



Andreas Silbermann Organ - 1748

Protestant Church

Blodelsheim, Alsace, France

By Blair Batty

Forward

I am a retired organbuilder. I've always had an interest in pipe organ scaling and voicing. Scaling are the measurements of the pipes, that give them the particular sound of a particular organ. Over the years, I have collected and studied the scales of dozens of organs. As it was for my personal use, and I am not an academic, I often failed to note where I got the measurements from.

As this data may be useful to others, I decided to share it. You must use it with caution, as some of it was written down years ago. I may no longer know the source, or how reliable it may be.

Bear in mind when studying the scales, this organ is pitched at approximately $A=392$ Hz (*a whole tone below modern concert pitch of $A=440$ Hz*), characteristic of its time.

If you are new to scaling, I recommend: <http://www.blairbatty.ca/tonal.html#scales>

Do contact me, if you have any comments, corrections, sources or questions. I won't be offended.

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The Blodelsheim Organ

The historic Johann Andreas Silbermann organ (1748) in the Protestant Church of Blodelsheim, in Alsace, France. This is a remarkable and well-preserved instrument by Johann Andreas Silbermann (1712-1783), the younger son of the legendary Andreas Silbermann and nephew of Gottfried Silbermann. He continued the Alsatian branch of the family tradition.

Historical Significance: It is one of only about thirty surviving Silbermann organs in Alsace and is particularly noted for its exceptional state of preservation. Much of its original pipework and mechanism remains intact.

The organ is relatively small but perfectly proportioned, typical of Silbermann's village church instruments. Its specification is classic French Baroque of the Alsatian style. It is One manual with a short octave (Do-sol-ré compass: C, D, E, F, G, A to d^{'''}).

The Pedalboard is a permanent, pull-down pedalboard (not an independent division), connected to the manual's lowest notes. This was common for smaller organs of the period.

Silbermann organs are renowned for their clarity, elegance, and perfect blend. The principals are bright and singing, the reeds (Trompette, Voix Humaine) are distinctive and rich without being overpowering, and the Cornet provides a magnificent solo voice. The overall sound is transparent, ideal for the music of J.S. Bach, François Couperin, Nicolas de Grigny, and other German and French Baroque composers.

Key Restoration (1974-75): Carried out by the famous Alsatian organ builder Alfred Kern. Kern's philosophy was "conservative restoration" – to preserve as much original material as possible while making the organ reliably playable. He meticulously cleaned and repaired the original pipework and mechanism, replacing only what was absolutely necessary with materials and techniques faithful to Silbermann's practice.

Stoplist

Grand Orgue (54 notes)

| | | |
|--------|-------------------------------------|-----------|
| 8' | Bourdon | |
| 4' | Prestant | |
| 4' | Flute | (missing) |
| 2 2/3' | Nazard | |
| 2' | Doublette | |
| 1 3/5' | Tierce | |
| 1' | Sifflet b&t | (missing) |
| III | Fourniture | |
| V | Cornet | |
| 8' | Cromhorne | |
| | Tremblant doux (a gentle tremulant) | |

Pedal, 13 notes. (Cc)

| | |
|----|--------------|
| 8' | Bourdon |
| 4' | Prestant |
| 8' | Cromorne b&t |

Pedal stops borrowed from Grand Orgue

Description of Measurements

If you are not familiar with scaling measurements, I recommend you checkout my book of Scaling. It is available for free download from my website <http://www.blairbatty.ca/tonal.html#scales>. I typically measure every “c” and “f#” pipe, to understand how the dimensions of the pipes change, throughout the compass, from bass to treble.

Diameter: This is the inside diameter of the pipe, measured in millimeters.

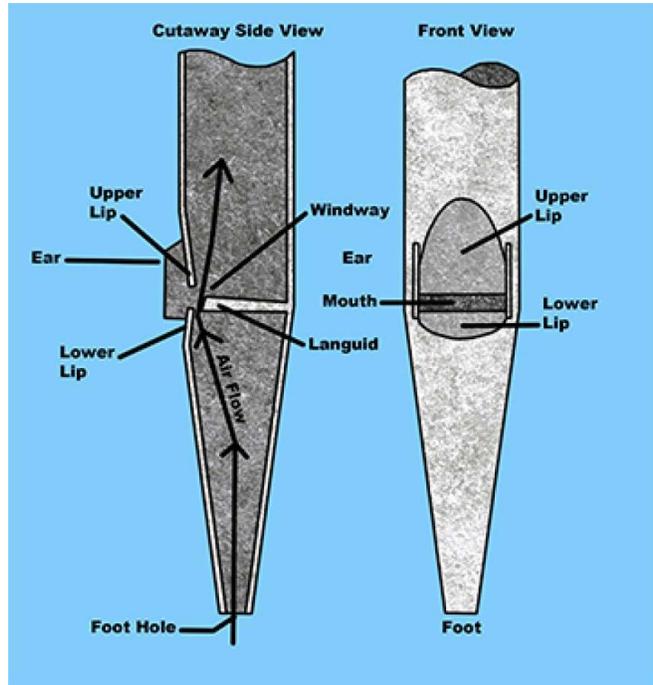
Mouthwidth: width of the mouth in millimeters.

