

MORPHEUS

Custom oscillator for KORG logue SDK synthesizers

Operations Manual

v.1.3-0

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Introduction

Morpheus is a morphing wavetable oscillator inspired by [WaveEdit](#).

The oscillator must be pre populated with wave data using the online constructor (see [Quick Start](#) section) before uploading to the synthesizer. For information on how to upload a custom oscillator to the synthesizer and how to activate it, please refer to the Synthesizer Owner's Manual and Sound Librarian Owner's Manual for your KORG synthesizer model.

For the wave data you can use WAV files created with WaveEdit, a huge library of such files is available at [WaveEdit Online](#). Alternatively you can use any 8- or 16-bit PCM WAV file and they will be automatically converted to 8-bit and trimmed to 16384 samples.

All the oscillator customization operations performed by the online constructor are done in JavaScript of your browser, so no actual upload occurs. Online constructor does not store any data, except for the your browser cookie setting for the last selected synthesizer model.

If you find a bug or wish to propose a new feature or improvement, don't hesitate to create a new issue at [GitHub](#) or just send me an email to dukesrg@gmail.com.

This custom oscillator is open source and free. However you can support the development via [PayPal me](#).

Quick start

The raw oscillator file has no wave data inside and won't produce any sound. To make the oscillator work you must first populate it with the wave data.

1. Navigate to the [online constructor](#) web page.
2. Select your KORG synthesizer model to define the target format of the oscillator file.
3. Locate the Morpheus oscillator row by the column **NAME**
4. Click the **Upload** button located in the **CUSTOM DATA** column of this row.
5. In the file open dialog select one wave files.
6. Check the **CUSTOM NAME** cell in this row. This name is populated from the name of the uploaded wave file and you can alter it now. This name will be displayed by the Librarian and your synthesizer.
7. Click the **Download** button located in the **CUSTOM UNIT** cell of this row.
8. Now you can upload the oscillator file to your KORG synthesizer with the Librarian application.

The screenshot shows the 'prologue' online constructor interface. At the top, there are tabs for 'prologue', 'minilogue xd', and 'NTS-1 digital'. A red circle with the number '2' is placed over the 'NTS-1 digital' tab. Below the tabs is a table of oscillators. The table has columns: NAME, VERSION, API, SHAPE, ALT, PARAM 1, PARAM 2, PARAM 3, PARAM 4, PARAM 5, PARAM 6, CUSTOM DATA, CUSTOM NAME, CUSTOM UNIT, SIZE, and DESCRIPTION. The row for 'Morpheus' is highlighted. Red circles with numbers are placed over specific cells: '5' over the 'CUSTOM DATA' cell, '7' over the 'CUSTOM UNIT' cell, '8' over the 'CUSTOM NAME' cell, and '4' over the 'Upload' button in the 'CUSTOM DATA' column. The 'Morpheus' row has '1.0.1' in the VERSION column, '1.5.0' in the API column, 'Waveform' in the SHAPE column, 'FB scale' in the ALT column, 'Voice 1' in the PARAM 1 column, 'Det scal AM' in the PARAM 2 column, 'Ret off AM' in the PARAM 3 column, 'Lvl off Car' in the PARAM 4 column, 'Algorithm' in the PARAM 5 column, 'Waveform (FM)' in the PARAM 6 column, and 'Upload' in the CUSTOM DATA column. The CUSTOM NAME cell contains '123456789' and the CUSTOM UNIT cell contains 'Download'. The SIZE column shows '1024 x 25'.

NAME	VERSION	API	SHAPE	ALT	PARAM 1	PARAM 2	PARAM 3	PARAM 4	PARAM 5	PARAM 6	CUSTOM DATA	CUSTOM NAME	CUSTOM UNIT	SIZE	DESCRIPTION
1	FM3	1.5.0	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 4	Yamaha DX100/101 series voice banks
2	FM4	1.7.5	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 5	Yamaha DX7 series voice banks
3	FM5	1.7.5	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 4	Yamaha DX7 series voice banks
4	FM6	1.7.5	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 3	Yamaha DX7 series voice banks
5	FM7	1.7.5	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 2	Yamaha DX7 series voice banks
6	FM8	1.7.5	1.5.0	Velocity	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 1	Yamaha DX7 series voice banks
7	Morpheus	1.0.1	1.5.0	Waveform	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload	123456789	Download	1024 x 25	Raw wave, y-lwr recorded
8	Antelope	0.7.0	1.5.0	Waveform	FB scale	Voice 1	Det scal AM	Ret off AM	Lvl off Car	Algorithm	Upload		Download	4096 x 5	Yamaha DX7 series voice banks
9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Advanced features

Oscillator modes

Oscillator can operate in two modes: Grid mode and Linear mode.

In Grid mode, all the 64 waveforms are represented as a grid of 8 x 8 waveforms and the resulting waveform is a bilinear interpolation of 4 source waveforms by a fractional X and Y coordinates as an input. X and Y coordinates can be selected explicitly or modulated by internal LFOs

In Linear mode, all waveforms are just a sequence. The resulting waveform is just a linear interpolation of 2 source waveforms by a fractional X coordinate as an input. X coordinate can be both selected explicitly and modulated by internal LFOs at the same time.

X and Y coordinates will be clipped in case several LFOs and/or depths overflow or underflow the coordinate value.

Oscillator parameters

Control \ Mode	Grid mode	Linear mode
Shape	LFO X rate / Waveform X position	Waveform X position
Alt (Shift + Shape)	LFO Y rate / Waveform Y position	LFO X rate
Param 1	LFO X mode	
Param 2	LFO Y mode	-
Param 3	LFO X wave	
Param 4	LFO Y wave	-
Param 5	LFO X depth	
Param 6	LFO Y depth	-

LFO modes

#	LFO mode	Description
1	One shot	Note On resets LFO phase to zero and LFO runs one cycle
2	Key trigger	Note On resets LFO phase to zero and LFO runs infinitely
3	Random	Note On resets LFO phase random and LFO runs infinitely
4	Free run	Note On has no effect on LFO that continues to run infinitely
5	One shot + Shape LFO	Same as One shot with Shape LFO from synth added
6	Key trigger + Shape LFO	Same as Key trigger with Shape LFO from synth added
7	Random + Shape LFO	Same as Random with Shape LFO from synth added
8	Free run + Shape LFO	Same as Free run with Shape LFO from synth added
9	Off	LFO Y only special value to activate oscillator Linear mode

LFO waves

#	LFO wave
0	Sawtooth
1	Triangle
2	Square
3	Sine
4	Random sample & hold
5...68	User waves

#	LFO wave
-1...-16	Firmware waves bank A
-17...-32	Firmware waves bank B
-33...-46	Firmware waves bank C
-47...-59	Firmware waves bank D
-60...-74	Firmware waves bank E
-75...-90	Firmware waves bank F

LFO depth

LFO depth represents the amplitude of the LFO span. For Grid mode 100% LFO depth will represent the full span of ± 3.5 waveforms. For the Linear mode that will be ± 31.5 waveforms. Negative LFO depth inverts the polarity of LFO waveform. Zero LFO depth activates switches Shape control to waveform position in Grid mode only. The following tables map the whole number of waveform span to the closest LFO depth value. For the complete list of precise depth values refer to [LFO depth lists](#).

Grid mode LFO depth waves span:

Waves span	Osc. LFO	Shape LFO
1	14	73
2	29	146
3	43	219
4	57	292
5	71	365
6	86	438
7	100	511

Linear mode LFO depth waves span:

Waves span	Osc. LFO	Shape LFO	Waves span	Osc. LFO	Shape LFO	Waves span	Osc. LFO	Shape LFO	Waves span	Osc. LFO	Shape LFO
1	2	8	17	27	138	33	52	268	49	78	397
2	3	16	18	29	146	34	54	276	50	79	406
3	5	24	19	30	154	35	56	284	51	81	414
4	6	32	20	32	162	36	57	292	52	83	422
5	8	40	21	33	170	37	59	300	53	84	430
6	10	49	22	35	178	38	60	308	54	86	438
7	11	57	23	37	187	39	62	316	55	87	446
8	13	65	24	38	195	40	63	324	56	89	454
9	14	73	25	40	203	41	65	333	57	90	462
10	16	81	26	41	211	42	67	341	58	92	470
11	17	89	27	43	219	43	68	349	59	94	479
12	19	97	28	44	227	44	70	357	60	95	487
13	21	105	29	46	235	45	71	365	61	97	495
14	22	114	30	48	243	46	73	373	62	98	503
15	24	122	31	49	251	47	75	381	63	100	511
16	25	130	32	51	260	48	76	389			

Waveform position

The values for Shape and Alt (Shift + Shape) to produce the desired waveform are represented in the following tables. Those just are the closest values, not absolutely precise. For the complete list of precise waveform positions [Waveform position list](#).

Grid mode waveform position:

#	Shape	0	146	292	438	585	731	877	1023
Alt	%	0.0	14.3	28.5	42.8	57.2	71.5	85.7	100.0
0	0.0	1	2	3	4	5	6	7	8
146	14.3	9	10	11	12	13	14	15	16
292	28.5	17	18	19	20	21	22	23	24
438	42.8	25	26	27	28	29	30	31	32
585	57.2	33	34	35	36	37	38	39	40
731	71.5	41	42	43	44	45	46	47	48
877	85.7	49	50	51	52	53	54	55	56
1023	100.0	57	58	59	60	61	62	63	64

Linear mode waveform position:

#	%	Wave	#	%	Wave	#	%	Wave	#	%	Wave
0	0.0	1	260	25.4	17	520	50.8	33	779	76.1	49
16	1.6	2	276	27.0	18	536	52.4	34	796	77.8	50
32	3.1	3	292	28.5	19	552	54.0	35	812	79.4	51
49	4.8	4	309	30.2	20	568	55.5	36	828	80.9	52
65	6.4	5	325	31.8	21	585	57.2	37	844	82.5	53
81	7.9	6	341	33.3	22	601	58.7	38	861	84.2	54
97	9.5	7	357	34.9	23	617	60.3	39	877	85.7	55
114	11.1	8	373	36.5	24	633	61.9	40	893	87.3	56
130	12.7	9	390	38.1	25	650	63.5	41	909	88.9	57
146	14.3	10	406	39.7	26	666	65.1	42	926	90.5	58
162	15.8	11	422	41.3	27	682	66.7	43	942	92.1	59
179	17.5	12	438	42.8	28	698	68.2	44	958	93.6	60
195	19.1	13	455	44.5	29	714	69.8	45	974	95.2	61
211	20.6	14	471	46.0	30	731	71.5	46	991	96.9	62
227	22.2	15	487	47.6	31	747	73.0	47	1007	98.4	63
244	23.9	16	503	49.2	32	763	74.6	48	1023	100.0	64

Tips and tricks

Single sample play:

Parameter	Value	Notes
LFO X rate	vary	refer to LFO rates list for the sample play speed
Waveform X position	50% / 511	refer to Waveform position to alter sample position
LFO X mode	1 (One shot)	
LFO Y mode	9 (Off)	
LFO X wave	0 (Sawtooth)	
LFO Y wave	-	
LFO X depth	100% / 511	refer to LFO depth to alter sample length
LFO Y depth	-	

Ping pong sample play:

Parameter	Value	Notes
LFO X rate	vary	refer to LFO rates list for the sample play speed
Waveform X position	50% / 512	refer to Waveform position to alter sample position
LFO X mode	2 (Key trigger)	
LFO Y mode	9 (Off)	
LFO X wave	1 (Triangle)	negative depth fixes upside down triangle direction
LFO Y wave	-	
LFO X depth	-100% (-511)	refer to LFO depth to alter sample length
LFO Y depth	-	

Vector synthesis:

Parameter	Value	Notes
Waveform X position	vary	control vector X position with Shape
Waveform Y position	vary	control vector Y position with Alt (Shift + Shape)
LFO X mode	-	
LFO Y mode	not Off (≠9)	
LFO X wave	-	
LFO Y wave	-	
LFO X depth	0% (0)	
LFO Y depth	0% (0)	

LFO rates list

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
0	0.0	0	∞	41	4.0	0.049	20.332	82	8.0	0.106	9.4677
1	0.1	0.001	892.21	42	4.1	0.050	19.814	83	8.1	0.107	9.3372
2	0.2	0.002	445.36	43	4.2	0.052	19.320	84	8.2	0.109	9.2098
3	0.3	0.003	296.41	44	4.3	0.053	18.849	85	8.3	0.110	9.0855
4	0.4	0.005	221.93	45	4.4	0.054	18.398	86	8.4	0.112	8.9641
5	0.5	0.006	177.25	46	4.5	0.056	17.967	87	8.5	0.113	8.8455
6	0.6	0.007	147.46	47	4.6	0.057	17.555	88	8.6	0.115	8.7296
7	0.7	0.008	126.18	48	4.7	0.058	17.159	89	8.7	0.116	8.6163
8	0.8	0.009	110.22	49	4.8	0.060	16.780	90	8.8	0.118	8.5056
9	0.9	0.010	97.809	50	4.9	0.061	16.416	91	8.9	0.119	8.3973
10	1.0	0.011	87.880	51	5.0	0.062	16.067	92	9.0	0.121	8.2914
11	1.1	0.013	79.756	52	5.1	0.064	15.730	93	9.1	0.122	8.1877
12	1.2	0.014	72.986	53	5.2	0.065	15.407	94	9.2	0.124	8.0863
13	1.3	0.015	67.258	54	5.3	0.066	15.096	95	9.3	0.125	7.9871
14	1.4	0.016	62.348	55	5.4	0.068	14.795	96	9.4	0.127	7.8899
15	1.5	0.017	58.093	56	5.5	0.069	14.506	97	9.5	0.128	7.7948
16	1.6	0.018	54.371	57	5.6	0.070	14.227	98	9.6	0.130	7.7016
17	1.7	0.020	51.086	58	5.7	0.072	13.957	99	9.7	0.131	7.6103
18	1.8	0.021	48.166	59	5.8	0.073	13.697	100	9.8	0.133	7.5209
19	1.9	0.022	45.553	60	5.9	0.074	13.446	101	9.9	0.135	7.4332
20	2.0	0.023	43.202	61	6.0	0.076	13.202	102	10.0	0.136	7.3473
21	2.1	0.024	41.075	62	6.1	0.077	12.967	103	10.1	0.138	7.2631
22	2.2	0.026	39.142	63	6.2	0.079	12.739	104	10.2	0.139	7.1805
23	2.2	0.027	37.376	64	6.3	0.080	12.518	105	10.3	0.141	7.0995
24	2.3	0.028	35.758	65	6.4	0.081	12.304	106	10.4	0.142	7.0200
25	2.4	0.029	34.270	66	6.5	0.083	12.096	107	10.5	0.144	6.9421
26	2.5	0.030	32.895	67	6.5	0.084	11.895	108	10.6	0.146	6.8656
27	2.6	0.032	31.623	68	6.6	0.085	11.700	109	10.7	0.147	6.7905
28	2.7	0.033	30.442	69	6.7	0.087	11.510	110	10.8	0.149	6.7168
29	2.8	0.034	29.342	70	6.8	0.088	11.326	111	10.9	0.151	6.6444
30	2.9	0.035	28.316	71	6.9	0.090	11.147	112	10.9	0.152	6.5734
31	3.0	0.037	27.355	72	7.0	0.091	10.973	113	11.0	0.154	6.5036
32	3.1	0.038	26.455	73	7.1	0.093	10.804	114	11.1	0.155	6.4350
33	3.2	0.039	25.610	74	7.2	0.094	10.639	115	11.2	0.157	6.3677
34	3.3	0.040	24.814	75	7.3	0.095	10.479	116	11.3	0.159	6.3015
35	3.4	0.042	24.064	76	7.4	0.097	10.323	117	11.4	0.160	6.2365
36	3.5	0.043	23.356	77	7.5	0.098	10.171	118	11.5	0.162	6.1726
37	3.6	0.044	22.685	78	7.6	0.100	10.023	119	11.6	0.164	6.1098
38	3.7	0.045	22.051	79	7.7	0.101	9.8790	120	11.7	0.165	6.0480
39	3.8	0.047	21.448	80	7.7	0.103	9.7385	121	11.8	0.167	5.9873
40	3.9	0.048	20.876	81	7.9	0.104	9.6014	122	11.9	0.169	5.9276

