	A	B	C	D	E	F	G
1	**I. Bocal**		Original bocal; Riedel1-O-Reil yes 10mm large end; 3.6mm small				
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**		Riedel1; bocal receiver: No, but from by wear				
14	choke bore dia.	8.5	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	40	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)				
16	wing joint length	520	total wing joint length, including tenon and socket				
17	tenon length	43.8	tenon length[longer wing 39.3mm]				
18							
19	wj f2	206	Reidel1; Tone hole not exactly drilled into center of bore; dist top of wing to where tone hole enters bore				
20	wj e	292					
21	wj d	330					
22			[not at the center of the tone hole]				
23	Bore dia. Bottom of wing joint	16.3	Need to Average, usally oval; Riedel1 no				
24	Bore dia. top of boot joint small side	16	Riedel1; vrfd boot socket slight smaller than wing tenon				
25	Bore dia. top of boot joint large side	23.7	Riedel1; 23.3 x 22.4				
26							
27	**III. Boot Lengths**		Riedel1 could remove plug, but used logic 1				
28	bj logic	1	logic=> if bj logic = 0 => plug removed; if bj logic = 1 => plug cannot be removed				
29	bj c	85	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]				
30	bj b	142					
31	bj a	186					
32							
33	bjstotal [Needed for both boot logics]	420	total length of boot, include socket, along the small bore side				
34	bjltotal [Needed for both boot logics]	420	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]	384	hook length along s bore => bjs-septum length = boot - septum <= calc the septum				
39	bootl [Needed for both boot logics]	384	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]	41.1	Outside dia of plug [measured] = small bore dia + large bore dia + the septum width				
45							
46	septum length exp [Need for logic 0 only]	34	dist. from very bottom of boot to septum [point between the large and small bore]				
47	septum length calc - do not imput value	36	dist. From very bottom of boot to spetum [bjl - bootl]	do not imput value			
48	septum length - do not imput value	36	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]	19.1	septum small bore dia [assume = lbore dia sep]				
51	lbore dia sep* [Needed for both boot logics]	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]	4.3	septum width; direct measurement if remove plug				
53	sep width calc - do not imput value	2.8	septum width; calc. => extreme bore - sbore - lbore	do not imput value			
54	sep width - do not imput value	2.8	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep	do not imput value			
55							
56	bj g	342	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]				
57	bj f1	135	Riedel1, vrfd long; 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	7.2	Riedel1; vrfd large F tone hole				
65	e	6					
66	d	5.8					
67							
68	c	7.8					
69	b	7.6					
70	a	6					
71	g	10.1					
72	f1	10.1					
73			Riedel1 vrfd; Tone holes on long joint small				
74	e1	14.2	Riedel1 oblong 15.6 x 12.8; e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
75	d1	9.5	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
76	c1	13.1	Riedel1 oblong 13.5 x 12.6, 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	36.7	Riedel1 tone hole not drilled exactly into center of bore				
84	e	31.5	Riedel1 tone hole on wing long in length				
85	d	34.5					
86							
87	c	24.4					
88	b	24					
89	a	23.5					
90	g	16	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]				
91	f1	22.5	meas along east side tone hole wall [north wall, toward reed, T hole usually at angle]				
92			Riedel1 long joint tone hole lengths shallow, tone hole flattened				
93	e1	3.5	e1 tone hole depth;meas east/west with deapth gauge [at center, or shortest dist]				
94	d1	5.8	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
95	c1	4.1	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
99							
100							
101	**VI. Long Joint**		Riedel1 a table along long joint				
102	lg_length	565	Riedel1; vrfd short; total length of long joint				
103	lg_tenon_bot	43.6	length bottom tenon on long joint [tenon going into boot joint]				
104	lj_bot_bore	24.1	Riedel1; 23.7 x 22.9; long joint bottom tenon bore diameter [tenon going into boot joint]				
105	lj_top_bore	30.2	long joint top tenon bore diameter [tenon going into bell]				
106	lg_tenon_top	35.5	length top tenon on long joint [tenon going into bell]				
107	e1 distance	58	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]				
108	d1 distance	267	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
109	c1 distance	472	Riedel1 vrfd; 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	11.1					
117	e	12.3					
118	d	13.1					
119							
120	c	16.4					
121	b	17					
122	a	17.3					
123	g	20.1					
124	f1	22.2					
125							
126	e1	24.2	e1 tone hole bore diameter on long joint				
127	d1	27.3	d1 tone hole bore diameter on long joint				
128	c1	29.9	c1 tone hole bore diameter on long joint				
129							
130							
131							
132							
133							
134	**VIII. Bell**		Riedel1 no tone hole in the bell				
135	bell logic	1	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)	275	total length of bell [lines 141 + 144 = line 136]				
137	bell_bot_bore (0, 1, 2)	30	Riedel1 29.7 x 30.2; dia bore at the bottom of bell [end with socket] OOR 33.2 x 33.5				
138	bell_top_bore 0, (1, 0, 2)	27.4	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)	36.2	bell socket length				
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]				
145	belflg	42	Usually about 10mm more than line 138				
146							
147							
148	**IX. PITCH**						
149	pitch	430	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: Riedel1-O-Reil-Wg1-WOB-DNM				
156							
157			Notes on long joint bore: Riedel1 slightly OOR in places				
158			Notes on boot joint bore: Riedel1 normal				
159	**XI. Bore Diameter Locations**		Notes on wing joint bore: Riedel1 good				
160		18	Number of diameters				
161	**Bell Bore**	8.5	Initial bore diameter [do not include in line 160 counting]				
162	30.0mm diameter at socket	395	dist1; measured from the bottom of the wing joint- 10mm				1
163	29mm rod 190mm from socket	345	dist2; measured from the bottom of the wing joint- 11mm				1
164	28mm rod 232mm from socket	260	dist3; measured from the bottom of the wing joint- 12mm				1
165	27.4mm diameter at bell end	205	dist4; measured from the bottom of the wing joint- 13mm				1
166		130	dist5; measured from the bottom of the wing joint- 14mm				1
167		62	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	16.3		1
168		0	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot small	16		2
169		148	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot large	23.7		2
170		235	dist9; measured from the top of the bootjoint - small bore side- 18mm				2
171		330	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia sep	19.1		2
172		360	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	19.2		3
173		275	Riedel1 OOR; dist12; measured from the top of the bootjoint - large bore side- 2	Hook Length	384		3
174		180	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		0	dist14; measured from the top of the bootjoint - large bore side- 23mm				3
176		520	dist15; measured from the top of the long joint- 24mm	lj_bot_bore	24.1		4
177		480	dist16; measured from the top of the long joint- 25mm				4
178		395	dist17; measured from the top of the long joint- 26mm				4
179		322	dist18; measured from the top of the long joint- 27mm;				4
180		255	dist19; measured from the top of the long joint- 28mm;				4
181		205	dist20; measured from the top of the long joint- 29mm				4
182		0	dist21; measured from the top of the long joint- 30mm				4
183		0	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	30.2		4