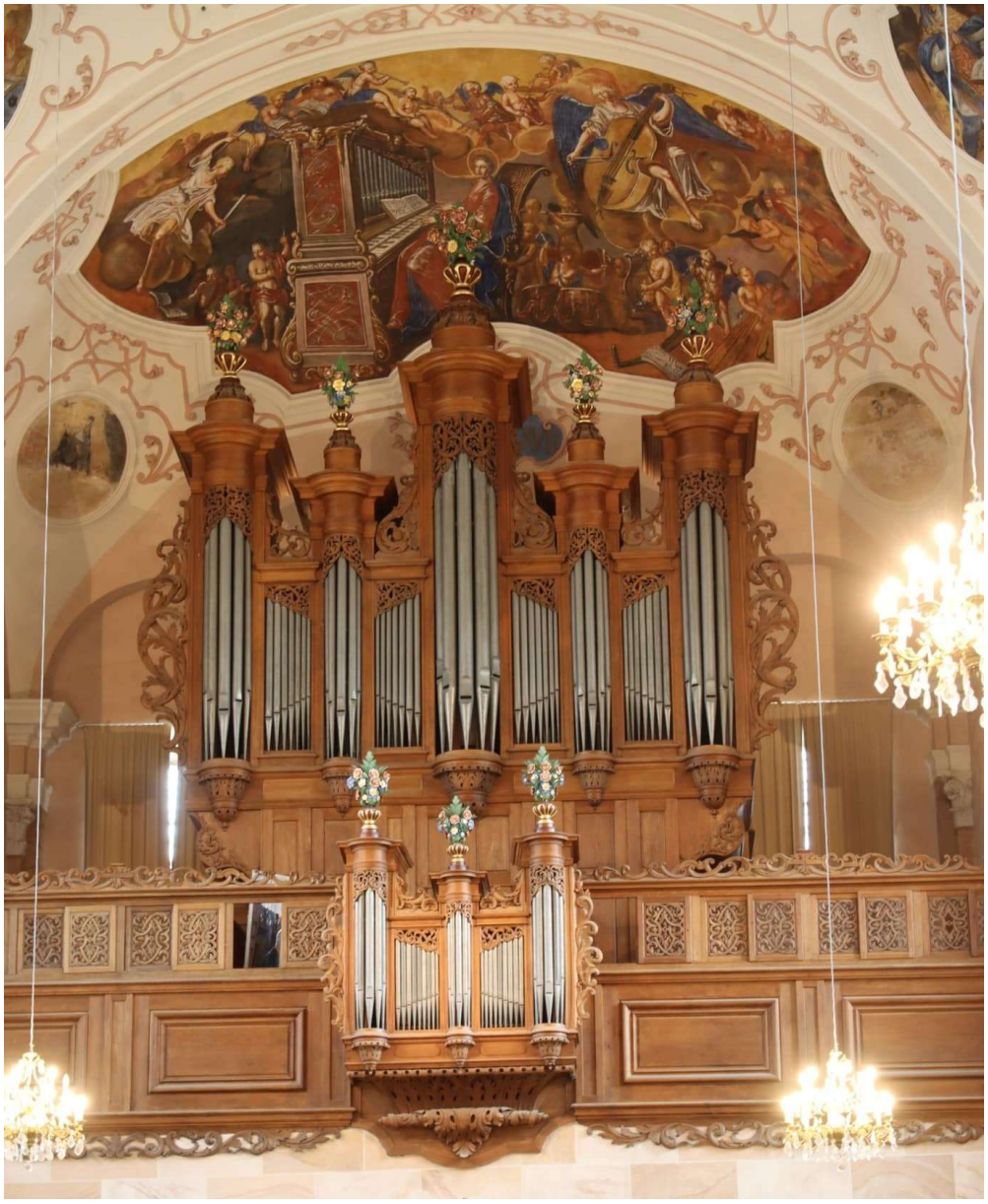

Andreas Silbermann Organ- 1730

Abbey Church of Saint Maurice

Ebersmunster, 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, it is pitched at approximately A=392 Hz *(a whole tone below modern concert pitch of A=440 Hz)*, which is an authentic 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 Ebermunster Organ

The organ housed in the Abbey Church of Saint Maurice (Abbatiale Saint-Maurice) in Ebersmunster, Alsace, France. It was constructed between 1730 and 1732 by the Andreas Silbermann, the founder of the famous Silbermann family of organ builders in Alsace.

