	A	B	C	D	E	F	G	H	I
1	**I. Bocal**		Original bocal; Remph1 no bocal						
2	dia reed end		inside diameter of reed end of bocal						
3	bocal string length (0, 1)		length of bocal inserted into receiver						
4	metal bocal length top (0, 1)		meas. along top of bocal						
5	metal bocal length bot (0, 1)		meas. along bottom of bocal						
6	dia wj end		inside diameter of bocal						
7									
8	bocal logic	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:Remph1, no, from wear						
14	choke bore dia.	11.1	Remph1, vrfd large; 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)	44	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)						
16	wing joint length	533	total wing joint length, including tenon and socket						
17	tenon length	48	tenon length						
18									
19	wj f2	217	dist top of wing to where tone hole enters bore [not at the center of the tone hole]						
20	wj e	286							
21	wj d	330							
22									
23	Bore dia. Bottom of wing joint	14.8	Need to Average, usally oval; Remph1 no						
24	Bore dia. top of boot joint small side	16							
25	Bore dia. top of boot joint large side	22.7							
26									
27	**III. Boot Lengths**								
28	bj logic	1	logic=> if bj logic = 0 => plug removed; if bj logic = 1 => plug cannot be removed						
29	bj c	90	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]						
30	bj b	150							
31	bj a	204							
32									
33	bjstotal [Needed for both boot logics]	437	total length of boot, include socket, along the small bore side						
34	bjltotal [Needed for both boot logics]	437	total length of boot, include socket, along large bore side						
35	plug small [Need for logic 0 only]	0	plug thickness, large bore side						
36	plug large [Need for logic 0 only]	0	plug thickness, small bore side						
37									
38	boots [Needed for both boot logics]	402	Remph1 vrfd long; hook length along s bore => bjs-septum length = boot - septum <= calc the septum						
39	bootl [Needed for both boot logics]	402	hook length along l bore => bjl-septum length = boot - septum <= calc the septum						
40									
41	boots bottom [Needed for both boot logics]	25	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick] 18 + 7 =25						
42	bootl bottom [Needed for both boot logics]	25	use hook, dist of bore [same as boots bot except tenon depth will be different]						
43									
44	extreme bore [Needed for logic 1 only]	44.5	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	dist. from very bottom of boot to septum [point between the large and small bore]						
47	septum length calc - do not imput value	35	dist. From very bottom of boot to spetum [bjl - bootl]	do not imput value					
48	septum length - do not imput value	35	if bj logic = 0 => septum = septum exp; if bj logic = 1 => septum = septum	do not imput value					
49									
50	sbore dia sep* [Needed for both boot logics]	18.9	septum small bore dia [assume = lbore dia sep]						
51	lbore dia sep* [Needed for both boot logics]	18.9	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	septum width; direct measurement if remove plug						
53	sep width calc - do not imput value	6.7	septum width; calc. => extreme bore - sbore - lbore	do not imput value					
54	sep width - do not imput value	6.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = s	do not imput value					
55									
56	bj g	337	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]						
57	bj f1	140	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	5.9							
65	e	6.2							
66	d	5.3							
67									
68	c	7.3							
69	b	6.7							
70	a	5.7							
71	g	8.1							
72	f1	9.8							
73									
74	e1	10.6	e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]						
75	d1	8.6	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]						
76	c1	10.4	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	27.5							
84	e	22							
85	d	26							
86									
87	c	25.5							
88	b	23.2							
89	a	27.1							
90	g	15.1	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]						
91	f1	19.2	meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]						
92									
93	e1	5.7	e1 tone hole depth;meas east/west with deapth gauge [at center, or shortest dist]						
94	d1	9.2	Remph1, vrfd long; d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]						
95	c1	5.4	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]						
96									
97									
98									
99									
100									
101	**VI. Long Joint**		Remph1 vrfd, No table along long joint, tone hole seats are flattened						
102	lg_length	608	Remph1 vrfd, long long joint, total length of long joint						

