GREAT ST. MARY'S CAMBRIDGE
FATHER SMITH ORGAN
1698

compiled by
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THE HARLEY FOUNDATION

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Contents

THE REMAINING PARTS OF THE BERNARD SMITH ORGAN BUILT IN 1698 FOR THE UNIVERSITY OF CAMBRIDGE IN THE CHURCH OF GREAT ST MARY'S

INTRODUCTION

This report on the Smith remains in the University organ in the church of Great St Mary's in Cambridge was carried out in July and August 1995 by Dominic Gwynn, with assistance from Stephen Bicknell (casework), and David Wickens and Bernardo Lievano (measuring pipework). It was written by Dominic Gwynn, and was commissioned by the University to coincide with the restoration of the organ by N.P.Mander Ltd. This report therefore belongs to the University of Cambridge, and is made available with their permission.

Its scope is limited to measurements, drawings and photographs of the Smith parts, with a few Turner and Parker details acquired incidentally.

HISTORY

For further information about the background of the organ researched from documentary evidence, see Nicholas Thistlethwaite's article on the Smith organ in BIOS Journal 2, pp31-64. Details of the subsequent history of the organ have also been researched by Nicholas Thistlethwaite for a pre-restoration report; it is hoped that a history of the organ, including its later history, will become publicly available in due course.

On July 18th 1697 the parish of Great St Mary's consented to a proposal from the Vice Chancellor to receive an organ paid for by the University. Bernard Smith signed a document acknowledging ten payments between May 24th and October 20th 1698. In a Chancery case between Smith and the Dean and Chapter of Christ Church Dublin, Renatus Harris in July 1698 deposed that he had heard that one of the organs built by Smith for Christ Church was to go to St Marys in Cambridge, though that may have been trade gossip. It seems more likely that this organ went to Christ Church Oxford, which had a very similar stoplist.

The first stoplist for the organ at Great St Mary's was recorded by Christopher Shrider in 1721. It included the Echos added by Henry Tolner in 1713.

Great	Chair	Echos
Open Diapason	Stop Diapason	Open Diapason
Stop Diapason	Principal	Principal
Principal	Nason	Cornet
Flute	Fifteenth	Trumpet
Twelfth		
Fifteenth		
Sesquialtara		
Cornet		
Trumpet		

Thomas Parker and his son Joseph signed a contract in July 1766 and for tonal additions in March 1767. The clock dial included in the panel between the two middle towers was removed in 1766.

1804-6 John Avery was paid £325 for repairing and rebuilding. In 1819 Thomas Elliot moved the organ from the gallery in front of the tower arch and placed it in the tower.

In 1870-1 Hill & Son rebuilt the organ, with new chests, etc. In 1963-4 Hill Norman and Beard restored the organ with several new stops and tonal alterations.

CURRENT STOP LIST

Pedal	1 Open Diapason	16	wood
	2 Bourdon	16	wood
	3 Principal	8	
	4 Flute	8	Mander in Hill style
	5 Fifteenth	4	Mander
	6 Mixture	II	Mander
	7 Trombone	16	
Choir	8 Stopped Diapason	8	Smith
	9 Dulciana	8	
	10 Principal	4	Smith
	11 Flute	4	Smith
	12 Fifteenth	2	Smith
	13 Cremona	8	remade, 1995
Great	14 Bourdon	16	Mander, wood in Hill style
	15 Open Diapason	8	Smith
	16 Stopped Diapason	8	Smith
	17 Gamba	8	former Spitz Principal new trb
	18 Principal	4	Smith
	19 Nason Flute	4	Smith
	20 Twelfth	2 2/3	Smith
	21 Fifteenth	2	Smith
	22 Mixture	III	Smith,reconstituted, 1995
	23 Cornet	V	mid c. Mander
	24 Trumpet	8	
Swell	25 Open Diapason	8	
	26 Stopped Diapason	8	Pre 1870
	27 Principal	4	
	28 Fifteenth	2	Mander
	29 Mixture	III	reconstituted
	30 Double Trumpet	16	former Cornopean + new basses
	31 Cornopean	8	Mander
	32 Oboe	8	former Contra Oboe + new treb.
	33 Clarion	4	
	34 Tremulant		

Almost 11 of the original 13 Smith stops survive, and their voicing is remarkably undisturbed. Nonetheless the speech and tone are now subdued, perhaps because of the slight quietening that comes with toeholes closing with settling and re-voicing, and moving the organ behind the tower arch.

KEY COMPASS

The present manual key compass is C to g^3. It looks as if Smith's compass was GG AA C D to c3 (50 notes), and Parker's was GG AA to d3 (55 notes), but both using the same Great chest. Pipes, pipe marks and numbers from all these notes survive.

WINDCHEST ORDER

The Smith chest seems to have had 56 channels. There were 50 channels with pipes on them. Parker remembered (or thought he remembered) four spare bass grooves (ie. 1 2 55 56) and two spare treble grooves (presumably 6 and 50): '...four spare grooves in the Bass, two at each end: & two spare grooves in the treble, one at each end'.

The Parker numbering presumably gives the order of the channels on the Smith Great chest. Unfortunately these numbers are by no means consistent, even where the order (as in the flats) is fairly clear.

It appears that Smith's order more or less followed the front (numbered from the bass):

1 2 spare bass channels

3 – 5 A# F# G#, as in the side tower

6 spare treble channel

7 – 24 $g\#^2$ e^2 c^2 $g\#^1$ e^1 c^1 $g\#^o$ e^o c^o d^o $f\#^o$ $a\#^o$ d^1 $f\#^1$ $a\#^1$ d^2 $f\#^2$ $a\#^2$ of which 9 (e^1 c^1 $g\#^o$ c^o d^o $f\#^o$ $a\#^o$ d^1) in the front

25 – 31 F C D GG D# AA E on the chest, of which perhaps F C D in one centre tower, D# AA E in the other, with GG on the chest.

The 7 pipes in the centre flat were surely the seven Principal pipes which are missing from the Great Principal, ie. GG AA C D D# E F

32 – 49 b^2 g^2 $d\#^2$ b^1 g^1 $d\#^1$ b^o g^o $d\#^o$ $c\#^o$ f^o a^o $c\#^1$ f^1 a^1 $c\#^2$ f^2 a^2 of which 9 ($d\#^1$ b^o g^o $d\#^o$ $c\#^o$ f^o a^o $c\#^1$ f^1) in the front

50 c^3

51 + 52 spare bass channels

53 55 56 A G B as in the side tower

54 spare bass channel

In fact the numbering of the pipes is not as neat as this; it may be that c^3 is on channel 6, and that the spare treble grooves are both on one side. But the general idea is quite possible. Unfortunately I found no graffiti on the front pipe toeboards.

It looks as if Parker merely made use of the spare channels, and left Smith's order untouched, but since Smith's order is not certain itself, Parker's is even more uncertain. It is difficult to say why the 1767 numbering is so apparently haphazard, but then, we are not mid 18th century organbuilders.

PITCH

Unfortunately the best clue to the original pitch, the front pipes, were disposed of in 1963. The only open pipe cut to length is the pitch pipe, Great Principal c^1, now at A440. William Hill's pitch (according to Alexander Ellis, who knew him well) was very close to this, at A441.7.

The main clues to the original pitch are the pipe marks, which show movements of a semitone or more, and the wooden pipes, especially the Parker Swell Stop Diapason, which give some idea of movements of less than a semitone.

The pipe marks show no movement after 1767. Wooden stopped pipes are unreliable indicators, but the Parker pipes do suggest that the stoppers are lower in the pipe than they would normally be, which suggests that the Parker pitch was lower than A440. It is likely to have been the usual 18th century concert pitch, ie. a' = 425Hz or thereabouts, or half a semitone flat to A440.

Parker moved the pipes up a semitone (and therefore the pitch down a semitone). We cannot now tell whether he cut any pipes down, but we can say that Smith's pitch was no more than a semitone higher than A425, say A440 - 450Hz.

Parker moved the pipes by altering the key action: "*...by making AA ye next half note, BB flat, & strikeing out ye movements to it accordingly...*" (Nicholas Thistlethwaite report, from the University Archives)

MIXTURE

Unfortunately the Smith pipes were not given a rank number, but it is likely that it had no more than three ranks. It is possible that pipes were taken out later which would have given breaks (eg. rank IV 4/5' to B, rank I 2' to b^o) and a fourth rank, but the only evidence to suggest it is the occasional pipe which does not fit the sequence, and the occasional channel with too many pipes. Parker only marked 1, 2 and 3.

On the other hand, the marking may reveal the traditional division of the 18th century mixture into octave, tierce and fifth ranks, often marked 15 or 22, 3 and 12. Adlington Hall already has ranks marked in this way. At St Helen's Bishopsgate and at St Mary Rotherhithe the pipes are marked like this rather than with rank numbers, so that only the survival of sufficient pipework reveals the number of ranks and the breaks. It may explain the apparently unbroken sequence of 17.19.22 in the mixture here.

At least there is no doubt that there was a tierce in 1698, which is positive enough in itself. The pattern of 17.19.22 unbroken to b^o, which was to become standard in the next century, seems already to be evident here.

The other interesting feature is that the ranks all seem to have the same scale, so eg. g^2 is always 74.5mm plate width, whichever rank it is in.

METAL PIPEWORK:

Manufacture

The high proportion of tin in the alloy is worth noting; not as high as the Dallam front pipes at eg. Stanford on Avon, but higher than the average 18th century metal. The pipes also have quite thick walls. It is not hammered.

There were no marking out lines on the inside of the pipe, similar to those at St Lawrence Whitchurch. The seams are thick, and have not been run to remove the roughness in the solder. The pipes are well made.

What is characteristic of Smith is the thick metal, the long feet and the scribing of the upper and lower lips to 1'c, either round, or occasionally bay leaf (Principal GG). The upper lips are characteristic of Dutch pipes of the 17th and 18th centuries.

The pipe feet are usually 9 ins (around 225mm), but sometimes 10 ins (Great Twelfth) and occasionally 11 ins. The fact that the discarded Cornet pipes had feet of this last length is not therefore an argument against their being mounted.

The ears are characteristic of 18th century English pipes, but definitely not Dutch 17th century. They may be a Smith innovation. They are hardly higher than the mouth height, which suggests the aim was to stabilise the side of the mouth rather than focus the stream of wind.

The languids are thick and heavy. They all seem to taper slightly towards the back. The bevel is high, the edge removed but not flattened. The nicks are made with a thin knife held vertically and at right angles to the languid, but with the handle held away from the pipe so that the nick does not come much of the way up the bevel.

Scales

The scales are not as clear as one would wish, partly because the pipes below 4'c are mostly missing, and partly because the original pitch of the pipes is not always clear, but there is no more plausible alternative to the following.

Firstly, all the pipes follow more or less the same scale line. They may actually, but points at which the addition constants affect the scale is not consistent from rank to rank.

The scale seems to be 3:5. It might be another ratio close to 3:5, but it is not 1:2 (on 1:2 graph paper the line follows a consistent curve). There is no constant until about f1 on the Principal, a1 of the Twelfth and g1 of the Fifteenth; it is about 9mm (3/8 ins).

The measured pipe seems to be G in the 8' octave, which has a plate width of 12ins, or close enough to it. But it may be that the measured pipes are 4'c or 2'c, which are close to the scale Talbot records in his ca1695 ms, 254mm (10 ins) and 152.4 (6 ins) respectively.

The ratio of the mouth widths to the plate widths is close to 2:9 throughout. The pipes below 1'c, ie. those with ears, were difficult to measure really accurately, and the mouth widths might be understated, but not by enough to approach 1:4.

Voicing

The mouth heights look original. The upper lip is straight. The cut ups are high for English classical pipes, but not for Dutch. It is around 1:3.6 throughout, ie. relatively rather high in the bass, and a bit low in the treble. This gives the opportunity for a fuller bass than the Dallam organs, though not as stringy.

Parker and Hill changed crucial elements in the voicing. The most important is that the toeholes have been closed in; no organ of ca1700 would have had such small toeholes, though the change towards an equilibrium of toe and flue might have already begun. The nicking has been deepened, though not too extensively. The flues are not as wide as I would expect, though they might have been narrowed in 1870, and 18th century

English practice was not consistent, though at St Lawrence Whitchurch (Gerard Smith ca1716) and St Mary Finedon (?Gerard Smith ?1719) they are quite wide.

The effect of closing the toeholes is crucial. Not only is the organ quieter as a result, it is also weaker and duller in speech and tone. The amount of air admitted to the pipe is an important part of the voicing, as important as the pressure, which in this case may be similar to the original. Dutch organs of about 1700 of this size had a pressure of about 65 to 75mm. Increasing the amount of wind at toe and flue increases the volume, but also the liveliness of speech and tone, which can become unstable. Increasing the pressure tends to make speech and tone smoother and duller, until the pipe overblows.

Attempts to control speech include nicking, which is evident in an ad hoc way in this organ. Closing the flue has a similar effect, especially if it is accompanied by closing of the toe. Another is to raise the pressure and close the toe, which maintains volume but makes the tone smoother and controls the speech, which is what happened in 19th century England.

The languids are quite low for open pipes, but the upper lips are pushed surpisingly far in. Almost all the 17th and 18th century voicing which I have examined seems to depend on pipes made with the upper lips outside the lower (the bodies perhaps half a pipe bigger than the foot). This is particularly true of the Netherlands, and yet here many of the pipes have the upper and lower lips level, or the upper lip behind, which is, even for modern voicers, supposed to be detrimental to the voicing. It does not seem to be here. The construction of the pipes does not suggest a later change.

Chamfering the upper lip has a similar effect to pushing the upper lip in, but it also makes the sound louder and reedier. It may be part of a system with high cut ups and low wind pressure (low being about 60 - 65mm). The chamfering looks original.

WOODEN PIPEWORK:

Manufacture

It is interesting that these Smith pipes are made of pine, in what was already the traditional English way. Those at St Katherine Cree and the Temple (ten years earlier than Great St Mary) are of oak.

Otherwise the construction is of the traditional English type, well known from the so-called Father Smith chamber organs. The flue is in the cap, the oak block projects above the cap, with a slight bevel on the edge, the toe is plugged with thin wedges. Father Smith would have known very few wooden pipes before he came to England, they would usually have been bass extensions of stopped ranks in small organs, and not in this style. It may be that earlier Smith wooden pipes were more like Dutch ones, with oak walls and high mouths, but these he must have learnt about in England. The walls are glued with back first, then sides and then front. The feet are filed round, rather than turned. The edges of the caps are planed.

The stopper handles have a distinctive shape, with a dot on the front of the knob to show the front of the pipe. They are carved from 2'c upwards. There is a step for the leathered part of the stopper, cut away (Choir Flute) or by gluing an extra piece on (Great Stopped Diapason).

The shape of the stopper handles, caps and the pipe feet, and the feel of the pipes generally, give the impression that the Choir Flute was made by a different man but to the same pattern as the Great Stopped Diapason.

Scales

It is always more difficult to be certain about the scales of wooden pipes, as they are not made as accurately as metal pipes. In this case though, they are quite accurately made, and they follow the metal pipe scale so exactly that there can be no doubt that they use the same scale line.

The remarkable feature of the scaling system is that the perimeter of the blocks is exactly the same as the open metal pipes of the same pitch, ie. the Stop Diap g is the same scale as the Principal G (about 185.6mm). The perimeter scale line seems to confirm the pattern of 3:5, from a measured pipe of 12 ins at G, without a constant.

The mouth widths do not follow a constant proportion to the perimeter aggregate however, starting at about 1:4.45 at C and ending at about 1:5 at c3. The depths have an addition constant of about 3mm, the widths a negative constant of about 1.5mm. It is more likely that two pipes with simple ratios were taken, or some simple geometric ratio.

Voicing

The mouth heights are low at 4'c, 1:4.64 of mouth width, rising to 1:3.5 at c3. They are also low at AA and C but rise haphazardly from C to A#, before suddenly returning to the lower level. One can only suppose that either Smith, or some other early voicer, had a spot of bother with the speech. The low cut ups give the characteristic nasal sound, with its strong twelfth, the characteristic tone of these pipes. The cutting up (which is original) has all been done with a knife after manufacture, which is rare in church organs, though not in the so-called Father Smith chamber organs.

It may be that the pipes are quieter than originally. Most of the wedges in the toes looks later, though without removing them it is difficult to say that more than some of it later. With a lower wind pressure than Hill's, which is likely, but with more wind, one would expect a fresher, more open sound, with a stronger speech characteristic.

In comparison with 18th century examples the flues are medium width, and the upper lips medium thickness. St Mary Finedon has thick upper lips and a wide flue. St Helen's Bishopsgate (Thos Griffin 1743) has thin upper lips and a narrow flue.

PARKER NUMBERING

This gives the order of the pipes on the chest. The numbers are just below the lower lip, though for the Twelfth there are also numbers on the upper lip from the same marking. The pitches are those marked by Parker below the lower lip and at the bottom of the foot. The first column gives the Smith pitches. I have given octave numbering, though the marks have none.

	1698	GtPr		Gt12		Gt15	GtOp		Mix
1	B	c#	tr	B	c				B
2	G	A	tr			G#			G
3									?
4	A	B	tr	A	A#	A#			?
5									?
6							1		f#
7	a2	b2					2	a/a#2	d
8	f2	g2?		a2	f#2	f#2	3	f/f#2	a#
9	c#2	d#2		c2	d2	d2	4	c#/d2	f#
10	a1	b1		g#1	a#1	a#1	5	a/a#1	
11	f1	g1		f1	f#1				d
12	c#1	d#1		c#1	d1	d1			f#
13	a	b		a	a#	a#			?
14	f	g		f	f#	f#			f#
15	c#	d#		c#	d	d			g#
16	d#	f		d#	e	e			g
17	g	a		g	g#				e
18				b	c1				c
19	d#1	f1		d#1	e1	e1			?
20	g1	a1		g1	g#1		6	g/g#1	g#
21	b1	c#2		c2	c#2	c2	7	b1/ c2	
22	d#1	f2		d2	e2	e/f2	8	d#/e2	?
23	g2	a2				g#2	9	g/g#2	f#
24	b2	c3					10	b2/c3	
25									F
26				F	F#				C?
27				C		C#			D
28						E/F#			(GG)
29				D#		D#			D#
30									A
31						F			E
32		c3					32	a#/b	b
33	f#2	g#2		f	g	g/a#2	33	f#/g2	
34	d2	e2		c#2	d#2	d#2	34	d/d#2	d#
35	a#1	c2		a1	b1	b1	35	a#/b1	b?
36	f#1	g#1				g#1	36	f#/g1	g
37	d1	e1				d#1			d#
38		c1		a#	b	b			c#
39	f#	g#		f#	g	g			f/g
40	d	e	bs	d	d#	d#			d#
41	c?	d	bs	c	c#	c#			?
42	e	f#	bs	e	f	f			f
43	g#	a#	bs	g#	a	a			g#?
44	c1	d1		c#1		c#1			c#

45	e1	f#1				f1			?
46	g#1	a#1				a1	37	g#/a1	a
47	c2?	d2				c#2	38	c/c#2	
48	e2	f#2		d#	f	f/g#2	39	e/f2	
49	g#2	a#2					40	g#/a2	f/g
50	c3						41	c/c#3	
51				D		D			?
52	G#	A#	bs	G#	A	A			G#
53	F#	G#	bs	F#	G	G			F#
54	A#	c	bs	A#	B	B			A#
55				C		C			C
56									

In the following table the numbering of the Great Principal is reversed, as it looks as if Parker started numbering from the bass end for the 12th and 15th and from the treble end for the Principal. The Open Diapason has two Parker pitches a semitone apart; that underneath corresponds to the other ranks. The numbering is even less consistent than the others, or rather the sequence is consistent, but the numbers chosen do not agree with the other ranks. The Mixture does not help matters much either, though I have used the central tower order to suggest a possible 1698 order on the second page.

Unfortunately, a logical sequence for Parker's rebuild is not obvious either. It looks as if the new pipes (AA# BB C# $c\#^3$ d^3) were placed on the unused channels. The Open suggests channel 6 and 50 for the two treble pipes, though that is not symmetrical, perhaps because channel 56 was unused. Although there were evidently 56 channels on the Smith chests, there are no pipes marked 56 till 1870. This suggests that Parker's additions did not include a GG#, which is also suggested in the documentary evidence.

The Choir ranks are marked Bass and tr; because Parker made new Choir chests, there is no way of knowing whether Smith's Choir chest order was the same as the Great, though it seems likely.

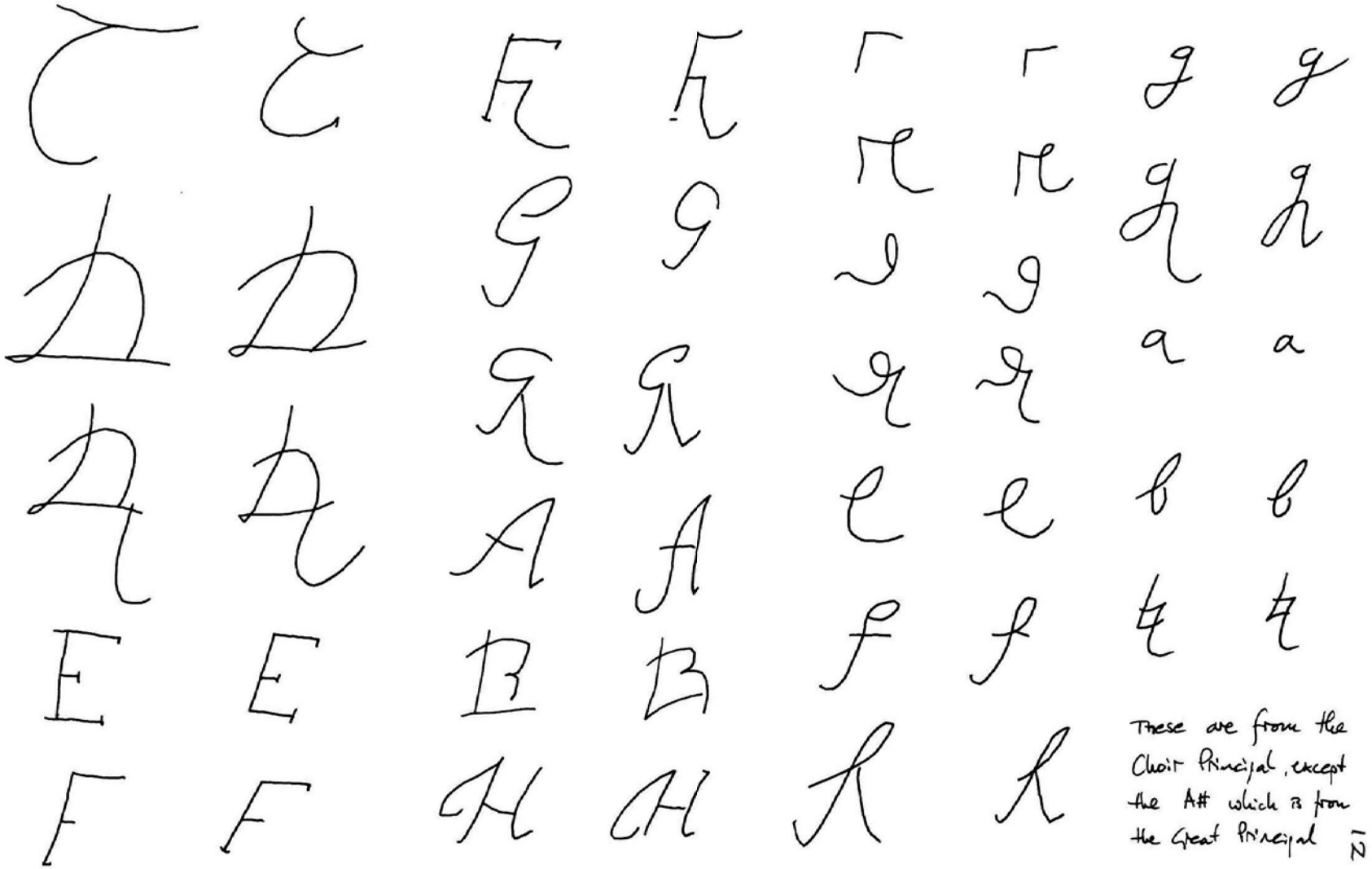
	1698	GtPr		Gt12		Gt15	GtOp	
1				B	c			
2						G#		
3	A#	c	bs					
4	F#	G#	bs	A	A#	A#		
5	G#	A#	bs					
6	c3						1	(d3?)
7	g#2	a#2?					2	a/a#2
8	e2	f#2		a2	f#2	f#2	3	f/f#2
9	c2?	d2		c2	d2	d2	4	c#/d2
10	g#1	a#1		g#1	a#1	a#1	5	a/a#1
11	e1	f#1		f1	f#1			
12	c1	d1		c#1	d1	d1		
13	g#	a#		a	a#	a#		
14	e	f#		f	f#	f#		
15	c?	d		c#	d	d		
16	d	e		d#	e	e		
17	f#	g#		g	g#			
18	(a#)	c1		b	c1			
19	d1	e1		d#1	e1	e1		
20	f#1	g#1		g1	g#1		6	g/g#1
21	a#1	c2		c2	c#2	c2	7	b1/c2

22	d2	e2		d2	e2	e/f2	8	d#/e2
23	f#2	g#2				g#2	9	g/g#2
24	(a#2)	c3					10	b2/c3
25	(F)							
26	(C)			F	F#			
27	(D)			C	C#			
28	(GG)				E/F#			
29	(D#)			D#	D#			
30	(AA)							
31	(E)				F			
32	b2	c3?					32	a#/b2
33	g2	a2		f	g	g/a#2	33	f#/g2
34	d#2	f2		c#2	d#2	d#2	34	d/d#2
35	b1	c#2		a1	b1	b1	35	a#/b1
36	g1	a1				g#1	36	f#/g1
37	d#1	f1				d#1		
38	(b)	(c#1)		a#	b	b		
39	g	a		f#	g	g		
40	d#	f	tr	d	d#	d#		
41	c#	d#	tr	c	c#	c#		
42	f	g	tr	e	f	f		
43	a	b	tr	g#	a	a		
44	c#1	d#1		c#1		c#1		
45	f1	g1				f1		
46	a1	b1				a1	37	g#/a1
47	c#2	d#2				c#2	38	c/c#2
48	f2	g2?		d#	f	f/g#2	39	e/f2
49	a2	b2					40	g#/a2
50							41	c/c#3
51				D		D		
52				G#	A	A		
53	A	B	tr	F#	G	G		
54				A#	B	B		
55	G	A	tr	C		C		
56	B	c#	tr					

