



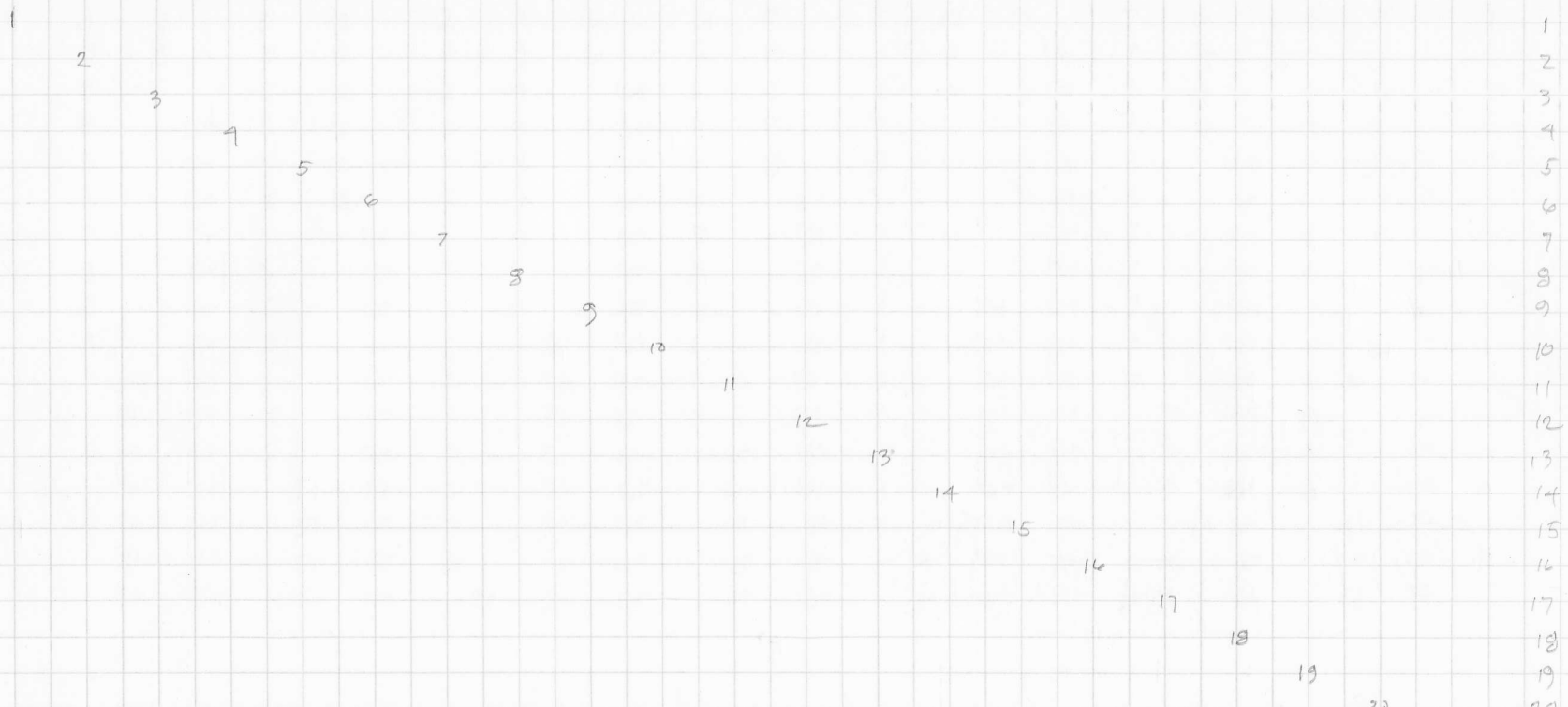
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39.	.9512	-	31	.9542	-.0032
38.	.9268	-			
37.	.9024	⊖	3.5	.9069	-.0045
36.	.8780	-			
35.	.8536	-	29	.8579	-.0043
34.	.8293	-			
33.	.8049	⊖ ⊖	7	.8074	-.0025
32.	.7805	-	5.11	.7814	-.0009
31.	.7561	⊖	3.9	.7549	+0.0012
30.	.7317	-	53	.7279	+0.0038
29.	.7073	⊖ ⊖	13	.7004	+0.0069
28.	.6829	-	51	.6724	+0.0105
27.	.6585	-			
26.	.6341	⊖	5.5	.6439	-.0098
25.	.6098	-	7.7	.6147	-.0049
24.	.5854	⊖ ⊖	3	.5850	+0.0004
23.	.5610	-	47	.5546	+0.0064
22.	.5366	-			
21.	.5122	⊖	23	.5236	-.0114
20.	.4878	-	5.9	.4919	-.0041
19.	.4634	⊖ ⊖	11	.4594	+0.0040
18.	.4390	-	43	.4263	+0.0117
17.	.4146	-			
16.	.3902	⊖	3.7	.3923	+0.0021
15.	.3658	-	41	.3575	+0.0083
14.	.3415	-			
13.	.3171	⊖ ⊖	5	.3219	-.0048
12.	.2927	-	3.13	.2854	+0.0073
11.	.2683	-			
10.	.2439	⊖	19	.2479	-.0040
9.	.2195	-	37	.2095	+0.0100
8.	.1951	-			
7.	.1707	⊖ ⊖	9	.1699	+0.0008
6.	.1463	-			
5.	.1220	-	5.7	.1293	-.0073
4.	.0976	⊖	17	.0875	+0.0101
3.	.0732	-			
2.	.0488	-	3.11	.0444	+0.0044
1.	.0244	-			
0.	.0000	⊖ ⊖	1	.0000	





# 41 TONE MOS

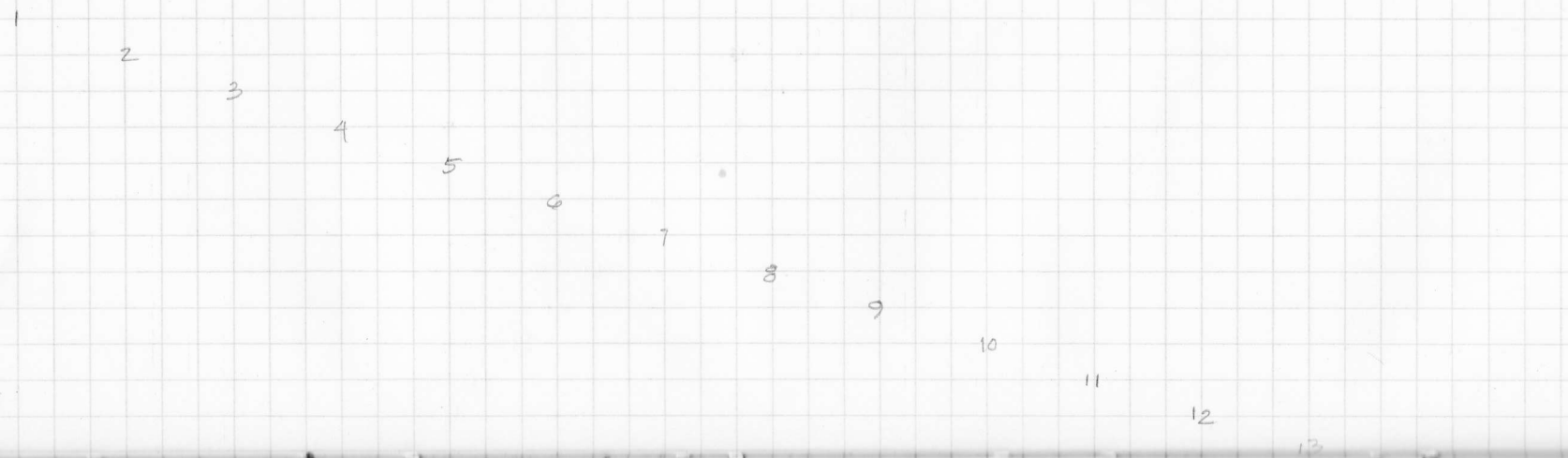
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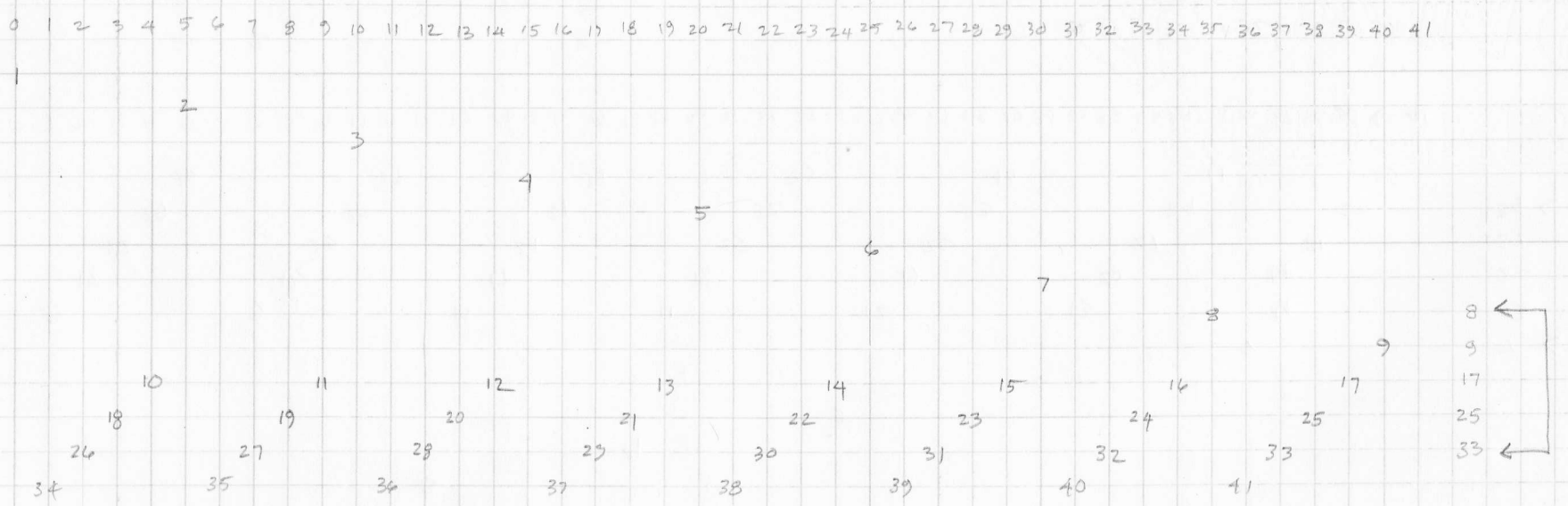
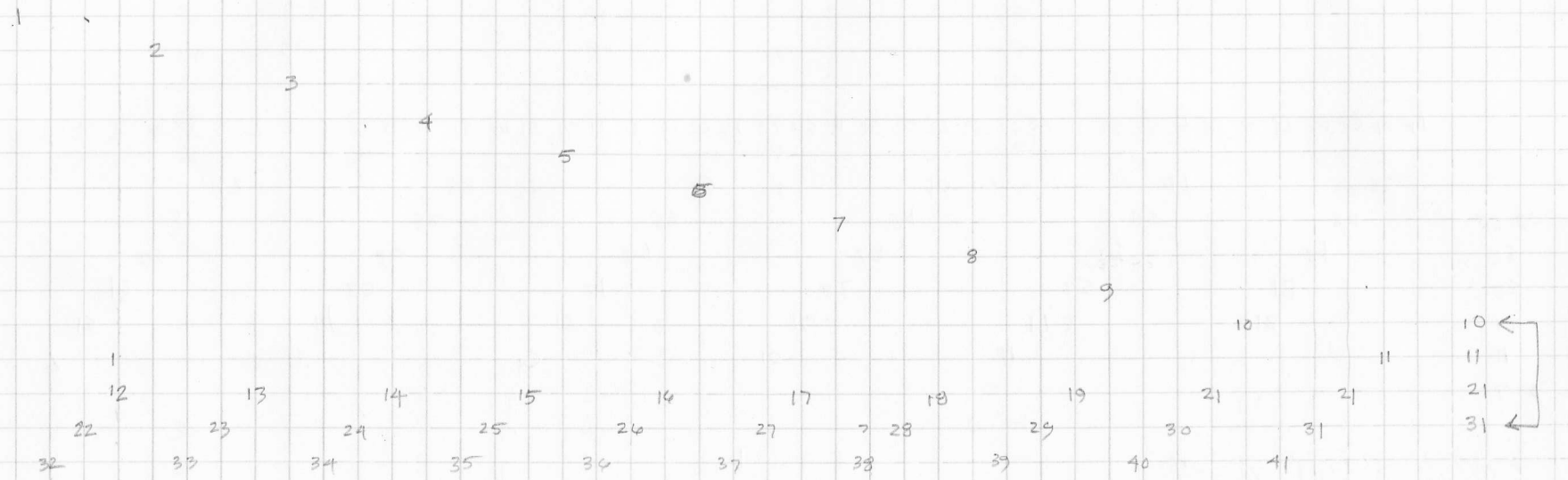
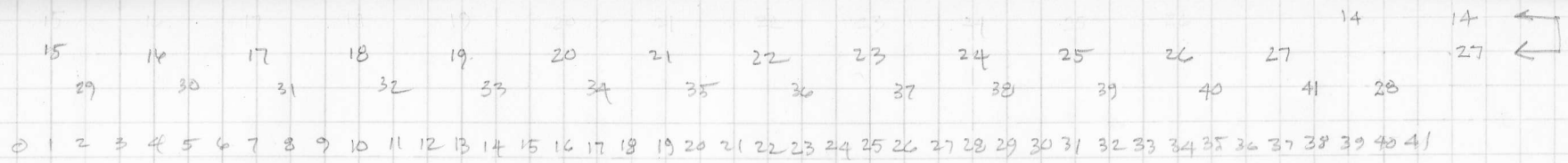