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
123	12.0	0.170	5.8689	166	16.2	0.249	4.0224	209	20.4	0.339	2.9501
124	12.1	0.172	5.8111	167	16.3	0.251	3.9910	210	20.5	0.341	2.9306
125	12.2	0.174	5.7543	168	16.4	0.253	3.9600	211	20.6	0.343	2.9112
126	12.3	0.175	5.6984	169	16.5	0.254	3.9293	212	20.7	0.346	2.8921
127	12.4	0.177	5.6434	170	16.6	0.256	3.8990	213	20.8	0.348	2.8731
128	12.5	0.179	5.5892	171	16.7	0.258	3.8691	214	20.9	0.350	2.8543
129	12.6	0.181	5.5359	172	16.8	0.260	3.8396	215	21.0	0.353	2.8357
130	12.7	0.182	5.4835	173	16.9	0.262	3.8103	216	21.1	0.355	2.8173
131	12.8	0.184	5.4318	174	17.0	0.264	3.7815	217	21.2	0.357	2.7990
132	12.9	0.186	5.3810	175	17.1	0.266	3.7530	218	21.3	0.360	2.7809
133	13.0	0.188	5.3309	176	17.2	0.268	3.7248	219	21.4	0.362	2.7630
134	13.1	0.189	5.2816	177	17.3	0.270	3.6969	220	21.5	0.364	2.7453
135	13.2	0.191	5.2330	178	17.4	0.273	3.6694	221	21.6	0.367	2.7277
136	13.3	0.193	5.1852	179	17.5	0.275	3.6421	222	21.7	0.369	2.7103
137	13.4	0.195	5.1380	180	17.6	0.277	3.6152	223	21.8	0.371	2.6931
138	13.5	0.196	5.0916	181	17.7	0.279	3.5886	224	21.9	0.374	2.6760
139	13.6	0.198	5.0458	182	17.8	0.281	3.5623	225	22.0	0.376	2.6591
140	13.7	0.200	5.0007	183	17.9	0.283	3.5363	226	22.1	0.378	2.6423
141	13.8	0.202	4.9563	184	18.0	0.285	3.5106	227	22.2	0.381	2.6257
142	13.9	0.204	4.9125	185	18.1	0.287	3.4851	228	22.3	0.383	2.6093
143	14.0	0.205	4.8693	186	18.2	0.289	3.4600	229	22.4	0.386	2.5930
144	14.1	0.207	4.8267	187	18.3	0.291	3.4351	230	22.5	0.388	2.5768
145	14.2	0.209	4.7847	188	18.4	0.293	3.4105	231	22.6	0.390	2.5608
146	14.3	0.211	4.7434	189	18.5	0.295	3.3862	232	22.7	0.393	2.5450
147	14.4	0.213	4.7025	190	18.6	0.297	3.3621	233	22.8	0.395	2.5292
148	14.5	0.214	4.6623	191	18.7	0.300	3.3383	234	22.9	0.398	2.5137
149	14.6	0.216	4.6226	192	18.8	0.302	3.3148	235	23.0	0.400	2.4982
150	14.7	0.218	4.5834	193	18.9	0.304	3.2915	236	23.1	0.403	2.4829
151	14.8	0.220	4.5448	194	19.0	0.306	3.2684	237	23.2	0.405	2.4678
152	14.9	0.222	4.5067	195	19.1	0.308	3.2456	238	23.3	0.408	2.4527
153	15.0	0.224	4.4691	196	19.2	0.310	3.2231	239	23.4	0.410	2.4378
154	15.1	0.226	4.4320	197	19.3	0.312	3.2007	240	23.5	0.413	2.4231
155	15.2	0.228	4.3954	198	19.4	0.315	3.1787	241	23.6	0.415	2.4084
156	15.2	0.229	4.3593	199	19.5	0.317	3.1568	242	23.7	0.418	2.3939
157	15.3	0.231	4.3236	200	19.6	0.319	3.1352	243	23.8	0.420	2.3795
158	15.4	0.233	4.2884	201	19.6	0.321	3.1137	244	23.9	0.423	2.3653
159	15.5	0.235	4.2536	202	19.7	0.323	3.0926	245	23.9	0.425	2.3511
160	15.6	0.237	4.2193	203	19.8	0.326	3.0716	246	24.0	0.428	2.3371
161	15.7	0.239	4.1855	204	19.9	0.328	3.0508	247	24.1	0.430	2.3232
162	15.8	0.241	4.1520	205	20.0	0.330	3.0303	248	24.2	0.433	2.3094
163	15.9	0.243	4.1190	206	20.1	0.332	3.0099	249	24.3	0.436	2.2958
164	16.0	0.245	4.0864	207	20.2	0.334	2.9898	250	24.4	0.438	2.2822
165	16.1	0.247	4.0542	208	20.3	0.337	2.9698	251	24.5	0.441	2.2688

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
252	24.6	0.443	2.2555	295	28.8	0.564	1.7731	338	33.0	0.703	1.4219
253	24.7	0.446	2.2423	296	28.9	0.567	1.7637	339	33.1	0.707	1.4149
254	24.8	0.449	2.2292	297	29.0	0.570	1.7543	340	33.2	0.710	1.4079
255	24.9	0.451	2.2162	298	29.1	0.573	1.7450	341	33.3	0.714	1.4010
256	25.0	0.454	2.2033	299	29.2	0.576	1.7358	342	33.4	0.717	1.3941
257	25.1	0.457	2.1905	300	29.3	0.579	1.7266	343	33.5	0.721	1.3873
258	25.2	0.459	2.1779	301	29.4	0.582	1.7175	344	33.6	0.724	1.3805
259	25.3	0.462	2.1653	302	29.5	0.585	1.7085	345	33.7	0.728	1.3737
260	25.4	0.465	2.1528	303	29.6	0.588	1.6995	346	33.8	0.732	1.3670
261	25.5	0.467	2.1405	304	29.7	0.591	1.6906	347	33.9	0.735	1.3604
262	25.6	0.470	2.1282	305	29.8	0.595	1.6818	348	34.0	0.739	1.3537
263	25.7	0.473	2.1160	306	29.9	0.598	1.6730	349	34.1	0.742	1.3472
264	25.8	0.475	2.1040	307	30.0	0.601	1.6643	350	34.2	0.746	1.3406
265	25.9	0.478	2.0920	308	30.1	0.604	1.6556	351	34.3	0.750	1.3342
266	26.0	0.481	2.0801	309	30.2	0.607	1.6471	352	34.4	0.753	1.3277
267	26.1	0.483	2.0684	310	30.3	0.610	1.6385	353	34.5	0.757	1.3213
268	26.2	0.486	2.0567	311	30.4	0.613	1.6300	354	34.6	0.760	1.3149
269	26.3	0.489	2.0451	312	30.5	0.617	1.6216	355	34.7	0.764	1.3086
270	26.4	0.492	2.0336	313	30.6	0.620	1.6133	356	34.8	0.768	1.3023
271	26.5	0.495	2.0222	314	30.7	0.623	1.6050	357	34.9	0.772	1.2961
272	26.6	0.497	2.0109	315	30.8	0.626	1.5967	358	35.0	0.775	1.2898
273	26.7	0.500	1.9996	316	30.9	0.630	1.5885	359	35.1	0.779	1.2837
274	26.8	0.503	1.9885	317	31.0	0.633	1.5804	360	35.2	0.783	1.2775
275	26.9	0.506	1.9774	318	31.1	0.636	1.5723	361	35.3	0.787	1.2714
276	27.0	0.509	1.9665	319	31.2	0.639	1.5643	362	35.4	0.790	1.2654
277	27.1	0.511	1.9556	320	31.3	0.643	1.5564	363	35.5	0.794	1.2594
278	27.2	0.514	1.9448	321	31.4	0.646	1.5485	364	35.6	0.798	1.2534
279	27.3	0.517	1.9341	322	31.5	0.649	1.5406	365	35.7	0.802	1.2474
280	27.4	0.520	1.9234	323	31.6	0.652	1.5328	366	35.8	0.805	1.2415
281	27.5	0.523	1.9129	324	31.7	0.656	1.5251	367	35.9	0.809	1.2357
282	27.6	0.526	1.9024	325	31.8	0.659	1.5174	368	36.0	0.813	1.2298
283	27.7	0.529	1.8920	326	31.9	0.662	1.5097	369	36.1	0.817	1.2240
284	27.8	0.531	1.8817	327	32.0	0.666	1.5021	370	36.2	0.821	1.2182
285	27.9	0.534	1.8714	328	32.1	0.669	1.4946	371	36.3	0.825	1.2125
286	28.0	0.537	1.8613	329	32.2	0.672	1.4871	372	36.4	0.829	1.2068
287	28.1	0.540	1.8512	330	32.3	0.676	1.4797	373	36.5	0.833	1.2011
288	28.2	0.543	1.8412	331	32.4	0.679	1.4723	374	36.6	0.836	1.1955
289	28.3	0.546	1.8312	332	32.5	0.683	1.4649	375	36.7	0.840	1.1899
290	28.3	0.549	1.8214	333	32.6	0.686	1.4576	376	36.8	0.844	1.1844
291	28.4	0.552	1.8116	334	32.6	0.689	1.4504	377	36.9	0.848	1.1788
292	28.5	0.555	1.8019	335	32.7	0.693	1.4432	378	37.0	0.852	1.1733
293	28.6	0.558	1.7922	336	32.8	0.696	1.4360	379	37.0	0.856	1.1679
294	28.7	0.561	1.7827	337	32.9	0.700	1.4289	380	37.1	0.860	1.1624

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
381	37.2	0.864	1.1570	424	41.4	1.050	0.9522	467	45.7	1.265	0.7905
382	37.3	0.868	1.1517	425	41.5	1.055	0.9480	468	45.7	1.270	0.7871
383	37.4	0.872	1.1463	426	41.6	1.060	0.9438	469	45.8	1.276	0.7838
384	37.5	0.876	1.1410	427	41.7	1.064	0.9396	470	45.9	1.281	0.7805
385	37.6	0.880	1.1358	428	41.8	1.069	0.9355	471	46.0	1.287	0.7772
386	37.7	0.885	1.1305	429	41.9	1.074	0.9314	472	46.1	1.292	0.7739
387	37.8	0.889	1.1253	430	42.0	1.078	0.9273	473	46.2	1.298	0.7707
388	37.9	0.893	1.1201	431	42.1	1.083	0.9233	474	46.3	1.303	0.7674
389	38.0	0.897	1.1150	432	42.2	1.088	0.9192	475	46.4	1.309	0.7642
390	38.1	0.901	1.1099	433	42.3	1.093	0.9152	476	46.5	1.314	0.7610
391	38.2	0.905	1.1048	434	42.4	1.097	0.9112	477	46.6	1.320	0.7578
392	38.3	0.909	1.0997	435	42.5	1.102	0.9072	478	46.7	1.325	0.7546
393	38.4	0.913	1.0947	436	42.6	1.107	0.9033	479	46.8	1.331	0.7514
394	38.5	0.918	1.0897	437	42.7	1.112	0.8993	480	46.9	1.336	0.7483
395	38.6	0.922	1.0847	438	42.8	1.117	0.8954	481	47.0	1.342	0.7452
396	38.7	0.926	1.0798	439	42.9	1.122	0.8915	482	47.1	1.348	0.7421
397	38.8	0.930	1.0749	440	43.0	1.127	0.8876	483	47.2	1.353	0.7390
398	38.9	0.935	1.0700	441	43.1	1.131	0.8838	484	47.3	1.359	0.7359
399	39.0	0.939	1.0651	442	43.2	1.136	0.8800	485	47.4	1.365	0.7328
400	39.1	0.943	1.0603	443	43.3	1.141	0.8762	486	47.5	1.370	0.7297
401	39.2	0.947	1.0555	444	43.4	1.146	0.8724	487	47.6	1.376	0.7267
402	39.3	0.952	1.0507	445	43.5	1.151	0.8686	488	47.7	1.382	0.7237
403	39.4	0.956	1.0460	446	43.6	1.156	0.8648	489	47.8	1.388	0.7207
404	39.5	0.960	1.0412	447	43.7	1.161	0.8611	490	47.9	1.393	0.7177
405	39.6	0.965	1.0365	448	43.8	1.166	0.8574	491	48.0	1.399	0.7147
406	39.7	0.969	1.0319	449	43.9	1.171	0.8537	492	48.1	1.405	0.7117
407	39.8	0.973	1.0272	450	44.0	1.176	0.8500	493	48.2	1.411	0.7088
408	39.9	0.978	1.0226	451	44.1	1.181	0.8464	494	48.3	1.417	0.7059
409	40.0	0.982	1.0180	452	44.2	1.187	0.8428	495	48.4	1.423	0.7029
410	40.1	0.987	1.0135	453	44.3	1.192	0.8391	496	48.5	1.428	0.7000
411	40.2	0.991	1.0089	454	44.4	1.197	0.8355	497	48.6	1.434	0.6971
412	40.3	0.996	1.0044	455	44.5	1.202	0.8320	498	48.7	1.440	0.6943
413	40.4	1.000	0.9999	456	44.6	1.207	0.8284	499	48.8	1.446	0.6914
414	40.5	1.005	0.9955	457	44.7	1.212	0.8249	500	48.9	1.452	0.6886
415	40.6	1.009	0.9910	458	44.8	1.218	0.8214	501	49.0	1.458	0.6857
416	40.7	1.014	0.9866	459	44.9	1.223	0.8179	502	49.1	1.464	0.6829
417	40.8	1.018	0.9822	460	45.0	1.228	0.8144	503	49.2	1.470	0.6801
418	40.9	1.023	0.9779	461	45.1	1.233	0.8109	504	49.3	1.476	0.6773
419	41.0	1.027	0.9735	462	45.2	1.238	0.8075	505	49.4	1.483	0.6745
420	41.1	1.032	0.9692	463	45.3	1.244	0.8040	506	49.5	1.489	0.6718
421	41.2	1.036	0.9649	464	45.4	1.249	0.8006	507	49.6	1.495	0.6690
422	41.3	1.041	0.9606	465	45.5	1.254	0.7972	508	49.7	1.501	0.6663
423	41.3	1.046	0.9564	466	45.6	1.260	0.7938	509	49.8	1.507	0.6635

