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A Manual for the Oboe Gouging Machine: Initial Setup, Maintenance and General Usage, Specifically for the Harvard Double Reed Gouging Machine

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THE FLORIDA STATE UNIVERSITY

COLLEGE OF MUSIC

A MANUAL FOR THE OBOE GOUGING MACHINE:
INITIAL SETUP, MAINTENANCE AND GENERAL USAGE,
SPECIFICALLY FOR THE HARVARD DOUBLE REED GOUGING MACHINE

By

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ABSTRACT

A high quality reed is of the utmost importance in producing a good tone on the oboe. The gouging machine, which thins and contours a piece of cane as the first step in the manufacturing of a reed, has a great effect in the overall outcome of the reed. An imprecise result from the gouging process will result in poor quality reeds. On the other hand, a great or even good gouge will help an oboist create a high quality reed that does the many things that a player demands. While many years ago very few oboists gouged their own cane, today most university and conservatory students, undergraduate and especially graduate, are expected to know how to gouge cane in the process of making their own reeds.

The *Barret Oboe Method*, first published in 1900, has a crude drawing of a gouging machine and some brief instructions on how to use it and how to adjust the overall thickness of the cane. Prior to these early machines cane was gouged by hand with chisels and sandpaper. Without having a consistent (machine given) result the oboist fights too many variables. The basic idea of the gouger has not changed over the years (1840s-2010,) but obviously the machining has improved with the aid of computer design. Today we have machines that are designed and manufactured well, and an oboist can adjust a machine with confidence. There are no manuals that fully explain how to calibrate, adjust, or maintain a machine, and this treatise exists to address that void.

Very few people know how to properly set-up a gouger: putting in the blade, knowing what to look for in a result, and knowing how to tell whether or not the finished product is a good gouge or not. There are very few places to learn these skills. This author apprenticed with John Ferrillo, Principal Oboist of the Boston Symphony, and designer of the Harvard Double Reed (HDR) gouging machine. When an oboist needs a blade sharpened and re-installed, or to have a new blade put in, one must mail the fragile machine to one of the few (often extremely busy) people who know how to do the work, and wait weeks, sometimes months, to receive the machine back in working order. The need to expand the knowledge of how to use, set-up and maintain one's own gouging machine has reached the point where this information must get out to many more oboists than currently have access to the information.

This paper intends to create a progressive manual that guides a trained oboist through the steps of setting up one's own machine, and maintaining that gouge. The manual will be

geared specifically toward the HDR machine, but the information will be relevant to any double radius gouger.¹ The manual will identify the various parts and screws on the machine, aided by photographs, and will include a section on how to gouge, and more importantly how to prepare cane for the HDR gouger. The main focus, however, will be on how to set up a gouging machine. A maintenance and troubleshooting section will conclude the manual.

¹ Double radius gouger, see page 11.

INTRODUCTION

The gouging machine is one of the most important reed-making tools that an oboist owns. The machine cuts, or gouges, cane to a very specified, complex and thin curve. From this gouged cane the oboist makes a reed. The gouger must always be in good working order, with a sharp and fully aligned blade. The gouger has a great influence on the quality of the finished reed.

The gouge “represents the inner contour of the reed. Gouged cane is thickest in the center and graduates evenly to the thinner sides. The gouge contour is variable, depending on the shape of the gouger blade, its relationship with the guides on the gouger’s carriage, and its setting in the machine.”¹ The setting of the blade in the machine is the most importance aspect of the gouging process that this paper covers. This process is referred to as “setting up” a machine, and only a small number of people know how to do this. There is a need for the expansion of this knowledge among oboists.

The oboist’s reed is of the utmost importance in producing a good tone quality on the instrument. The reed is the “crucial [aspect] for control of volume, response, intonation, and ease of playing.”² Throughout the history of the oboe it has been known that the reed is a major component in the creation of its sound. In 1752, Johann Joachim Quantz wrote about the desirable qualities of the double reed timbre in his treatise *On Playing the Flute*: “As to the tone on both of these instruments [the oboe and bassoon], much depends upon a good reed, that is, whether it is made of good and seasoned wood, whether it has the proper concavity, whether it is neither too wide nor too narrow, neither too long or too short, and whether, when shaved, it is made neither too thick nor too thin.”³ The sound of the oboe is “inextricably tied to the sound-producing agent, the reed.”⁴ Due to the importance of the reed, most (nearly all) professional

¹ Mark Ostoich, “The Influence of Gouge and Shape on Pitch and Tone Quality of the Oboe” (doctoral thesis, Louisiana State University, 1980), 4.

² Jonathan Davis, “Oboe Gouging Machines: A Brief History and Guide” (doctoral thesis, The Juilliard School, 1999), ii.

³ Johann Joachim Quantz, *On Playing the Flute*, trans. Edward R. Reilly (Boston: Northeastern University Press, 2001), 85-86.

⁴ Ostoich, 1.

oboists make their reeds by hand. In today's competitive world, collegiate students are expected to become experienced reed makers who are not allowed to rely on their teacher as their sole reed provider. If the student is serious about the pursuit of oboe playing as a career, the student must own a gouging machine (or two!).⁵ With the higher level of knowledge and reed-making ability in the twenty-first century, it has become a wide-spread expectation that an oboist know how to gouge cane.

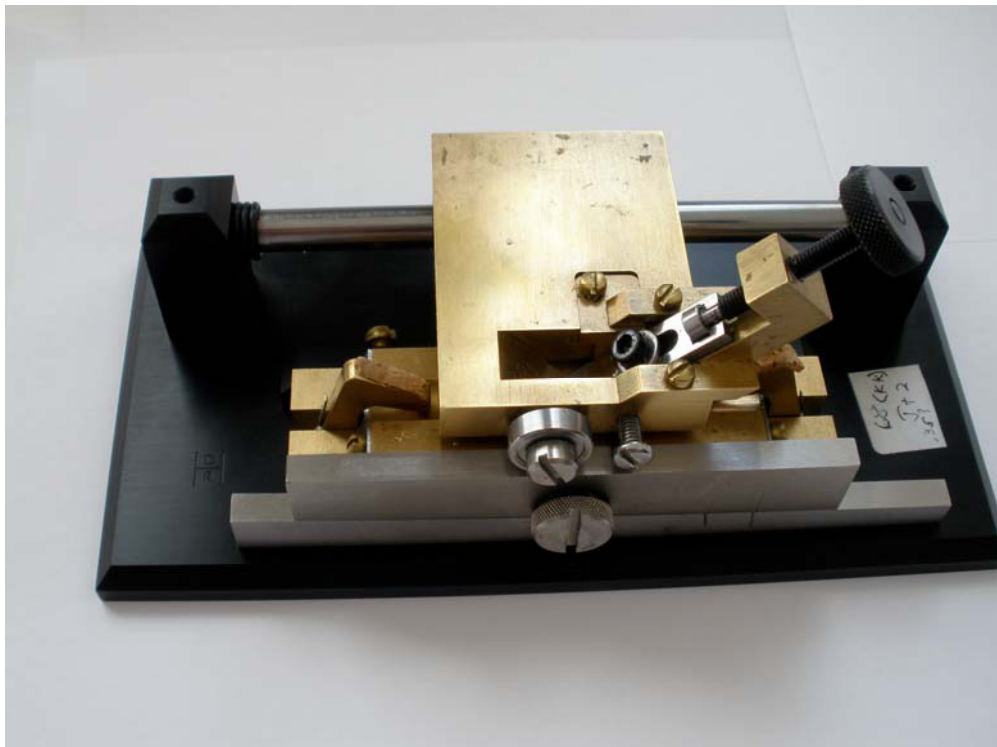


Figure 1: Photograph, the HDR gouging machine

The gouging machine has a great effect in the overall outcome of the reed. A bad result of the gouging process only makes poor quality reeds. On the other hand, a good or even great gouge helps an oboist create a high quality reed that does many things that a player demands, such as holding the pitch steady, keeping the tone centered, and articulating well. Today we have gouging machines that are designed and manufactured well, and an oboist can adjust a machine

⁵ John Ferrillo, personal lessons, Boston, MA, 2005-2007.

with confidence. However, many of the reed-making manuals available today contain very little, if any information, on how to gouge, and almost nothing on adjusting a machine. The knowledge of using and maintaining one's own machine has remained basically an oral tradition. Very few modern guides exist that are highly detailed and solely dedicated to gouging machines. When purchasing a gouger, one might receive a machine-specific booklet on adjusting that machine, but even these are fairly basic—two or three pages of computer printouts.

This progressive manual guides a trained oboist through the steps of setting up a machine, and maintaining that gouge. The manual will be geared specifically toward the Harvard Double Reed (HDR) machine designed by John Ferrillo, principal oboist of the Boston Symphony Orchestra. The information, however, will be relevant to any double radius gouger, such as the Graf machine (which the HDR is based on), Robin Driscoll's OpusOne gouger, or the Jeanné gouger.

CHAPTER 1

A HISTORY OF GOUGING

According to Bruce Haynes, one of the leading early-music and baroque oboe scholars, the first commercially-made gouging machine was created in 1847.⁶ Haynes mentions that Henri Brod (an early-nineteenth-century Paris Conservatoire teacher) penned the first written source that addresses gouging. In Brod's *Méthod pour le Hautbois*, written in 1825, he described a lateral tapering of the cane: that the thickest part lie down the center of the cane from end to end, leaving both sides equally thinner.⁷ This was originally done by hand, until Brod invented a gouger in 1837. He displayed his "reedmaking machinery" at the Paris Exhibition in 1839, but, due to his death later that year, "further innovations were stymied."⁸ The Triébert family took up Brod's ideas and created a machine around 1847. The Triébert workshop was established by Georg Ludwig Wilhelm Triébert (1770-1848). He trained as a cabinet maker, but became an oboe maker, and a famous one, in 1834 when his oboes were "declared by the Paris Exhibition jury to be superior to all the others there."⁹ The two sons of Georg, Charles Louis (1810-1867) and Frédéric (1813-1878) carried on the tradition of building oboes, and also invented a gouger with a "return system with [an] inclined bed."¹⁰ In this machine, there is a blade that is held in a locked position in some sort of carriage, and it travels on a rod in order to have the same cutting motion each time. The piece of cane sits in a bed that lines up with the blade, creating a somewhat consistent result from the machine, as opposed to the hand-gouging that was done with chisels and sandpaper, and the cane held in a wooden jig.¹¹ The Barret *Oboe Method*,

⁶ Bruce Haynes, *The Eloquent Oboe A History of the Hautboy from 1640-1760*, (Oxford University Press: 2001), 116.

⁷ Ibid., 117.

⁸ Davis, 9.

⁹ William Waterhouse, *The New Langwell Index: A Dictionary of Musical Wind-Instrument Makers and Inventors*, (Tony Bingham, London: 1993), 403.

¹⁰ Ibid., 404.

¹¹ Anthony Baines, *Woodwinds Instruments and their History*, (New York: W.W. Norton & Co.: 1963), 78-81.

published in 1862 (second Ed.) contains an illustration of the Triébert machine, and one hundred and fifty years later, the same general idea remains intact.

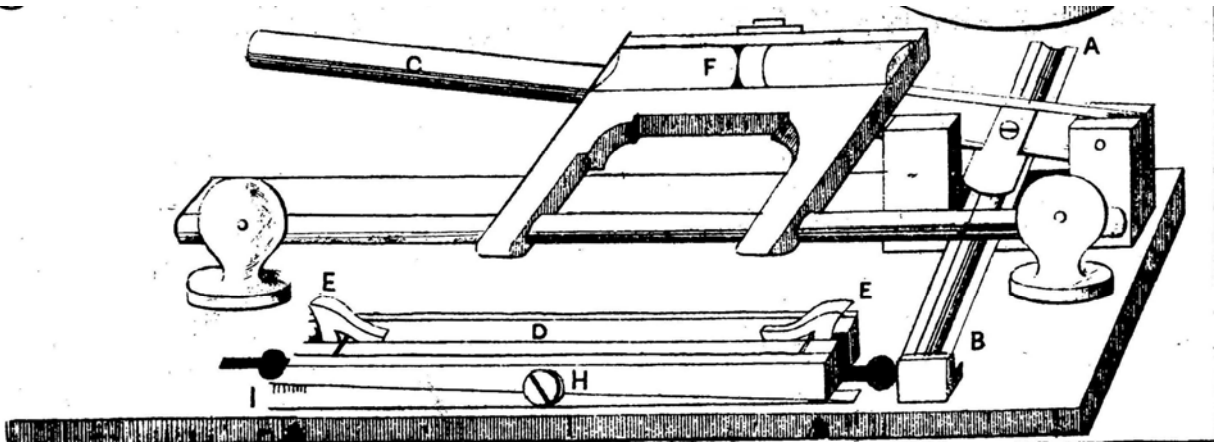


Figure 2: Photograph, the Triébert gouging machine from the Barret *Oboe Method*¹²

Gouging machines have barely changed in design from this earliest invention: “A blade is mounted in a guide on a carriage which has a cam follower. The carriage tracks parallel to the rod. There are parallel bars for adjusting the thickness of the cane, cane clips, a guillotine, and a means of adjusting the blade.”¹³ The gouging machine is a “type of sophisticated plane which must be able to produce cane to dimensions with tolerances of less than one hundredth of a millimeter.”¹⁴

When gouging was done by hand, the ability to produce a consistent result was too low. Today’s oboist needs a machine-given result without which the oboist faces too many variables in the end result. Modern machining makes this possible. A gouging machine has a curved blade that cuts a “furrow along the inside of the cane on a radius roughly similar to the outside

¹² AMR Barret, *Oboe Method*, 2nd ed. (New York: Boosey and Hawkes), 17.

¹³ Davis, 10.

¹⁴ Ostoich, 15.

(bark side) radius of the reed cane.”¹⁵ (Detailed photographs of an HDR gouger and explanations of the parts are included in Chapter 3, beginning on page 20.) The radius of the cane is usually slightly smaller than the radius of the blade. The bed of the gouger in which the cane lies is 11 millimeters (mm) in diameter (on the HDR machine; other machines have slightly larger beds).¹⁶ The cane that one places in the bed to be gouged should ideally have a radius between 10mm and 10.5mm. Other machines can accept a larger diameter of cane, with a radius of 10-11mm, and these machines usually have an 11.2mm bed. The radius of the blade is usually 12mm. The guide is the curved piece of metal on the bottom of the carriage that lies in front and back of the blade. The blade is mounted through an opening in the guide. The blade barely protrudes below the guide, but should protrude far enough to cut cleanly. On the HDR machine the guide begins as a simple 12mm curve, but is shaped by hand, ending up slightly tapered on the sides.¹⁷ The relationship between the curve of the blade and the shape of the guide, especially the front guide, is extremely important. This relationship determines “the amount of blade exposed to the cane, the parts of the blade exposed, the size and shape of the cane chip removed, and the depth of the cut.”¹⁸ The function of the guide is to “restrain the cutting action of the blade by exposing only as much blade as necessary.”¹⁹ Ferrillo notes, some people advocate using a simple 11mm or 12mm guide, but “amongst those who studied with Marcel Tabuteau [1887-1966] or his students, a slightly more complex shape is used.”²⁰ This complex shape is used on the HDR machine. The shaping of the guide is the one process still done by hand on an otherwise purely computer-made machine. Ferrillo hopes to soon have even a complex curve of a guide machined, but, thus far, the technology to properly measure a good curve has proved elusive.

¹⁵ Ibid.

¹⁶ John Ferrillo, personal lessons, 2005-2007.

¹⁷ John Ferrillo, Build Your Own Gouger Workshop, Ayer, MA, December 2005.

¹⁸ Ostoich, 17.

¹⁹ Ferrillo, unpublished gouger handbook, 29.

²⁰ Ibid.