	A	B	C	D	E	F	G	H	I
103	lg_tenon_bot	45.5	length bottom tenon on long joint [tenon going into boot joint]						
104	lj_bot_bore	22.4	long joint bottom tenon bore diameter [tenon going into boot joint]						
105	lj_top_bore	32	long joint top tenon bore diameter [tenon going into bell]						
106	lg_tenon_top	45.6	length top tenon on long joint [tenon going into bell]						
107	e1_distance	73	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]						
108	d1 distance	266	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]						
109	c1 distance	492	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	11.2							
117	e	12							
118	d	12.5							
119									
120	c	16.7							
121	b	17.1							
122	a	18.4							
123	g	19.1							
124	f1	21.7							
125									
126	e1	24.3	e1 tone hole bore diameter on long joint						
127	d1	27.6	d1 tone hole bore diameter on long joint						
128	c1	29.5	c1 tone hole bore diameter on long joint						
129									
130									
131									
132									
133									
134	**VIII. Bell**		Remph1, no tone hole in the bell						
135	bell logic	1	If bell_logic = 0 => normal conical bore; if bell_logic = 1 => inverted concial bore						
136	bell_length (0, 1, 2)	372	Remph1, vrfd long, total length of bell [lines 141 + 144 = line 136]						
137	bell_bot_bore (0, 1, 2)	35.7	Remph1, 35.4 x 35.9; dia bore at the bottom of bell [end with socket]						
138	bell_top_bore 0, (1, 0, 2)	35.6	Remph1, 36.1 x 35.1; 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; 40 is a good approximation						
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)	50.2	bell socket length						
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]						
145	belflg	46.5	Usually about 10mm more than line 138						
146									
147									
148	**IX. PITCH**								
149	pitch	415	input the historical pitch of the bassoon, must input value, best guess						
150	freq_init	380	Initial frequency range variable						
151	Delta frequency	2	frequency increment parameter						
152	Number of frequencies	60	number of frequencies to scan for min chi sq						
153	Frequency adjust	1.05	frequency adjustment parameter						
154	**X. Title**								
155	title		Bassoon Calculation: Remph1-O-Leipzig1371-Wg1-WOB-DNM						
156									
157			Notes on long joint bore: Remph1 normal to good						
158			Notes on boot joint bore: Remph1 mostly OOR						
159	**XI. Bore Diameter Locations**		Notes on wing joit bore: Remph1 normal						
160		18	Number of diameters						
161	**Bell Bore**	11.1	Initial bore diameter [do not include in line 160 counting]						
162	35.7mm dia. at socket	0	dist1; measured from the bottom of the wing joint- 10mm				1		
163	Rod 35mm; 65mm from bell socket	0	dist2; measured from the bottom of the wing joint- 11mm				1		
164	Rod 34mm; 75mm from bell socket	245	dist3; measured from the bottom of the wing joint- 12mm				1		
165	Rod 33mm; 120mm from bell socket, OOR	180	dist4; measured from the bottom of the wing joint- 13mm				1		
166	Rod 34mm; 95mm from bell end	108	dist5; measured from the bottom of the wing joint- 14mm				1		
167	35.6mm dia. at bell end	0	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	14.8		1		
168		0	dist7; measured from the bottom of the wing joint- 16mm	top boot small	16		1		
169		140	dist8; measured from the bottom of the wing joint- 17mm	top boot large	22.7		2		
170		180	dist9; measured from the top of the bootjoint - small bore side- 18mm				2		
171		392	dist10; measured from the top of the bootjoint - small bore side- 19mm	sbore dia sep	18.9		3		
172		300	dist11; measured from the top of the bootjoint - small bore side- 20mm	lbore dia sep	18.9		2		
173		245	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	402		3		
174		125	dist13; measured from the top of the bootjoint - large bore side- 22mm				3		
175		593	dist14; measured from the top of the bootjoint - large bore side- 23mm				4		
176		548	dist15; measured from the top of the bootjoint - large bore side- 24mm	lj_bot_bore	22.4		4		
177		495	dist16; measured from the top of the bootjoint - large bore side- 25mm				3		
178		455	dist17; measured from the top of the long joint- 26mm				4		
179		430	dist18; measured from the top of the long joint- 27mm				4		
180		185	Remph1, vrfd gap; dist19; measured from the top of the long joint- 28mm				4		
181		150	dist20; measured from the top of the long joint- 29mm				4		
182		70	dist21; measured from the top of the long joint- 30mm				4		
183		40	dist22; measured from the top of the long joint- 31mm				4		
184		0	dist23; measured from the top of the long joint- 32mm	lj_top_bore	32		4		