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
510	49.9	1.513	0.6608	553	54.1	1.800	0.5556	596	58.3	2.131	0.4692
511	50.0	1.519	0.6581	554	54.2	1.807	0.5533	597	58.4	2.140	0.4674
512	50.0	1.526	0.6554	555	54.3	1.814	0.5512	598	58.5	2.148	0.4656
513	50.1	1.532	0.6528	556	54.3	1.822	0.5490	599	58.6	2.156	0.4638
514	50.2	1.538	0.6501	557	54.4	1.829	0.5468	600	58.7	2.165	0.4620
515	50.3	1.545	0.6474	558	54.5	1.836	0.5446	601	58.7	2.173	0.4602
516	50.4	1.551	0.6448	559	54.6	1.843	0.5425	602	58.8	2.181	0.4584
517	50.5	1.557	0.6422	560	54.7	1.851	0.5403	603	58.9	2.190	0.4566
518	50.6	1.564	0.6396	561	54.8	1.858	0.5382	604	59.0	2.198	0.4549
519	50.7	1.570	0.6370	562	54.9	1.865	0.5361	605	59.1	2.207	0.4531
520	50.8	1.576	0.6344	563	55.0	1.873	0.5340	606	59.2	2.215	0.4514
521	50.9	1.583	0.6318	564	55.1	1.880	0.5318	607	59.3	2.224	0.4496
522	51.0	1.589	0.6293	565	55.2	1.888	0.5297	608	59.4	2.233	0.4479
523	51.1	1.596	0.6267	566	55.3	1.895	0.5277	609	59.5	2.241	0.4462
524	51.2	1.602	0.6242	567	55.4	1.903	0.5256	610	59.6	2.250	0.4445
525	51.3	1.609	0.6216	568	55.5	1.910	0.5235	611	59.7	2.259	0.4428
526	51.4	1.615	0.6191	569	55.6	1.918	0.5215	612	59.8	2.267	0.4411
527	51.5	1.622	0.6166	570	55.7	1.925	0.5194	613	59.9	2.276	0.4394
528	51.6	1.628	0.6141	571	55.8	1.933	0.5174	614	60.0	2.285	0.4377
529	51.7	1.635	0.6117	572	55.9	1.940	0.5153	615	60.1	2.294	0.4360
530	51.8	1.641	0.6092	573	56.0	1.948	0.5133	616	60.2	2.302	0.4343
531	51.9	1.648	0.6067	574	56.1	1.956	0.5113	617	60.3	2.311	0.4327
532	52.0	1.655	0.6043	575	56.2	1.964	0.5093	618	60.4	2.320	0.4310
533	52.1	1.661	0.6019	576	56.3	1.971	0.5073	619	60.5	2.329	0.4294
534	52.2	1.668	0.5995	577	56.4	1.979	0.5053	620	60.6	2.338	0.4277
535	52.3	1.675	0.5970	578	56.5	1.987	0.5033	621	60.7	2.347	0.4261
536	52.4	1.682	0.5946	579	56.6	1.995	0.5014	622	60.8	2.356	0.4244
537	52.5	1.688	0.5923	580	56.7	2.002	0.4994	623	60.9	2.365	0.4228
538	52.6	1.695	0.5899	581	56.8	2.010	0.4975	624	61.0	2.374	0.4212
539	52.7	1.702	0.5875	582	56.9	2.018	0.4955	625	61.1	2.383	0.4196
540	52.8	1.709	0.5852	583	57.0	2.026	0.4936	626	61.2	2.392	0.4180
541	52.9	1.716	0.5828	584	57.1	2.034	0.4917	627	61.3	2.402	0.4164
542	53.0	1.723	0.5805	585	57.2	2.042	0.4897	628	61.4	2.411	0.4148
543	53.1	1.730	0.5782	586	57.3	2.050	0.4878	629	61.5	2.420	0.4132
544	53.2	1.737	0.5759	587	57.4	2.058	0.4859	630	61.6	2.429	0.4117
545	53.3	1.743	0.5736	588	57.5	2.066	0.4840	631	61.7	2.439	0.4101
546	53.4	1.750	0.5713	589	57.6	2.074	0.4822	632	61.8	2.448	0.4085
547	53.5	1.757	0.5690	590	57.7	2.082	0.4803	633	61.9	2.457	0.4070
548	53.6	1.764	0.5667	591	57.8	2.090	0.4784	634	62.0	2.467	0.4054
549	53.7	1.772	0.5645	592	57.9	2.098	0.4766	635	62.1	2.476	0.4039
550	53.8	1.779	0.5622	593	58.0	2.107	0.4747	636	62.2	2.485	0.4023
551	53.9	1.786	0.5600	594	58.1	2.115	0.4729	637	62.3	2.495	0.4008
552	54.0	1.793	0.5578	595	58.2	2.123	0.4710	638	62.4	2.504	0.3993

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
639	62.5	2.514	0.3978	682	66.7	2.956	0.3383	725	70.9	3.467	0.2884
640	62.6	2.524	0.3963	683	66.8	2.967	0.3370	726	71.0	3.480	0.2874
641	62.7	2.533	0.3948	684	66.9	2.978	0.3358	727	71.1	3.492	0.2863
642	62.8	2.543	0.3933	685	67.0	2.989	0.3345	728	71.2	3.505	0.2853
643	62.9	2.552	0.3918	686	67.1	3.001	0.3333	729	71.3	3.518	0.2842
644	63.0	2.562	0.3903	687	67.2	3.012	0.3320	730	71.4	3.531	0.2832
645	63.0	2.572	0.3888	688	67.3	3.023	0.3308	731	71.5	3.544	0.2822
646	63.1	2.582	0.3873	689	67.4	3.034	0.3296	732	71.6	3.557	0.2811
647	63.2	2.591	0.3859	690	67.4	3.046	0.3283	733	71.7	3.570	0.2801
648	63.3	2.601	0.3844	691	67.5	3.057	0.3271	734	71.7	3.583	0.2791
649	63.4	2.611	0.3830	692	67.6	3.068	0.3259	735	71.8	3.597	0.2780
650	63.5	2.621	0.3815	693	67.7	3.080	0.3247	736	71.9	3.610	0.2770
651	63.6	2.631	0.3801	694	67.8	3.091	0.3235	737	72.0	3.623	0.2760
652	63.7	2.641	0.3786	695	67.9	3.103	0.3223	738	72.1	3.636	0.2750
653	63.8	2.651	0.3772	696	68.0	3.114	0.3211	739	72.2	3.650	0.2740
654	63.9	2.661	0.3758	697	68.1	3.126	0.3199	740	72.3	3.663	0.2730
655	64.0	2.671	0.3744	698	68.2	3.138	0.3187	741	72.4	3.677	0.2720
656	64.1	2.681	0.3730	699	68.3	3.149	0.3175	742	72.5	3.690	0.2710
657	64.2	2.691	0.3716	700	68.4	3.161	0.3164	743	72.6	3.704	0.2700
658	64.3	2.701	0.3702	701	68.5	3.173	0.3152	744	72.7	3.717	0.2690
659	64.4	2.712	0.3688	702	68.6	3.185	0.3140	745	72.8	3.731	0.2680
660	64.5	2.722	0.3674	703	68.7	3.196	0.3129	746	72.9	3.744	0.2671
661	64.6	2.732	0.3660	704	68.8	3.208	0.3117	747	73.0	3.758	0.2661
662	64.7	2.743	0.3646	705	68.9	3.220	0.3105	748	73.1	3.772	0.2651
663	64.8	2.753	0.3633	706	69.0	3.232	0.3094	749	73.2	3.786	0.2642
664	64.9	2.763	0.3619	707	69.1	3.244	0.3083	750	73.3	3.800	0.2632
665	65.0	2.774	0.3605	708	69.2	3.256	0.3071	751	73.4	3.813	0.2622
666	65.1	2.784	0.3592	709	69.3	3.268	0.3060	752	73.5	3.827	0.2613
667	65.2	2.795	0.3578	710	69.4	3.280	0.3049	753	73.6	3.841	0.2603
668	65.3	2.805	0.3565	711	69.5	3.292	0.3037	754	73.7	3.855	0.2594
669	65.4	2.816	0.3552	712	69.6	3.305	0.3026	755	73.8	3.869	0.2584
670	65.5	2.826	0.3538	713	69.7	3.317	0.3015	756	73.9	3.884	0.2575
671	65.6	2.837	0.3525	714	69.8	3.329	0.3004	757	74.0	3.898	0.2566
672	65.7	2.848	0.3512	715	69.9	3.341	0.2993	758	74.1	3.912	0.2556
673	65.8	2.858	0.3499	716	70.0	3.354	0.2982	759	74.2	3.926	0.2547
674	65.9	2.869	0.3486	717	70.1	3.366	0.2971	760	74.3	3.941	0.2538
675	66.0	2.880	0.3473	718	70.2	3.379	0.2960	761	74.4	3.955	0.2528
676	66.1	2.891	0.3460	719	70.3	3.391	0.2949	762	74.5	3.969	0.2519
677	66.2	2.901	0.3447	720	70.4	3.404	0.2938	763	74.6	3.984	0.2510
678	66.3	2.912	0.3434	721	70.5	3.416	0.2927	764	74.7	3.998	0.2501
679	66.4	2.923	0.3421	722	70.6	3.429	0.2916	765	74.8	4.013	0.2492
680	66.5	2.934	0.3408	723	70.7	3.441	0.2906	766	74.9	4.028	0.2483
681	66.6	2.945	0.3396	724	70.8	3.454	0.2895	767	75.0	4.042	0.2474

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
768	75.1	4.057	0.2465	811	79.3	4.739	0.2110	854	83.5	5.526	0.1810
769	75.2	4.072	0.2456	812	79.4	4.756	0.2103	855	83.6	5.546	0.1803
770	75.3	4.087	0.2447	813	79.5	4.773	0.2095	856	83.7	5.566	0.1797
771	75.4	4.101	0.2438	814	79.6	4.790	0.2088	857	83.8	5.586	0.1790
772	75.5	4.116	0.2429	815	79.7	4.807	0.2080	858	83.9	5.605	0.1784
773	75.6	4.131	0.2421	816	79.8	4.825	0.2073	859	84.0	5.625	0.1778
774	75.7	4.146	0.2412	817	79.9	4.842	0.2065	860	84.1	5.645	0.1771
775	75.8	4.161	0.2403	818	80.0	4.859	0.2058	861	84.2	5.666	0.1765
776	75.9	4.176	0.2394	819	80.1	4.877	0.2051	862	84.3	5.686	0.1759
777	76.0	4.192	0.2386	820	80.2	4.894	0.2043	863	84.4	5.706	0.1753
778	76.1	4.207	0.2377	821	80.3	4.912	0.2036	864	84.5	5.726	0.1746
779	76.1	4.222	0.2368	822	80.4	4.929	0.2029	865	84.6	5.747	0.1740
780	76.2	4.237	0.2360	823	80.4	4.947	0.2021	866	84.7	5.767	0.1734
781	76.3	4.253	0.2351	824	80.5	4.965	0.2014	867	84.8	5.788	0.1728
782	76.4	4.268	0.2343	825	80.6	4.983	0.2007	868	84.8	5.808	0.1722
783	76.5	4.284	0.2334	826	80.7	5.001	0.2000	869	84.9	5.829	0.1716
784	76.6	4.299	0.2326	827	80.8	5.019	0.1993	870	85.0	5.850	0.1710
785	76.7	4.315	0.2318	828	80.9	5.037	0.1985	871	85.1	5.870	0.1703
786	76.8	4.330	0.2309	829	81.0	5.055	0.1978	872	85.2	5.891	0.1697
787	76.9	4.346	0.2301	830	81.1	5.073	0.1971	873	85.3	5.912	0.1691
788	77.0	4.362	0.2293	831	81.2	5.091	0.1964	874	85.4	5.933	0.1685
789	77.1	4.378	0.2284	832	81.3	5.109	0.1957	875	85.5	5.954	0.1679
790	77.2	4.393	0.2276	833	81.4	5.127	0.1950	876	85.6	5.975	0.1674
791	77.3	4.409	0.2268	834	81.5	5.146	0.1943	877	85.7	5.997	0.1668
792	77.4	4.425	0.2260	835	81.6	5.164	0.1936	878	85.8	6.018	0.1662
793	77.5	4.441	0.2252	836	81.7	5.183	0.1930	879	85.9	6.039	0.1656
794	77.6	4.457	0.2243	837	81.8	5.201	0.1923	880	86.0	6.061	0.1650
795	77.7	4.473	0.2235	838	81.9	5.220	0.1916	881	86.1	6.082	0.1644
796	77.8	4.490	0.2227	839	82.0	5.239	0.1909	882	86.2	6.104	0.1638
797	77.9	4.506	0.2219	840	82.1	5.257	0.1902	883	86.3	6.125	0.1633
798	78.0	4.522	0.2211	841	82.2	5.276	0.1895	884	86.4	6.147	0.1627
799	78.1	4.538	0.2203	842	82.3	5.295	0.1889	885	86.5	6.169	0.1621
800	78.2	4.555	0.2195	843	82.4	5.314	0.1882	886	86.6	6.191	0.1615
801	78.3	4.571	0.2188	844	82.5	5.333	0.1875	887	86.7	6.213	0.1610
802	78.4	4.588	0.2180	845	82.6	5.352	0.1869	888	86.8	6.235	0.1604
803	78.5	4.604	0.2172	846	82.7	5.371	0.1862	889	86.9	6.257	0.1598
804	78.6	4.621	0.2164	847	82.8	5.390	0.1855	890	87.0	6.279	0.1593
805	78.7	4.638	0.2156	848	82.9	5.409	0.1849	891	87.1	6.301	0.1587
806	78.8	4.654	0.2149	849	83.0	5.429	0.1842	892	87.2	6.323	0.1581
807	78.9	4.671	0.2141	850	83.1	5.448	0.1836	893	87.3	6.346	0.1576
808	79.0	4.688	0.2133	851	83.2	5.468	0.1829	894	87.4	6.368	0.1570
809	79.1	4.705	0.2126	852	83.3	5.487	0.1822	895	87.5	6.391	0.1565
810	79.2	4.722	0.2118	853	83.4	5.507	0.1816	896	87.6	6.413	0.1559

