User Guide to Database of Historical Bassoons

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How to use the General Information PDF Document

On this PDF document important details and measurements taken on the bassoons can be found. These measurements are not needed by the acoustic model programs but are nevertheless important. Many significant details that are found in museum catalogs are given here; including the standing height, and the number and names of the keys.

The first line of the document contains the bassoon maker, number of keys, and a shorter version of the project tile. The elements of the shorter version of the project title are as follow: 1) the maker with a series number which indicates the order of the bassoon in the data base by the same maker. For example, Amlingue2 would be the second bassoon made by Amlingue entered into the data base; 2) an "O" means that the bassoon is an original, a "C" means the bassoon is a historical copy; and 3) the location or owner of the bassoon.

The second line of the document contains the complete project title used by the computer program. To the shorter version described above is added the following: 1) the wing joint number. Many bassoons have more than one wing, if the bassoon has only one wing joint a number 1 is assigned.; 2) "WOB" means without bocal. This in reality could be omitted since we have decided that all the bassoons will be entered into the programs without a bocal. We have noted that it is difficult to know if a bocal is original and most bassoons to not have a bocal with them. "DNM" means data not modified. We have modified some dimensions when entered into the programs in order to determine if the bassoon could be improved. Only "DNM" dimensions will be given in the website.

The next few lines of text give several sources that can be consulted regarding the maker or bassoon. Literature listed is not intended to be complete. As sources are added for a particular maker, these are placed in the maker pages, not necessarily on the PDF for each bassoon. Therefore, it is necessary to consult both the maker page and the bassoon General Information PDF to obtain a more complete list of sources.

The location of the bassoon is given next and gives more detail than what is listed in the first line in the short version of the bassoon title. In the case of bassoons in private collections, only the city or country is given.

The date when the bassoon was measured is given next.

Next is a section on the PDF that gives a detailed description of the bassoon. The following are details relating to this description:
Number and name of the keys found on the bassoon; the acoustic model program is made for a bassoon with three finger holes on the wing and three on

the boot joint. Because of this, the upper limit of the number of keys is usually around eight. For example, if there are either a G key for the right hand third finger or a Bb key for right hand third finger, this bassoon would usually not be included in the data base. However, there are some bassoons with more than eight keys detailed in the data base. For example, included are several bassoons by Savary jeune that have more than eight keys. Note that the number of keys is determined by the touches (the part of the key that is pressed by a finger) found on a bassoon.

Swallowtail F key touch This refers to an F key that can be played with either left or right hand little finger.

Two-piece saddles on F key flap and F key touch This indicates an older, mostly German system where two brass plates are forced into the wood and the key pivots between these plates.

Two-hole boot joint system This refers to a boot joint turn around with two round corks as opposed to the more common single oblong cork. The wood is removed between the two bores in order to complete the bore profile.

Military bell A bell made either of wood or metal that is long or flared more than normal. Found mostly in French, 19th Century bassoons.

Bell flare A wooden bell that has a bore that flares the last 30 or 40 mm of the bell bore. these bells are not considered military bells.

Bell crown A metal, or other material such as ivory, reinforcing the top of bell.

Bell chamber This is an expansion in the bell, usually at the end but can be found in other locations in the bell. This bell chamber is usually found only on the early 18th Century bassoon.

Tone hole on bell A small tone hole drilled in the bell.

Platform on long joint A long, flat platform going down the entire length of the long joint. The Germans call this a (die) *Leiste* or ledge. The purpose of this platform is to add length to the tone holes on the long joint.

Dated The date is given when a bassoon is date stamped.

The next three lines give the following: Standing height, which is the length of the boot joint, long joint, and bell; the Wing plus boot length; and where makers stamps can be found if any. The Standing height and the Wing plus boot lengths are the only measurements given in centimeters, not millimeters.

Next are Measurements not included on Data file: the diameter, position, and length (length of the tone hole through the wood) of the Ab, F#, low Eb, or other tone holes measured if found on the bassoon.

The boot joint socket depths are listed, and these lengths tend to be close to the tenon lengths given in rows 17 and 103 on the Excel spreadsheet.

The Cronin Measurement is the distance between tone holes I and IV, or the distance between the center the tone holes closed by the first fingers of the left and right hands. (Note: this is the only measurement taken from the center of the tone holes.) Robert Cronin, a retired period woodwind maker in California,

suggested that we measure this distance since it can be used to obtain a general pitch level of the bassoon particularly if compared with other bassoons.

Wing thickness across E [II] tone hole This is the most consistent method to measure the width of the *épaule* (the portion of the wing where the three tone holes closed by the right hand are found). It is measured with the caliper across the wing at the E tone hole. This measurement can give an idea of the size of the *épaule.*

Additional Abbreviations used:

OOR Out-of-round; meaning that a tone hole or the bore is not totally round but oval. This is caused by the uneven shrinkage of the wood.

vrfd Verified; given after a second measurement if the dimension is found to be out of the ordinary from other bassoons of the same maker.

How to use the Measurements Data Sheet PDF Document

This document is a PDF of an Excel spreadsheet. In general, the measurements are those that are needed by the acoustic model program. The measurements are taken for: 1) the diameter, length, and position for each tone hole; 2) bore segment lengths; and 3) the bore profile diameters at various positions. The dimensions are given in groups by bore segment; for example, measurements taken on the wing joint, boot joint, long joint, and bell are listed together. However, some measures like tone hole diameters, tone hole depths (length of the tone holes) and bore diameters at tone holes are grouped together.

