12-key tenoroon, Jean-Nicholas SAV	ARY JE	UNE (4),	Paris, ca. 1838	
BASIC - OUTSIDE				
Joint lengths	mm	mm	Comments	
Standing length to bell	982			
Standing length to wing joint	660			
Wing joint length	379.5			
Wing joint - tenon length	41.3			
<u> </u>			Without bottom ferrule	
Butt joint length	320		(0.8 thickness)	
Long joint length	472		(Coo and and Co)	
Long joint - south tenon length	41.2			
Long joint - north tenon length	28.6			
Bell length	257.5			
Vent hole distance from north	х			
Vent hole approx diameter	х			
Tone hole distance, axis				
Wing - tone hole 1 distance from north	177			
Wing - tone hole 2 distance from north	206			
Wing - tone hole 3 distance from north	236			
Butt - tone hole 4 distance from north	74.5			
Butt - tone hole 5 distance from north	104.5			
Butt - tone hole 6 distance from north	135			
Butt - tone hole F distance from north	245			
Butt - tone hole E distance from north	99.5			
Butt - tone hole Ab distance from north	263.5			
Butt - tone hole F# distance from north	215			
Long joint - tone hole D distance from north	420			
Long joint - tone hole Eb distance from north	370			
Long joint - tone hole C distance from north	268.5			
Long joint - tone hole Bb distance from north	98			
Wing - major axis at tone hole 1	47.1			
Wing - major axis at tone hole 2	47.1			
Wing - major axis at tone hole 3	47			
Butt - major axis (side to side) at tone hole 4	56.5			
Butt - minor axis (front to back) at tone hole 4	44.4			
Butt - major axis (side to side) at tone hole 5	55.7			
Butt - minor axis (front to back) at tone hole 5	43.7			
Butt - major axis (side to side) at tone hole 6	54.5			
Butt - minor axis (front to back) at tone hole 6	42.8			
Butt - major axis (side to side) at tone hole F	49			
Butt - minor axis (front to back) at tone hole F	37.8			
Butt - major axis (side to side) at tone hole E	55.6			
Butt - minor axis (front to back) at tone hole E	43.8			
Butt - major axis (side to side) of the bottom butt ellipse	43.4		Without ferrule. Thickness of bottom butt ferrule on sides 0.5	
Butt - minor axis (front to back) of the bottom butt ellipse	33.1		Without ferrule. Thickness of bottom butt ferrule on sides 0.5	
·			Without ferrule. Thickness of top butt ferrule on	
Butt - major axis (side to side) of the top butt ellipse	55		sides 0.5/0.6 Without ferrule. Thickness of bottom butt ferrule on	
Butt - minor axis (front to back) of the top butt ellipse	40.2		sides 0.5	
Butt - cork major axis (side to side)	37.3		+	
Butt - cork minor axis (front to back)	19.3		+	
Long joint - minor axis (front to back) at tone hole D	33.7 32.4			

12-key tenoroon, Jean-Nicholas SAV	ARY JEUN	IE (4),	Paris, ca. 1838	
Long joint - minor axis (front to back) at tone hole Eb	33.3			
Long joint - major axis (side to side) at tone hole Eb	33.6			
Long joint - minor axis (front to back) at tone hole C	37.1			
Long joint - major axis (side to side) at tone hole C	34.8			
Long joint - minor axis (front to back) at tone hole Bb	37.9			
Long joint - major axis (side to side) at tone hole Bb	37.4			