Marcel Tabuteau's Influence

The name of Marcel Tabuteau elicits ideas of musicality and phrasing, these being his lasting pedagogical influences from his teachings at the Curtis Institute of Music. As an oboist, however, Tabuteau was obsessed with his gouging machines and the curves of the blades and guides. When Tabuteau lived in France at the very beginning of his oboe career, he used gouging machines made by Giraud.²¹

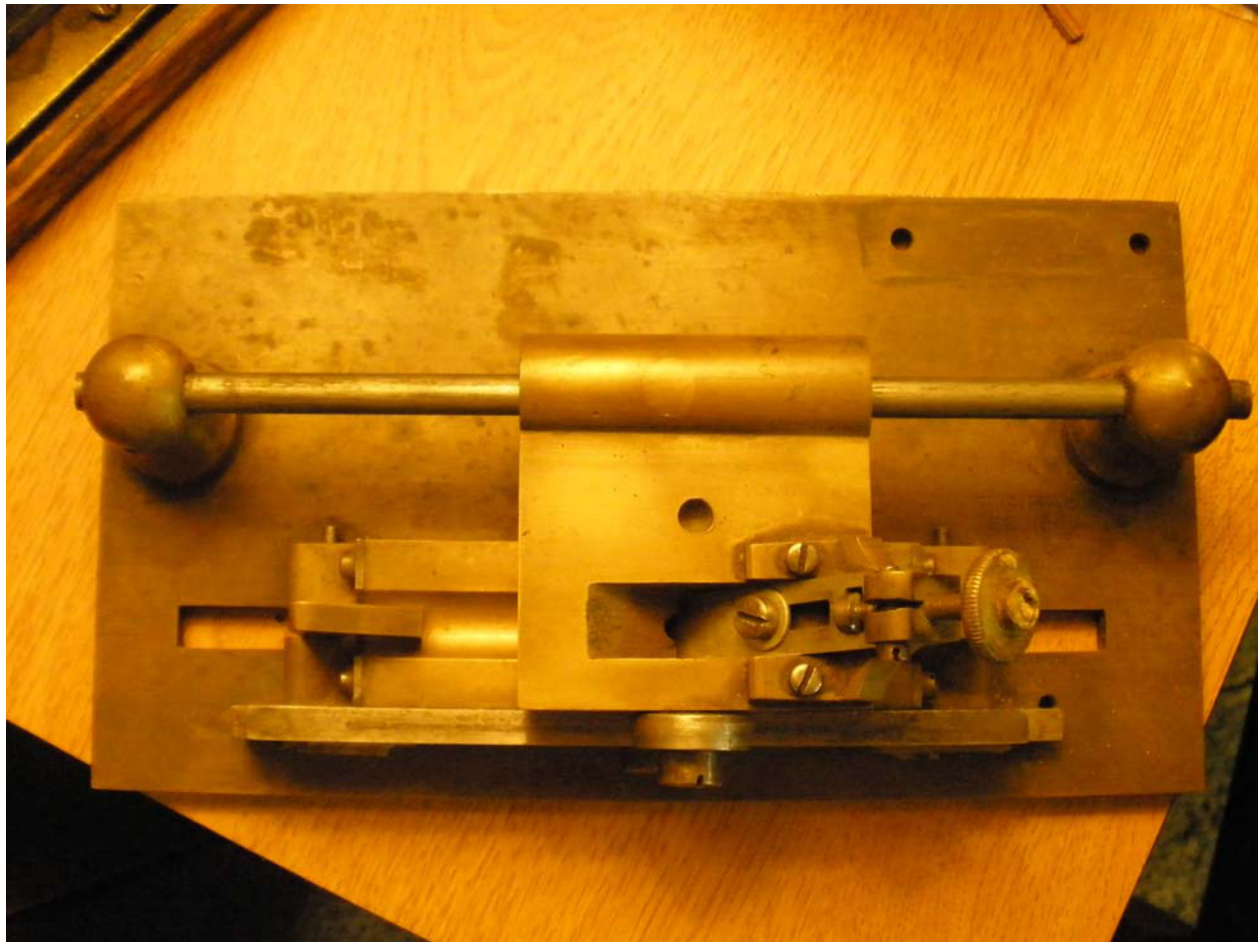


Figure 3: Photograph, Marcel Tabuteau's Giraud English horn gouger.

²¹ Davis, 11,

Upon moving to the U.S, Tabuteau needed a new machine supplier. A mutual friend introduced him to Ernst Graf (1869-1968), an executive at Exide Battery Co., who was also a machine shop expert: “Graf and Tabuteau (with the likely help or advice of Hans Moenig, the Philadelphia based woodwind repairman) designed the Graf gouging machine. It is essentially a copy of the Giraud machine, which itself copies the Triébert machine.”²² Laila Storch, in her new and extensive biography of Tabuteau, *Marcel Tabuteau: How Do You Expect to Play the Oboe If You Can’t Peel a Mushroom?*, suspects that while many oboists, including herself, thought that Tabuteau and Graf had a good relationship, and that Graf enjoyed making the oboe tools needed, Graf was actually very unhappy with Tabuteau. Graf “held to a high standard of precision in finishing the machines. Then Tabuteau in his impatient way would take a file to the guide, insert dimes under the posts, and do anything to get the result he wanted.”²³ Tabuteau was infamous for reshaping the guide and blade of his gouging machines. He was rarely happy with the gouge he had, and sometimes less happy with his reeds. Laila Storch wrote home to her mother, “he’s having an awful time—keeps fiddling with the blade in his gouger. He says he has the worst cane in the country, but if you get the gouger just right, everything is o.k. The gouge is everything, he says.”²⁴ When Tabuteau died he had over forty used blades, some so short from regrounding that they could no longer fit into the machine.²⁵

See the following page for a photograph of Tabuteau working on reeds with his gouging machine in front of him.

Tabuteau was often secretive about his reed making concepts and gouging machines, rarely helping his students in these areas. Some students, however, did learn how to gouge and set up a machine. John Mack (1927-2006), one of Tabuteau’s top Curtis pupils, learned how to set up machines, and continuously worked on his own machines throughout his life. Mack greatly influenced Robin Driscoll, maker of the OpusOne gouger, Valerie Anderson of Jeanné, Inc., and John Ferrillo, maker of the HDR gouger. These machines were not produced until the

²² Ibid., 11-12.

²³ Laila Storch, *Marcel Tabuteau: How Do You Expect to Play the Oboe If You Can’t Peel a Mushroom?*, (Indiana University Press, 2008), 362-363.

²⁴ Storch, 225.

²⁵ Davis, 12.

late twentieth or early twenty-first century; in the second half of the twentieth century quite a few different gouging machines were created and marketed.



*Tabuteau sitting at his desk in the studio scraping on a reed. Photo by Zev Pressman.
Philadelphia Orchestra Archives.*

Figure 4: Photograph, Tabuteau scraping reeds, his gouging machine in front of him. Photo used with permission of Laila Storch. Reproduced from *Marcel Tabuteau* (IUP 2008), 230.

CHAPTER 2

POPULAR AMERICAN GOUGERS

There are two types of gouging machines that are currently, and have previously been, popular. The first is the double radius gouger, in which the “axis of the blade should be slightly offset or displaced from the centerpoint [of the bed] producing an asymmetrical gouge contour.”²⁶ When a piece of cane is gouged, the cane is reversed in the bed several times during the gouging process. This produces an end result where one side of the blade finishes cutting a piece of cane, ideally producing the same curve on both halves of the cane. Figure 5 (on the following page) is an illustration of an asymmetrical blade placement. The “D” represents the distance the blade’s axis is displaced, and the “R” represents “the resulting radius of the gouge on the single direction of a gouge stroke.”²⁷ “R1” is the initial curve put into the cane, and “R2” is the curve put into the opposite side of the cane after the cane is reversed in the bed. The same side of the blade puts this identical curve into both sides of the cane because the cane is reversed.

The second type of machine is known as a symmetrical gouger. The “gouge contours from the centerpoint to each side should be identical. This relationship requires that the centerpoints of the blade and guide also coincide with the center of the gouger bed.”²⁸ The symmetrical gouger is designed to eliminate the reversing of the cane. The blade of this machine must be truly symmetrical in order to keep the finished gouge balanced. As a blade ages with use, the two sides often wear unevenly, creating asymmetry in the finished product. This usually produces an unusable gouge.

²⁶ Ostoich, 28.

²⁷ Ibid., 35.

²⁸ Ibid.

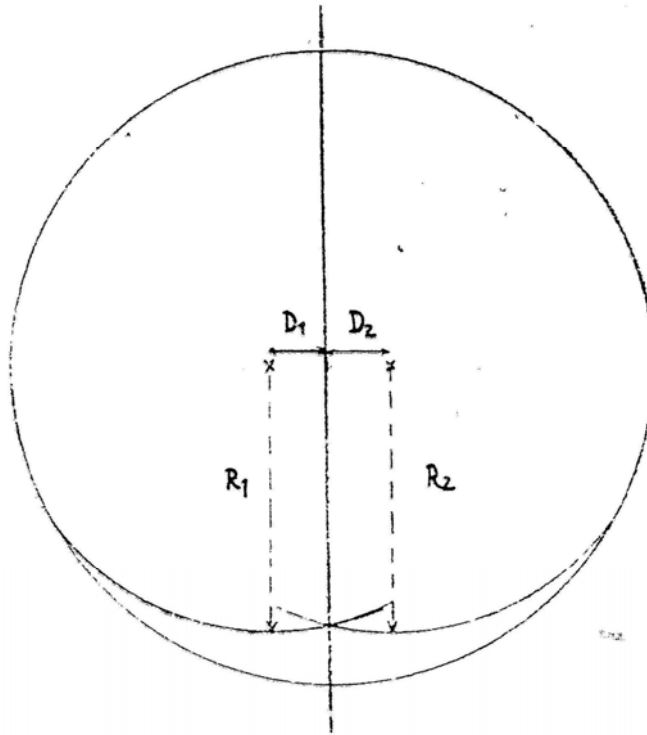


Figure 5: Illustration, Asymmetrical Blade Placement²⁹

The Graf Machine

After World War II, Ernst Graf's son, Robert Graf, Sr. (1907-1988) began making gouging machines as a hobby. He "standardized many things and continuously sought to make improvements."³⁰ His son, Robert Graf, Jr. (b. 1951) continues the production of the gouging machines, and is the current maker of the Graf machine. Graf, Jr. is a stationary engineer, and over the past years has made many improvements to the machine. He began making the base out of aluminum instead of brass to reduce warping. He made jigs to "speed up his production of certain elements of the machine." Graf makes the machines in a shop at his house in New Jersey, and has expanded into making English horn gouging machines, and Baroque oboe

²⁹ Ostoich, 37.

³⁰ Davis, 12.

gouging machines. Graf, however, does not set up the machines. Because he is not an oboist he cannot make reeds; reed making is essential to the set up of the machine. Without making a reed on the machine one cannot know whether the result coming off the machine is good or bad. When a gouging machine is purchased from Graf, it must be sent to an oboist who must finish the set up of the machine.³¹ The Graf machine is a double radius gouger.

The Gilbert Machine

Other well-known makers of gouging machines include Robert (Bob) Daniel Gilbert (1925-2008), who also was not an oboist. After returning from WWII, Gilbert enrolled at the University of the Redlands. There he majored in economics and worked for the band as a copyist. In his final semester he signed up for an import/export class; one of the assignments was to import something. Gilbert connected with the reed supplier, Delacroix, through an ex-Marine in the school band who had met Delacroix while serving in France. Gilbert asked Delacroix to send him some clarinet reeds, and Delacroix responded with 300 reeds and a request for money or a care package. The USC band director bought all of the reeds for his band, and Gilbert made a healthy profit after sending money to Delacroix. Thus began Gilbert's reed/cane business.³²

In 1949 Gilbert began importing gouged and shaped cane for two oboists he knew: Ray Weaver and Frank Desby. In 1952 Gilbert decided to go into the music business full time, founding RDG, Inc. (currently www.rdgwoodwinds.com.) In 1963, someone asked Gilbert for a gouging machine. Frank Desby drew some designs, and he and Gilbert sent those drawings to the Swiss machinist who then made the RDG knives. The machinist modified some of Desby's design, and Gilbert sold those machines under his label for a time. The machines, however, were not reliably made, and shipments of them were even less reliable. Upon hearing of Kunibert Michel, a German machinist and clarinetist known for incredibly precise and perfectionistic work, Gilbert tried working with Michel. Again Gilbert had trouble receiving shipments on a

³¹ Ibid., 12-13.

³² Ibid., 26.

regular basis, ending the venture.³³ In Germany, Michel's oboe gougers are one of the most popular gougers. German reeds are short-scrape reeds, unlike American long-scrape reeds. The German gouger is designed to produce different measurements than gougers for American reeds, making them unusable for American-style players.³⁴

Gilbert was eventually introduced to a machinist in Orange County, Edward Laker. Laker and Desby made some significant changes to the design of the machine in order to make the machine, in their view, more user friendly. "First, they eliminated the possibility of moving the bed. To a machinist, this seems obvious: since one wants the bed parallel to the rod, build it that way and do not let it ever get out of alignment by letting either the bed or the posts move."³⁵ They also changed the bearing and replaced the parallel bars with a wedge that has an oversized screw that is used to adjust the overall thickness of the cane. Most importantly, they designed the knife blade to align in the center of the guide, creating a symmetrical gouge; "then there would be no need to move the bed or the blade once it was centered."³⁶ This creates the ease of use that Desby, and ultimately Gilbert, were after. However, this machine is "not what John Mack calls, 'fully adjustable'. 'Fully adjustable' means that each aspect can be changed independently."³⁷ There are only three adjustments that can be made on the Gilbert machine. There are many more than can be made on the HDR (or any other double radius gouger.)

The Ross Machine

Another American gouger that is somewhat similar to the Gilbert machine is the machine made by Dan Ross. Ross was principal oboist of the Arkansas Symphony for 24 years, and is currently professor of oboe at the Arkansas State University. He founded Ross Woodwind Specialists in 1980. Ross purchased the milling machine, drill press and other machines necessary to make gougers, and he machines each gouger himself. He discussed design ideas

³³ Ibid., 27-28.

³⁴ Ferrillo, Boston University Tanglewood Institute Oboe Workshop, June, 2009.

³⁵ Davis, 31.

³⁶ Ibid.

³⁷ Ibid., 32.

with Richard Kilmer, oboe professor at the Eastman School, and also consulted Paul Klipsch, an engineer at Westinghouse, (and the stereo speaker maker) who is also a “superb machinist.”³⁸ According to Ross’ website, all machines sold today are checked by Ross himself, his son, or his wife.³⁹

The Ross machine is designed to be simple and easy to use, with the fewest adjustments possible: “Mr. Ross seems to have a target of oboist who want to gouge their own cane in order to control their cane supply, but do not want to fuss with a machine.”⁴⁰ The design is even simpler than that of the Gilbert machine. There is a thick aluminum base that resists warping, and a thick rod that prevents bending when the oboist exerts downward pressure on the carriage. The bed is immobile on the Ross machine. The blade, though it can move side to side, is only retractable. When setting up a Ross machine, if the blade is retracted too far it must be taken out and the set-up process restarted. The overall thickness is adjusted by a screw connected to an eccentric roller bearing; the twisting of this large screw adjusts the thickness of the finished piece of cane. Lastly, the nylon clips that hold the cane are set in a way that keeps the blade from making contact with the clips. On other machines it is possible to accidentally nick the blade if the carriage is lifted at the end of a swipe; the “carriage comes up, the cane clip is released, and especially if the spring is strong and quick, it is possible for the blade to hit the brass cane clip.”⁴¹ Doing so would ruin the blade, requiring the purchase and setting of a new one. Ross truly designed this machine to have the smallest amount of adjustments as possible.