It has 3 manuals and a pedalboard; 29 stops across its divisions *(Grand Orgue, Positif de Dos, Pédale)*. A stunning, ornately carved Baroque case in oak, typical of Silbermann's work, which is a work of art in itself.

Historical and Musical Significance

Andreas Silbermann's Masterpiece: It is considered one of his finest and best-preserved organs. It showcases the quintessential Silbermann sound: clear, singing principals, colorful reeds, and a brilliant, well-balanced ensemble.

Exceptional Preservation: Unlike many historic organs, the Ebermunster organ has survived the centuries with remarkably little alteration. Most of its pipework and the key action are original, allowing us to hear the authentic Silbermann sound as it was in the 18th century.

Perfect Acoustics: The abbey church itself, a splendid example of South German Baroque architecture (finished in 1727), provides a warm, resonant acoustic of about 6 seconds of reverberation. This space and the organ were made for each other, creating an immersive musical experience.

Notable Features

Temperament: The organ is tuned in a historical modified meantone temperament, which gives each key a distinct color and character, as was common in the Baroque period.

Pitch: It is pitched at approximately A=392 Hz (a whole tone below modern concert pitch of A=440 Hz), which is another authentic characteristic of its time.

The Organists: The organ has been played by many famous musicians, including Albert Schweitzer, the Alsatian theologian, physician, and Bach specialist, who was a frequent visitor and admirer.

Stoplist

Grand Orgue

16’	Bourdon
8’	Montre
8’	Bourdon
4’	Prestant
2 2/3'	Nazard
2’	Quarte de Nazard
1 3/5'	Tierce
III	Fourniture
III	Cymbale
V	Cornet
8’	Trompette *(basse et dessus)*
4’	Clairon *(basse et dessus)*
8’	Voix Humaine

Positif de Dos

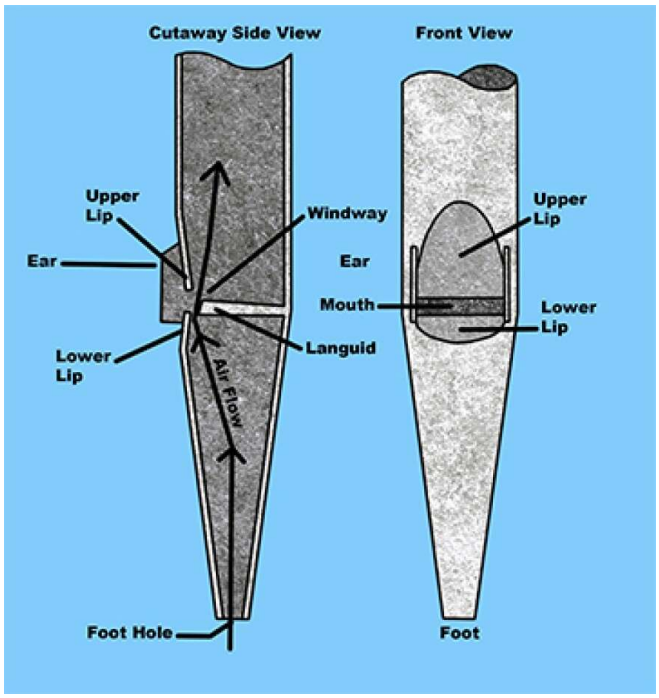
8’	Bourdon
4’	Prestant
2 2/3'	Nazard
2’	Doublette
1 3/5'	Tierce
III	Fourniture
8’	Cromorne

Pédale

8’	Octavebasse' *(or 16' in other sources)*
16’	Bombarde
8’	Trompette
4’	Clairon

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 ¼ mouth as normal, cutup presumes ¼ cutup as normal.

