

Nut and Saddle Intonation Calculations - Method Based on Gore-Gilet Design Book - Section 4.7

General Data

Elastic Modulus	E	2.10E+05	N/mm ²
Scale Length	L	643.64	mm

Player Preference Data

Fp	0.85	Equ. 4.7-29
g ₀	0.5	Equ. 4.7-29

Data for String

G			
Dist - nut to tuner		121	mm
Stretchable Length	L _s ¹	764.64	mm
String Core diameter		0.30	mm
String Core Area		0.070686	mm ²
	k	1.48E+04	N
String Mass`	μ	1.647E-03	kg/m
Open Frequency		196.00	Hz

Trial Compensations

Nut Comp	0.8	mm	Positive is towards saddle
Saddle comp	0.5	mm	Positive is away from nut
String Length	643.34	mm	Unfretted, compensated nut to compensated saddle
String Tension	104.72	N	Unfretted, for correct open pitch

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
			Calculation of Path Length $L_{s,n}$														
Fret No.	Fret Position Uncompensated	$d_{s,n}$	l_1	g	f	l_2	l_3	Path Length $L_{s,n}$	$\Delta L_{s,n}$	$\Delta T_{s,n}$	Target Note frequency	Frequency Step	Fretted tension	Fretted Frequency	Intonation Error	Intonation Error	
		mm	mm	mm	mm	mm	mm	mm	mm	N	Hz	Hz	N	Hz	Hz	Cents	
0	0.000	0.100					643.3400			0.000000	196.00		104.7197	196.0000	0.0000	0.00	
1	36.125	0.427	0.0000	0.4250	17.6645	35.3392	608.0152	643.35431	0.01431	0.277848	207.65	11.65	104.9976	207.6623	0.0075	0.06	
2	70.222	0.692	35.3276	0.4011	17.0490	34.1075	573.9184	643.35347	0.01347	0.261516	220.00	12.35	104.9813	219.9825	-0.0201	-0.16	
3	102.405	0.928	69.4254	0.3786	16.0919	32.1928	541.7358	643.35402	0.01402	0.272220	233.08	13.08	104.9920	233.0627	-0.0219	-0.17	
4	132.783	1.140	101.6092	0.3574	15.1894	30.3872	511.3583	643.35466	0.01466	0.284709	246.94	13.86	105.0045	246.9226	-0.0219	-0.16	
5	161.455	1.332	131.9879	0.3373	14.3363	28.6806	482.6868	643.35534	0.01534	0.297987	261.63	14.68	105.0177	261.6063	-0.0223	-0.15	
6	188.518	1.506	160.6605	0.3184	13.5318	27.0710	455.6245	643.35606	0.01606	0.311972	277.19	15.56	105.0317	277.1632	-0.0227	-0.15	
7	214.062	1.664	187.7240	0.3005	12.7722	25.5516	430.0812	643.35682	0.01682	0.326681	293.67	16.48	105.0464	293.6449	-0.0233	-0.14	
8	238.172	1.808	213.2685	0.2836	12.0552	24.1171	405.9720	643.35762	0.01762	0.342175	311.13	17.46	105.0619	311.1064	-0.0242	-0.14	
9	260.929	1.939	237.3789	0.2677	11.3787	22.7637	383.2159	643.35846	0.01846	0.358529	329.63	18.50	105.0783	329.6061	-0.0253	-0.14	
10	282.409	2.058	260.1362	0.2527	10.7402	21.4863	361.7369	643.35935	0.01935	0.375815	349.23	19.60	105.0956	349.2061	-0.0262	-0.13	
11	302.684	2.166	281.6165	0.2385	10.1376	20.2809	341.4629	643.36029	0.02029	0.394110	370.00	20.77	105.1139	369.9720	-0.0268	-0.13	
12	321.820	2.266	301.8918	0.2251	9.5681	19.1416	322.3280	643.36129	0.02129	0.413481	392.00	22.00	105.1332	391.9714	-0.0286	-0.13	
13	339.882	2.357	321.0280	0.2125	9.0311	18.0672	304.2671	643.36235	0.02235	0.434022	415.31	23.31	105.1538	415.2788	-0.0308	-0.13	
14	356.931	2.440	339.0902	0.2006	8.5246	17.0539	287.2194	643.36347	0.02347	0.455814	440.01	24.70	105.1756	439.9730	-0.0321	-0.13	
15	373.023	2.516	356.1394	0.1893	8.0461	16.0966	271.1287	643.36466	0.02466	0.478931	466.17	26.16	105.1987	466.1353	-0.0338	-0.13	
16	388.211	2.585	372.2315	0.1787	7.5941	15.1924	255.9421	643.36592	0.02592	0.503460	493.89	27.72	105.2232	493.8516	-0.0375	-0.14	
17	402.547	2.649	387.4196	0.1687	7.1681	14.3401	241.6075	643.36726	0.02726	0.529504	523.26	29.37	105.2492	523.2164	-0.0408	-0.14	
18	416.079	2.708	401.7557	0.1592	6.7661	13.5359	228.0771	643.36869	0.02869	0.557151	554.37	31.11	105.2769	554.3285	-0.0432	-0.14	
19	428.851	2.762	415.2878	0.1503	6.3861	12.7756	215.3067	643.37020	0.03020	0.586492	587.34	32.96	105.3062	587.2889	-0.0475	-0.14	
20	440.906	2.812	428.0599	0.1418	6.0276	12.0584	203.2535	643.37180	0.03180	0.617636	622.26	34.92	105.3374	622.2081	-0.0531	-0.15	

Denotes special formula at nut