FULL SIZE, ON THE RIGHT SIDE OF THE PIPE, LEVEL WITH THE TOP AND BOTTOM OF THE FLATTING

GREAT ST. MARY'S

BERNARD SMITH MARKS 1698



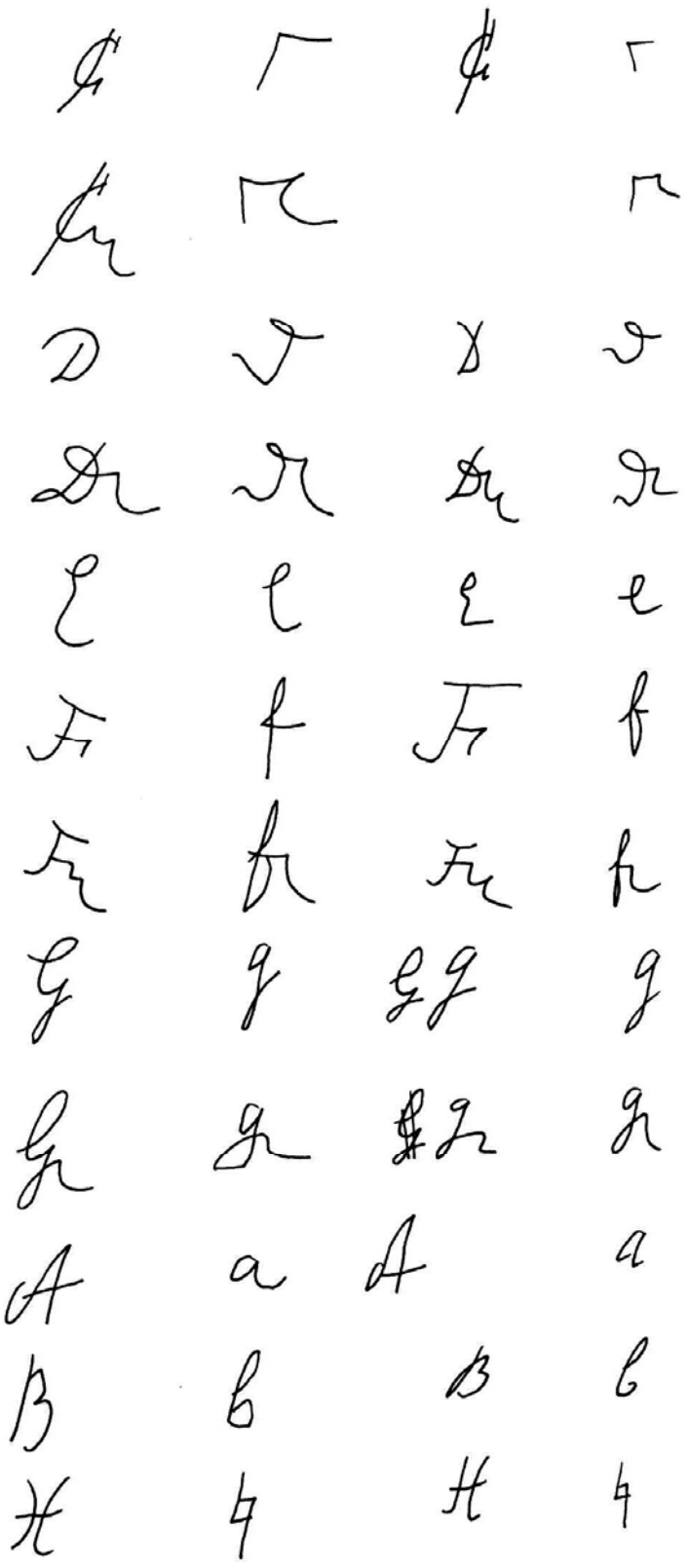
These are from the Choir Principal, except the A# which is from the Great Principal

GREAT ST MARY'S
CAMBRIDGE

PARKER MARKS 1768

CHOIR PRINCIPAL C – b°

MIXTURE



GSM Cambridge-analysis of pipe metal

SMITH

55.4% Lead
43.1% Tin
0.9% Antimony
0.2% Cadmium
0.2% Silver
0.2% Bismuth

Use for Great Cornet V
any new pipes needed for Gt Mixture III

HILL

69.3% Lead
26.5% Tin
3.3% Antimony
0.7% Bismuth
0.1% Cadmium
0.1% Silver

Use for trebles of Great Gamba 8
Swell 15th
basses of Swell Double Trumpet 16
Swell Cornopean 8
trebles of Swell Oboe 8
resonators of Choir Cremona 8
Pedal 15th
Pedal Mixture II
any new pipes needed for Sw Mixture III

ORGAN GREAT ST. MARY'S CAMBRIDGE | STOP GREAT OPEN | 15

Measured by DG | Date 13.7.95 | order post 1963

1698 mark	Pitch Pipe mark	Body length	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT		1698 mark	PIPE	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT	
	e°						f	a#	74.8	16.4	4.2	
	f						f	b	73.3	15.4	4.1	
129 A	f#		234.3	55.6	15.4		g	c	70.7	14.8	3.9	
C18	g		213.6	48.8	13.0		g	c#	67.1	14.2	3.9	
C18	g#		192.5	43.0	10.8		a	d	64.9	13.3	3.6	
C15 G	a		189.0	44.0	12.2		b	d#	62.1	12.8	3.6	
C18	a#		193.6	42.8	12.7		C18?	e	59.0	13.2	3.4	
	b	C19						f	57.4	12.2	3.3	
A	c	41° up	174.0	38.8	9.7		b	f#	56.0	12.7	3.5	
C18	c#		164.2	36.8	9.4		f	g	53.1	11.2	?	
	d		161.6	37.0	9.6							
	d#											
C18	e		150.4	32.7	9.2							
	f		141.2	33.2	8.8							
	f#		144.2	30.6	8.7	↓						
	g	C19										
e	g#		131.7	29.1	8.3	ears						
e	a		129.1	28.6	8.0	no ears	225–230 long feet					
f	a#		124.9	26.4	7.7							
	b		119.8	26.2	7.0	↓						
g	c		115.8	24.4	6.3							
g	c#		112.2	24.3	5.7							
a	d		106.4	23.0	5.4							
b	d#		101.6	22.5	5.0							
	e		98.7	21.4	(5.8)							
	f		93.2	20.2	4.8							
	f#		89.0	19.7	4.9							
	g		87.8	19.3	4.9							
	g#		82.8	18.3	4.8							
	a		76.8	17.8	3.9							

ORGAN Great St. Mary's Cambridge | STOP Gt St. Diap 8 | (2) 16

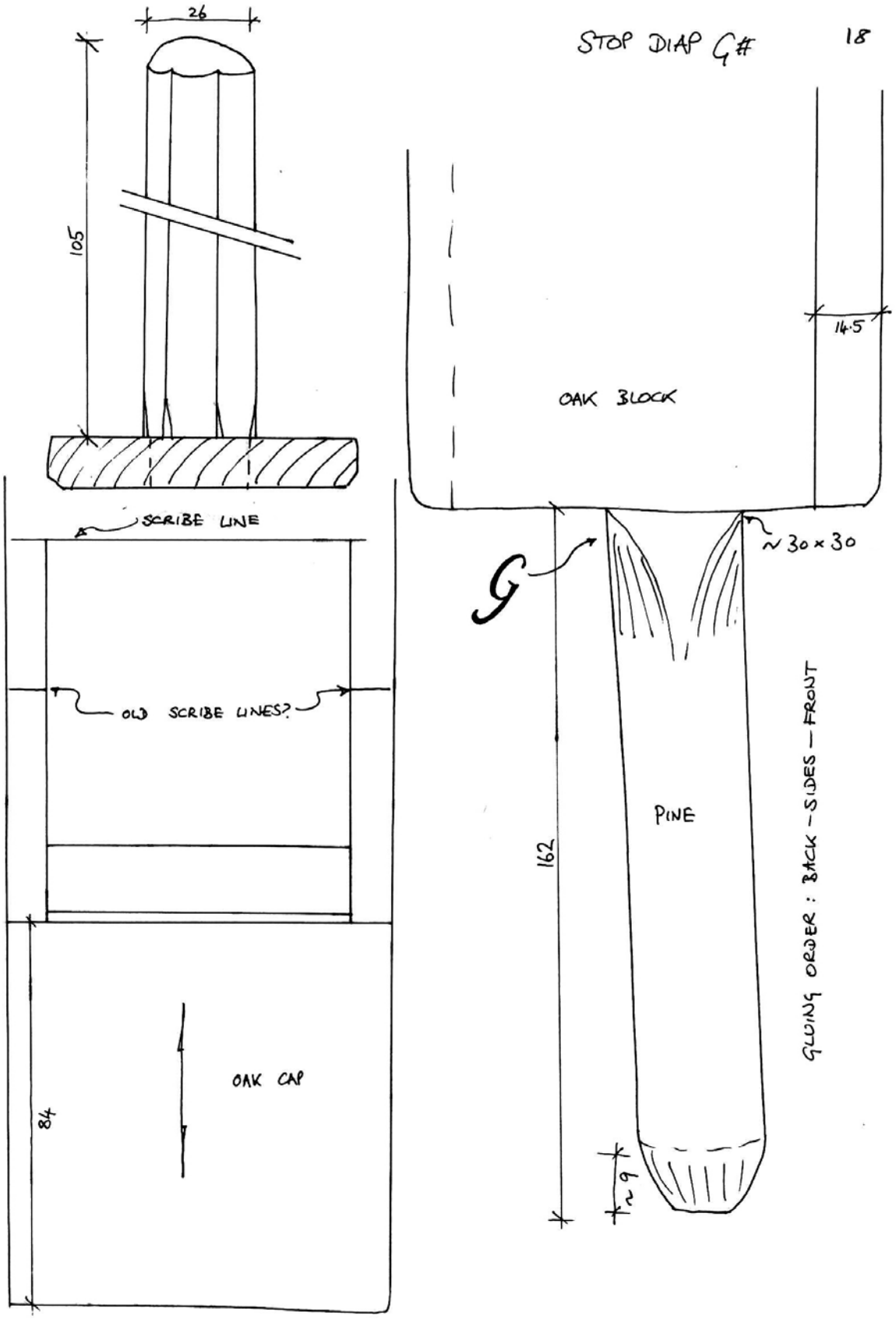
Measured by [redacted] | Date 11 7 95

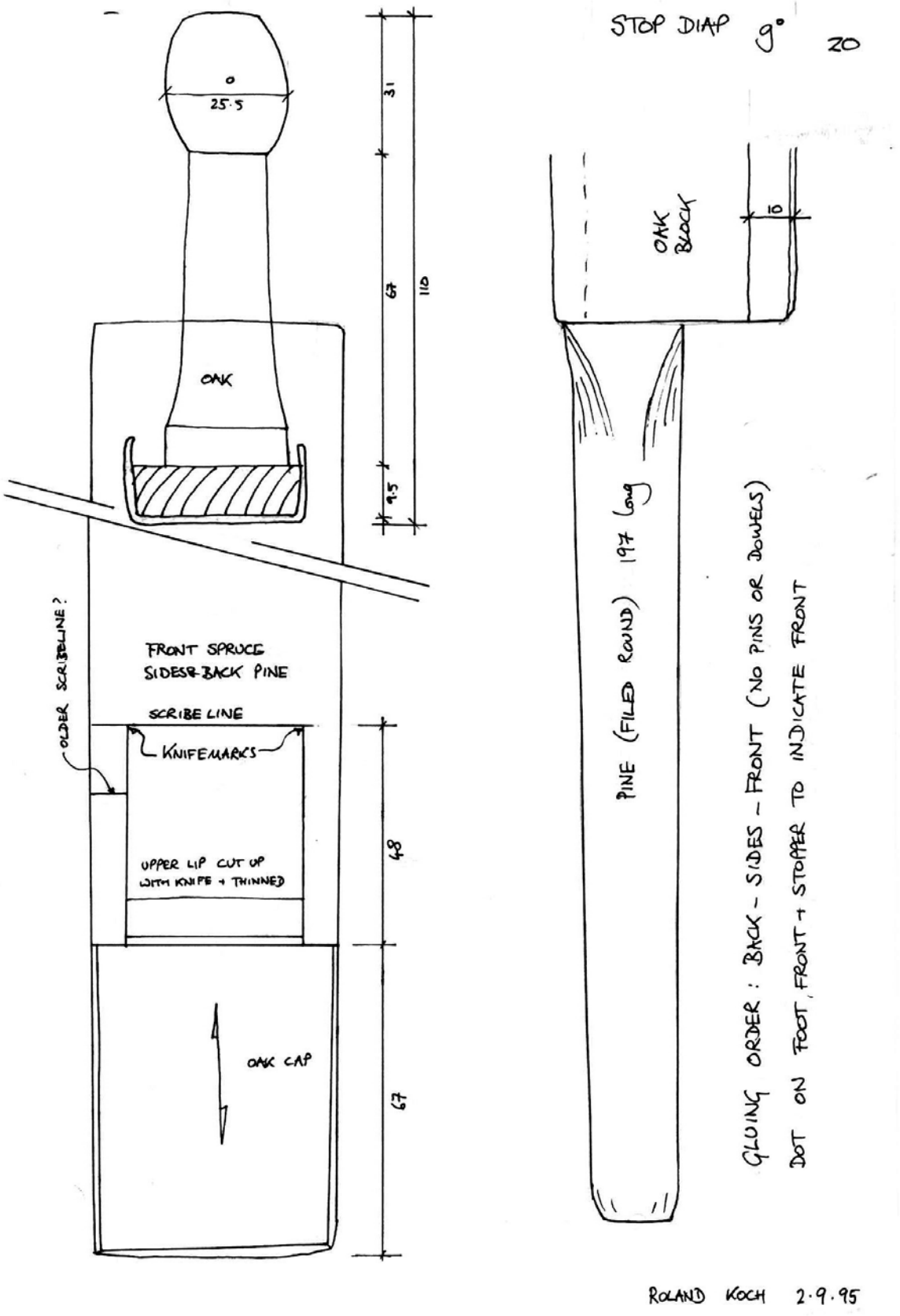
	Pitch Pipe mark	Body length	Inside depth	Inside width	Mouth height	Flue	Toehole ø	Outside W x D	Block Bevel °	Upper lip thickness	Bevel upper lip from cap	Block height	Foot length
	C	1097	117·0	97·4	17–18·5 15–16·5	1·7	≙ 13	137·3 119·8	67°	2·0	67	107 STEPPED	152
	#	1038	115·5	98·2	21 23·5	2·2	≙ 13	139·2 120·9	72°	1·9	122	100	
	D	986	109·5	94·8	19·5 21·5	1·5	≙ 13	133·2 116·5	65°	1·6	116	91 CAP	
	#	934	106·6	87·3	18·5 20·5	2·0	≙ 12	125·2 107·6	70°	1·7	61	94·5	
	E	870	100·9	84·6	19·5–20·5 22–23	1·3	≙ 13	121·3 104·7	72°	2·3	62	91·5	
BODY	F	829	92·6	80·9	16·7 18	1·4							
	#	794	89·8	74·4	16·7 17·8	1·4	≙ 12	111·9 94·5	71°	1·8	61	88	152
	G	749	88·1	71·8	16·0 17·6								NEW FEET (TURNED)
	#	694	83·8	68·5	15·4 16·5								
	A	643	84·6	70·5	16·5–17·5 18–19								
	B_b	616 588	75·6 71·6	62·2 58·1	16·0 17·5 17·5 19·0								
FOOT	C	552	69·6	57·5	12·8 12·8	1·6	≙ 9	86·5 75·0	78°	1·2	44	78	169 OLD FEET MOSTLY
	#	525	66·6	55·4	11·0 11·7							OCTAGONAL STOPPERS	
	d	492	63·9	52·3	11·7 12·5								
	#	469	60·4	48·2	10·2 10·7								
	e	434	59·5	47·6	9·6 10·6								
	f	411	57·4	44·5	10·2 11·0								
	#	385	54·3	43·0	9·0 9·7	1·4	≙ 9	66·5 57·8	74°	1·1	36	68·5	160
	g	354	52·9	42·7	8·3 9·4							SHAPED STOPPERS	
	#	335	50·6	42·2	7·8 8·7								
	a	312	47·8	37·7	8·0 9·2								
	#	291	46·4	36·9	8·0 8·7								
	b	279	43·9	35·7	7·5 8·2								
	c'	261	44·0	33·5	6·2 7·5	1·2	≙ 8	56·1 46·1	74°	0·9	30	64·8	195
	#	251	41·3	32·8	6·5 8·0								
	d	237	39·3	30·1	6·6 7·5								
	#	225	39·8	29·8	6·0 7·5								
	e	214	37·8	29·0	5·8 7·5								
	f	201	35·4	27·1	6·6 7·8								
	#												

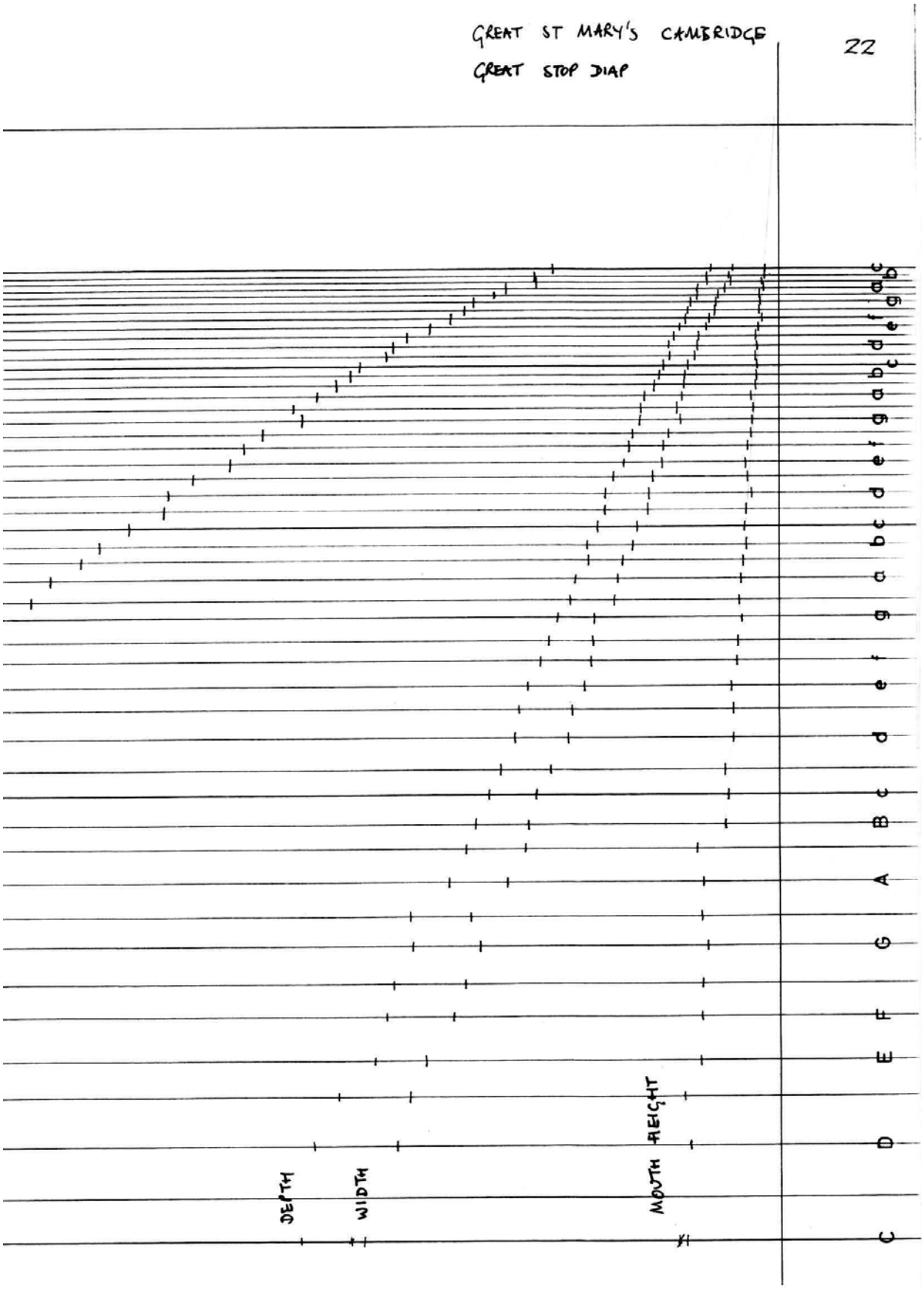
ORGAN GREAT St. MARY'S CAMBRIDGE — STOP Gt St Diap 8 — ①

Measured by [redacted] — Date 11 7 95

FOOT	Pitch Pipe mark	Body length	INSIDE DEPTH	INSIDE WIDTH	MOUTH HEIGHT	FLUE	TOEHOLE	OUTSIDE W×D	BEVEL	UPPER LIP THICKNESS	UPPER LIP HEIGHT (from Cap)	BLOCK HEIGHT	FOOT LENGTH
f	f#'	189	34·3	26·7	6·1 / 4·4	[redacted] 1·1	e 5	46/39	75°	0·9	28	60	197
	g	177	33·4	25·5	5·5 / 6·5								
g	#	165	31·8	22·6	5·2 / 6·1								
gi	a	154	31·8	23·6	5·1 / 6·1								
a	#	144	30·7	22·1	5·2 / 6·6								
b	b	133	28·6	21·9	4·4 / 5·6								
c'	c"	120	27·4	21·4	4·2 / 5·2	0·9	3·2	39/33	75°	<1·0	27	56	193
	#	112	26·6	21·1	4·3 / 5·3								
d	d	108	25·2	19·6	4·1 / 5·4								
	#	102	25·2	18·9	3·9 / 5·2								
e	e	94	24·0	18·5	4·5 / 5·5								
f	f	85	22·8	16·9	3·9 / 4·9								
f#	#	79	21·3	16·1	3·2 / 3·9	0·8	3·0	30·5/26	76°	<1·0	22	56	196
g	g	74	21·0	14·8	3·5 / 4·6								
gi	#	71	20·2	14·6	3·4 / 4·4								
a	a	69	18·6	13·9	3·5 / 4·6								
a#	#	65	18·6	12·6	2·6 / 3·5								
b	b	64	16·6	11·1	3·3 / 4·0								
c''	c'''	60	16·6	11·4	2·7 / 3·2	0·7	2·5	25/19·5	79°	<1·0	17	49	186
	#	57	15·5	10·4	2·2 / 3·1	FOOT							
d	d	57	14·7	8·6	2·3 / 3·2	[redacted]							
	#	Hill											
e	e	Hill											
f	f	Hill											
f#	f#												
g	g	Hill											

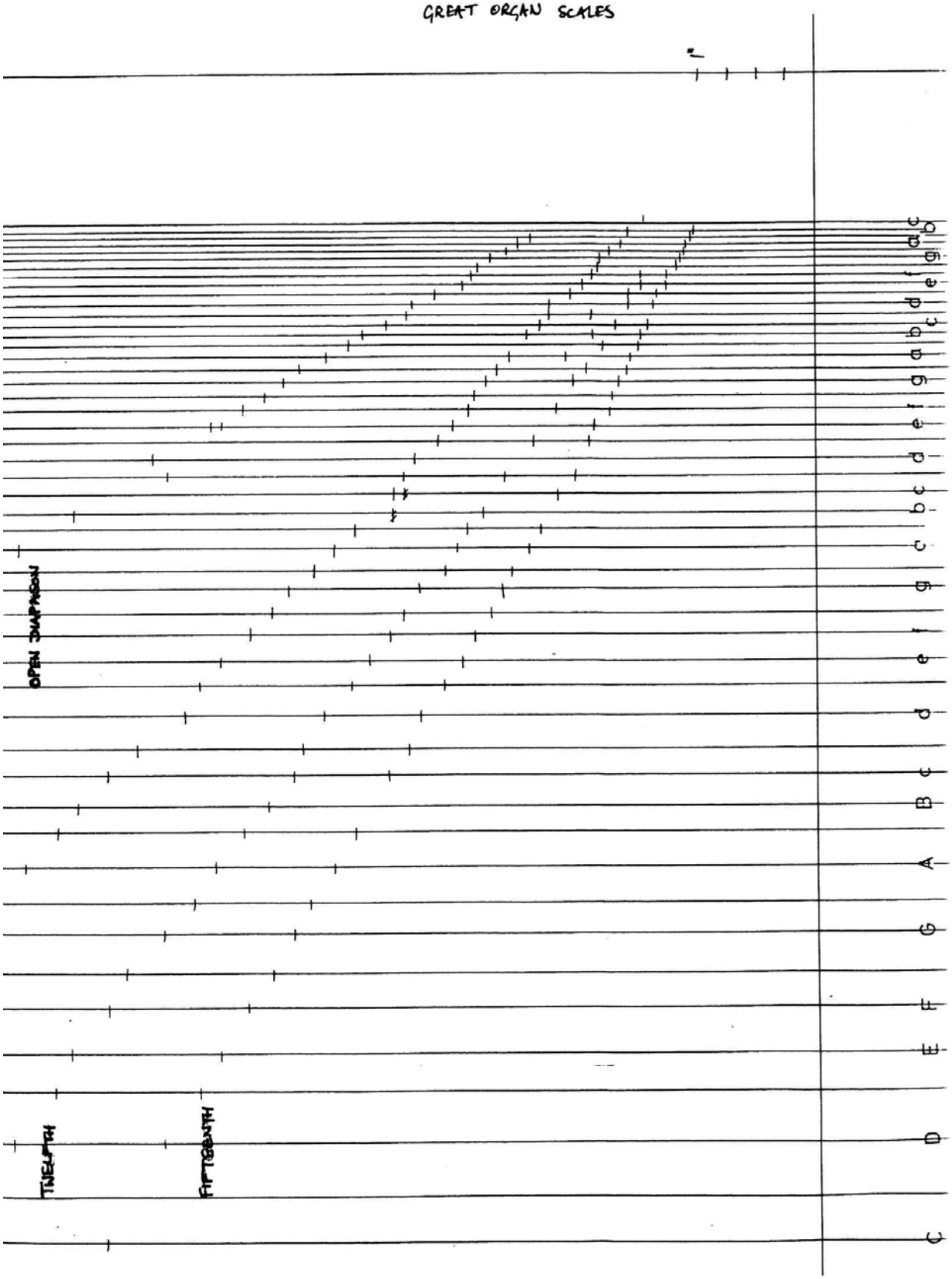

STOP DIAP G# 18
26
105
SCRIBE LINE
OLD SCRIBE LINES?
OAK CAP
84
OAK BLOCK
14.5
~30×30
G
162
PINE
~9
GLUING ORDER : BACK - SIDES - FRONT