Mouthwidth and cutups: are commonly described as fractions *(e.g. ¼ mouthwidth, ¼ 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.

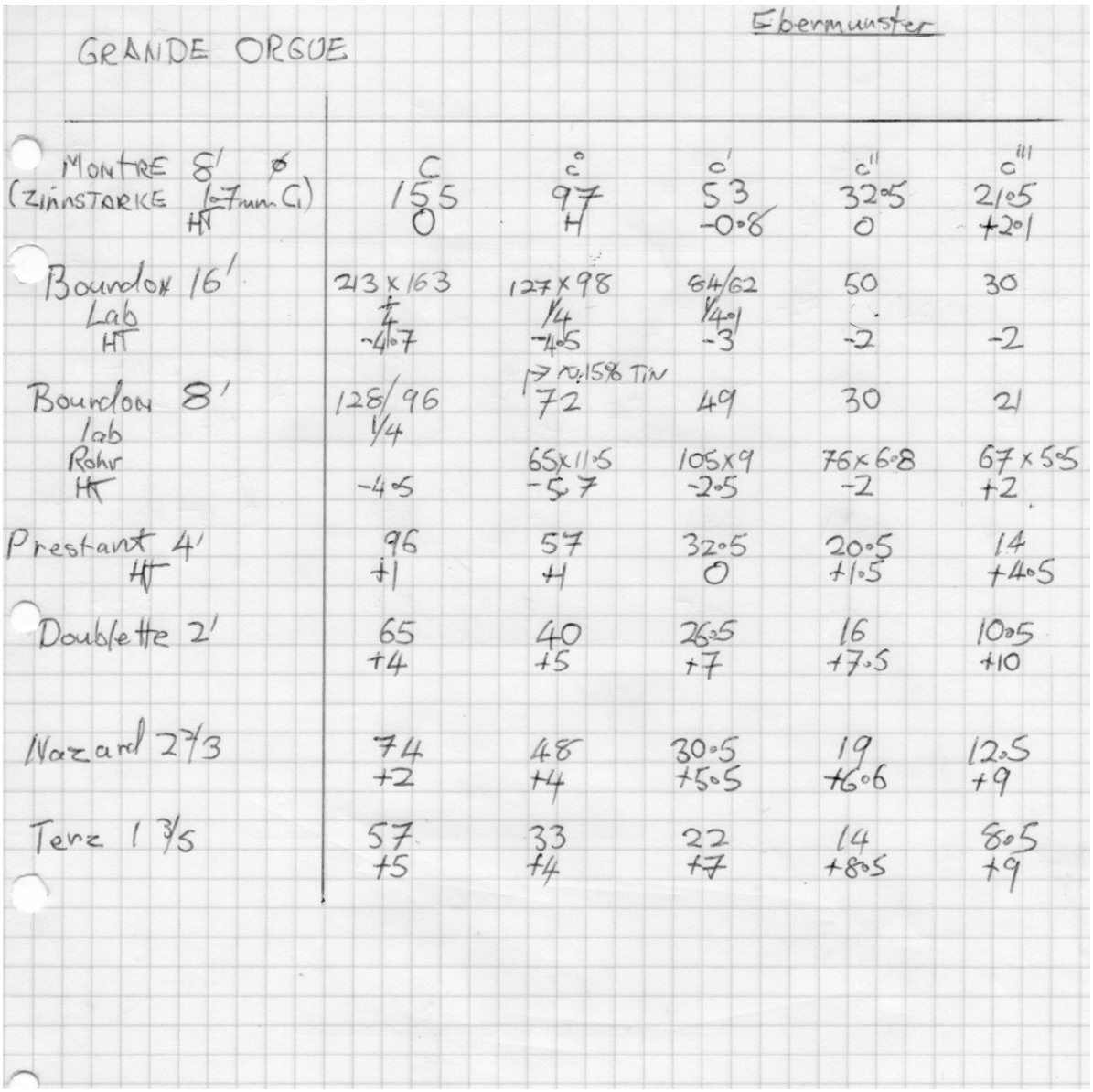
What do the Numbers Tell Us?