Tone hole angle, Ø, length				
Wing - tone hole 1 angle	53.5° North			
Wing - tone hole 2 angle	34.5° South			
Wing - tone hole 3 angle	35.5° South			
Wing - tone hole 1 approx. Ø	4.6			
Wing - tone hole 2 approx. Ø	5.3			
Wing - tone hole 3 approx. Ø	4.8			
Wing - tone hole 1 approx. length	44.7			
Wing - tone hole 2 approx. length	25.6			
Wing - tone hole 3 approx. length	26			
Butt - tone hole 4 angle	44° North	1		
Butt - tone hole 5 angle	21° South			
Butt - tone hole 6 angle	28° South			
Butt - tone hole E angle	21.5° South			
Butt - tone hole 4 approx. Ø	6.8			
Butt - tone hole 5 approx. Ø	6.1			
Butt - tone hole 6 approx. Ø	5.5			
Butt - tone hole E approx. Ø	7.2			
Butt - tone hole 4 approx. length	24			
Butt - tone hole 5 approx. length	19.8			
Butt - tone hole 6 approx. length	18.6			
Butt - tone hole E approx. length	12.7			
Long joint - tone hole C angle	0			
Long joint - tone hole C Ø	10			
Long joint - tone hole C approx. length	6.6			
BASIC - INSIDE				
Inner bore length				
Bore length	1657.3			
Wing bore length	381			
Butt - small bore length	307		Without cork 321.5 mm	
Butt - big bore length	308		Without cork 322 mm	
Butt - small bore socket length	42.7			
Butt - big bore socket length	44.3			
Butt - small bore beginning of septum	282.5			
Butt - big bore beginning of septum	282.5			
Long joint bore length	474			
Bell bore length	269			
Inner bore beginning Ø (not socket!)	Min.	Max.		
			Internal diameter of bocal	
Wing bore Ø north	10.3	10.6	well	
Wing bore Ø south	13	13.3		
Bocal well length	27			
Butt - small bore Ø north	13.6			
Butt - big bore Ø north	22.3			
_ong joint Ø north	28.6	29		
ong joint Ø south	21.7	22.4		
Bell bore Ø north	39		Towards the end, bell flares	

Bell sockel length Bocal Ø at the beginning Bocal Ø at the beginning Bocal O at the tenon Rocal Ø at the tenon Rocal Well from the thickness with ferrule Rocal Well from Rocal Ø at the tenon Rocal Ø at	Bell bore Ø south	29.5				T
Bocal Park beginning  3.7  Bocal Park beginning  3.7  Bocal Park B						+
30cal θ at the tenon 30cal for the tenon 30cal for the tenon 30cal for the tenon 30cal for the tenon 30cal entitions at the tenon 30cal entitions the form at the tenon 30cal entitions the tenon tenon the tenon ten	Ţ					1
		0.2				
30cal length (along top)   229   30cal length (along top)   220		7.3				
Min.   Max.	Bocal thickness at the tenon					
Min.   Max.	Bocal length (along top)	229				
Socal well ferrule thickness with ferrule Socal well ferrule thickness  Ming - tenon northern extern. Ø  Ming - tenon northern extern. Ø  Ming - tenon southern extern. Ø  Ming - tenon southern extern. Ø  Ming - tone hole A distance from north  Ming - tone hole A distance from north  Ming - tone hole A approx. Ø  Ming - tone hole A approx. Ø  Ming - tone hole A approx. Ø  Ming - tone hole A distance from north  Ming - tone hole A distance from north  Ming - tone hole C distance from north  Ming - tone hole C approx. Ø  Ming - tone hole C approx. Papprox. Ø  Ming - tone hole C approx. Papprox. Ø  Ming - tone hole C approx. Pappro		Min.	Max.			
