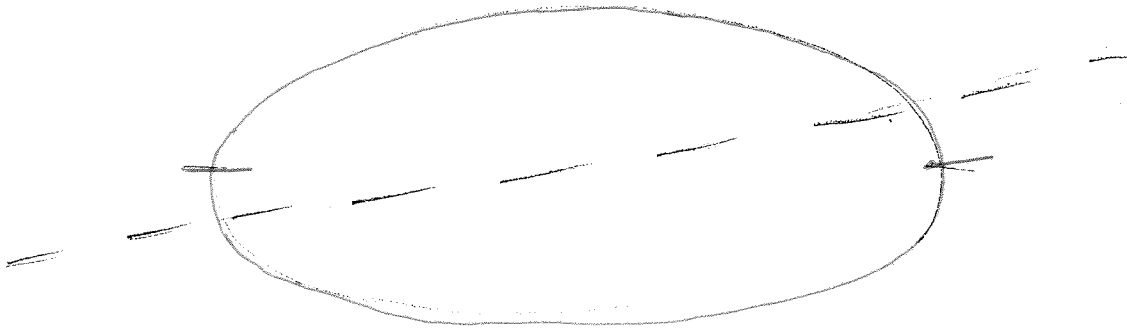
Back



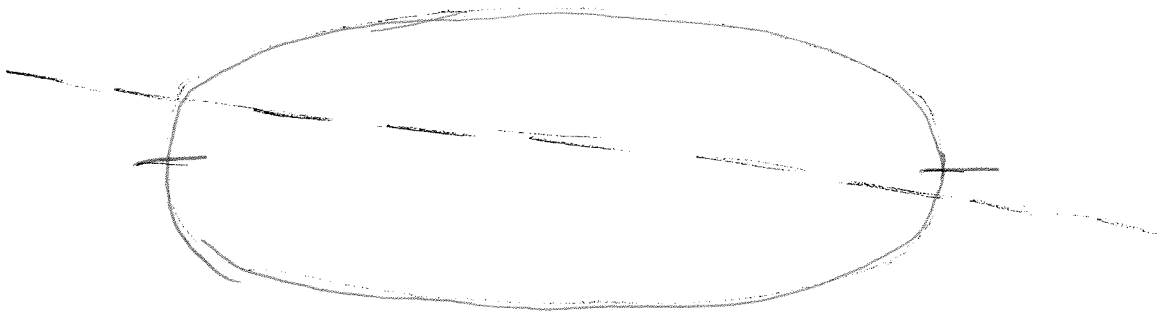
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## Overlap

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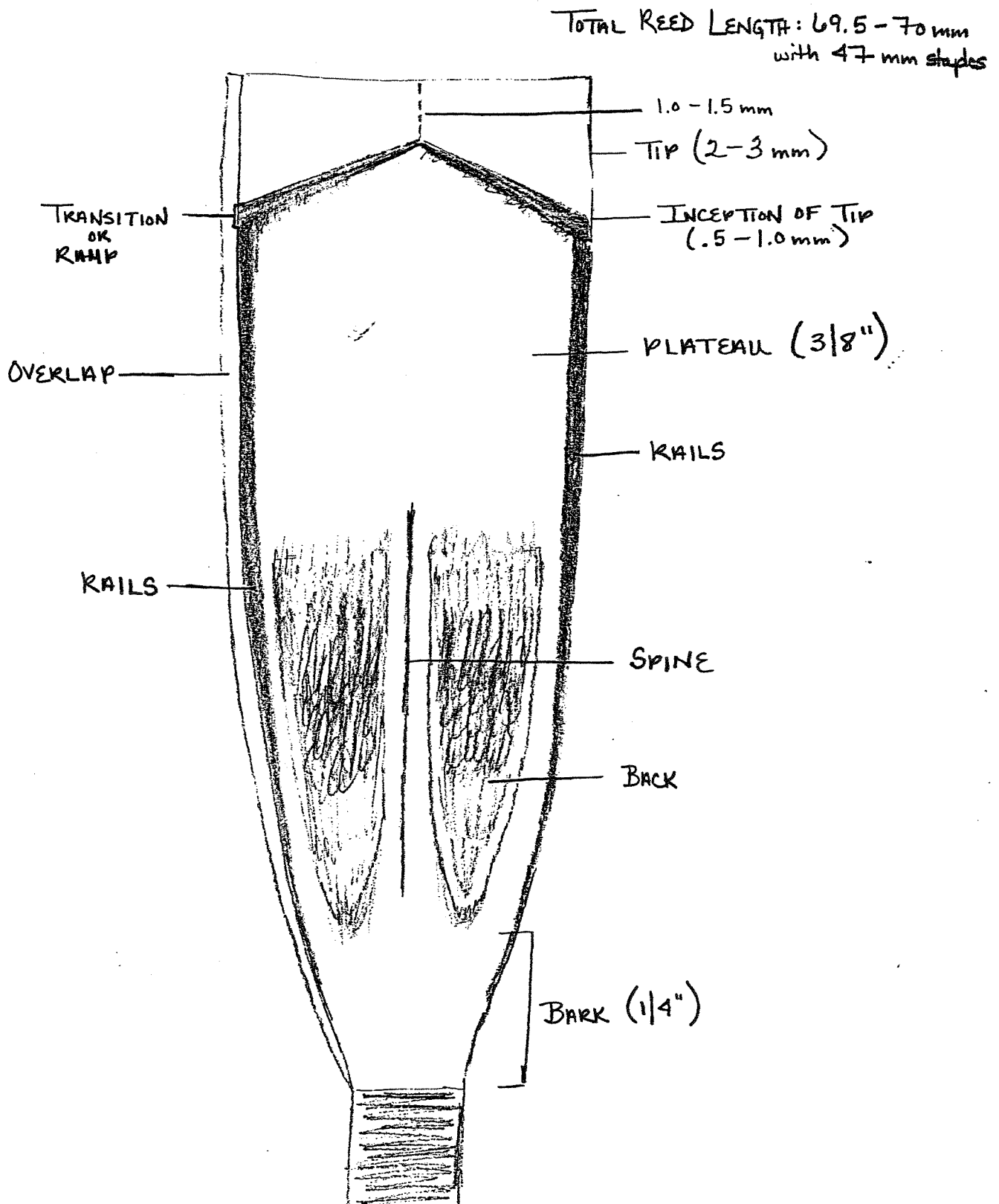