The Jeanné Machine

In 1990 Valerie Anderson, a student of John Mack, designed a fully adjustable gouging machine with Mack’s help. After they “de-constructed every available gouging machine to determine what [they] liked best and what additional features were desirable,” Anderson began

³⁸ Ibid, 38.

³⁹ <http://rosswoodwind.com/gougers.htm> (accessed Oct 12, 2009).

⁴⁰ Davis, 39.

⁴¹ Ibid., 40-41.

working on the machine that became the Jeanné gouging machine.⁴² Anderson built a machine that gives the oboist complete control over the gouge. The machine is a double radius gouger. Some of its features, which Anderson lists in the “Equipment Needed for Gouging” chapter in her new book, *Gouge, Shape and Scrape: A Complete Guide to the Oboe Reed*, include: “Adjustment for overall gouge thickness; Blade depth adjustment; Blade side-to-side adjustment; Adjustable bed; Adjustments to level [the] carriage.”⁴³ Anderson herself sets up the machine when a Jeanné gouger is purchased. As an oboist, she can determine how the machine functions best for her, but notes that a gouger should be set up to “accommodate the shaper being used,” and that “the gouge will be greatly affected by changes in humidity and altitude.”⁴⁴ The set up of the machine may be for her preference in Minnesota, but might need some adjustment to create an ideal gouge for an oboist in Florida, who uses a vastly different shape.

The Opus1 Gouger

Robin Driscoll, a student of Mack’s during the 1980s, realized his long-held dream of building his own gouger in 2001. Driscoll purchased the milling machine and lathes needed, and began machining the gougers himself. After manufacturing the gougers, he personally sets up each machine. He sets the blade in the carriage, makes reeds on every machine, and ensures that each machine works correctly. Only then does he send the machine to the purchaser. As of 2010, Driscoll has produced a few hundred machines, and wait time on a new machine often exceeds a year because demand for his machines is so high. His production capability is reduced by the maintenance requests for previously manufactured Opus1 gougers. Driscoll must provide all of the work for new and used gougers, and this creates a problem in servicing orders. He is very aware of this problem. In order to help his customers do more of their own maintenance, he has created a very informative website, <http://www.Opus1gouger.com>. Driscoll has sections on how to sharpen the blade, how to put the blade in the carriage and center it, as well as five different adjustment procedures. While the Opus1 is a double radius gouger, Driscoll has made some

⁴² Valerie Anderson, *Gouge, Shape and Scrape: A Complete Guide to the Oboe Reed*, ([Minnesota?] Jeanné Inc., 2009), vi-vii.

⁴³ Ibid., 78.

⁴⁴ Ibid., 85.

patent pending changes to the machine, making it differ from other double radius gougers. The machine is built on the concept of “ ‘Limited Degrees of Freedom’ . To manipulate a specific measurement of the gouger curve, one only needs to turn a single screw. If the results are not as desired, that same screw is just reversed to undo the changes made.”⁴⁵ There are more adjustment features on the Opus1 than on any other gouger. To change the side thickness, one turns a screw, rather than manipulating the placement of the blade. The bed is semi-moveable; it is “pinned on the left side and rotates around that fixed position.”⁴⁶ The latest updates to the machine, first occurring around 2008, have replaced the center thickness adjustment wheel (similar to the Ross machine) with a cantilever arm. Driscoll also abandoned the blade drive screw and replaced it with a smooth mounting mechanism that Driscoll has not yet (as of 2010) named.⁴⁷ In early 2009 Driscoll posted videos on YouTube (www.youtube.com), including those on how to properly use the machine with the new parts that are not on a traditional machine (such as the HDR), and how to make basic adjustments on the machine.

The HDR Machine

John Ferrillo began designing a gouging machine in the 1990s. The machine was based on both the Graf and the Wohlfeld machines. The Wohlfeld was designed by oboist Eric Barr, and machined by Robert Wohlfeld. In the 1990s Ferrillo gouged exclusively on the Wohlfeld machines because he liked their superior manufacturing. When designing his own gouger Ferrillo knew he would want the same superior craftsmanship in the manufacturing.⁴⁸ He made some improvements and changes to the design, eventually coming out with the machine now known as the HDR machine. The machines are produced at the Maine Tool Room (www.maine-toolroom.com), and Ferrillo sets up each machine personally. A few of his oboe students (including this author) have apprenticed with him, learning to set up these machines, in order to ease his work load. The waiting period to receive a new machine is often six months to a year,

⁴⁵ http://home.comcast.net/~robin.driscoll/overview/overview_1.htm (accessed Oct., 25, 2009.)

⁴⁶ http://home.comcast.net/~robin.driscoll/overview/overview_3.htm (accessed Oct., 25, 2009.)

⁴⁷ <http://home.comcast.net/~robin.driscoll/Design%20Changes/Cantilever%20Arm%20and%20Blade%20Push%201.htm> (accessed Feb. 25, 2010.)

⁴⁸ John Ferrillo, phone interview with author, November 25, 2009.

and turnaround time for a machine that needs a new blade can sometimes exceed a few months. Ferrillo feels that with the number of machines constantly increasing, one person cannot be responsible for the maintenance of all of these machines. It is with this thought in mind that Ferrillo began giving annual Build Your Own Gouger Workshops. Twice a year (depending on his schedule) Ferrillo hosts a two-day workshop in Ayer, MA, where five to six participants build a gouger. Each person shapes the guide on their machine by hand, and then learns to set a blade. Ferrillo provides a copy of his unpublished book on gouger set up to all participants. Each person also receives the necessary tools for adjusting the machine and checking the alignment, which is greatly advantageous to the set up process.

Today most professional oboists in the United States own one or more of the previously listed machines (or one of the few other machines not listed here.) Even as recent as thirty years ago, many oboists, especially younger players, ordered cane from oboe specialty shops. Over the last few decades, though, knowledge of gouging has become an expected skill.

Dr. Eric Ohlsson, Professor of Oboe at the Florida State University, has been teaching oboe students at the university level for just under thirty years. In a recent interview he explained how the teaching of reedmaking has changed.

The approach to teaching reedmaking has changed dramatically over the last thirty years. This is a continuation of the advances made during, say, the fifty years before that. If you were fortunate enough to study with Tabuteau you were ok for reedmaking, I think, but the distribution of first-rate advice on reeds was hard to come by. Also, Tabuteau himself was evolving in his making of reeds. So, by the mid-to-late 1970's there had been lots of advancements in teaching students how to make reeds. There were places that had very large oboe classes—at Ohio State we had eighteen students in the studio. I think there may have been more at Indiana. John Mack was teaching at Cleveland, John deLancie at Curtis, etc. The [oboists] who studied with Tabuteau had higher expectations about students making reeds, using gougers, etc I think. If you hadn't been forced to learn about gougers and reeds, you probably didn't do so. There was a lower expectation because the technology was less available to everyone. If you purchased a Graf gouger and didn't know how to set it up or know where to get help with it, you were probably better off buying your cane already gouged.⁴⁹

By 1980 a greater percentage of oboe students were learning reedmaking skills. The dissemination of this knowledge, by Mack and deLancie and their students, among others, made this possible. With more students making reeds, the next logical step in the reedmaking process became the greater use of gouging machines. Oboe players want to have more control over the

⁴⁹ Eric Ohlsson, email message to author, November 22, 2009.

finished reed, and gouging cane personally provides this control. Supply began to catch up with demand. Around 1980 a number of different gougers became available:

Around this time RDG started selling a gouger (that is still in production today), there was a decent machine sold through Brannen in Chicago, and Dan Ross began making machines. With all this help for reed makers it was easy to get a gouger that helped you make a much better reed. They came already set up and ready to go, and didn't need (or allow) you to mess around with them.⁵⁰

Ohlsson notes that, because of the advances made through the use of a studio or personal gouging machine, “reedmaking became a much less arbitrary craft.”⁵¹ He believes that today, most university level oboe studios probably have one or two (occasionally more) gouging machines, and that all students are expected to know how to use and maintain the machines. The importance of knowing how to use a gouger, expressly owning a gouger, cannot be stressed enough. Ohlsson explains,

I expect my performance majors to purchase a gouger at some point. In reality, most of them should own a gouger. The music education students need to own one, too. They will all be making reeds for themselves and their students... All students who will be actively involved in oboe performance and/or oboe instruction in their careers should own a gouger.”⁵²

If an oboist expects to have any kind of career related to the oboe, owning a gouger is a must. The oboist must decide what kind of machine to buy: one with few adjustments and control, or one that is fully adjustable. After purchasing, the oboist must know how to use, maintain, and ideally, set up the gouger.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Ibid.

CHAPTER 3

UNDERSTANDING YOUR GOUGER

Learning the terminology of the various components of the gouger is the first task one must undertake before adjusting a machine. Some of the terms are quite obvious, while others need more explaining.

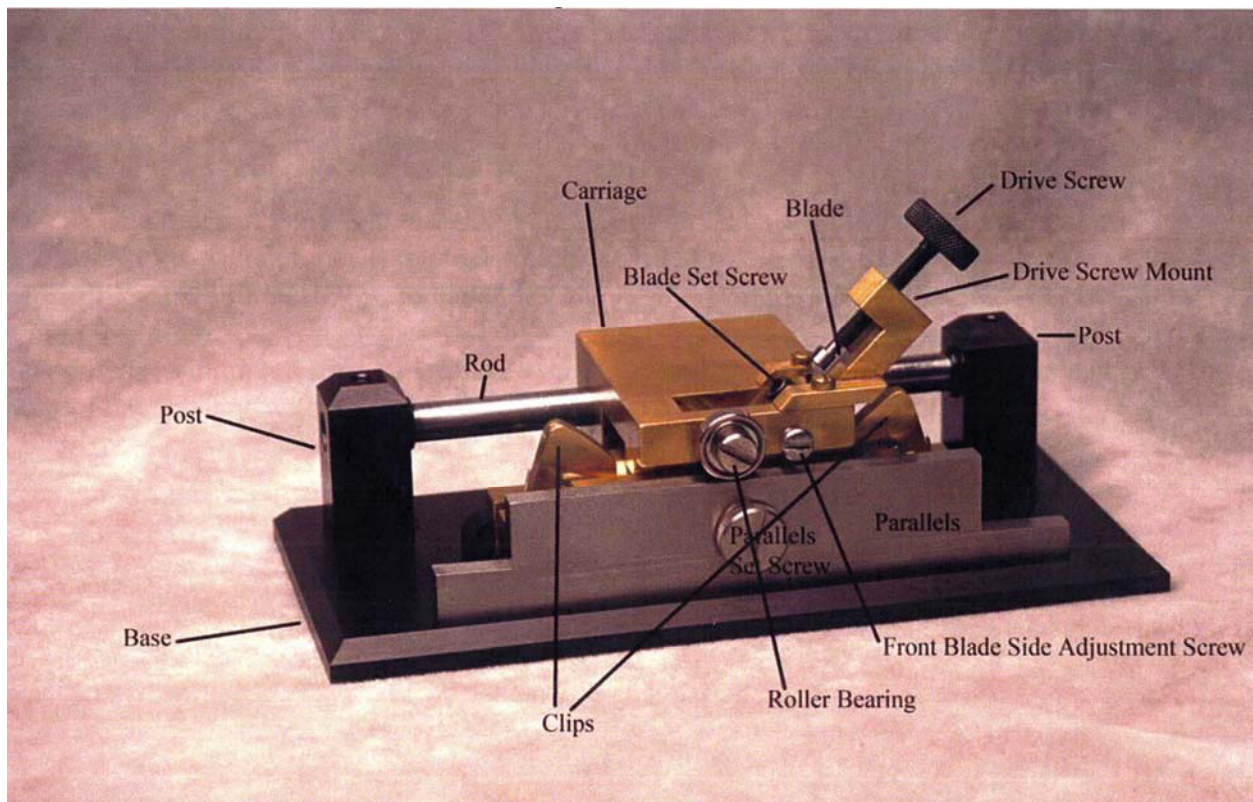


Figure 6: Photograph, labels of various components of the HDR machine. Photo by John Ferrillo

The base of the machine is made of a flat piece of metal (often made of anodized aluminum today) that the rest of the machine is built upon. Two posts attach to the base. A steel rod is mounted between the posts, and the carriage rides along this rod. The drive screw mount is

screwed onto the carriage and the drive screw, or thruster, holds the blade. The blade is extended through the carriage at an angle of approximately forty-five degrees, and protrudes on the underside of the carriage. The blade has a curved, beveled edge which “has traditionally been hand ground but, over the last twenty five years, is frequently cut or ground by machine.”⁵³ The guide is the curved piece of metal on the underside of the carriage in front and back of the blade that helps protect that blade. The carriage runs down the bed of the machine, which cradles the piece of cane while gouging. The cane clips hold down the cane on each end of the bed. The carriage balances on the parallel bars, which sit in front of (but are not attached to) the bed, and adjusts the overall height of the carriage, thus changing the thickness of the gouge.⁵⁴

There are a number of screws on the machine that must be identified. The blade set screw, or blade lock screw, sits on top of and extends through the blade, securing the blade once the ideal placement is reached. The two side adjustment screws are on the sides of the carriage, and allow the blade to move horizontally. One screw sits on the front of the carriage (facing the user) and the other sits opposite, on the back side of the carriage. This screw on the back of the carriage usually “pushes against a long pin inserted through the carriage which pushes, in turn, against the side of the blade.”⁵⁵ On newer machines there is a screw on top of the carriage next to the blade well that locks a plate in place. This plate trues the blade as it extends through the carriage, making sure the blade does not get pushed into a misaligned position by the side adjustment screws (a substantial problem on machines without this function.) On the top side of the base, screwed through a bar that sits parallel to the bed, are the bed adjustment screws. The large screw between the parallel bars, the parallel set screw, locks the parallels into place, securing the overall thickness of the gouge. On the bottom of the bed there are two hex screws that secure the posts, and two flathead screws that secure the placement of the bed.

⁵³ Ferrillo, unpublished gouger handbook, 4.

⁵⁴ Ibid., 4-6.

⁵⁵ Ibid., 5.