30-cal well ferrule thickness   0.3   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3.2   3			_			
Ming - tenon northerness						+
Ming - tenon northern extern. Ø  Ming - tenon southern extern. Ø  Ming - tenon hole A distance from north  Ming - tenon hole A approx. Ø  Ming - tenon hole A approx. Ø  Ming - tenon hole A approx. Ø  Ming - tenon hole C approx. Ø  Ming - tenon hole C angle  Ming - tenon hole C angle  Ming - tenon hole C approx. Ø  Ming - tenon hole L approx. Ø  Ming - tenon h			3.2			1
Ming - tenon southern extern. Ø Ming - tone hole A distance from north Ming - tone hole A angle Ming - tone hole A approx. Ø Ming - tone hole A approx. Ø Ming - tone hole A approx. length Ming - tone hole C distance from north Ming - tone hole C approx. length Ming - tone hole	-	21.3	_			
Ming - tone hole A distance from north  79  Ming - tone hole A approx. Ø  Ming - tone hole A approx. Ø  Ming - tone hole A approx. length  Ming - tone hole C distance from north  Ming - tone hole C distance from north  Ming - tone hole C approx. length  A tone hole C approx. length  Ming - tone hole C approx. length  A tone hole C approx. length  Ming - tone hole C approx. length  A tone hole D approx. length  A tone hole	-					
Ming - tone hole A approx. Ø  Ming - tone hole A approx. Jength  Ming - tone hole A approx. Jength  Ming - tone hole C distance from north  Ming - tone hole C approx. Jength  Ming - tone hole						†
Ming - tone hole A approx. Ø   3   an muntil ca. end of hole tunnel; another hole A approx. length   7.6   ming - tone hole C distance from north   41   ming - tone hole C distance from north   41   ming - tone hole C distance from north   41   2.8 until ca. end of the hole tunnel; another hole with 2.6 mm Ø going into the line of the hole C approx. Ø   2.8   another hole with 2.3 mm Ø going into the line of the hole caprox. In the line of the hole tunnel; another hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole with 2.3 mm Ø going into the line of the hole line of the line of the hole line of the hole line of the hole line of the line of the hole line of the hole line of the	· ·					1
Ming - tone hole A approx. length Ming - tone hole C distance from north Ming - tone hole C distance from north Ming - tone hole C approx. Ø Ming - tone hole C approx. Ø Ming - tone hole C approx. length Butt - big socket thickness with ferrule Butt - small socket thickness with ferrule Butt - tone from the tone of the swith ferrule Butt - tone from the thickness  0.6 Minimum wall thickness between butt sockets 1.7 Butt - wood space between corks - bottom Butt - small bore cork Ø - bottom Butt - small bore cork Ø - bottom Butt - wood wall between cork/front - small bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - wood wall between cork/side - big bore Butt - bottom ferrule thickness Dong joint - south tenon northern extern. Ø Butt - bottom ferrule thickness Dong joint - south tenon northern extern. Ø Butt - bottom ferrule thickness Dong joint - south tenon northern extern. Ø Butt - tone hole Fangle Butt - tone hole				3 mm until ca. end of ho	le tunnel;	
Wing - tone hole C distance from north  Wing - tone hole C angle  20° North  71	Wing - tone hole A approx. Ø	3		another hole with 2.6 mr	m Ø going into	<u>bo</u> re