Cutup: is distance between the upper and lower lips, in millimeters.

Windway: is the width of the slit of the windway, in millimeters.

Toehole: Is the diameter of the wind hole in the bottom of the foot, in millimeters.

Foot WP: Is the windpressure inside the foot of the pipe, measured in Pascal. Ten Pascal = ~1 millimeter watercolumn.



Calculations

Not everything was measured. Some of the numbers written down here were calculated from the measurements.

Topfer NM: The diameter, mouthwidth and cutup measurements were converted to Topfer Normmeasure and graphed. Mouth NM presumes $\frac{1}{4}$ mouth as normal, cutup presumes $\frac{1}{4}$ cutup as normal.

Mouthwidth and cutups: are commonly described as fractions (e.g. $\frac{1}{4}$ mouthwidth, $\frac{1}{4}$ cutup). So, these fractions were also calculated.

Foot wp %: is (footpressure/chestpressure)*100; another interesting reference.

Dr Hartmut Ising developed a formula to show how well the mouth matches the resonator. It provides an intonation number (I), a dimensionless value that represents a pipe's timbre and efficiency.

An Ising of 2 is an ideal match between the mouth and the resonator (*but not necessarily the best sound*). The pipe works most efficiently. For a given frequency, what Ising requires is the cutup, and the amount of energy input.

The Ising number provides a useful reference point. But you need some experience to make sense of the numbers. As Ising numbers get larger, the sound gets brighter;

- I=1.4 is typical for a Stopped Diapason.
- I=2 is a typical Diapason.
- I=3 makes a good string.

dB 3pf: Is the theoretical, nearfield, dB loudness of 3 adjacent pipes simultaneously played.

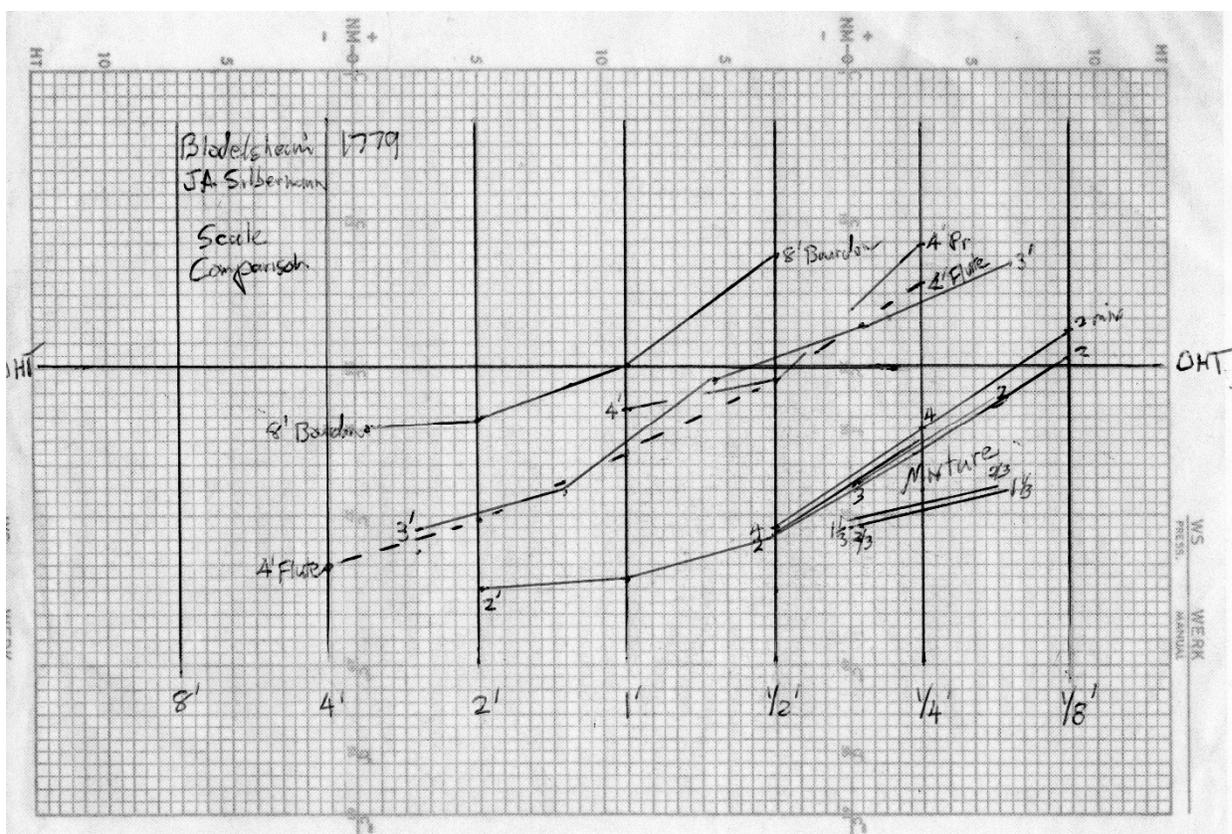
What do the Numbers Tell Us?

