	A	B	C	D	E	F	G	H
1	I. Bocal	Wing 1	Wing 2	Original bocal; Port4 yes				
2	dia reed end	4.3	4.3	inside diameter of reed end of bocal				
3	bocal string length (0, 1)	25	25	length of bocal inserted into receiver				
4	metal bocal length top (0, 1)	328	328	meas. along top of bocal				
5	metal bocal length bot (0, 1)	310	310	meas. along bottom of bocal				
6	dia wj end	9.5	9.5	inside diameter of bocal				
7								
8	bocal logic	2	2	if bocal logic = 0 => bocal is choke; if bocal logic=1=>choke in wing joint calc; if bocal logic=2=>no bocal				
9								
10								
11								
12								
13	II. Wing Joint Lengths			bocal receiver: Port4 no				
14	choke bore dia.	7.6	8.2	logic 1; bore diameter of choke; logic 0; either diameter bocal bottom or beginning of bore at bottom or receiver				
15	receiver length (1, 0) (formally choke length)	49	66	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)				
16	wing joint length	490	510	total wing joint length, including tenon and socket				
17	tenon length	47.4	46	tenon length				
18								
19	wj f2	196	215	dist top of wing to where tone hole enters bore [not at the center of the tone hole]				
20	wj e	273	295					
21	wj d	313	335					
22								
23	Bore dia. Bottom of wing joint	15.7	15.1	Need to Average, usally oval; Port4 yes				
24	Bore dia. top of boot joint small side	15.8	15.8					
25	Bore dia. top of boot joint large side	24.9	24.9					
26								
27	III. Boot Lengths							
28	bj logic	1	1	logic=> if bj logic = 0 => plug removed; if bj logic = 1 => plug cannot be removed				
29	bj c	90	90	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]				
30	bj b	148	148					
31	bj a	194	194					
32								
33	bjstotal [Needed for both boot logics]	430	430	total length of boot, include socket, along the small bore side				
34	bjltotal [Needed for both boot logics]	430	430	total length of boot, include socket, along large bore side				
35	plug small [Need for logic 0 only]	0	0	plug thickness, large bore side				
36	plug large [Need for logic 0 only]	0	0	plug thickness, small bore side				
37								
38	boots [Needed for both boot logics]	395	395	hook length along s bore => bjs-septum length = boot - septum <= calc the septum				
39	bootl [Needed for both boot logics]	395	395	hook length along l bore => bjl-septum length = boot - septum <= calc the septum				
40								
41	boots bottom [Needed for both boot logics]	12.5	12.5	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick] 7 + 5.5 =12.5				
42	bootl bottom [Needed for both boot logics]	12.5	12.5	use hook, dist of bore [same as boots bot except tenon depth will be different]				
43								
44	extreme bore [Needed for logic 1 only]	41.9	41.9	Outside dia of plug [measured] = small bore dia + large bore dia + the septum width				
45								
46	septum length exp [Need for logic 0 only]	0	0	dist. from very bottom of boot to septum [point between the large and small bore]				
47	septum length calc - do not imput value	35	35	dist. From very bottom of boot to spetum [bjl - bootl]	do not imput value			
48	septum length - do not imput value	35	35	if bj logic = 0 => septum = septum exp; if bj logic = 1 => septum = septum c	do not imput value			
49								
50	sbore dia sep* [Needed for both boot logics]	18.5	18.5	septum small bore dia [assume = lbore dia sep]				
51	lbore dia sep* [Needed for both boot logics]	19.2	19.2	septum large bore dia [assume = sbore dia sep] [mesure if cork can be removed; for Logic 0]				
52	sep width exp [Need for logic 0 only]	0	0	septum width; direct measurement if remove plug				
53	sep width calc - do not imput value	4.2	4.2	septum width; calc. => extreme bore - sbore - lbore	do not imput value			
54	sep width - do not imput value	4.2	4.2	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep	do not imput value			
55								
56	bj g	340	340	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]				
57	bj f1	132	132	dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]				
58								
59								
60								
61								
62								
63	IV. Tone Hole Diameters							
64	f2	5.4	5.7					
65	e	5.7	5.8					
66	d	5.5	5.8					
67								
68	c	7.1	7.1					
69	b	7	7					
70	a	5.8	5.8					
71	g	8.4	8.4					
72	f1	8.8	8.8					
73								
74	e1	10.2	10.2	e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
75	d1	8.3	8.3	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
76	c1	11.3	11.3	c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
77								
78								
79								
80								
81								
82	V. Tone Hole Depths							
83	f2	30.3	29.1					
84	e	29.9	29.4					
85	d	27.5	34					
86								
87	c	25.6	25.6					
88	b	24.4	24.4					
89	a	25.8	25.8	Port4 extreme downward angle				
90	g	15.6	15.6	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]				
91	f1	16	16	meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]				
92								
93	e1	8.3	8.3	e1 tone hole depth;meas east/west with deapth gauge [at center, or shortest dist]				
94	d1	6.9	6.9	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
95	c1	7.4	7.4	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