Wing - tone hole C angle  Wing - tone hole C approx. Ø  2.8 until ca. end of the hole tunnel; 2.8 until ca. end of the hole tunnel; another hole with 2.3 mm Ø going into to wing - tone hole C approx. length  7.1  Butt - big socket thickness with ferrule Butt - big socket thickness with ferrule Butt - top ferrule thickness  0.6  Winimum wall thickness between butt sockets 1.7  Butt - bog baze between corks - bottom  x  One cork  Butt - big bore cork Ø - bottom  Butt - wood wall between cork/front - small bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/side - big bore Wood wall between cork/side - small bore Wood wall between cork/side - small bore Sutt - south tenon thickness  0.5  Long joint - south tenon northern extern. Ø 28.7  29  Long joint - south tenon northern extern. Ø 27.5  Butt one hole Ft angle Butt - tone hole Ft approx. length Butt - tone hole Ft approx. length Butt - tone hole Ft approx. length Long joint - tone hole Ft approx. length Butt - tone hole Ft approx. length Long joint - tone hole F	Wing - tone hole A approx. length	7.6				
2.8 until ca. end of the hole tunnel; another hole with 2.3 mm Ø going into to with 5.3 mm Ø going into to with 6.5 mm Ø going into to with	Wing - tone hole C distance from north	41				
2.8 until ca, end of the hole tunnel; another hole with 2.3 mm Ø going into to wing - tone hole C approx. length   7.1	Wing - tone hole C angle	20° North		right.	· · · · · · · · · · · · · · · · · · ·	<del></del>
Wing - tone hole C approx. length	J				ole tunnel;	
Wing - tone hole C approx. length	Wing - tone hole C approx. Ø			another hole with 2.3 mr	m Ø going into	<u>bore</u>
Butt - small socket thickness with ferrule  Butt - top ferrule thickness 0.6  Butt - top ferrule thickness 0.6  Butt - wood space between butt sockets 1.7  Butt - wood space between corks - bottom x One cork  Butt - big bore cork Ø - bottom 18  Butt - small bore cork Ø - bottom 18.5  Butt - wood wall between cork/front - small bore 6  Butt - wood wall between cork/front - big bore 6.5 7 Without/with ferrule 8  Butt - wood wall between cork/back - small bore 5.8 6.3 Without/with ferrule 8  Butt - wood wall between cork/back - small bore 5.7 6.2 Without/with ferrule 8  Butt - wood wall between cork/side - small bore 3.5  Wood wall between cork/side - small bore 3.5  Wood wall between cork/side - small bore 3.5  Butt - bottom ferrule thickness 0.5  Long joint - south tenon thickness 2.8 3  Long joint - south tenon thickness 2.8 3  Long joint - south tenon southern extern. Ø 28.7 29  Long joint - south tenon southern extern. Ø 27.5 27.8  Long joint - north tenon northern extern. Ø 33.3 33.5  Long joint - north tenon northern extern. Ø 33.3 33.5  Bell socket thickness with brass 2 2.1 2.3  Long joint - north tenon southern extern. Ø 33.3 33.5  Bell socket thickness with brass 2 2.1  Bell ferrule height 29  Tone hole angle, Ø, length 30  Butt - tone hole Fa angle 10° South 30  Butt - tone hole Fa angle 11° South 30  Butt - tone hole Fa pprox. Ø 6.3  Butt - tone hole Fa pprox. Ø 6.3  Butt - tone hole Fa pprox. length 11.5  Butt - tone hole Fa pprox. length 12.3  Long joint - tone hole Fa pprox. length 12.3  Long joint - tone hole Fa pprox. length 12.3  Long joint - tone hole Fa pprox. length 12.3		7.1				
Butt - top ferrule thickness	Butt - big socket thickness with ferrule	1.6	1	With/without ferrule		
Minimum wall thickness between butt sockets 3utt - wood space between corks - bottom x One cork 3utt - big bore cork Ø - bottom 3utt - wood wall between cork/front - small bore 3utt - wood wall between cork/front - big bore 3utt - wood wall between cork/front - big bore 3utt - wood wall between cork/front - big bore 5.8 3utt - wood wall between cork/front - big bore 5.8 3utt - wood wall between cork/back - small bore 5.8 3utt - wood wall between cork/side - small bore 8.5 Without/with ferrule 3utt - wood wall between cork/side - small bore 8.5 Wood wall between cork/side - small bore 8.5 Wood wall between cork/side - small bore 9.5 Wood wall between cork/side - small bore 9.5 Wood wall between cork/side - big bore 9.5 Wood wall between cork/side - side wall between cork/side - big bore 9.5 Wood wall between cork/side - small bore 9.5 Without/with ferrule 9.5 8.3 W	Butt - small socket thickness with ferrule	0.7		Ferrule 0.6		
