	A	В	C	D	F	F	G	Н
1	I. Bocal	Long Wing 1	Short Wing 2	Original bocal; Floth1 Longer bocal meas. below	_		Ŭ	
2	dia reed end bocal string length (0, 1)	4.4 24.3	4.4 24.3	inside diameter of reed end of bocal; 4.3mm length of bocal inserted into receiver; 24.3mm				
4		313	313	meas. along top of bocal; 323mm				
5	metal bocal length bot (0, 1)	293	293	meas. along bottom of bocal; 306mm				
7	dia wj end	10	10	inside diameter of bocal; 9.6mm				
8	bocal logic	2	2	if bocal logic = 0 => bocal is choke; if bocal logic = 1 =>choke in wing joint calc; if b	ocal logic = 2 => no	o bocal		
9 10				Floth1 Has two bocals in case, might be original				
11								
12								
13	II. Wing Joint Lengths; Longer Wing choke bore dia.	8.4	9.5	bocal receiver: Floth1 yes on wing joint 1 (longer) logic 1; bore diameter of choke; logic 0; either diameter bocal bottom or beginning of	hore at hottom or r	eceiver		
15	receiver length (1, 0) (formally choke length)	24.3	72	logic 1; length of choke from top of wing joint; logic 0; length of receiver (same as sti		CCCIVCI		
	wing joint length	530	520	total wing joint length, including tenon and socket tenon length[longer wing 39.3mm]				
18	tenon length	42	42	tenon length[longer wing 39.3mm]				
19	wj f2	236	232	dist top of wing to where tone hole enters bore [not at the center of the tone hole]				
20	wj e wj d	296 338	291 338					
22								
23	Bore dia. Bottom of wing joint	15.6 16.2	15.7	Need to Average, usally oval; Floth1 slightly				
24 25	Bore dia. top of boot joint small side Bore dia. top of boot joint large side	24.4	16.2 24.4					
26								
	III. Boot Lengths bj logic	1	1	logic=> if bj logic = 0 => plug removed; if bj logic = 1 => plug cannot be removed				
29	bj c	84	84	dist from top of boot to where topmost tone hole enter bore [not at center of tone hole	e]			
	bj b bj a	135 183	135 183					
32	ы а — — — — — — — — — — — — — — — — — —		103					
33		424	424	total length of boot, include socket, along the small bore side				
34 35	bjltotal [Needed for both boot logics] plug small [Need for logic 0 only]	424 0	424 0	total length of boot, include socket, along large bore side plug thickness, large bore side			-	
36		0	0	plug thickness, small bore side				
37 38	hoots [Needed for both boot logics]	382	382	book longth along c boro => his-contum longth = boot - contum <= calc the contum				
39		382	382	hook length along s bore => bjs-septum length = boot - septum <= calc the septum hook length along I bore => bjl-septum length = boot - septum <= calc the septum				
40					11.5 . 10.5			
41		18.5 18.5	18.5 18.5	use hook, dist of bore [dist on stick plus 7mm, diff between hook and bot of stick] 7 + use hook, dist of bore [same as boots bot except tenon depth will be different]	11.5 + 18.5			
43								
44	extreme bore [Needed for logic 1 only]	42.3	42.3	Outside dia of plug [measured] = small bore dia + large bore dia + the septum width				
46	septum length exp [Need for logic 0 only]	0	0	dist. from very bottom of boot to septum [point between the large and small bore]				
47	septum length calc - do not imput value	42	42	dist. From very bottom of boot to spetum [bjl - bootl]	do not imput value			
48	septum length - do not imput value	42	42	if bj logic = 0 => septum = septum exp; if bj logic = 1 => septum = septum calc	do not imput value			
50		17.6	17.6	septum small bore dia [assume = Ibore dia sep]				
51 52	Ibore dia sep* [Needed for both boot logics] sep width exp [Need for logic 0 only]	18.6 0	18.6 0	septum large bore dia [assume = sbore dia sep] [mesure if cork can be removed; for septum width; direct measurement if remove plug	Logic 0]			
53	sep width calc - do not imput value	6.1	6.1	septum width; calc. => extreme bore - sbore - lbore	do not imput value			
		0.1						
54		6.1	6.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width				
55	sep width - do not imput value	6.1	6.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width				
55 56 57	sep width - do not imput value bj g							
55 56 57 58	sep width - do not imput value bj g	6.1 326	6.1 326	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60	sep width - do not imput value bj g	6.1 326	6.1 326	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60	sep width - do not imput value bj g	6.1 326	6.1 326	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62	sep width - do not imput value bj g	6.1 326	6.1 326	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing	6.1 326 121	6.1 326 121 5.4	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing	6.1 326 121 5.4 5.7	5.4 5.7	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65 66	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing	5.4 5.7 5.5	5.4 5.7 5.5	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65 66 67	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing	5.4 5.7 5.5	5.4 5.7 5.5 7.6	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing	5.4 5.7 5.5 7.6 7.2 6.4	5.4 5.7 5.5 7.6 7.2 6.4	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g	5.4 5.7 5.5 7.6 7.2 6.4 9	5.4 5.7 5.5 7.6 7.2 6.4 9	if bj logic = $0 => sep$ width $= sep$ width exp; if bj logic = $1 => sep$ width $= s$				
