

	A	B	C	D	E	F	G
1	I. Bocal		Original bocal, Hasler1 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 calc; if bocal logic = 2 => no bocal				
9							
10							
11							
12							
13	II. Wing Joint Lengths		bocal receiver: Hasler1 No reciever, a choke				
14	choke bore dia.	10.7	logic 1; bore diameter of choke; logic 0; either dia bocal bottom or begin. of bore at bottom or receiver				
15	receiver length (1, 0) (formally choke length)	50	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as string length)				
16	wing joint length	516	total wing joint length, including tenon and socket				
17	tenon length	47.3	tenon length				
18							
19	wj f2	217	Hasler1 vrfd short; dist top of wing to where tone hole enters bore [not at the center of the tone hole]				
20	wj e	283					
21	wj d	326					
22							
23	Bore dia. Bottom of wing joint	16.1	Need to Average, usually oval; Hasler1 no				
24	Bore dia. top of boot joint small side	16.4					
25	Bore dia. top of boot joint large side	24.2					
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	95	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole]				
30	bj b	161					
31	bj a	201					
32							
33	bjtotal [Needed for both boot logics]	438	Hasler1 vrfd; total length of boot, include socket, along the small bore side				
34	bjtotal [Needed for both boot logics]	438	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]	395	hook length along s bore => bjs-septum length = boot - septum <= calc the septum				
39	bootl [Needed for both boot logics]	395	hook length along l bore => bj-septum length = boot - septum <= calc the septum				
40							
41	boots bottom [Needed for both boot logics]	21	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick] 14 + 7 = 21				
42	bootl bottom [Needed for both boot logics]	21	use hook, dist of bore [same as boots bot except tenon depth will be different]				
43							
44	extreme bore [Needed for logic 1 only]	40.4	Hasler1 vrfd; 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	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]	18.5	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]	0	septum width; direct measurement if remove plug				
53	sep width calc - do not imput value	2.7	septum width; calc. => extreme bore - sbore - lbore	do not imput value			
54	sep width - do not imput value	2.7	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	361	dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]				
57	bj f1	157	Hasler1 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	4.3	Hasler1, f & e finger holes roughly flared at surface [where finger touches tone hole]				
65	e	5.8					
66	d	5	Hasler1 vrfd; small				
67							
68	c	6.8					
69	b	6					
70	a	5.5					
71	g	7.5	Hasler1 vrfd small				
72	f1	8.8					
73			Hasler1 small tone holes on long joint				
74	e1	9.6	e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
75	d1	7.9	d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
76	c1	11.5	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	31					
84	e	22.5					
85	d	24.2					
86							
87	c	25.7					
88	b	27.2					
89	a	25.3					
90	g	17.2	meas along bot tone hole wall [north wall, toward reed,tone hole usually at angle]				
91	f1	22	Hasler1 vrfd; meas along east side tone hole wall [north wall, toward reed,t hole usually at angle]				
92							
93	e1	10.6	e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
94	d1	10.2	d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
95	c1	10.1	c1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
96			Hasler1, Long joint Tone holes longer, thicker walls				
97							
98							
99							
100							
101	VI. Long Joint		Hasler1 There is a table alon long joint				
102	lg length	570	total length of long joint				

	A	B	C	D	E	F	G
103	lg tenon_bot	46	length bottom tenon on long joint [tenon going into boot joint]				
104	lj_bot_bore	25	Hasler1 OOR 24.5 x 25.5; long joint bottom tenon bore diameter [tenon going into boot joint]				
105	lj_top_bore	29.6	Hasler1 OOR 28.6 x 30.5; long joint top tenon bore diameter [tenon going into bell]				
106	lg tenon_top	40.5	length top tenon on long joint [tenon going into bell]				
107	e1 distance	59	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]				
108	d1 distance	247	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
109	c1 distance	462	Hasler1 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	11.8					
117	e	13.4					
118	d	13.8					
119							
120	c	16	Hasler1 vrfd; smaller than socket				
121	b	17.3					
122	a	17.9					
123	g	21.1					
124	f1	23.1					
125							
126	e1	24	Hasler1 vrfd, E tone hole less than tenon dia.; e1 tone hole bore diameter on long joint				
127	d1	26.2	d1 tone hole bore diameter on long joint				
128	c1	29	c1 tone hole bore diameter on long joint				
129							
130							
131							
132							
133							
134	VIII. Bell		Hasler1, There is not a tone hole in the bell				
135	bell logic	1	If bell logic=0=>normal conical; if bell logic=1=>inverted conical; if bell logic = 2 => bell expansion				
136	bell length (0, 1, 2)	327	total length of bell [lines 141 + 144 = line 136]				
137	bell_bot_bore (0, 1, 2)	30.7	dia bore at the bottom of bell [end with socket]				
138	bell_top_bore 0, (1, 0, 2)	43	Hasler1, see bore diameters on row 161, bell chokes to 26mm dia. dia bore at 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)	40.7	bell socket length				
144	bell_expansion_length (only for logic 2)		distance of maxium expansion to top of bell [where Bb exits]				
145	bellfg	54.5	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: Hasler1-O-Sigal1991.01-Wg1-WB-DNM				
156							
157			Notes on long joint bore: Hasler1 considerable out of round around low C tone hole				
158			Notes on boot joint bore: Hasler1 normal				
159	XI. Bore Diameter Locations		Notes on wing joint bore: Hasler1 very good shape, no OOR				
160		17	Number of diameters				
161	Bell Bore	10.7	Initial bore diameter [do not include in line 160 counting]				
162	30.7mm dia. at socket	0	dist1; measured from the bottom of the wing joint- 10mm				1
163	29mm rod 55mm from socket	350	dist2; measured from the bottom of the wing joint- 11mm				1
164	28mm rod 155mm from socket	290	dist3; measured from the bottom of the wing joint- 12mm				1
165	27mm rod 200mm from socket	250	dist4; measured from the bottom of the wing joint- 13mm				1
166	26mm rod 245mm from socket	193	dist5; measured from the bottom of the wing joint- 14mm				1
167	27mm rod 65mm from top of bell	80	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	16.1		1
168	28mm rod 58mm from top of bell	0	dist7; measured from the bottom of the wing joint - 16mm	top boot small	16.4		1
169	29mm rod 55mm from top of bell	140	dist8; measured from the top of the bootjoint - 17mm	top boot large	24.2		2
170	30mm rod 45mm from top of bell	255	Hasler1 OOR; 210 x 300; dist9; measured from the top of the boot joint - 18mm				2
171	31mm rod 40mm from top of bell	0	dist10; measured from the top of the bootjoint -small bore side- 19mm	sbore dia sep	18.5		2
172	32mm rod 33mm from top of bell	376	dist11; measured from the top of the bootjoint - large bore side- 20mm	lbore dia sep	19.2		3
173	43mm dia. at bell end	340	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	395		3
174		260	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		174	Hasler1 vrfd; dist14; measured from the top of the bootjoint - - 23mm				3
176		60	Hasler1 vrfd; dist15; measured from the top of the bootjoint - 24mm	lj_bot_bore	25		3
177		440	dist16; measured from the top of the long joint- 25mm				4
178		338	dist17; measured from the top of the long joint- 26mm				4
179		230	Hasler1 vrfd; dist18; measured from the top of the long joint- 27mm				4
180		180	dist19; measured from the top of the long joint- 28mm				4
181		50	Hasler1 vrfd; 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	li_top_bore	29.6		4