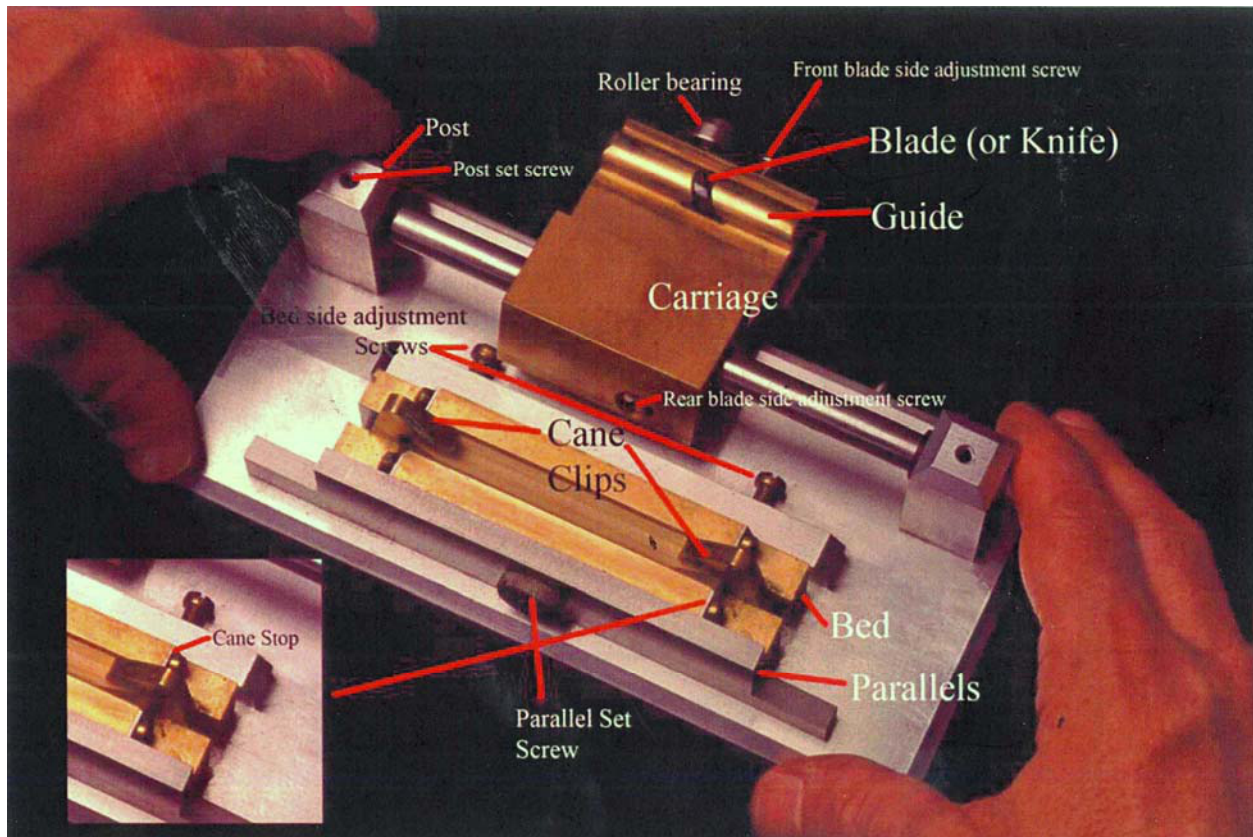


Figure 7: Photograph, various labels on the machine. Photo courtesy by John Ferrillo

When ready to gouge, one should place the gouger in one's lap, ideally on a towel that spans both legs and tucks under the outside of the legs. The gouger should sit lengthwise on the towel with the parallels facing the body and the carriage opening away from the person. One lifts the carriage from the center of the rod in order to expose the bed. It cannot be emphasized enough that the carriage *must* always be lifted and lowered from its position in the center of the bed. If lifted while at either end of the rod, the clips at each end of the bed will spring back to the bed with great force, resulting in nicking the soft brass bed, and possibly catching the blade, which will *ruin* it.

Once the carriage is open, place a piece of pre-gouged cane in the bed by either gently lifting the clip on the left, or by sliding the piece of cane under the left clip. Finish by lifting the right clip and placing it gently on the right end of the cane. Make sure the cane is completely centered in the bed. Place the carriage down onto the cane *in the center* of the bed. Remember,

if one brings the carriage down on either end, the guide will hit the clips, nicking the soft brass of the guide. With the carriage in the center of the bed, lightly slide the carriage to the end of the rod on the right side. With a very gentle and slightly downward pressure, move the carriage across the cane to the left in a fluid motion. When the carriage reaches the end of the rod on the left side, clean out the cane chip from the blade well. Without lifting the carriage, but removing the downward pressure, move it back to the right end of the rod. Continue this motion until six swipes have been completed. Lift the carriage (from the center) and reverse the cane in the bed by moving the end under the right cane clip to the left cane clip, and the left end to the right. Complete six more swipes, and again reverse the cane. Continue this process until the carriage moves freely and no more cane can be removed. On the final reverse of the cane one should remove a narrow sliver of cane, called the offset. This occurs because the carriage moves down the bed slightly off center, and cuts very slightly on the rod side. The asymmetry in this gouge is known as the double radius gouge because of the two overlapping diameters cut into the cane, as illustrated in Figure 5 on page 11. By flipping the cane each side of the cane is finished by the same half of the blade. In a symmetrical gouge the blade is manufactured as an identical curve on both sides of the blade. If the blade is not truly symmetrical, or if the blade wears unevenly over time, the gouge becomes unbalanced, creating problems in the finished reed. The double radius gouge tries to remedy this by having only one side of the blade (the side closer to the rod) truly creating the finished curve.⁵⁶

⁵⁶ Ibid., 19.

CHAPTER 4

CANE SELECTION AND PREPARATION

There is a computer saying coined by George Fuechsel, that refers to the fact that a bad end product is a result of the wrong information put into the computer in the first place: Garbage In, Garbage Out. “If you input the wrong data, the results will also be wrong.”⁵⁷ This idea holds true with the oboe gouger. If the cane going into the gouger is not of a strict, high quality, the end result, no matter how good the gouge, will be poor. In the 1961 book, *The Art of Oboe Playing*, Robert Sprenkle describes the importance of cane selection, and discusses the fact that cane is a natural substance: “Little control can be exercised over this natural growth. Thorough, careful selection of cane is therefore of utmost importance, because cane is usable only within limits... In some instances the cane will be unusable.”⁵⁸ While setting up the machine one can use cane that is not one-hundred percent ideal, but when looking for the finished product, the cane must be straight in length, not swaybacked (where both ends on the bark side touch a flat surface and the middle is lifted, producing a gap,) and should not be too soft (or too hard!).

Soft cane is often grainy and rubbery. The inside of the pre-gouged cane is often springy, which does not gouge well. On a soft piece of cane the guide will depress the fibers of the cane because they are so pliable. The blade then cannot remove the cane that needs to be cut away. Often, when one attempts to gouge a soft piece of cane, the cane never seems to finishing gouging. Each swipe removes a few wisps of cane, seemingly endlessly. Discard these soft piece of cane. Alternately, hard pieces of cane that are brittle and crack easily should not be used. These pieces gouge well, but even when fully soaked, these piece tend to crack when folded in half to shape, or do not scrape well under the knife. It is often difficult to get a hard, brittle piece of cane to vibrate well as a finished reed. For these reasons, avoid pieces of came deemed very soft or very hard.

Pre-gouging is very important; it involves the cane selection, guillotining the piece to the appropriate length, and removing excess cane before placing the piece in the gouger bed. To begin, split a tube of cane and look first for an ideal radius. After splitting that ideal piece by

⁵⁷ <http://www.wisegeek.com/what-is-garbage-in-garbage-out.htm> (accessed June 17, 2009).

⁵⁸ Robert Sprenkle, *The Art of Oboe Playing*, (Evanston, IL: Summy-Bichard Publishing Co.: 1961), 48.

hand with a razor blade, check the piece for straightness and curve along something with a truly flat edge, either a sharpening stone, or the side of a radius gauge. If the piece is swaybacked, discard that piece. When gouged and folded in half the swaybacked nature of the cane will cause the opening of the reed to pull apart, creating loose sides. If a piece of cane is slightly bowed, where the center touches and the two ends lift off the edge in a gentle U shape, one can try gouging. If the U shape is too pronounced the cane will pop out of the bed while gouging; if it stays in the bed, then it should gouge properly, but it might create a more closed reed.

Look for cane that has no irregular grooves on the bark side. Ideally the cane should have a strong density, and should not twist or bend easily. When choosing a section of cane that will become the piece placed in the gouger, one can guillotine off both ends if needed, or choose one end to use. If one end of the piece is chosen, it is best to cut off a few millimeters on that end in order to create a clean surface on the very end of the cane. Sometimes the cane, especially on the bark side, can fray; it is very important to get rid of those types of imperfections.

The next step of removing excess cane, often called pre-gouging alone, is the most important step. It not only saves the life of the gouger blade by taking off excess cane before going into the gouger, but also takes the width down to a specific 8mm across the flat side of the cane. This is best done with a planer, not a fillier, or push-through pre-gouger. The fillier is a much more rudimentary pre-gouger; a planer takes off excess cane in a more controlled manner. Ferrillo believes this early step influences the final product, the reed.⁵⁹ If the cane is too wide coming out of the planer one can simply raise the bottom of the planer bed by placing a piece (or two, three, etc.) of scotch tape along the length of the bed until the final product coming out of the planer is 8mm across. This preparatory work can be done with dry cane. The cane used in the HDR gouger, as well as the OpusOne and Graf gougers, must be planed to only 8mm wide on the flat side. A width wider than that interferes with the guide's ability to hold the cane in place, and the carriage cannot finish cutting the gouge. The bed on the HDR machine is machined to an 11mm radius, therefore cane of the 10-10.5mm diameter range is best, 10.25 being ideal.

Before gouging one must soak the cane. Depending on the climate and season, thirty to forty-five minutes in hot water is best. Over-soaking the cane creates a false result: the fibers of

⁵⁹ Ferrillo, BUTI Oboe Workshop, 2009.

the cane can take in too much water and become too bulky. As a result, more cane is gouged off. When the cane dries out and the fibers return to their normal size the overall thickness of the gouge shrinks, leaving an end product that is too thin.

Before placing a piece of cane in the bed to gouge, it is best to take off the 4 corners of the cane, creating a triangular shape on each end of the cane. This eases the blade into the piece of cane during gouging, saving wear and tear on the fragile, short-lived blades.⁶⁰

⁶⁰ Ferrillo, personal lessons, 2005-2007.

CHAPTER 5

WORKING ON YOUR OWN MACHINE

There is certain equipment one must have to best work on a gouger. The basic tools include a size 0.9mm allen wrench, or an allen key with various sizes on it, and a flat-head screwdriver in a medium size. With these two tools one can take the blade in and out of the machine, position the blade, and align the bed. An additional tool one needs to check the bed alignment is an alignment jig. To sharpen a blade one needs an EZE Lap diamond stone (of any grit) in the 3"x8" size, and emery paper in varying grits. See Appendix A for a list of where tools and supplies can be purchased

A gouger blade usually needs sharpening after six to twelve months of use, depending on the frequency of use. It is difficult to predict the life expectancy of a blade, other than that it is very short, or "shockingly brief."⁶¹ To sharpen the blade one goes through a series of steps: remove the blade, sharpen, check the alignment of the bed and align if needed, reinsert the blade and adjust.

Sharpening the Blade

Unscrew the blade lock screw on top of the blade and remove the screw and washers in order to remove the blade. Loosen one of the side-adjustment screws one half turn and this will loosen the blade. Retract the blade until it is almost at the top of the drive screw, and carefully lift it out of the blade well without the blade edges touching anything. Place the blade on the table with the longer side facing up. This ensures the cutting edge does not contact the table or anything else it should not touch. The curved end of the longer side is the cutting edge of the blade. A used blade will have a dull crescent shape on the very end of the curve, a visual clue that the blade needs sharpening.

⁶¹ Ferrillo, unpublished gouger handbook, 28.



Figure 8: Photograph, worn blades. Photo by John Ferrillo

Emery paper produces the finest edge when sharpening a blade. The Norton company is probably the most prominent maker of emery paper. The paper comes in varying grits. For blade polishing the needed grits are 2/0, 3/0, and 4/0, which are placed in order of increasing smoothness. There are also Japanese papers that have ceramic coatings that are extremely smooth and “these put a very fine finish on one’s blade.”⁶² A blade usually needs only the 4/0 and the Japanese paper, though the 4/0 alone can polish the blade. A heavily used blade might possibly need to go through the 2/0 to 3/0 to 4/0 (finishing with the Japanese paper if one has it.) This author receives the Japanese paper directly from Ferrillo, and he has said it is very difficult, if almost impossible, to find online. It is only available, as far as he knows, in the Japanese

⁶² Ibid., 21.

department store Tokyu Hands.⁶³ When using the rougher paper, however, one risks changing the shape of the blade's curve, which is undesirable.

The motion used to sharpen the blade is the same on every paper. Place a sheet of emery paper that is approximately the 3"x8" size of the diamond stone upon the stone. The blade needs sharpening on the curved edge, so a "U" shape curve is made on the paper. Start on one corner of the blade and, in a fluid motion, follow the edge of the curve around to the other corner. This will create the U shape on the paper. Make sure to "travel only in one direction: one tends to change the attitude of the blade when traveling in the opposite direction."⁶⁴ See Appendix A on page 60 for multiple photographs showing the direction and angle used to sharpen the blade.



Figure 9: Photograph, U shape needed for sharpening a blade

It is extremely important that the edge of the curve maintains contact with the paper over the entire curve. And yet, the edge cannot be pressed too aggressively into the paper. In order to find the true edge one can very lightly lift the blade up and down in the center of the blade to feel

⁶³ Ferrillo, interview.

⁶⁴ Ferrillo, unpublished gouger handbook., 23.

the difference between being too far back, where the blade does not sharpen, or too far forward, where the edge of the blade aggressively cuts into the paper. It cannot be stressed enough that the angle of the blade should not be too high. This rounds the end of the blade, taking off the cutting edge and ruining the blade. One should err on the side of having a sharpening angle that is too low. If the blade is sharpened at an angle that is far too low the blade will not sharpen and one will know to go through the motions again at a slightly higher angle. After six or eight sweeps on the curve, place the blade flat on the paper with the longer side down, and rub the blade lengthwise a few times on the paper to take off any burr that might begin building up on the blade. Repeat the entire process, first sharpening the beveled side followed by the flat side, a few times on each paper, always moving upward in grit. As the blade progresses through the papers the crescent shape on the flat side of the blade should fade. After finishing with the 4/0 or the Japanese paper the blade needs to have a mirror finish on the flat side all the way to the end of the blade.⁶⁵

A used blade should only be resharpened once. Additional sharpenings could possibly alter the curve of the blade, mismatching the blade to the guide, creating problems in the gouge. Also, note that sometimes a blade does not resharpen well enough to create a usable gouge. When this occurs a new blade should be placed in the machine, rather than wasting excess time and usable cane on a blade that will not produce a functioning gouge.

⁶⁵ Ferrillo, Build Your Own Gouger Workshop, 2005.

CHAPTER 6

ALIGNING THE GOUGING MACHINE

Before placing the blade into the carriage one must check that the bed is aligned with the rod. The use of an alignment jig is necessary for making the most accurate adjustment of this sensitive area. To attach the alignment jig one must unscrew the drive screw mount and remove it from the top of the carriage. Next, place the alignment jig through the blade well and, with a washer (from the blade lock screw,) use one of the drive screw mount's screws to secure the alignment jig. The needle of the jig, which measures through its vertical movements, must descend through the opening in the carriage where the blade usually sits. When the carriage is closed the needle of the jig will be raised from its contact with the bed. One must make sure the needle of the jig is on one side of bed, and not directly running down the center of the bed. Both sides of the bed must be tested and the results compared. Ideally, the needle will run parallel on both sides of the bed, neither rising nor falling, meaning the bed is parallel to the rod.

See the following two pages for a photograph of an alignment jig, and a photograph of the alignment jig on a gouging machine.

When testing the alignment the jig should be read in one direction only: the jig should move left to right, or right to left, for both sides of the bed. Record the results after deciding in which direction to move the carriage. It is very important to test in one direction only on both sides of the bed in order to correctly interpret the results. As stated, if the needle of the jig rides without rising or falling on both sides of the bed, the bed is in parallel. If the bed is out of parallel, the needle will usually rise on one side of the bed and fall on the other when traveling in the same direction. The jig measures in hundredths of a millimeter, and the pointer on the clock-like front of the jig will show how many hundredths the extended needle rises or falls. A tolerance of just less than one-hundredth of a millimeter difference between the two sides is acceptable. If the needle movement is greater than that, one must align the bed. There are a few possible reasons why an initial reading might not come out parallel.



Figure 10: Photograph, an alignment jig. Photo by John Ferrillo



Figure 11: Photograph, an alignment jig on a machine. Photo by John Ferrillo

Before moving the bed one must check that all screws are tight. Make sure the posts are not moving at all (screws are located on the bottom of the machine and on top of the posts). If the posts are moving even a very slight amount—something the eye cannot discern—the bed might appear to be out of alignment. Once it is determined that all the screws are tightly locked, make sure the parallel bars are marked with a solid vertical pencil line. This allows one to realign the bars to roughly the same position when putting them back on. Next, remove the parallel bars by loosening the parallel set screw just enough to slide the bars out. Make sure there are no excess oil spots or cane shavings on the bars. This author has set up a machine that was so drenched in oil (not atop the parallel bars, but between and under them) that the bed appeared to be two hundredths of a millimeter out of alignment when, in reality, the bed was perfectly aligned after cleaning the excess oil off of the bars and the base of the machine. After the bars and the base are cleaned with a towel, the bars should be placed back on the machine. In doing so, the pencil marks must be realigned, the parallel set screw tightened, and the alignment rechecked.

