

	A	B	C	D	E	F	G
1	I. Bocal		Original bocal; Löhner1 no				
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: Löhner1 No, formed by ware				
14	choke bore dia.	9.1	logic 1; bore diameter of choke; logic 0; diameter bocal bottom or beginning of bore at bottom or receiver				
15	receiver length (1, 0) (formally choke length)	42	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)				
16	wing joint length	488	total wing joint length, including tenon and socket				
17	tenon length	41.2	tenon length				
18							
19	wj f2	197	dist top of wing to where tone hole enters bore [not at the center of the tone hole]				
20	wj e	265					
21	wj d	314	Löhner1 vrfd finger holes short				
22							
23	Bore dia. Bottom of wing joint	17.8	Need to Average, usally oval; Löhner1 a bit, tenon in bad shape, pieces missing				
24	Bore dia. top of boot joint small side	16.1	Löhner1 15.8 x 16.3, vrfd smaller than wing tenon				
25	Bore dia. top of boot joint large side	26.4	Löhner1 26.0 x 26.7				
26							
27	III. Boot Lengths		Lehner1; No Two whole design, cork too close to septum				
28	bj logic	1	logic=> if bj logic = 0 => plug removed; if bj logic = 1 => plug cannot be removed				
29	bj c	96	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]				
30	bj b	148					
31	bj a	189					
32							
33	bjstotal [Needed for both boot logics]	432	total length of boot, include socket, along the small bore side				
34	bjltotal [Needed for both boot logics]	432	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]	406	hook length along s bore => bjs-septum length = boot - septum <= calc the septum				
39	bootl [Needed for both boot logics]	406	hook length along l bore => bjl-septum length = boot - septum <= calc the septum				
40							
41	boots bottom [Needed for both boot logics]	10	Löhner1 vrfd very short; use hook, dist of bore [dist on stick plus 7mm] 7 + 3 =10				
42	bootl bottom [Needed for both boot logics]	10	use hook, dist of bore [same as boots bot except tenon depth will be different]				
43							
44	extreme bore [Needed for logic 1 only]	45.8	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	26	dist. From very bottom of boot to spetum [bjl - bootl]		do not imput value		
48	septum length - do not imput value	26	if bj logic = 0 => septum = septum exp; if bj logic = 1 => septum = septum ca		do not imput value		
49							
50	sbore dia sep* [Needed for both boot logics]	19.7	septum small bore dia [assume = lbore dia sep]				
51	lbore dia sep* [Needed for both boot logics]	19.8	Löhner1 OOR; 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	6.3	septum width; calc. => extreme bore - sbore - lbore		do not imput value		
54	sep width - do not imput value	6.3	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep		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 fl	137	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	5.8					
65	e	5.8					
66	d	5.7					
67							
68	c	8.2	Löhner1 finger holes on boot very large				
69	b	7.9					
70	a	6.1					
71	g	9.5					
72	fl	9.7					
73							
74	e1	11.9	Löhner1 oblong 11.5 x 12.2; e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
75	d1	10.9	Löhner1 oblong 10.5 x 11.2; d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
76	c1	11.9	Löhner1 round tone hole; c1 tone hole dia, long joint [need to average NS and EW dias, NS usually greater]				
77							
78							
79							
80							
81							
82	V. Tone Hole Depths						
83	f2	31					
84	e	29.5	Löhner1 long épaule on wing				
85	d	28.3					
86							
87	c	26.5					
88	b	23.1					
89	a	22					
90	g	12.5	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]				
91	fl	21.5	meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]				
92							
93	e1	11.7	e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				

	A	B	C	D	E	F	G
94	d1	11.7	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
95	c1	10.7	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
96			Löhner1 High Platform on long joint				
97							
98							
99							
100							
101	VI. Long Joint		Löhner1 There is a table along long joint				
102	lg_length	583	total length of long joint; yes 600 mm				
103	lg_tenon_bot	48	length bottom tenon on long joint [tenon going into boot joint]				
104	lj_bot_bore	25.9	OOR slightly; long joint bottom tenon bore diameter [tenon going into boot joint]				
105	lj_top_bore	33.4	long joint top tenon bore diameter [tenon going into bell]				
106	lg_tenon_top	28	length top tenon on long joint [tenon going into bell]				
107	e1_distance	66	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]				
108	d1_distance	257	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
109	c1_distance	457	Löhner1 vrfd very short; dist long joint tenon to c1 [from bot of tenon to where tone hole enters bore]				
110			Löhner1 c1 tone hole position is far down from top of long joint tenon going into bell				
111							
112							
113							
114							
115	VII. Bore diameters at Tone Holes						
116	f2	11.3					
117	e	12.7					
118	d	14.9					
119							
120	c	16.5					
121	b	16.7					
122	a	18.1	Löhner1 vrfd large				
123	g	21.1					
124	f1	24.3					
125							
126	e1	27.4	e1 tone hole bore diameter on long joint				
127	d1	30.7	d1 tone hole bore diameter on long joint				
128	c1	32.8	c1 tone hole bore diameter on long joint				
129							
130							
131							
132							
133							
134	VIII. Bell		Löhner1 There is not a tone hole in the bell				
135	bell_logic	1	If bell_logic = 0 => normal conical bore; if bell_logic = 1 => inverted conical bore; if bell_logic = 2 => bell expansion				
136	bell_length (0, 1, 2)	282	total length of bell [lines 141 + 144 = line 136]				
137	bell_bot_bore (0, 1, 2)	32	dia bore at the bottom of bell [end with socket]				
138	bell_top_bore 0, (1, 0, 2)	24.7	Löhner1 25.0 x 24.3 OOR; 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)	28.1	bell socket length				
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]				
145	bellfg	42					
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		dated 1788				
155	title		Bassoon Calculation: Löhner1-O-Goettingen110-Wg1-WOB-DNM				
156							
157			Notes on long joint bore: Löhner1 out of round near top tenon going into bell				
158			Notes on boot joint bore: Löhner1 normal				
159	XI. Bore Diameter Locations		Notes on wing joint bore: Löhner1 normal				
160		22	Number of diameters				
161		9.1	Initial bore diameter [do not include in line 160 counting]				
162		0	dist1; measured from the bottom of the wing joint- 10mm				1
163		305	dist2; measured from the bottom of the wing joint- 11mm				1
164		280	dist3; measured from the bottom of the wing joint- 12mm				1
165		205	dist4; measured from the bottom of the wing joint- 13mm				1
166		195	dist5; measured from the bottom of the wing joint- 14mm				1
167		150	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	17.8		1
168		28	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot small	16.1		1
169		165	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot large	26.4		2
170		183	dist9; measured from the top of the bootjoint - small bore side- 18mm				2
171		285	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia sep	19.7		2
172		380	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	19.8		3
173		354	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	406		3
174		270	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		220	dist14; measured from the top of the bootjoint - large bore side- 23mm				3
176		170	dist15; measured from the top of the boot joint- large bore side- 24mm	lj_bot_bore	25.9		3
177		115	dist16; measured from the top of the long joint- 25mm				3
178		555	dist17; measured from the top of the long joint- 26mm				4
179		530	dist18; measured from the top of the long joint- 27mm				4
180		470	dist19; measured from the top of the long joint- 28mm				4
181		420	dist20; measured from the top of the long joint- 29mm				4
182		370	dist21; measured from the top of the long joint- 30mm				4
183		290	dist22; measured from the top of the long joint- 31mm				4
184		185	dist23; measured from the top of the long joint- 32mm	li_top_bore	33.4		4