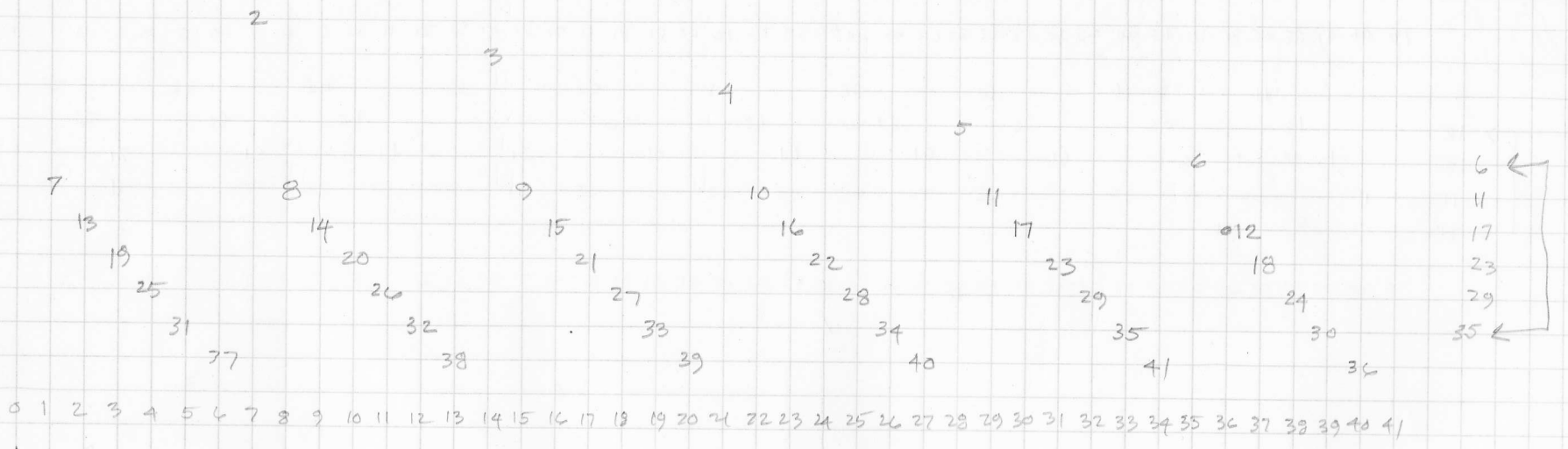
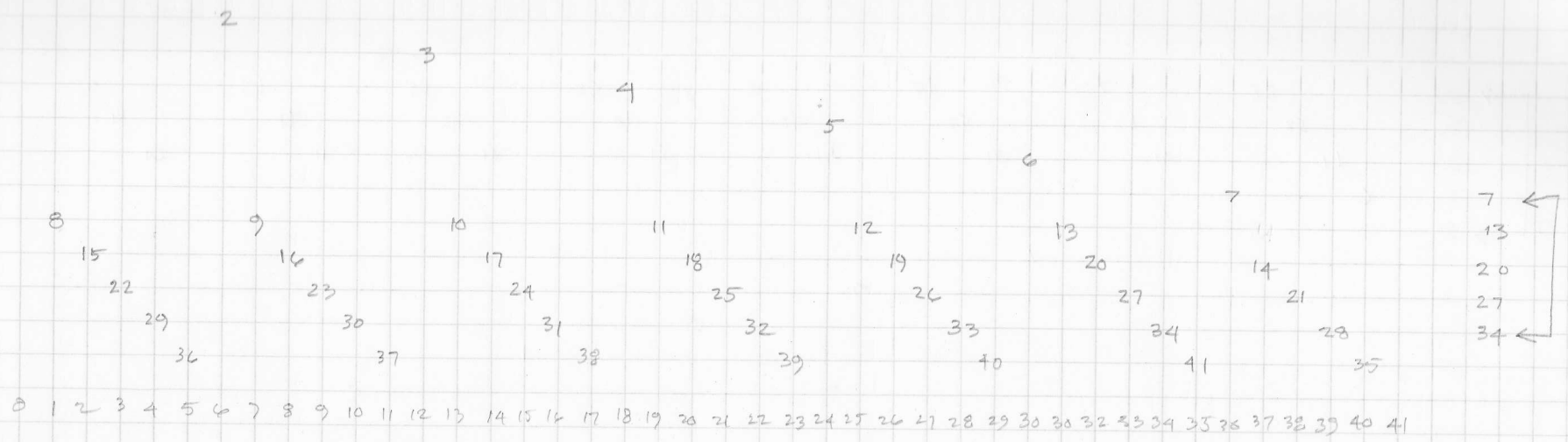
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22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41





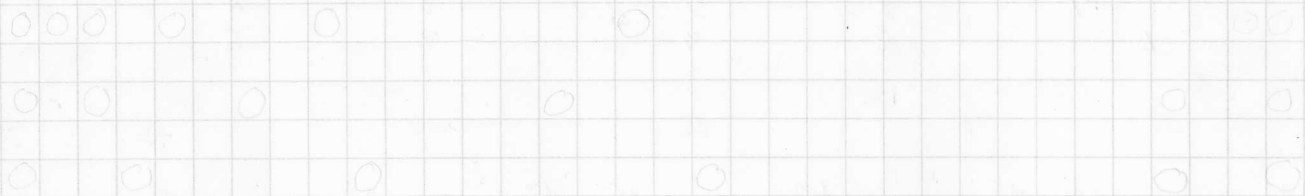


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	8						5					2	9					6				3							10+	7							4							
	8						5					2				9+		6				3							10+	7							4							
					8+		5					2				9+		6				3							10+	7							4							
					8+		5					2				9+		6				3							10+			7+					4							
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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

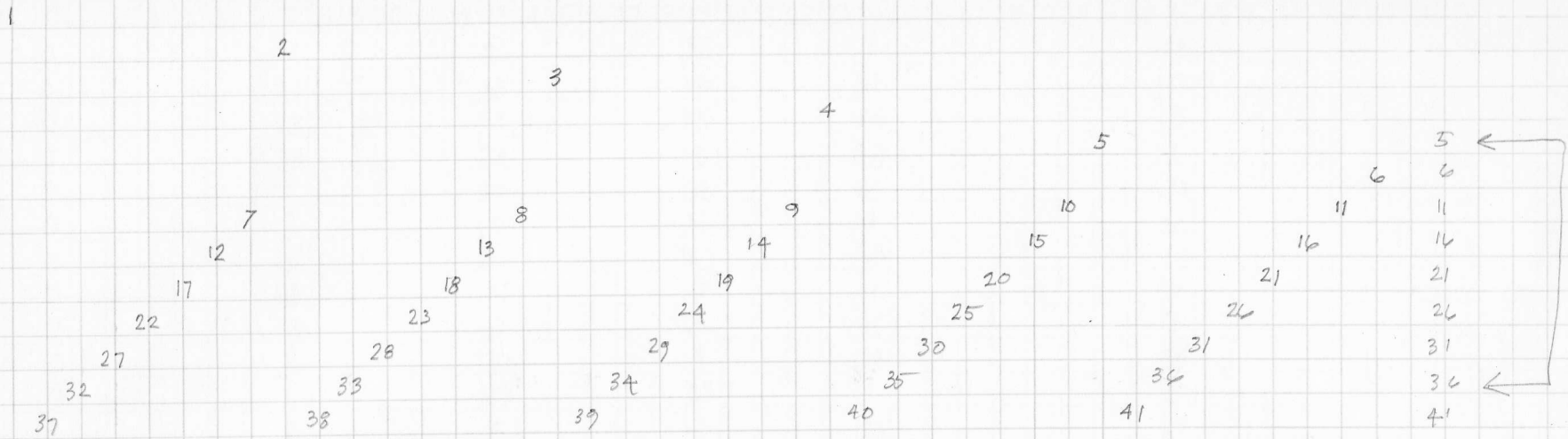
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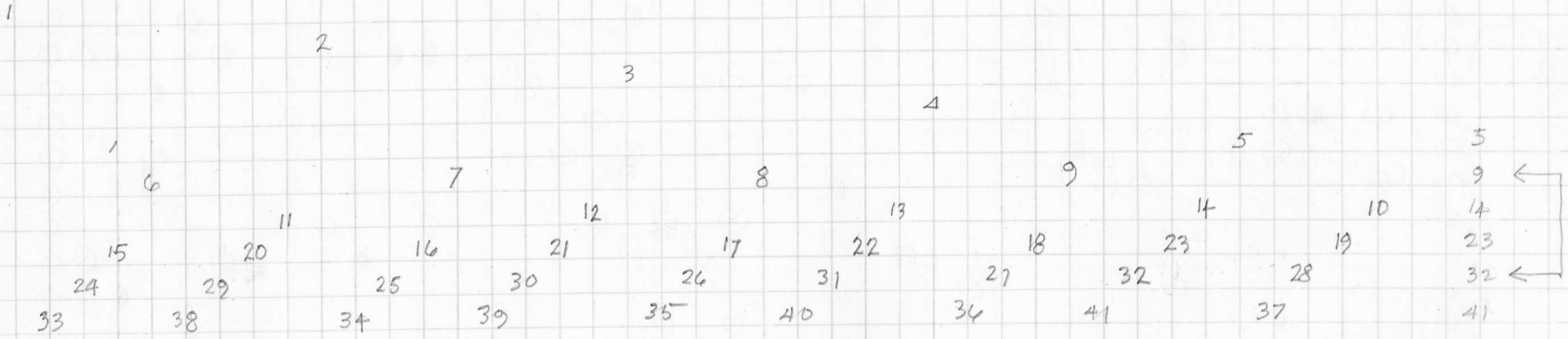
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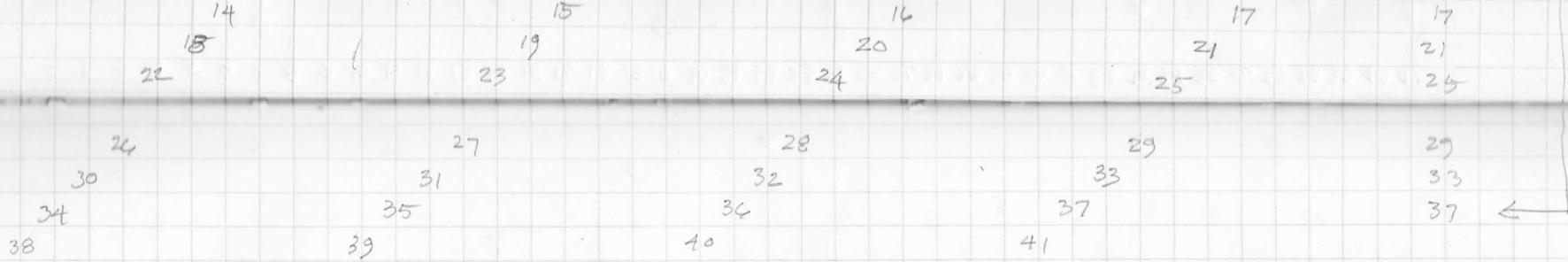


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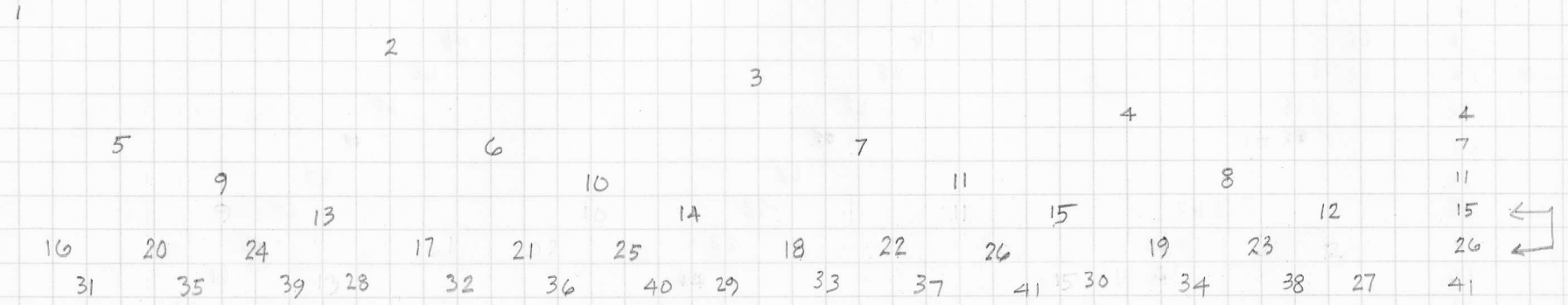