Butt - wood space between corks - bottom Butt - big bore cork Ø - bottom Butt - wood wall between cork/front - small bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/side - small bore Butt - wood wall between cork/side - small bore Butt - wood wall between cork/side - small bore Butt - wood wall between cork/side - small bore Butt - bottom ferrule thickness Butt - bottom ferrule then no northern extern. Ø Butt - bottom ferrule then on southern extern. Ø Butt - bottom ferrule then on northern extern. Ø Butt - bottom ferrule ferrule Butt - bone hole Ab angle Butt - tone hole Ab angle Butt - tone hole Fa pprox. Ø Butt - tone hole Fa pprox. Bength Butt - tone hole Fa pprox. Length	Butt - top ferrule thickness	0.6				
Butt - big bore cork Ø - bottom	Minimum wall thickness between butt sockets	1.7				
Butt - small bore cork Ø - bottom  Butt - wood wall between cork/front - small bore  Butt - wood wall between cork/front - big bore  Butt - wood wall between cork/front - big bore  Butt - wood wall between cork/back - small bore  Butt - wood wall between cork/back - small bore  Butt - wood wall between cork/back - big bore  Butt - wood wall between cork/side - small bore  Wood wall between cork/side - big bore  3.5  Without/with ferrule  Butt - bottom ferrule thickness  0.5  Long joint - south tenon thickness  2.8  3.3  Long joint - south tenon northern extern. Ø  28.7  29  Long joint - south tenon southern extern. Ø  27.5  27.8  Long joint - north tenon northern extern. Ø  33.3  33.3  Butt - bore hole angle, Ø, length  Butt - tone hole Fangle  Butt - tone hole Fangle  Butt - tone hole Fapprox. Ø  Butt - tone hole Fapprox. Ø  Butt - tone hole Fapprox. length	Butt - wood space between corks - bottom			One cork		
Butt - wood wall between cork/front - small bore Butt - wood wall between cork/front - big bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - big bore S.7 6.2 Without/with ferrule Butt - wood wall between cork/back - big bore S.7 6.2 Without/with ferrule  Wood wall between cork/side - small bore 3.5  Wood wall between cork/side - big bore 3.5  Butt - bottom ferrule thickness 0.5  Long joint - south tenon thickness 2.8 3  Long joint - south tenon fire extern. Ø 28.7 29  Long joint - south tenon southern extern. Ø 27.5 27.8  Long joint - north tenon southern extern. Ø 33.3 33.5  Long joint - north tenon northern extern. Ø 33.3 33.5  Bell socket thickness with brass 2 2.1  Bell socket thickness with brass 2 2.1  Bell ferrule height 29  Tone hole angle, Ø, length Butt - tone hole Fangle 10° South Butt - tone hole Fangle 11° South Butt - tone hole Fangle 11° South Butt - tone hole Fangle 11° South Butt - tone hole Fapprox. Ø 7.7  Butt - tone hole Fapprox. Ø 30.3  Butt - tone hole Fapprox. Ø 50.3  Butt - tone hole Fapprox. length 50.3  Butt - tone hole Fapprox. length 50.4  Butt - tone hole Fapp						
Butt - wood wall between cork/front - big bore Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - big bore Butt - wood wall between cork/back - big bore Butt - wood wall between cork/side - small bore Wood wall between cork/side - small bore  Wood wall between cork/side - big bore Butt - bottom ferrule thickness  Long joint - south tenon thickness  Long joint - south tenon northern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - north tenon southern extern. Ø  Long joint - north tenon northern extern. Ø  Butt - tone hole spangle Butt - tone hole F approx. Ø  Butt - tone hole F approx. length Butt - tone hole F #approx. length	Butt - small bore cork Ø - bottom					