STOP DIAM 9° 20
25.5
31
67
110
9.5
OAK
OAK BLOCK
10
PINE (FILED ROUND) 197 long
FRONT SPRUCE
SIDES & BACK PINE
OLDER SCRIBELINE?
SCRIBE LINE
KNIFEMARKS
UPPER LIP CUT UP WITH KNIFE & THINNED
48
OAK CAP
67
GLUING ORDER : BACK - SIDES - FRONT (NO PINS OR DOWELS)
DOT ON FOOT, FRONT & STOPPER TO INDICATE FRONT
ROLAND KOCH 2.9.95


GREAT ST MARY'S CAMBRIDGE
GREAT STOP DIAP
22
DEPTH
WIDTH
MOUTH HEIGHT
C
D
E
F
G
A
B
c
d
e
f
g
a
b
c
d
e
f
g
a
b
c

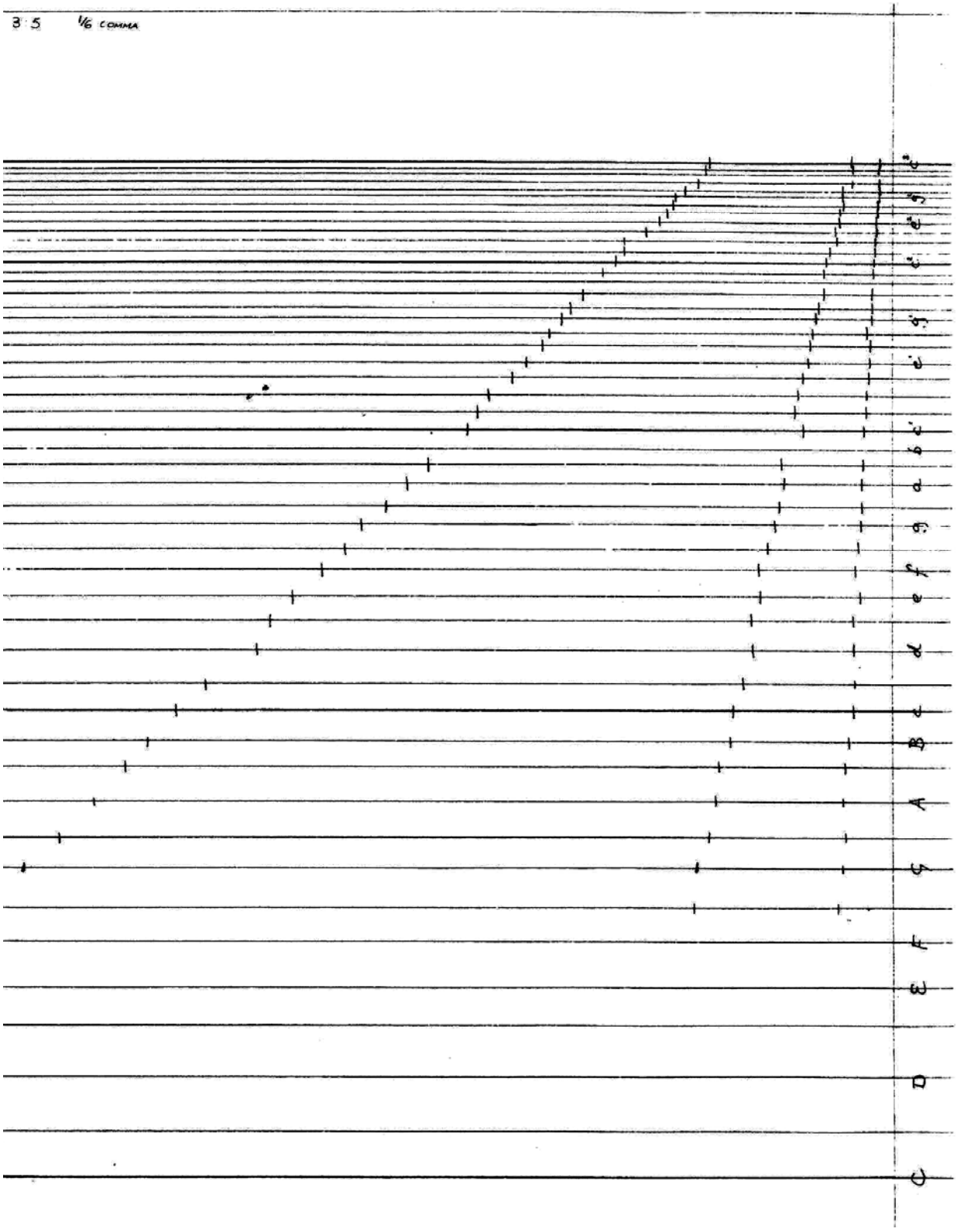
GREAT ST. MARY'S CAMBRIDGE 19

GREAT ORGAN SCALES



GREAT St. MARY CAMBRIDGE

GREAT PRINCIPAL 21



ORGAN GREAT ST. MARY'S CAMBRIDGE | STOP GT PRINCIPAL | 23

Measured by JDW | Date 12.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Language bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
	C		286.4	62.1	16.5	not	Smith					↑	
	D		247.6	58.3	14.4	not	Smith						
	G		200.0	47.2	11.2	not	Smith						
Fe	G#	717	195.8	43.3	12.1	?1.5	8.8	60°/3.1	0.6	40	12		224
G	A		188.6	42.4	11.2								
Ge	B		180.7	40.1	10.6								
A	4		172.9	38.3	11.1								
B	C	559	166.0	37.7	10.3	1.14	7.3	60°/3.5	1.1	40	8		227
H	C#		161.3	35.6	9.7								
T	D		154.8	34.8	8.4			(on side 15th D)					
Te	D#		148.3	32.4	8.7								
Ze	E		137.7	30.5	8.3			Smith	?				
D	F		134.7	30.8	8.4		ext. Ø 11.1						230
E	F#		129.9	26.7	7.2							to ♯ measure.	
F	G		123.6	29.1	7.9								
Fe	G#		118.7	27.0	7.3								
G	A		115.0	25.6	7.0								
Ge	B		109.6	24.7	6.8								
A	4		105.0	23.4	6.8								
B	C	274	100.5	24.2	6.2	0.75	4.6 11.6	72°/2.2					
Te	C#	261	92.2	19.3	6.2	0.90	5.2	60°/2.2	0.7	20	18	no ears	222
Ze	D		89.9	21.5	5.8								
Ze	D#		87.6	20.5	5.6								
Ze	E		82.4	19.2	5.1								
Te	F		79.2	18.1	4.9								

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP GT PRINCIPAL | 24

Measured by DCW | Date 12.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Language bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
Trebles	F#		75.9	17.8	4.9								
	G		74.5	17.1	5.8								
	G#		72.0	16.8	4.6								
	A		69.7	16.1	4.5								
	B		67.0	15.0	4.4								
	4		66.9			not	Smith						
	C	129.5	62.9	15.1	3.9	0.69	3.5	80°/1.2	0.5	17	6	none	228
	C#		60.2	14.4	3.9								
	D		58.1	13.8	3.9								
	D#		58.2	12.0	3.3								
	E		53.6	12.4	3.3								
	F		50.9	11.7	3.4								
	F#		48.8	11.4	3.0								
	G		47.6	10.9	3.3								
	G#		47.0	6.8	2.9								
	A		45.1	10.7	2.7								
	B		42.3	8.4	2.9								
	A# sic					modern							
Tenors	C	63.5 (pieced)	40.8	8.7	3.0	0.73	3.4	80°/1.2	0.45	10	4	none	232
	C#		39.8	9.1	2.8								
	D		43.4	8.9	2.9								
	D#		39.4			not Smith							
	E		37.4	7.8	2.9								
	F		31.2			not Smith							
	F#					modern							
	G					missing							

ORGAN Gt St Mary's Cambridge | STOP Gt Nason 4' | 25

Measured by [redacted] | Date 11 7 95

Pitch Pipe mark	Body length	INT DEPTH	INT WIDTH	MOUTH HEIGHT TO Block/TO CAP	FLUE	TOEHOLE ø	EXT D x W	BLOCK BEVEL °	UPPER LIP THICKNESS	HEIGHT OF UPPER LIP BEVEL FROM CAP	BLOCK HEIGHT	FOOT LENGTH
C		69·0	55·6	12·6/14·2	1·4	NEW FOOT	85/74			72	76	152
C#		66·4	53·4	10·5/11·7	1·2	"	83/71	NGO		ON SIDE		
F#		55·1	43·5	8·6/10·1	1·1	7·5	69/58	5ø hole in stopper – no longer open				
C°		43·6	35·5	7·6/9·1	1·0	6	57/49	"				
F#°		34·7	26·1	6·1/7·3	1·0	6	46/39	"				
C'		29·2	22·2	4·6/5·1	0·9	5·5	40/33	4·5ø hole				
F#'		22·6	16·6	3·0/4·1	0·8	6	32/26	3·5ø				
C"		17·2	12·9	1·8/3·2	0·6	5	24/21	3·2ø				

WOOD PIPES: PERIMETERS

	Great St Dp	Choir St Dp	Great Ns Fl	Choir Fl
	428.8	439.4		
	427.4	427.0		
C	408.6	393.6		
D	387.8	389.2		
D#	371.0	367.0		
E	347.0	354.0		
F	328.4	335.2		
F#	319.8	322.4		
G	304.6	308.2		
G#	310.2	271.4		
A	275.6	286.0		
A#	259.4	276.0		
B	254.2	276.0		(218.2)
c	244.0	260.6	249.2	222.2
c#	233.6	253.0	239.2	
d	217.2	235.4		199.2
d#	214.2	227.6		183.6
e	203.8	219.6		175.4
f	194.6	214.0		166.6
f#	191.2	203.2	197.2	158.0
g	185.6	192.0		152.8
g#	171.0	187.0		139.2
a	166.6	178.6		141.8
a#	159.2	164.4		132.6
b	155.0	155.4		124.8
c^1	148.2	147.4	158.2	125.6
c#	140.0	139.6		115.4
d	139.2	137.4		115.0
d#	133.6	132.2		107.4
e	125.0	122.0		100.6
f	122.0	122.0		96.4
f#	117.8	114.0	121.6	96.6
g	108.8	109.8		92.0
g#	110.8	108.2		85.2
a	105.6	106.0		80.6
a#	101.0	100.0		82.0
b	97.6	99.0		76.0
c^2	95.4	95.2	102.8	70.2
c#	89.6	92.4		72.0
d	88.2	89.6		68.0
d#	85.0	81.0		66.8
e	79.4	79.0		63.4
f	74.8	72.8		58.8
f#	71.6	70.2	78.4	60.2
g	69.6	67.0		57.0
g#	65.0	66.2		53.6
a	62.4	62.6		52.8
a#	55.4	58.2		52.8
b	56.0	57.0		50.8
c^3	51.8	50.3	60.2	50.0

ORGAN GREAT St. MARY'S CAMBRIDGE — STOP 12th. — 27

Measured by BL. — Date 12.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Fluc	Toehole	Languid Bevel/Thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
C18	C	766.0	192.5	42.0	11.5	0.9	6.4	64°/8.0	1.0	61.0	7	25×6	213
	C#	717.0	190.0	41.5	12.0	1.1	7.9						272
C18	D	681.0	178.5	42.5	10.6	1.0	6.9						
	D#	636.0	176.0	40.5	10.7	1.2	6.5						
	E	607.0	166.5	38.5	11.2	1.3	7.7						
	F	560.0	163.0	38.0	9.5	1.1	6.3						
	F#	536.0	155.0	36.0	9.0	1.1	5.4						
	G	502.0	151.0	35.0	8.9	0.9	5.9						250
	G#	471.0	142.5	34.0	8.6	1.1	5.8						
	A	444.0	136.0	32.5	7.8	0.9	5.5						
	A#	425.0	131.0	31.5	8.0	0.9	5.7						
	B	400.0	125.0	31.0	7.4	1.1	4.4						
	c	377.0	119.5	28.0	6.5	1.0	5.0/	45°/1.8	1.0	48.0	8	15×5	248
	c#	358.0	114.0	26.5	7.2	0.8	5.2						
	d	333.0	112.0	26.0	6.1	0.8	5.5						
	d#	314.0	107.5	25.5	7.5	0.9	5.0						
	e	294.0	101.5	24.0	7.0	1.0	4.2						
	f	280.0	97.5	24.0	5.7	0.5	4.1						
	f#		93.0	22.5	5.2	0.8	3.7						
	g		90.0	19.5	5.4	0.8	4.1						
	g#.		86.5	20.0	5.1	0.3	5.9						
	a		81.0	17.0	4.8	0.8	3.5						
	a#		78.5	17.0	4.9	0.8	3.4						
	b		76.0	16.0	4.8	0.4	4.0						
	c̄		72.5	15.5	3.3	0.8	3.2/9.4	?/1.3	0.7	28.0	—	—	230
C8?	C#'		74.0	16.0	4.6	0.5	4.0						
	d'		68.0	14.0	3.9	0.5	3.4						
C18?	d'#		63.0	14.0	3.9	0.6	2.9						
	e'		61.5	13.0	3.6	0.8	3.2						
C18?	f'		56.5	11.0	3.2	0.7	2.8						

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP 12 th. | 28

Measured by B.L. | Date 12.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Tonehole	Language bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
T	f'♯		56.5	12.0	3.7	0.5	3.0						
C18	g'		52.5	10.5	3.2	0.8	2.7						
R	g'♯		53.0	10.5	3.3	0.7	3.0						
E	a'		54.5	10.5	3.0	0.5	2.8						
M	a'♯		50.0	10.0	2.8	0.7	2.7						
F	b'		48.5	10.0	3.2	0.6	3.0						
F	c²		46.5	9.0	3.2	0.7	3.0/9.6	?/1.2	0.8	20.0	—	—	240
G	c²♯		49.0	11.0	3.2	0.6	3.6						
G	d²		43.5	8.0	2.9	0.6	2.9						
B	d²♯		41.0	8.0	2.6	0.6	1.9						
A	e²		41.0	8.0	2.1	0.7	1.9						
T	f²		38.0	7.5	2.3	0.7	2.0						
T	f²♯		38.0	7.5	2.4	0.6	2.4						
16ft	g²		37.0	7.0	2.3	0.6	2.4						
	g²♯		37.0	7.0	2.0	0.5	2.5						
	a²		38.0	7.0	1.9	0.5	2.5						
	a²♯		35.0	6.5	2.0	0.6	2.9						
	b²		33.0	6.5	2.1	0.5	3.6						
	c³		33.0	5.7	1.6	0.5	2.2/9.5	?/0.8	0.8	14.0	—	—	225
	c³♯		31.0	6.0	1.8	0.5	2.5						
	d³		32.0	6.0	2.0	0.6	2.2						
	d³♯		32.0	6.0	2.0	0.5	2.0						
	e³		29.5	6.0	2.1	0.6	2.3						
	f³		30.0	5.8	1.8	0.6	1.8						
	f³♯		27.5	5.0	2.0	0.5	2.4						
	g³		27.0	5.0	1.8	0.6	2.0						

ORGAN GREAT ST. MARY'S CAMBRIDGE | STOP GT FIFTEENTH | 29

Measured by DCW | Date 12.7.95

Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Language Bevel/Thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
C	550	175.0	38.6	10.5	1.12	7.5	80°	3.0	38	7	12 / 20	235
C#		158.3				7.2	not Smith				4	
D	491	155.5	32.6	8.7	0.86	7.1						
D#		145.3				~~6.7~~	not Smith					
E	435	142.3	32.2	8.7	1.02	6.7						
F	415	134.9	29.8	7.4	0.92	6.6						
F#	389.5	130.4	29.2	7.4	0.95	6.3						
G	369	124.2	28.4	6.8	0.98	6.0						
G#	346.5	119.0	26.3	6.9	0.96	6.7						
A	326	114.1	26.4	7.2	0.76	5.8						
B	302	110.7	24.4	6.7	0.94	5.7						
H	285	105.6	22.7	6.0	0.74	6.2						
C	273	100.7	23.0	6.3	0.77	5.6	80°/1.6	0.9	25	11	10 / 25	224
C#	257.5	93.5	20.3	5.3	0.80	4.3					2.5	
D	246	89.0	19.9	5.6	0.68	4.7					no ears	
D#	229	86.3	19.0	5.2	0.78	4.1						
E	216	81.2	17.7	5.0	0.78	4.1						
F	206	77.3	17.3	4.6	0.63	4.3						
F#	194	74.3	17.0	4.2	0.53	3.7						
G	182	71.0	15.4	4.3	0.74	3.7		too Ø 9.3		from Ø measure		225
G#	172	68.4	14.8	4.2	0.65	3.4						
A	161.5	66.4	14.4	4.4	0.80	4.2						
B	153.5	62.6	13.3	3.8	0.63	3.3						
H	142	60.1	12.8	3.8	0.65	3.5						
C		57.9					not Smith					
C#	126	56.3	11.6	3.4	0.80	3.2	80°/1.4	0.9	13	3	no ears	24
D		55.9	12.8	3.3								
D#		52.6	12.9	3.2								
E		49.6	10.7	3.2								
F		48.5	10.6	2.9								

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP GT FIFTEENTH | 30

Measured by DCW | Date 12.7 95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Languid bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
f	F#		45.0	9.7	3.0								
f#	G		44.3	8.8	2.6								
g	G#		43.0	9.6	2.9								
g#	A		41.1	8.3	2.7								
a	B		40.4	8.2	2.6								
b	b		38.4	7.5	2.6								
b#	C		38.1	7.1	2.2								
c	C#	60.5	36.7	7.4	2.4	0.49	2.6	75°/0.6	0.6	10	none	no ears	225
	D		37.2			not Smith							
	D#		37.2			not Smith							
c#	E		35.3	7.4	2.3								
d	F		34.7	7.3	2.1								
e	F#		32.9	6.3	2.1								
f	G		32.6	6.6	2.2								
f#	G#		30.4	5.9	2.1								
g	A		29.6	6.0	1.9								
g#	B		28.7	6.7	2.0			Smith, but different from most of rest of rank					
a	b		28.3	6.2	2.1								
a#	C		27.2	5.5	1.9								
b	C#		26.8	4.7	1.7								
b#	D		27.3	5.2	1.7								
c	D#		27.2	5.4	1.8								
	E		28.0			not Smith							
c#	F		27.2	5.4	1.7								
	F#		26.9			not Smith							
	G		modern										
[23]C	Pos P. A#		187.5	41.5	11.9								

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP MIXTURE | 31

Measured by B.L. | Date 11.7.95 | STARE PIPES + RANK I

Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Languid Bevel/Thickness	Metal thickness	Scribe lines	Nicks	Ears	
C	445.0	137.1	31.0	7.6	0.7	5.1						
C#	416.5	132.4	28.5	8.2	0.7	5.0	71°/2.8	0.9	49.5	5	14. 3.5	
D	393.0	123.8	26.0	7.0	0.6	4.8						
D#	376.7	119.0	26.0	7.4	0.7	5.3						
E	349.5	116.5	24.5	7.0	0.7	4.4						
F	331.2	109.2	24.5	7.4	0.5	4.9						
F#	313.0	107.8	22.5	6.8	0.7	4.4						
G	296.5	102.0	22.0	6.6	0.8	4.9						
G#	279.0	98.5	22.0	6.1	0.6	4.3						
A	265.0	91.4	20.5	5.7	0.8	4.0	78°/1.7	0.6	37.0	4	11.5×5.0	
RANK I												
C1	367.5	120.8	27.0	7.0	0.9	5.1	66°/2.7	0.9	41.0	6	18×4.2	
C#	336.5	120.8	26.0	7.6	1.1	6.9						
D	322.5	116.5	25.0	6.8	0.8	4.7						
D#	298.0	113.5	26.5	6.6	0.9	5.3						
E	287.5	116.5	24.5	6.9	0.7	5.7						
F	268.5	99.5	22.0	6.5	0.8	4.7						
F#	250	99.0	21.0	6.0	0.6	4.6						
G	239.5	91.8	22.0	5.8	0.7	4.2	65°/1.9	1.0	35.5	5+3	12×3	x
G#	224.0	92.5	19.5	5.9	0.7	5.2						
A	210.5	89.0	20.0	5.5	0.8	4.0						
A#	200.0	85.0	19.0	5.2	0.7	3.0						
B	187.5	79.0	17.0	5.2	0.7	4.0						
C2	175.0	80.5	18.0	4.9	0.6	4.1	75°/1.7	1.0	32.5	5	—	x
C#	169.0	77.2	16.0	4.6	0.5	4.1						
d	158.5	70.0	15.0	4.2	0.7	3.5						
d#	218.5	89.0	20.0	5.2	0.9	3.2						
e	211.5	86.0	19.0	5.3	0.7	3.3						
f	203.0	82.7	18.0	5.5	0.7	3.9						
f#	190.0	80.0	18.0	4.9	0.9	3.8						

ORGAN GREAT ST. MARY'S CAMBRIDGE							STOP MIXTURE						32
Measured by B.L.				Date 11.7.95									
Pitch Pipe mark	Body length	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT	FLUE	TOEHOLE	LANGUID BEVEL/THICKNESS	METAL THICKNESS	SCRIBE LINES	NICKS	EARS		
g	178.0	76.5	17.0	4.2	0.8	4.7							
g#	167.5	74.5	16.5	4.2	0.7	3.7							
a	156.0	72.5	15.0	4.3	0.8	4.1							
a#	147.0	69.0	15.0	4.4	0.7	4.2							
b	138.5	65.5	14.5	4.0	0.7	4.6							
c' 25	131.0	66.0	14.0	3.6	0.8	3.7	64°/1.5	0.9	27.0	5	—		
c#'	118.0	65.0	14.0	4.2	0.8	3.9							
d'	112.5	63.5	14.0	3.8	0.7	4.6							
d#'	104.0	61.0	13.0	3.9	0.6	4.3							
e'	98.5	58.5	12.5	3.6	0.6	3.0							
f' 30	95.0	55.0	12.0	3.6	0.6	3.9							
a'' 46	72.5	50.0	10.5	3.3	0.6	2.2							
a#''	68.0	48.0	10.0	3.0	0.6	2.8							
b''	62.0	47.0	9.5	2.9	0.4	3.1							
c'''	58.5	44.0	9.0	3.2	0.4	4.3	?/1.2	0.6	18.5	4	—		
c#'''	56.0	45.5	9.0	2.9	0.4	4.0							
d'''	53.0	42.0	8.5	2.9	0.2	3.3							
d#'''	47.0	41.5	8.0	2.5	0.2	3.6							
e'''	44.5	40.5	8.0	2.6	0.2	3.1							
f'''	41.5	39.0	7.5	2.7	0.2	2.9							
f#'''	38.0	38.5	7.5	2.4	0.1	2.9							
g'''	39.0	34.0	7.5	2.4	0.1	3.2							

ORGAN GSM | STOP MIXTURE II | 33

Measured by DCW | Date 11.7.95 | (circ. only) + not complete

	Pitch Pipe mark	Body length	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT	FLUE	TOEHOLE	LANGUID BEVEL/THICK	METAL THICKNESS	SCRIBE LINES	NICKS	EARS	
	C 1		101.8			not Smith		F*		44,3			
	C# 2		95.3			"	"	G		42,1			
Γ	D 3		91.0					G*		40,6			
	D# 4		89.6			not Smith		A		38,5			
~e	E 5		86.1					A*		38,8			
~g	F 6		82.4					B		36,1			
	F# 7		82.7			not Smith							
f	G 8		79.2										
g	G# 9		74.0										
g	A 10		71.6										
a	B 11		69.8										
b	H 12		67.3										
H	C 13		65.0										
Γ	C#		63.0										
~e	D		57.7										
g	D#		70.5										
a	E		69.7										
b	F		67.1										
H	F#		64.6										
Γ	G		61.2										
H	G#.		58.9										
~e	A		58.5										
~g	B		56.7										
e	H		55.8										
f	C		53.4										
f	C#		50.3										
f	D		50.6										
g	D#		46.6										
g	E		45.0										
b	F		43.8										

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP GT MIXTURE | 34

Measured by DCW | Date 11.7.95 | RANK 3

Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Languid bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
C1	182.5	76.6	16.1	4.6	0.93	4.3	55°/1.1	0.6	25/22	10	none	221
C#	169.5	74.2	15.9	4.8 sic	0.83	4.8			from top of mouth			
D	157.5	72.0	15.8	3.5 to 4.4	0.65	4.2						
D#	149.0	69.0	14.9	2.6	0.85	3.8						
E	141.5	63.4	13.6	4.0	0.75	3.7						
F	127.5	66.8	14.6	4.3	0.80	4.4						
F#	121.5	62.6	13.1	2.6 to 4.1	0.78	38	70°/1.1	0.7	15	5	none	223
G	113.5	60.6	12.3	3.5	0.70	3.6						
G#	106.0	59.7	13.2	3.7	0.74	3 6						
A	100.0	57.7	12.3	3 6	0.80	4.1						
A#	94.0	54.7	11 5	3.9	0.85	3.5						
B	87.5	51.4	10.4	3.5	0.83	3.5						
C13	79.5	55.7	11.4	3.7	0.66	3.5	70°/0.9	0.5	15	4	none	220
C#	76.0	50.5	10,6	3.5	0.52	2.6						
D	74.0	46.5	9.7	3.2	0.63	2.5						
D#	107.5	56.6	11.9	3.7	0.64	3 4						
E	100.0	56.4	11.8	3.4	0.73	3.9						
F	96.5	52.2	11.1	3.4	0.69	3.2						
F#	89.0	50.3	10.5	3.2	0.63	3.4						
G	85.5	47.0	11.1	3.2	0.69	4.0						
G#	79.0	49.2	10.5	2.1 to 2.3	0.54	3.4						
A	74.0	45.7	9.6	2.8	0.47	3.3						
A#	70.0	45.6	9.6	2.2	0.66	4.1						
B	63.5	43.5	8.8	2.9	0.74	3.7						
C25	61.0	41.7	8.8	2.8	0.66	3.3	75°/1.0	0.55	10	3	none	202
C#	54.5	41.7	8.3	2.9	0.65	3.2						
D	50.5	41.5	8.5	2.6	0.60	3.8	75°/1.0	0.65	9	6	none	205
D#	47.5	40.1	7.9	2.6	0.70	2 8						
E	47.0	37.1	7.4	2.5	0.47	2.2						
F	39.5	36.3	7.7	2.4	0.49	2.4						
	sic											

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP GT MIXTURE | 35

Measured by | Date | RANK 3

Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Fluе	Toehole	Languid Bevel/Thick	Metal thickness	Scrape lines	Nicks	Ears	Foot length
F#	52.0	43.8	9.0	2.9	0.70	4.7						
G	50.5	41.7	8.2	2.7	0.69	3.2						
G#	45.5	40.2	8.4	2.6	0.50	3.2						
A	44.0	38.0	9.0	2.6	0.64	2.7						
A#	43.0	38.3	7.8	2.6	0.60	3.4						
B	39.0	38.0	7.5	2.3	0.47	3.6						
C 37	36.0	35.2	6.8	2.7	0.55	3.5	80/1.0	0.6	8	2	none	195
C#	34.0	33.3	7.5	2.4	0.60	2.4						
D	34.0	30.6	6 3	1.9	0.43	2.4						
D#	30.5	30.6	6.8	2.4	0.33	3.2						

MIXTURE COMPOSITIONS

The following are the compositions after the various rebuilds.