#	%	Hz	sec.	#	%	Hz	sec.	#	%	Hz	sec.
897	87.7	6.436	0.1554	940	91.9	7.487	0.1336	983	96.1	8.702	0.1149
898	87.8	6.459	0.1548	941	92.0	7.514	0.1331	984	96.2	8.732	0.1145
899	87.9	6.482	0.1543	942	92.1	7.540	0.1326	985	96.3	8.763	0.1141
900	88.0	6.505	0.1537	943	92.2	7.566	0.1322	986	96.4	8.793	0.1137
901	88.1	6.528	0.1532	944	92.3	7.593	0.1317	987	96.5	8.824	0.1133
902	88.2	6.551	0.1527	945	92.4	7.620	0.1312	988	96.6	8.855	0.1129
903	88.3	6.574	0.1521	946	92.5	7.646	0.1308	999	97.7	9.200	0.1087
904	88.4	6.597	0.1516	947	92.6	7.673	0.1303	1000	97.8	9.232	0.1083
905	88.5	6.620	0.1510	948	92.7	7.700	0.1299	1001	97.8	9.264	0.1079
906	88.6	6.644	0.1505	949	92.8	7.727	0.1294	1002	97.9	9.297	0.1076
907	88.7	6.667	0.1500	950	92.9	7.754	0.1290	1003	98.0	9.329	0.1072
908	88.8	6.691	0.1495	951	93.0	7.781	0.1285	1004	98.1	9.362	0.1068
909	88.9	6.714	0.1489	952	93.1	7.809	0.1281	1005	98.2	9.394	0.1064
910	89.0	6.738	0.1484	953	93.2	7.836	0.1276	1006	98.3	9.427	0.1061
911	89.1	6.762	0.1479	954	93.3	7.864	0.1272	1007	98.4	9.460	0.1057
912	89.1	6.786	0.1474	955	93.4	7.891	0.1267	1008	98.5	9.493	0.1053
913	89.2	6.810	0.1469	956	93.5	7.919	0.1263	1009	98.6	9.526	0.1050
914	89.3	6.834	0.1463	957	93.5	7.947	0.1258	1010	98.7	9.559	0.1046
915	89.4	6.858	0.1458	958	93.6	7.974	0.1254	1011	98.8	9.592	0.1043
916	89.5	6.882	0.1453	959	93.7	8.002	0.1250	1012	98.9	9.625	0.1039
917	89.6	6.906	0.1448	960	93.8	8.030	0.1245	1013	99.0	9.659	0.1035
918	89.7	6.931	0.1443	961	93.9	8.058	0.1241	1014	99.1	9.692	0.1032
919	89.8	6.955	0.1438	962	94.0	8.087	0.1237	1015	99.2	9.726	0.1028
920	89.9	6.979	0.1433	963	94.1	8.115	0.1232	1016	99.3	9.760	0.1025
921	90.0	7.004	0.1428	964	94.2	8.143	0.1228	989	96.7	8.885	0.1125
922	90.1	7.029	0.1423	965	94.3	8.172	0.1224	990	96.8	8.916	0.1122
923	90.2	7.053	0.1418	966	94.4	8.200	0.1219	991	96.9	8.948	0.1118
924	90.3	7.078	0.1413	967	94.5	8.229	0.1215	992	97.0	8.979	0.1114
925	90.4	7.103	0.1408	968	94.6	8.258	0.1211	993	97.1	9.010	0.1110
926	90.5	7.128	0.1403	969	94.7	8.287	0.1207	994	97.2	9.041	0.1106
927	90.6	7.153	0.1398	970	94.8	8.316	0.1203	995	97.3	9.073	0.1102
928	90.7	7.179	0.1393	971	94.9	8.345	0.1198	996	97.4	9.105	0.1098
929	90.8	7.204	0.1388	972	95.0	8.374	0.1194	997	97.5	9.136	0.1095
930	90.9	7.229	0.1383	973	95.1	8.403	0.1190	998	97.6	9.168	0.1091
931	91.0	7.255	0.1378	974	95.2	8.433	0.1186	1017	99.4	9.794	0.1021
932	91.1	7.280	0.1374	975	95.3	8.462	0.1182	1018	99.5	9.828	0.1017
933	91.2	7.306	0.1369	976	95.4	8.492	0.1178	1019	99.6	9.862	0.1014
934	91.3	7.331	0.1364	977	95.5	8.521	0.1174	1020	99.7	9.896	0.1010
935	91.4	7.357	0.1359	978	95.6	8.551	0.1169	1021	99.8	9.931	0.1007
936	91.5	7.383	0.1354	979	95.7	8.581	0.1165	1022	99.9	9.965	0.1003
937	91.6	7.409	0.1350	980	95.8	8.611	0.1161	1023	100.0	10.00	0.1000
938	91.7	7.435	0.1345	981	95.9	8.641	0.1157				
939	91.8	7.461	0.1340	982	96.0	8.671	0.1153				

LFO depth lists

Oscillator LFO depth list

Depth	Waves span		Depth	Waves span		Depth	Waves span		Depth	Waves span	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
1	0.63	0.07	26	16.38	1.82	51	32.13	3.57	76	47.88	5.32
2	1.26	0.14	27	17.01	1.89	52	32.76	3.64	77	48.51	5.39
3	1.89	0.21	28	17.64	1.96	53	33.39	3.71	78	5.46	49.14
4	2.52	0.28	29	18.27	2.03	54	34.02	3.78	79	5.53	49.77
5	3.15	0.35	30	18.90	2.10	55	34.65	3.85	80	5.60	50.40
6	3.78	0.42	31	19.53	2.17	56	35.28	3.92	81	5.67	51.03
7	4.41	0.49	32	20.16	2.24	57	35.91	3.99	82	5.74	51.66
8	5.04	0.56	33	20.79	2.31	58	36.54	4.06	83	5.81	52.29
9	5.67	0.63	34	21.42	2.38	59	37.17	4.13	84	5.88	52.92
10	6.30	0.70	35	22.05	2.45	60	37.80	4.20	85	5.95	53.55
11	6.93	0.77	36	22.68	2.52	61	38.43	4.27	86	6.02	54.18
12	7.56	0.84	37	23.31	2.59	62	39.06	4.34	87	6.09	54.81
13	8.19	0.91	38	23.94	2.66	63	39.69	4.41	88	6.16	55.44
14	8.82	0.98	39	24.57	2.73	64	40.32	4.48	89	6.23	56.07
15	9.45	1.05	40	25.20	2.80	65	40.95	4.55	90	6.30	56.70
16	10.08	1.12	41	25.83	2.87	66	41.58	4.62	91	6.37	57.33
17	10.71	1.19	42	26.46	2.94	67	42.21	4.69	92	6.44	57.96
18	11.34	1.26	43	27.09	3.01	68	42.84	4.76	93	6.51	58.59
19	11.97	1.33	44	27.72	3.08	69	43.47	4.83	94	6.58	59.22
20	12.60	1.40	45	28.35	3.15	70	44.10	4.90	95	6.65	59.85
21	13.23	1.47	46	28.98	3.22	71	44.73	4.97	96	6.72	60.48
22	13.86	1.54	47	29.61	3.29	72	45.36	5.04	97	6.79	61.11
23	14.49	1.61	48	30.24	3.36	73	45.99	5.11	98	6.86	61.74
24	15.12	1.68	49	30.87	3.43	74	46.62	5.18	99	6.93	62.37
25	15.75	1.75	50	31.50	3.50	75	47.25	5.25	100	7.00	63.00

Shape LFO depth list

Depth	Waves span		Depth	Waves span		Depth	Waves span		Depth	Waves span	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
0	0	0	33	0.45	4.07	66	0.90	8.14	99	1.36	12.21
1	0.01	0.12	34	0.47	4.19	67	0.92	8.26	100	1.37	12.33
2	0.03	0.25	35	0.48	4.32	68	0.93	8.38	101	1.38	12.45
3	0.04	0.37	36	0.49	4.44	69	0.95	8.51	102	1.40	12.58
4	0.05	0.49	37	0.51	4.56	70	0.96	8.63	103	1.41	12.70
5	0.07	0.62	38	0.52	4.68	71	0.97	8.75	104	1.42	12.82
6	0.08	0.74	39	0.53	4.81	72	0.99	8.88	105	1.44	12.95
7	0.10	0.86	40	0.55	4.93	73	1.00	9.00	106	1.45	13.07
8	0.11	0.99	41	0.56	5.05	74	1.01	9.12	107	1.47	13.19
9	0.12	1.11	42	0.58	5.18	75	1.03	9.25	108	1.48	13.32
10	0.14	1.23	43	0.59	5.30	76	1.04	9.37	109	1.49	13.44
11	0.15	1.36	44	0.60	5.42	77	1.05	9.49	110	1.51	13.56
12	0.16	1.48	45	0.62	5.55	78	1.07	9.62	111	1.52	13.68
13	0.18	1.60	46	0.63	5.67	79	1.08	9.74	112	1.53	13.81
14	0.19	1.73	47	0.64	5.79	80	1.10	9.86	113	1.55	13.93
15	0.21	1.85	48	0.66	5.92	81	1.11	9.99	114	1.56	14.05
16	0.22	1.97	49	0.67	6.04	82	1.12	10.11	115	1.58	14.18
17	0.23	2.10	50	0.68	6.16	83	1.14	10.23	116	1.59	14.30
18	0.25	2.22	51	0.70	6.29	84	1.15	10.36	117	1.60	14.42
19	0.26	2.34	52	0.71	6.41	85	1.16	10.48	118	1.62	14.55
20	0.27	2.47	53	0.73	6.53	86	1.18	10.60	119	1.63	14.67
21	0.29	2.59	54	0.74	6.66	87	1.19	10.73	120	1.64	14.79
22	0.30	2.71	55	0.75	6.78	88	1.21	10.85	121	1.66	14.92
23	0.32	2.84	56	0.77	6.90	89	1.22	10.97	122	1.67	15.04
24	0.33	2.96	57	0.78	7.03	90	1.23	11.10	123	1.68	15.16
25	0.34	3.08	58	0.79	7.15	91	1.25	11.22	124	1.70	15.29
26	0.36	3.21	59	0.81	7.27	92	1.26	11.34	125	1.71	15.41
27	0.37	3.33	60	0.82	7.40	93	1.27	11.47	126	1.73	15.53
28	0.38	3.45	61	0.84	7.52	94	1.29	11.59	127	1.74	15.66
29	0.40	3.58	62	0.85	7.64	95	1.30	11.71	128	1.75	15.78
30	0.41	3.70	63	0.86	7.77	96	1.32	11.84	129	1.77	15.90
31	0.42	3.82	64	0.88	7.89	97	1.33	11.96	130	1.78	16.03
32	0.44	3.95	65	0.89	8.01	98	1.34	12.08	131	1.79	16.15