96								
97								
98								

	A	B	C	D	E	F	G	H
99								
100								
101	**VI. Long Joint**			Porthaux4 There is a table along long joint				
102	lg_length	605	605	total length of long joint				
103	lg_tenon_bot	46.9	46.9	length bottom tenon on long joint [tenon going into boot joint]				
104	lj_bot_bore	25.4	25.4	long joint bottom tenon bore diameter [tenon going into boot joint]				
105	lj_top_bore	29.5	29.5	long joint top tenon bore diameter [tenon going into bell]				
106	lg_tenon_top	37.6	37.6	length top tenon on long joint [tenon going into bell]				
107	e1 distance	55	55	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]				
108	d1 distance	258	258	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
109	c1 distance	491	491	dist long joint tenon to c1 [from bot of tenon to where tone hole enters bore]				
110								
111								
112								
113								
114								
115	**VII. Bore diameters at Tone Holes**							
116	f2	11.7	11.6					
117	e	12.7	12.5					
118	d	13.3	13.1					
119								
120	c	15.9	15.9					
121	b	16.6	16.6					
122	a	17.1	17.1					
123	g	20.6	20.6					
124	f1	23.5	23.5					
125								
126	e1	25.7	25.7	e1 tone hole bore diameter on long joint				
127	d1	26.7	26.7	d1 tone hole bore diameter on long joint				
128	c1	29.3	29.3	c1 tone hole bore diameter on long joint				
129								
130								
131								
132								
133								
134	**VIII. Bell**			There is not a tone hole in the bell				
135	bell logic	0	0	If bell_logic = 0 => normal conical bore; if bell_logic=1=> inverted concial bore; if bell_logic = 2 => bell expansion				
136	bell_length (0, 1, 2)	321	321	total length of bell [lines 141 + 144 = line 136]				
137	bell_bot_bore (0, 1, 2)	29.2	29.2	dia bore at the bottom of bell [end with socket]				
138	bell_top_bore 0, (1, 0, 2)	29.6	29.6	dia bore at the top of bell [where low Bb exits]				
139	bell_center_bore (only for logic 2)			dia bore at max center of expansion				
140	bell_wall (only for logic 2)			bell wall thickness, Just for David				
141	bell_bot_bore_expansion (only for logic 2)			dist of bottom to maxium of expansion [including bell socket length,if bell logic=0 =>100]				
142	Outside diameter of wood at expansion			Just for David				
143	bell_tenon (0, 1, 0, 2)	38.1	38.1	bell socket length				
144	bell_expansion_length (only for logic 2)			distance of maxium expansion to top of bell [where Bb exits]				
145	belflg	34.5	34.5	Usually about 10mm more than line 138				
146								
147								
148	**IX. PITCH**							
149	pitch	430	430	input the historical pitch of the bassoon, must input value, best guess				
150	freq_init	380	380	Initial frequency range variable				
151	Delta frequency	2	2	frequency increment parameter				
152	Number of frequencies	60	60	number of frequencies to scan for min chi sq				
153	Frequency adjust	1.05	1.05	frequency adjustment parameter				
154	**X. Title**							
155	title			Bassoon Calculation: Porthaux4-O-Basel1887.183-Wg1-WB-DNM				
156								
157				Notes on long joint bore: Port4 out of round in places				
158				Notes on boot joint bore: Port4 normal				
159	**XI. Bore Diameter Locations**			Notes on wing joint bore: Port4 normal				
160		19	19	Number of diameters				
161		7.6	8.2	Initial bore diameter [do not include in line 160 counting]				
162		375	359	dist1; measured from the bottom of the wing joint- 10mm				1
163		343	313	dist2; measured from the bottom of the wing joint- 11mm				1
164		262	258	dist3; measured from the bottom of the wing joint- 12mm				1
165		208	180	dist4; measured from the bottom of the wing joint- 13mm				1
166		79	14	dist5; measured from the bottom of the wing joint- 14mm				1
167		12	3	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	15.7		1
168		123	123	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot small	15.8		2
169		194	194	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot large	24.9		2
170		280	280	dist9; measured from the top of the bootjoint - small bore side- 18mm				2
171		0	0	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia sep	18.5		3
172		364	364	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	19.2		3
173		325	325	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	395		3
174		335	335	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		190	190	dist14; measured from the top of the bootjoint - large bore side- 23mm				3
176		205	205	dist15; measured from the top of the boot joint- large bore side- 24mm	lj_bot_bore	25.4		3
177		58	58	dist16; measured from the top of the boot joint- 25mm				3
178		462	462	dist17; measured from the top of the long joint- 26mm				4
179		300	300	dist18; measured from the top of the long joint- 27mm				4
180		242	242	dist19; measured from the top of the long joint- 28mm				4
181		216	216	dist20; measured from the top of the long joint- 29mm				4
182		0	0	dist21; measured from the top of the long joint- 30mm				4
183		0	0	dist22; measured from the top of the long joint- 31mm				4
184		0	0	dist23; measured from the top of the long joint- 32mm	lj_top_bore	29.5		4