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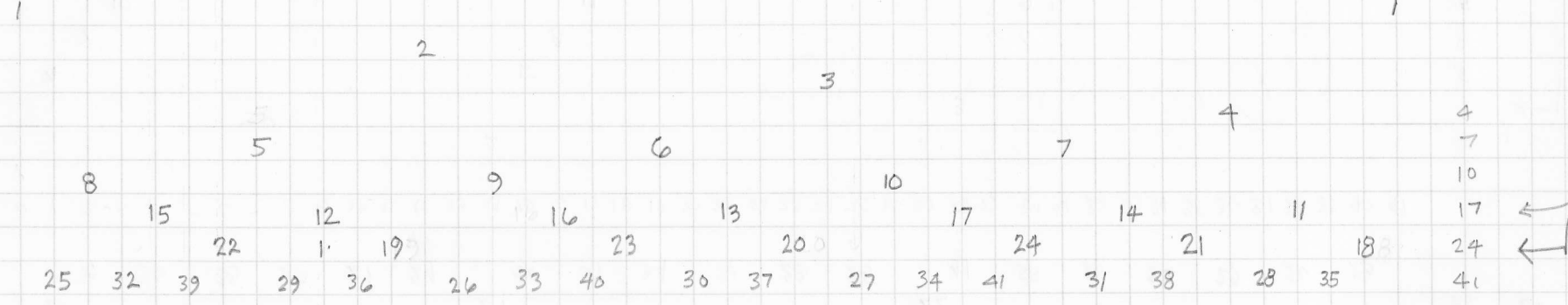




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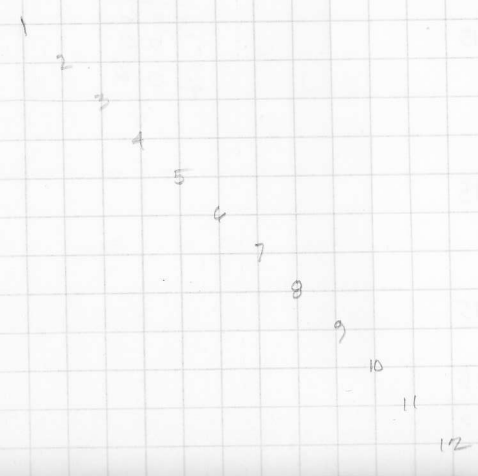


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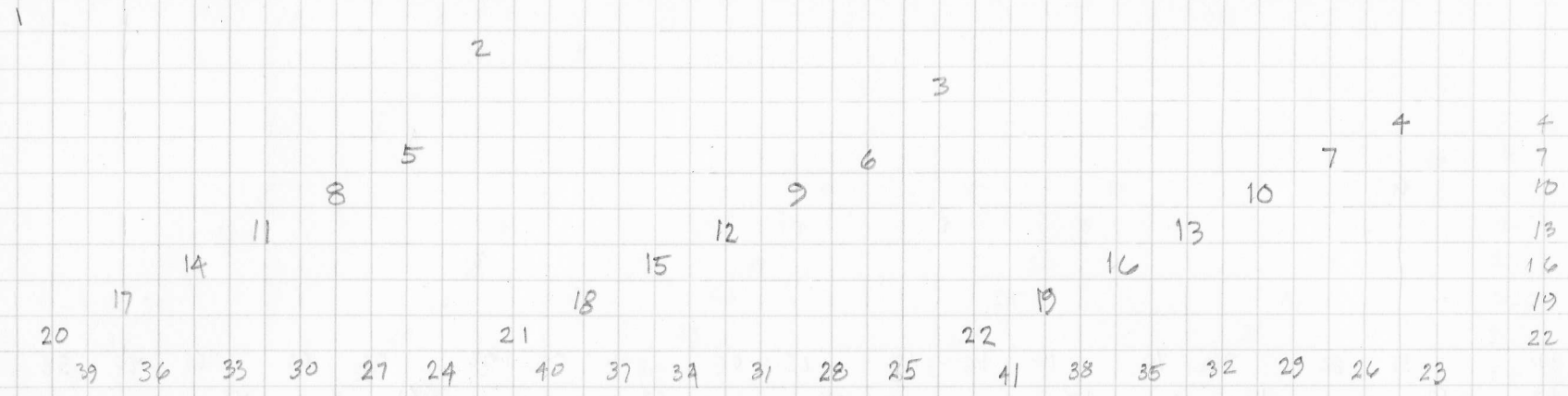
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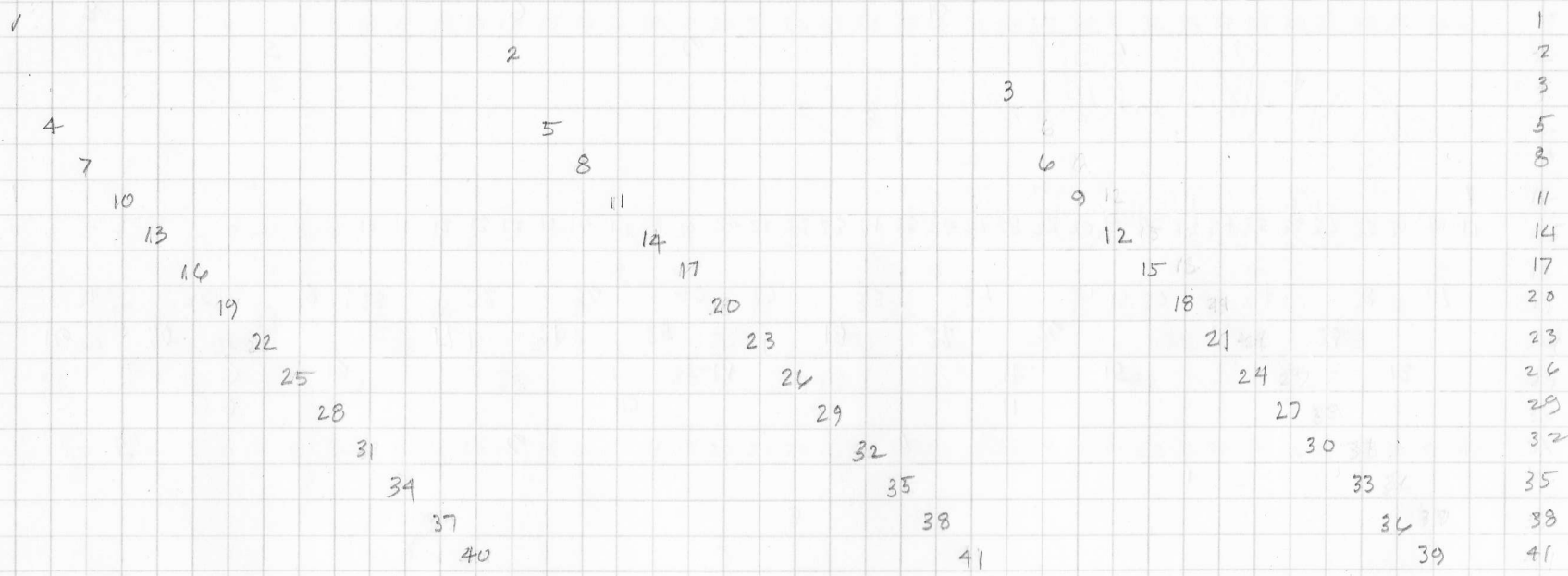


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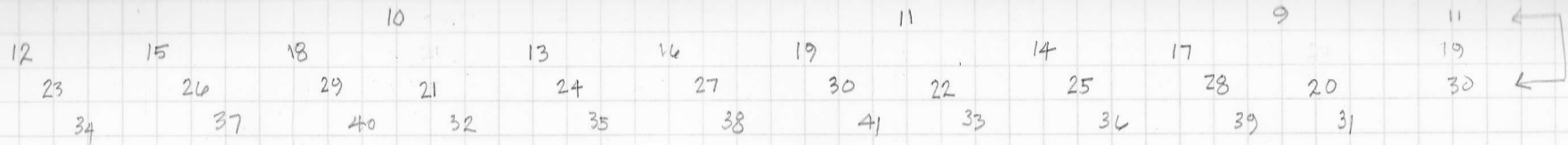