Depth	Waves span		Depth	Waves span		Depth	Waves span		Depth	Waves span	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
132	1.81	16.27	167	2.29	20.59	202	2.77	24.90	237	3.25	29.22
133	1.82	16.40	168	2.30	20.71	203	2.78	25.03	238	3.26	29.34
134	1.84	16.52	169	2.32	20.84	204	2.79	25.15	239	3.27	29.47
135	1.85	16.64	170	2.33	20.96	205	2.81	25.27	240	3.29	29.59
136	1.86	16.77	171	2.34	21.08	206	2.82	25.40	241	3.30	29.71
137	1.88	16.89	172	2.36	21.21	207	2.84	25.52	242	3.32	29.84
138	1.89	17.01	173	2.37	21.33	208	2.85	25.64	243	3.33	29.96
139	1.90	17.14	174	2.38	21.45	209	2.86	25.77	244	3.34	30.08
140	1.92	17.26	175	2.40	21.58	210	2.88	25.89	245	3.36	30.21
141	1.93	17.38	176	2.41	21.70	211	2.89	26.01	246	3.37	30.33
142	1.95	17.51	177	2.42	21.82	212	2.90	26.14	247	3.38	30.45
143	1.96	17.63	178	2.44	21.95	213	2.92	26.26	248	3.40	30.58
144	1.97	17.75	179	2.45	22.07	214	2.93	26.38	249	3.41	30.70
145	1.99	17.88	180	2.47	22.19	215	2.95	26.51	250	3.42	30.82
146	2.00	18.00	181	2.48	22.32	216	2.96	26.63	251	3.44	30.95
147	2.01	18.12	182	2.49	22.44	217	2.97	26.75	252	3.45	31.07
148	2.03	18.25	183	2.51	22.56	218	2.99	26.88	253	3.47	31.19
149	2.04	18.37	184	2.52	22.68	219	3.00	27.00	254	3.48	31.32
150	2.05	18.49	185	2.53	22.81	220	3.01	27.12	255	3.49	31.44
151	2.07	18.62	186	2.55	22.93	221	3.03	27.25	256	3.51	31.56
152	2.08	18.74	187	2.56	23.05	222	3.04	27.37	257	3.52	31.68
153	2.10	18.86	188	2.58	23.18	223	3.05	27.49	258	3.53	31.81
154	2.11	18.99	189	2.59	23.30	224	3.07	27.62	259	3.55	31.93
155	2.12	19.11	190	2.60	23.42	225	3.08	27.74	260	3.56	32.05
156	2.14	19.23	191	2.62	23.55	226	3.10	27.86	261	3.58	32.18
157	2.15	19.36	192	2.63	23.67	227	3.11	27.99	262	3.59	32.30
158	2.16	19.48	193	2.64	23.79	228	3.12	28.11	263	3.60	32.42
159	2.18	19.60	194	2.66	23.92	229	3.14	28.23	264	3.62	32.55
160	2.19	19.73	195	2.67	24.04	230	3.15	28.36	265	3.63	32.67
161	2.21	19.85	196	2.68	24.16	231	3.16	28.48	266	3.64	32.79
162	2.22	19.97	197	2.70	24.29	232	3.18	28.60	267	3.66	32.92
163	2.23	20.10	198	2.71	24.41	233	3.19	28.73	268	3.67	33.04
164	2.25	20.22	199	2.73	24.53	234	3.21	28.85	269	3.68	33.16
165	2.26	20.34	200	2.74	24.66	235	3.22	28.97	270	3.70	33.29
166	2.27	20.47	201	2.75	24.78	236	3.23	29.10	271	3.71	33.41

Depth	Waves span		Depth	Waves span		Depth	Waves span		Depth	Waves span	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
272	3.73	33.53	307	4.21	37.85	342	4.68	42.16	377	5.16	46.48
273	3.74	33.66	308	4.22	37.97	343	4.70	42.29	378	5.18	46.60
274	3.75	33.78	309	4.23	38.10	344	4.71	42.41	379	5.19	46.73
275	3.77	33.90	310	4.25	38.22	345	4.73	42.53	380	5.21	46.85
276	3.78	34.03	311	4.26	38.34	346	4.74	42.66	381	5.22	46.97
277	3.79	34.15	312	4.27	38.47	347	4.75	42.78	382	5.23	47.10
278	3.81	34.27	313	4.29	38.59	348	4.77	42.90	383	5.25	47.22
279	3.82	34.40	314	4.30	38.71	349	4.78	43.03	384	5.26	47.34
280	3.84	34.52	315	4.32	38.84	350	4.79	43.15	385	5.27	47.47
281	3.85	34.64	316	4.33	38.96	351	4.81	43.27	386	5.29	47.59
282	3.86	34.77	317	4.34	39.08	352	4.82	43.40	387	5.30	47.71
283	3.88	34.89	318	4.36	39.21	353	4.84	43.52	388	5.32	47.84
284	3.89	35.01	319	4.37	39.33	354	4.85	43.64	389	5.33	47.96
285	3.90	35.14	320	4.38	39.45	355	4.86	43.77	390	5.34	48.08
286	3.92	35.26	321	4.40	39.58	356	4.88	43.89	391	5.36	48.21
287	3.93	35.38	322	4.41	39.70	357	4.89	44.01	392	5.37	48.33
288	3.95	35.51	323	4.42	39.82	358	4.90	44.14	393	5.38	48.45
289	3.96	35.63	324	4.44	39.95	359	4.92	44.26	394	5.40	48.58
290	3.97	35.75	325	4.45	40.07	360	4.93	44.38	395	5.41	48.70
291	3.99	35.88	326	4.47	40.19	361	4.95	44.51	396	5.42	48.82
292	4.00	36.00	327	4.48	40.32	362	4.96	44.63	397	5.44	48.95
293	4.01	36.12	328	4.49	40.44	363	4.97	44.75	398	5.45	49.07
294	4.03	36.25	329	4.51	40.56	364	4.99	44.88	399	5.47	49.19
295	4.04	36.37	330	4.52	40.68	365	5.00	45.00	400	5.48	49.32
296	4.05	36.49	331	4.53	40.81	366	5.01	45.12	401	5.49	49.44
297	4.07	36.62	332	4.55	40.93	367	5.03	45.25	402	5.51	49.56
298	4.08	36.74	333	4.56	41.05	368	5.04	45.37	403	5.52	49.68
299	4.10	36.86	334	4.58	41.18	369	5.05	45.49	404	5.53	49.81
300	4.11	36.99	335	4.59	41.30	370	5.07	45.62	405	5.55	49.93
301	4.12	37.11	336	4.60	41.42	371	5.08	45.74	406	5.56	50.05
302	4.14	37.23	337	4.62	41.55	372	5.10	45.86	407	5.58	50.18
303	4.15	37.36	338	4.63	41.67	373	5.11	45.99	408	5.59	50.30
304	4.16	37.48	339	4.64	41.79	374	5.12	46.11	409	5.60	50.42
305	4.18	37.60	340	4.66	41.92	375	5.14	46.23	410	5.62	50.55
306	4.19	37.73	341	4.67	42.04	376	5.15	46.36	411	5.63	50.67

Depth	Waves span		Depth	Waves span		Depth	Waves span		Depth	Waves span	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
412	5.64	50.79	437	5.99	53.88	462	6.33	56.96	487	6.67	60.04
413	5.66	50.92	438	6.00	54.00	463	6.34	57.08	488	6.68	60.16
414	5.67	51.04	439	6.01	54.12	464	6.36	57.21	489	6.70	60.29
415	5.68	51.16	440	6.03	54.25	465	6.37	57.33	490	6.71	60.41
416	5.70	51.29	441	6.04	54.37	466	6.38	57.45	491	6.73	60.53
417	5.71	51.41	442	6.05	54.49	467	6.40	57.58	492	6.74	60.66
418	5.73	51.53	443	6.07	54.62	468	6.41	57.70	493	6.75	60.78
419	5.74	51.66	444	6.08	54.74	469	6.42	57.82	494	6.77	60.90
420	5.75	51.78	445	6.10	54.86	470	6.44	57.95	495	6.78	61.03
421	5.77	51.90	446	6.11	54.99	471	6.45	58.07	496	6.79	61.15
422	5.78	52.03	447	6.12	55.11	472	6.47	58.19	497	6.81	61.27
423	5.79	52.15	448	6.14	55.23	473	6.48	58.32	498	6.82	61.40
424	5.81	52.27	449	6.15	55.36	474	6.49	58.44	499	6.84	61.52
425	5.82	52.40	450	6.16	55.48	475	6.51	58.56	500	6.85	61.64
426	5.84	52.52	451	6.18	55.60	476	6.52	58.68	501	6.86	61.77
427	5.85	52.64	452	6.19	55.73	477	6.53	58.81	502	6.88	61.89
428	5.86	52.77	453	6.21	55.85	478	6.55	58.93	503	6.89	62.01
429	5.88	52.89	454	6.22	55.97	479	6.56	59.05	504	6.90	62.14
430	5.89	53.01	455	6.23	56.10	480	6.58	59.18	505	6.92	62.26
431	5.90	53.14	456	6.25	56.22	481	6.59	59.30	506	6.93	62.38
432	5.92	53.26	457	6.26	56.34	482	6.60	59.42	507	6.95	62.51
433	5.93	53.38	458	6.27	56.47	483	6.62	59.55	508	6.96	62.63
434	5.95	53.51	459	6.29	56.59	484	6.63	59.67	509	6.97	62.75
435	5.96	53.63	460	6.30	56.71	485	6.64	59.79	510	6.99	62.88
436	5.97	53.75	461	6.32	56.84	486	6.66	59.92	511	7.00	63.00

Waveform position list

#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
0	0.000	0.00	36	0.246	2.22	72	0.493	4.43	108	0.739	6.65
1	0.007	0.06	37	0.253	2.28	73	0.500	4.50	109	0.746	6.71
2	0.014	0.12	38	0.260	2.34	74	0.506	4.56	110	0.753	6.77
3	0.021	0.18	39	0.267	2.40	75	0.513	4.62	111	0.760	6.84
4	0.027	0.25	40	0.274	2.46	76	0.520	4.68	112	0.766	6.90
5	0.034	0.31	41	0.281	2.52	77	0.527	4.74	113	0.773	6.96
6	0.041	0.37	42	0.287	2.59	78	0.534	4.80	114	0.780	7.02
7	0.048	0.43	43	0.294	2.65	79	0.541	4.87	115	0.787	7.08
8	0.055	0.49	44	0.301	2.71	80	0.547	4.93	116	0.794	7.14
9	0.062	0.55	45	0.308	2.77	81	0.554	4.99	117	0.801	7.21
10	0.068	0.62	46	0.315	2.83	82	0.561	5.05	118	0.807	7.27
11	0.075	0.68	47	0.322	2.89	83	0.568	5.11	119	0.814	7.33
12	0.082	0.74	48	0.328	2.96	84	0.575	5.17	120	0.821	7.39
13	0.089	0.80	49	0.335	3.02	85	0.582	5.23	121	0.828	7.45
14	0.096	0.86	50	0.342	3.08	86	0.588	5.30	122	0.835	7.51
15	0.103	0.92	51	0.349	3.14	87	0.595	5.36	123	0.842	7.57
16	0.109	0.99	52	0.356	3.20	88	0.602	5.42	124	0.848	7.64
17	0.116	1.05	53	0.363	3.26	89	0.609	5.48	125	0.855	7.70
18	0.123	1.11	54	0.370	3.33	90	0.616	5.54	126	0.862	7.76
19	0.130	1.17	55	0.376	3.39	91	0.623	5.60	127	0.869	7.82
20	0.137	1.23	56	0.383	3.45	92	0.630	5.67	128	0.876	7.88
21	0.144	1.29	57	0.390	3.51	93	0.636	5.73	129	0.883	7.94
22	0.151	1.35	58	0.397	3.57	94	0.643	5.79	130	0.890	8.01
23	0.157	1.42	59	0.404	3.63	95	0.650	5.85	131	0.896	8.07
24	0.164	1.48	60	0.411	3.70	96	0.657	5.91	132	0.903	8.13
25	0.171	1.54	61	0.417	3.76	97	0.664	5.97	133	0.910	8.19
26	0.178	1.60	62	0.424	3.82	98	0.671	6.04	134	0.917	8.25
27	0.185	1.66	63	0.431	3.88	99	0.677	6.10	135	0.924	8.31
28	0.192	1.72	64	0.438	3.94	100	0.684	6.16	136	0.931	8.38
29	0.198	1.79	65	0.445	4.00	101	0.691	6.22	137	0.937	8.44
30	0.205	1.85	66	0.452	4.06	102	0.698	6.28	138	0.944	8.50
31	0.212	1.91	67	0.458	4.13	103	0.705	6.34	139	0.951	8.56
32	0.219	1.97	68	0.465	4.19	104	0.712	6.40	140	0.958	8.62
33	0.226	2.03	69	0.472	4.25	105	0.718	6.47	141	0.965	8.68
34	0.233	2.09	70	0.479	4.31	106	0.725	6.53	142	0.972	8.74
35	0.239	2.16	71	0.486	4.37	107	0.732	6.59	143	0.978	8.81

#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
144	0.985	8.87	183	1.252	11.27	222	1.519	13.67	261	1.786	16.07
145	0.992	8.93	184	1.259	11.33	223	1.526	13.73	262	1.793	16.13
146	0.999	8.99	185	1.266	11.39	224	1.533	13.79	263	1.800	16.20
147	1.006	9.05	186	1.273	11.45	225	1.540	13.86	264	1.806	16.26
148	1.013	9.11	187	1.280	11.52	226	1.546	13.92	265	1.813	16.32
149	1.020	9.18	188	1.286	11.58	227	1.553	13.98	266	1.820	16.38
150	1.026	9.24	189	1.293	11.64	228	1.560	14.04	267	1.827	16.44
151	1.033	9.30	190	1.300	11.70	229	1.567	14.10	268	1.834	16.50
152	1.040	9.36	191	1.307	11.76	230	1.574	14.16	269	1.841	16.57
153	1.047	9.42	192	1.314	11.82	231	1.581	14.23	270	1.848	16.63
154	1.054	9.48	193	1.321	11.89	232	1.587	14.29	271	1.854	16.69
155	1.061	9.55	194	1.327	11.95	233	1.594	14.35	272	1.861	16.75
156	1.067	9.61	195	1.334	12.01	234	1.601	14.41	273	1.868	16.81
157	1.074	9.67	196	1.341	12.07	235	1.608	14.47	274	1.875	16.87
158	1.081	9.73	197	1.348	12.13	236	1.615	14.53	275	1.882	16.94
159	1.088	9.79	198	1.355	12.19	237	1.622	14.60	276	1.889	17.00
160	1.095	9.85	199	1.362	12.26	238	1.629	14.66	277	1.895	17.06
161	1.102	9.91	200	1.369	12.32	239	1.635	14.72	278	1.902	17.12
162	1.109	9.98	201	1.375	12.38	240	1.642	14.78	279	1.909	17.18
163	1.115	10.04	202	1.382	12.44	241	1.649	14.84	280	1.916	17.24
164	1.122	10.10	203	1.389	12.50	242	1.656	14.90	281	1.923	17.30
165	1.129	10.16	204	1.396	12.56	243	1.663	14.96	282	1.930	17.37
166	1.136	10.22	205	1.403	12.62	244	1.670	15.03	283	1.936	17.43
167	1.143	10.28	206	1.410	12.69	245	1.676	15.09	284	1.943	17.49
168	1.150	10.35	207	1.416	12.75	246	1.683	15.15	285	1.950	17.55
169	1.156	10.41	208	1.423	12.81	247	1.690	15.21	286	1.957	17.61
170	1.163	10.47	209	1.430	12.87	248	1.697	15.27	287	1.964	17.67
171	1.170	10.53	210	1.437	12.93	249	1.704	15.33	288	1.971	17.74
172	1.177	10.59	211	1.444	12.99	250	1.711	15.40	289	1.978	17.80
173	1.184	10.65	212	1.451	13.06	251	1.717	15.46	290	1.984	17.86
174	1.191	10.72	213	1.457	13.12	252	1.724	15.52	291	1.991	17.92
175	1.197	10.78	214	1.464	13.18	253	1.731	15.58	292	1.998	17.98
176	1.204	10.84	215	1.471	13.24	254	1.738	15.64	293	2.005	18.04
177	1.211	10.90	216	1.478	13.30	255	1.745	15.70	294	2.012	18.11
178	1.218	10.96	217	1.485	13.36	256	1.752	15.77	295	2.019	18.17
179	1.225	11.02	218	1.492	13.43	257	1.759	15.83	296	2.025	18.23
180	1.232	11.09	219	1.499	13.49	258	1.765	15.89	297	2.032	18.29
181	1.239	11.15	220	1.505	13.55	259	1.772	15.95	298	2.039	18.35
182	1.245	11.21	221	1.512	13.61	260	1.779	16.01	299	2.046	18.41