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.



GRANDE ORGUE — Ebermunster

	C	c°	c'	c''	c'''
Montre 8' ø (Zinnstarke 1.7mm C) HT	155 0	97 H	53 -0.8	32.5 0	21.5 +2.1
Bourdon 16' Lab HT	213 x 163 ¼ -4.7	127 x 98 ¼ -4.5	64/62 ¼ -3	50 -2	30 -2
Bourdon 8' lab Rohr HT	128/96 ¼ -4.5	72 ~0.158 TiN 65 x 11.5 -5.7	49 105 x 9 -2.5	30 76 x 6.8 -2	21 67 x 5.5 +2
Prestant 4' HT	96 +1	57 +1	32.5 0	20.5 +1.5	14 +4.5
Doublette 2'	65 +4	40 +5	26.5 +7	16 +7.5	10.5 +10
Nazard 2 2/3	74 +2	48 +4	30.5 +5.5	19 +6.6	12.5 +9
Terz 1 3/5	57 +5	33 +4	22 +7	14 +8.5	8.5 +9

Ebermünster

Positive

	C	c°	c'	c''	c'''
Bourdon 8' ϕ chimney	Wood	70 95x15 -6.5	45 80x11.5 -4.5	29 72x7 -2.5	22 60x6 +3
PRESTANT 4' HT	93 0	51 -1.5	31 -1	19.5 0	11.2! 0
NAZARD 2 2/3 ϕ chimney HT	C 54 105x? -5.5	c 33 88x9.7 ~~42 0.5~~ -4.5	b° 23 65x7.7 -1	c' 26 +2	c'' 17.5 +5	c''' 12 +8
Doublette 2' HT	51 -1.5	31 -1	18.5 -1	17.2 0	8 +3.7
Terz 1 3/5 HT	53 +3	31 +2.5	20 +4	13 +6.7	8 +7.5