It is very important to make sure the parallel bars are not set too low, especially if the pencil marks rubbed off, or if one forgot to draw a line before beginning the process. Err on the side of sliding the wider part of the lower bar under the top bar. The initial gouge may come out too thick, but if the bars are too low the blade can run into the cane stop at the end of the bed and ruin the blade.

If, after checking these other areas, the bed is still slightly misaligned, it must be moved from its current position. First, determine which direction the bed must move. Analyze what the needle of the jig does on both sides of the bed, referred to as 1) away from the rod side, and 2) on the rod side. Next, determine where the needle of the jig sinks and where it rises. Most likely it will rise on one side and fall on the other. Less common is a rising or falling action on one side, paired with an identical reading on the other.

Rising Away From the Rod, Falling on the Rod Side

Assume the jig is read from right to left when the parallel bars face the user. When the measurements indicate the needle rises away from the rod, and falls on the rod side, the bed is slightly misaligned with the left end of the bed closer to the rod. This occurs because the bed

pushes the needle higher on the side away from the rod as the needle travels a straight line. To correct this the left bed adjustment must be screwed in the equivalent of about one minute on a clock (on a very small screw that is a very small amount.) The left bed adjustment screw is determined with the parallel bars facing the user. Therefore, the left screw is the one at the end of the bed where the carriage finishes its cutting action.

Falling Away from the Rod, Rising on the Rod Side

To correct a bed that is misaligned with the right end of the bed closer to the rod, the right bed adjustment screw must be tightened, most likely, by one minute (remember, if the screw is akin to a clock face, one minute is a very small movement.)

How To Move the Bed

Before moving the bed, make sure that the two bed adjustment screws on the rod side of the bed are touching the bed. Do *not* screw them in tightly. Loosen them a small amount, and then screw them clockwise until they just stop moving. Next, place a pencil mark on the base where the screws are currently aligned. It is helpful to mark the entire size of the screw slot on both sides of the slot, not just one thin line. One can much more easily see how far the screw has turned when the entire slot has been marked. This action ensures one knows the position of the screws before they are moved. The bed will be moved by tightening or loosening one of the bed adjustment screws a small amount, usually about one minute.

Once the screws are touching the bed and their placement is marked, open the carriage and hold the bed firmly by placing one's fingertips in the bed with the base of the machine anchored in the palm of one's hand. Place a heavy amount of pressure on the bed that pushes the bed downward and in the direction of the rod. Without this pressure the bed can easily move grossly out of adjustment. Flip the machine over and loosen the bed lock screws no more than one half-turn. Next, the bed adjustment screw that was determined earlier needs tightening by no more than one minute. For a visual reference, one minute is about equivalent to turning the screw one half of the width of the pencil mark made earlier. On the very rare occasion that the bed measures two (or more) hundredths of a millimeter off, one may need to tighten the bed

adjustment screw with a movement of two minutes or more. After tightening the bed adjustment screw the proper amount, make sure the bed is *firmly* pressed against both of those screws. Flip the machine over and thoroughly tighten the bed lock screws. Test the bed's alignment again. If more movement in the same direction is needed, repeat the process again.

If the bed moved too far, and the opposite result is achieved versus the first reading, one has gone too far. If this is the case, literally undo the adjustment just performed. After loosening the bed lock screws this time, loosen the screw previously tightened, about half the amount it moved before. If one continues to only tighten the bed adjustment screws, and makes multiple adjustments in one direction, one will end up moving the bed too far in the direction it is moving. This creates either too much offset, creating thin sides, or no offset at all, depending on the direction in which the bed moves. This is why adjusting the bed must be a push/pull process with the adjustment screws.

After every move strongly lock the bed in place and check the alignment again. Repeat this process until the bed is in alignment. Note that this can take a frustratingly-long amount of time, and can be a multi-trial process. It can also take just one or two adjustments. There is absolutely some luck involved in putting the bed perfectly parallel to the rod.

Next, replace the drive screw mount on top of the carriage and make certain that the screws are thoroughly tightened on each side.

Shimming the bed

On some machines, mostly older ones, the alignment jig will sometimes appear to rise evenly on both sides in the same direction. This most likely means that the parallel bars slope slightly toward one end and a small shim is needed under the end measuring lower to prop it up. Shims are usually made of shimming steel, but can be made of many metals. If one suspects that the bed needs a shim, it is best to contact a gouger-repair technician and have them assess the problem. See Appendix B for a list of recommended repair technicians and their contact information.

CHAPTER 7

PLACING THE BLADE IN THE GOUGING MACHINE

When the bed is aligned correctly it is time to place the blade back in the machine. The tools needed are the same tools used to take out the blade earlier: a 0.9mm allen wrench and a medium sized flat head screwdriver. A bright desk lamp is also needed for proper illumination. Use a white background (piece of paper) against which you can sight the blade. “Test cane” is needed at this point. This cane is accumulated from the pieces that are not quite good enough for reed making; these are pieces that are not quite straight, have some convexness on the bark side (swayback), or are dissimilar in diameter from end to end. Larger diameter pieces are best used in the beginning to see how the machine is cutting. It helps to mark pieces 75, for 10.75, or 11, for 11-diameter cane. Pieces that are swaybacked (when held against a flat surface on the bark side the two ends touch but the outer bark is lifted off the surface) mark with an SW, or another identifying mark. When a swaybacked piece comes out of the soaking water to gouge, bend it slightly to reduce (or get rid of) the swayback. Once it loses its convex curve it is ready for gouging. It is also beneficial to have some good pieces of cane marked as well, to use as the final testing pieces. Once the machine is cutting well with good measurements it is time to make a reed from a good piece of cane, not a test piece. The results from a straight piece of cane will offer a much more accurate representation of what the gouger is doing.

A brief review of the screws at this point will help speed up the process. The blade lock screw is on top of the blade and locks the blade in place. The side adjustment screws are on the side of the carriage and push the blade from side to side. By tightening the screw on the rod side the blade moves away from the rod; tightening the screw on the side away from the rod moves the blade toward the rod. The plate lock screw on top of the carriage locks in place the plate that rests against the blade. This screw and plate must be loose to make side adjustments.

Before putting the blade in the machine, put the test cane in warm to hot water to soak. Ideally the cane should be in the water about thirty minutes. This is the amount of time it usually takes to center the blade, or slightly less when one begins to feel more skilled with the process. Cane will easily waterlog—do not soak it longer than one hour!⁶⁶

⁶⁶ Ferrillo, personal lessons, 2005-2007.

With the carriage closed, carefully place the blade in the blade well with the longer side of the blade facing up. The very first time this author took a blade out and put it back in, the author kept placing the blade upside-down and could not figure out why it would not fit correctly! Take care to avoid scraping the end of the blade on the walls of the gouger bed. Attach the blade to the thruster and thread it down far enough to insert the blade lock screw. Make sure the washers that were under the blade lock screw when it was taken off are used again. There should be one or two washers (depending on how many were there originally) between the blade lock screw and the blade. The washers distribute the pressure of the screw over a greater area. Do *not* lower the blade past the point where the blade lock screw can be inserted. If one tries to lower the blade so it protrudes out of the bottom of the carriage a small amount, or is flush with the opening, the blade will push farther down and show too much when the blade lock screw is tightened. When the blade protrudes too far it can catch on the cane stop at the end of the bed, or if showing a great amount, could even touch the bed. Remember, the blade should not touch anything except the cane!

After tightening the blade lock screw to the point that it touches the blade, but is not fully tightened, make sure both side adjustment screws are touching the blade. If only one was loosened when the blade was taken out, tighten that same screw to bring it close to its original placement. Now, flip the carriage open and sight down the guide. To sight the blade look down the front guide toward the back guide. There should be no blade showing at this point. Slowly begin to expose the blade while sighting down the carriage. It is often easiest to hold the machine with the right hand fingers in the bed and the right palm under the machine, and the left hand supporting both the machine and the open carriage. Robin Driscoll suggests looking down “the front guide in the same fashion you would if you were aiming a rifle.”⁶⁷ It can be difficult to sight the blade the first time one looks down the guide. Make sure the light is strong enough and the background being used is white. If one has trouble seeing the blade tilt the machine up so only the front end of the guide is visible. Very slowly lower the machine until the length of the guide comes into sight. The crescent of the blade should just be visible, or if the blade is not showing, the line that is the back guide will be seen. Get used to sighting the blade front to back. To make sure one is truly sighting down the middle, slightly move the gouger to the right and

⁶⁷ Robin Driscoll, “Sharpening your own Opus1 Gouger Blade,” pdf from <http://home.comcast.net/~robin.driscoll/index.htm> (accessed July 25, 2009), 5.

left, taking note of where the center lies. When turned too far in one direction one will have a distorted view of the blade. Get used to eyeing the blade so that it can be adjusted properly.

When the blade barely begins to show (a small sliver of crescent,) tighten down the blade lock screw. The blade may now protrude farther than originally seen. If this is the case, loosen the blade lock screw and retract the blade a small amount. When moving the blade, it is best to loosen the blade lock screw, then tighten it just to the point that it touches the blade, and then make the adjustment. This keeps the blade from floating freely, and makes more controlled movements.⁶⁸ Also, make sure that both side adjustment screws touch the blade, aiding the blade lock screw in holding the blade in place. The highest point of the blade should be visible in the center of the guide and should reduce evenly on both the left and the right sides. Adjust the side screws to center the blade. If a large amount of movement is needed, as sometimes happens just after inserting a blade, tighten the screw on the side the blade needs to move away from, and slightly loosen the screw on the side that the blade needs to move toward. When the blade is close to being centered and minimal movements are needed, make minimal changes with the screws. If the blade needs to move away from the rod, tighten the screw on the rod side approximately one minute. When the blade needs to move an even smaller amount it is best to loosen the screw a minute or less on the side the blade needs to move toward. Both screws need to firmly touch the blade. Remember, the side adjustment screws help hold the blade in place, in addition to the blade lock screw on top.

There are two ways to change the blade exposure. After loosening the blade lock screw, open the carriage. Sight down the guide and thread the blade screw in the direction needed while watching the blade to see how far it has moved. This method is problematic in that only a miniscule movement of the blade is usually needed. In order to visually notice a difference in blade placement usually means that the blade has moved too far. There is another method that usually produces better results. Before loosening the blade lock screw, tighten the thruster in the direction the blade needs to move. Loosen and then retighten the blade lock screw. The pressure placed on the blade before the lock screw is loosened creates enough push or pull to move the blade a tiny amount when that screw is undone. One can make controlled movements of the blade this way. Check before and after each tightening to assess whether the blade needs more movement. Learning how much pressure to put on the thruster also takes some experience. Do

⁶⁸ Ibid., 4.

not turn it as far as possible. It usually takes just a small turn (again, about one minute) past the point where the thruster stops.

Once it looks as if the blade is centered it is time to gouge a test piece of cane. Remember, cane should soak for about thirty minutes in hot water, and no longer than one hour. If it soaks longer than this, the cane will be waterlogged and will give inaccurate readings.

CHAPTER 8

NOW YOU ARE READY TO GOUGE

The cutting action of the machine is the first evaluation one must make. Does the machine remove cane easily without shredding the cane? Is the cutting action too light, or too aggressive? That is, does the cane come off the machine as little shavings instead of one piece, or if it is one piece, is that piece too thick, measuring over .06mm? Gouge a piece of cane in one direction until the blade no longer removes cane (do not reverse it at all). The shavings must be clean through the blade's final cut. If the shavings come off in a shredding manner the machine is not cutting well, and more blade needs to be exposed. Shavings that are too thick correlate to the sides of the finished gouge being too thin; therefore the blade must be retracted. One can measure the actual shavings coming off of the cane, though some people do not regard that measurement at all. Driscoll suggests that the cane shavings should be approximately .05mm thick, with a range from .04mm to .06mm.⁶⁹ Ferrillo does not use this test at all, but for someone just starting to work on gougers, measuring the shavings can provide a guideline. Make sure that the test cane used is no smaller than 10mm in diameter, and no larger than 11mm, though it is best on the HDR machine to not use cane larger than 10.75mm in diameter. It is also extremely important that the cane be no wider than 8mm across the planed flat front; "if the cane is wider than 8.0mm, the gouger will need to cut more deeply into the cane to arrive at the proper center measurement. You are now bringing into play more of the sides of the guide and blade than necessary and undesirable results are likely. If the cane is too narrow [less than 7.75mm across,] you may not have a proper width to fit your shaper."⁷⁰

⁶⁹ Driscoll, http://home.comcast.net/~robin.driscoll/procedures/blade-positioning/3_align_step_1.htm (accessed July 25, 2009).

⁷⁰ Driscoll, http://home.comcast.net/~robin.driscoll/procedures/blade-positioning/2_align_tools.htm (accessed July 25, 2009).

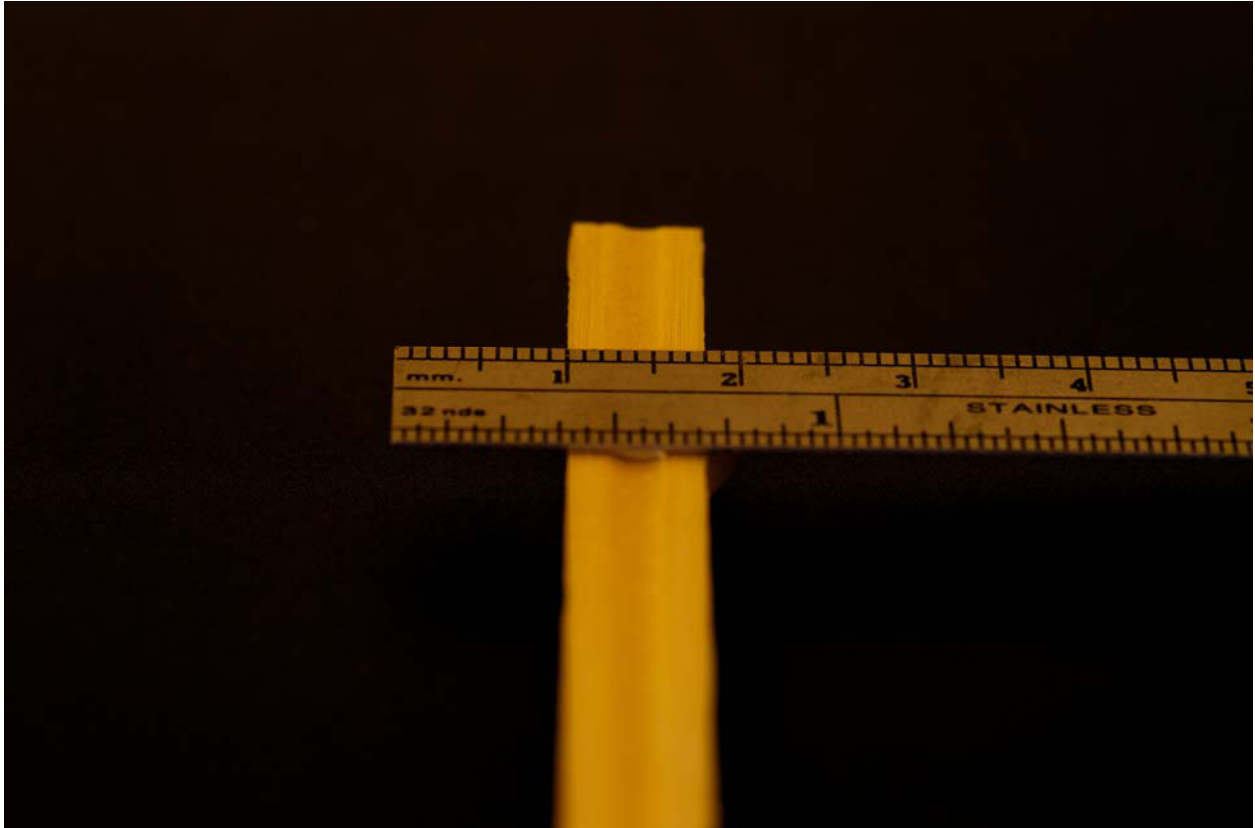


Figure 12: Photograph, proper cane width: 8mm across the planed side. Photo by Dylan Farnsworth

Most likely, the blade will need some adjustment to the exposure once the gouging of test cane begins. As previously mentioned, when first testing a machine, gouge the piece cane in one direction until the blade no longer removes cane. This helps quicken the set-up process, and helps determine the size and location of the offset ribbon. This offset ribbon is the distance the blade is offset from the bed. The ribbon is usually approximately 1mm wide, though the size of the offset varies from machine to machine. Once the machine cuts well while removing cane in one direction, proceed with reversing the cane and take the offset swipe. Make sure to look down into the blade well. Take notice from which side of the cane the offset is removed. The offset should occur on the rod side. If the blade is placed too far away from the rod the offset will occur on the side away from the rod. If this happens, the next obvious step is to move the blade closer to the rod. Loosen the rod side adjustments screw one minute, and tighten the

screw on the side away from the rod. Both actions, together, usually move the blade significantly enough to move it onto the rod side.