#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
300	2.053	18.48	339	2.320	20.88	378	2.587	23.28	417	2.853	25.68
301	2.060	18.54	340	2.326	20.94	379	2.593	23.34	418	2.860	25.74
302	2.066	18.60	341	2.333	21.00	380	2.600	23.40	419	2.867	25.80
303	2.073	18.66	342	2.340	21.06	381	2.607	23.46	420	2.874	25.87
304	2.080	18.72	343	2.347	21.12	382	2.614	23.52	421	2.881	25.93
305	2.087	18.78	344	2.354	21.18	383	2.621	23.59	422	2.888	25.99
306	2.094	18.84	345	2.361	21.25	384	2.628	23.65	423	2.894	26.05
307	2.101	18.91	346	2.368	21.31	385	2.634	23.71	424	2.901	26.11
308	2.108	18.97	347	2.374	21.37	386	2.641	23.77	425	2.908	26.17
309	2.114	19.03	348	2.381	21.43	387	2.648	23.83	426	2.915	26.23
310	2.121	19.09	349	2.388	21.49	388	2.655	23.89	427	2.922	26.30
311	2.128	19.15	350	2.395	21.55	389	2.662	23.96	428	2.929	26.36
312	2.135	19.21	351	2.402	21.62	390	2.669	24.02	429	2.935	26.42
313	2.142	19.28	352	2.409	21.68	391	2.675	24.08	430	2.942	26.48
314	2.149	19.34	353	2.415	21.74	392	2.682	24.14	431	2.949	26.54
315	2.155	19.40	354	2.422	21.80	393	2.689	24.20	432	2.956	26.60
316	2.162	19.46	355	2.429	21.86	394	2.696	24.26	433	2.963	26.67
317	2.169	19.52	356	2.436	21.92	395	2.703	24.33	434	2.970	26.73
318	2.176	19.58	357	2.443	21.99	396	2.710	24.39	435	2.977	26.79
319	2.183	19.65	358	2.450	22.05	397	2.717	24.45	436	2.983	26.85
320	2.190	19.71	359	2.457	22.11	398	2.723	24.51	437	2.990	26.91
321	2.196	19.77	360	2.463	22.17	399	2.730	24.57	438	2.997	26.97
322	2.203	19.83	361	2.470	22.23	400	2.737	24.63	439	3.004	27.04
323	2.210	19.89	362	2.477	22.29	401	2.744	24.70	440	3.011	27.10
324	2.217	19.95	363	2.484	22.35	402	2.751	24.76	441	3.018	27.16
325	2.224	20.01	364	2.491	22.42	403	2.758	24.82	442	3.024	27.22
326	2.231	20.08	365	2.498	22.48	404	2.764	24.88	443	3.031	27.28
327	2.238	20.14	366	2.504	22.54	405	2.771	24.94	444	3.038	27.34
328	2.244	20.20	367	2.511	22.60	406	2.778	25.00	445	3.045	27.40
329	2.251	20.26	368	2.518	22.66	407	2.785	25.06	446	3.052	27.47
330	2.258	20.32	369	2.525	22.72	408	2.792	25.13	447	3.059	27.53
331	2.265	20.38	370	2.532	22.79	409	2.799	25.19	448	3.065	27.59
332	2.272	20.45	371	2.539	22.85	410	2.805	25.25	449	3.072	27.65
333	2.279	20.51	372	2.545	22.91	411	2.812	25.31	450	3.079	27.71
334	2.285	20.57	373	2.552	22.97	412	2.819	25.37	451	3.086	27.77
335	2.292	20.63	374	2.559	23.03	413	2.826	25.43	452	3.093	27.84
336	2.299	20.69	375	2.566	23.09	414	2.833	25.50	453	3.100	27.90
337	2.306	20.75	376	2.573	23.16	415	2.840	25.56	454	3.107	27.96
338	2.313	20.82	377	2.580	23.22	416	2.847	25.62	455	3.113	28.02

#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
456	3.120	28.08	495	3.387	30.48	534	3.654	32.89	573	3.921	35.29
457	3.127	28.14	496	3.394	30.55	535	3.661	32.95	574	3.928	35.35
458	3.134	28.21	497	3.401	30.61	536	3.668	33.01	575	3.935	35.41
459	3.141	28.27	498	3.408	30.67	537	3.674	33.07	576	3.941	35.47
460	3.148	28.33	499	3.414	30.73	538	3.681	33.13	577	3.948	35.53
461	3.154	28.39	500	3.421	30.79	539	3.688	33.19	578	3.955	35.60
462	3.161	28.45	501	3.428	30.85	540	3.695	33.26	579	3.962	35.66
463	3.168	28.51	502	3.435	30.91	541	3.702	33.32	580	3.969	35.72
464	3.175	28.57	503	3.442	30.98	542	3.709	33.38	581	3.976	35.78
465	3.182	28.64	504	3.449	31.04	543	3.716	33.44	582	3.982	35.84
466	3.189	28.70	505	3.456	31.10	544	3.722	33.50	583	3.989	35.90
467	3.196	28.76	506	3.462	31.16	545	3.729	33.56	584	3.996	35.96
468	3.202	28.82	507	3.469	31.22	546	3.736	33.62	585	4.003	36.03
469	3.209	28.88	508	3.476	31.28	547	3.743	33.69	586	4.010	36.09
470	3.216	28.94	509	3.483	31.35	548	3.750	33.75	587	4.017	36.15
471	3.223	29.01	510	3.490	31.41	549	3.757	33.81	588	4.023	36.21
472	3.230	29.07	511	3.497	31.47	550	3.763	33.87	589	4.030	36.27
473	3.237	29.13	512	3.503	31.53	551	3.770	33.93	590	4.037	36.33
474	3.243	29.19	513	3.510	31.59	552	3.777	33.99	591	4.044	36.40
475	3.250	29.25	514	3.517	31.65	553	3.784	34.06	592	4.051	36.46
476	3.257	29.31	515	3.524	31.72	554	3.791	34.12	593	4.058	36.52
477	3.264	29.38	516	3.531	31.78	555	3.798	34.18	594	4.065	36.58
478	3.271	29.44	517	3.538	31.84	556	3.804	34.24	595	4.071	36.64
479	3.278	29.50	518	3.544	31.90	557	3.811	34.30	596	4.078	36.70
480	3.284	29.56	519	3.551	31.96	558	3.818	34.36	597	4.085	36.77
481	3.291	29.62	520	3.558	32.02	559	3.825	34.43	598	4.092	36.83
482	3.298	29.68	521	3.565	32.09	560	3.832	34.49	599	4.099	36.89
483	3.305	29.74	522	3.572	32.15	561	3.839	34.55	600	4.106	36.95
484	3.312	29.81	523	3.579	32.21	562	3.846	34.61	601	4.112	37.01
485	3.319	29.87	524	3.586	32.27	563	3.852	34.67	602	4.119	37.07
486	3.326	29.93	525	3.592	32.33	564	3.859	34.73	603	4.126	37.13
487	3.332	29.99	526	3.599	32.39	565	3.866	34.79	604	4.133	37.20
488	3.339	30.05	527	3.606	32.45	566	3.873	34.86	605	4.140	37.26
489	3.346	30.11	528	3.613	32.52	567	3.880	34.92	606	4.147	37.32
490	3.353	30.18	529	3.620	32.58	568	3.887	34.98	607	4.153	37.38
491	3.360	30.24	530	3.627	32.64	569	3.893	35.04	608	4.160	37.44
492	3.367	30.30	531	3.633	32.70	570	3.900	35.10	609	4.167	37.50
493	3.373	30.36	532	3.640	32.76	571	3.907	35.16	610	4.174	37.57
494	3.380	30.42	533	3.647	32.82	572	3.914	35.23	611	4.181	37.63

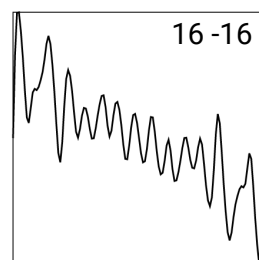
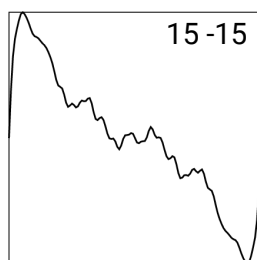
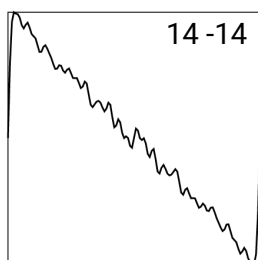
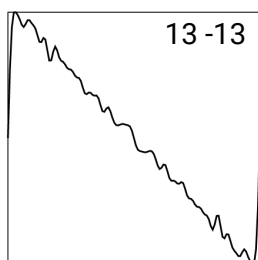
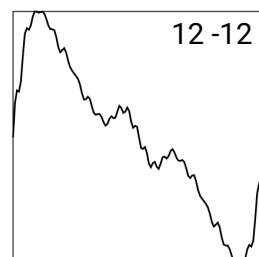
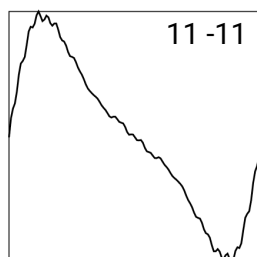
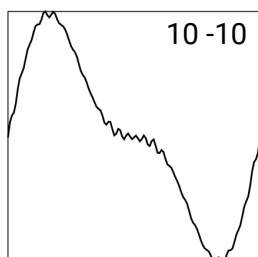
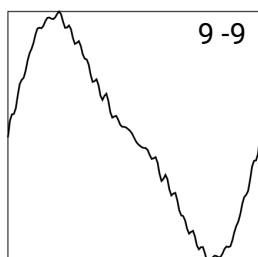
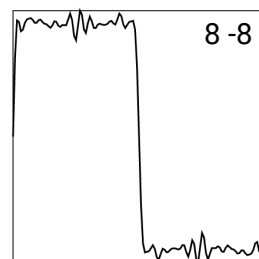
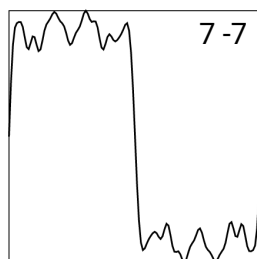
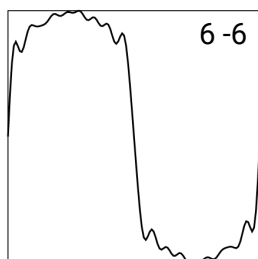
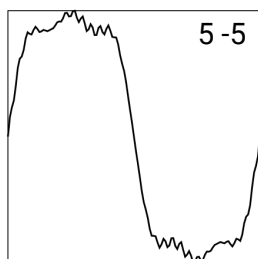
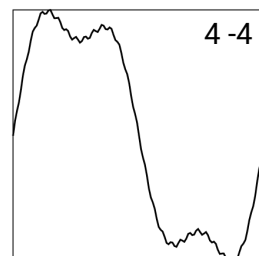
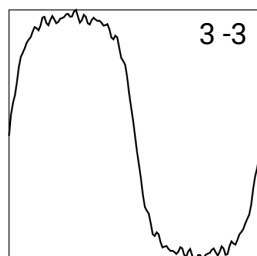
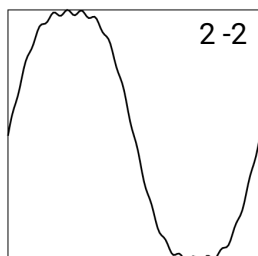
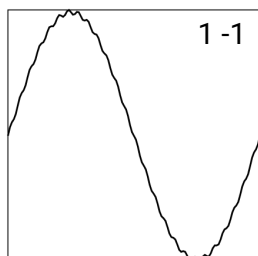
#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
612	4.188	37.69	651	4.455	40.09	690	4.721	42.49	729	4.988	44.89
613	4.195	37.75	652	4.461	40.15	691	4.728	42.55	730	4.995	44.96
614	4.201	37.81	653	4.468	40.21	692	4.735	42.62	731	5.002	45.02
615	4.208	37.87	654	4.475	40.28	693	4.742	42.68	732	5.009	45.08
616	4.215	37.94	655	4.482	40.34	694	4.749	42.74	733	5.016	45.14
617	4.222	38.00	656	4.489	40.40	695	4.756	42.80	734	5.022	45.20
618	4.229	38.06	657	4.496	40.46	696	4.762	42.86	735	5.029	45.26
619	4.236	38.12	658	4.502	40.52	697	4.769	42.92	736	5.036	45.33
620	4.242	38.18	659	4.509	40.58	698	4.776	42.99	737	5.043	45.39
621	4.249	38.24	660	4.516	40.65	699	4.783	43.05	738	5.050	45.45
622	4.256	38.30	661	4.523	40.71	700	4.790	43.11	739	5.057	45.51
623	4.263	38.37	662	4.530	40.77	701	4.797	43.17	740	5.064	45.57
624	4.270	38.43	663	4.537	40.83	702	4.804	43.23	741	5.070	45.63
625	4.277	38.49	664	4.543	40.89	703	4.810	43.29	742	5.077	45.70
626	4.283	38.55	665	4.550	40.95	704	4.817	43.35	743	5.084	45.76
627	4.290	38.61	666	4.557	41.01	705	4.824	43.42	744	5.091	45.82
628	4.297	38.67	667	4.564	41.08	706	4.831	43.48	745	5.098	45.88
629	4.304	38.74	668	4.571	41.14	707	4.838	43.54	746	5.105	45.94
630	4.311	38.80	669	4.578	41.20	708	4.845	43.60	747	5.111	46.00
631	4.318	38.86	670	4.585	41.26	709	4.851	43.66	748	5.118	46.06
632	4.325	38.92	671	4.591	41.32	710	4.858	43.72	749	5.125	46.13
633	4.331	38.98	672	4.598	41.38	711	4.865	43.79	750	5.132	46.19
634	4.338	39.04	673	4.605	41.45	712	4.872	43.85	751	5.139	46.25
635	4.345	39.11	674	4.612	41.51	713	4.879	43.91	752	5.146	46.31
636	4.352	39.17	675	4.619	41.57	714	4.886	43.97	753	5.152	46.37
637	4.359	39.23	676	4.626	41.63	715	4.892	44.03	754	5.159	46.43
638	4.366	39.29	677	4.632	41.69	716	4.899	44.09	755	5.166	46.50
639	4.372	39.35	678	4.639	41.75	717	4.906	44.16	756	5.173	46.56
640	4.379	39.41	679	4.646	41.82	718	4.913	44.22	757	5.180	46.62
641	4.386	39.48	680	4.653	41.88	719	4.920	44.28	758	5.187	46.68
642	4.393	39.54	681	4.660	41.94	720	4.927	44.34	759	5.194	46.74
643	4.400	39.60	682	4.667	42.00	721	4.934	44.40	760	5.200	46.80
644	4.407	39.66	683	4.674	42.06	722	4.940	44.46	761	5.207	46.87
645	4.413	39.72	684	4.680	42.12	723	4.947	44.52	762	5.214	46.93
646	4.420	39.78	685	4.687	42.18	724	4.954	44.59	763	5.221	46.99
647	4.427	39.84	686	4.694	42.25	725	4.961	44.65	764	5.228	47.05
648	4.434	39.91	687	4.701	42.31	726	4.968	44.71	765	5.235	47.11
649	4.441	39.97	688	4.708	42.37	727	4.975	44.77	766	5.241	47.17
650	4.448	40.03	689	4.715	42.43	728	4.981	44.83	767	5.248	47.23