EBERMUNSTER

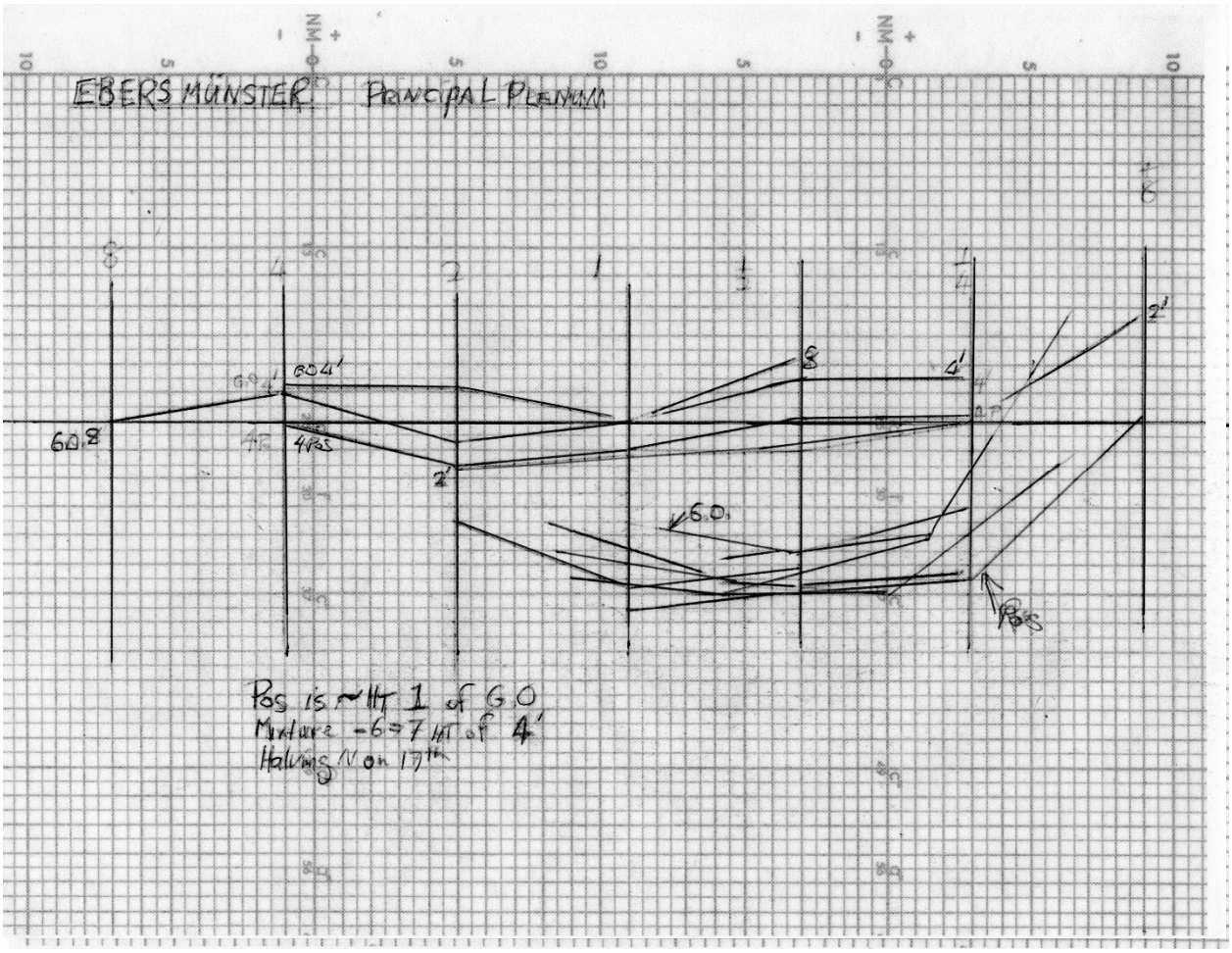
REEDS

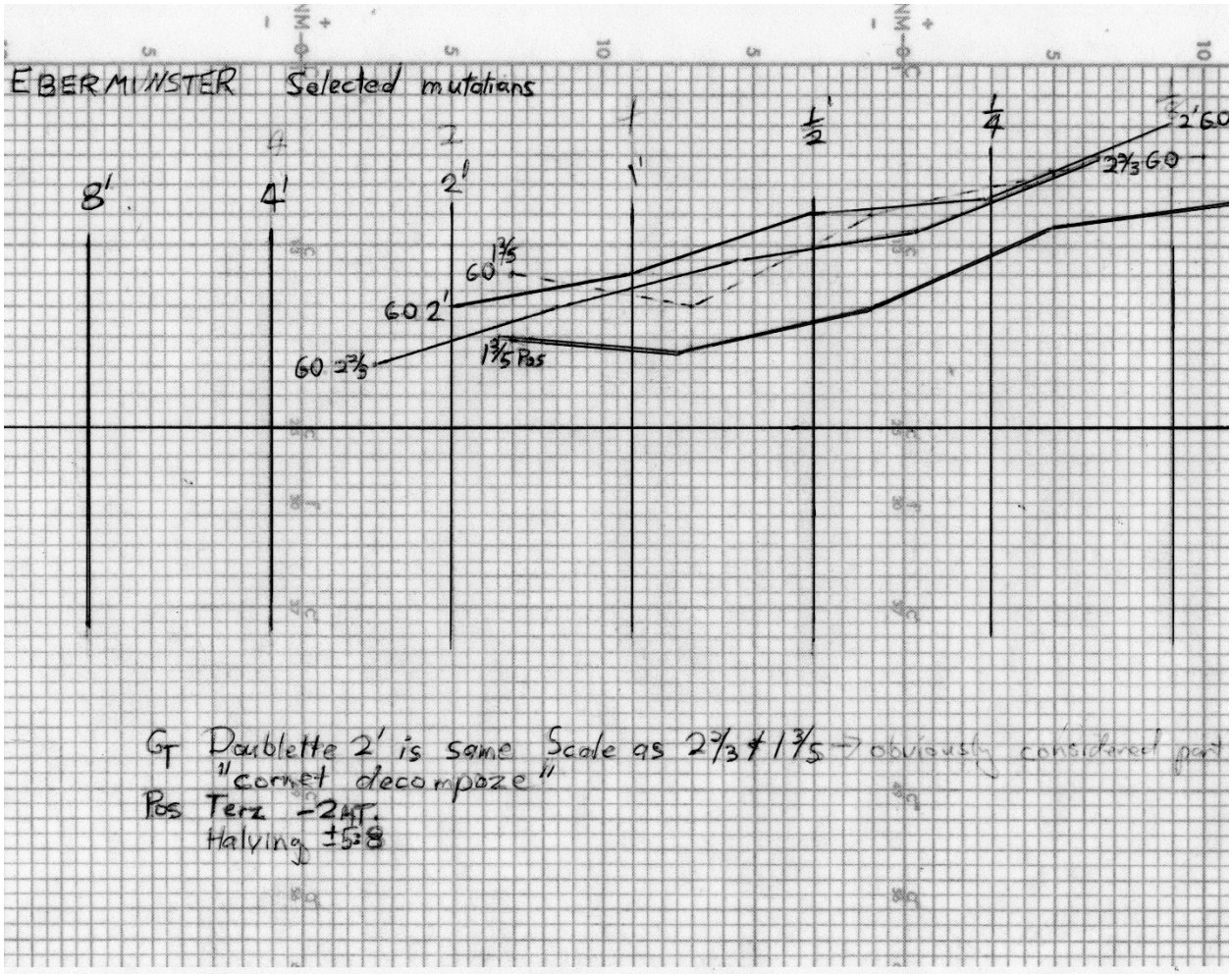
	C	c°	c'	c''	c'''
8 TRUMPET ϕ	102	74	64	54	43
length	2295	1155	565	265	110
4' CLARION ϕ	74	58	47	38	30
Length	1150	553	263	260	118
8' VOX HUMANA ϕ	57	57	57	39	12
Becherlange (konus)	790	790	790	690	40 (cm or mm?)
8' CROMORNE ϕ	31	29	27	26	25
Length	1300	740	385	206	110