A proper placement of the blade will allow the offset to occur on the rod side, and the offset swipe(s) need to produce just one or two ribbons of cane. Sometimes more ribbons shave off, and there are a few reasons why cane is still removed on a third, or further, swipes. First, make sure the cane is truly finished gouging in the first direction before reversing it for the final cut. If the blade has not removed all of the cane in that first direction, excess cane will sometimes be removed from the reversed side. Second, the blade might possibly be placed too far to one side. When this happens, the blade continues to remove multiple wisps of cane, and the blade never seems to finish cutting. This absolutely means the blade is placed too far from the center. Move the blade away from the side where the wisps occur.

Again, this process can be very time consuming. The most important point to remember is that the blade should be aligned and centered to the guide. When one is unsure of the next step, spend some time away from the machine! Come back later and reassess the problems. Make sure the blade is centered with the guide, and that the highest point of the blade is visible in that center, and that the blade reduces evenly on each side.

When the blade is fairly centered and the offset is removed in one or two swipes, it is time to fold, shape, and measure the cane. With a clean, but not too aggressive cutting action, the center of the gouge should measure very close to .60mm. Unless the parallel bars were moved a great deal when cleaned, the parallels should be in approximately the same position as they were prior to changing the blade. If the center measurement of the finished gouge is grossly off, adjust the parallels so the cane measures .60mm. Though the center measurements can range from .59mm to .61mm, .60mm is usually the best starting point. Once a piece of cane measures correctly, one can then fold and shape it. There are a few more measurements to take that help determine whether or not the blade is centered correctly.

CHAPTER 9

TESTING A PIECE OF GOUGED CANE

Folding Cane

When folding cane in half to create the two halves of the reed, the cane should be folded over one's index finger. Do not first score the center of the cane with a knife on an easel (a popular tool used for just that purpose.) The cane should be folded over the finger because it can help indicate both the strength of the gouge, which influences the roundness of the reed opening, and whether or not the gouge is wildly off-balance. When folding the cane, create a round arch in the middle of the cane, bringing the two ends of the piece together. Lightly press together the two sides of the cane near the rounded center until the cane creases. If the gouge is too thin the cane will crease and fold immediately upon bending. If the gouge is too thick, the cane will resist folding, and/or the bark along the top, at the crease, will split open. Ideally, the cane should have some resistance to folding, but with a small amount of pressure it should fold cleanly and in a straight line. The length of both sides of the piece must meet evenly, rather than the cane folding on a diagonal axis where the long sides of the cane do not lie on the same plane. Of course, within all of these tests, one must take into account the actual cane itself. If the cane is soft, it might collapse. If it is especially brittle, the bark might split open along the top. These are all indicators that the cane is substandard; they are not indicators of the results from the gouging machine. However, these tests can point one in the right direction; therefore, they are still utilized.

A Dial Indicator

A dial indicator, or micrometer, with a very fine tip must be used to take the precise measurements of the cane that are needed. The easiest dial indicator to use, in this author's opinion, is the HDR dial indicator made by Ferrillo. This indicator has half of a ball bearing, or anvil, as the surface on which cane is measured. Ferrillo got the idea for his dial indicator from Kunibert Michel, the aforementioned German toolmaker. The tip on the stylus of the indicator is

a tiny, almost needle-like, pin. There is no rounded ball on the end of the pin, as is common on many indicators, (as seen on the alignment jig in Figure 10, on page 31) nor is the pin of a large thickness. One can use almost any dial indicator, but the tip must be the smallest point available. Ferrillo stresses that “it’s very hard to get an accurate measurement” on dial indicators with larger points.⁷¹ The very small tips can be purchased alone for about twenty dollars (see the supplier page.) One merely needs to unscrew and remove the old tip from an existing dial indicator, then insert and tighten the new pin-like tip. Changing just the tip might be a more economical solution as opposed to purchasing a new dial indicator. The HDR indicator cost, in 2010, was \$385 through Midwest Musical Imports.

The first indicator pictured is used solely for measuring gouged cane. The second one pictured can be used to measure both gouged cane and a reed.



Figure 13: Photograph, the HDR dial indicator. Photo by Dylan Farnsworth

⁷¹ Ferrillo, BUTI Oboe Workshop, 2009.



Figure 14: Photograph, a dial indicator with a replaced tip. Photo by Dylan Farnsworth



Figure 15: Photograph, a close-up view of the needle-like tip. Photo by Dylan Farnsworth

The Ear and Thread Measurements

The ear and thread measurements help to indicate if the gouge is centered. Both the ear and thread measurements should be taken on a shaped piece of cane. The four ear points and the four thread points must measure evenly and within a specific range. The ear is the piece of excess cane that remains on the outside of all four quadrants under the center fold after shaping a piece of cane. Under the ear the cane should measure between .47-.50mm, but the ideal measurement, according to Ferrillo, is .48mm.⁷² The ear measurement should be taken just under the ear as close to the side as possible without the cane pivoting onto its side, which can happen if one measures too close to the edge of the of the cane. The thread measurement should be

⁷² Ibid.

taken approximately where the top of the thread will wind around the piece of cane when it is tied onto a staple, and as close to the side as possible without the cane pivoting onto its side, and needs to be between .53-.55mm thick. This is approximately three or four millimeters from the bottom of the cane. When the thread measurement is too thin a finished reed produces a nasal-like tone that lacks depth and complexity. When the measurement is too thick the finished reed does not articulate well and produces a tone that is too muffled. The precise measurements taken at the ear and thread need to be taken with the smallest measuring point available, and illustrate the need for a dial indicator with a tiny tip. One cannot accurately take these measurements without this tiny point.



Figure 16: Photograph, taking the ear measurement just under the ear. Photo by Dylan Farnsworth

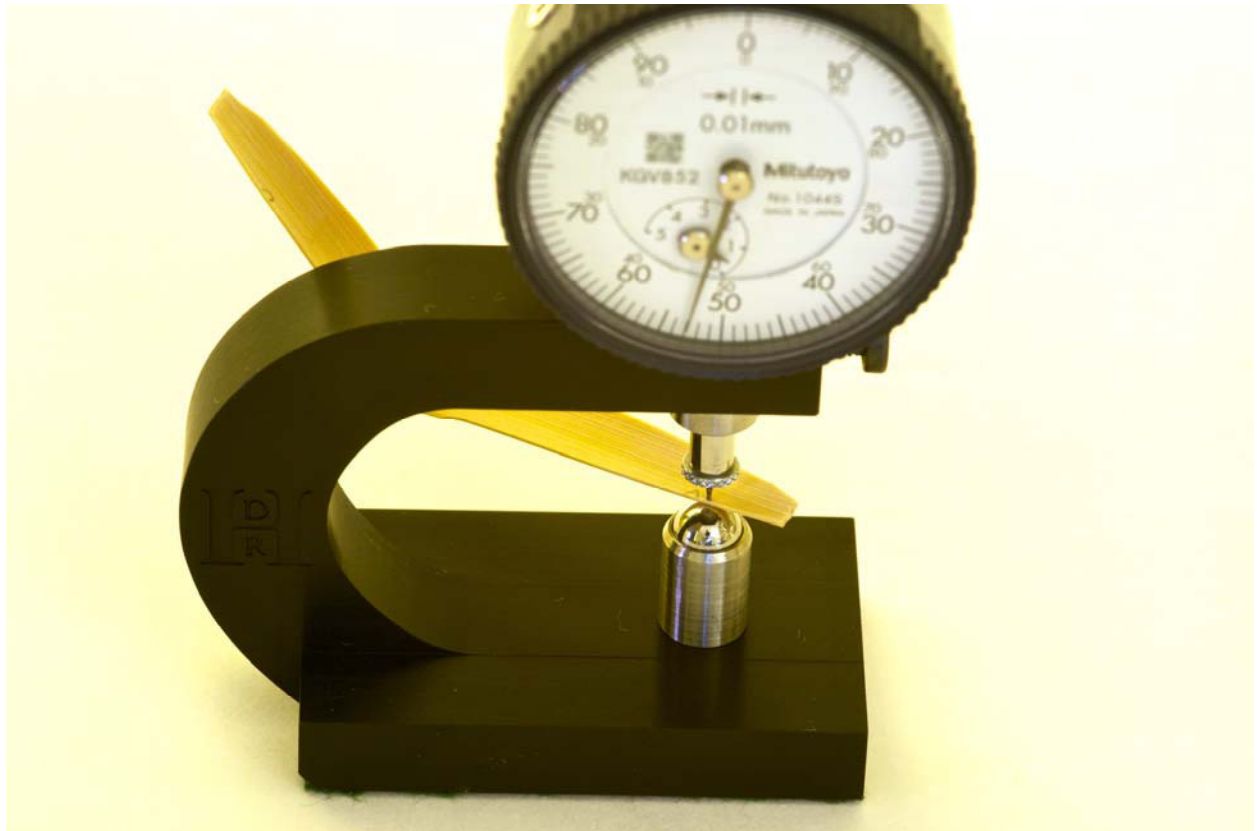


Figure 17: Photograph, taking the thread measurement approximately where the top of the thread ties onto a reed. Photo by Dylan Farnsworth

All four quadrants of the cane must be equal before attempting to make a reed from the new gouge. Very often, however, the first piece of cane that is measured comes out uneven. One side of the reed is usually heavier than the other, with measurements such as .50mm on one side of the ear and .46mm on the other. In order to correct this problem, pay attention to which side of the cane the offset occurs, and how many offset swipes are removed. A helpful tool in this process is to mark small lines in pencil across the cane down the length of the entire piece. These lines should be drawn after the blade has finished removing cane on one side, before the offset swipe has been taken. After shaping and measuring the cane, the marks will allow one to know on which side the cane is heavier. One can then move the blade away from that side.

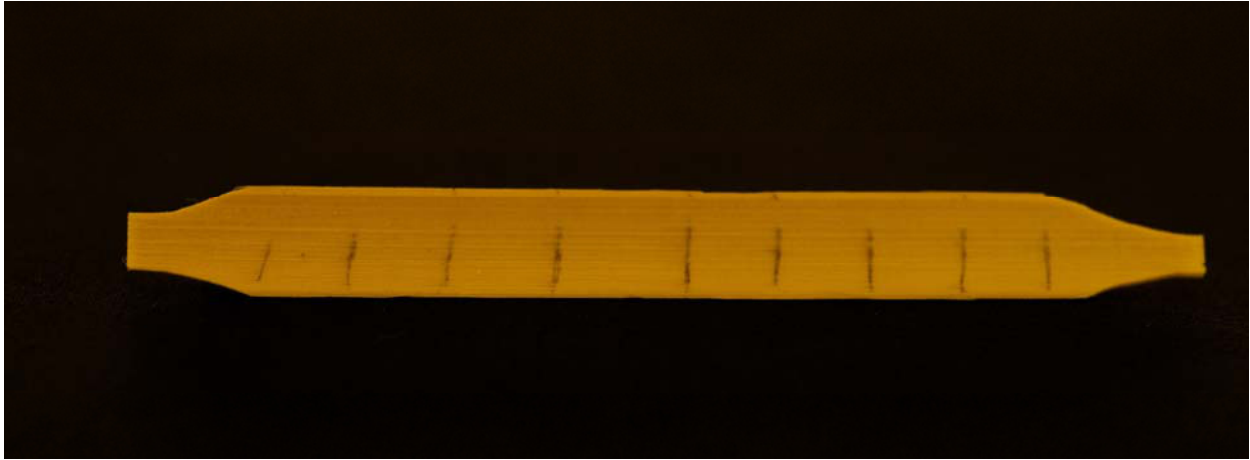


Figure 18: Photograph, cane marked with pencil, offset gouged out. Photo by Dylan Farnsworth

By this point the blade should be set and cutting on the rod side. Attention must be paid to the offset swipes in order to know in which direction to move the blade when the ear measurements are uneven. If very little (or no) cane is removed on the offset swipe the blade most likely needs to move toward the rod, which will produce the offset swipe that is needed in a centered gouge. Contrarily, when a great amount of offset is removed, such as three or more full swipes, the blade most likely needs to move away from the rod. At this point the blade is very close to a correct placement, so make sure all movements made are very small! Remember, if a tiny change needs to occur, it is often better to loosen the screw on the side which the blade needs to move toward, rather than tighten the opposing screw.

The amount of offset affects the thinness of the thread measurements. The offset width is literally the distance between the ear and the thread measurements. Sometimes a thick offset (greater than 1mm in width) can occur, the blade removing two full ribbons, and the thread measurement will remain thick enough. But often, when two full offset ribbons are removed the thread measurement will be too thin, producing a reed that collapses and has no depth to the sound quality. If the machine produces a large offset, the blade most likely needs to move away from the rod. The most important aspect one should look for in this final stage of machine set-up is symmetry in the finished piece of cane. Once a piece of cane measures with four equal quadrants one can make a reed from that piece.

The overall thickness of the reed should measure between .59-.61mm, with the ideal gouge usually occurring at a thickness of .60mm, as previously stated. However, there are times a gouging machine's center measurement can be thinned down to .59 (or even .58,) usually in warm, rainy weather (such as a summer season at Tanglewood.)⁷³ The parallel bars affect the thickness of this overall center measurement. The higher the bars, the higher the measurement, the lower the bars, the lower the measurement. When removing a blade and replacing it with a new one (or the old one after resharpening,) one will find that the placement of the parallels does not change very much. If one has to raise or lower the bars a large amount, the blade is probably, respectively, cutting too aggressively, or not showing enough.

Any time a piece of cane comes out of the gouger with odd measurements, address all other possible issues before blaming and then adjusting the machine. If the cane measures too thick, make sure it finished gouging and all possible cane was removed. Return the piece of cane to the bed and run the carriage over the cane a few times, reversing the piece, to make sure all excess cane is removed. If the cane still measures too thick, make sure the planed cane is narrow enough. Is the diameter too big? Is the piece of cane soft and grainy? The density of the cane will affect how well the blade cuts it. Recently, the availability of high quality cane has been almost nonexistent. Much of the cane currently available for purchase is soft and grainy, resulting in a piece that gouges in a shredding manner that has nothing to do with the cutting action of the blade. It solely reflects that the cane is soft. If one is unsure of what element to blame when strange measurements occur, gouge a few additional pieces of cane and see if the additional finished pieces measure differently.