#	Position		#	Position		#	Position		#	Position	
	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
768	5.255	47.30	807	5.522	49.70	846	5.789	52.10	885	6.056	54.50
769	5.262	47.36	808	5.529	49.76	847	5.796	52.16	886	6.063	54.56
770	5.269	47.42	809	5.536	49.82	848	5.803	52.22	887	6.069	54.62
771	5.276	47.48	810	5.543	49.88	849	5.809	52.28	888	6.076	54.69
772	5.283	47.54	811	5.549	49.94	850	5.816	52.35	889	6.083	54.75
773	5.289	47.60	812	5.556	50.01	851	5.823	52.41	890	6.090	54.81
774	5.296	47.67	813	5.563	50.07	852	5.830	52.47	891	6.097	54.87
775	5.303	47.73	814	5.570	50.13	853	5.837	52.53	892	6.104	54.93
776	5.310	47.79	815	5.577	50.19	854	5.844	52.59	893	6.110	54.99
777	5.317	47.85	816	5.584	50.25	855	5.850	52.65	894	6.117	55.06
778	5.324	47.91	817	5.590	50.31	856	5.857	52.72	895	6.124	55.12
779	5.330	47.97	818	5.597	50.38	857	5.864	52.78	896	6.131	55.18
780	5.337	48.04	819	5.604	50.44	858	5.871	52.84	897	6.138	55.24
781	5.344	48.10	820	5.611	50.50	859	5.878	52.90	898	6.145	55.30
782	5.351	48.16	821	5.618	50.56	860	5.885	52.96	899	6.152	55.36
783	5.358	48.22	822	5.625	50.62	861	5.891	53.02	900	6.158	55.43
784	5.365	48.28	823	5.631	50.68	862	5.898	53.09	901	6.165	55.49
785	5.371	48.34	824	5.638	50.74	863	5.905	53.15	902	6.172	55.55
786	5.378	48.40	825	5.645	50.81	864	5.912	53.21	903	6.179	55.61
787	5.385	48.47	826	5.652	50.87	865	5.919	53.27	904	6.186	55.67
788	5.392	48.53	827	5.659	50.93	866	5.926	53.33	905	6.193	55.73
789	5.399	48.59	828	5.666	50.99	867	5.933	53.39	906	6.199	55.79
790	5.406	48.65	829	5.673	51.05	868	5.939	53.45	907	6.206	55.86
791	5.413	48.71	830	5.679	51.11	869	5.946	53.52	908	6.213	55.92
792	5.419	48.77	831	5.686	51.18	870	5.953	53.58	909	6.220	55.98
793	5.426	48.84	832	5.693	51.24	871	5.960	53.64	910	6.227	56.04
794	5.433	48.90	833	5.700	51.30	872	5.967	53.70	911	6.234	56.10
795	5.440	48.96	834	5.707	51.36	873	5.974	53.76	912	6.240	56.16
796	5.447	49.02	835	5.714	51.42	874	5.980	53.82	913	6.247	56.23
797	5.454	49.08	836	5.720	51.48	875	5.987	53.89	914	6.254	56.29
798	5.460	49.14	837	5.727	51.55	876	5.994	53.95	915	6.261	56.35
799	5.467	49.21	838	5.734	51.61	877	6.001	54.01	916	6.268	56.41
800	5.474	49.27	839	5.741	51.67	878	6.008	54.07	917	6.275	56.47
801	5.481	49.33	840	5.748	51.73	879	6.015	54.13	918	6.282	56.53
802	5.488	49.39	841	5.755	51.79	880	6.022	54.19	919	6.288	56.60
803	5.495	49.45	842	5.761	51.85	881	6.028	54.26	920	6.295	56.66
804	5.501	49.51	843	5.768	51.91	882	6.035	54.32	921	6.302	56.72
805	5.508	49.57	844	5.775	51.98	883	6.042	54.38	922	6.309	56.78
806	5.515	49.64	845	5.782	52.04	884	6.049	54.44	923	6.316	56.84

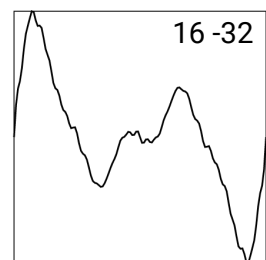
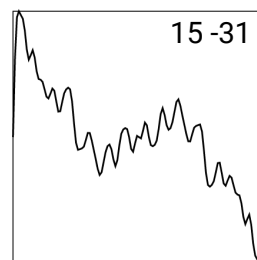
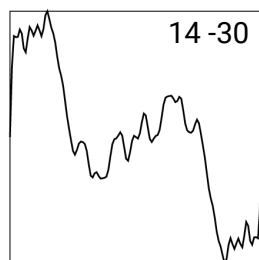
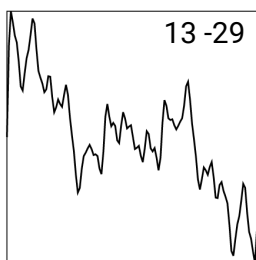
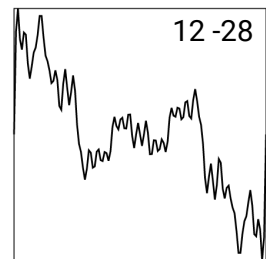
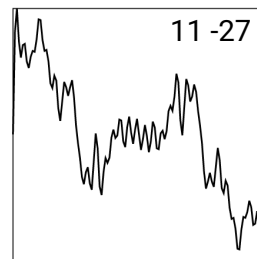
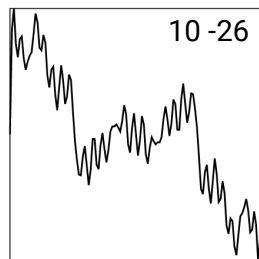
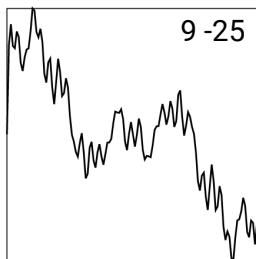
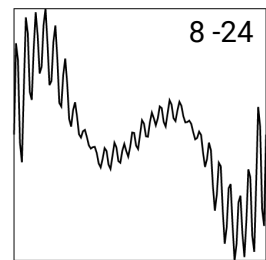
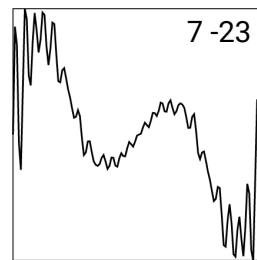
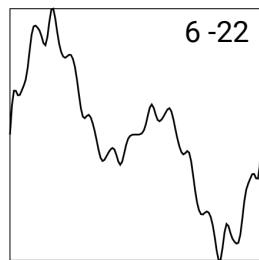
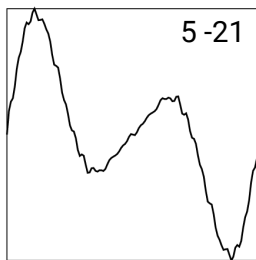
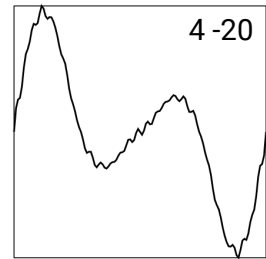
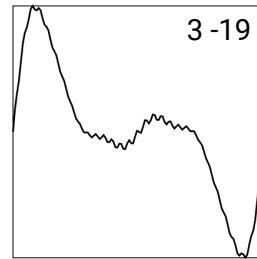
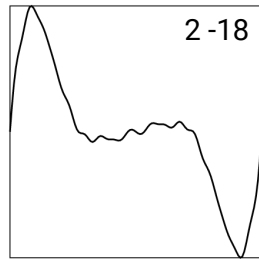
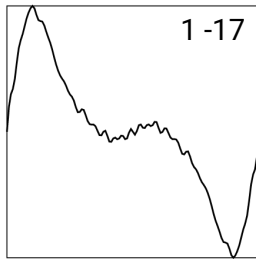
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	Grid	Linear		Grid	Linear		Grid	Linear		Grid	Linear
924	6.323	56.90	949	6.494	58.44	974	6.665	59.98	999	6.836	61.52
925	6.329	56.96	950	6.500	58.50	975	6.672	60.04	1000	6.843	61.58
926	6.336	57.03	951	6.507	58.57	976	6.678	60.11	1001	6.849	61.65
927	6.343	57.09	952	6.514	58.63	977	6.685	60.17	1002	6.856	61.71
928	6.350	57.15	953	6.521	58.69	978	6.692	60.23	1003	6.863	61.77
929	6.357	57.21	954	6.528	58.75	979	6.699	60.29	1004	6.870	61.83
930	6.364	57.27	955	6.535	58.81	980	6.706	60.35	1005	6.877	61.89
931	6.370	57.33	956	6.542	58.87	981	6.713	60.41	1006	6.884	61.95
932	6.377	57.40	957	6.548	58.94	982	6.719	60.48	1007	6.891	62.01
933	6.384	57.46	958	6.555	59.00	983	6.726	60.54	1008	6.897	62.08
934	6.391	57.52	959	6.562	59.06	984	6.733	60.60	1009	6.904	62.14
935	6.398	57.58	960	6.569	59.12	985	6.740	60.66	1010	6.911	62.20
936	6.405	57.64	961	6.576	59.18	986	6.747	60.72	1011	6.918	62.26
937	6.412	57.70	962	6.583	59.24	987	6.754	60.78	1012	6.925	62.32
938	6.418	57.77	963	6.589	59.30	988	6.761	60.84	1013	6.932	62.38
939	6.425	57.83	964	6.596	59.37	989	6.767	60.91	1014	6.938	62.45
940	6.432	57.89	965	6.603	59.43	990	6.774	60.97	1015	6.945	62.51
941	6.439	57.95	966	6.610	59.49	991	6.781	61.03	1016	6.952	62.57
942	6.446	58.01	967	6.617	59.55	992	6.788	61.09	1017	6.959	62.63
943	6.453	58.07	968	6.624	59.61	993	6.795	61.15	1018	6.966	62.69
944	6.459	58.13	969	6.630	59.67	994	6.802	61.21	1019	6.973	62.75
945	6.466	58.20	970	6.637	59.74	995	6.808	61.28	1020	6.979	62.82
946	6.473	58.26	971	6.644	59.80	996	6.815	61.34	1021	6.986	62.88
947	6.480	58.32	972	6.651	59.86	997	6.822	61.40	1022	6.993	62.94
948	6.487	58.38	973	6.658	59.92	998	6.829	61.46	1023	7.000	63.00