1963: The composition after 1963 was/is:

	I	II	III
C	$1^1/_3$'	1'	$^2/_3$'
d#	2'	$1^1/_3$'	1'
f#^{1}	$2^2/_3$'	2'	$1^1/_3$'
a^2	4'	$2\ ^2/_3$'	2'

1870: The Hill marks are on the upper lip. They give the rank, the note and the number. Hill's note and number are given in the first two columns. The present position of the pipes are in the second two columns, under the list number and the 1963 rank number.

The fifth column gives the scale, which helps to establish the pitch of the pipes. The scales are not particularly accurate indicators, but if the columns are cut into strips and slid up and down so that the scales correspond, the relative pitches are obvious enough. There was obviously some re-thinking in the area f#^{1} to b^1, though it is not clear what the original intention was. The inked Hill rank numbers do not correspond to the position occupied by the pipes. Unfortunately the ink marks are not clear on the smaller pipes.

I					II			III		
1	C	5	0	137.1	15	I1	120.8	56	II1	101.8
2	#	6	0	132.4	16	I2	120.8	57	II2	95.3
3	D	7	0	123.8	17	I3	116.5	58	II3	91.0
4	#	8	0	119.0	18	I4	113.5	59	II4	89.6
5	E	9	0	116.5	19	I5	116.5	60	II5	86.1
6	F	10	0	109.2	20	I6	99.5	61	II6	82.4
7	#	11	0	107.8	21	I7	99.0	62	II7	82.7
8	G	12	0	102.0	22	I8	91.8	63	II8	79.2
9	#	13	0	98.5	23	I9	92.5	64	II9	74.0
10	A	14	0	91.4	24	I10	89.0	65	II10	71.6
11	A#				25	I11	85.0	66	II11	69.8
12	B	30	I16	89.0	26	I12	79.0	67	II12	67.3
13	c	31	I17	86.0	27	I13	80.5	68	II13	65.0
14	#	32	I18	82.7	28	I14	77.2	69	II14	63.0
15	d	33	I19	80.0	29	I15	70.0	70	II15	57.7
16	#	92	III1	76.6	71	II16	70.5	107	III16	56.6
17	e	93	III2	74.2	72	II17?	69.7	108	III17	56.4
18	f	94	III3	72.0	73	II18?	67.1	109	III18	52.2
19	#	95	III4	69.0	74	II19	64.6	110	III19	50.3
20	g	34	I20	76.5	75	II20	61.2	111	III20	47.0
21	#	35	I21	74.5	76	II21	58.9	112	III21	49.2
22	a	36	I22	72.5	77	II22	58.5	113	III22	45.7
23	#	37	I23	69.0	78	II23	56.7	114?	III23	45.6
24	b	38	I24	65.5	79	II24	55.8	115?	III24	43.5
25	c^1	39	I25	66.0	80	II25	53.4			
26	#	40	I26	65.0	81	II26	50.3			
27	d	41	I27	63.5	82	II27	50.6			

28	#	42	I28	61.0	83	II28	46.6	119?	III28	40.1
29	e	43	I29	58.5	84	II29	45.0			
30	f	44	I30	55.0	85	II30	43.8			
31	#	86	II31	44.3						
32	g	87	II32	42.1	116	III25	41.7	128	III37	35.2
33	#	88	II33	40.6	117	III26	41.7	129	III38	33.3
34	a	89	II34	38.5	118	III27	41.5	130	III39	30.6
35	#	90	II35	38.8				131	III40	30.6
36	b	91	II36	36.1						
		96	III5	63.4						
37	c^2	97	III6	66.8						
38	#	98	III7	62.6						
39	d	99	III8	60.6						
40	#	100	III9	59.7						
41	e	101	III10	57.7						
42	f	102	III11	54.7						
43	#	103	III12	51.4						
44	g	104	III13	55.7						
45	#	105	III14	50.5						
46	a	45?	I46	50.0						
47	#	46	I47	48.0						
48	b	47	I48	47.0						
49	c^3	48	I49	44.0						
50	#	49	I50	45.5						
51	d	50	I51	42.0						
52	#	51	I52	41.5						
53	e	52	I53	40.5						
54	f	53	I54	39.0						
55	#	54	I55	38.5						
56	g	55	I56	34.0						

It looks as if the composition after 1870 was as follows:

	I	II	III
C	$1^3/_5$'	$1^1/_3$'	1'
g	2'	$1^1/_3$'	1'
C^2	4'	($2^{\ 2}/_3$')	(2')

LATE EIGHTEENTH CENTURY MARKING

These are made in ink, but only apply to the bottom octave for some reason. They give the same pitches as the Parker marks, but are moved down a pipe (c becomes c#, etc.) in Rank II only. Perhaps they reminded the then builder (Avery?) of the full bottom octave, and the stop name and rank number, which the Parker marks did not. They merely reveal that the composition was 17.19.22 from GG to c^o.

I				II		III	
1	GG			Op e^1	150.4	I2	120.8
2							
3	AA			Op f#	144.2		
4	AA#	Op g#	149.2	Op g#	131.7		
5	BB	0				II1	101.8
6	C	0	137.1	I1	120.8	II2	95.3
7	C#	0	132.4	I3	116.5	II3	91.0
8	D	0	123.8	I4	113.5	II4	89.6
9	D#	0	119.0	I5	116.5	II5	86.1
10	E	0	116.5	I6	99.5	II6	82.4
11	F	0	109.2	I7	99.0	II7	82.7
12	F#	0	107.8	I8	91.8	II8	79.2
13	G	0	102.0	I9	92.5	II9	74.0
14	G#	0	98.5	I10	89.0	II10	71.6
15	A	0	91.4	I11	85.0	II11	69.8
16	A#			I12	79.0	II12	67.3
17	B	I16	89.0	I13	80.5	II13	65.0
18	c	I17	80.5	I14	77.2	II14	63.0

1767: PARKER MARKINGS (MARK $^{1}/_{7}$ AND NUMBER/RANK 4)

These would appear to be contemporary with each other, and to date from the Parker rebuild. Although the marks are either at the top of the pipe, or the bottom of the foot, the scratching implement and the style are the same, and are also similar to the numbers. There are so many anomalies though, that nothing very useful is revealed. I think the marking must have been done more for one man to sort things out for himself than as a workshop routine for colleagues to identify pipes. Even so, I feel that if I had had the pipes next to me as I was sorting out the figures, I would have made more sense of them.

I have made tables using the other marks in the Catalogue of 1698 and 1767 (and other?) marks, which are even more haphazard. I think the 4a marks are also Parker, made before the pipes were laid in their new order after his rebuild (not that it would have changed much), and some of the pitches given (eg. list numbers 56 57 and 59, which were new pipes) make more sense in this table if the 4a marks are used.

If one tries to put the scales in sequences, there are signs that there were four ranks, either before or after 1767, and that there was more than one break, but nothing obvious.

The first two columns show the Parker channels by key and number, corresponding more or less to the pipes in the table and the numbers on Great Principal, Twelfth and Fifteenth. The numbers following are the list numbers from the catalogue. The ranks are those marked, with the pitch mark and scale of the corresponding pipes.

					1		2		3		none	
GG	28	1	16				g	150.4	g	120.8		
AA	30	2	4		?	149.2	?	131.7				
AA#	3	3						144.2				
BB	5	56								101.8		
C	55	5	15	57	c	139.1	c	120.8	?	95.3		
C#	26	6	17	58	c#	132.4	c#	116.5	c	91.0		
D	51	7			d	123.8						
D#	27	8	19	20	d#	119.0	d#	116.5	e	99.5		
E	29	9		60	e	116.5			d	86.1		
F	31	10	21	62	f	109.2	f	99.0	d	82.7		
F#	25	11	22	61	f#	107.8	f#	91.8	d#	82.4		
G	53	12			a#	102.0						
G#	2	13	64				b	98.5	g	74.0		
		24					g#	89.0				
A	52	14	18	23 25	c	91.4	d	113.5	g	92.5	a	85.0
A#	4	26	66				f	79.0	a	69.8		
B	54	30	73	27	b	89.0			a#	67.1	a#	80.5
c	1	28	68				c	77.2	b	65.0		
		31					c	86.0				
c#	41	32			c#	82.7						
d	15	77	33	100			d	58.5	g	59.7	d	80.0
		112	39						g	49.2	b	66.0
		94									g#	72.0
d#	40	92	131	72	f#	76.6	g#	30.6			a	69.7

e	16	93					g	74.2				
f	42	74	104				b	64.6			e	55.7
f#	14	98	78	67			c	62.6	d#	56.7	a#	67.3
g	39	36	40	81	g#	72.5	b	65.0			g	50.3
		97			a#	66.8						
g#	17	38									a#	65.5
		44									d#	55.0
		87							f	42.1		
a	43	69	90		c	63.0					g#	38.8
a#	13	79	114				e	55.8	a	45.6		
b	38	35	41				g	74.5			c	63.5
		80					g	53.4				
c^1	18	105	108				f#	50.5			d#	56.4
$c\#^1$	44	46	51	86 | 29	g	48.0	c	41.5	?	44.3	c#	70.0
		103									e	51.4
d^1	12	37	110	99			a	69.0	f	50.3	c#	60.6
$d\#^1$	37	43									d	58.5
		95									a	69.0
		96									a	63.4
		107									d	56.6
e^1	19	89							g	38.5		
f^1	45	83									g#	46.6
$f\#^1$	11	84	71						a	45.0	g#	70.5
g^1	36	42									c#	61.0
		70									c#	57.7
		88									f#	40.6
$g\#^1$	20	116	101				b	41.7			d	57.7
			120								d#	37.1
a^1	46	113	54						g#	45.7	d#	38.5
		102	118						c	41.5	d#	54.7
$a\#^1$	10											
b^1	35	115	82				a#	43.5			f	50.6
c^2	21	121			d#	36.3						
$c\#^2$	47											
d^2	9	75									c	61.2
$d\#^2$	34	45									f#	50.0
e^2	22	85			a#	43.8						
f^2	48	117			b	71.7						
$f\#^2$	8	109									e	52.2
g^2	33	119			c#	40.1						
		129			f	33.3						
$g\#^2$	23	130	63				g	30.6	f	79.2		
a^2	49	34							f#	76.5		
$a\#^2$	7	47	52		g#	47.0	c#	40.5				
b^2	32	128	53		e	35.2					d	39.0
		49			a	45.5						
c^3	6	50	55		c	42.0					f	34.0
$c\#^3$	50											
d^3	24											
	56	unused										

1767: PARKER MARKINGS (MARK $^{1}/_{7}$ AND NUMBER/RANK 4)

This table follows one of Parker's numbering systems, that positioned below the lower lip, presumably starting at the bass end of the chest. It includes C# and the new pipes, and since mark $^{1}/_{7}$ pitches the note a semitone higher, and the pitch a semitone lower, than mark 6 and lower lip, one assumes that it post-dates his rebuild.

Channel		List No.		1		2		3		None	
c	1	28	68			c	77.2	b	65.0		
		31				c	86.0				
G#	2	13	64			b	98.5	g	74.0		
		24				g#	89.0				
AA#	3	3					144.2				
A#	4	26	66			f	79.0	a	69.8		
BB	5	56					101.8				
c^{3}	6	50	55	c	42.0					f	34.0
$a\#^{2}$	7	47	52	g#	47.0	c#	40.5				
$f\#^{2}$	8	109								e	52.2
d^{2}	9	75								c	61.2
$a\#^{1}$	10										
$f\#^{1}$	11	84	71					a	45.0	g#	70.5
d^{1}	12	37	110 99			a	69.0	f	50.3	c#	60.6
a#	13	79	114			e	55.8	a	45.6		
f#	14	98	78 67			c	62.6	d#	56.7	a#	67.3
		87						f	42.1		
d	15	77	33 100			d	58.5	g	59.7	d	80.0
		112	39					g	49.2	b	66.0
		94								g#	72.0
e	16	93				g	74.2				
g#	17	38								a#	65.5
		44								d#	55.0
c^{1}	18	105	108			f#	50.5			d#	56.4
e^{1}	19	89						g	38.5		
$g\#^{1}$	20	116	101			b	41.7			d	57.7
		120								d#	37.1
c^{2}	21	121		d#	36.3						
e^{2}	22	85		a#	43.8						
$g\#^{2}$	23	130	63			g	30.6	f	79.2		
d^{3}	24										
F#	25	11	22 61	f#	107.8	f#	91.8	d#	82.4		
C#	26	6	17 58	c#	132.4	c#	116.5	c	91.0		
D#	27	8	19 20	d#	119.0	d#	116.5	e	99.5		
GG	28		1 16			g	150.4	g	120.8		
e2	29	9	60	e	116.5			d	86.1		
AA	30	2	4	?	149.2	?	131.7				
F#	31	10	21 62	f#	109.2	f	99.0	d	82.7		
		49		a	45.5						

b^2	32	128	53	e	35.2					d	39.0
g^2	33	119		c#	40.1						
		129		f	33.3						
$d\#^2$	34	45								f#	50.0
b^1	35	115	82			a#	43.5			f	50.6
g^1	36	42								c#	61.0
		70								c#	57.7
		88								f#	40.6
$d\#^1$	37	43								d	58.5
		95								a	69.0
		96								a	63.4
		107								b	56.6
b	38	35	41			g	74.5			c	63.5
		80				g	53.4				
g	39	36	40 81	g#	72.5	b	65.0			g	50.3
		97		a#	66.8						
d#	40	92	131 72	f#	76.6	g#	30.6			a	69.7
c#	41	32		c#	82.7						
f	42	74	104			b	64.6			e	55.7
a	43	69	90	c	63.0					g#	38.8
$c\#^1$	44	46	51 86 29	g#	48.0	c	41.5	?	44.3	c#	70.0
		103								e	51.4
f^1	45	83								g#	46.6
a^1	46	113	54					g#	45.7	d#	38.5
		102	118					c	41.5	d#	54.7
$c\#^2$	47										
f^2	48	117		b	41.7						
a^2	49	34						f#	76.5		
$c\#^3$	50										
D	51	7		d	123.8						
A	52	14	18	c	91.4	d	133.5	g	92.5	a	85.0
G	53	12		a#	102.0						
B	54	30	73 27	b	89.0			a#	67.1	a#	80.5
C	55	5	15 57	c	139.1	c	120.8	?	95.3		
	56										

1698 SMITH MARKINGS

These are an accumulation of pipes, using the marked numbers and scales as a guide. The number marks above or on the upper lip seem to be associated with the Smith marks. They are not scratched with the same tool, but they have the same compass, are occasionally scratched over, and are in a logical position. Apart from a couple of rogues, and a strange jump at E F, they form a sequence (up to b^{o} in the corrected table).

	I				II			III			IV		
1	GG				144.2	d	[2]	116.5	a	[13]			
2	AA	149.2	c#	[1]	?131.7	e	[3]	91.0	c	[50]			
3	C	132.4	e	[4]	116.5	g	[12]	86.1	d	[51]			
4	D	119.0	f#	[5]				82.4	d#	[52]			
5	D#	116.5	g	[6]	99.5	e	[14]						
6	E												
7	F												
8	F#	109.2	g#	[7]	99.0	b	[15]						
9	GG	107.8	a	[8]	91.8	c	[16]	79.2	f	[54]			
10	G#	102.0	a#	[9]	92.5	c#	[17]	65.0	b	[34]	55.7	e	[94]
11	A	98.5	b	[10]	89.0	d	[18]	74.0	g	[55]			
12	A#	91.4	c#	[11]	85.0	d#	[19]	71.6	g#	[56]			
13	B												
14	c	89.0	d	[24]	80.5	f	[21]	67.1	a#	[64]			
15	c#	86.0	d#	[25]	77.2	f#	[22]	65.0	b	[59]			
16	d	82.7	e	[26]	63.5	c	[35]						
17	d#	80.0	f	[27]	72.0	g#	[84]						
18	e	76.5	f#	[28]	69.8	a	[57]	58.5	d	[37]			
		76.6	f#	[82]	69.7	a	[63]						
19	f	74.5	g	[29]	67.3	a#	[58]						
		74.2	g	[83]									
20	f#	72.5	g#	[30]									
21	g	69.0	a	[31]	62.6	c	[89]				42.1	f	[78]
22	g#	66.8	a#	[87]	61.0	c#	[36]	50.3	f#	[72]			
23	a	66.0	b	[33]	58.5	d	[68]	49.2	g	[103]			
24	a#	63.0	c	[60]							38.8	g#	[81]
25	b	60.6	c#	[89]	55.8	e	[70]						
26	c^{1}	53.4	f	[71]									
27	c#	50.5	f#	[95]									

This table shows the above table with some of the evident anomalies taken out. The scales and pitch marks are in a sequence; they have been followed at the expense of the numbering.

	I (1 $^{3}/_{5}$')				I I (1 $^{1}/_{3}$')			I I I (1 ')		
1	GG				144.2	d	[2]			
2	AA	149.2	c#	[1]	?131.7	e	[3]	116.5	a	[13]
3	C	132.4	e	[4]	116.5	g	[12]	91.0	c	[51]
4	D	119.0	f#	[5]				86.1	d	[53]
5	D#	116.5	g	[6]	99.5	a#	[14]	82.4	d#	[54]
6	E	109.2	g#	[7]	99.0	b	[15]			
7	F	107.8	a	[8]	91.8	c	[16]	79.2	f	[56]
8	F#	102.0	a#	[9]	92.5	c#	[17]	76.6	f#	[84]
9	GG	98.5	b	[10]	89.0	d	[18]	74.0	g	[57]
10	G#	91.4	c	[11]	85.0	d#	[19]	71.6	g#	[58]
11	A							69.7	a	[65]
12	A#	89.0	d	[24]	80.5	f	[21]	67.1	a#	[66]
13	B	86.0	d#	[25]	77.2	f#	[22]	65.0	b	[61]
14	c	82.7	e	[26]	74.2	g	[85]	63.5	c	[35]
15	c#	80.0	f	[27]	72.0	g#	[86]			
16	d	76.5	f#	[28]	69.8	a	[59]	58.5	d	[37]
17	d#	74.5	g	[29]	67.3	a#	[60]			
18	e	72.5	g#	[30]	65.0	b	[34]	55.7	e	[96]
19	f	69.0	a	[31]	62.6	c	[90]			
20	f#	66.8	a#	[89]	61.0	c#	[36]	50.3	f#	
21	g	66.0	b	[33]	58.5	d	[70]			
22	g#	63.0	c	[62]						
23	a	60.6	c#	[91]	55.8	e	[72]			
24	a#				53.4	f	[73]			
25	b				50.5	f#	[97]			

In the interests of uniformity, the possibility of other breaks and a fourth rank have been ignored. Unfortunately, the remaining pipes, which have no numbers, nor (apart from a handful) a pitch mark to indicate the key as well as the pitch, do not give a further clue to the mixture composition. They could all be fitted in a standard 18th century composition of 17.19.22/12.15.17. However, there are enough oddities to leave the possibility of another solution open.

This is a list of the unnumbered pipes, giving the pitch marks and Smith list number:

c	61.2	cf	[66]	42.0	[44]	41.5		[45]		
c#	59.7		[90]	57.7	[61]	40.5		[46]		
d	82.7		[53]	59.7	[91]	56.6		[97]	39	[47]
d#	56.7		[67]	55.0	[38]	54.7	d# a	[92]	38.5	[48]
e	52.2		[99]	51.4	[93]					
f	79.0	ef	[20]	50.6	[73]	50.3		[100]	34	[49]
f#	50.0		[39]	46.5	[96]	40.6		[79]		
g	70.0		[23]	48.0	[40]	38.5		[80]		
g#	70.5	g# a#	[62]	47.0	[41]	46.6		[74]	44	[42]
a	69.0		[85]	63.4	[86]	45.5		[43]	45	[75]
a#	65.5		[32]	43.0	[76]	44.3?		[77]		
b	64.6	bf	[65]	58.9	[67]					

And a comparison with the numbered pipes of rank III, the octave rank:

	III (1ft)									
c	91.0									
c#										
d	86.1	82.7		[53]						
d#	82.4									
e										
f	79.2	79.0		[20]						
f#	76.6									
g	74.0	70.0		[23]	70.5	g# a#	[62]			
g#	71.6									
a	69.7	69.0		[85]	63.4					
a#	67.1	65.5		[32]						
b	65.0	64.6	bf	[65]	58.9		[67]			
c	63.5	61.2	c f#	[66]						
c#		57.7	c# g	[61]	59.7		[90]			
d	58.5	57.7	d g#	[91]	56.6		[97]			
d#		55.0		[38]	56.7		[69]	54.7	d# a	[92]
e	55.7	51.4		[93]	52.2		[99]			
f		50.6	fb	[73]	50.3		[100]			
f#	50.3	50.0		[39]	40.6		[79]	46.5		[96]
g		48.0		[40]	38.5		[80]			
g#		47.0		[41]	44.0		[42]	46.6		[74]
a		45.5		[43]	45.0		[75]			
a#		44.3?		[77]						
b										
c		42.0		[44]	41.5		[45]			
c#		40.5		[46]						
d		39.0		[47]						
d#		38.5		[48]						
e										
f		34.0		[49]						

CATALOGUE OF 1698 AND 1767 PIPEWORK

This is a catalogue of the marks which look mid 18th century. Mark1+7 and Mark 6+lower lip, which seem to form sequences, resemble each other closely, and are very similar to the Parker marks on the other pipes (Great Principal and Swell Stop Diap).

The numbers are also closely related; they are either by Parker, or around that time. Mark 1+7 and the numbers are on all the pipes, including the 1767 pipes, but Mark 6+lower lip are not, apart from 56 57 and 59 in the catalogue. Also, Mark 1+7 includes c#, and is generally a semitone lower in pitch than 6+lower lip. This suggests that 6+lower lip was made before the compass was extended in 1767, but that the other marks were made afterwards.

It is strange that number 4a was marked twice so often. One gets the feeling of some desperation on the part of the 1767 builder. It is puzzling, and a great pity, that only the most vague of sequences emerges.