If the measurement of the cane is too thin in the center, such as .56mm, the blade is most likely too exposed. Were the chips being removed at the beginning of the gouging process very thick? The thickness of the chips will slightly lessen as the blade cuts closer to the bottom of the gouge, but make sure to pay attention to the chips being removed throughout the gouging process. There needs to be a clean cutting action (no shredding) all the way down to the offset swipe, but the blade should be exposed just enough to get that clean cutting action, and no more. When the blade is exposed too much, the overall thickness of the cane will be too thin, and even if the parallel bars are raised to correct this, the sides of the cane will be too thin. To thicken the

⁷³ Ibid.

sides and center of the cane very gently retract the blade. After retracting the blade, make sure it still cuts cleanly to the bottom of the gouge. If it does not, reverse the previous movement, and expose the blade a small amount: gouge another piece of cane. If the blade cuts cleanly throughout the cane removal, the blade is most likely exposed the correct amount; but do take note that one can easily fluctuate between too much, and not enough, blade exposure. At this point, if the center thickness is not measuring correctly, adjust the parallel bars accordingly. Finding the optimal cutting action can be one of the most difficult aspects of machine set-up. Often it seems as if the machine moves back and forth between a cutting action that is too aggressive and one that is not aggressive enough. Try to make very minimal movements when changing the blade. The smaller the movement, the closer one gets to the ideal blade position. Minimal movements lower the risk of overshooting that position.

CHAPTER 10

NOW YOU ARE READY TO MAKE A REED

Assuming the measurements at the ear and thread are even and of the correct thickness, it is now time to make a reed. After tying the reed first take note of the opening of the reed blank. The strength of the finished gouge influences the strength of the opening. There should be curve to each half of the reed opening, but without a massive football shape, or a tiny, almost flat, opening. After clipping open the reed it is imperative that the sides of the reed (where the blades meet) should close tightly, gripping the plaque when it is inserted into the reed opening. Begin scraping the reed and scrape it until it is about eighty percent finished, concentrating on the tip and heart. After removing enough cane to get the reed vibrating easily, and crowing a clean “C,” that is, no extra intervals or sounds other than a double octave C, it is time to check whether or not the reed passes the plaque test.

The Plaque Test

The plaque test illustrates if the reed can close down equally from the sides into the center. With the plaque inserted in the reed, sight down the opening, only looking at one blade of the reed (the side facing up is easiest to see.) Slowly and gently press down on the heart and watch how the reed closes on the plaque. It is supposed to close from the sides down to the center, finishing fully flat against the plaque. Both sides of the reed need to pass this test. Very often one blade passes and the other does not, or neither blade passes. The plaque test is a result of the cutting action. If the machine cuts too aggressively, or not aggressively enough, the cane will not pass the plaque test. Determining which direction the blade needs to move, whether retracting it or exposing it, is difficult. The blade of the gouger cannot cut so aggressively that it pulls the cane. Nor can the cutting action be weak, producing wispy cane chips, especially on the offset swipe.⁷⁴ If the offset ribbon is not clean, the reed almost always fails the plaque test. If this happens, return to adjusting the blade, and try to achieve a cleaner offset. First, sight down the guide to the blade and make sure it looks truly centered. If the blade seems to be

⁷⁴ Ferrillo, interview.

placed even slightly off-center to the guide, move it toward the direction that will center it. One can also take the offset ribbon into account. If there was a great amount of cane removed on the offset swipes, move the blade away from the rod. If there was a small amount, especially when the offset ribbon comes off in a shredding manner, the blade probably needs to move toward the rod. After slightly moving the blade in a certain direction, gouge another piece of cane, make sure it is still even, and make another reed. Continue this alternation of making a reed and, if needed, adjusting the blade, until the reed passes the plaque test.

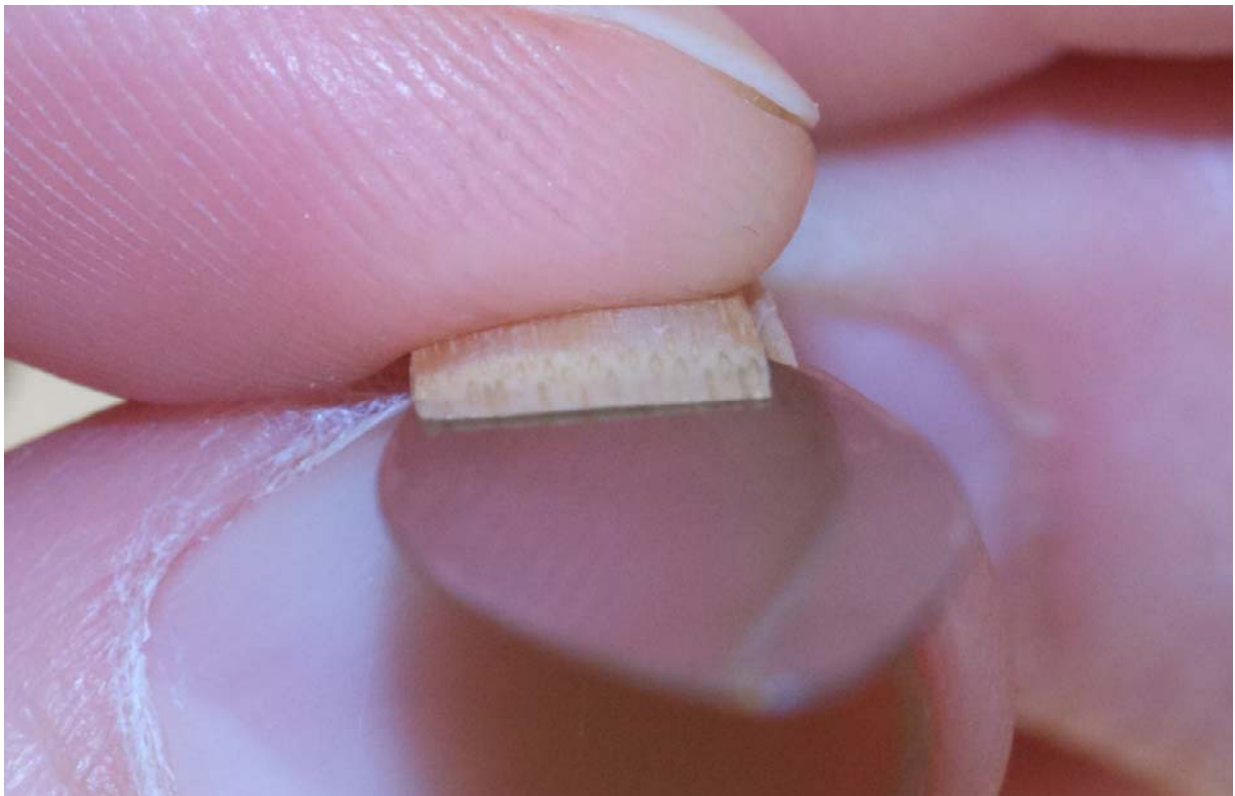


Figure 19: Photograph, a reed passing the plaque test. Photo by Dylan Farnsworth



Figure 20: Photograph, a reed failing the plaque test. Photo by Dylan Farnsworth

At this point, the reed should be holding up the pitch to approximately A440 without jaw pressure in the embouchure, the crow should focus into a clean, double octave C, and the reed should produce a nice tone (assuming the reed is scraped well.) Once the reed passes the plaque test and seals nicely, one can make small adjustments for personal preference. If one wants reeds that have a slightly heavier feel to them, raise the parallel bars a small amount. If one wants a slightly weaker reed, lower the parallel bars. If these movements do not create the reed one desires (and make sure to scrape at least three reeds before deciding the gouger is to blame,) the exposure of the blade can be adjusted. Show more blade to thin the sides of the reed, or retract it to thicken the sides. The reed should feel comfortable to play. More importantly it should hold itself together, that is, the embouchure does not need jaw pressure to raise the pitch of the reed to A440 in any register. The pitch of the reed should be correct as a result of the gouge. According to Robert Sprenkle, “a gouge may be termed successful if the oboist, after gouging a few pieces of cane to a particular measurement, makes a few reeds from it and gets usable results according

to his style of reedmaking and his musical desires.”⁷⁵ This is the exact result to aim for when setting up the gouger one owns. As long as the machine produces reeds that work for the player, it is working.

Last Minute Adjustments and Troubleshooting

Sometimes the pitch and tone of reed does not hold together, and the player must use jaw pressure, or bite the reed up to pitch. This usually coincides with a crow that has excess noise—more sounds than a double octave C. This creates a reed that is flat in pitch overall, and cannot play a scale in tune when it is played in the oboe. There are multiple reasons for this; the first and most obvious reason is that the piece of cane that was originally used was swaybacked. If that is absolutely not the case, there are a few other factors to check.

Do not scrape a large amount of bark off the ends of the piece of cane that go under the thread; this author scrapes no bark off. Scraping the ends thin does make the thread wrapping appear “prettier” by lying against the staple nicely, but it weakens the two ends of the cane on the tube, making the opposite end of the reed, the opening, spring apart. This occurrence is not always visual (the two blades pulling apart,) but the reed will often fail to hold a plaque tightly, or the pitch of the crow at the tip of the reed will drop greater than a minor third. This indicates the reed has loose sides.

If the bark has been left intact on the ends of the cane, and looseness is still a problem, make sure the reed is not tied too tightly. Many young students learn to tie a reed just under the point of where the string breaks while tying. This is too tight! Ferrillo has warned “squeezing way tight will [produce looseness.] Better to be a little light and have a slightly leaky reed [in the thread] that you can fill with wax. If you tie too tight it might seal, but it will pop open up top.”⁷⁶ And of course, make sure the plaque is not sitting in the reed for longer than thirty minutes at a time. Thirty minutes is really the lengthiest amount of time one should scrape on a reed; a more ideal time is fifteen minutes. Elaine Douvas, principal oboist of the Metropolitan Opera Orchestra, and teacher at Juilliard, has a famous saying; “learn to make a reed in fifteen

⁷⁵ Sprenkle, 52.

⁷⁶ Ferrillo, BUTI Oboe Workshop, 2009.

minutes or less, or you will ruin your life!”⁷⁷ Looseness can also be a product of poor quality cane. Discard that reed and make another.

If multiple reeds still have looseness issues after making sure they pass all of these tests, one must go back to the gouger and adjust the blade slightly to achieve a better result. If one reaches this point, try removing the blade from the machine and lightly polishing it on the smoothest emery paper available. After a quick polish, replace the blade in the machine and go through the set-up process again. Often, polishing the blade takes out tiny inconsistencies, and will then produce a nice gouge on the second try. Sometimes a different, new blade is needed to create a useable gouge. This is especially true if one resharpened an old blade. If a usable result cannot be achieved fairly quickly, replace the resharpened blade with a new one.⁷⁸

⁷⁷ Elaine Douvas, “Oboe Reed Class #1” (paper presented at a reed making class, Aspen Music Festival, Aspen, CO, July 2002).

⁷⁸ Ferrillo, personal lessons, 2005-2007.

CHAPTER 11

DAILY USE AND CARE

Once the gouging machine is set up and producing a good result it can, and usually should, be left alone. As Ferrillo often says to the author of this paper, do not act as Goldilocks and search for the best gouge out there! If the machine produces good, playable reeds, leave it alone!⁷⁹ After a gouging session, whether it is only one piece of cane, or six, certain steps must be taken to maintain the machine. To keep the machine in good working order, and to protect the blade, one should never gouge many pieces in one sitting. Do not gouge more than a few pieces (three to six) at a time. When larger batches of cane are gouged, one cannot tell whether the cane coming out of the gouger at the end of the batch is as good as the beginning of the batch. One never knows when the blade will stop producing a good result. If this happens in the middle of gouging a large amount of cane, the second half of the cane will be unusable. Weather can also play a role in the gouging process. In the spring and fall in the northern states weather patterns are constantly changing. The temperature can change drastically from one day to the next. What works one day might not work on the following day. The overall thickness of the gouge can be slightly adjusted to stay in line with humid or drier weather. But again, if thirty pieces were gouged on a thin gouge for hot, humid weather, and suddenly the temperature drops to fifty degrees (F) the gouge will not be ideal for the situation.⁸⁰

When finished gouging cane, clean the blade with either a finger, or with an empty paper cover off of a razor blade. The paper can be used to wipe not just the blade, but between the blade and the blade well. It is imperative to clean all of the shavings off of the blade, lest a wet shaving stay on the blade and rust it. To help prevent rusting of the blade, which would ruin it, one must oil the blade after every use, even if only one piece of cane has been gouged! Use mineral oil, not three-in-one oil. Three-in-one is a carcinogen, and while the oil does not directly go in one's mouth, it does sit on the blade, which gouges a piece of cane, which does go into one's mouth. Mineral oil can be bought very cheaply at any drugstore and is safe for human consumption. To apply the oil, put a small amount on the paper cover (of the razor blade) and

⁷⁹ Ibid.

⁸⁰ Ferrillo, interview.

wipe oil on both the underside, exposed part of the blade, as well as the upper part of the blade that is inside the blade well.

Traditionally, at every use the rod should be oiled as well, but on HDR gougers the rod is self-oiling.⁸¹ On any other gouger, however, do oil the rod. A miniscule amount of oil can be rubbed along the top of the parallel bars, as well. Be wary of over oiling! Too much oil can cause the parallel bars to act as if they are out of alignment, as explained earlier. It is best to clean the cane shavings off the rest of the machine, but it is not necessary. A small, flat brush (0.5" in width) can be used to brush the shavings off of the machine. The machine is now ready for storage on the reed desk, or in a drawer until the next use. Do not store the machine with a cotton ball under the blade! This is a common misconception. When the machine travels (with the owner or in shipping) it does need a cotton ball to protect the blade, but not after daily use. A cotton ball can hold moisture, even when saturated with oil, and that moisture can rust the blade. Again, this would ruin the blade! The blade needs only oil for daily storage.

When traveling, or shipping a machine, pack the gouger in this specific way: do place an oiled cotton ball under the blade. Tape the carriage closed with packing tape, or alternatively, with a long piece of plastic wrap (especially the packing kind, which is much narrower than plastic wrap for food.) The carriage must be completely immobilized. Once there is enough tape to secure the carriage, wrap the machine with a large amount of bubble wrap. The small bubbles work best, not the large (inch-wide) bubbles. There should be enough bubble wrap on the machine that the specific parts (base corners, carriage corners, and especially the drive screw) do not stick out. From here the machine can be packed into a suitcase, or placed in a large box with styrofoam peanuts for shipping (and if one can find an ecologically better packing material, by all means use it!) This author once received a gouger that, upon opening, was lying in half of a tissue box, with no bubble wrap (though luckily packed with peanuts.) The sender had "secured" the carriage with two rubber bands, both of which had snapped before arriving; the carriage was free-floating! The blade could have hit a cane clip and been ruined. But more importantly, an unsecured machine can much more easily go out of adjustment! Always pack a machine properly before travel. When so much time is spent setting up the machine and caring for it, one does not want to jeopardize the functionality and well being of the machine.

⁸¹ Ibid.

CONCLUSION

There are many different gouging machines to choose from today, and an oboist must decide on the degree of involvement one is willing, or able, to commit to with the gouger. When more control is wanted over the entire reed making process, then a fully adjustable gouger is more likely to be the better choice. Without knowing how to make each and every adjustment, however, there is almost no difference between the adjustable gougers and the more basic non-adjustable machines. A detailed adjustment guide needs to exist in order to give oboists a written reference on how to adjust a machine. Not everyone has the opportunity to study or apprentice with a gouging-machine-repair expert, and even fewer people have the opportunity, and funding, to take John Ferrillo's Build Your Own Gouger Workshop. Robin Driscoll is trying to remedy this problem by using technology to help him explain his patented machines; he utilizes both YouTube, where he posts videos of how he uses the machine, and a webpage to offer written instruction. While John Ferrillo does not have the time to create and maintain a webpage, a detailed written manual explaining the HDR gouger would be a boon to all present and future owners of HDR machines. The manual would ideally benefit owners of any double-radius machine, since many of these machines are built on the same principals. Different machines might use different screws, a flat head versus a hex screw, but the general adjustments are all nearly identical. The knowledge of gouging machine use and adjustment must exceed the oral realm and become hard, written knowledge, accessible by any and all oboists.