Looking from cane downward  
toward handle  
~~View from tip of Tube~~  
(16 of / 14 after)



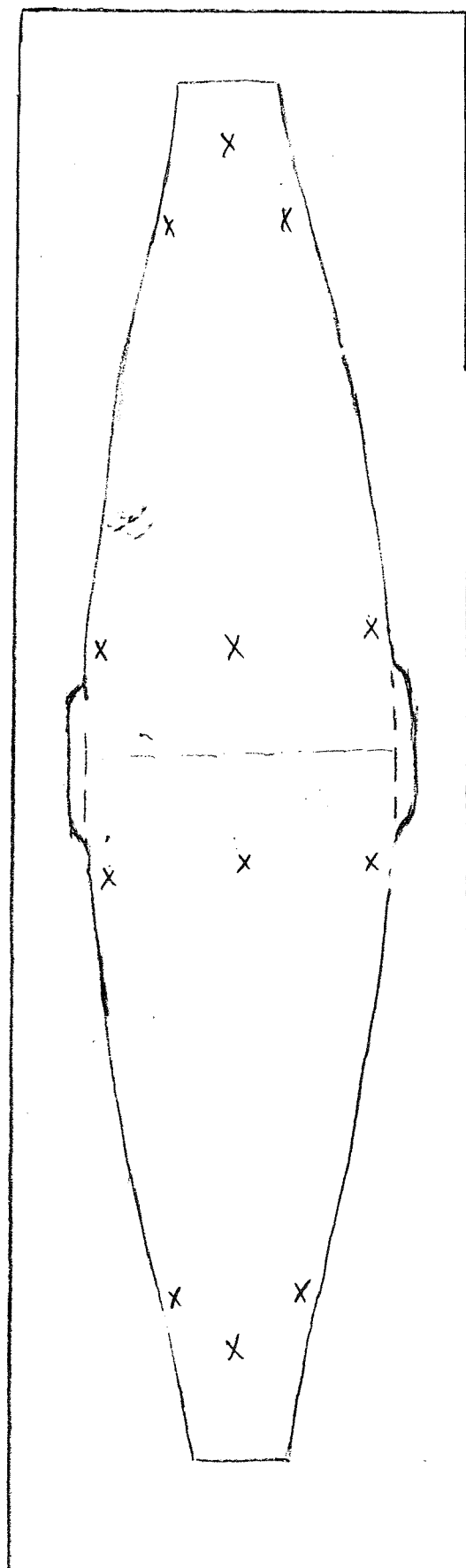
Looking bottom of marshel  
toward cap  
of reed.  
~~View from cork of tube~~  
(14 of / 16 after)

## Parts of the Reed Defined and Basic Proportional Guidelines





## Points to Measure on a Piece of Shaped Cane





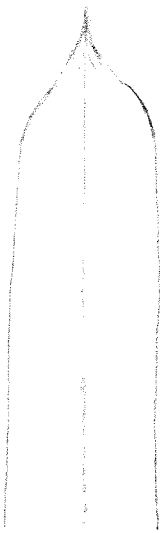


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## Profile Views

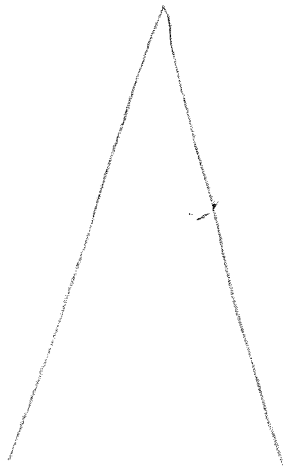
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1