Some people, like I, enjoy measuring the various dimensions of the pipes in an organ, and generating various charts and graphs of that data. We do that to discover how the original designer and voicer scaled and manipulated the pipes, to arrive at the sound they wanted.

In very simplistic terms, scaling and voicing can be described in this way:

- Diameter determines the loudness of the fundamental of the pipe.
- Cutup fine-tunes the harmonic content.
- Toehole/mouthwidth/windway fine-tunes the loudness.

Of course, it's not that simple. For example, you can increase the scale of the pipe, which would increase the loudness of the fundamental (*and will also make the tone brighter*). Then by reducing the toehole size which reduces the wind and loudness, and by using a lower cutup to reduce the brightness you can approximate the original pipes sound. But it is not identical, change has consequence.



What about This Organ?

As you can see for the chart above, most of the stops have the same scale. It is a fairly normal curved French scale, which grows larger and fluty in the treble. One exception is the 8' Bourdon which is about three pipes larger. However, the Bourdon 8' scale follows the same French curve.

The other exception are the Furniture and Doublette, both of which follow a French scale that is about 4 pipes narrower than the rest. The Cornet ranks also have a different scale (see below).

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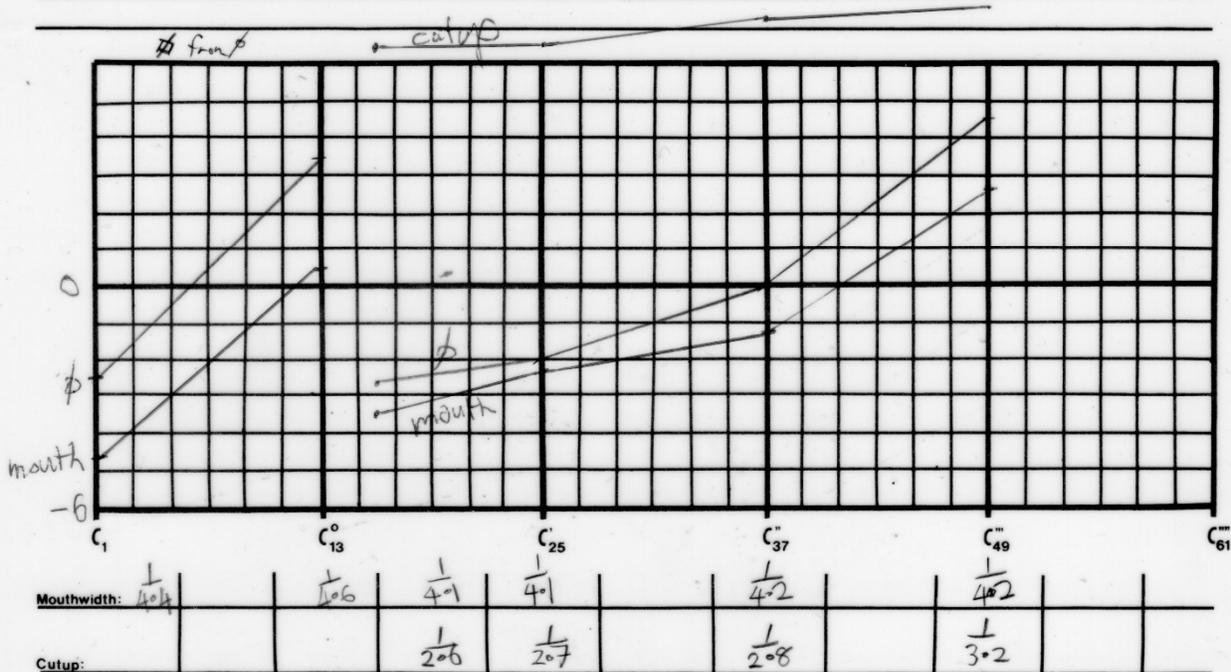
Stop: BOURDON 8 Div: _____

Builder: J. A. Silberman Date: 1779

Windpressure: _____ Pitch: _____

Church: Blodelstein

Description of site & organ: _____



ACTUAL MEASURE Hz ← ds

| | | | | | | |
|--------------------|-----|-----|------|------|------|------|
| Top Diameter: | | | | | | |
| Diameter at Mouth: | 155 | 125 | 72 | 50.5 | 32.4 | 23.4 |
| Mouthwidth: 100 | | 74 | 55 | 39 | 24.5 | 17.2 |
| Cutup: | | | 21 | 14.3 | 8.8 | 5.3 |
| Metal Thickness: | | | | | | |
| Windway: | | | | | | |
| Lanquid: | | | | | | |
| Body Length: | | | 525 | 292 | 139 | 57 |
| Toe Hole: | | | | | | |
| Roller ϕ | | | 13.7 | 11 | 8.8 | 7 |
| Roller length | | | 100 | 66 | 77 | 62 |