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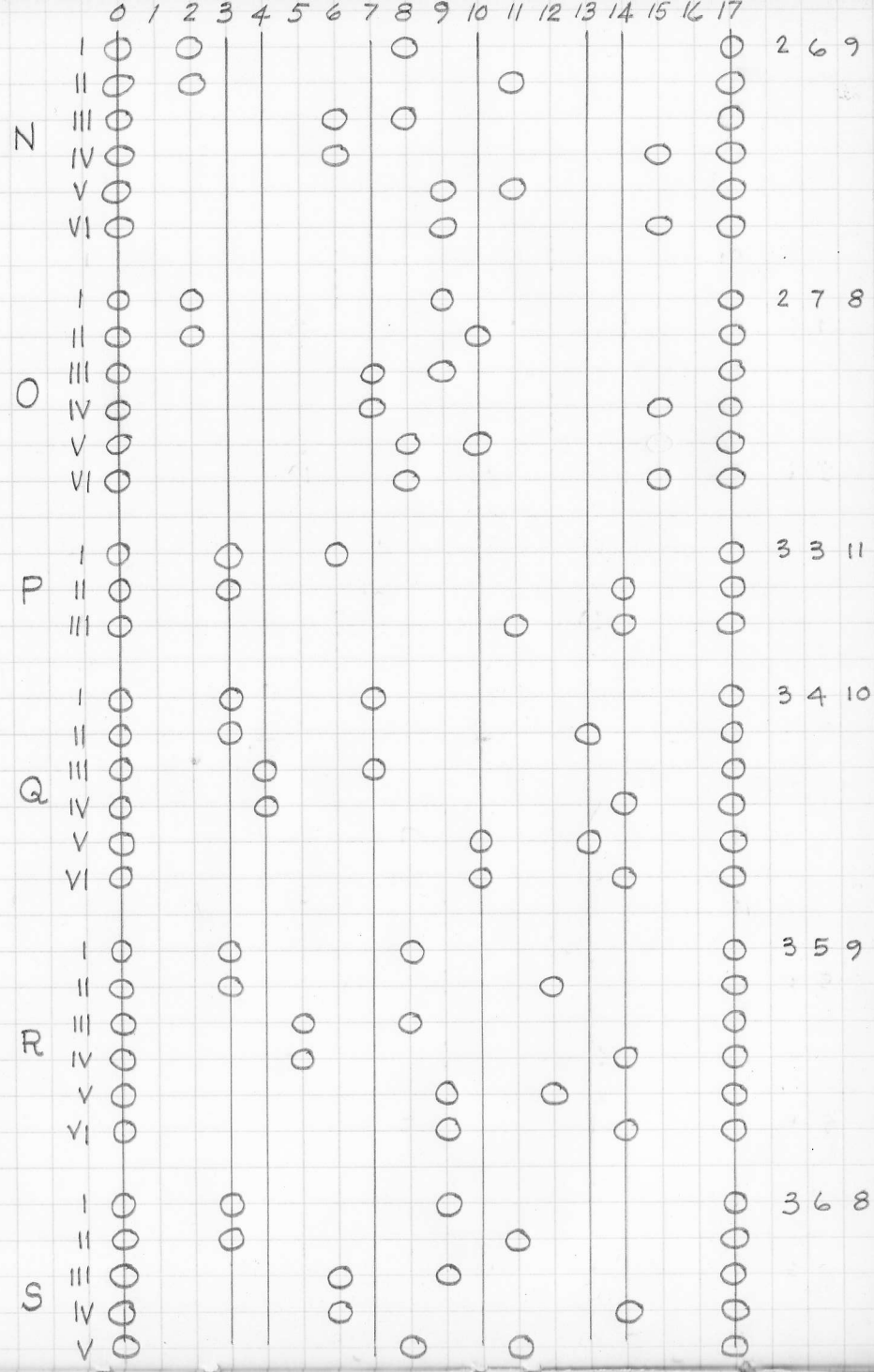
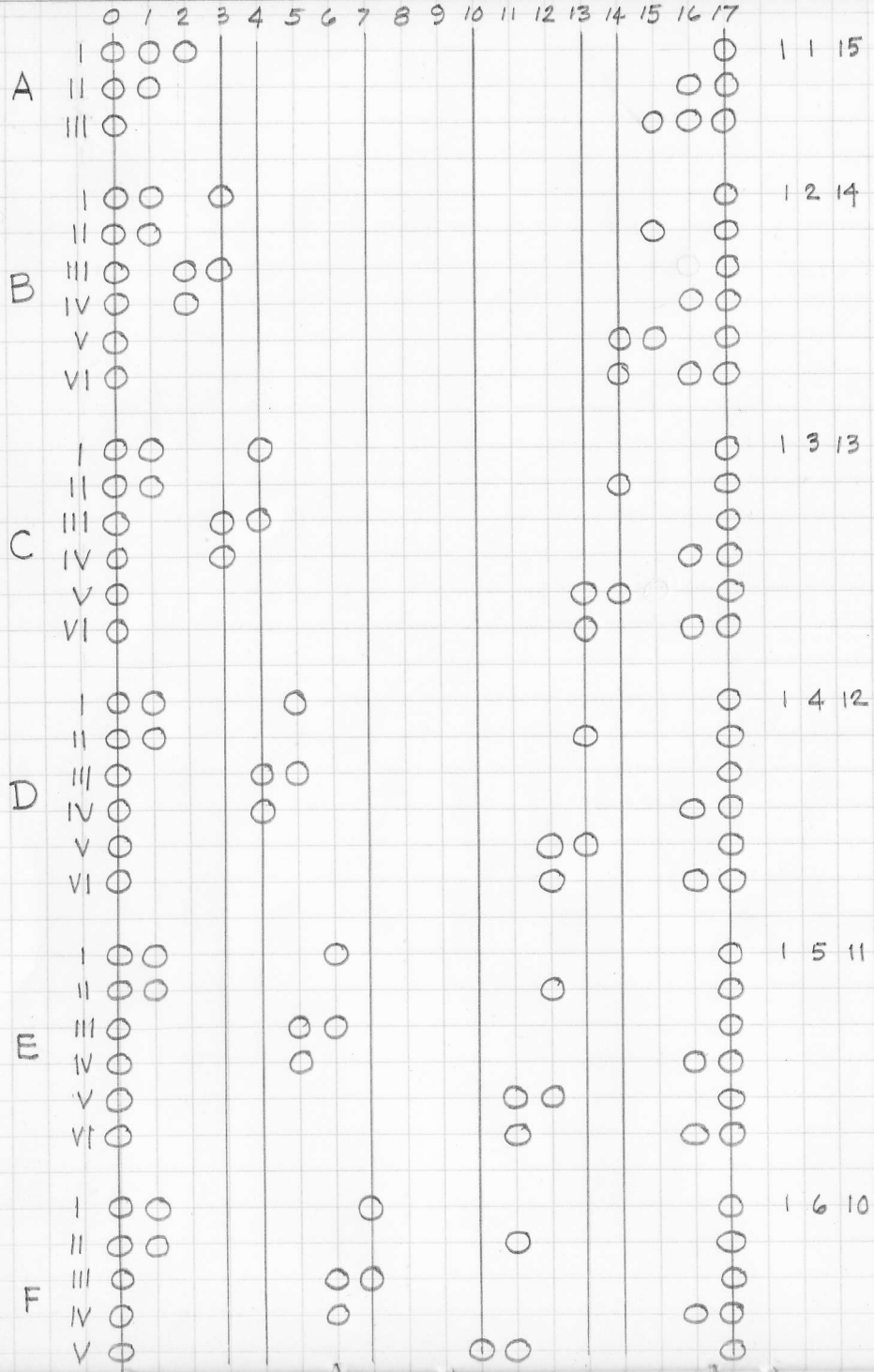
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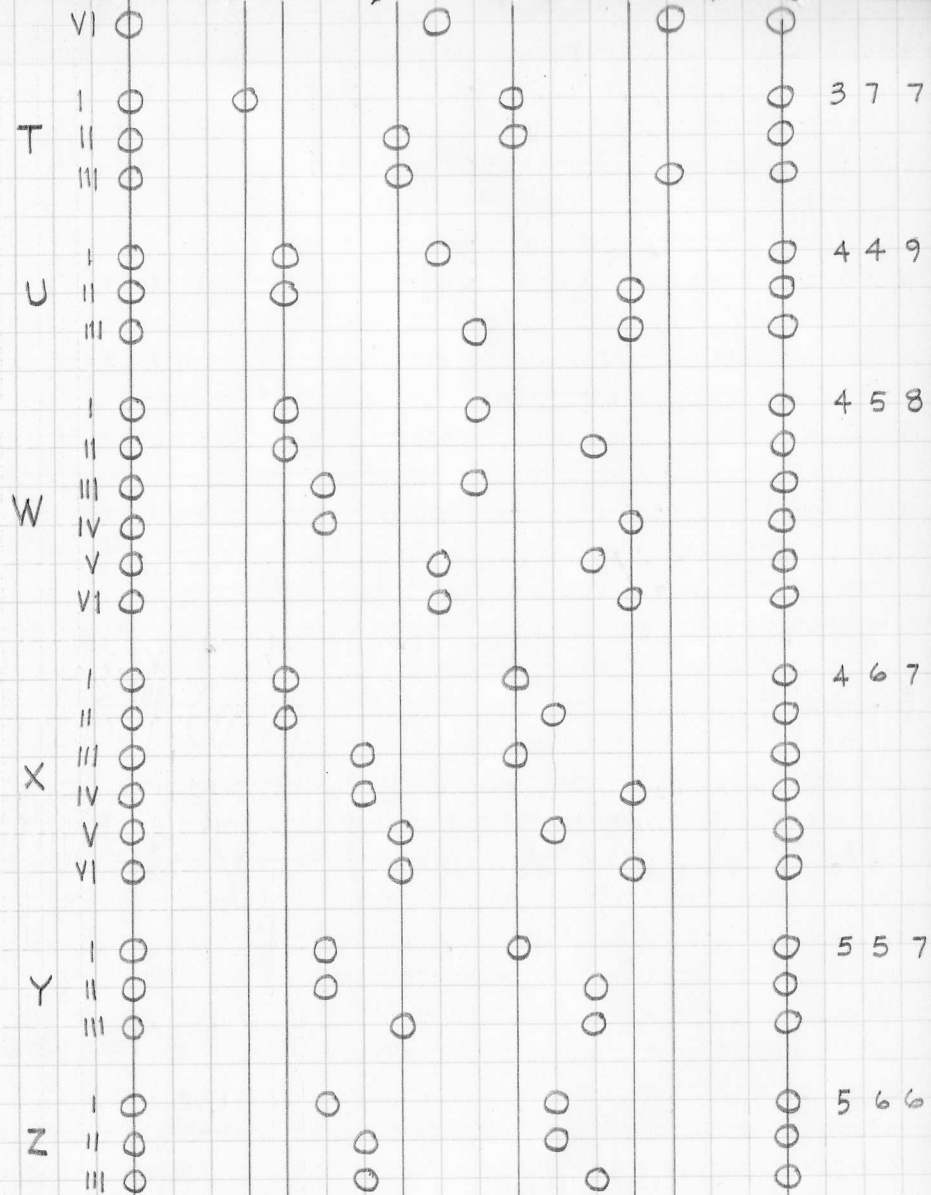
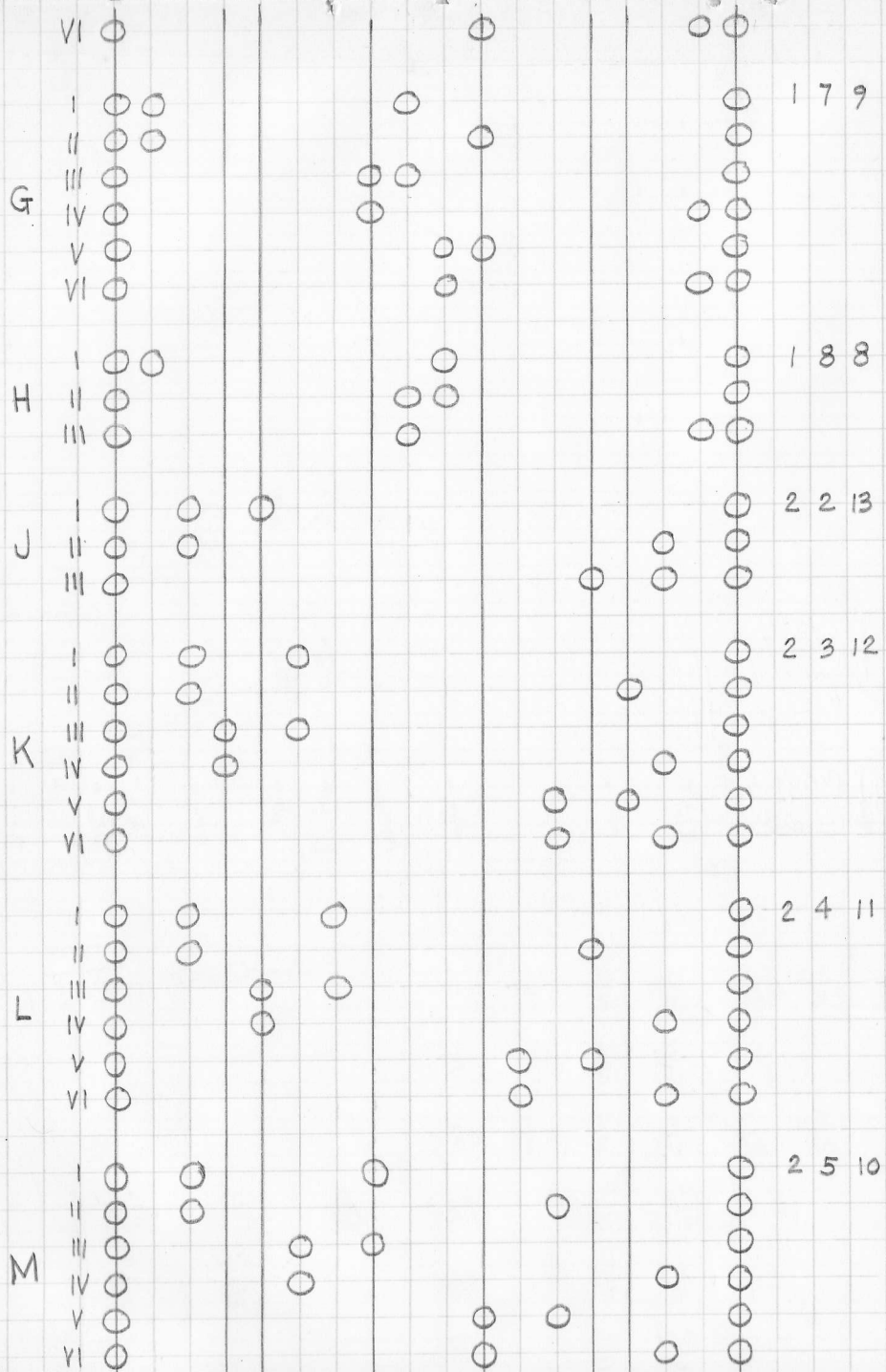
5

# 41 TONE HEPTATONICS









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○	○		○	○	○	○	○	○ Çarigâh
○	○	○	○	○	○	○ 70	○	○ Pöselik (1)
○	○	○	○	○	○	○	○	○ Pöselik (2)
○	○	○	○	○	○	○	○	○ Kürdî
○	○	○	○	○	○	○	○	○ Rast
○	○	○	○	○	○	○	○	○ Ussak
○	○	○	○	○	○	○	○	○ Hüseyinî
○	○	○	○	○	○	○	○	○ Neva
○	○		○	○	○	○	○	○ Hicaz •
○	○		○	○	○	○	○	○ Hicaz Hümâyon •
○	○		○	○	○	○	○	○ Uzzal •
○	○		○	○	○	○	○	○ Zırgüle
○	○	○	○	○	○	○	○	○ Karcıgar •
○	○	○	○	○	○	○	○	○ Suzinak •



0	7	10	17	24	31	37	41					
0	5	10-2	3	8-4	1	6	11-1	4	9-3	2	7	12 0
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17 Tent Loop