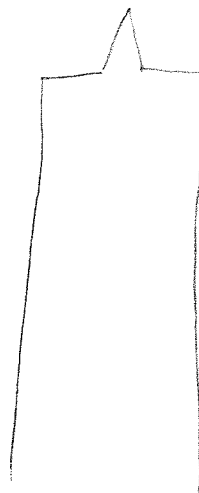
"Good" Profile

2



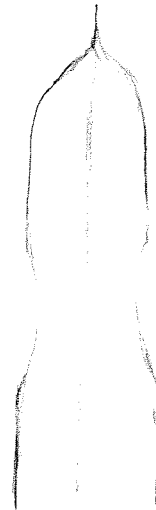
"Pencil" Tip

3



"Drastic Save"  
Tip

4



Interrupted  
Spine



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# The Use of Objective Tests

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	REED TEST	OBOE TEST	WHAT THE TEST SHOWS	WHERE TO SCRAPE
1	ASPIRATED ATTACKS	HIGH C, LOW D	RESPONSE (CUSHION VS. FIGHT)	TIP
2	PEEP IN PLAYING POSITION	HIGH A, Bb, B, C	RESISTENCE, QUALITY OF TONE, AND PITCH OF THE HIGH NOTES	CONTRAST BETWEEN TIP AND PLATEAU (TRANSITION)
3	GLISSANDO TEST	OCTAVE SLURS	STABILITY VS. FLEXIBILITY (PITCH OF THE HIGH NOTES)	LENGTH OF TIP AND CONCAVITY AT THE BASE OF TIP
4	THREAD CROW	OCTAVE E, F, F#, G	PITCH AND DEPTH	BACK (CORNERS OF THE TIP, JUNCTION OF TIP AND PLATEAU)
5	THREAD CROW	LOW A TO LOW G	DEPTH (LOW-NOTE EXTENSION)	AMOUNT OF OPENING; CORNERS OF TIP, JUNCTION OF TIP AND PLATEAU, CHANNELS OF THE BACK



## Oboe Reed Equipment Recommendations

### Cane

- Twenty pieces minimum on hand at all times
- Additional thirty pieces of a known entity of good quality cane (gouged and shaped, or gouged only if shaper tip owned). FOR EMERGENCY ONLY!

### Tubes (staples)

- 47mm nickel silver
- Stevens tubes (#2 Football), Loree AK tubes, Glotin or Loree (older), Jeanne French, or Pisoni Professional
- Minimum of twenty on hand at all times
- Avoid tubes that are bent, irregular in shape or too small at the top

### Mandrel

- Loree or France (no round handle)

### Block

- Wooden, convex with smooth top (file as necessary)

### Plaques

- Must be sufficiently narrow; no edges, points, or indentations.
- File the sides or replace the plaque when it begins to wear at the sides.
- Thinner plaques are preferred to allow sides to hold together. Avoid contoured plaques.
- Three on hand at all times

### Knives

- Landwell (medium or hard)
- "Reeds and Stuff" (German knives)

### Stones

- Norton India Stone, FB6 or FB35 (not IB series or any other manufacturer).
  - Stone will need to become sufficiently gritty for prime use.
  - Avoid using oil.
- Norton Hard Arkansas Stone (use with oil)
- Diamond Plate (EX Lap 8x3 Plate medium or fine preferred; DMT red stone acceptable for Landwell Knives)

String – Nylon EE or F thread preferred (slightly thinner than FF thread)

### Beeswax

Ruler – In millimeters (metal preferred)

Sandpaper – 600 grit Silicon Carbide

Razor Blades – GEM for clipping; #9 or #12 for shaping

Bright Lamp – Non-halogen

### **Additional Reed Equipment:**

Mill-bastard file – Any size 6"-14" is workable

### Shaper Tip

- Preference is very individual
- Avoid sides that have become worn or a tip that flares too much at the top

### Micrometer

- Ferrillo, Mititoyo RDG, or Albion
- Dial indicator (with sufficient point and accuracy in hundredths of millimeters)
- Hand held with sufficient point and accuracy in hundredths of millimeters

### Supporting Equipment for Gouging

- Razor blades (For greatest use of a tube of cane avoid using a cane splitter.)
- Guillotine
  - The blade must be sharp
  - An adjustable guillotine is most versatile. (available from Jeanne)
- Planing board from John Ferrillo (avoid using a pre-gouger to plane cane)
- 1 inch planer for trimming sides of planed cane
- Radius gauge with rounded slots (about 1/3 of a circle)
  - Avoid the square or V-shaped gauges
  - Available from John Ferrillo



Reed-making Goals:

[illegible]