The first column gives the list number included in the other tables. The second gives the 1963 rank position. The third gives the scale. The asterisks show the 1767 pipes; all the others are 1698.

			scale	mk1+7	mk6+lip	no(4a)+ rank		no(4a)	no (1a) + rank	
2	OD	f[1]	149.2		A	30	1	27		
3	OD	f#[1]	144.2		G	3	2	3	53	2
4	OD	g#[1]	131.7		A	30	2	27		
5	*O1		139.1	C		55	1			
6	O2		132.4	C#	C	26	1	24	30	1
7	*O3		123.8	D		51	1		5	1
8	O4		119.0	d#	D	27	1	26	27	1
9	O5		116.5	e	D#	29	1	25	24	1
10	O6		109.2	f	E	31	1	28	25	1
11	O7		107.8	f#	F	25	1	23	31	1
12	O8		102.0	a#	F#	53	1	49	3	1
13	O9		98.5	b	g	2	2	12	54	1
14	O10		91.4	c	g#	52	1	48	4	1
15	*I1	C	120.8	C		55	2	6	7	2
16	*I 2	C#	120.8	G		28	3	24	28	3
17	I 3	D	116.5	c#	C	26	2		30	2
18	*I 4	D#	113.5	D		52	2	26	5	2
19	I 5	E	116.5	d#	D	27?	2	25	?	2
20	I 6	F	99.5	e	D#	27	2	28	29	2
21	I 7	F#	99.0	f	E	31	2	23	25	2
22	I 8	G	91.8	f#	F	25	2	49	31	2
23	I 9	G#	92.5	g	F#	52	3?	2	3	2
24	I 10	A	89.0	g#	g	2	2	48	54	2
25	I 11	A#	85.0	a	g#	52			1?	
26	I 12	B	79.0	f	e	4	2		2	2
27	I 13	c	80.5	b	A#	54		50	55	2
28	I 14	c#	77.2	c	B	1	2	1	12	
29	I 15	d	70.0	c#		44			2	1
30	I 16	d#	89.0	b	a#	54	1	50	55	
31	I 17	E	86.0	C	b	1	2	1	55	

				mk1+7	mk6+lip	no(4a)+	rank	no(4a)	no (1a) +	rank
32	I 18	f	82.7	c#		41	1	38		
33	I 19	f#	80.0	d		15		13		
34	I 20	g	76.5	f#	F g	49?	3	53	3	3
35	I 21	g#	74.5	g	c#	38	2	41	15	
36	I 22	a	72.5	g#	f	39	1	42	13	
37	I 23	a#	69.0	a	f#	12	2?	13	14	
38	I 24	b	65.5	a#	g? e	17		19	9?	
39	I 25	c^1	66.0	b	g#	15		17	11	
40	I 26	c#	65.0	b	f	39	2	42		
41	I 27	d	63.5	c	c#	38		41	15	
42	I 28	d#	61.0	c#	g	36		39	17	
43	I 29	e	58.5	d	d#	37		40	16	
44	I 30	f	55.0	d#	e	17		19	?	
45	I 46	a^2	50.0	f#	d#	34	1	37		
46	I 47	a#	48.0	g	c#	44	1	47		
47	I 48	b	47.0	g#	d	7	1	8		
48	I 49	c^3	44.0	g#						
49	I 50	c#	45.5	a	d#	31	1	34		
50	I 51	d	42.0	c	f#	6	1	7	20	
51	I 52	d#	41.5	c	c#	44	2	47		
52	I 53	e	40.5	c#		7?	2	9?	19	
53	I 54	f	39.0	d	b	32		35	21	
54	I 55	f#	38.5	d#		46		?		
55	I 56	g	34.0	f	f#	6		8		
56	*II1	C	101.8		b?	5	3	8?	51	3
57	*II2	C#	95.3		C	55	3	4		3
58	II3	D	91.0	c	c#	26	3	24		3
59	*II4	D#	89.6		D		3	10	5	3
60	II5	E	86.1	d		29	3?	26	2	3
61	II6	F	82.4	d#	D E	25	3	27	29	3
62	II7	F#	82.7	d	f	31	3		25	3
63	II8	G	79.2	f	f#	23	3	25	31	3
64	II9	G#	74.0	g	g g#	2	3	2	54	3
65	II10	A	71.6	g#	g# a		3	48	4	3
66	II11	A#	69.8	a	a a#	4	3	4	52	3
67	II12	B	67.3	a#	b	14			12?	
68	II13	c	65.0	b	b	1	3	1	55	3
69	II14	c#	63.0	c		43	1	40		
70	II15	d	57.7	c#	g?	36		33		
71	II16	d#	70.5	g#	d	11?		10	16?	
72	II17	e	69.1	a	d#	40		37	16	
73	II18	f	67.1	a#	a#	54	3	50	2	3
74	II19	f#	64.6	b	f	42	2	45	10	
75	II20	g	61.2	c	f#	9		10		
76	II21	g#	58.9	b						
77	II22	a	58.5	d	g#	15	2	17		
78	II23	a#	56.7	d#		14	3	16	12	
79	II24	b	55.8	e		13	2		15	
80	II25	c^1	53.4	f	b	38	2	35	18	

				mk1+7	mk6+lip	no(4a)+ rank		no(4a)	no (1a) + rank	
81	II26	c#	50.3	f#	g	39		36	18	
82	II27	d	50.6	f	d b	35		32	17	
83	II28	d#	46.6	g#		45		42		
84	II29	e	45.0	a		11	3	9	16	
85	II30	f	43.8	a#	g#	22	1	20	6	
86	II31	f#	44.3			44	3	3		
87	II32	g	42.1	f	f#	14	3	12	14	
88	II33	g#	40.6	f#	g	36		33	20	
89	II34	a	38.5	g		19	3	17		
90	II35	a#	38.8	g#		43		46/48	13	
91	II36	b	36.1	a						
92	III1	C	76.6	f#	d#	40	1	37	15	
93	III2	C#	74.2	g	e	16	1	14	12	
94	III3	D	72.0	g#	d	15		13	13	
95	III4	D#	69.0	a	d#	37		34		
96	III5	E	63.4	a	d d	37		X	19	
97	III6	F	66.8	a#	g	39	1	36		
98	III7	F#	62.6	c	f#	14	2	12	14	
99	III8	G	60.6	c#	a#	12		11	15	
100	III9	G#	59.7	c#	d	15	3	13	13	
101	III10	A	57.7	d	g#	20		18	8	
102	III11	A#	54.7	d#	a	46		43	9	
103	III12	B	51.4	e	f	44		42	11	
104	III13		55.7	e	f	42		39	14	
105	III14		50.5	f#	c	18	2	16	10	
106	III15		46.5	f#						
107	III16		56.6	d	d#	37		34	19	
108	III17		56.4	d#	c	18		16	10	
109	III18	f	52.2	e	a#	8				
110	III19		50.3	f	a# d	12	3	10	16	
111	III20		47.0	f#	g			X		
112	III21		49.2	g	g#	15	3	17	11	
113	III22		45.7	g#	a	46	2	43		
114	III23		45.6	a	a#	13	3	11		
115	III24		43.5	a#	b	35	2	32		
116	III25		41.7	b	g#	20	2	18		
117	III26		41.7	b	f	48	1	45		
118	III27		41.5	c	a	46	3	43		
119	III28		40.1	c#	g	33	1	30		
120	III29		37.1	d#	d e	20				
121	III30		36.3	d#	d#	21	1	19		
122	III31		43.8	(a#)						
123	III32		41.7	(b)						
124	III33		40.2	(c#)						
125	III34		38.0	(d)						
126	III35		38.3	(d)						
127	III36		38.0	(d)						
128	III37		35.2	e		32	1	29		
129	III38		33.3	f	g	33	1	30		
130	III39		30.6	g	g#	23	2	21		
131	III40		30.6	g#	a	40	2	46		

Smith marks and numbers, giving a) the list number, b) a Smith list number, c) the present position (rank and note), d) the scale, and e) original note mark and number.

a)	b)	c)		d)	e)		
2	1	OD	f[1]	149.2	c#		2
3	2	OD	f#[1]	144.2	d		1
4	3	OD	g#[1]	131.7	e		
6	4	O2		132.4	e		3
8	5	O4		119.0	f#		4
9	6	O5		116.5	g		5
10	7	O6		109.2	g#		8
11	8	O7		107.8	a		9
12	9	O8		102.0	a#		10
13	10	O9		98.5	b		11
14	11	O10		91.4	c		12
17	12	I 3	D	116.5	g	c#	3
19	13	I 5	E	116.5	a		
20	14	I 6	F	99.5	e	e	5
21	15	I 7	F#	99.0	b	f	8
22	16	I 8	G	91.8	c	f#	9
23	17	I 9	G#	92.5	c#	g	10
24	18	I 10	A	89.0	d	g#	11
25	19	I 11	A#	85.0	d#	a	12
26	20	I 12	B	79.0	e	f	
27	21	I 13	c	80.5	f	b	14
28	22	I 14	c#	77.2	f#	c	15
29	23	I 15	d	70.0	g		
30	24	I 16	d#	89.0	d		14
31	25	I 17	e	86.0	d#		15
32	26	I 18	f	82.7	e		16
33	27	I 19	f#	80.0	f		17
34	28	I 20	g	76.5	f#		18
35	29	I 21	g#	74.5	g		16
36	30	I 22	a	72.5	g#		20
37	31	I 23	a#	69.0	a		21
38	32	I 24	b	65.5	a#		
39	33	I 25	c[1]	66.0	b		23
40	34	I 26	c#	65.0	b		10
41	35	I 27	d	63.5	c		16
42	36	I 28	d#	61.0	c#		22
43	37	I 29	e	58.5	d		18
44	38	I 30	f	55.0	d#		
45	39	I 46	a[2]	50.0	f#		3
46	40	I 47	a#	48.0	g		
47	41	I 48	b	47.0	g#		
48	42	I 49	c[3]	44.0	g#		
49	43	I 50	c#	45.5	a		
50	44	I 51	d	42.0	c		
51	45	I 52	d#	41.5	c		
52	46	I 53	e	40.5	c#		
53	47	I 54	f	39.0	d		
54	48	I 55	f#	38.5	d#		

a)	b)	c)		d)	e)		
55	49	I 56	g	34	f		
58	50	II3	D	91	c		3
60	51	II5	E	86.1	d		4
61	52	II6	F	82.4	d#		5
62	53	II7	F#	82.7	d		
63	54	II8	G	79.2	f		9
64	55	II9	G#	74	g		11
65	56	II10	A	71.6	g#		12
66	57	II11	A#	69.8	a		18
67	58	II12	B	67.3	a#		19
68	59	II13	c	65	b		15
69	60	II14	c#	63	c		24
70	61	II15	d	57.7	c#	g	
71	62	II16	d#	70.5	g#	a#	
72	63	II17	e	69.7	a		18
73	64	II18	f	67.1	a#		14
74	65	II19	f#	64.6	b	f	
75	66	II20	g	61.2	c	f#	
76	67	II21	g#	58.9	b		
77	68	II22	a	58.5	d	g#	23
78	69	II23	a#	56.7	d#		
79	70	II24	b	55.8	e		25
80	71	II25	c[1]	53.4	f	b	26
81	72	II26	c#	50.3	f#		22
82	73	II27	d	50.6	f	b	
83	74	II28	d#	46.6	g#		
84	75	II29	e	45	a		
85	76	II30	f	43	a#		
86	77	II31	f#	44.3			
87	78	II32	g	42.1	f		21?
88	79	II33	g#	40.6	f#		
89	80	II34	a	38.5	g		
90	81	II35	a#	38.8	g#		24
91	82	II36	b				
92	83	III1	c	76.6	f#		18
93	84	III2	c#	74.2	g	d	19
94	85	III3	D	72	g#	d#	17
95	86	III4	D#	69	a		
96	87	III5	E	63.4	a		
97	88	III6	F	66.8	a#		22
98	89	III7	F#	62.6	c		21
99	90	III8	G	60.6	c#		25
100	91	III9	G#	59.7	c#		
101	92	III10	A	57.7	d	g#	
102	93	III11	A#	54.7	d#	a	
103	94	III12	B	51.4	e		
104	95	III13	c	55.7	e		10
105	96	III14	c#	50.5	f#	c	27

a)	b)	c)		d)	e)	
106	III15	d	46.5	f#		
107	III16	d#	56.6	d		
108	III17	e	56.4	d#	a#	7?
109	III18	f	52.2	e		
110	III19	f#	50.3	f		
111	III20	g	47.0	f#		
112	III21	g#	49.2	g		
113	III22	a	45.7	g#		
114	III23	a#	45.6	a		
115	III24	b	43.5	a#		
116	III25	c	41.7	b		
117	III26	c#	41.7	b		
118	III27	d	41.5	c		
119	III28	d#	40.1	c#		
120	III29	e	37.1	d#		
121	III30	f	36.3	d#		
122	III31	f#	43.8	a#		
123	III32	g	41.7	b		
124	III33	g#	40.2	c#		
125	III34	a	38.0	d		
126	III35	a#	38.3	d		
127	III36	b	38.0	e		
128	III37	c	35.2	e		
129	III38	c#	33.3	f		
130	III39	d	30.6	g		
131	III40	d#	30.6	g#		

ORGAN Great St. Mary's Cambridge — STOP Ch St. Diap 8 — 52 (1)

Measured by [redacted] — Date 11 7 95

	Pitch Pipe mark	Body length	INT DEPTH	INT WIDTH	MOUTH HEIGHT / HEIGHT TO BLOCK/TOP CAP	FLUE ≤	TOEHOLE ø	EXT D x W	BLOCK BEVEL °	UPPER LIP THICKNESS	HEIGHT OF UPPER LIP BEVEL FROM CAP	BLOCK HEIGHT	FOOT LENGTH
	C	1107	117·5	102·2	21·2 / 22·6	1·9	≈23	139·8 / 126·0	62°	1·3	121	95	148
	#	1037	115·0	98·5	20·2 / 22·4	1·9							
BODY	D	1072	107·2	89·6	18·1 / 19·6	0·9							
	#	920	106·0	88·6	20·3 / 22·7	1·6							
	E	881	101·1	82·4	17·2 / 19·1	2·1	≈13						194
FOOT	F	906	96·6	80·1	16·1 / 17·6	1·6							
	#	779	91·5	76·1	15·1 / 16·8	1·3							
	G	739	88·7	72·5	14·9 / 16·2	1·2							
	#	687	85·6	68·5	14·9 / 16·5	1·7							
	A	651	73·2	62·5	11·3 / 12·6	1·2							
	#	609	80·0	62·3	12·6 / 14·2	1·6							
	B	580	70·7	60·5	9·9 / 11·2	1·6							
	C°	545	78·8	63·2	12·8 / 14·4	0·8	≈16	92 / 79	66°	1·2	75	85	196
	#	508	72·2	58·1	11·2 / 13·2	1·4							
	d	477	69·2	57·3	11·2 / 13·0	1·2							
	#	450	64·6	53·1	12·8 / 14·6	1·[illegible]							
	e	421	63·6	50·2	10·0 / 11·8	1·1							
	f	397	60·0	49·8	10·2 / 11·5	1·2							
	#	370	58·6	46·4	9·0 / 11·1	1·1							
	g	345	57·2	44·4	9·2 / 10·6	1·1							
?	#	325	53·6	42·4	8·8 / 10·6	1·0							
	a	307	51·4	42·1	8·3 / 10·1	0·9							
	#	284	50·2	39·1	8·2 / 10·1	1·0							
	b	268	45·6	36·6	7·6 / 9·2	1·1							
	c'	258	44·6	33·1	7·4 / 8·6	1·0	8·5	56 / 46·5	67°	≈1·0	34	65	195
	#	248	41·2	32·5	7·4 / 8·7	1·2							
?	d	237	39·7	30·1	6·9 / 8·3	1·1							
	#	222	39·1	29·6	6·9 / 8·4	1·2							
	e	207	37·2	28·9	6·2 / 7·9	1·1							
	f	192	34·8	26·2	6·0 / 7·2	0·9							

NEW FEET
OLD FEET
OCTAGONAL STOPPERS
MUSIC ROOM STOPPERS AS

ORGAN Gt St Mary's Cambridge | STOP Ch St Diap 8 | ②

Measured by [redacted] | Date 11 7 95 | 53

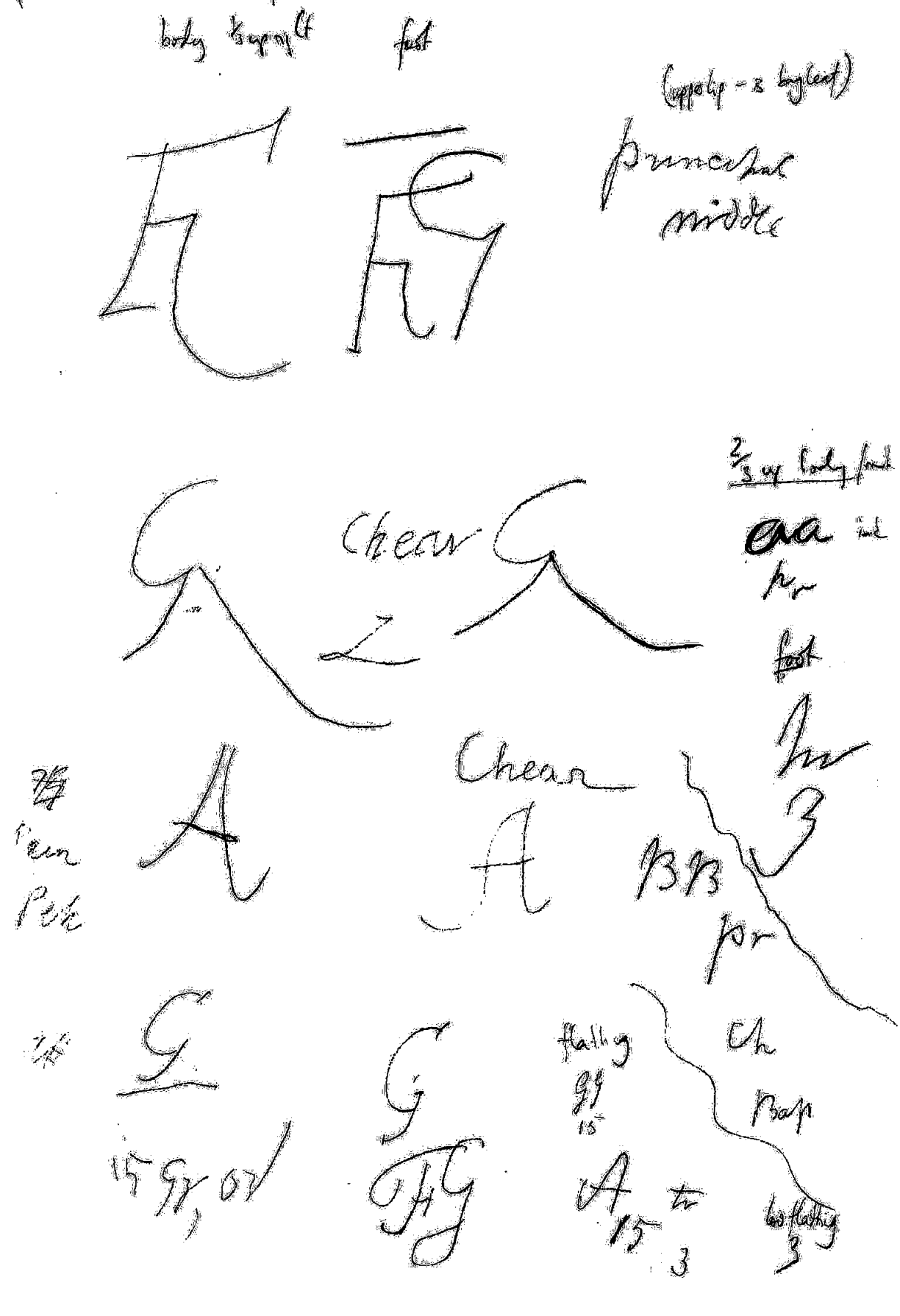
	Pitch Pipe mark	Body length	INT DEPTH	INT WIDTH	MOUTH HEIGHT TO BLOCK/TOP CAP	FLUE	TOESHOLE ø	EXT D x W	BLOCK BEVEL °	UPPER LIP THICKNESS	HEIGHT OF UPPER LIP BEVEL FROM CAP	BLOCK HEIGHT	FOOT LENGTH
	~~F#~~ 1	184	34·0	27·0	5·6/7·0	1·0	8·5						
	g	173	31·9	25·1	5·2/6·8	0·8							
	#	159	31·4	23·5	5·5/6·6	0·6							
	a	148	30·8	23·3	5·1/6·2	0·9							
	#	141	30·6	22·4	4·8/5·2	0·9							
	b	132	28·5	21·5	4·6/6·1	1·0							
g	c''	122	28·3	21·2	4·4/5·8	1·0	7·0	38·5/32	71°	<1·0	27	56	195
T	#	113	27·0	20·6	4·3/5·7	0·9							
Me	d	109	26·6	19·6	4·0/5·3	0·8							
9	#	100	25·4	19·4	4·0/5·2	0·8							
	e	94	23·2	17·3	3·9/5·1	0·7							
	f	87	22·8	16·7	3·9/5·2	0·6							
	#	83	20·9	15·5	3·2/4·8	0·7	4·0						
h	g	77	20·4	14·7	3·1/4·4	0·6							
g	#	72	19·1	14·4	2·6/3·8	0·5							
gr	a	70	18·7	14·4	2·5/3·6	0·5							
a	#	66	18·7	12·6	2·4/3·4	0·5							
→	b	64	17·6	11·5	1·9/3·0	<0·5	FOOT → 3 Choir						
#	c'''	58	17·4	11·1	2·0/3·2	h	4·5	25/19	77°		7·5	47	175
→	#	55	15·7	9·6	2·1/3·0	h	FOOT → 4 Choir						
	d	51	14·9	9·4	2·2/3·2	L							
	#	Hill											
	e	Hill											
	f	Hill											
	#	Hill											
	g	Hill											

ORGAN GREAT ST. MARY'S CAMBRIDGE | STOP PEDAL PRINCIPAL | 54

Measured by | Date | 1698, PIPES ONLY

	PRESENT/ORIG Pitch Pipe mark	Body length	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT	FLUE	TOEHOLE	LANGUID BEVEL/THICK	METAL THICKNESS	SCRIBE LINES	NICKS	EARS	FOOT LENGTH
GtPr?	G/GG?	∩	337.7	83.2	21.9	1.5	c.135 c.290	7.2	1<1.6	∩ 226	13 deepened	Later	335
ChPr?	A/GG?		309.5	c.750	21.6	1.7	c.431 ø	6.0	1<1.6	∩ 205		21.5×4	405
ChPr?	B/AA		294.4	67.6	18.7	1.4	c24 ø	6.4	1<1	∩ 116		21.5×4	240
Gt 15	~~G#~~/GG?		187.3	42.7	12.2	1.2	c18 ø	78° 2.2	0.6<0.8	∩ 66		16×35	222
ChPr	G#/GG	C18											
ChPr	A#/AA	C18											

from Pedal Principal



ORGAN GREAT St. MARY'S CAMBRIDGE — STOP CHOIR. PRINCIPAL — 56

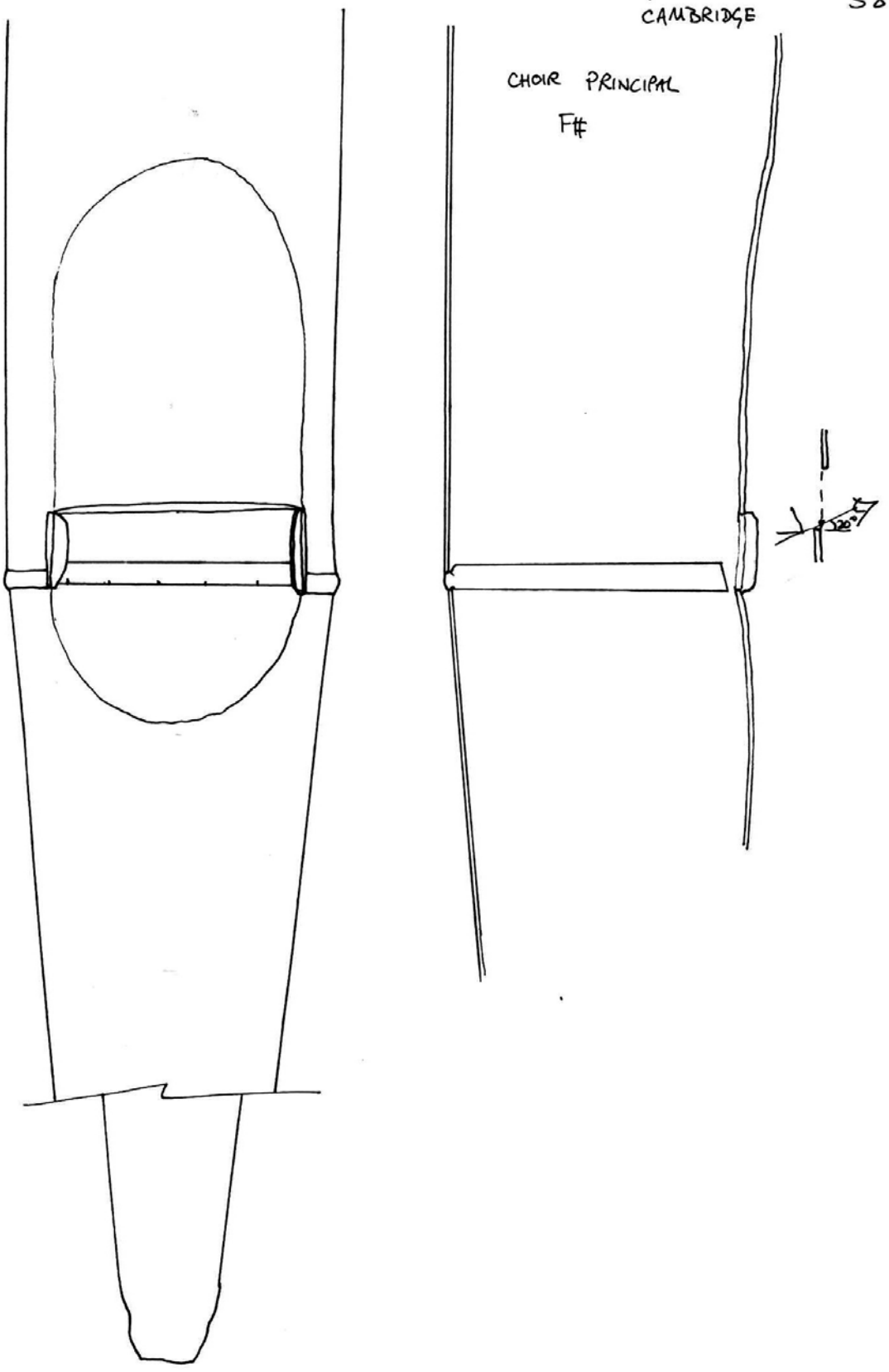
Measured by B.L. — Date 13.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Tongue outside ø	Languid bevel/thick	Metal thickness	Scrape lines	Nicks	Ears	Foot length
C18	C	∩	276.0	65.0	15.9	1.5	11.9	60°/3.8	1.2	180	14	27×6	225
C18	C♯	∩	265.0	63.0	15.5	1.0	8.1						
C	D	∩	254.0	58.0	16.1	1.6	9.6	78°/5.5	1.0<1.1	101	8 deepened	21×4	240
C18	D♯	∩	246.0	58.0	13.9	1.2	9.0						
D	E	∩	236.0	55.0	14.8	1.2	8.9						
D	F		225.0	50.5	14.5	1.7	10.6						
E	F♯		218.0	50.0	14.0	1.0	8.8				5 deep		
F	G		204.0	48.0	13.4	1.7	10.3				4v. light		
F	G♯		198.0	45.5	12.4	1.1	8.0						
G	A		188.0	43.0	13.3	1.3	8.7						
G	A♯		182.0	42.0	12.1	1.2	7.9						
A	B		175.0	40.5	11.6	1.1	9.6						
H	c		161.0	36.0	10.4	1.1	7.4/9.6	66°/3.0	1.0	64	5	14×4	240
c	c♯		155.0	35.0	10.0	1.0	5.7						
c	d		149.0	33.0	9.7	0.9	6.0						
d	d♯		142.5	33.0	9.4	1.2	5.4						
d	e		135.0	30.0	7.8	0.8	6.0						
e	f		130.0	29.0	8.3	1.0	5.0						
f	f♯		125.0	28.5	7.2	0.8	6.0						
f	g		120.0	27.5	8.0	0.7	5.6						
g	g♯		115.0	27.0	7.1	0.9	4.6						
g	a		110.0	26.0	7.3	0.8	4.8						
a	a♯		105.0	25.5	7.0	0.8	5.2						
b	b		100.0	24.0	6.6	0.7	5.3						
h	c'		97.0	21.0	6.0	1.0	5.6/8.7	65°/2.0	0.8	38	14	9×3	230
h	c'♯		98.0	21.0	6.6	0.6	5.0						
	d'		93.5	21.0	5.6	0.8	4.3						
	d'♯		90.0	20.0	5.5	0.9	3.7						
	e'		86.5	17.5	5.7	0.6	5.0						
	f'		83.0	18.0	4.9	0.7	4.0						