Source of Data: _____ Material: "Metal"

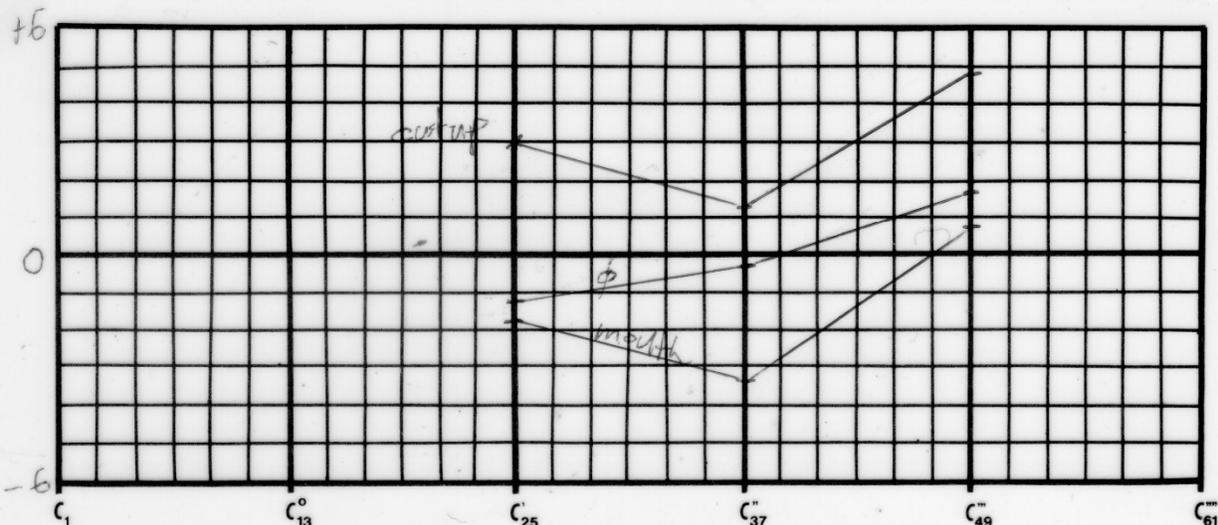
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Stop: PRESTANT 4' Div: _____

SILBERMAN
Builder: Johann ANDREAS Date: 1779?
Church: BLODELSTEIN

Windpressure: _____ Pitch: _____

Description of site & organ: _____



| | | | | | | |
|-------------|--|--|-------|-------|-------|--|
| Mouthwidth: | | | 1/4=1 | 1/4=6 | 1/4=2 | |
| Cutup: | | | 1/3=3 | 1/3=3 | 1/3=4 | |

ACTUAL MEASURE

| | | | | | | |
|--------------------|--|--------|------|------|------|--|
| Top Diameter: | | | | | | |
| Diameter at Mouth: | | | 31 | 19.3 | 12.5 | |
| Mouthwidth: | | 23.8 → | 19.3 | 13.2 | 9.4 | |
| Cutup: | | | 7.3 | 4 | 2.8 | |
| Metal Thickness: | | | | | | |
| Windway: | | | | | | |
| Lanquid: | | | | | | |
| Body Length: | | | | | | |
| Toe Hole φ: | | | | | | |

Source of Data: _____ Material: TIK

NOTES (ears, bearus, slots, tuners, voicing, etc) C-b facade

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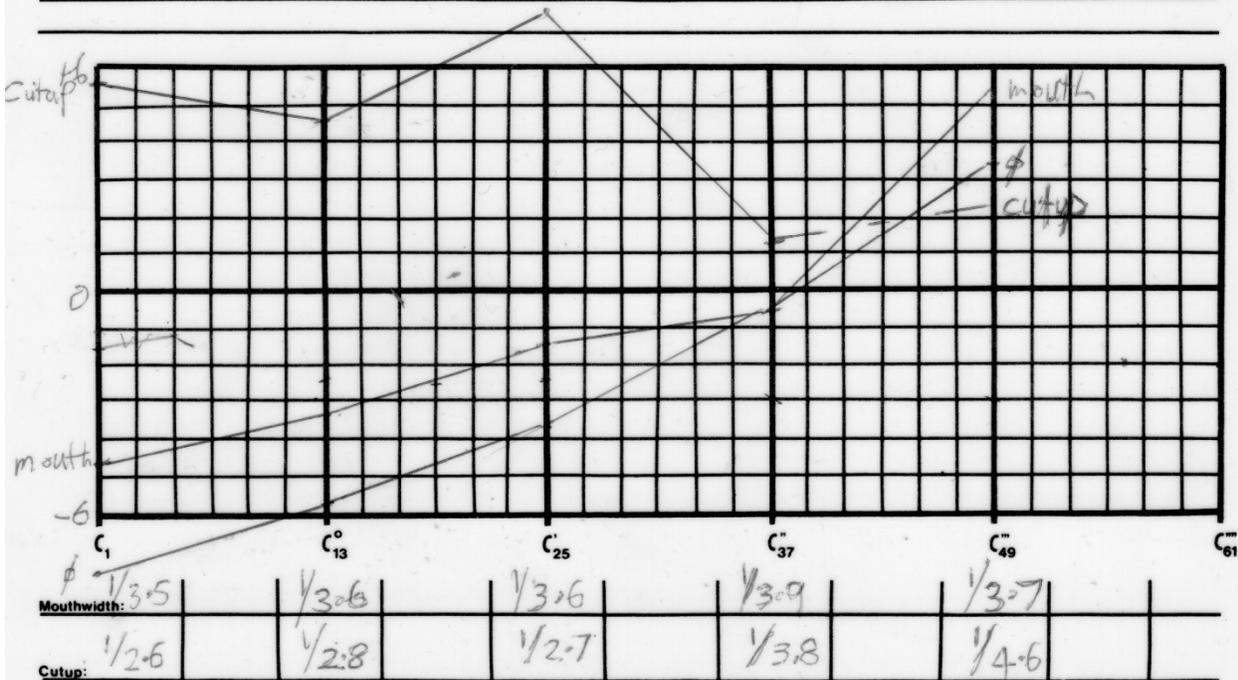
Stop: FLUTE 4' Div.: _____