55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d d c b a g f1	5.4 5.7 5.5 7.6 7.2 6.4 9	5.4 5.7 5.5 7.6 7.2 6.4 9	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]				
55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74	sep width - do not imput value bi g b) f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f11 e1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	5.4 5.7 5.5 5.7 5.5 7.6 7.2 6.4 9 9.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]				
55 56 57 58 59 60 61 62 63 64 65 66 70 71 72 73 74 75	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a 9 f1 e1 d1	5.4 5.7 5.5 7.6 7.2 6.4 9	5.4 5.7 5.5 7.6 7.2 6.4 9	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]				
55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 77	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a 9 f1 e1 d1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  enter bore [not at cent of tone hole]  el tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a 9 f1 e1 d1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 77 78 80	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a 9 f1 e1 d1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 77 78 80 81	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
555 566 577 588 599 600 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78 80 81 82 83 83 84 85 86 86 87 87 88 88 88 88 88 88 88 88	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
555 566 577 58 599 601 611 62 63 645 666 677 72 73 74 75 76 77 78 81 82 83 83 84	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer	5.4 5.7 5.5 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
555 566 577 588 599 600 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78 80 81 82 83 83 84 85 86 86 87 87 88 88 88 88 88 88 88 88	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
555 566 577 588 599 600 61 622 633 64 655 667 71 72 73 74 75 76 77 78 81 82 83 84 85 86 87	sep width - do not imput value  bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d  c b a g f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width  dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]  c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater]				
555 566 577 588 599 600 61 622 633 644 655 666 771 772 73 747 777 78 80 81 82 83 83 84 85 86 87 87 88 88	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer f2 e	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round				
55 56 57 58 59 60 61 62 63 66 67 78 77 74 77 78 79 80 81 82 83 84 85 86 87 88 89 99 90	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer f2 e d	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle  Floth1 extreme downward angle meas along bot tone hole usually at angle]				
555 566 577 588 599 60 611 623 664 655 666 677 688 770 771 722 733 744 775 767 778 801 818 828 838 848 858 868 879 879 879 879 879 879 879 879 879 87	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1 V. Tone Hole Depths: Wing 1 longer f2 e d	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle				
55 56 57 58 59 60 61 62 63 66 67 78 77 74 77 78 79 80 81 82 83 84 85 86 87 88 89 99 90	sep width - do not imput value  bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d  c b a g f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle  Floth1 extreme downward angle meas along bot tone hole usually at angle]				
555 566 60 611 626 63 644 656 66 677 77 78 78 79 90 81 81 83 84 85 86 87 89 90 90 91 92 93 94	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a q f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d d	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5 21.4 24 25.5 13.3 21 7.6 7.5	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bet side to hole wall [north wall, toward reed, tone hole usually at angle] meas along bet side tone hole wall [north wall, toward reed, tone hole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 606 6162 6366 666 677 727 727 737 744 757 808 818 828 838 848 858 869 90 91 91 92 93 94 94 95	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d d c b a g f1 c1 V. Tone Hole Depths: Wing 1 longer f2 e d d c f1 c1 c2 e d d c3 e d d f1 c1 e1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5 21.4 24.2 25.5 13.3 21	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 Extreme downward angle meas along east side tone hole wall [north wall, toward reed, tone hole usually at angle] meas along east side tone hole wall [north wall, toward reed, the loue usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 577 588 599 60 61 62 63 64 65 66 66 67 77 78 77 78 79 80 81 82 83 84 85 87 88 89 90 90 90 90 90 90 90 90 90 90 90 90 90	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a q f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d d	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5 21.4 24 25.5 13.3 21 7.6 7.5	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bet side to hole wall [north wall, toward reed, tone hole