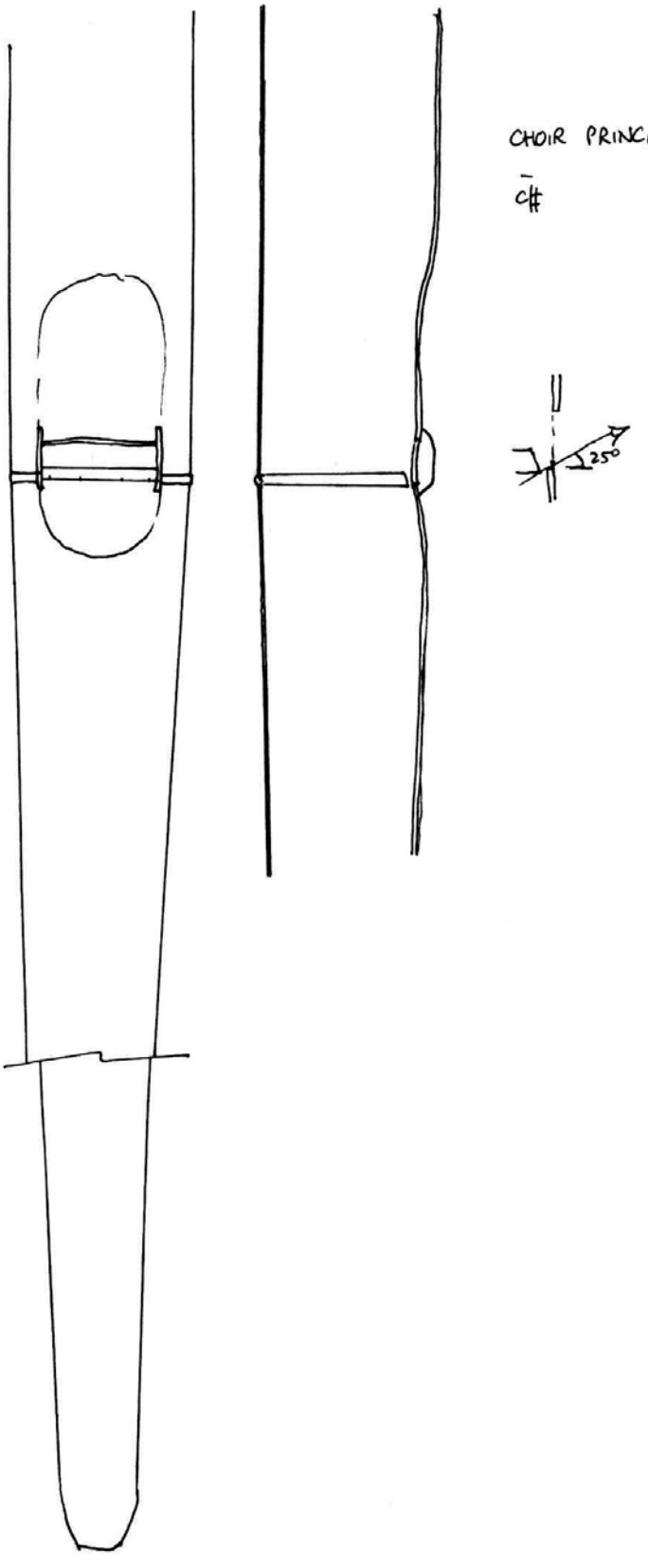
ORGAN GREAT St. MARY'S CAMBRIDGE — STOP CHOIR PRINCIPAL — 57

Measured by B.L. — Date 13.7.95

Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole outside ø	Language Bevel/Thick	Metal thickness	Scrape lines	Nicks	Ears	Foot length
f'♯		82.0	17.0	5.2	0.8	4.0						
g'		77.0	16.5	5.0	0.7	4.0						
g'♯		75.0	16.0	5.0	0.7	4.3						
a'		73.0	16.0	4.7	0.9	3.8						
a'♯		70.0	15.6	4.4	0.7	3.7						
b'		68.0	15.0	4.2	0.7	3.5						
c²		65.0	14.0	4.2	0.7	33/9.0	65°/1.6	0.9	25	14		222
c²♯		62.5	14.0	3.4	0.8	3.4						
d²		61.0	13.0	3.8	0.8	3.0						
d²♯		58.0	12.5	3.8	0.5	2.9						
e²		56.0	12.5	3.8	0.4	3.3						
f²		54.0	12.5	3.4	0.5	2.7						
f²♯		51.0	10.5	3.3	0.6	3.0						
g²		49.0	10.0	3.2	0.4	2.6						
g²♯		48.0	10.0	3.0	0.6	2.6						
a²		46.0	9.0	2.9	0.8	2.6						
a²♯		44.0	9.0	2.8	0.6	2.5						
b²		46.0	9.0	2.8	0.6	3.0						
c³		41.0	8.0	2.9	0.4	2.7/8.8	70°/1.4	0.5	18	0		222
c³♯		41.0	7.5	2.9	0.5	3.0						
d³		39.0	7.5	2.6	0.4	3.0						
d³♯	C20											
e³		36.6	7.5	3.1	0.5	2.7						
f³		35.0	8.0	2.6	0.5	3.0						
f³♯		35.0	8.0	1.6	0.4	3.0						
g³		34.0	7.0	2.7	0.6	3.5						

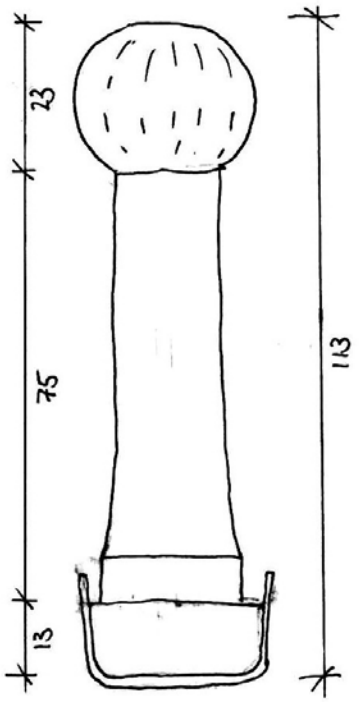

GREAT St MARY'S
CAMBRIDGE
58
CHOIR PRINCIPAL
F#
20°

GREAT St MARY's 59
CAMBRIDGE



CHOIR PRINCIPAL

C#

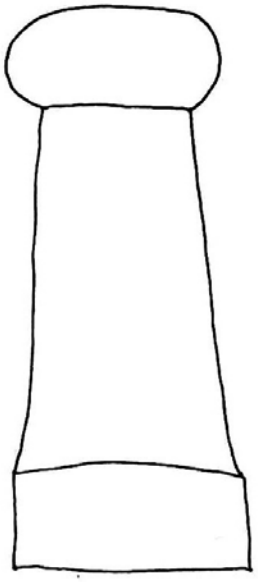


g

CHOIR FLUTE

g°

No scribe lines on upper lip
Stopper made out of a single piece
Pipe feet slightly different



g

SWELL STOP DIAP

g°

Gluing order: sides – back/front

ORGAN Gt St Mary's Cambridge | STOP Ch Flute 4' | (1) 61

Measured by [illegible] | Date 11 7 95

Mark	Pitch / Pipe mark	Body length	INT DEPTH	INT WIDTH	MOUTH HEIGHT TO BLOCK/TO CAP	FLUE	TOEHOLE ø	EXT D×W	BLOCK BEVEL °	UPPER LIP THICKNESS	HEIGHT OF UPPER LIP BEVEL FROM CAP	BLOCK HEIGHT	FOOT LENGTH
18th C? BODY	C	656	61.2	47.9	11.4/13.0	1.3			* on C# BODY TO R. OF MOUTH :- 12C				
C*	#	582	63.1	48.0	9.2/10.6	1.0	8.5	80/65.5	53°	1.0	45	83	193
FOOT	D	509	57.5	42.1	9.2/10.6	1.1							
	#	478	53.8	38.0	7.7/9.3	1.2							
	E	444	51.1	36.6	8.3/9.6	0.9							
C	F	413	49.5	33.8	7.1/9.2	1.1							
	#	400	46.4	32.6	7.2/9.0	0.9							
	G	370	45.0	31.4	7.1/8.1	1.1							
	#	359	44.2	28.6	7.1/8.1	1.0							
	A	342	42.1	28.8	7.1/8.2	1.0							
a	#	316	39.1	27.2	6.3/8.1	0.8							
BODY	B	297	38.4	27.2	5.9/7.2	0.7							
H	C°	281	36.2	26.2	6.0/7.2	0.8	5.5	51/40.6	69°	<1.0	35	69	163
	#	262	33.6	26.0	5.3/6.9	0.8							
	d	246	34.2	23.5	5.9/7.1	0.6							
	#	230	33.0	24.5	5.2/6.6	0.6							
	e	218	31.1	22.6	4.8/5.9	0.6							
	f	206	28.9	21.4	4.8/5.9	0.6							
	#	190	28.1	20.1	4.3/5.4	0.8							
	g	176	27.7	20.6	4.3/5.6	0.6							
	#	171	26.1	19.9	4.1/5.2	0.6							
	a	165	24.4	18.2	4.2/5.5	0.7							
a	#	158	22.5	17.8	3.9/5.1	0.6							
	b	146	22.9	18.1	3.8/4.8	0.6							
	c'	141	21.2	17.1	3.9/5.0	0.6	4.0	30.5/25.5	67°	<1.0	18	56	160
	#	131	18.9	16.2	3.8/4.8	0.5							
	d	123	20.0	16.0	3.2/4.6	0.5							
	#	116	18.6	15.4	3.6/4.6	0.5							
	e	109	18.0	15.4	3.2/4.4	0.6							
e	f	101	17.1	14.6	3.4/4.5	<0.5							

Vertical annotations: OCTAGONAL STEPS (foot length, D–G#); MUSHROOM STOPPERS AT GT. SD. 8' (foot length, A–B); MOSTLY OLD FEET (block height, F–A#); NEWER FEET (block height, C°–d#); NEWER FEET (block height, b–d); OLD FEET (block height, e–f).

ORGAN Gt St Mary's Cambridge | STOP Ch Flute 4 | (2) 62

Measured by [redacted] | Date 11 7 95

Pitch Pipe mark	Body length	INT DEPTH	INT WIDTH	MOUTH HEIGHT TO BODY/TOCAP	FLUE ≡	TOEHOLE Ø	EXT D x W	BLOCK BEVEL °	UPPER LIP THICKNESS	HEIGHT OF UPPER LIP BEVEL FROM CAP	BLOCK HEIGHT	FOOT LENGTH
~~F#'~~	95	16·2	13·2	2·4/3·5	<0·5							
g	87	17·1	13·1	2·6/3·3								
#	81	15·6	12·9	2·3/3·8								
a	76	15·0	11·8	2·4/3·8								
#	71	15·1	16·3	2·2/3·1								
b	68	15·1	11·3	2·1/3·3								
c"	64	15·2	10·2	2·1/3·1		4·0	21/17·5	74°	<1·0	17	50	185
#	60	14·9	10·1	2·0/3·2								
d	58	13·9	10·2	1·8/3·1								
#	55	13·1	9·9	1·8/3·1								
e	51	13·9	9·6	2·6/3·7								
f	43	13·5	9·6	1·6/3·0								
#	47	14·0	1·0	1·6/2·4								
g	42	11·2	9·7	1·5/2·6								
#	39	10·7	8·6	1·5/2·4								
a	38	10·2	8·0	1·4/2·3								
#	36	9·6	7·5	1·4/2·3								
b	34	9·1	7·5	1·1/2·1								
c'''	31	8·9	7·1	2·0/2·4		4·0	165/13			13	37	196
#	31	9·0	6·9	1·3/2·2								
d	29	8·8	6·8	1·1/1·9								
#	Hill											
e	Hill											
f	Hill											
#	Hill											
g	Hill											

ORGAN GREAT St. MARY'S CAMBRIDGE | STOP CH FIFTEENTH | 63

Measured by DCW | Date 13.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Tonehole	Language Bevel/Thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
H	C	553	160.2	38.2	8.4	0.88		88/2.2	0.6	24	8	⌐	205
Γ	C#		155.6	34.3	9.1								
	D		153.6	34.3	9.2								
	D#		143.2	33.5	8.4	not	Smith						
	E		141.8	31.6	9.5								
	F		136.5	29.2	8.8								
e	F#		131.5	30.0	8.4								
	G		120.5	25.0	7.8			(from	all c.	rank)			
	G#		119.0	27.0	7.5								
g	A		115.8	25.7	7.7								
g	B		109.5	24.4	7.2								
a	♮		105.7	24.5	5.9								
b	C	268	100.4	22.7	6.1	0.83		80°/1.8	0.8	20	5		218
h	C#		97.4	22.4	6.0								
c	D		92.7	20.2	5.4								
	D#		88.9	19.1	6.0							no ears	
	E		85.5	19.0	5.2								
	F		82.1	17.7	5.2								
e	F#		79.3	17.3	5.0								
f	G		74.4	16.1	4.9								
fe	G#		73.2	15.7	4.3								
g	A		69.0	15.0	4.1								
g	B		65.6	14.1	4.3								
a	♮		61.9	13.2	3.6								
b	C	132	59.1	12.7	4.1	0.63		88/1.1	0.6	13	19		226.5
Γ	C#		55.8	11.6	3.3								
	D		58.4	12.4	3.0								
	D#		58.4	12.6	3.9								
	E		53.4	12.0	3.3								
e	F		50.8	11.8	3.2								

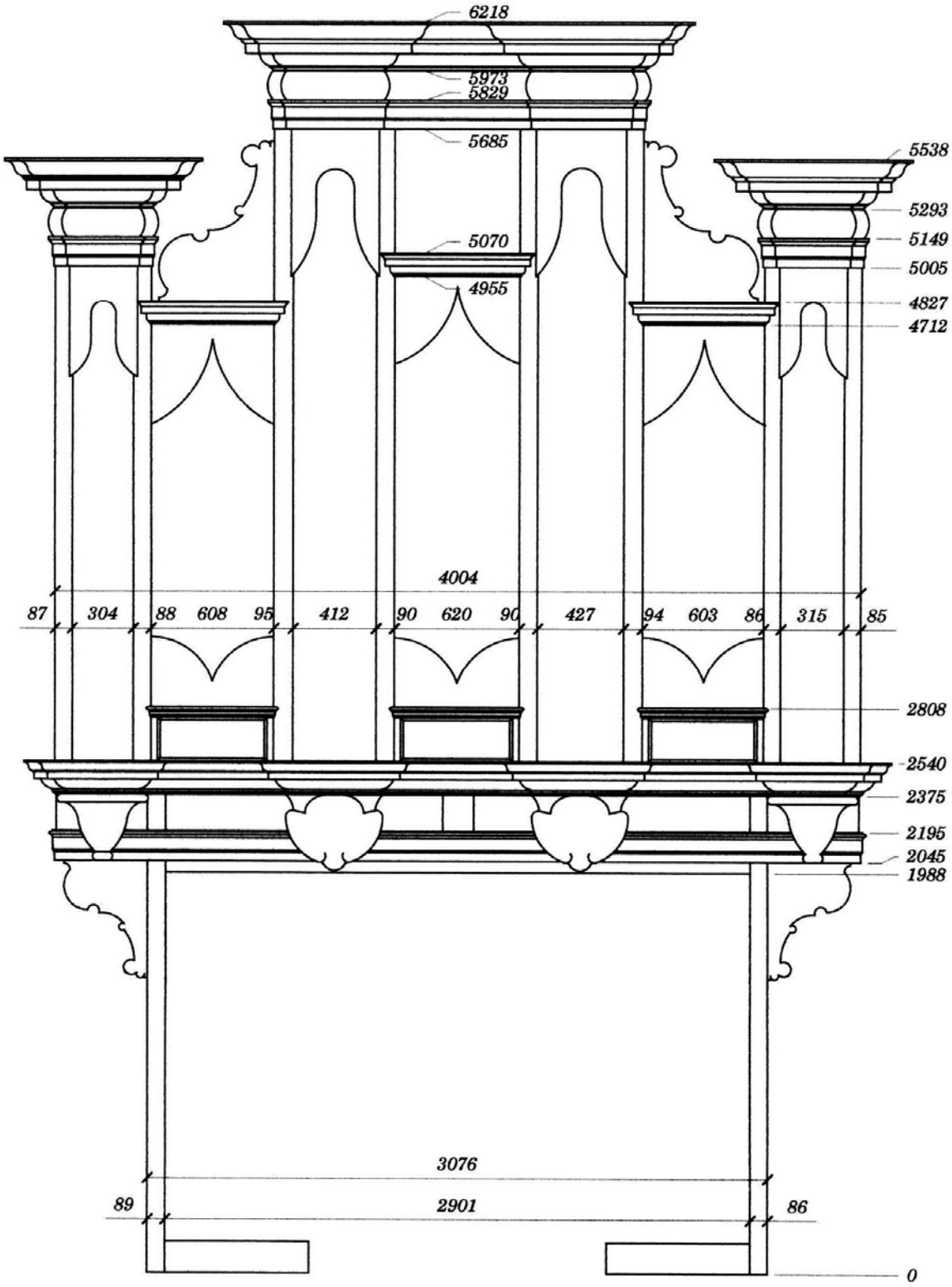
ORGAN GREAT St. MARY'S CAMBRIDGE | STOP CH FIFTEENTH | 64

Measured by JCW | Date 13.7.95

	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Languid bevel/thick	Metal thickness	Scribe lines	Nicks	Ears	Foot length
	F#		52.3	10.7	3.4								
	G		50.2	10.6	3.1	not Smith?							
	G#		49.0	11.7	3.2								
	A		43.7	8.9	3.0								
	B		46.0	10.5	2.7								
			44 9	9.8	3.2								
	C	59.5	44.5	9.5	2.9	0.49		80° / 0.8	0.6	10	4	none	224
	C#		45.4	9.2	2.9	not Smith							
	D		42.9	9.6	3.2								
	D#		41.7	9.5	2.8								
	E		37.0	7.6	2.3								
	F		37.8	7.7	2.5								
	F#		34.5	6.6	2.2	not Smith?							
	G		35.8	7.7	2.4								
	G#		34.0	6.5	2.3								
	A		33.5	7.2	2.1								
	B		33.0	6.3	2.0								
			30.8	6.1	2.3								
	c	26.5	30.1	6.9	2.0	0.43		80° / 0.8	0.7	8	none	none	228
	C#		32.8	6.3	2.2								
	D		28.3	5.3	1.9								
	D#		26.5	5.3	2.0								
	E		25.1	5.0	2.0	not Smith							
	F					modern							
	F#					--							
	G					--							

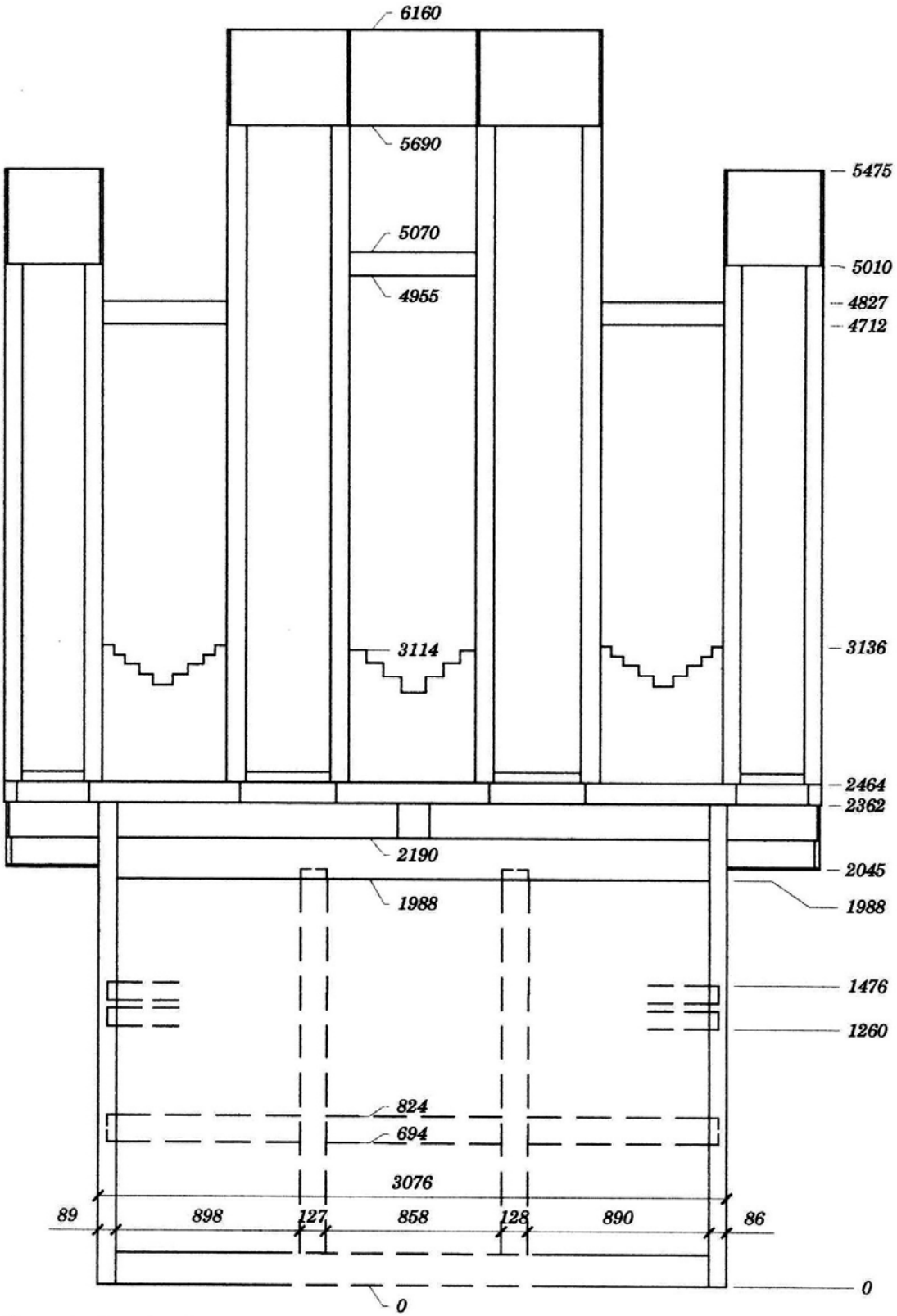
ORGAN GREAT St. MARY'S CAMBRIDGE								STOP SWELL PRIN 4'					65
Measured by					Date								
Pitch Pipe mark	Body length	PLATE WIDTH	MOUTH WIDTH	MOUTH HEIGHT	FLUE	TOEHOLE	LANGUID BEVEL/THICK	METAL THICKNESS	SCRIBE LINES	NICKS	EARS	FOOT LENGTH
C		234	54.0	15.0	1.0	9.5	55°/4.3	2.0	112	20	5D×8	232
C♯		223	50.5	13.9	1.3	8.5						
D		216	49.0	13.3	1.6	8.5						
D♯		217	47.5	12.9	0.8	8.5						
E		198	44.0	11.9	1.2	8.0						
F		189	42.0	12.0	1.5	7.6						
F♯												
G												
G♯												
A												
A♯												
B												
c												
c♯												
d												
d♯												
e												
f												
f♯		TURNER PIPES (SWELL PRINCIPAL)										
g		118.0	26.0	7.0	0.8	3.7						
g♯		115.0	26.0	7.0	1.2	3.8						
a		111.0	25.0	7.0	0.9	4.7						
a♯		105.0	25.0	6.2	0.9	3.7						
b		101.0	22.5	5.7	1.1	4.3						
c'		98.0	22.0	5.9	1.0	4.0/8.6	65°/5.7	1.0	30	6	14×3	172
c'♯		96.0	22.0	4.7	0.9	3.7						
d'		92.0	19.5	5.4	0.3	4.6						
d'♯		80.0	18.0	3.3	0.5	3.1						
e'		85.0	18.0	5.0	0.7	4.0						
f'		83.0	18.0	4.7	0.6	3.0						

ORGAN GREAT ST. MARY'S CAMBRIDGE								STOP SWELL. PPAL 4'					66
Measured by					Date								
	Pitch Pipe mark	Body length	Plate width	Mouth width	Mouth height	Flue	Toehole	Language Bevel/Thick	Metal Thickness	Scribe Lines	Nicks	Ears	Foot Length
	f♯'		76.0	17.5	4.1	0.7	3.6						
	g'		77.0	17.5	4.5	0.6	3.5						
	g♯'		72.0	15.0	4.3	0.3	2.9						
	a'		70.0	15.0	4.1	0.6	3.8						
	a♯'		67.0	13.5	3.0	0.7	3.1						
	b'		63.0	13.5	3.5	0.5	2.9						
	c²		62.0	12.5	3.6	0.8	3.2	75°/1.6	0.5	23.0	6	—	170
	c♯²		48.0	10.0	3.4	0.8	3.0						
	d²		59.0	12.5	3.3	0.4	3.5						
	d♯²		58.0	12.5	3.5	0.3	4.7						
	e²		50.0	10.0	3.1	0.8	3.4						
	f²		49.0	10.0	2.8	0.7	2.8						
	f♯²		43.5	8.0	3.2	0.8	2.9						
	g²		58.5	12.0	3.6	0.5	3.3						
	g♯²		53.0	12.0	3.3	0.7	3.5						
	a²		46.0	9.0	3.0	0.3	3.0						
	a♯²		43.0	9.0	3.0	0.3	3.0						
	b²		43.0	9.0	2.7	0.3	3.8						
	c³		41.0	8.0	2.5	0.5	3.0	?/0.9	0.7	21.0	—	—	155
	c♯³		34.0	7.0	2.4	0.7	2.8						
	d³		38.0	7.0	2.6	0.3	3.8						
	d♯³		41.0	8.0	3.0	0.8	3.0						
	e³		38.0	8.0	2.8	0.2	3.2						
	f³		36.0	8.0	2.7	0.3	4.2						
	f♯³		35.0	7.0	2.7	0.4	2.4						
	g³		32.0	7.0	2.3	0.3	2.2						