Builder: JA Silberman Date: 1779

Windpressure: _____ Pitch: _____

Church: Blodelshain

Description of site & organ: _____



ACTUAL MEASURE

| | | | | | | |
|--------------------|------|------|------|------|------|--|
| Top Diameter: | | | | | | |
| Diameter at Mouth: | 67 | 43 | 27.8 | 19 | 13.4 | |
| Mouthwidth: | 59.4 | 37.5 | 24.1 | 15.3 | 11.5 | |
| Cutup: | 23.2 | 13.2 | 9 | 4 | 2.5 | |
| Metal Thickness: | | | | | | |
| Windway: | | | | | | |
| Languid: | | | | | | |
| Body Length: | 674 | 317 | 151 | 66 | 28.5 | |
| Toe Hole: | | | | | | |
| Roh - ϕ 14 | 11 | 9 | 7 | 6 | | |
| Roh - length | 90 | 77 | 58 | 43 | | |

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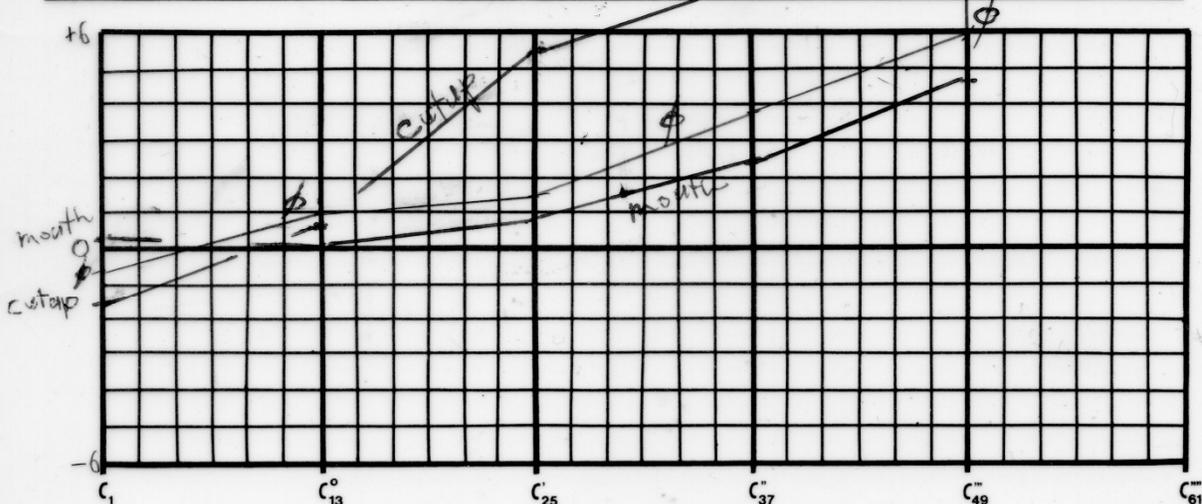
Stop: NAZARD 2²/₃ Div.: _____

Builder: J. A. Silberman Date: 1779

Windpressure: _____ Pitch: _____

Church: Bladelsheim

Description of site & organ: _____



| | | | | | | |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| Mouthwidth: | $\frac{1}{3.9}$ | $\frac{1}{4.1}$ | $\frac{1}{4.1}$ | $\frac{1}{4.3}$ | $\frac{1}{4.2}$ | |
| Cutup: | $\frac{1}{4.3}$ | $\frac{1}{3.7}$ | $\frac{1}{3.3}$ | $\frac{1}{3.2}$ | $\frac{1}{3.2}$ | |