PIPEWORK NOTES

All flues regular lab ca. ⅓-¼

Cutups ¼-⅕ principals
⅓ Bourdons.


EBERSMÜNSTER PRINCIPAL PLENUM
8
4
2
1
1
3
5
2'
8
4'
6.0
Pos
Pos is ~ Wt 1 of 6.0
Mixture - 6 ranks of 4'
Halving on 17th

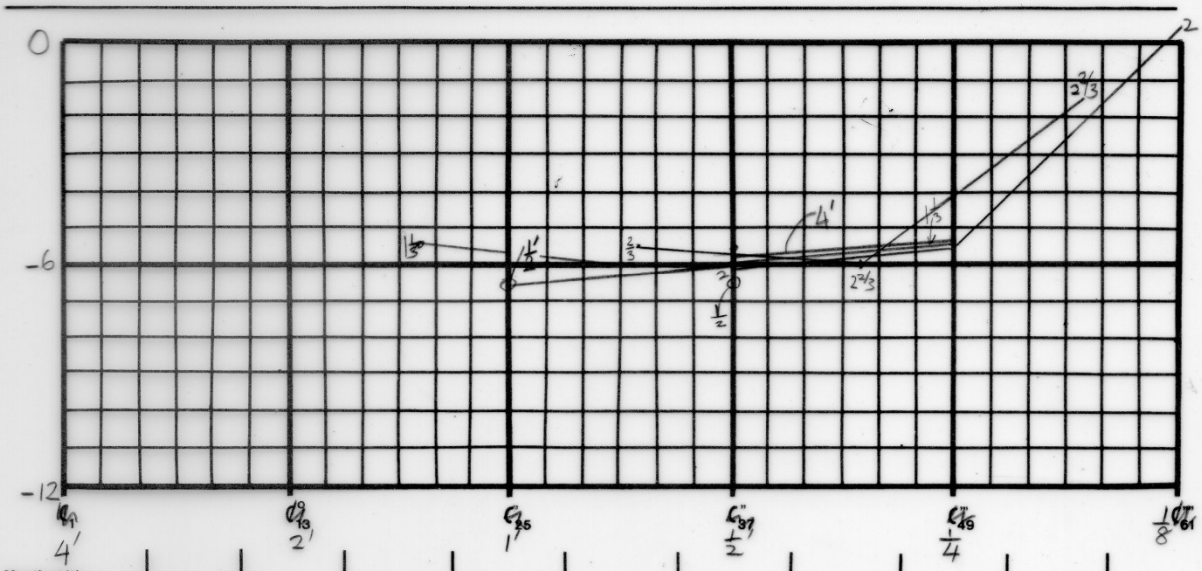

EBERMÜNSTER Selected mutations
8'
4'
2'
1'
1/2'
1/4
2'60
2 7/3 60
60 1 3/5
60 2'
60 2 7/3
1 3/5 Pos
GT Doublette 2' is same Scale as 2 7/3 + 1 3/5 → obviously considered part "cornet decompoze"
Pos Terz -2 2/7
Halving ±5 8

A. B. Batty

Stop: MIXTUR III Div.: POS Builder: Date:

Windpressure: Pitch: Church:

Description of site & organ:



Mouthwidth:

Cutup:

ACTUAL MEASURE

	C1	C#13	C#25	C#37	C#49	C#61
Top Diameter:						
Diameter at Mouth:						
1/2 Mouthwidth:	14.5					
2/3 Cutup:	19	11				
1 Metal Thickness:	24.5	15	9			
1 1/3 Windway:		18.8	11			
2 Languid:			15	9	7	
2 2/3 Body Length:				11	8	
4 Toe Hole ø:				15	9	

Source of Data: Material:

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

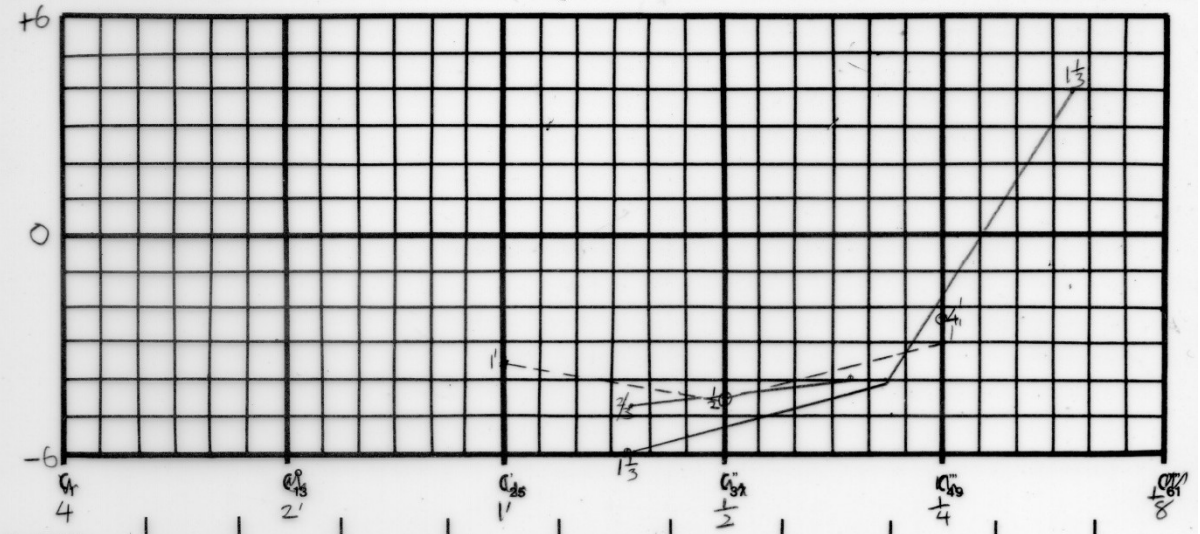
C				1 1/3	1	2/3
c			2	1 1/3	1	
c'		4	2 2/3	2		
c''	8	4	2 2/3			