Butt - wood wall between cork/back - small bore Butt - wood wall between cork/back - big bore Butt - wood wall between cork/side - small bore Wood wall between cork/side - big bore Wood wall between cork/side - big bore 3.5  Without/with ferrule  Wood wall between cork/side - big bore 3.5  Butt - bottom ferrule thickness 0.5  Long joint - south tenon thickness 2.8  Long joint - south tenon northern extern. Ø 28.7  29  Long joint - south tenon southern extern. Ø 27.5  27.8  Long joint - north tenon thickness 2.1  Long joint - north tenon thickness 2.1  Long joint - north tenon northern extern. Ø 33.3  Bell socket thickness with brass 2  Bell socket thickness with brass 2  Bell ferrule height 29  Tone hole angle, Ø, length Butt - tone hole Fangle Butt - tone hole Fa	Butt - wood wall between cork/front - small bore			Without/with ferrule		
Butt - wood wall between cork/back - big bore  Wood wall between cork/side - small bore  3.5  Wood wall between cork/side - big bore  3.5  Butt - bottom ferrule thickness  0.5  Long joint - south tenon thickness  2.8  Long joint - south tenon northern extern. Ø  28.7  29  Long joint - south tenon southern extern. Ø  27.5  27.8  Long joint - north tenon thickness  2.1  2.3  Long joint - north tenon northern extern. Ø  33.3  33.5  Long joint - north tenon southern extern. Ø  33.3  33.5  Bell socket thickness with brass  2  2.1  Bell ferrule height  29  Tone hole angle, Ø, length  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole F approx. Ø  Butt - tone hole F approx. length	<u> </u>					
Wood wall between cork/side - small bore  Wood wall between cork/side - big bore  Butt - bottom ferrule thickness  Long joint - south tenon thickness  Long joint - south tenon northern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - north tenon thickness  Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  Long joint - north tenon northern extern. Ø  33.3  33.5  Long joint - north tenon southern extern. Ø  33.3  Bell socket thickness with brass  2  2.1  Butt - tone hole angle, Ø, length  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. length						
Butt - bottom ferrule thickness  Long joint - south tenon thickness  Long joint - south tenon northern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - north tenon southern extern. Ø  Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  Long joint - north tenon southern extern. Ø  Long joint - north tenon southern extern. Ø  Bell socket thickness with brass  Bell socket thickness with brass  Bell socket thickness with brass  Brass thickness of the bell ferrule  D.5  Bell ferrule height  Tone hole angle, Ø, length  Butt - tone hole Ab angle  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Long joint - hole D angle  X	<u> </u>		6.2	Without/with ferrule		
Butt - bottom ferrule thickness						
Long joint - south tenon thickness  Long joint - south tenon northern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  Long joint - north tenon northern extern. Ø  Long joint - north tenon southern extern. Ø  Long joint - north tenon northern extern. Ø  Long joint - tone hole Ab approx. Ø  Long joint - tone hole Fapprox. length  Long joint - tone hole D angle   28.7  29.  27.8  27.8  29.  20.1  23.  33.3  33.3  33.3  33.3  33.3  33.3  33.3  33.3  33.3  33.5  Long joint - south tenon northern extern. Ø  20.5  20.1  20.1  20.5  20.1  20.7  20.5  20.1  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.7  20.	<u> </u>					
Long joint - south tenon northern extern. Ø  Long joint - south tenon southern extern. Ø  Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  Long joint - north tenon northern extern. Ø  Long joint - north tenon southern extern. Ø  Long joint - north tenon northern extern. Ø  Long joint - north tenon northern extern. Ø  Long joint - north tenon thickness  Long joint - tenon hole tenon northern extern. Ø  Long joint - tenon hole fell part long  Long joint - tone hole D angle  Long joint - tone hole D angle  Zong Joint - tone hole D angle						