ACTUAL MEASURE

| | | | | | | |
|--------------------|------|------|------|------|-----|--|
| Top Diameter: | | | | | | |
| Diameter at Mouth: | 67 | 42 | 25.7 | 16.8 | 11 | |
| Mouthwidth: | 54 | 31.8 | 19.5 | 12.4 | 8.2 | |
| Cutup: | 12.5 | 8.5 | 6 | 3.9 | 2.6 | |
| Metal Thickness: | | | | | | |
| Windway: | | | | | | |
| Lanquid: | | | | | | |
| Body Length: | | | | | | |
| Top Hole: | | | | | | |

Source of Data: _____ Material: Common

NOTES (ears, bearus, slots, tuners, voicing, etc)

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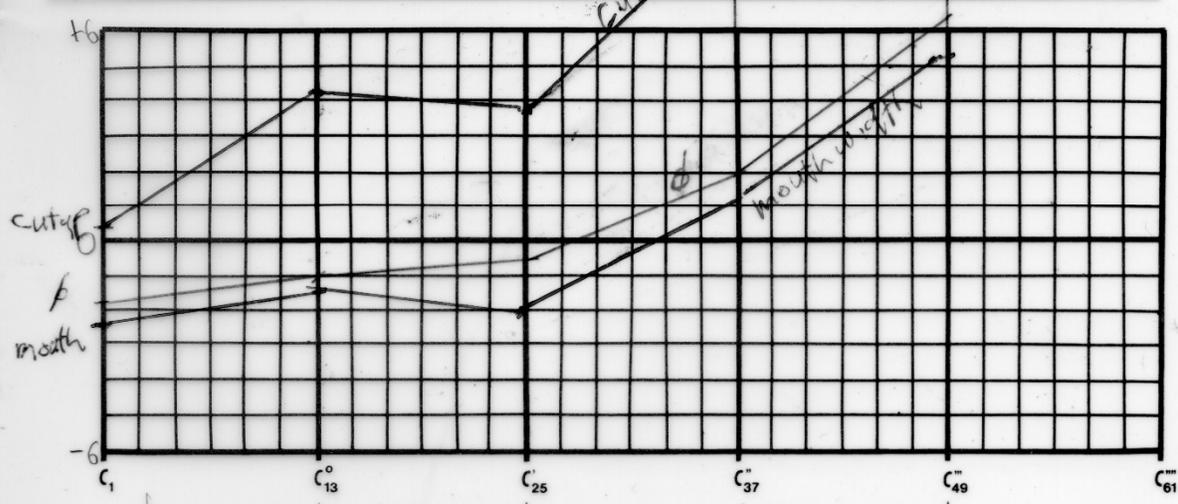
Stop: Doublette 2' Div.: _____