The following is a general description of the information given in each column on the data spread sheet: column A is the model program shortened name for each measurement taken; column B is the measurement result given in millimeters; column C is a shorthand explanation of how and where the measurements were made; column G is specific to the bore measurements made with the plastic rods and indicates on which bore segment the measure was taken; occasionally, other columns are used but only for notes and comparisons to other similar bassoons. These notes enumerated in red and usually give important details on the state of the bassoon. For example, OOR is an abbreviation for a tone hole or bore that is out-of-round. The acoustic model only used columns A, B, C, and G.

Because of the conical nature of the bassoon bore, the tone hole positions (distance from a point on the bore segment) are measured in different methods depending on where the tone hole is found. For example, the 'bj c" position (boot joint C tone hole[1], or tone hole IV) found in Column B, under "Boot Lengths", row 29) is measured in millimeters from the top of the boot joint socket to the top of the tone hole, NOT the center of the tone hole. Note that most researchers measure the tone hole position to the center of the tone hole. Using the center of the tone hole is an effective method when measuring the position of a large tone hole drilled at a 90-degree angle into the bore. However, since in most cases the

bassoon tone holes are drilled obliquely, it is difficult to determine the true center of a long, narrow tone hole. In many cases, the method in which the measure was taken is described in Column C.[2] To cite another example, the "wj f2" (wing joint F2 tone hole or tone hole I, found in column B, under "Wing Joint Lengths", row 19) is measured in millimeters from the top of the wing (not from the bottom of the bocal receiver) to the top of the tone hole, again not the center of the tone hole. The position of all tone holes on a particular joint segment, are all measured using the way method. For example, all tone holes on the wing are measured from the top of the boot joint socket to the top of the tone hole.

Rows 149 to 153 are instructions to the computer program and the most important is row 149 where the model is given a "best informed guess" of the pitch level or diapason of the bassoon. In most cases, I have chosen to give pitch level whose which are used on modern historical copies. For example, Baroque diapason A=415 Hz; Classical diapason A=430 Hz and in rare case Chorton A=465 Hz or low French diapason A=392 Hz.

Bore Profile Measurements

In general, the bore profile diameters are taken using two methods and listed on the data spread sheet in an order to save time while taking the measurements. Depending on the bassoon, there are approximately 40 diameter measurements taken along the bassoon bore. The first method used is a measurement of the bore diameter at a particular point on the bore; for example, the bore diameters at the tenons, sockets, tone holes, and boot turn around. The second method involves the use of a certain diameter found at what point on the bore. This method uses plastic rods of a determined length inserted into the bore and the length from a certain point on the bore segment is listed.

Not every measurement listed in column A is taken. The following are some factors why a measurement is not listed in column B: 1) the state of the bassoon could prevent taking a measurement. An example of this would be if a tube is perturbing into the bore where the plastic rod needed to be inserted; 2) there are several logics that indicates to the computer model that certain measurements are required. The most important is row 28 which indicates whether the boot turn around cork could or could not be removed. If the cork cannot be removed – which is usually the case – certain measurements need to be made.; 3) the number of Bore Diameter Locations (rows 162 to 184) is determined by the diameter of the bore. For example, if the bore profile on the long joint is smaller than 32 mm, there would not be a number given in column B, row 184.

Bore diameters at Tone Holes (rows 116 to 128); these are the diameters of the bore at the tone holes given in millimeters and is the actual bore diameter at the tone hole. This measurement is important since it is used to calculate the open hole lattice cutoff frequency.[3]

Bore Diameter Locations (rows 162 to 184); these are the positions where a rod of a specific width can be inserted into the bore measured from a particular point on the body segments of the bassoon. These rods are from 10 to 32 mm in width. This distance how far a rod can be inserted into the segment bore is given in column B. Because of the boot turn around and other factors such as the wing choke, not all distances are necessarily taken.

Measurements that might not be clear from the explanations in column C:

belflg (row 145); this is the diameter of the body of the bell at the end where the Bb1 exists the bassoon.

boots and bootl (rows 38 and 39); this is the distance from the top of the boot joint socket – not the bottom of socket – to the septum (the turnaround at the bottom of the boot joint).

Bocal measurements (rows 2 to 6); in most cases, the original bocal is not found with the bassoon. We have decided in row 6 the bocal logic will be 2 (no bocal) for all bassoons, and in most cases no bocal measurements are not taken.

Wing joint choke (rows 14 and 15); the choke is a position along the top of the wing joint bore profile, just below the bottom of the bocal insertion that is narrower than at the top of the wing joint. Not all wing joints have a choke and if this is the case than the diameter of the bottom of the bocal received is taken.

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[1] The name of open standing tone holes is derived from the note which exits that tone hole. The C tone hole – often called tone hole IV – is where the note C exits on the boot joint. This confusion derives from the fact that the note B is fingered by closing the C tone hole. In the case of closed standing tone holes that name of the tone hole and the fingering is the same.

[2] If one wanted to compare the position of a tone hole to a study that uses the center of the hole method, one just has to half the tone hole diameter found in rows 64 to 76 and add this to the tone hole length.

[3] See Arthur Benade (1976) *Fundamentals of Musical Acoustics*, Oxford University Press, pp. 449-455 for a complete discussion of the open-hole lattice cutoff frequency.