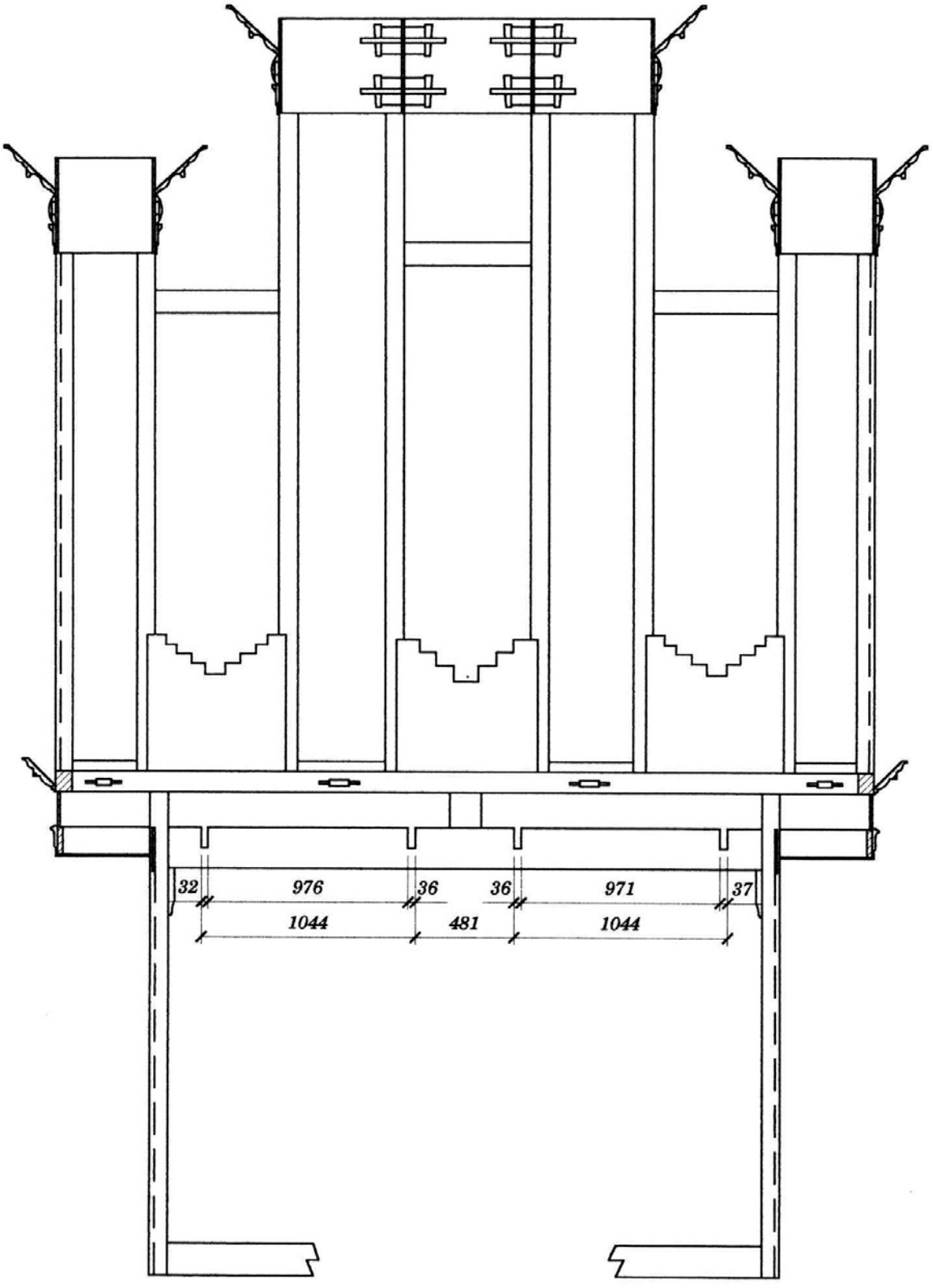
Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Elevation of surviving casework 1:25 *Stephen Bicknell del. MCMXCV*

68

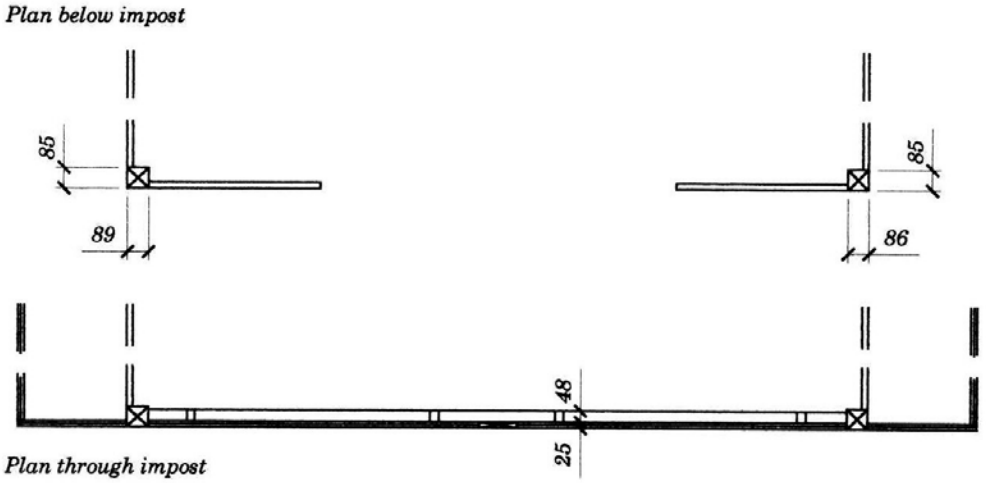


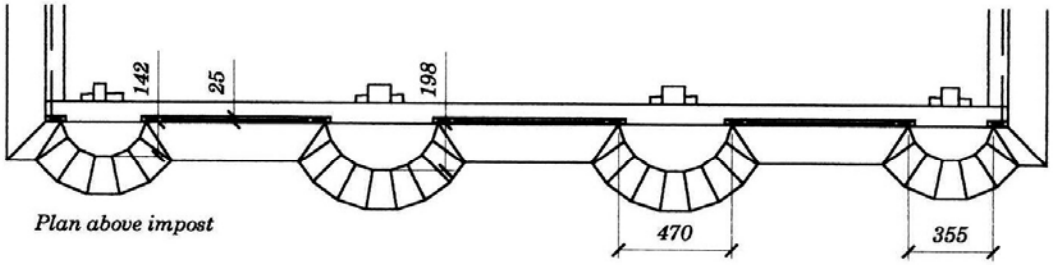
Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Elevation of surviving casework with mouldings and carvings removed 1:25

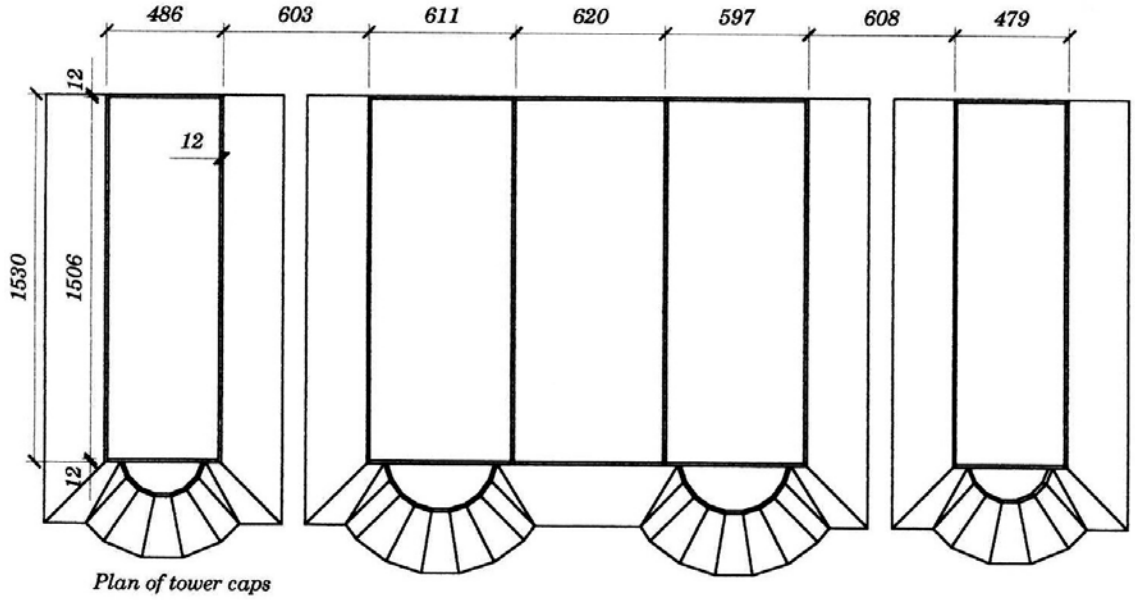
69



Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Case front seen from inside 1:25

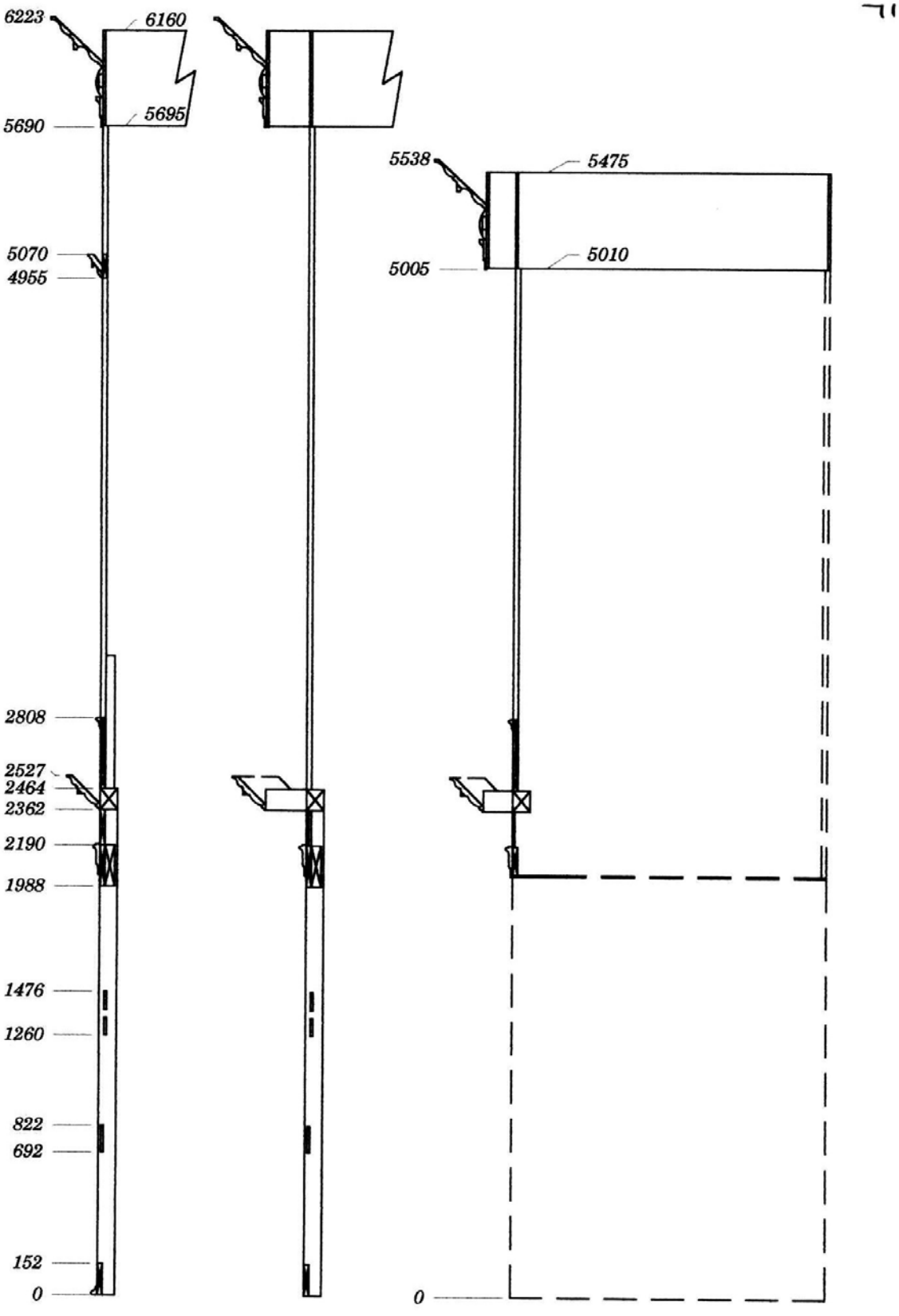




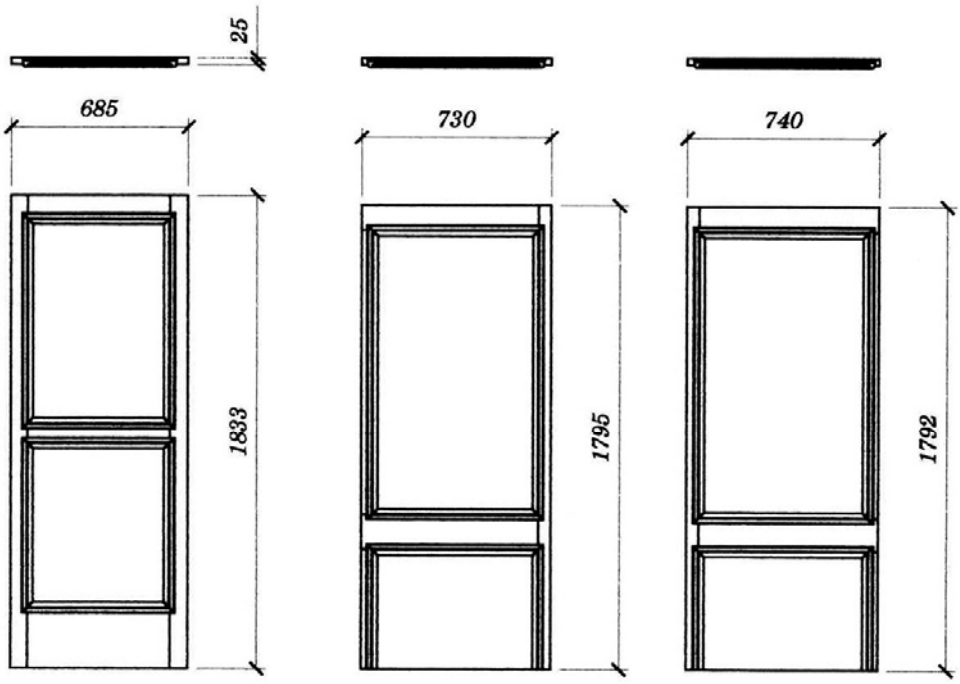


Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Plans 1:25

From left to right: section through centre; section through middle tower; section through end tower

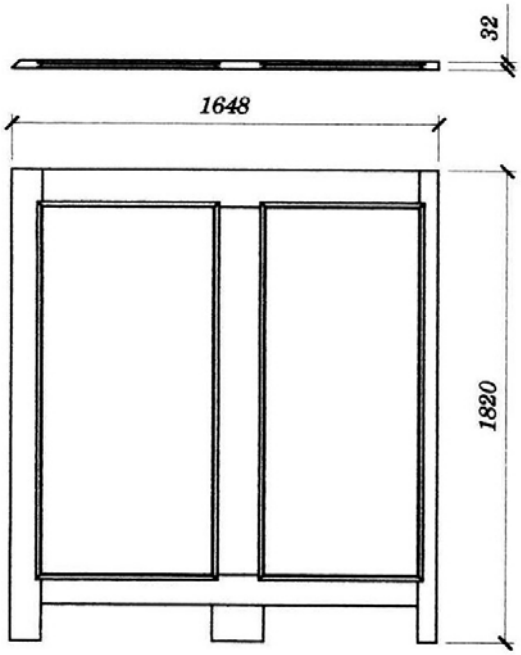


Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Sections 1:25

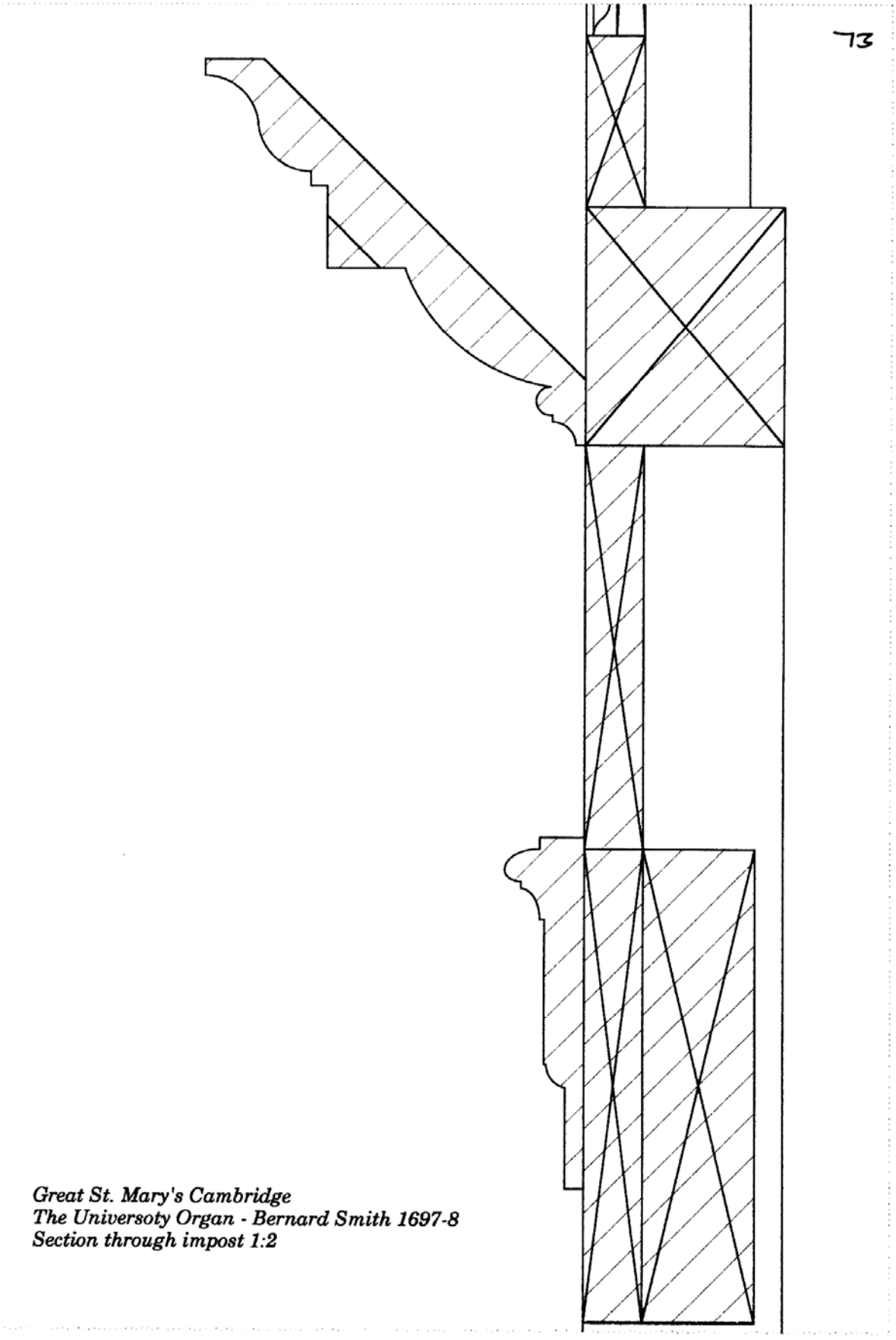


Panels with bolection moulding - possibly from forner sides of case

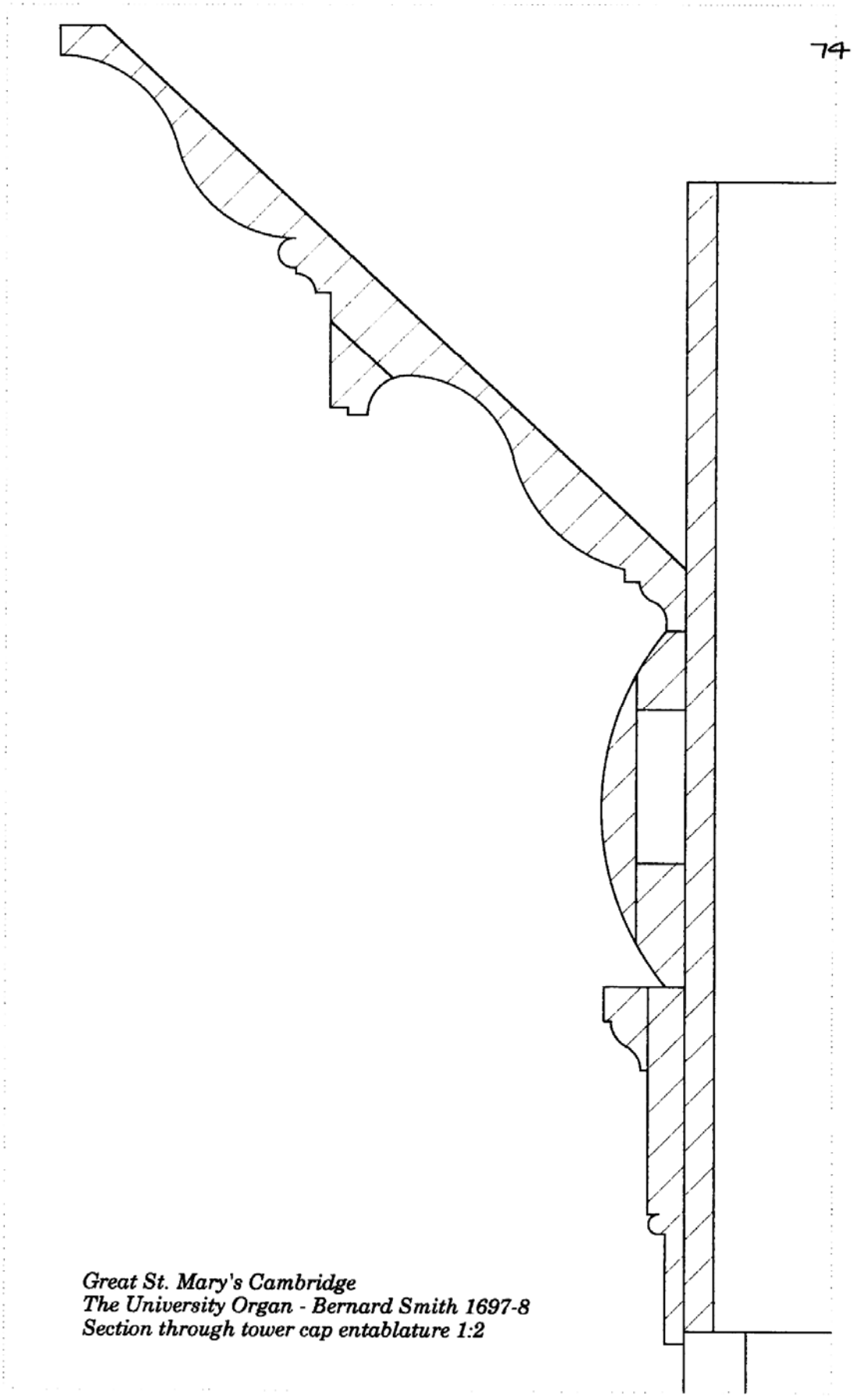
Panel with quadrant moulding - possibly from former back of case



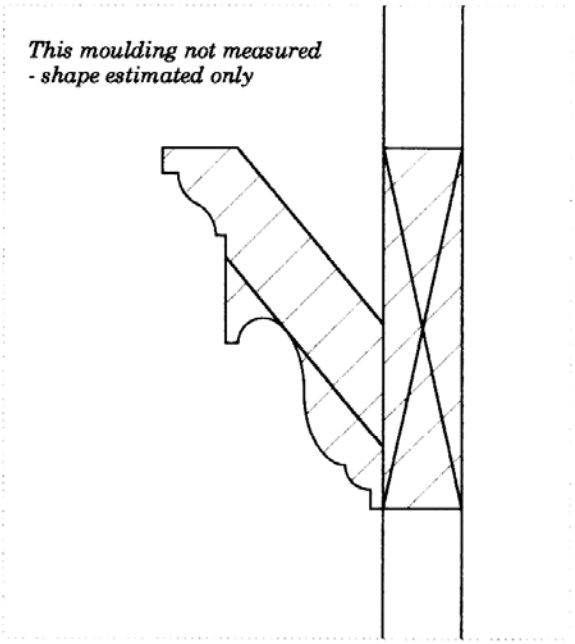
Great St. Mary's, Cambridge - The University Organ - Bernard Smith 1697-8
Remains of side and back panelling 1:25