Builder: J. A. Silberman Date: 1779

Windpressure: _____ Pitch: _____

Church: Blackstone

Description of site & organ: _____

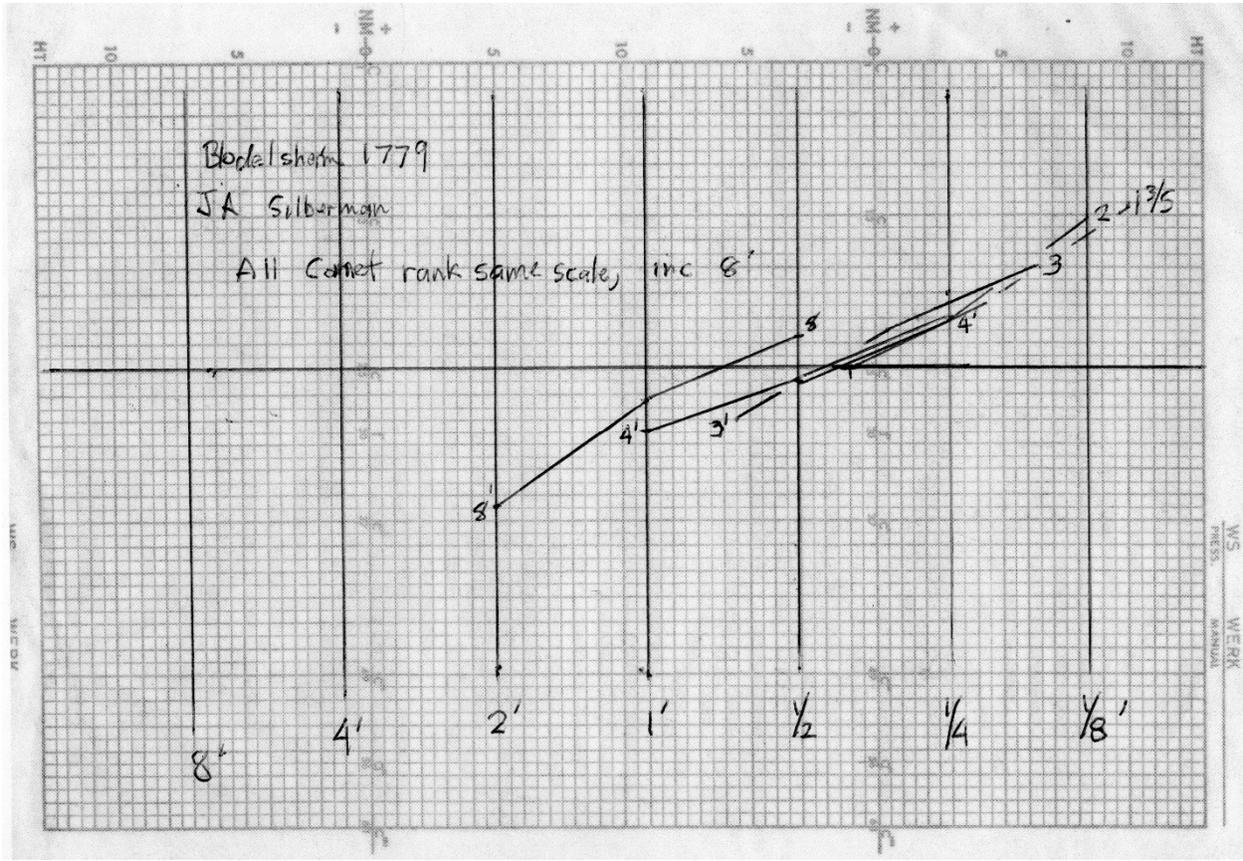


| | | | | | | |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| Mouthwidth: | $\frac{1}{4.1}$ | $\frac{1}{4.1}$ | $\frac{1}{4.2}$ | $\frac{1}{4.1}$ | $\frac{1}{4.1}$ | |
| Cutup: | $\frac{1}{3.5}$ | $\frac{1}{3.1}$ | $\frac{1}{3.1}$ | $\frac{1}{2.8}$ | $\frac{1}{3.2}$ | |

ACTUAL MEASURE

| | | | | | | |
|--------------------|------|------|------|-----|--|--|
| Top Diameter: | | | | | | |
| Diameter at Mouth: | 31.4 | 18.9 | 12.6 | 9 | | |
| Mouthwidth: | 24.2 | 14 | 9.5 | 6.8 | | |
| Cutup: | 7.7 | 4.5 | 3.4 | 2.1 | | |
| Metal Thickness: | | | | | | |
| Windway: | | | | | | |
| Lanquid: | | | | | | |
| Body Length: | | | | | | |
| Toe Hole: | | | | | | |

Source of Data: _____ Material: _____



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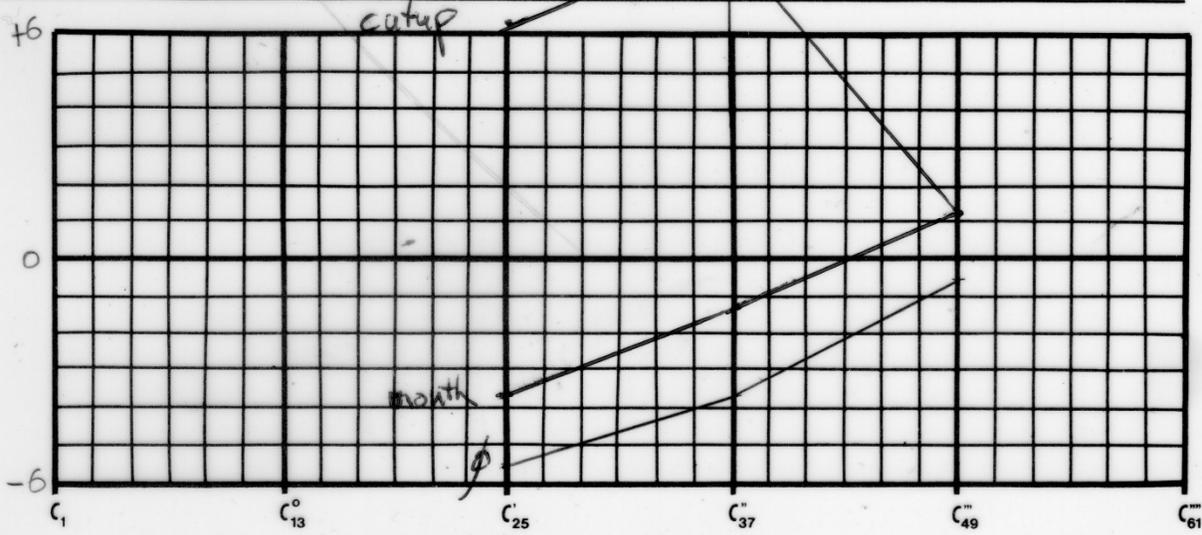
Stop: CORNET II Bourbons! Div: _____

Builder: _____ Date: _____

Windpressure: _____ Pitch: _____

Church: Bledelsheim

Description of site & organ: _____



| | | | | | | | |
|-------------|--|--|-----------------|-----------------|-----------------|--|--|
| Mouthwidth: | | | $\frac{1}{3.7}$ | $\frac{1}{3.5}$ | $\frac{1}{3.7}$ | | |
| Cutup: | | | $\frac{1}{2.6}$ | $\frac{1}{2.6}$ | $\frac{1}{4}$ | | |