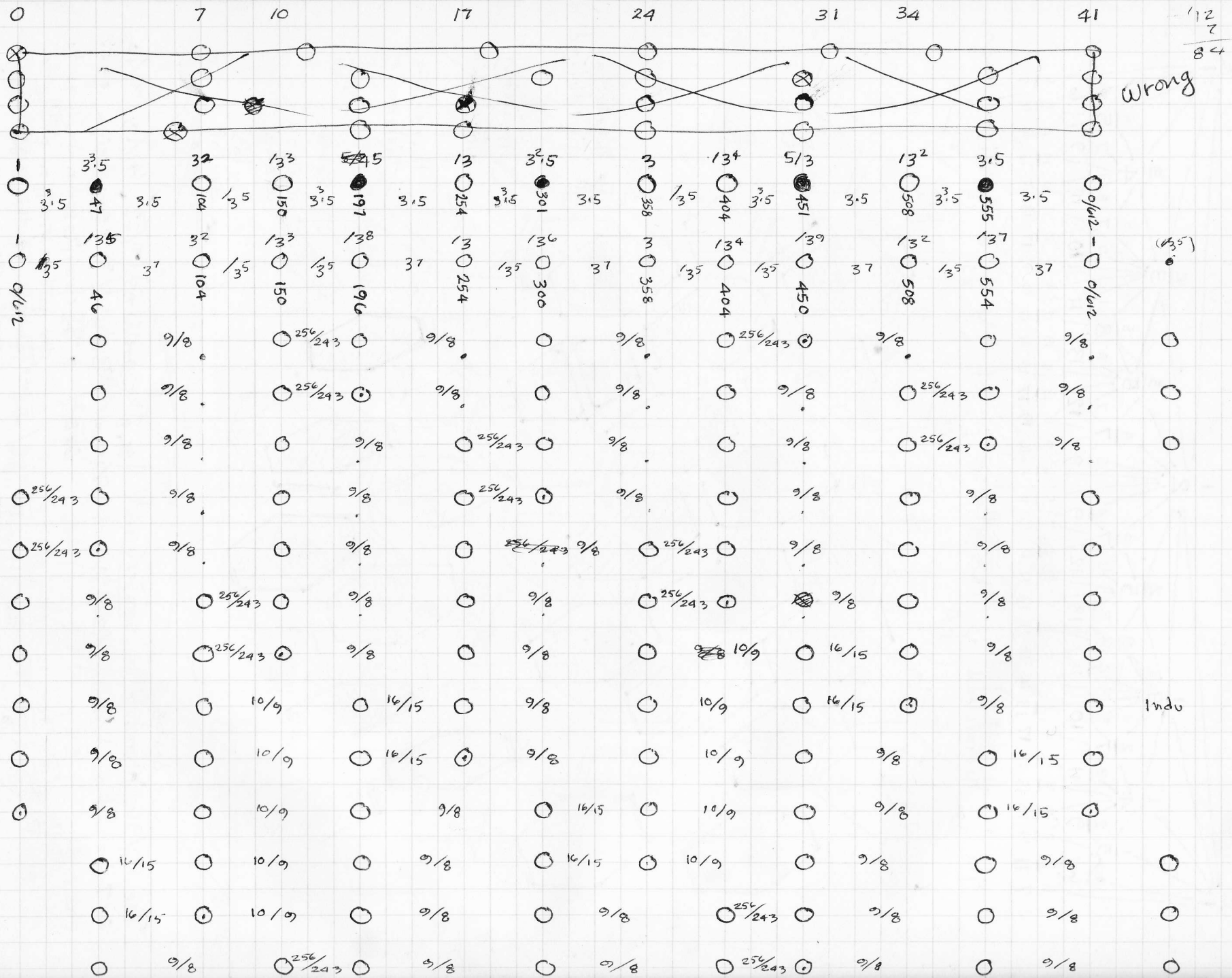
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	OC <sub>#</sub> <sup>16/15</sup>	OD	10/9	OE <sub>1</sub>	9/8	OF <sub>1</sub> <sup>16/15</sup>	OG	9/8	OA	10/9	<del>OB<sub>1</sub></del>	9/8	m m	
	OC <sub>#</sub> <sup>16/15</sup>	<del>D</del>	9/8	OE	10/9	OF <sub>1</sub> <sup>16/15</sup>	OG	9/8	OA	10/9	OB <sub>1</sub>	9/8	M	
	OC <sub>#</sub> <sup>16/15</sup>	OD	9/8	OE	10/9	<del>OF<sub>1</sub></del>	9/8	G <sub>#</sub> <del>OB<sub>1</sub></del>	16/15	OA	9/8	OB <sub>1</sub>	9/8	m m
16/15	<del>OC<sub>#</sub></del> <sup>16/15</sup>	OD	<del>9/8</del>	OE	10/9	OF <sub>1</sub>	9/8	G <sub>#</sub> <del>OB<sub>1</sub></del>	16/15	<del>OA</del>	75/64	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>	<del>75/64</del>	
16/15	<del>OC<sub>#</sub></del>	9/8	OE <sub>1</sub> <sup>16/15</sup>	OE	10/9	OF <sub>1</sub>	9/8	G <sub>#</sub> <del>OB<sub>1</sub></del>	16/15	OA	75/64	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>		
16/15	OC <sub>#</sub>	9/8	OE <sub>1</sub> <sup>16/15</sup>	<del>E</del>	75/64	OG <sub>1</sub> <sup>16/15</sup>	<del>OA<sub>b</sub></del> <sup>16/15</sup>	OA	75/64	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>			Turkish	
16/15	OC <sub>#</sub>	9/8	OE <sub>1</sub> <sup>16/15</sup>	OE	75/64	OG <sub>1</sub> <sup>16/15</sup>	<del>OA<sub>b</sub></del> <sup>16/15</sup>	9/8	OB <sub>b</sub>	10/9	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>		222mak, karciger Hicaz, Uzzal Turkish	
9/8	OD <sub>1</sub> <sup>16/15</sup>	OE <sub>1</sub> <sup>16/15</sup>	OE	75/64	OG <sub>1</sub> <sup>16/15</sup>	<del>OA<sub>b</sub></del> <sup>16/15</sup>	9/8	OB <sub>b</sub>	10/9	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>				
9/8	OD <sub>1</sub> <sup>16/15</sup>	<del>EB</del>	9/8	OF	10/9	OG <sub>1</sub> <sup>16/15</sup>	<del>OA<sub>b</sub></del> <sup>16/15</sup>	9/8	OB <sub>b</sub>	10/9	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>		M	
<del>9/8</del>	OD <sub>1</sub> <sup>16/15</sup>	OE <sub>1</sub>	9/8	OF	10/9	<del>OG<sub>1</sub></del>	9/8	OA <sub>1</sub> <sup>16/15</sup>	OB <sub>b</sub>	10/9	B <sub>2</sub> <sup>#</sup> OC <sub>1</sub>		m	
OC	10/9	OD <sub>1</sub> <sup>16/15</sup>	OE <sub>1</sub>	9/8	OF	10/9	OG <sub>1</sub>	9/8	OA <sub>1</sub> <sup>16/15</sup>	<del>OB<sub>b</sub></del>	9/8	<del>OC</del>	M	
OC	10/9	<del>D<sub>1</sub></del>	9/8	OE <sub>1</sub> <sup>16/15</sup>	OF	10/9	OG <sub>1</sub>	9/8	OA <sub>1</sub> <sup>16/15</sup>	OB <sub>b</sub>	9/8	OC	m	
OC	10/9	OD <sub>1</sub>	9/8	OE <sub>1</sub> <sup>16/15</sup>	<del>F</del>	9/8	OG	10/9	OA <sub>1</sub> <sup>16/15</sup>	OB <sub>b</sub>	9/8	OC	M	
OC	10/9	OD <sub>1</sub>	9/8	OE <sub>1</sub> <sup>16/15</sup>	OF	9/8	OG	10/9	<del>OA<sub>1</sub></del>	9/8	OB <sub>1</sub> <sup>16/15</sup>	OC	m	
<del>OC</del>	9/8	OD	10/9	OE <sub>1</sub> <sup>16/15</sup>	OF	9/8	OG	10/9	OA <sub>1</sub>	9/8	OB <sub>1</sub> <sup>16/15</sup>	<del>OC</del>	M	
OC	9/8	OD	10/9	<del>OE<sub>1</sub></del>	9/8	OF <sub>1</sub> <sup>16/15</sup>	OG	10/9	OA <sub>1</sub>	9/8	OB <sub>1</sub> <sup>16/15</sup>	OC	m	
OC	(9/8)	OD (10/9)	OE <sub>1</sub> (9/8)	OF <sub>1</sub> <sup>16/15</sup>	<del>OG</del> (9/8)	OA (10/9)	OB <sub>1</sub> <sup>16/15</sup>	OC (M)						



$$\frac{5}{4} \times 3.5^2 \times \frac{3}{5} \times 3^2 = 31.5^2$$

	7	10	17	24	31	34	41					
0	5	10-2	3	8-4	1	6	11-1	4	9-3	2	7	12 0
0	7	14 4	11	1 8	15	5	12 2	9	16 6	13	3	10 0
⑥	○	○	○	○	○	○	○	○	○	○	○	○
	135/128	14/15	14/15	135/128	10/9	14/15	135/128	10/15	10/9	10/9	14/15	14/15
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	14/15	16/15	135/128	10/9	16/15	135/128	14/15	10/9	10/9	81/80	81/80
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	14/15	135/128	16/15	10/9	16/15	135/128	14/15	10/9	10/9	81/80	81/80
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	16/15	135/128	16/15	10/9	81/80	10/9	14/15	10/9	10/9	81/80	81/80
	○	④	○	○	○	○	○	○	○	○	○	○
	10/9	16/15	135/128	16/15	10/9	81/80	10/9	16/15	135/128	16/15	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	81/80	10/9	16/15	10/9	81/80	10/9	16/15	135/128	16/15	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	81/80	10/9	16/15	135/128	16/15	10/9	16/15	135/128	16/15	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	81/80	10/9	16/15	135/128	16/15	10/9	16/15	135/128	16/15	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	10/9	14/80	10/9	16/15	135/128	16/15	10/9	16/15	81/80	10/9	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	135/128	16/15	10/9	16/15	15	135/128	16/15	10/9	81/80	10/9	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	135/128	14/15	10/9	81/80	10/9	16/15	16/15	10/9	81/80	10/9	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	135/128	14/15	10/9	81/80	10/9	16/15	135/128	16/15	16/80	10/9	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	14/15	16/15	10/9	81/80	10/9	16/15	135/128	16/15	16/15	10/9	16/15	16/15
	○	○	○	○	○	○	○	○	○	○	○	○
	16/15	16/15	135/128	14/15	10/9	16/15	16/15	2	135/128	16/15	10/9	135/128
	○	○	○	○	○	○	○	○	○	○	○	○
	16/15	14/15	135/128	14/15	10/9	16/15	135/128	16/15	16/15	10/9	13	3
	○	○	○	○	○	○	○	○	○	○	○	○
	16/15	14/15	135/128	14/15	10/9	16/15	135/128	16/15	16/15	135/128	10/9	10/9
	○	○	○	○	○	○	○	○	○	○	○	○
	16/15	135/128	14/15	16/15	10/9	135/128	16/15	16/15	135/128	10/9	10/9	10/9
	○	○	○	○	○	○	○	○	○	○	○	○
	16/15	135/128	14/15	16/15	135/128	10/9	16/15	16/15	135/128	10/9	10/9	10/9

$$\frac{9}{8} \times \frac{15}{16} = \frac{135}{128}$$



Wrong

$$\frac{12}{7} = 84$$

Indu

0	7	10	17	24	31	34	41
$3^3 \cdot 5$	32	$13^3$	<del>24</del> 5	13	$3^2 \cdot 5$	13 <sup>2</sup>	3.5
3.5	3.5	$\frac{1}{3} \cdot 5$	3.5	3.5	$\frac{3}{3} \cdot 5$	3.5	3.5
47	104	150	197	254	301	404	451
135	32	$13^3$	138	13	136	134	137
3.5	37	$\frac{1}{3} \cdot 5$	$\frac{1}{3} \cdot 5$	37	$\frac{1}{3} \cdot 5$	$\frac{1}{3} \cdot 5$	$\frac{1}{3} \cdot 5$
46	104	150	196	254	300	404	554
	9/8	$\frac{256}{243}$		9/8		$\frac{256}{243}$	
	9/8	$\frac{256}{243}$		9/8		$\frac{256}{243}$	
	9/8		9/8	$\frac{256}{243}$		9/8	
$\frac{256}{243}$	9/8		9/8	$\frac{256}{243}$		9/8	
$\frac{256}{243}$	9/8		9/8	$\frac{256}{243}$	9/8	$\frac{256}{243}$	9/8
9/8	$\frac{256}{243}$		9/8	9/8	$\frac{256}{243}$	9/8	9/8
9/8	$\frac{256}{243}$		9/8	9/8	<del>9/8</del> 10/9	16/15	9/8
9/8		10/9	14/15	9/8	10/9	16/15	9/8
9/8		10/9	16/15	9/8	10/9	9/8	16/15
9/8		10/9		9/8	16/15	10/9	16/15
16/15		10/9		9/8	16/15	10/9	9/8
16/15		10/9		9/8		$\frac{256}{243}$	9/8
9/8		$\frac{256}{243}$		9/8		$\frac{256}{243}$	9/8



Table I

○	$\frac{28}{27}$	○
○	$\frac{28}{27}$	○

$\frac{80}{1}$

○	$\frac{32}{27}$
○	

$\frac{81}{8}$

○	$\frac{4}{3}$	○	$\frac{22}{21}$	○	$\frac{88}{63}$
○		○	$\frac{21}{20}$	○	$\frac{7}{5}$

$\frac{12}{11}$

$\frac{10}{9}$

○  $\frac{32}{21}$

○  $\frac{14}{9}$

$\frac{7}{6}$

$\frac{8}{7}$

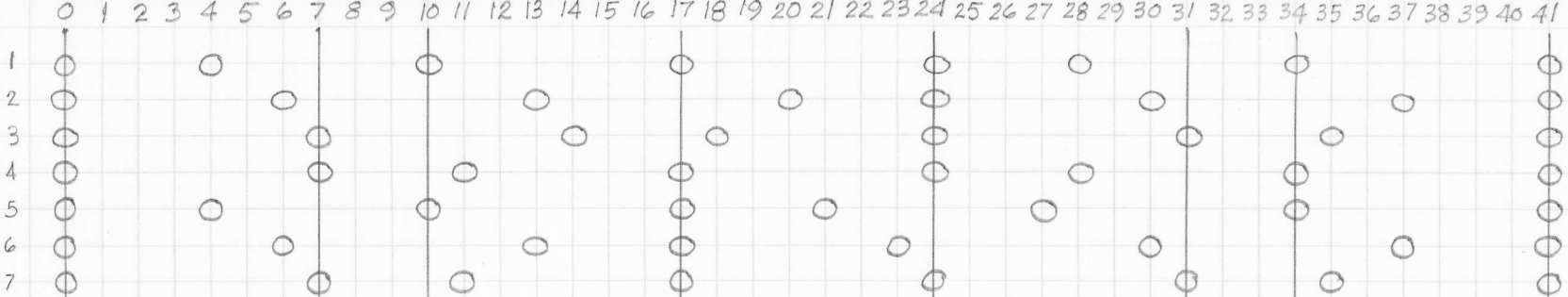
○	$\frac{9}{5}$
○	

$\frac{81}{8}$

○	$\frac{2}{1}$
○	

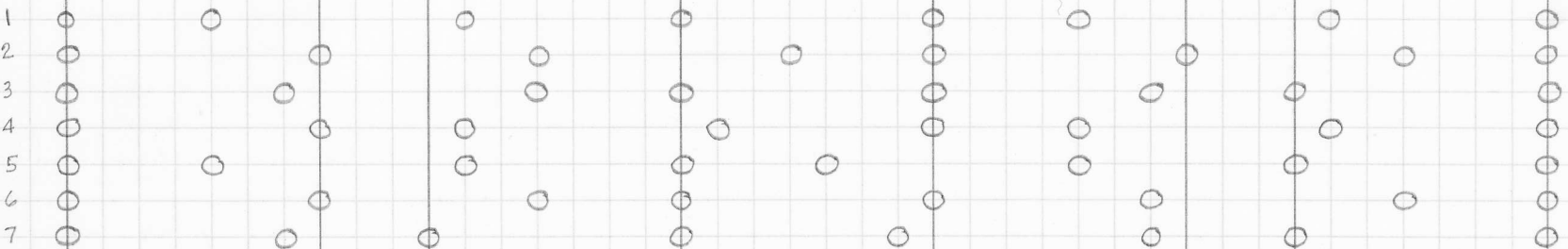
Ptolemaei  
 Libri  
 II  
 chap 15  
 "Harmonicorum"