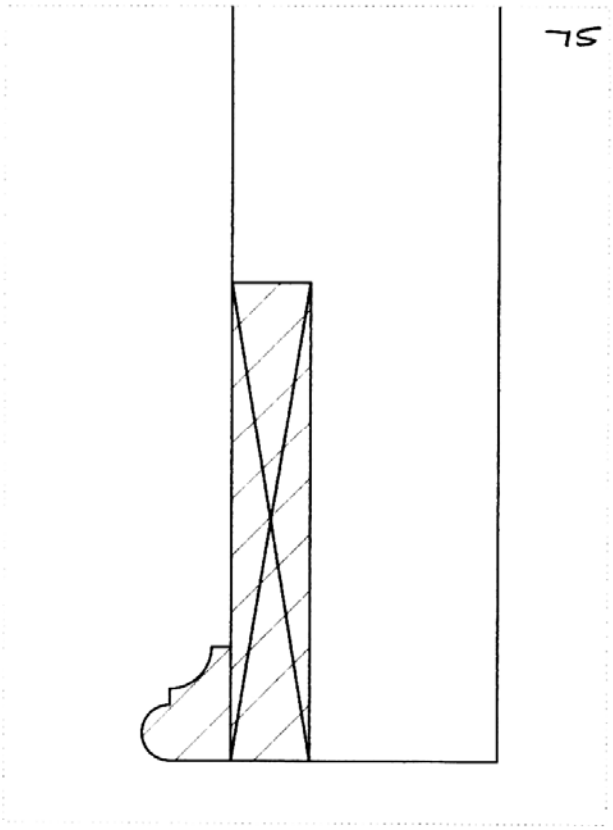


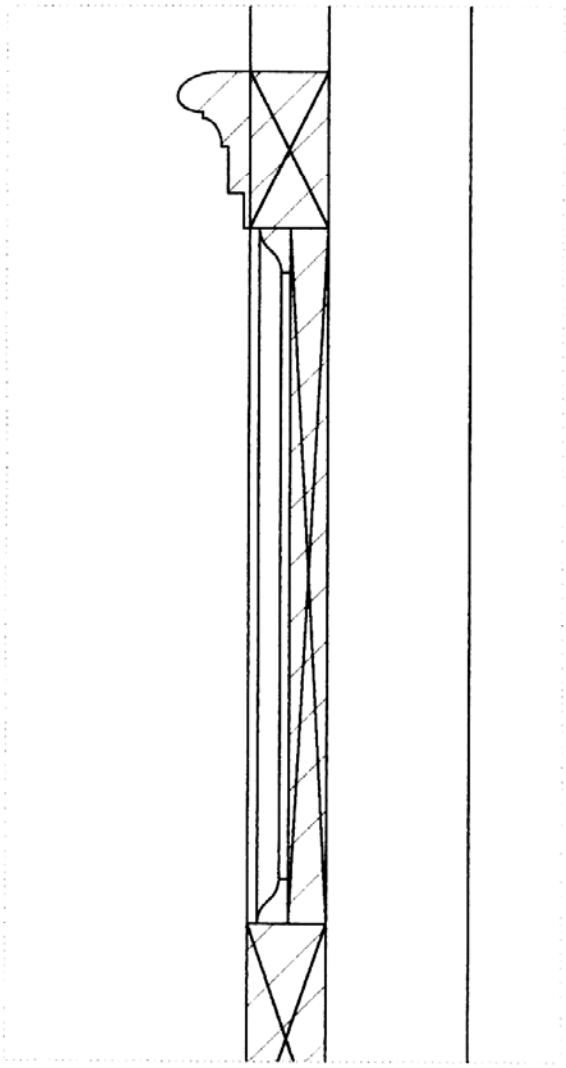
Great St. Mary's Cambridge
The Universoty Organ - Bernard Smith 1697-8
Section through impost 1:2



Great St. Mary's Cambridge
The University Organ - Bernard Smith 1697-8
Section through tower cap entablature 1:2







Great St. Mary's Cambridge
The University Organ - Bernard Smith 1697-8
Top left - Moulding above flats 1:2
Top right - skirting 1:2
Bottom left - panels below flats 1:2

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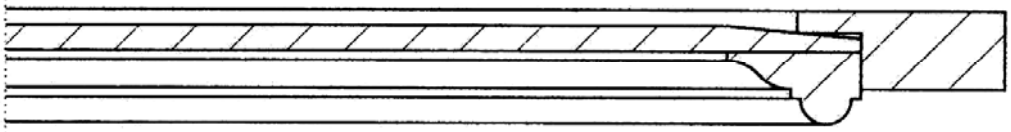
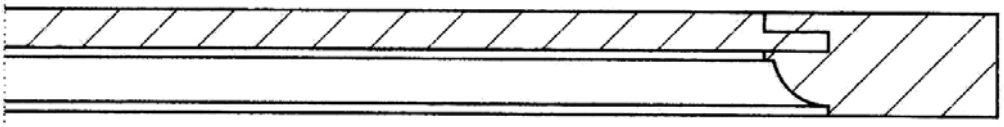




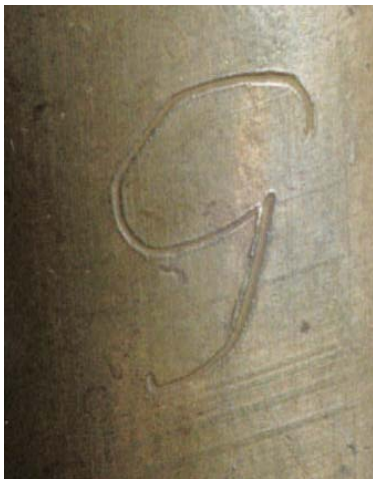
Great St. Mary's Cambridge
The University Organ - Bernard Smith 1697-8
Above: bolection moulded panel 1:2
Below: quadrant moulded panel 1:2

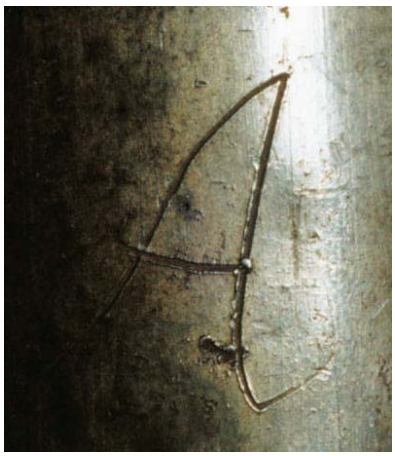
The photographs of the marks are from the bottom two octaves of the Choir Principal. For actual size see the sheet of Smith marks

This is made with a different scribing tool from the Smith marks, perhaps indicating left or bass side of chest for the C pipe





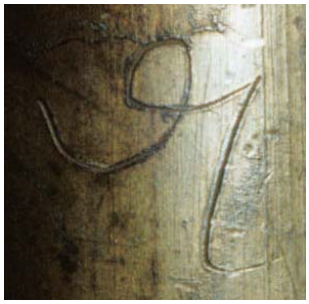



















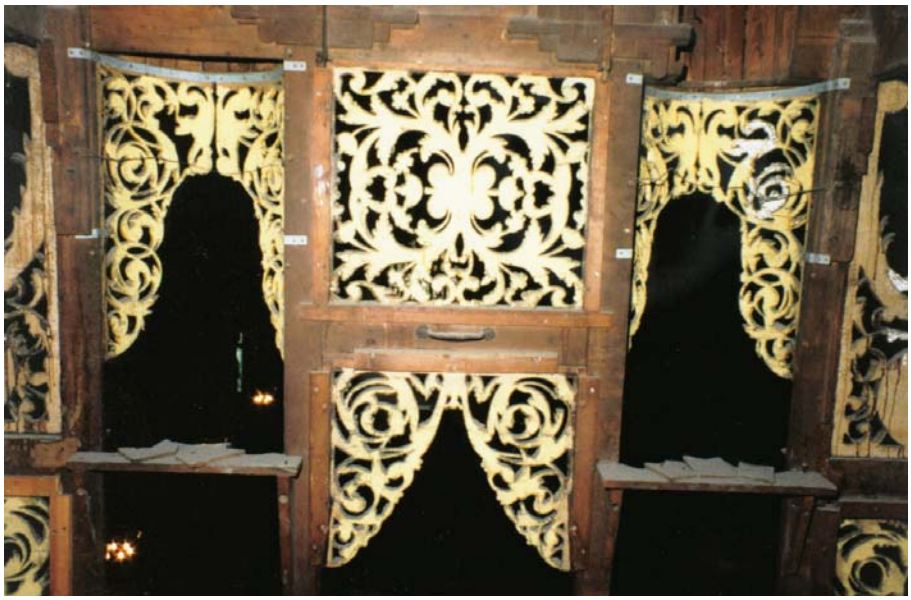


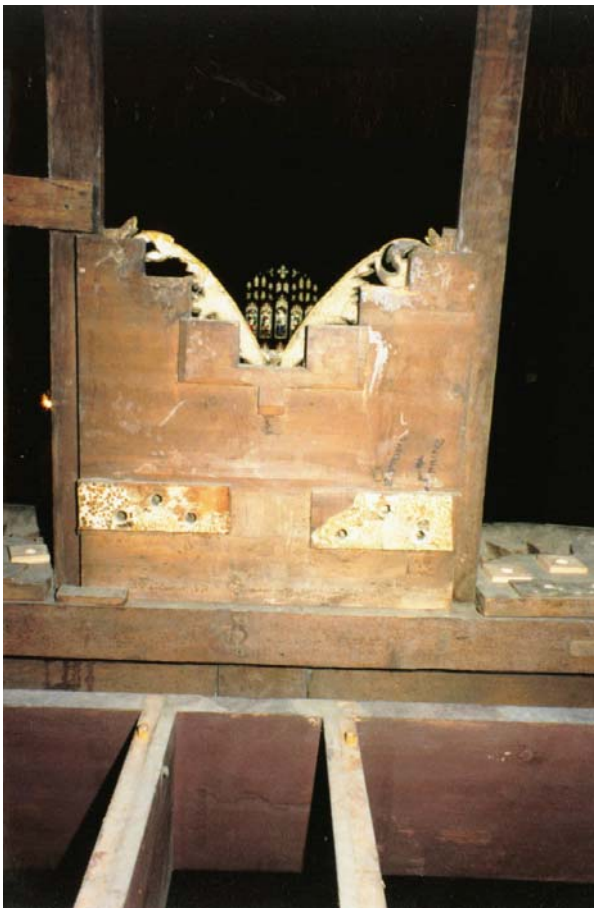




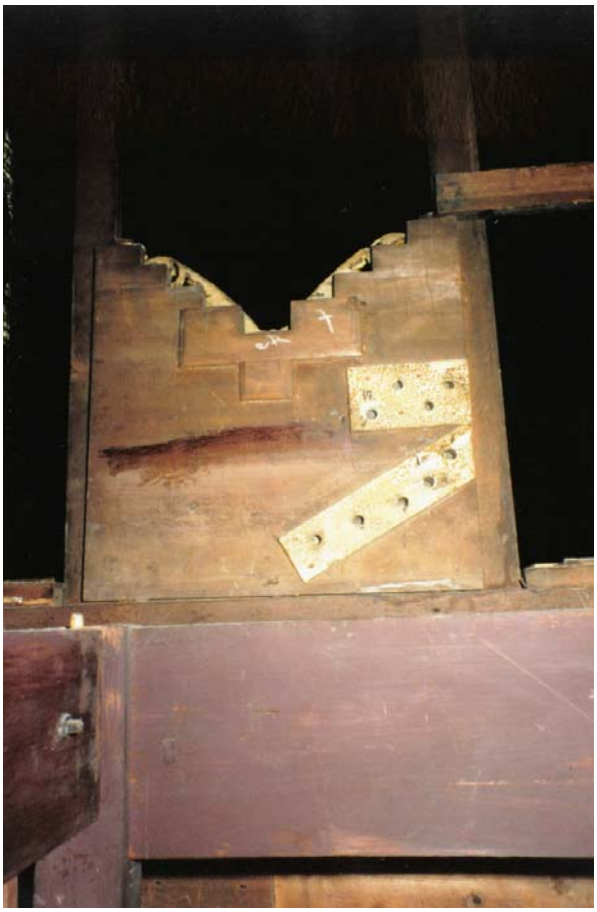
The gilding dates from 1963, not all of the gilding on the moulding covers original gilding if any

Treble side panel



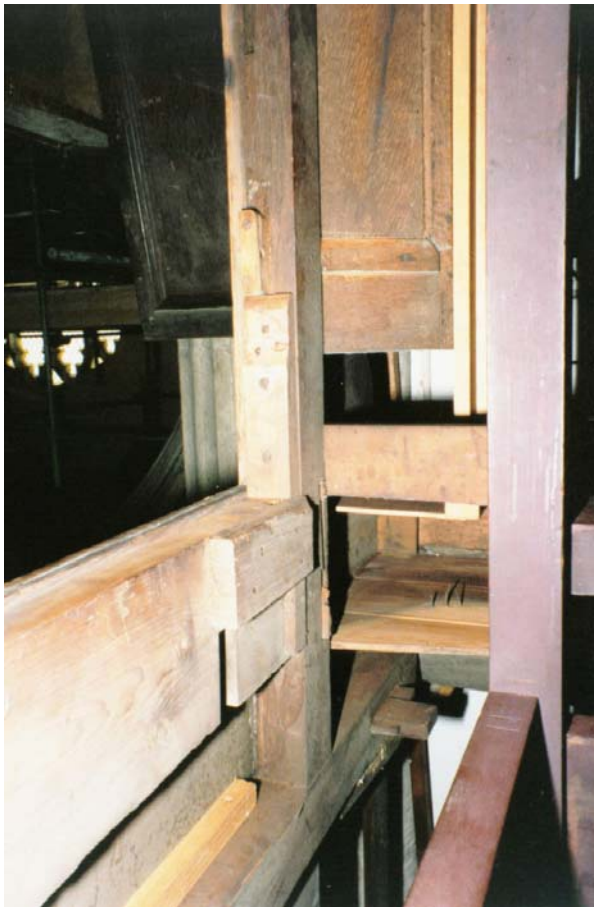


Centre flat



Treble flat

Bass flat



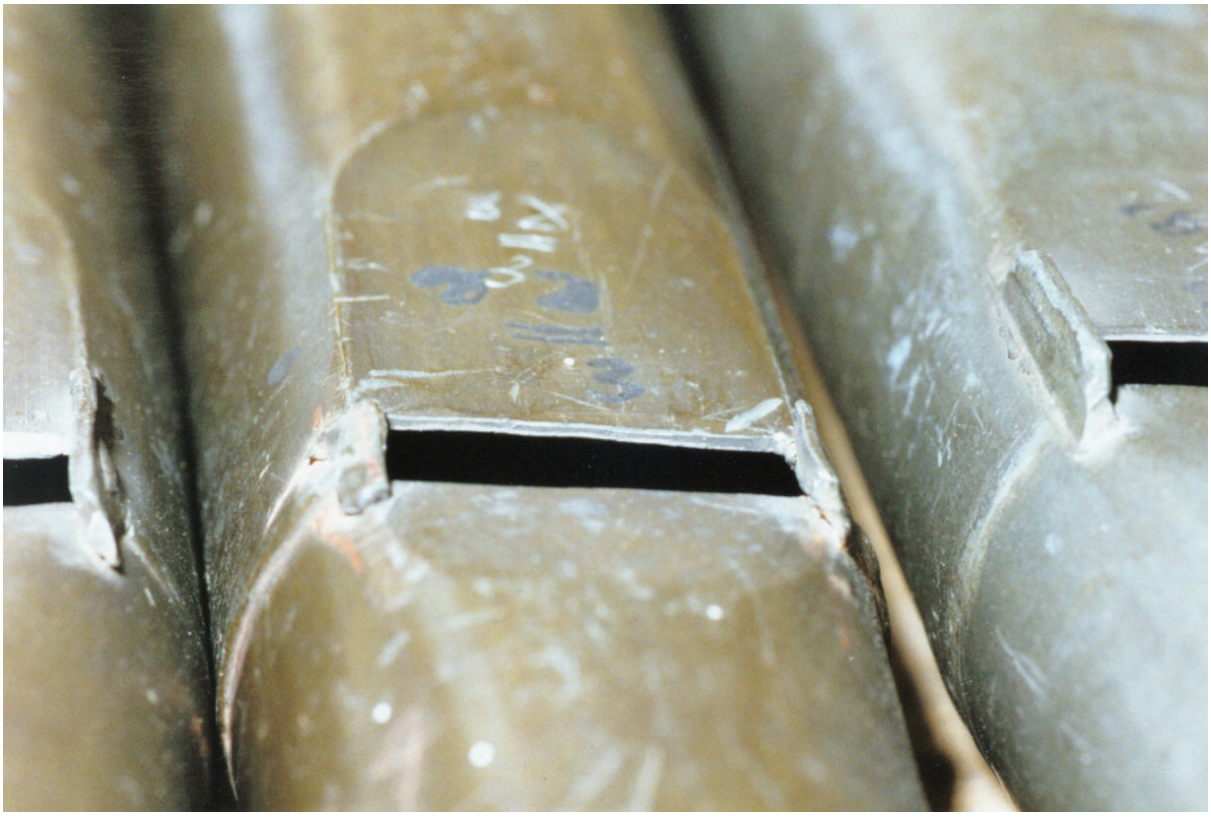
GREAT MIXTURE: rank II Hill 1871 marks on upper lip in ink
HNB 1963 marks scribed halfway up front

CHOIR PRINCIPAL, showing extent of re-voicing compared to mixture

AVERY 1804 ink marks halfway up front?

Without chamfer

1698 upper lip and chamfer

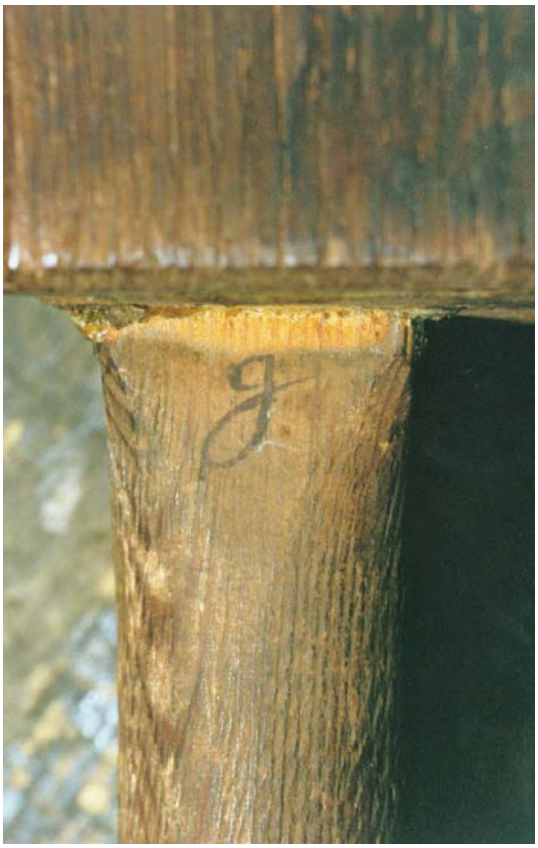


1698 ears, compared with 1768 ears on D^4

G# at top of foot: 1698 ink mark

Great Stopped Diapason G# mark at top of pipe: 1768

g^{o} + G#



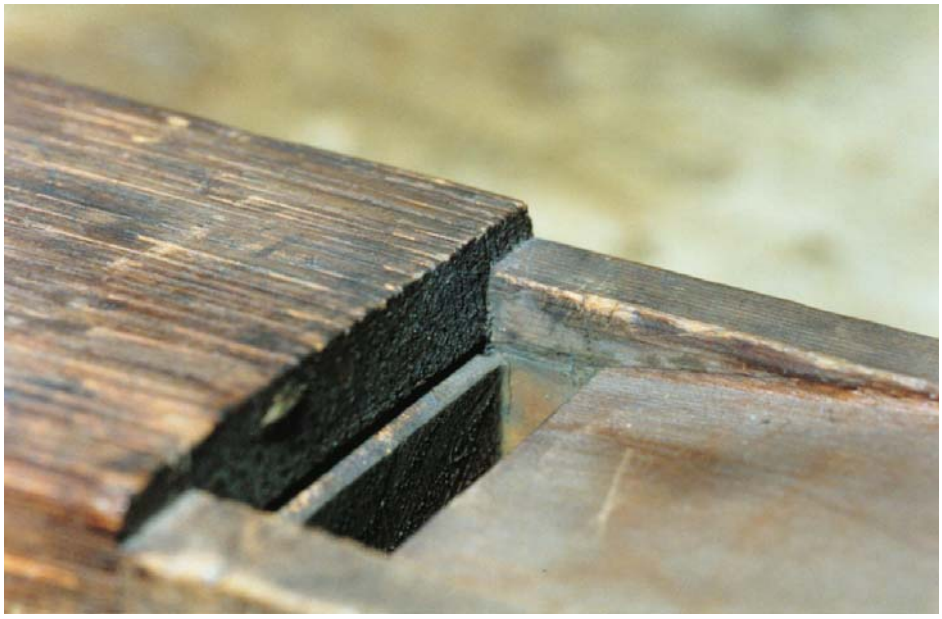
Great Stopped Diapason g^{o}

g + G#

g + G#

G#

G#



g^{o}

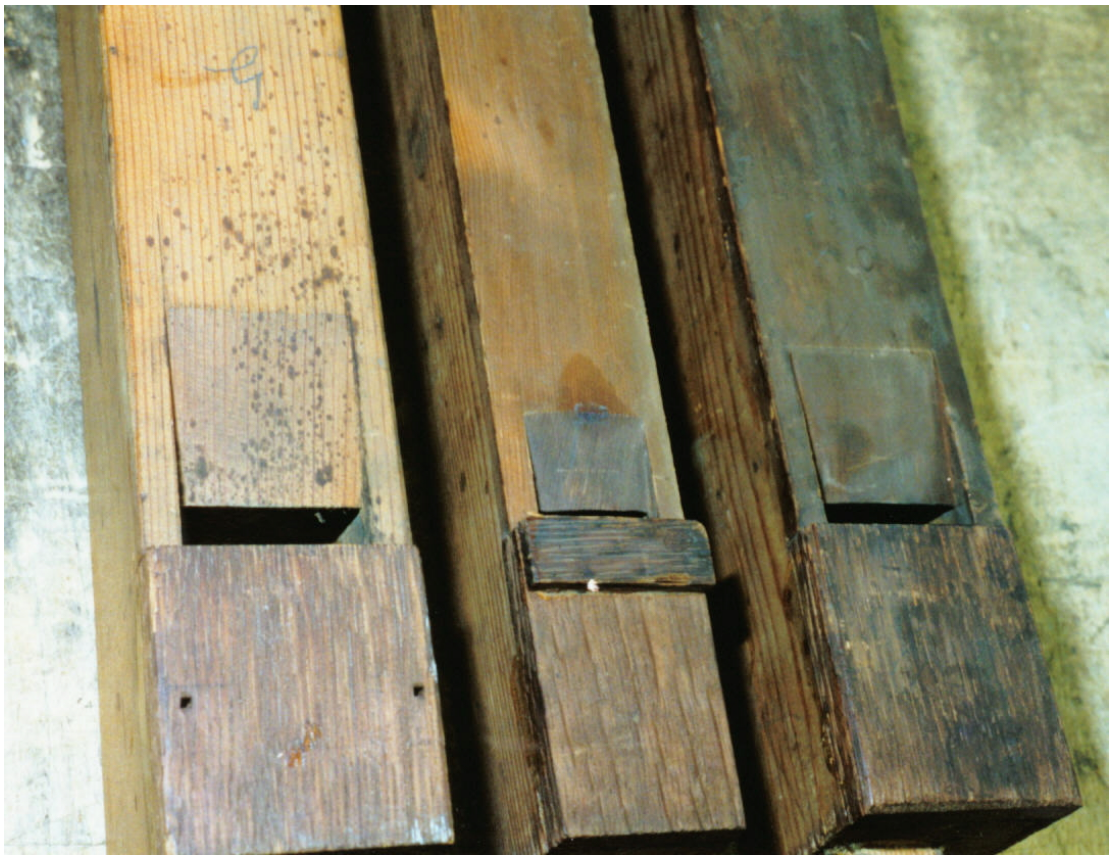
G#

G# + g

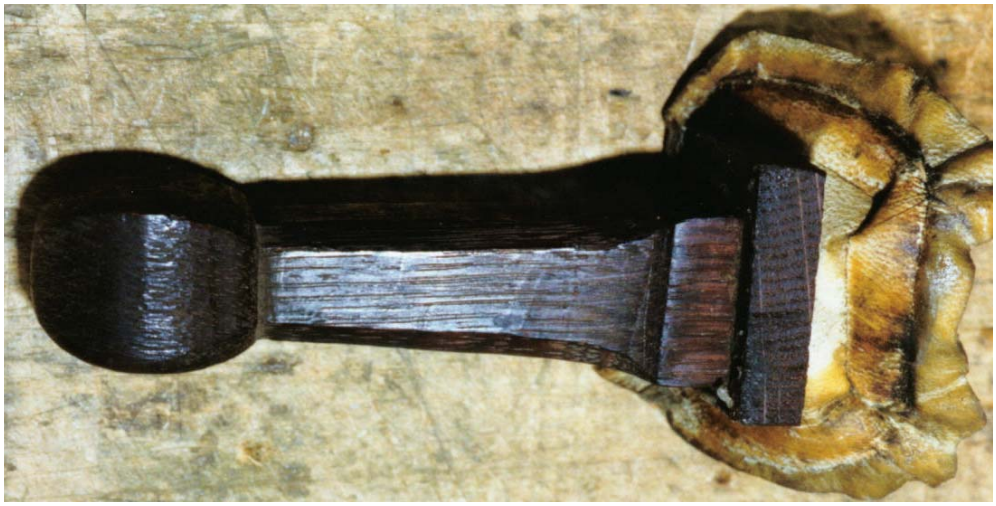
Choir FLUTE

Choir Stop Diap at NP Mander

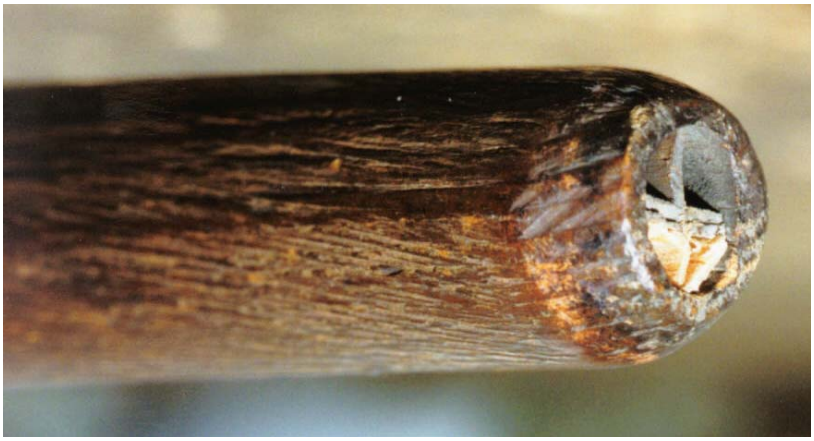
Swell St. Diap g^{o} ; Choir Flute G# ; Choir St. Diap A#



Swell St. Diap g^{o} ; Choir Flute G# ; Choir St. Diap A#



Choir St. Diap A#



Choir St. Diap A#

Swell St. Diap g^{o} ; Choir Flute G# ; Choir St. Diap A#

Choir St. Diap A#