	A	B	C	D	E	F	G	H
1	**I. Bocal**		Original bocal; B & K4; 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: B & K4; yes, probably from wear; bocal receiver has been replaced, a brass lining					
14	choke bore dia.	8.6	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)	35	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)					
16	wing joint length	492	total wing joint length, including tenon and socket;					
17	tenon length	47.7	tenon length					
18								
19	wj f2	213	dist top of wing to where tone hole enters bore [not at the center of the tone hole]					
20	wj e	289						
21	wj d	346						
22								
23	Bore dia. Bottom of wing joint	14.5	B & K4; Need to Average, usally oval; no					
24	Bore dia. top of boot joint small side	15.7						
25	Bore dia. top of boot joint large side	23.1	B & K4; OOR; 22.8 x 23.4					
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	87	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]					
30	bj b	155						
31	bj a	196						
32								
33	bjstotal [Needed for both boot logics]	431	total length of boot, include socket, along the small bore side,					
34	bjltotal [Needed for both boot logics]	431	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]	388	hook length along s bore => bjs-septum length = boot - septum <= calc the septum					
39	bootl [Needed for both boot logics]	388	hook length along l bore => bjl-septum length = boot - septum <= calc the septum					
40								
41	boots bottom [Needed for both boot logics]	18	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick]	11 + 7 + =18				
42	bootl bottom [Needed for both boot logics]	18	use hook, dist of bore [same as boots bot except tenon depth will be different]					
43								
44	extreme bore [Needed for logic 1 only]	41.6	Outside dia of plug [measured] = small bore dia + large bore dia + the septum width					
45			B & K4, Used logic 1 but could remove cork					
46	septum length exp [Need for logic 0 only]	43	dist. from very bottom of boot to septum [point between the large and small bore]					
47	septum length calc - do not imput value	43	dist. From very bottom of boot to spetum [bjl - bootl]	do not imput value				
48	septum length - do not imput value	43	if bj logic = 0 => septum = septum exp; if bj logic = 1 => septum = septum calc	do not imput value				
49								
50	sbore dia sep* [Needed for both boot logics]	17.6	septum small bore dia [can assume = lbore dia sep]					
51	lbore dia sep* [Needed for both boot logics]	18.3	septum large bore dia [can assume = sbore dia sep] [mesure if cork can be removed; for Logic 0]					
52	sep width exp [Need for logic 0 only]	6.8	septum width; direct measurement if remove plug					
53	sep width calc - do not imput value	5.7	septum width; calc. => extreme bore - sbore - lbore	do not imput value				
54	sep width - do not imput value	5.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep w	do not imput value				
55								
56	bj g	324	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]					
57	bj f1	142	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	5.1						
65	e	5.9						
66	d	5.5						
67								
68	c	6.9						
69	b	7.2						
70	a	6						
71	g	9						
72	f1	9.5						
73								
74	e1	11	B & K4, oblong 10.7 x 11.2; e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]					
75	d1	9.2	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]					
76	c1	13	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	36.5						
84	e	31						
85	d	43	B & K4; extreme downward angle					
86								
87	c	26.5						
88	b	26						
89	a	25.6	B & K4; extreme downward angle					
90	g	13	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]					
91	f1	21.5	meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]					
92								
93	e1	9	e1 tone hole depth;meas east/west with deapth gauge [at center, or shortest dist]					
94	d1	8.5	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]					
95	c1	9.3	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]					
96								

	A	B	C	D	E	F	G	H
97								
98								
99								
100								
101	**VI. Long Joint**		B & K4, a table along long joint					
102	lg_length	602	total length of long joint					
103	lg_tenon_bot	47.8	length bottom tenon on long joint [tenon going into boot joint]					
104	lj_bot_bore	23.2	B & K4, OOR; long joint bottom tenon bore diameter [tenon going into boot joint] Average out of round					
105	lj_top_bore	31	B & K4, OOR 32.0 x 30.0; long joint top tenon bore diameter [tenon going into bell]					
106	lg_tenon_top	43.7	length top tenon on long joint [tenon going into bell]					
107	e1 distance	65	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	484	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	11.6						
117	e	12.5						
118	d	13.2						
119								
120	c	16.1						
121	b	16.2						
122	a	16.3						
123	g	19.3						
124	f1	21.8						
125								
126	e1	23.8	e1 tone hole bore diameter on long joint					
127	d1	27.4	d1 tone hole bore diameter on long joint					
128	c1	30.2	c1 tone hole bore diameter on long joint					
129								
130								
131								
132								
133								
134	**VIII. Bell**		B & K4 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)	322	total length of bell [lines 141 + 144 = line 136]					
137	bell_bot_bore (0, 1, 2)	32.2	dia bore at the bottom of bell [end with socket]					
138	bell_top_bore 0, (1, 0, 2)	31.9	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)	45.2	bell socket length					
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]					
145	belflg	53.3						
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								
155			Bassoon Calculation: Buhner & Keller4-O-BrusMIMIDK0027-Wg1-WOB-DNM					
156								
157			Notes on long joint bore: B & K4; very out of round in places					
158			Notes on boot joint bore: B & K4 both bores not OOR					
159	**XI. Bore Diameter Locations**		Notes on wing joint bore: B & K4; good, not OOR					
160		19	Number of diameters					
161	**Bell Bore**	8.6	Initial bore diameter [do not include in line 160 counting]					
162	32.2mm dia. at socket	395	dist1; measured from the bottom of the wing joint- 10mm				1	
163	32mm rod 70mm from socket	335	dist2; measured from the bottom of the wing joint- 11mm				1	
164	31mm rod 108mm from socket	255	dist3; measured from the bottom of the wing joint- 12mm				1	
165	30mm rod 148mm from socket	170	dist4; measured from the bottom of the wing joint- 13mm				1	
166	29.5mm rod 172mm from socket	8	dist5; measured from the bottom of the wing joint- 14mm				1	
167	29.5mm rod 100mm from bell	0	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing	14.5		1	
168	30mm rod 88mm from top of bell	77	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot sma	15.7		2	
169	31mm rod 50mm from top of bell	240	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot larg	23.1		2	
170	31.9mm dia.at bell end	0	dist9; measured from the top of the bootjoint - small bore side- 18mm;				2	
171		365	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia se	17.6		3	
172		275	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	18.3		3	
173		208	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	388		3	
174		120	dist13; measured from the top of the bootjoint - large bore side- 22mm				3	
175		565	dist14; measured from the top of the bootjoint - large bore side- 23mm				4	
176		518	dist15; measured from the top of the long joint- 24mm	lj_bot_bore	23.2		4	
177		480	dist16; measured from the top of the long joint- 25mm				4	
178		405	dist17; measured from the top of the long joint- 26mm				4	
179		350	B & K4; very OOR; dist18; measured from the top of the long joint- 27mm				4	
180		295	dist19; measured from the top of the long joint- 28mm				4	
181		225	dist20; measured from the top of the long joint- 29mm				4	
182		135	B & K4; very OOR; 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	31		4	