I

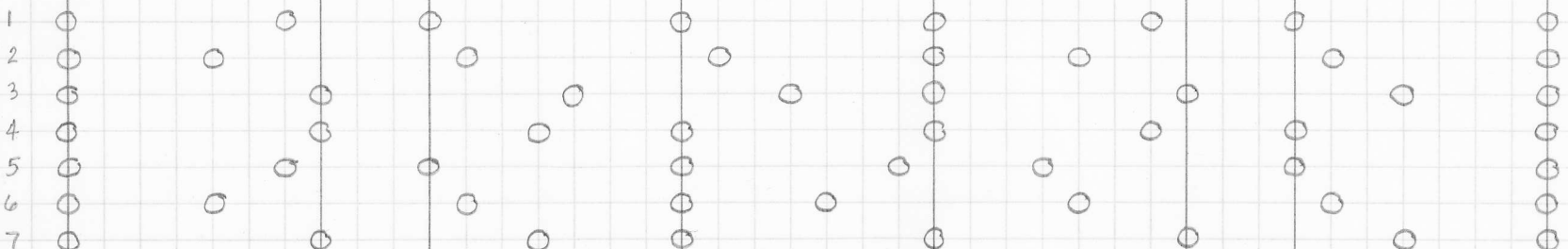


V

II

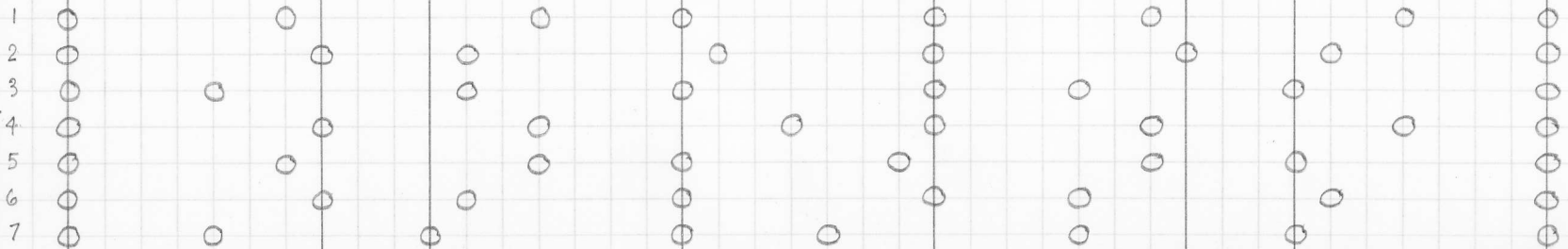


III

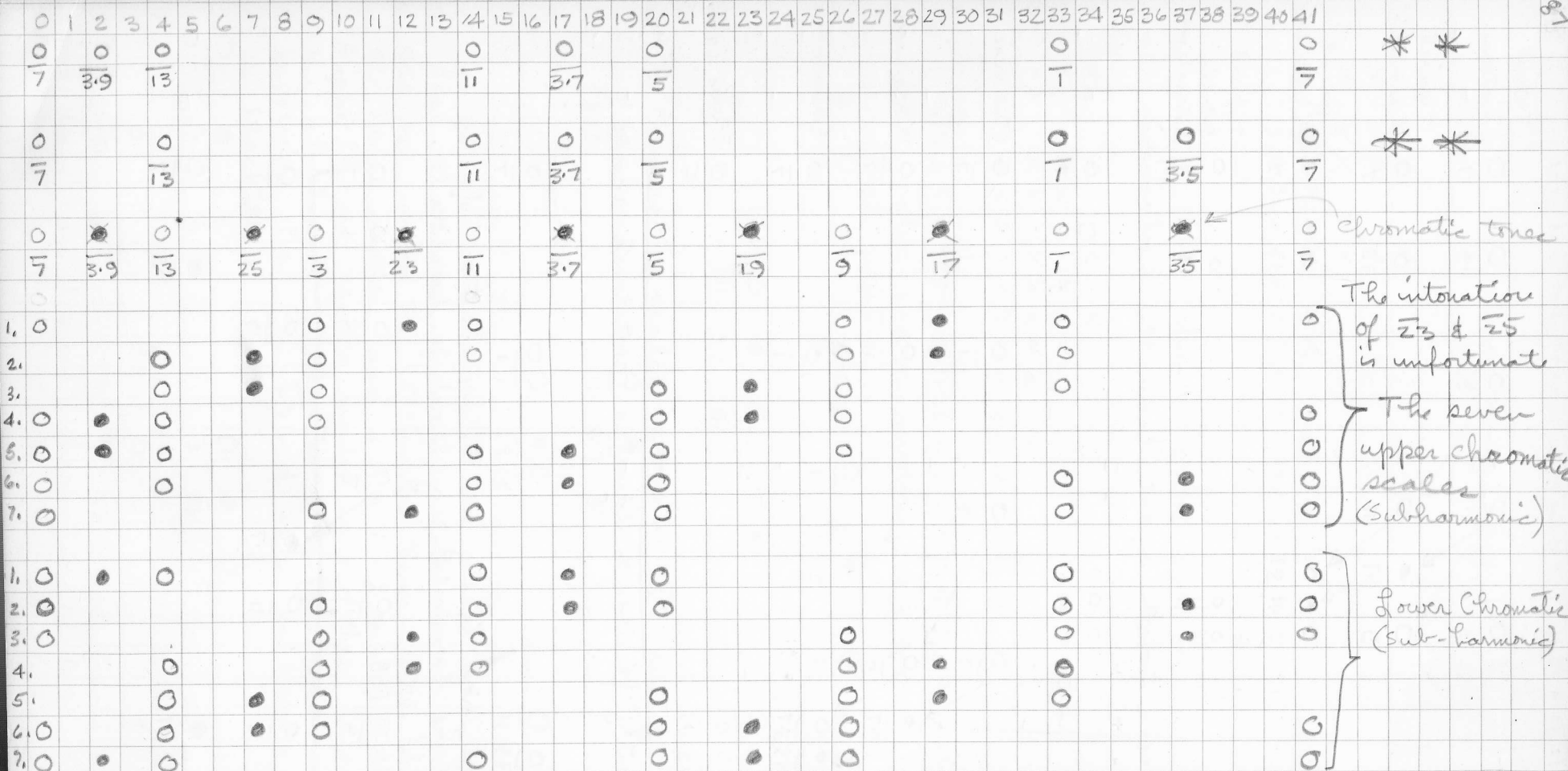


VI

IV







\* \*

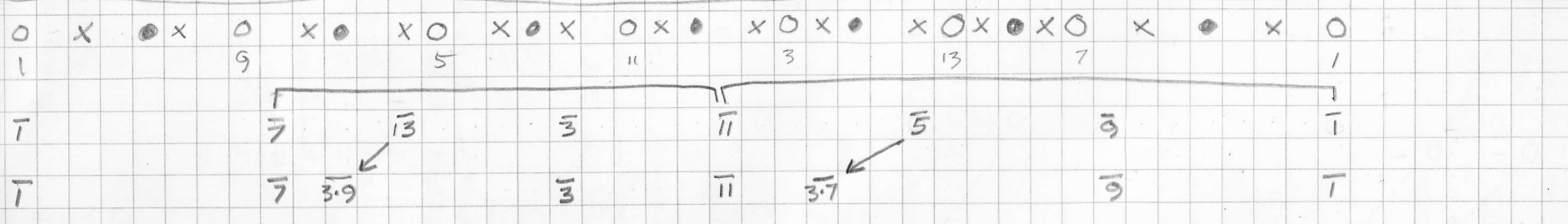
\* \*

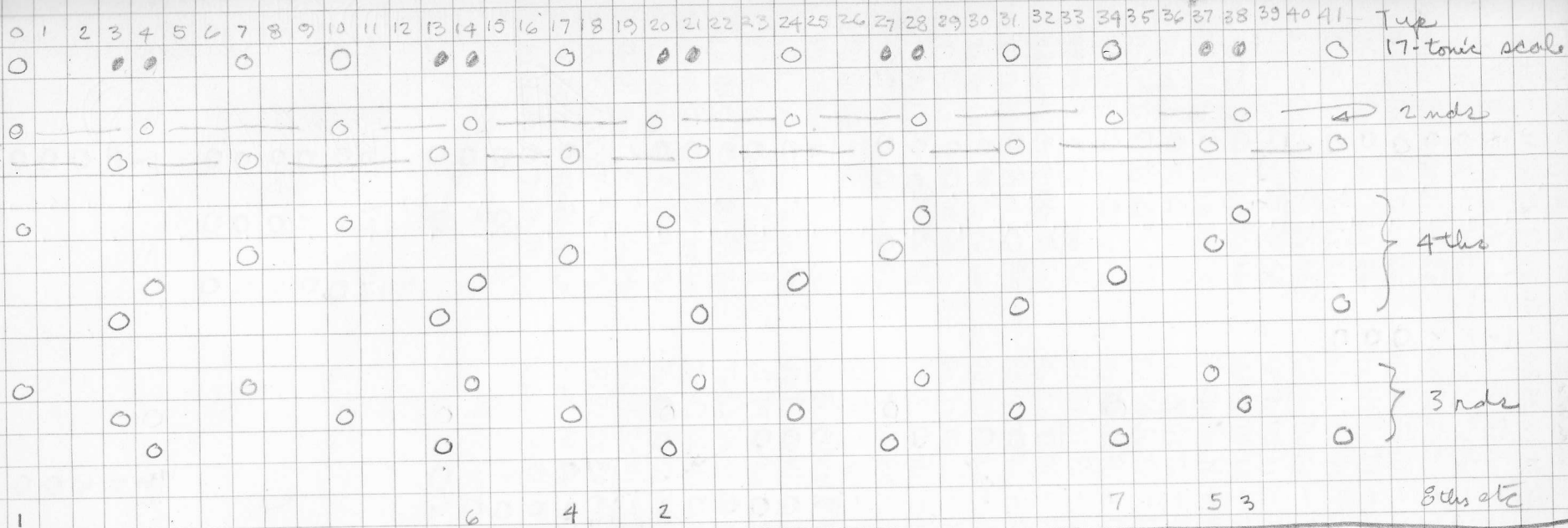
← chromatic tones

The intonation of  $\bar{2}^3$  &  $\bar{2}^5$  is unfortunate

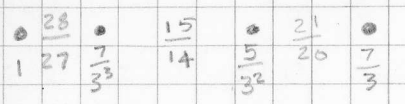
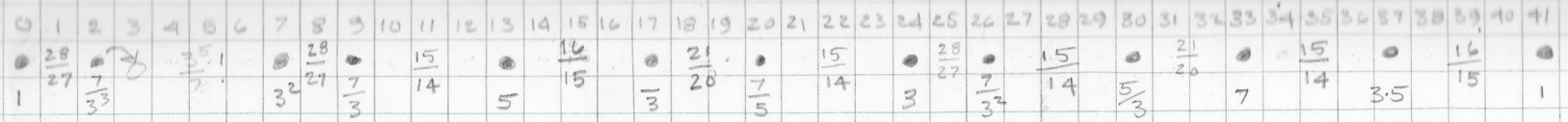
The seven upper chromatic scales (Subharmonic)

Lower Chromatic (Sub-harmonic)

