	A	B	C	D	E	F	G
1	**I. Bocal**		Original bocal, Buhner&Keller6; 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; Buhner&Keller6, yes there is a receiver				
14	choke bore dia.	7.9	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	499	total wing joint length, including tenon and socket				
17	tenon length	44.2	tenon length				
18							
19	wj f2	214	dist top of wing to where tone hole enters bore [not at the center of the tone hole]				
20	wj e	290					
21	wj d	343					
22							
23	Bore dia. Bottom of wing joint	14.4	Need to Average, usally oval; Buhner&Keller6, no				
24	Bore dia. top of boot joint small side	15.4	Need to Average, usally oval; Buhner&Keller6, no				
25	Bore dia. top of boot joint large side	23.6	Buhner&Keller6, OOR; 23.3 X 23.9				
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	82	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]				
30	bj b	153					
31	bj a	198					
32			Buhner&Keller6, meas. With boot cap removed				
33	bjstotal [Needed for both boot logics]	430	total length of boot, include socket, along the small bore side				
34	bjltotal [Needed for both boot logics]	430	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]	387	hook length along s bore => bjs-septum length = boot - septum <= calc the septum				
39	bootl [Needed for both boot logics]	387	hook length along l bore => bjl-septum length = boot - septum <= calc the septum				
40							
41	boots bottom [Needed for both boot logics]	23	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick]; 16+7=23, verified				
42	bootl bottom [Needed for both boot logics]	23	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]		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]	18.1	septum small bore dia [assume = lbore dia sep]				
51	lbore dia sep* [Needed for both boot logics]	19.1	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	3.9	septum width; calc. => extreme bore - sbore - lbore	do not imput value			
54	sep width - do not imput value	3.9	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width calc	do not imput value			
55							
56	bj g	325	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]				
57	bj f1	144	B & K6 vrfd; 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	6.1					
66	d	5.5					
67							
68	c	7.3					
69	b	7.1					
70	a	6.4					
71	g	9.8	B & K6 G tone hole filled with wax				
72	f1	9.6					
73							
74	e1	10.7	e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]:				
75	d1	8.8	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
76	c1	12.3	Buhner&Keller6, tone hole filled with cork; 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	38.2	Buhner&Keller6, Wing tone holes at extreme angles				
84	e	35.9					
85	d	44.5					
86							
87	c	24.4					
88	b	24.3					
89	a	25					
90	g	13	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]				
91	f1	29	Buhner&Keller6 vrfd, meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]				
92							
93	e1	9.4	e1 tone hole depth;meas east/west with deapth gauge [at center, or shortest dist]				
94	d1	7.8	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
95	c1	7.6	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
96							
97							
98							
99							
100							

	A	B	C	D	E	F	G
101	**VI. Long Joint**		There is a table along long joint; Buhner&Keller6, yes a table along long joint				
102	lg_length	603	total length of long joint;				
103	lg_tenon_bot	48.3	length bottom tenon on long joint [tenon going into boot joint]				
104	lj_bot_bore	22.7	Buhner&Keller6, OOR 23.6 x 23.8 Average; long joint bottom tenon bore diameter [tenon going into boot joint]				
105	lj_top_bore	31.1	long joint top tenon bore diameter [tenon going into bell]				
106	lg_tenon_top	44.4	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	483	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	12.1					
118	d	12.6					
119							
120	c	15.8					
121	b	16					
122	a	16.2					
123	g	19.3					
124	f1	22					
125							
126	e1	24.5	e1 tone hole bore diameter on long joint				
127	d1	27.3	d1 tone hole bore diameter on long joint				
128	c1	30	c1 tone hole bore diameter on long joint				
129							
130							
131							
132							
133							
134	**VIII. Bell**		Buhner&Keller6, There is not a tone hole in the bell				
135	bell logic	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)	322	total length of bell				
137	bell_bot_bore (0, 1, 2)	31.1	dia bore at the bottom of bell [end with socket];				
138	bell_top_bore 0, (1, 0, 2)	31.6	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)	44.3	bell socket length				
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]				
145	belflg	57.1	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	3	frequency increment parameter				
152	Number of frequencies	18	number of frequencies to scan for min chi sq				
153	Frequency adjust	1.05	frequency adjustment parameter				
154	**X. Title**						
155	title		Bassoon Calculation: Buhner & Keller6-O-Deitch-Wg1-WB-DNM				
156							
157			Notes on long joint bore: Buhner&Keller6, normal				
158			Notes on boot joint bore: Buhner&Keller6, normal, down bore slightly OOR				
159	**XI. Bore Diameter Locations**		Notes on wing joint bore: Buhner&Keller6, normal				
160		20	Number of diameters				
161	**Bell Bore;** almost cylindrical	7.9	Initial bore diameter [do not include in line 160 counting]				
162	31.1mm dia. at socket	381	dist1; measured from the bottom of the wing joint- 10mm				1
163	31.3mm rod 92mm from top of bell	315	dist2; measured from the bottom of the wing joint- 11mm				1
164	31.5mm rod 75mm from top of bell	233	dist3; measured from the bottom of the wing joint- 12mm				1
165	31.6mm dia.at bell end	130	dist4; measured from the bottom of the wing joint- 13mm				1
166		35	dist5; measured from the bottom of the wing joint- 14mm				1
167		0	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	14.4		1
168		95	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot small	15.4		2
169		270	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot large	23.6		2
170		365	dist9; measured from the top of the bootjoint - small bore side- 18mm				2
171		0	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia sep	18.1		2
172		295	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	19.1		3
173		203	dist12; measured from the top of the bootjoint - large bore side- 21mm;	Hook Length	387		3
174		140	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		70	dist14; measured from the top of the bootjoint - large bore side- 23mm;				3
176		557	dist15; measured from the top of the long joint- 24mm	lj_bot_bore	22.7		4
177		512	dist16; measured from the top of the long joint- 25mm				4
178		430	dist17; measured from the top of the long joint- 26mm				4
179		370	dist18; measured from the top of the long joint- 27mm				4
180		315	dist19; measured from the top of the long joint- 28mm				4
181		253	dist20; measured from the top of the long joint- 29mm				4
182		115	dist21; measured from the top of the long joint- 30mm				4
183		15	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	31.1		4