ACTUAL MEASURE

| | | | | | | | |
|--------------------|--|--|---------|------|----|--|--|
| Top Diameter: | | | | | | | |
| Diameter at Mouth: | | | 23.2 | 27.5 | 19 | | |
| Mouthwidth: | | | 37.2705 | 24.2 | 16 | | |
| Cutup: | | | 29.69 | 9.4 | 4 | | |
| Metal Thickness: | | | 14.1 | | | | |
| Windway: | | | | | | | |
| Lanquid: | | | | | | | |
| Body Length: | | | 316 | 151 | 67 | | |
| Toe Hole: | | | | | | | |
| Rel. ϕ | | | 10.4 | 8.9 | 7 | | |
| Rel. Length | | | 90 | 82 | 51 | | |

Source of Data: _____

Material: Common

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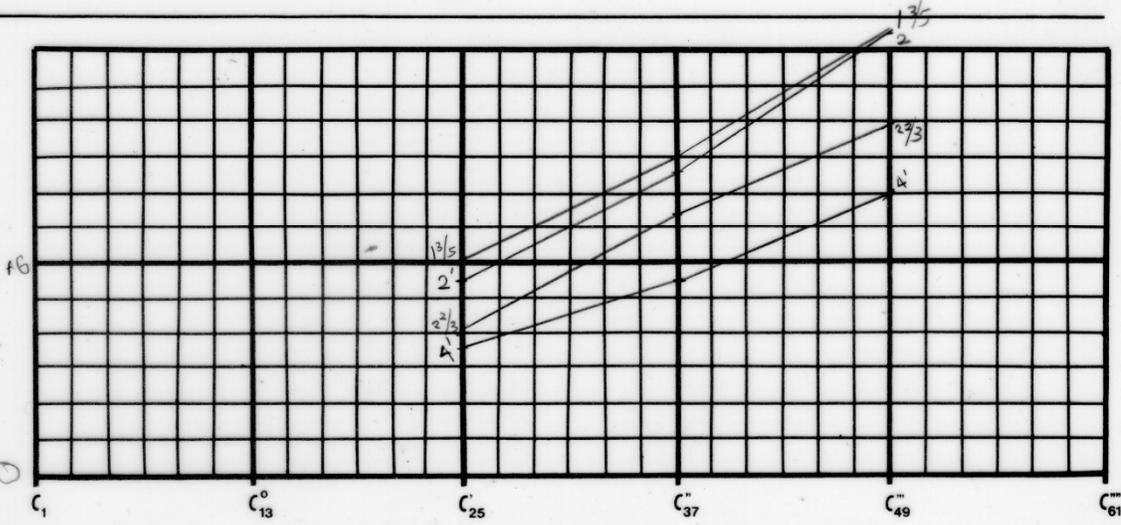
Stop: CORNET II Div: _____

Builder: J. A. Silberman Date: 1779

Windpressure: _____ Pitch: _____

Church: Bodelshain

Description of site & organ: _____



| | | | | | | | |
|-------------|--|--|--|--|--|--|--|
| Mouthwidth: | | | | | | | |
| Cutup: | | | | | | | |

ACTUAL MEASURE

| | | | | | | | | |
|-------|--------------------|--------------------|--------------------|-------------------|--|--|--|--|
| 4' | Top Diameter: | | | | | | | |
| | Diameter at Mouth: | d | lab | out | | | | |
| 2 2/3 | Cutup: | 37.8 | 24.6 | 16.3 | | | | |
| | Metal Thickness: | 29.3 $\frac{1}{4}$ | 18.4 $\frac{1}{2}$ | 12 $\frac{1}{3}$ | | | | |
| 2' | Windway: | 7.6 $\frac{1}{2}$ | 5.7 $\frac{1}{2}$ | 3.7 $\frac{1}{2}$ | | | | |
| | Lanquid: | 28.8 | 19.5 | 13 | | | | |
| 1 3/5 | Body Length: | 21.6 $\frac{1}{2}$ | 14.3 $\frac{1}{3}$ | 9.6 $\frac{1}{3}$ | | | | |
| | Toe Hole: | 6.5 $\frac{1}{2}$ | 4.5 $\frac{1}{3}$ | 3.7 $\frac{1}{2}$ | | | | |
| | | 24.3 | 16.4 | 11.8 | | | | |
| | | 18.1 $\frac{1}{2}$ | 12.5 $\frac{1}{4}$ | 8.4 $\frac{1}{4}$ | | | | |
| | | 5.4 $\frac{1}{3}$ | 3.8 $\frac{1}{3}$ | 2.1 $\frac{1}{4}$ | | | | |
| | | 21.4 | 14.4 | 10 | | | | |
| | | 16.7 $\frac{1}{4}$ | 10.6 $\frac{1}{3}$ | 7 $\frac{1}{4}$ | | | | |
| | | 4.3 $\frac{1}{3}$ | 3.5 $\frac{1}{3}$ | 2.2 $\frac{1}{3}$ | | | | |

Source of Data: _____ Material: COMMON