usually at angle] meas along bet side tone hole wall [north wall, toward reed, tone hole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 6162 6366 667 668 697 707 717 778 78 79 811 82 83 84 84 87 88 89 90 91 92 93 94 95 96 97 97 98	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a q f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d d	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5 21.4 24 25.5 13.3 21 7.6 7.5	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bet side to hole wall [north wall, toward reed, tone hole usually at angle] meas along bet side tone hole wall [north wall, toward reed, tone hole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 666 667 688 699 707 717 727 733 747 758 811 883 844 85 867 877 99 99 99 99 99 99	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d d c t t t t t t t t t t t t t t t t t	6.1 326 121 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5	6.1  326 121  5.4 5.7 5.5  7.6 7.2 6.4 9 9.7  10.8 9.8 11.1  25.2 26.2 33.5  21.4 24 25.5 13.3 21 7.6 7.5	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bet side to hole wall [north wall, toward reed, tone hole usually at angle] meas along bet side tone hole wall [north wall, toward reed, tone hole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 57 58 58 59 60 61 61 62 63 66 66 67 70 77 77 78 80 82 83 84 85 89 90 90 100 100 100 100 100 100 100 100	sep width - do not imput value bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1 c1 v. Tone Hole Depths: Wing 1 longer f2 e d d V. Tone Hole Depths: Wing 1 longer f1 e1 d1 c1 c1 b a g f1 f1 e1 d1 c1	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5 7.1	6.1  326 121  5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1  25.2 26.2 33.5  21.4 24 25.5 13.3 21 7.6 7.5 7.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole] e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] t1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bot tone hole wall [north wall, toward reed, tone hole usually at angle] meas along east side tone hole wall [north wall, toward reed, thole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				
555 566 57 58 58 59 60 61 61 62 63 66 66 67 70 77 77 78 80 82 83 84 85 89 90 90 100 100 100 100 100 100 100 100	sep width - do not imput value  bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d c b a g f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d d  V. Tone Hole Depths: Wing 1 longer f2 e d f1 f1 c1 c1 c1 d1 c1 d1 c1 d1 c1 longer f2 e d d c b longer f3 e e d d c longer f4 longer f5 e e d d longer f5 longer f6 longer f7 longer f8 longer f8 longer f9 longer f9 longer f9 longer f9 longer f1 longer f1 longer f1 longer f2 longer f2 longer f3 longer f4 longer f4 longer f5 longer f6 longer f7 longer f8 longer f9 longer f9 longer f9 longer f1 longer f1 longer f1 longer f1 longer f1 longer f2 longer f1 longer f1 longer f2 longer f2 longer f3 longer f4 longer f4 longer f4 longer f4 longer f5 longer f6 longer f6 longer f7 longer f8	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5 7.1	5.4 5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.2 26.2 33.5 21.4 24 25.5 13.3 21 7.6 7.5 7.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole]  e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] c1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bot tone hole wall [north wall, toward reed, tone hole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]  Floth1 There is a table along long joint: yes total length of long joint				
55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 81 82 83 84 87 87 99 99 99 99 99 99 99 99 99 9	sep width - do not imput value  bj g bj f1  IV. Tone Hole Diameters; Longer Wing f2 e d  c b a g f1 e1 d1 c1  V. Tone Hole Depths: Wing 1 longer f2 e d  V. Tone Hole Depths: Wing 1 longer f2 e d	5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1 25.5 25.8 28.4 21.4 24 25.5 13.3 21 7.6 7.5 7.1	6.1  326 121  5.4 5.7 5.5 7.6 7.2 6.4 9 9.7 10.8 9.8 11.1  25.2 26.2 33.5  21.4 24 25.5 13.3 21 7.6 7.5 7.1	if bj logic = 0 => sep width = sep width exp; if bj logic = 1 => sep width = sep width dist from top of boot (socket) to where G hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole] dist from top of boot (socket) to where F1 hole enters bore [not at cent of tone hole] e1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] d1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] t1 tone hole dia, on long joint [need to average NS and EW dias, NS usually greater] Floth1 All three long joint ton holes totally round  Floth1 extreme downward angle meas along bot tone hole wall [north wall, toward reed, tone hole usually at angle] meas along east side tone hole wall [north wall, toward reed, thole usually at angle] e1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist] d1 tone hole depth; meas east/west with deapth gauge [at center, or shortest dist]				

			C	5	-	F	_	
105	A li ton hore	B 30.9	30.9	D  long joint ton tenon hore diameter [tenon going into hell]	E	٠.	G	Н