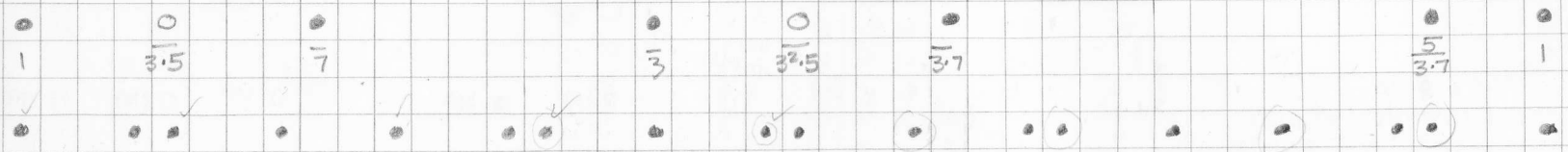




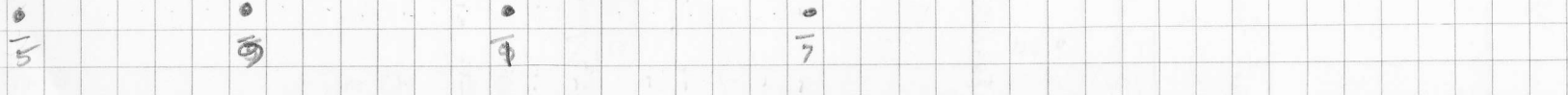
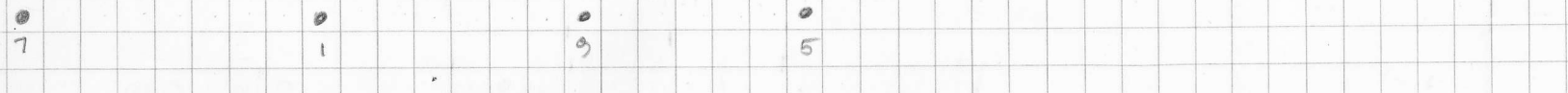
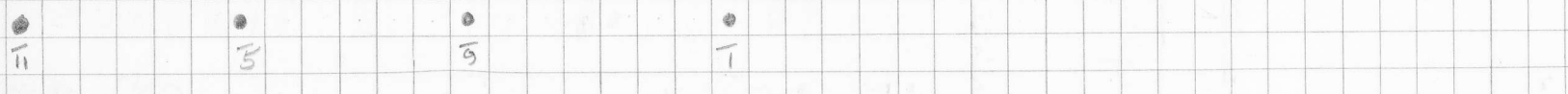
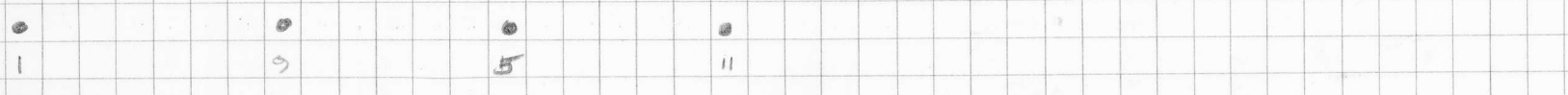
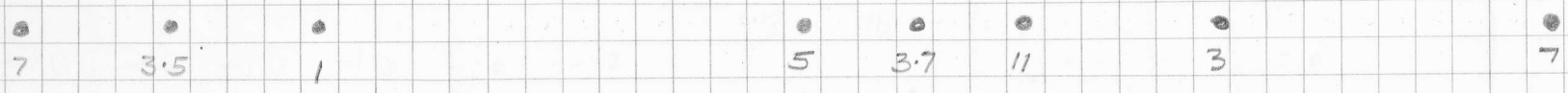
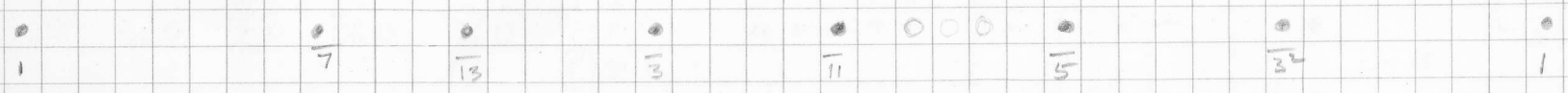
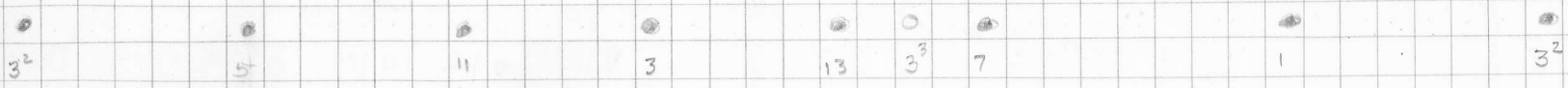
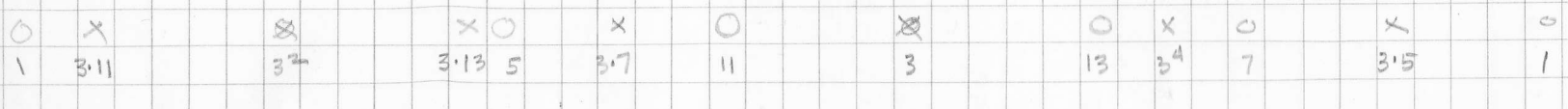
$\frac{0}{3.13}$	$\frac{0}{3.3}$	$\frac{0}{3.5}$	$\frac{0}{7}$	$\frac{0}{13}$	$\frac{0}{3}$	$\frac{0}{3.27}$	$\frac{0}{3.13}$	Pelag <sup>(Sw P5)</sup>	
0	0	0	0	0	0	0	0	Pelag	
0	0	0	0	0	0	0	0	Dangsoe	
0	0	0	0	0	0	0	0	Bem	
0	0	0	0	0	0	0	0	Barang	
0	0	0	0	0	0	0	0	Miring	
0	0	0	0	0	0	0	0	Menjoera	
$\frac{0}{3.7}$	$\frac{0}{3.13}$	$\frac{0}{1}$	$\frac{0}{15}$	$\frac{0}{7}$	$\frac{0}{13}$	$\frac{0}{11}$	$\frac{0}{3.7}$	Pelag?	
$\frac{0}{13}$		$\frac{0}{11}$	$\frac{0}{3.7}$	$\frac{0}{5}$	$\frac{0}{1}$	$\frac{0}{7}$	$\frac{0}{3.9}$	$\frac{0}{13}$	Ref p. 91 *
$\frac{0}{3.7}$	$\frac{0}{5}$	$\frac{0}{1}$		$\frac{0}{7}$	$\frac{0}{3.9}$	$\frac{0}{13}$	good		
							$\frac{0}{11}$	$\frac{0}{3.7}$	* excellent



OR

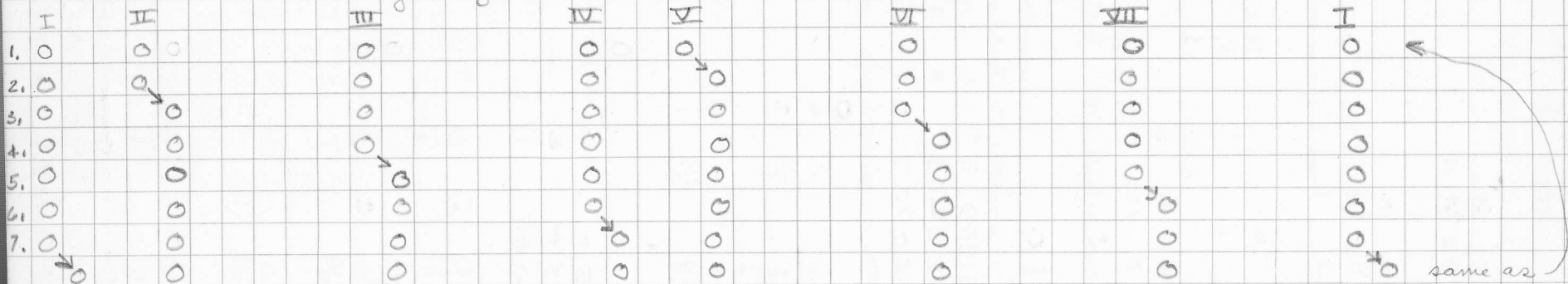


17-ton moment of symmetry

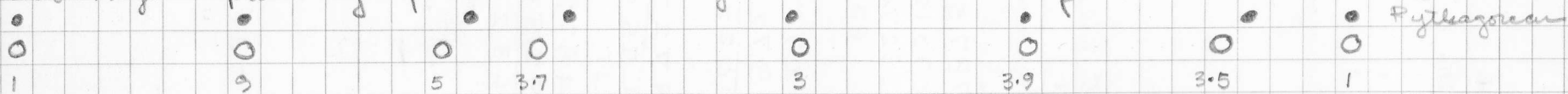


0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41						
•					•						•							•			•					•						•					•					•					•
$\frac{1}{11}$					$\frac{1}{5}$						$\frac{1}{3}$							$\frac{1}{7}$				$\frac{1}{13}$					$\frac{1}{3}$									$\frac{1}{3}$							$\frac{1}{11}$				
$\frac{0}{11}$	$\frac{0}{3}$									$\frac{0}{3/7}$								$\frac{0}{1}$					$\frac{0}{3/11}$			$\frac{0}{7}$											$\frac{0}{13}$							$\frac{0}{11}$			
$\frac{0}{11}$	$\frac{0}{5}$				$\frac{0}{3}$									$\frac{0}{7}$								$\frac{0}{1}$			$\frac{0}{5}$														$\frac{0}{5}$						$\frac{0}{11}$		

### Variations between Pythagorean and Ptolemaic Scales

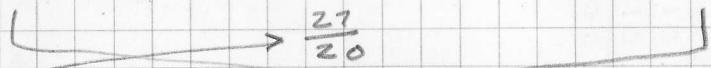


Scale 5, mode II, for example is our theoretical "Major" scale, In actual practice our "Major" probably fluctuates through the Mode II of all seven scales.

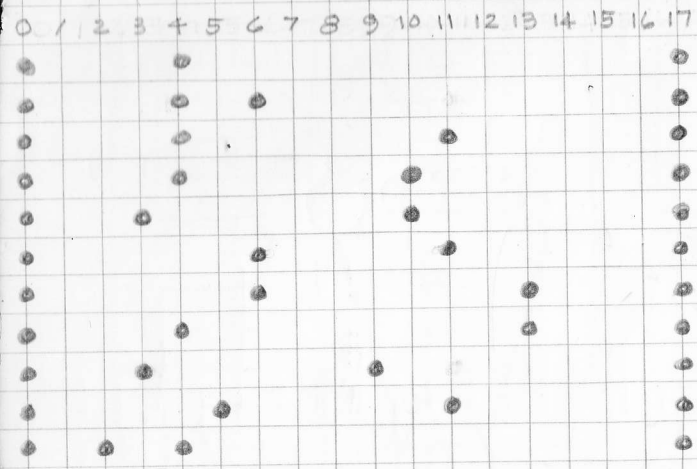


Variation for Pythagorean involving both 5 & 7 ratios

There is hardly a point in trying to avoid the obvious interval  $\frac{27}{20}$  as it has a complexity factor of only 14.

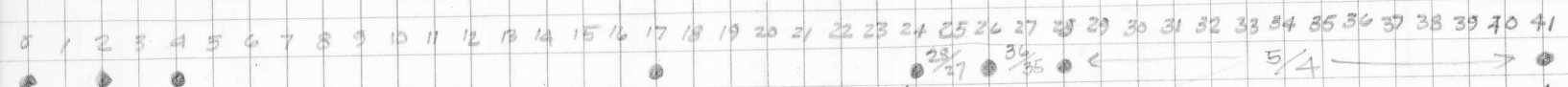


The musician of the future will probably find this discrimination highly rewarding

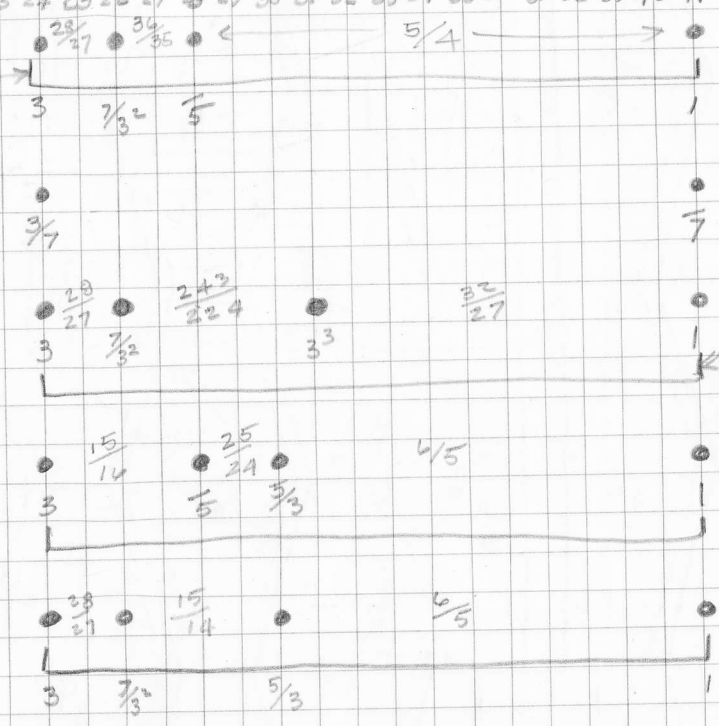


1. Olympus
2. Old Chromatic
3. Diatonic
4. Didymus
5. Doric
6. Phrygian
7. Lydian
8. Helmholtz
9. Soft Diatonic
10. Ptolemy's equal Diatonic
11. Enharmonic

} converted from Helmholtz



This tetrachord is found in 41-Matrix P. 28 on degrees 24, 26, 28, 41, exactly as shown here!