Firmware waves banks list

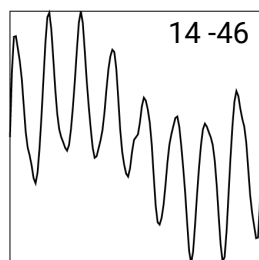
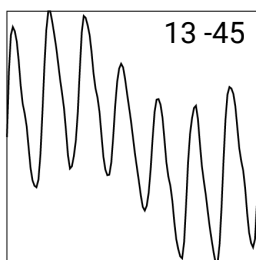
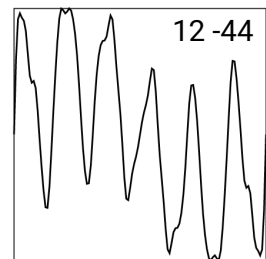
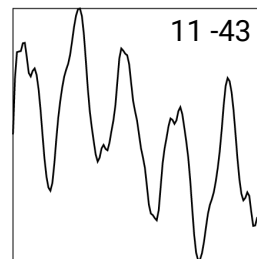
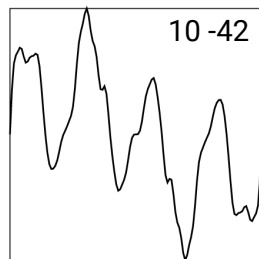
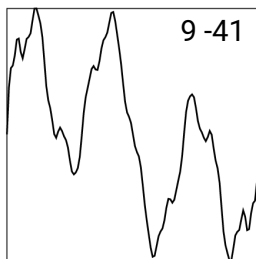
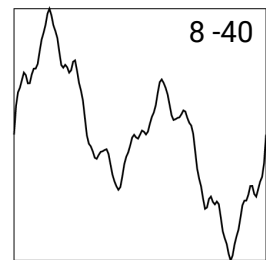
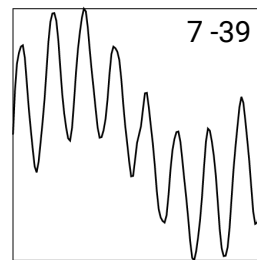
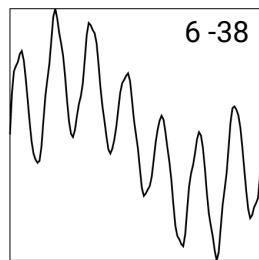
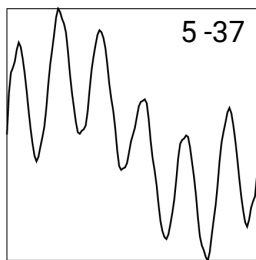
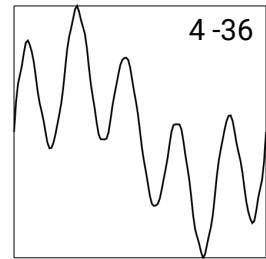
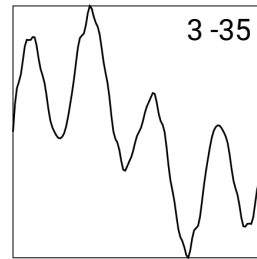
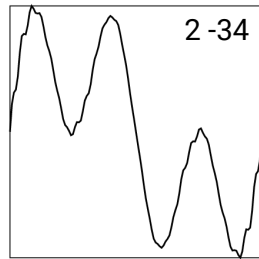
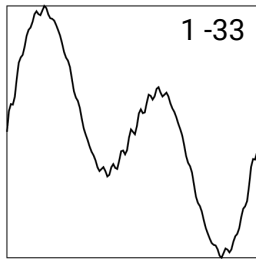
Waves bank A



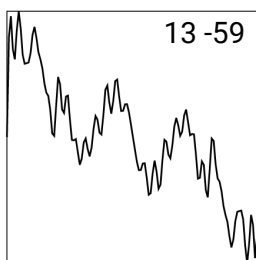
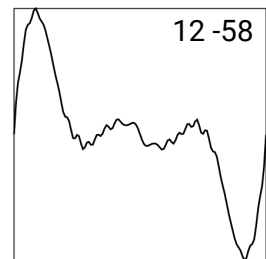
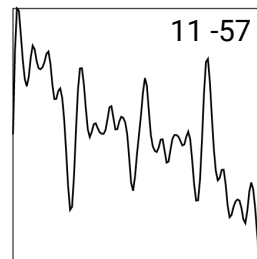
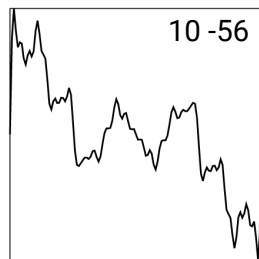
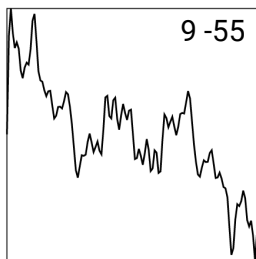
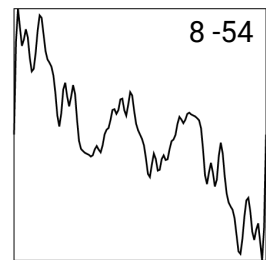
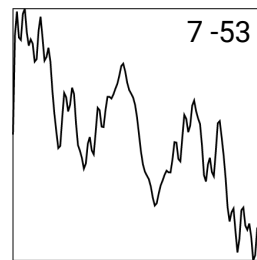
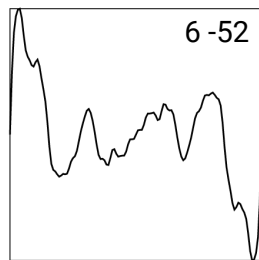
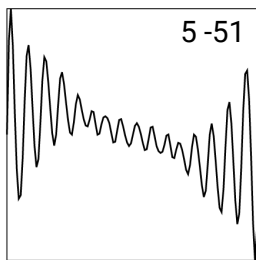
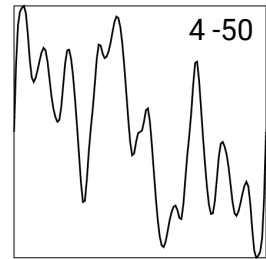
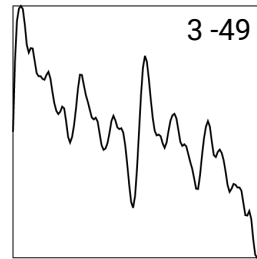
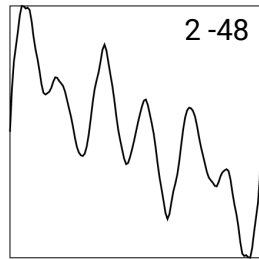
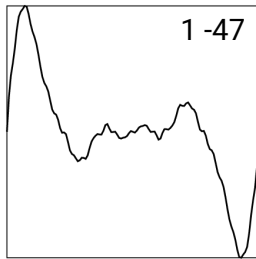
Waves bank B



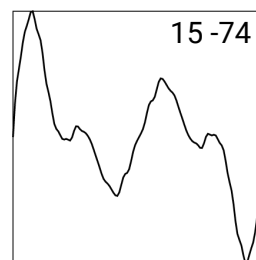
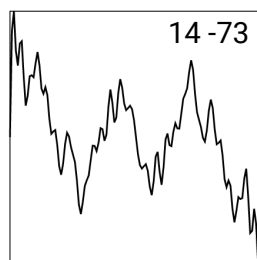
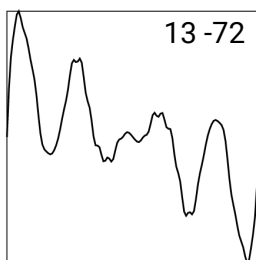
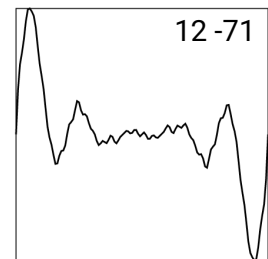
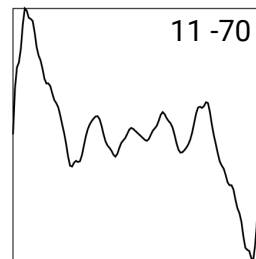
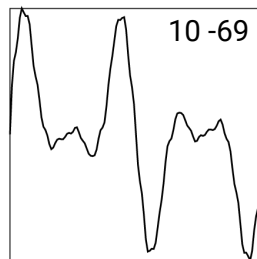
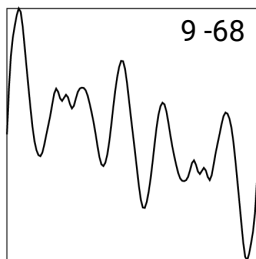
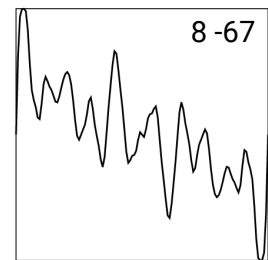
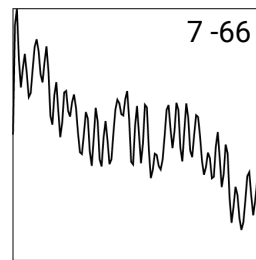
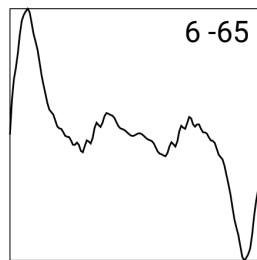
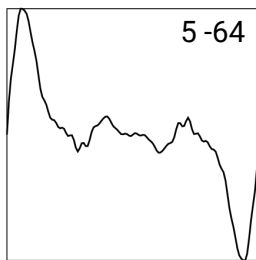
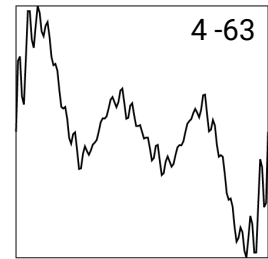
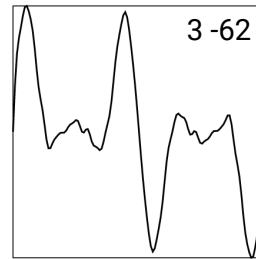
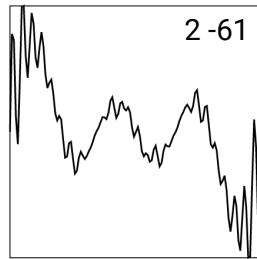
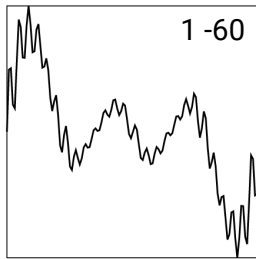
Waves bank C



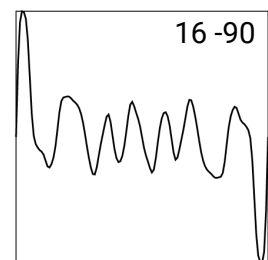
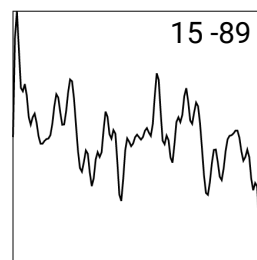
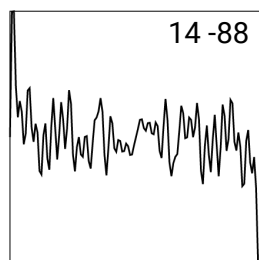
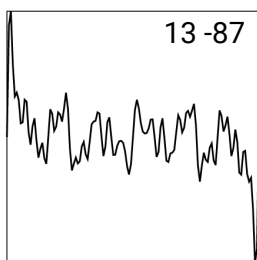
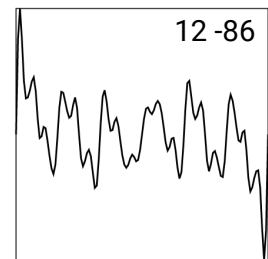
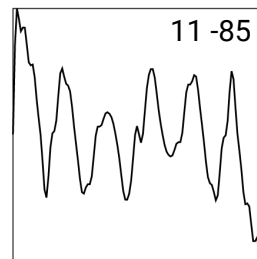
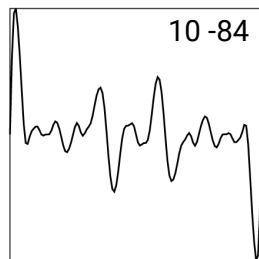
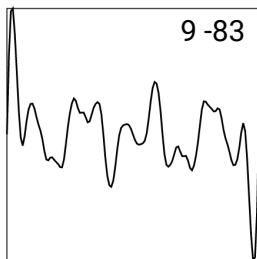
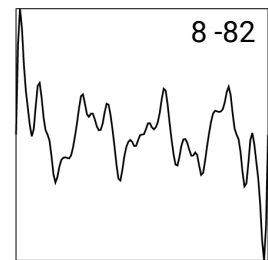
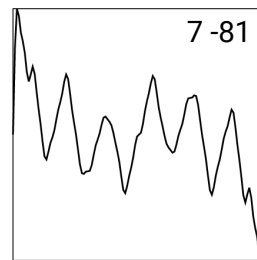
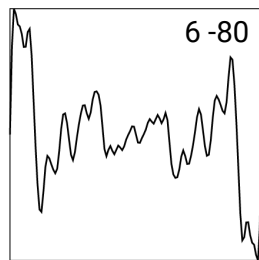
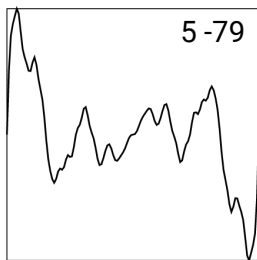
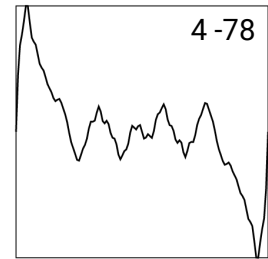
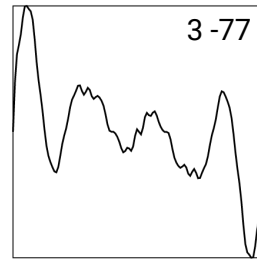
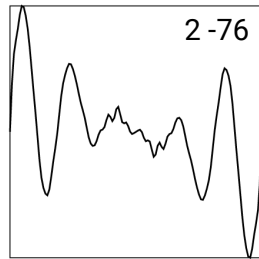
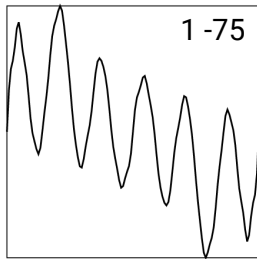
Waves bank D



Waves bank E



Waves bank F



Known issues

- prologue and minilogue XD synthesizers can produce distorted sound or hang when LFO is routed to the Shape. This is due to high CPU utilization of the oscillator and additional CPU load produced by the firmware code for the Shape LFO. To restore normal operation the synthesizer power cycle is needed.
- NTS-1 can produce distorted sound when more than 2 effects are enabled. This is due to high CPU utilization of the oscillator and shared CPU architecture of the NTS-1. Disable excessive effects to get normal sound from the oscillator.
- Due to the issue in current prologue and minilogue XD firmwares, LFO depth parameter is initialized at -100% value when the oscillator is selected for the first time. That does not affect program recall with saved parameter value.
- Due to the different LFO implementation in NTS-1 that provides only positive values, the effect of LFO modes that use Shape LFO differs from prologue and minilogue XD.