A. B. Batty

Stop: Cymbal III Div.: G.O. Builder: Date:

Windpressure: Pitch: Church: EBER MUNSTER

Description of site & organ:



Mouthwidth:

Cutup:

ACTUAL MEASURE

	Top Diameter:										
1/2	Diameter at Mouth:	16									
3/4	Mouthwidth:	19.5	12								
1	Cutup:	28	16		10						
1 1/3	Metal Thickness:		19.5		12		10				
2	Windway:				16.5		12		7		
2 2/3	Languid:						16.5		8		
4	Body Length:								10.2		
	Toe Hole ø:										

Source of Data: Material:

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

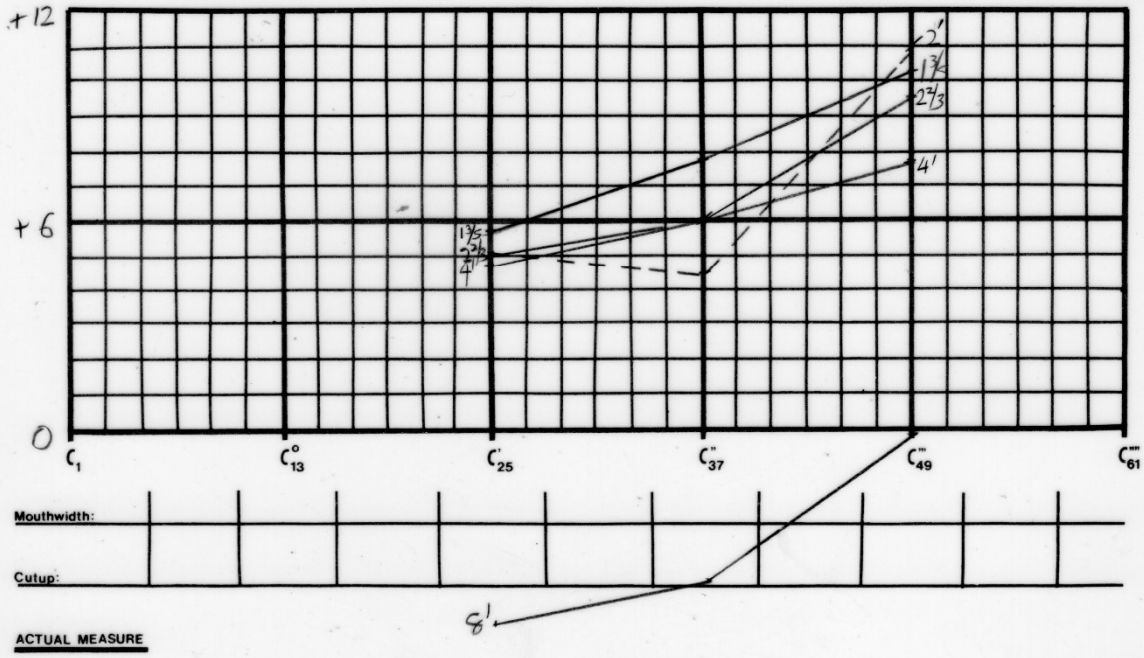
C				2/3	1/2
c			1 1/3	2/3	
c'		2	1 1/3	1	
c''		2 2/3	2	1 1/3	
c'''	4	2 2/3	2		

A. B. Batty

Stop: CORNET I Div.: GT Builder: Date:

Windpressure: Pitch: Church: EBERMUNSTER

Description of site & organ:



Mouthwidth:

Cutup:

ACTUAL MEASURE

8'	~~Top Diameter~~:				44		27.5		19.5	
Rohr length	~~Diameter at Mouth~~:				113		80		53	
Rohr ø	~~Mouthwidth~~:				10.3		7		5.8	
4'	~~Cutup~~:				40		25		16	
2⅔	~~Metal Thickness~~:				30		18.5		12.8	
2	~~Windway~~:				24		14		11	
1⅗	~~Languid~~:				21		13.5		9	
	Body Length:									
	Toe Hole ø:									

Source of Data: Material:

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