100	lj_top_bore lg_tenon_top	30.9	30.9	long joint top tenon bore diameter [tenon going into bell] length top tenon on long joint [tenon going into bell]				
	e1 distance	32.3 57	32.3 57	dist long joint tenon to e1 [from bot of tenon to where tone hole enters bore]				
		260	260	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
109	d1 distance c1 distance	521	521	dist long joint tenon to d1 [from bot of tenon to where tone hole enters bore]				
110	C2 distance	J41	J21	and rong joint terior to express of terior to where tone note enters bore				
111								
112								
113								
114								
115	VII. Bore diameters at Tone Holes							
116	f2	11.5	11.7					
117	e	12.5	13					
118	d	13.1	13.4					
119								
120	С	16.6	16.6					
121	b	17.1	17.1					
122	a	17.4	17.4					
123	g 51	19.1	19.1					
124	11	22.8	22.8			-		
125 126	01	24.3	24.3	e1 tone hole bore diameter on long joint				
125	ei di	24.3	24.3	d1 tone hole bore diameter on long joint				
128	c1	29.2	29.2	c1 tone hole bore diameter on long joint				
129	C1	23.2	23.2	er tone note bore diameter on long joint				
130								
131								
132								
133								
	VIII. Bell			Floth1 There is tone hole in the bell: 4.5mm, 148 mm from bottom, include bell socke	t			
135	bell logic	0	0	If bell_logic=0=>normal conical bore;if bell_logic=1=>inverted concial bore;if bell_logic=0=>normal conical bore;if bell_logic=1=>inverted concial bore;if bell_logic=1=>inver	gic=2=>bell expan	sion		
136	bell_length (0, 1, 2)	296	296	total length of bell [lines 141 + 144 = line 136]				
137	bell_bot_bore (0, 1, 2)	31.5	31.5	dia bore at the bottom of bell [end with socket]				
138	bell_top_bore 0, (1, 0, 2)	38.2	38.2	dia bore at the top of bell [where low Bb exits]				
	bell_center_bore (only for logic 2)			dia bore at max center of expansion				
	bell_wall (only for logic 2)			bell wall thickness, Just for David	L			
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	22.5	20.0	Just for David				
143	bell_tenon (0, 1, 0, 2)	32.2	32.2	bell socket length				
144	bell_expansion_length (only for logic 2)	40	40	distance of maxium expansion to top of bell [where Bb exits]				
145	belfig	49	49	Usually about 10mm more than line 138				
145								
	IX. PITCH							
	pitch	430	430	input the historical pitch of the bassoon, must input value, best guess				
	frea init	380	380	Initial frequency range variable				
	Delta frequency	2	2	frequency increment parameter				
152	Number of frequencies	60	60	number of frequencies to scan for min chi sq				
153	Frequency adjust	1.05	1.05	frequency adjustment parameter				
154	X. Title							
	title			Bassoon Calculation: Floth1-O-Waterhouse-Wg1-WOB-DNM [longerwing]				
156								
157				Notes on long joint bore: Floth1 OOR in places				
158	VI D D:			Notes on boot joint bore: Floth1 normal				
159 160	XI. Bore Diameter Locations; Bocal 1 Long	ger 19	19	Notes on wing joint bore: Floth1 normal				
161		8.4	9.5	Number of diameters  Initial bore diameter [do not include in line 160 counting]				
162		382	399	dist1; measured from the bottom of the wing joint- 10mm				- 1
163		317	399	dist2; measured from the bottom of the wing joint- 10mm  dist2; measured from the bottom of the wing joint- 11mm				1
164		258	269	dist3; measured from the bottom of the wing joint- 11mm				1
165		197	230	dist4; measured from the bottom of the wing joint- 13mm				1
166		110	135	dist5; measured from the bottom of the wing joint- 14mm				1
167		9	60	dist6; measured from the bottom of the wing joint- 15mm	Bottom wing jt	15.6		1
168		0	0	dist7; measured from the top of the bootjoint - small bore side- 16mm	top boot small	16.2		2
169		118	118	dist8; measured from the top of the bootjoint - small bore side- 17mm	top boot large	24.4		2
170		0	0	dist9; measured from the top of the bootjoint - small bore side- 18mm				2
171		350	350	dist10; measured from the top of the bootjoint - large bore side- 19mm	sbore dia sep	17.6		3
172		305	305	dist11; measured from the top of the bootjoint - large bore side- 20mm	Ibore dia sep	18.6		3
173		265	265	dist12; measured from the top of the bootjoint - large bore side- 21mm	Hook Length	382		3
174		192	192	dist13; measured from the top of the bootjoint - large bore side- 22mm				3
175		100	100	dist14; measured from the top of the bootjoint - large bore side- 23mm	In here he	22.5		3
176		565	565	dist15; measured from the top of the long joint - 24mm	lj_bot_bore	23.5		4
177		490	490	dist16; measured from the top of the long joint- 25mm				4
178		410	410	dist17; measured from the top of the long joint- 26mm				4
179		365	365	dist18; measured from the top of the long joint- 27mm				4
180 181		200 105	200 105	dist19; measured from the top of the long joint- 28mm dist20; measured from the top of the long joint- 29mm				4
182		40	40	dist21; measured from the top of the long joint- 29mm dist21; measured from the top of the long joint- 30mm				4
183		0	0	dist22; measured from the top of the long joint- 31mm;				4
184		0	0		li top bore	30.9		4
		U	U	paistes, incasared notificial of the folig joint selling,	III COD DOLE			