Long joint - south tenon southern extern. Ø  Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  33.3  33.5  Long joint - north tenon southern extern. Ø  33.3  33.5  Long joint - north tenon southern extern. Ø  33  33.3  Bell socket thickness with brass  2  2.1  Brass thickness of the bell ferrule  0.5  Bell ferrule height  29  Tone hole angle, Ø, length  Butt - tone hole Ab angle  10° South  Butt - tone hole F angle  11° South  Butt - tone hole F approx. Ø  7.7  Butt - tone hole F approx. Ø  8utt - tone hole F approx. Ø  8utt - tone hole F approx. Ø  8utt - tone hole F approx. length  11.5  Butt - tone hole F approx. length  12  Long joint - tone hole D angle  x	• •					
Long joint - north tenon thickness  Long joint - north tenon northern extern. Ø  33.3 33.5  Long joint - north tenon southern extern. Ø  33.3 33.3  Bell socket thickness with brass  2 2.1  Brass thickness of the bell ferrule  0.5  Bell ferrule height  29  Tone hole angle, Ø, length  Butt - tone hole Ab angle  Butt - tone hole F angle  Butt - tone hole F angle  10° South  Butt - tone hole Ab approx. Ø  8utt - tone hole F approx. length  11.5  8utt - tone hole F approx. length  12.3  8utt - tone hole F approx. length  12.4  Long joint - tone hole D angle	ŭ,					↓
Long joint - north tenon northern extern. Ø  33.3  33.5  Long joint - north tenon southern extern. Ø  33 33.3  Bell socket thickness with brass  2 2.1  Brass thickness of the bell ferrule  0.5  Bell ferrule height  29  Tone hole angle, Ø, length  Butt - tone hole Ab angle  Butt - tone hole F angle  10° South  Butt - tone hole F angle  13° South  Butt - tone hole Ab approx. Ø  7.7  Butt - tone hole F approx. Ø  Butt - tone hole F approx. length  11.5  Butt - tone hole F approx. length  12  Long joint - tone hole D angle						
a 33 33.3 33.3 33.3 33.3 33.3 33.3 33.3	0,		_			
Bell socket thickness with brass  Brass thickness of the bell ferrule  Brass thickness of the bell ferrule  0.5  Bell ferrule height  29  Fone hole angle, Ø, length  Butt - tone hole Ab angle  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole Ab approx. Ø  Butt - tone hole F approx. length  Butt - tone hole D angle						
Brass thickness of the bell ferrule  Bell ferrule height  Tone hole angle, Ø, length  Butt - tone hole F angle  Butt - tone hole Ab approx. Ø  Butt - tone hole F approx. length  Butt - tone hole D angle	ong joint - north tenon southern extern. Ø	33	33.3			
Tone hole angle, Ø, length  Butt - tone hole Ab angle Butt - tone hole F approx. Ø  T.7  Butt - tone hole F approx. Ø  T.7  Butt - tone hole F approx. Ø  Butt - tone hole F approx. length  Cong joint - tone hole D angle  x	Bell socket thickness with brass	2	2.1			
Tone hole angle, Ø, length  Butt - tone hole Ab angle  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole Ab approx. Ø  Butt - tone hole Ab approx. Ø  T.7  Butt - tone hole F approx. Ø  Butt - tone hole Ab approx. length  Butt - tone hole F approx. length  Cong joint - tone hole D angle	Brass thickness of the bell ferrule	0.5				
Butt - tone hole Ab angle Butt - tone hole F angle Butt - tone hole Ab approx. Ø T.7 Butt - tone hole F approx. Ø Butt - tone hole F approx. Ø Butt - tone hole Ab approx. Ø Butt - tone hole Ab approx. length Butt - tone hole F approx. length Butt - tone hole D angle	Bell ferrule height	29				
Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole F angle  Butt - tone hole Ab approx. Ø  7.7  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole Ab approx. length  Butt - tone hole F approx. length  Cong joint - tone hole D angle  X	Tone hole angle, Ø, length					