APPENDIX A

THE BLADE SHARPENING PROCESS

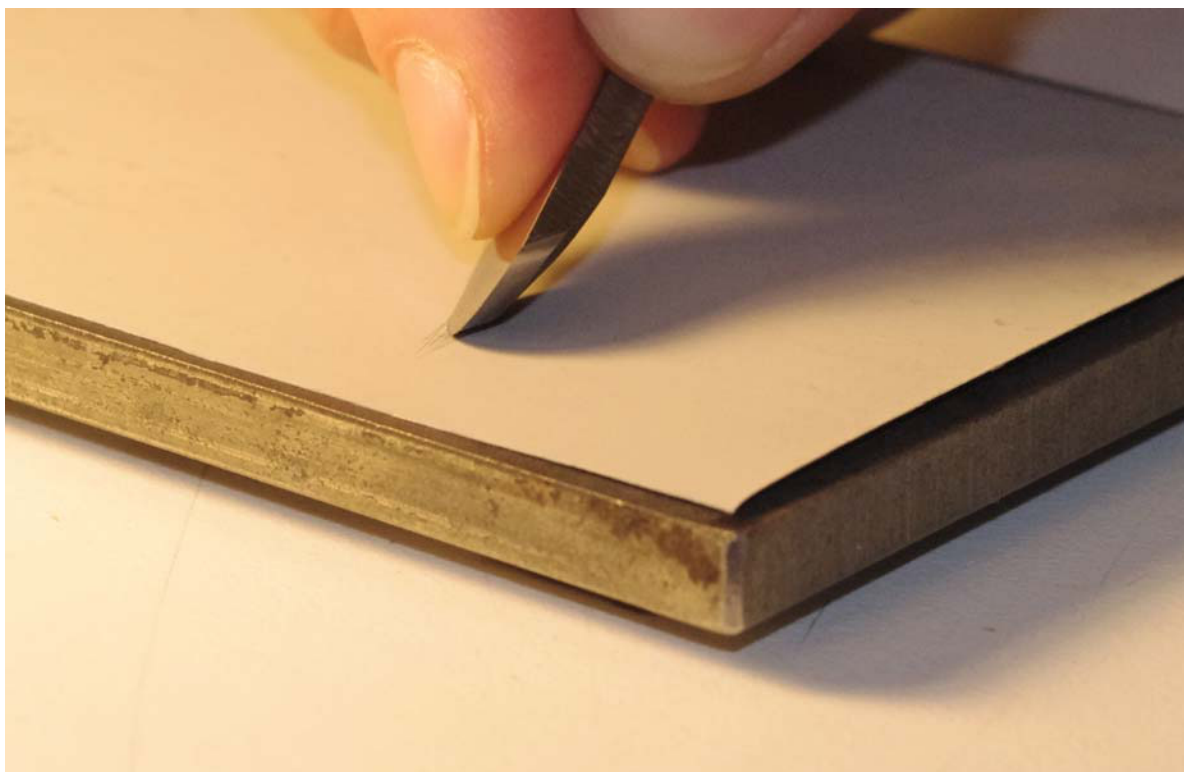


PHOTO 1: Start the sharpening process on one corner of the blade.

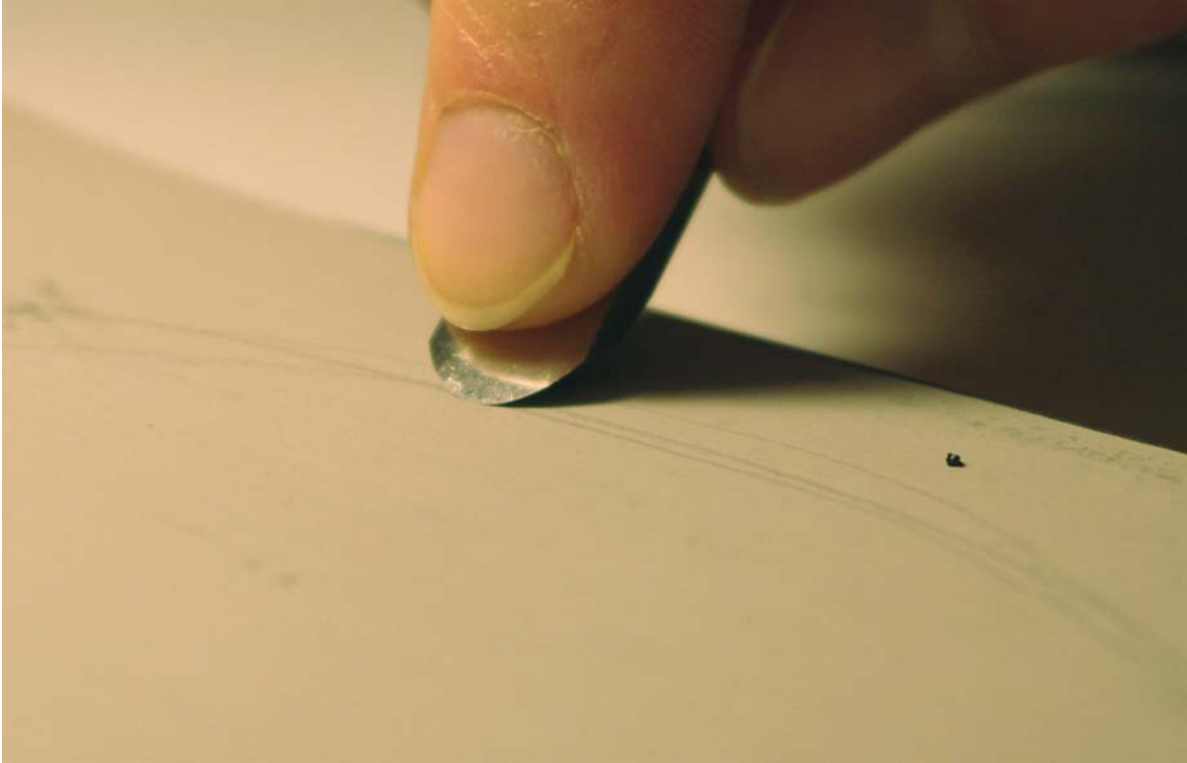


PHOTO 2: Proceed in a fluid motion in a U shape toward the other corner of the blade.

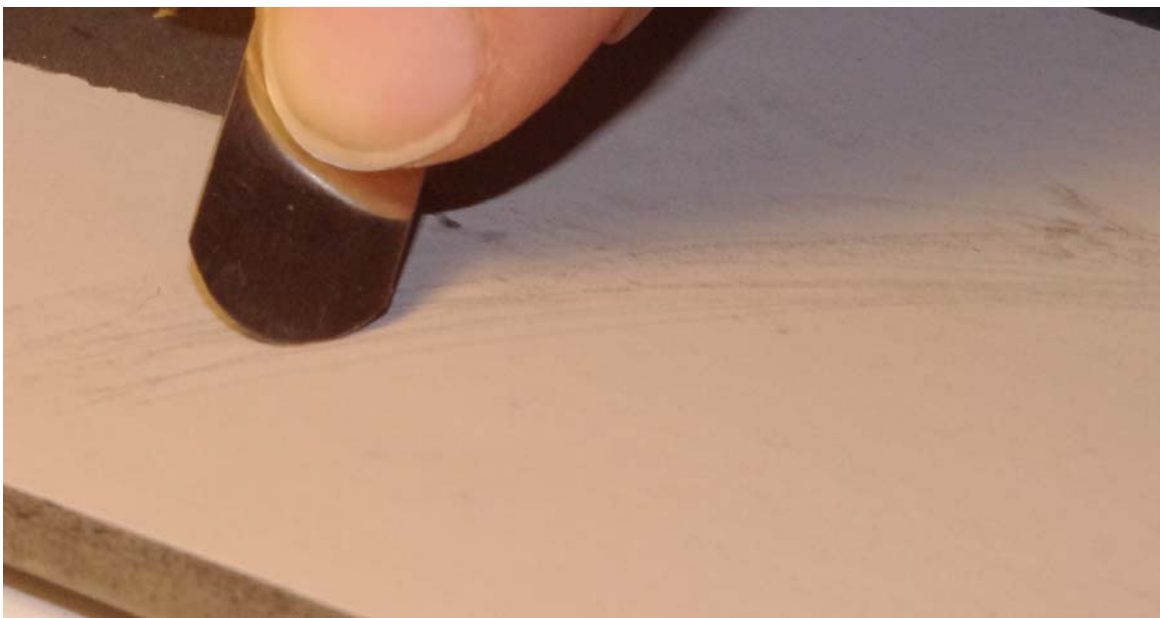


PHOTO 3: Continue around the U shape toward the other corner.

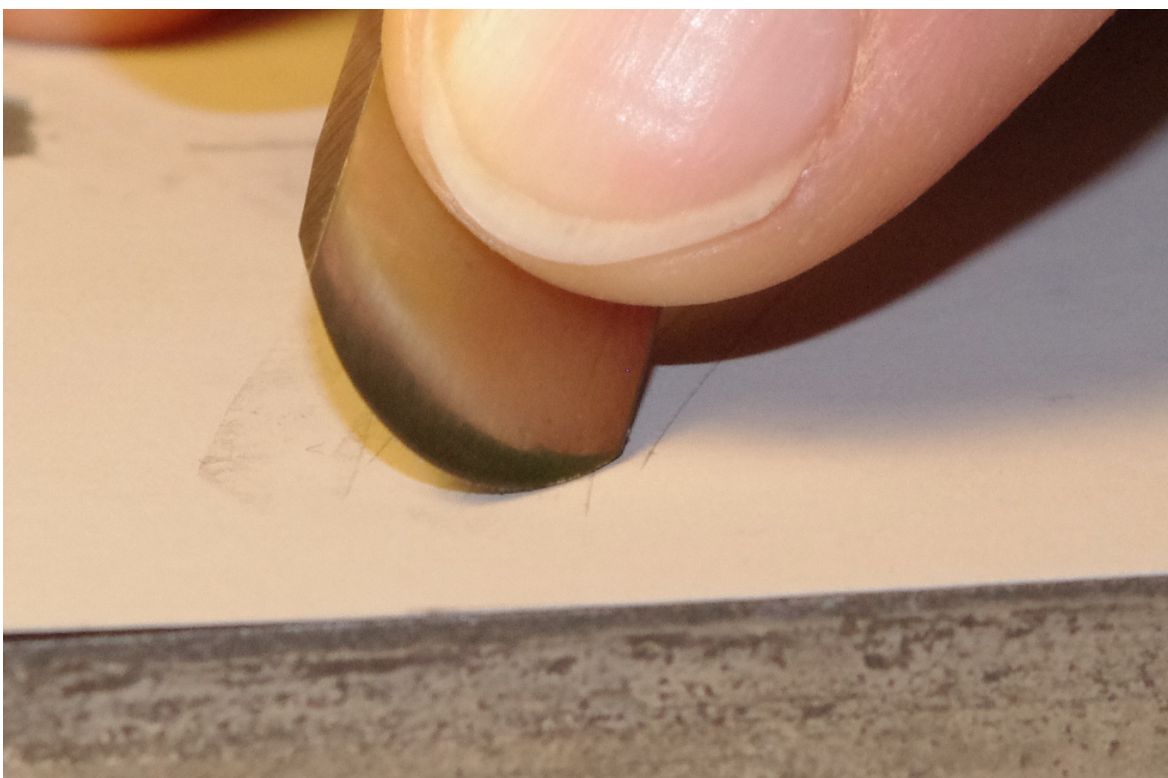


PHOTO 4: Finish on the corner opposite the one on which the process was started.

APPENDIX B

SUPPLIES/SUPPLIERS

Alignment Jig—John Ferrillo, johnferrillo@gmail.com

Blades—John Ferrillo

Emery Paper— <http://www.ottofrei.com/store/product.php?productid=4042&cat=823&page=1>

EZE Lap diamond stone—Oboeworks www.oboeworks.com, or any online hardware supplier

Gouging Machine—John Ferrillo, Boston Double Reed www.bostondoublereed.com,

Jeanné <http://www.jeanne-inc.com/>,

Robin Driscoll <http://home.comcast.net/~robin.driscoll/index.htm>,

RDG Woodwinds www.rdgwoodwinds.com, Dan Ross <http://Rosswoodwind.com>

Guillotine— Jeanné, RDG Woodwinds

Micrometer/Dial Indicator—RDG Woodwinds, Boston Double Reed,

Midwest Musical Imports (MMI) www.mmimports.com

Micrometer Tips—John Ferrillo

Planer/pre-gouger—Boston Double Reed

Radius Gauge—John Ferrillo, MMI

Reed-making Supplies—Covey www.oboes.com, Jeanné, MMI, Oboeworks, RDG Woodwinds

Screwdrivers and allen wrenches—any hardware store; Home Depot, Lowes, Ace Hardware, etc

APPENDIX C

RECOMMENDED GOUGER REPAIR TECHNICIANS

Valerie Anderson, MN 763-754-6695

Robin Driscoll, Washington, PA 412-491-5603

John Ferrillo, Harvard, MA 201-970-3245

Chikao Inomato, Boston, MA 617-699-9576

Ginger Ramsey, Blairsville, GA 706-745-6263

Dan Ross, Jonesboro, AK 870-932-3308 (Ross only)

John Symer, Collingswood, NJ 856-858-0605

David Weber, Chandler, AZ 480-726-6800

Robert Weiner, Miami, FL rweiner@miami.edu

APPENDIX D

HUMAN SUBJECTS APPROVAL

PI Name: Karen Melinda Kistler

Project Title: A Set Up, Maintenance and General Use Manual for a Double Radius Gouge, specifically the HDR Gouging Machine

HSC Number: 2009.3217

Your application has been received by our office. Upon review, it has been determined that your protocol is an oral history, which in general, does not fit the definition of "research" pursuant to the federal regulations governing the protection of research subjects. Please be mindful that there may be other requirements such as releases, copyright issues, etc. that may impact your oral history endeavor, but are beyond the purview of this office.

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BIOGRAPHICAL SKETCH

Karen Kistler began her study of the oboe at age fourteen in her hometown of Reston, VA. She began musical studies at age 10 through her public school band program, playing the flute. Upon auditioning for high school, the high school band director asked her whether she would be interested in playing an instrument a little less common, like that oboe? She jumped at the chance, and with her parents' permission, began playing the oboe. After only four years of high school study, the last year and a half of that study with Carol Stephenson, Assistant Principal Oboe of the National Symphony Orchestra, Karen (known as Kari) began college at the Florida State University, studying with Dr. Eric Ohlsson. She graduated summa cum laude in 2001, having won two prestigious awards: the Sophomore Woman of the Year For Academic Achievement, and the Presser Award. She immediately enrolled in a Masters of Music program at the Cleveland Institute of Music. At CIM she studied with the late, esteemed pedagogue John Mack. Kari graduated in 2003 from CIM and chose to freelance for 2 years, spending time in Charleston, SC, Atlanta, GA, London, England, and Reston, VA. In 2005 Kari relocated to Boston to pursue a Performance Diploma at Boston University, studying with John Ferrillo. While at BU, Kari received the Outstanding Woodwind Player award in 2007, just prior to graduation. Kari returned to the Florida State University that autumn to begin a Doctor of Music degree. After two years of coursework Kari relocated once again, to Miami Beach, FL to join the New World Symphony as an oboe fellow. Kari has worked with other well-known oboe teachers in the U.S, who have influenced her; namely Elaine Douvas, Linda Stromman, Robert Sheena, and the aforementioned Carol Stephenson. Kari has attended the Tanglewood Music Festival, the Aspen Music Festival, Music Academy of the West, Brevard Music Festival, and Domaine Forget.