Butt - tone hole F# angle  Butt - tone hole Ab approx. Ø  7.7  Butt - tone hole F approx. Ø  7.3  Butt - tone hole F# approx. Ø  6.3  Butt - tone hole Ab approx. length  11.5  Butt - tone hole F approx. length  12.3  Butt - tone hole F# approx. length  12  Long joint - tone hole D angle	Butt - tone hole Ab angle					
Butt - tone hole Ab approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole Ab approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Cong joint - tone hole D angle	Butt - tone hole F angle					
Butt - tone hole F approx. Ø  Butt - tone hole F approx. Ø  Butt - tone hole Ab approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Butt - tone hole F# approx. length  Cong joint - tone hole D angle	Ÿ					
Butt - tone hole F# approx. Ø  Butt - tone hole Ab approx. length  Butt - tone hole F approx. length  Butt - tone hole F approx. length  Butt - tone hole F# approx. length  12  Long joint - tone hole D angle  x	•					
Butt - tone hole Ab approx. length 11.5 Butt - tone hole F approx. length 12.3 Butt - tone hole F# approx. length 12 Long joint - tone hole D angle x	·					
Butt - tone hole F approx. length 12.3  Butt - tone hole F# approx. length 12  Long joint - tone hole D angle x						
Butt - tone hole F# approx. length 12 Long joint - tone hole D angle x						
Long joint - tone hole D angle x						
						<u> </u>
anniciat tencholo El annic	· · · · · · · · · · · · · · · · · · ·	Х				
Long joint - tone hole E ♭ angle   x   Long joint - tone hole B ♭ angle   x   x   x   x   x   x   x   x   x	_ong joint - tone hole E ♭ angle	х				

12-key tenoroon, Jean-Nicholas SAV	ARY JEUN	NE (4), I	Paris, ca. 1838	
Long joint - tone hole D approx. Ø	11.2	11.4		
Long joint - tone hole E ♭ approx. Ø	6.5	6.7		
Long joint - tone hole B ♭ approx.Ø	13.1	13.2		
Long joint - tone hole D approx. length	6.3			
Long joint - tone hole E bapprox. length	4.6			
Long joint - tone hole B   approx. length	6.2			
COMPLETE - INSIDE				
Wing - tone hole 1 distance from south	239			
Wing - tone hole 2 distance from south	158			
	129			
Wing - tone hole 3 distance from south	305			
Wing - tone hole A distance from south	342.5			
Wing - tone hole C distance from south				
Butt - tone hole 4 distance from north	55			
Butt - tone hole 5 distance from north	110			
Butt - tone hole 6 distance from north	142			
Butt - tone hole Ab distance from north	262		In big bore	
Butt - tone hole F distance from north	243			
Butt - tone hole F♯ distance from north	214			
Butt - tone hole E distance from north	102			
Long joint - tone hole D distance from north	422			
Long joint- tone hole E ♭ distance from north	372			
Long joint - tone hole C distance from north	269			
Long joint - hole B ♭ distance from north	98			
Bell - vent hole distance from north	Х			
EXTRAS				
Tone hole distance, axis				
Long joint - tone hole C♯ distance from north	161.5			
Long joint - tone hole B distance from north	42.5			
Long joint - major axis (side to side) at tone hole C♯	36.3			
Long joint - minor axis (front to back) at tone hole C♯	35.5			
Long joint - major axis (side to side) at tone hole B	38.3	1		
Long joint - minor axis (front to back) at tone hole B	38.1			
Long joint - tone hole C#Ø	7.4	7.5		
Long joint - tone hole C♯ approx. length	5	7 .0		
Long joint - tone hole B Ø	7.9	8		
Long joint - tone hole B approx. length	4.9	+		
Long joint - tone hole C# distance from north	162.5	+		
Long joint - hole B distance from north	42.5			
Wing - tone hole A length	7.6			
			Front - back, with hole in	
Wing - tone hole A extern. Ø	22.5	23.3	front / (side to side)	
Wing - tone hole C length	7.1		Front book 20 to 12	
Wing tone halo Courters C	L	l	Front - back, with hole in	
Ivving - tone noie C extern. Ø	121.5	22.4	Ifront / (side to side)	
Wing - tone hole C extern. Ø  Butt - wood wall between cork/front in middle	21.5 7.5	22.4	front / (side to side)	