• Archytas Enharmonic (Barlow)

• 5-tone scale from 41-matrix

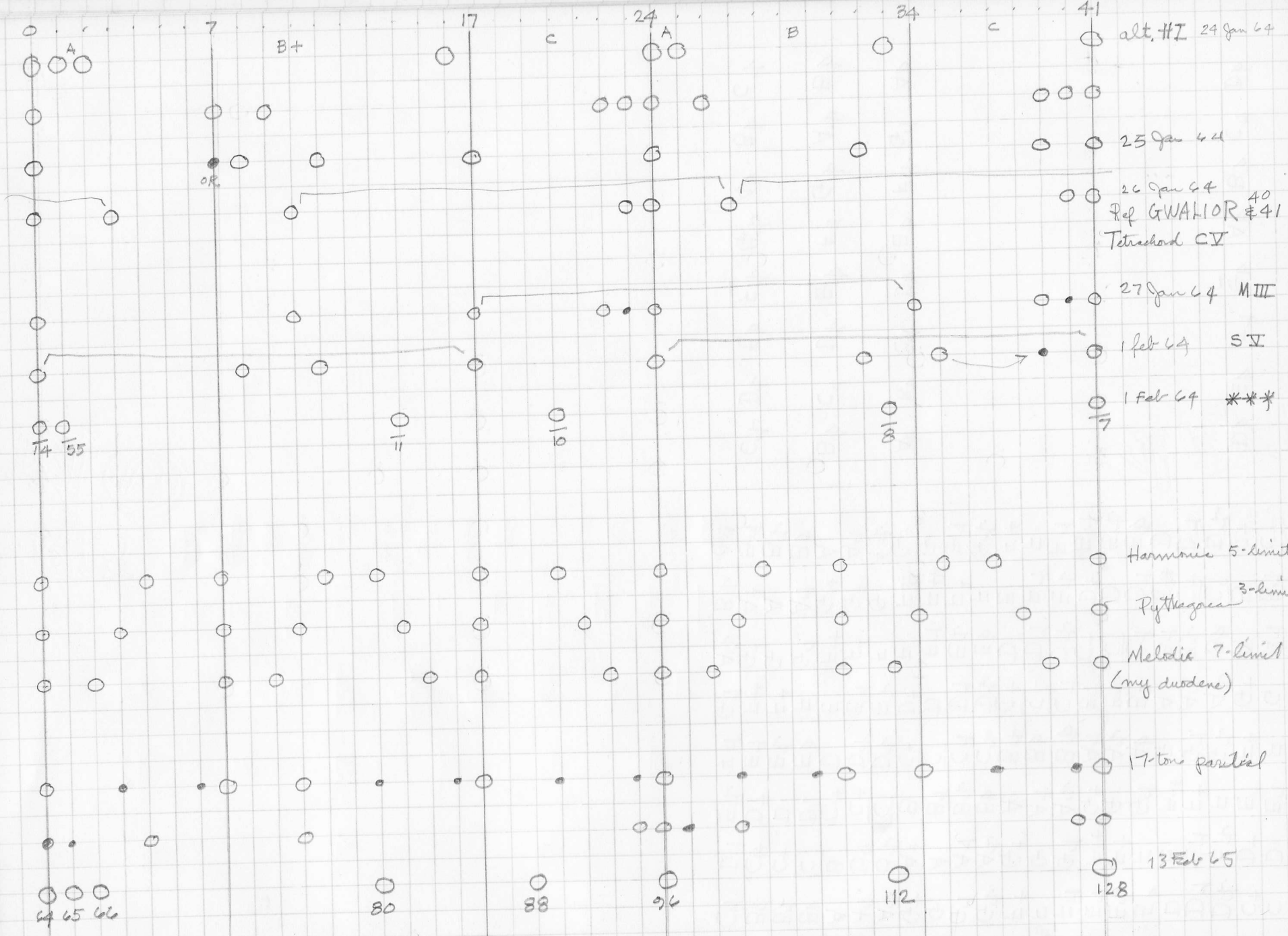
• Archytas Chromatic found in 41-Matrix

• Didymus Chromatic

• Ptolemy Chromatic Malakon (41-Matrix)



Entire scale is found in 41-Matrix



alt. #1 24 Jan 64

25 Jan 64

26 Jan 64  
Ref GWALIOR #41  
Tetrachord CV

27 Jan 64 M III

1 Feb 64 S V

1 Feb 64 \*\*\*

Harmonic 5-limit

Pythagorean 3-limit

Melodic 7-limit  
(my duodec)

17-tone partial

13 Feb 65

74  
75

110

110

110

84  
85  
86

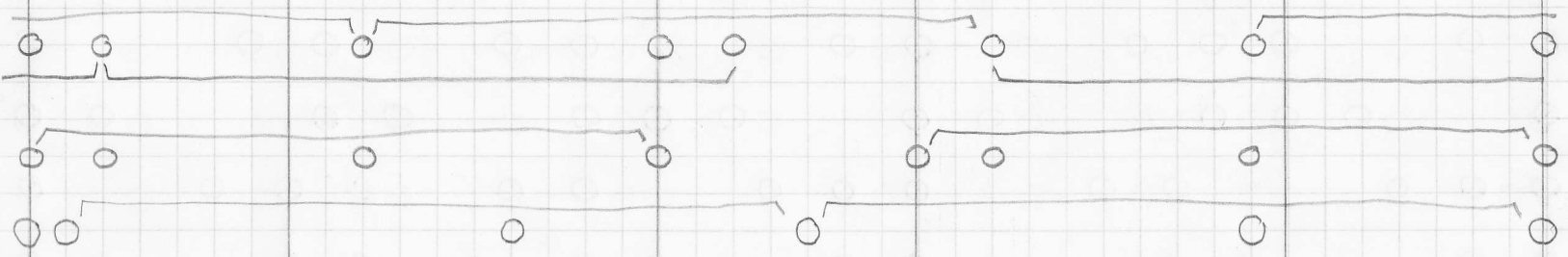
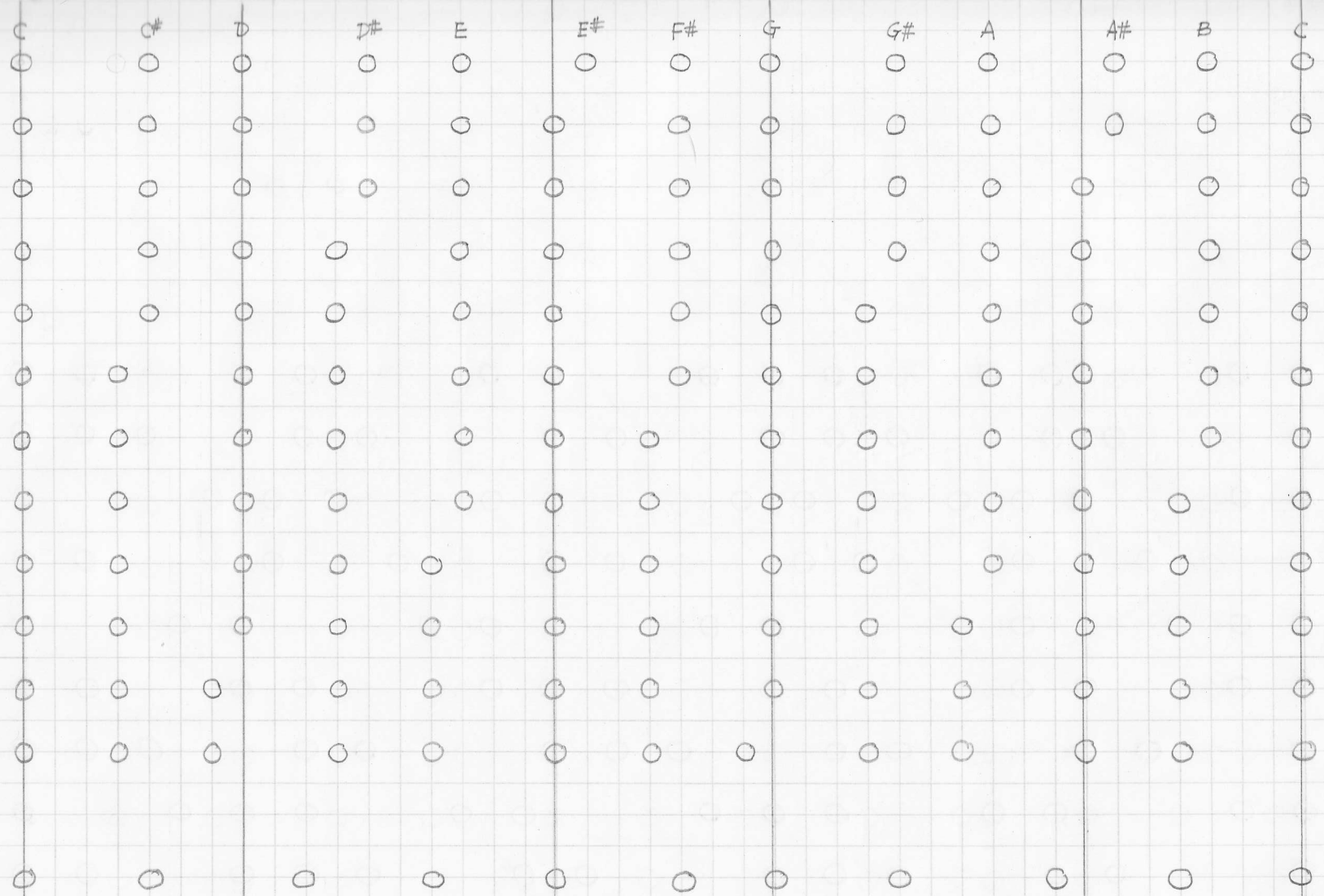
80

88

96

112

128



OV  
 OV or

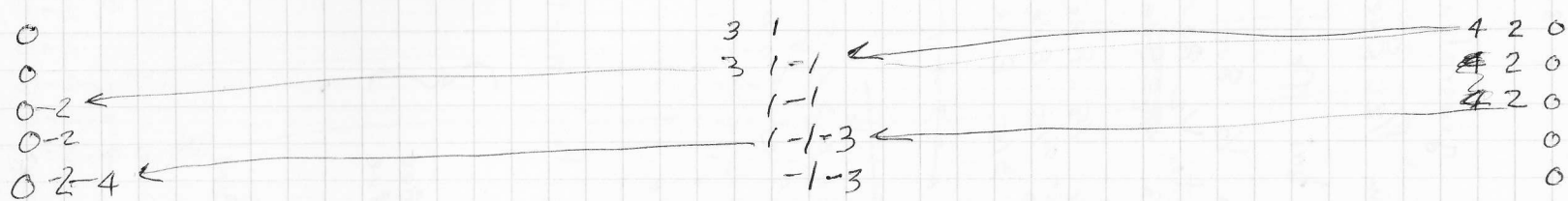
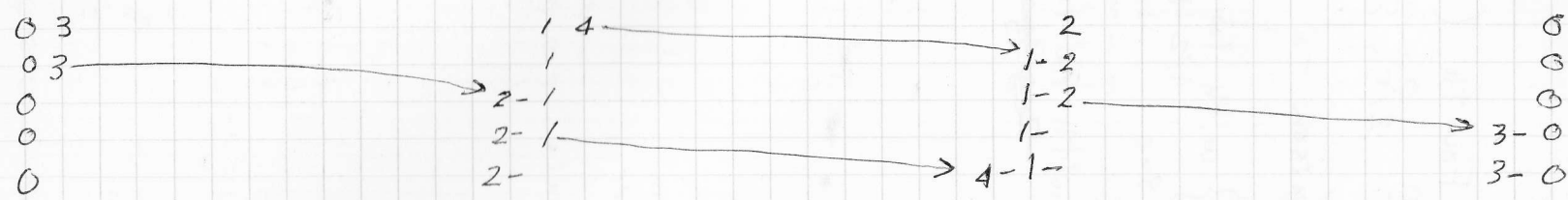
OI

Identical  
 Triads





1 1 1 1 1  
 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41



AI

56 55 54

42

56 55 54

42  
56 55 54

43  
42

(28 NOV 64)

$\frac{9}{3}$   $\frac{62}{55}$   $\frac{7}{6}$

$\frac{63}{44}$

$\frac{3}{2}$   $\frac{84}{55}$   $\frac{14}{9}$

$\frac{21}{11}$

$\frac{2}{1}$

$\frac{7}{5 \cdot 11}$   $\frac{3 \cdot 7}{5}$   $\frac{3^2}{11}$   $\frac{3^2 \cdot 7}{5 \cdot 11}$   $\frac{7}{3}$

$\frac{7}{11}$

$\frac{3^2}{5 \cdot 11}$   $\frac{7}{3 \cdot 5 \cdot 11}$

$\frac{7}{5}$

$\frac{3 \cdot 7}{11}$

3  $\frac{3 \cdot 7}{5 \cdot 11}$

$\frac{3 \cdot 5 \cdot 11}{3^2}$   $\frac{7}{5}$   $\frac{3^2 \cdot 7}{5}$

$\frac{3^2}{11}$

$\frac{7}{3 \cdot 11}$

$\frac{3}{5 \cdot 11}$   $\frac{7}{3^2 \cdot 5 \cdot 11}$   $\frac{3^2}{5}$

$\frac{7}{3 \cdot 5}$

$\frac{3 \cdot 7}{11}$

$\frac{3^2 \cdot 7}{11}$

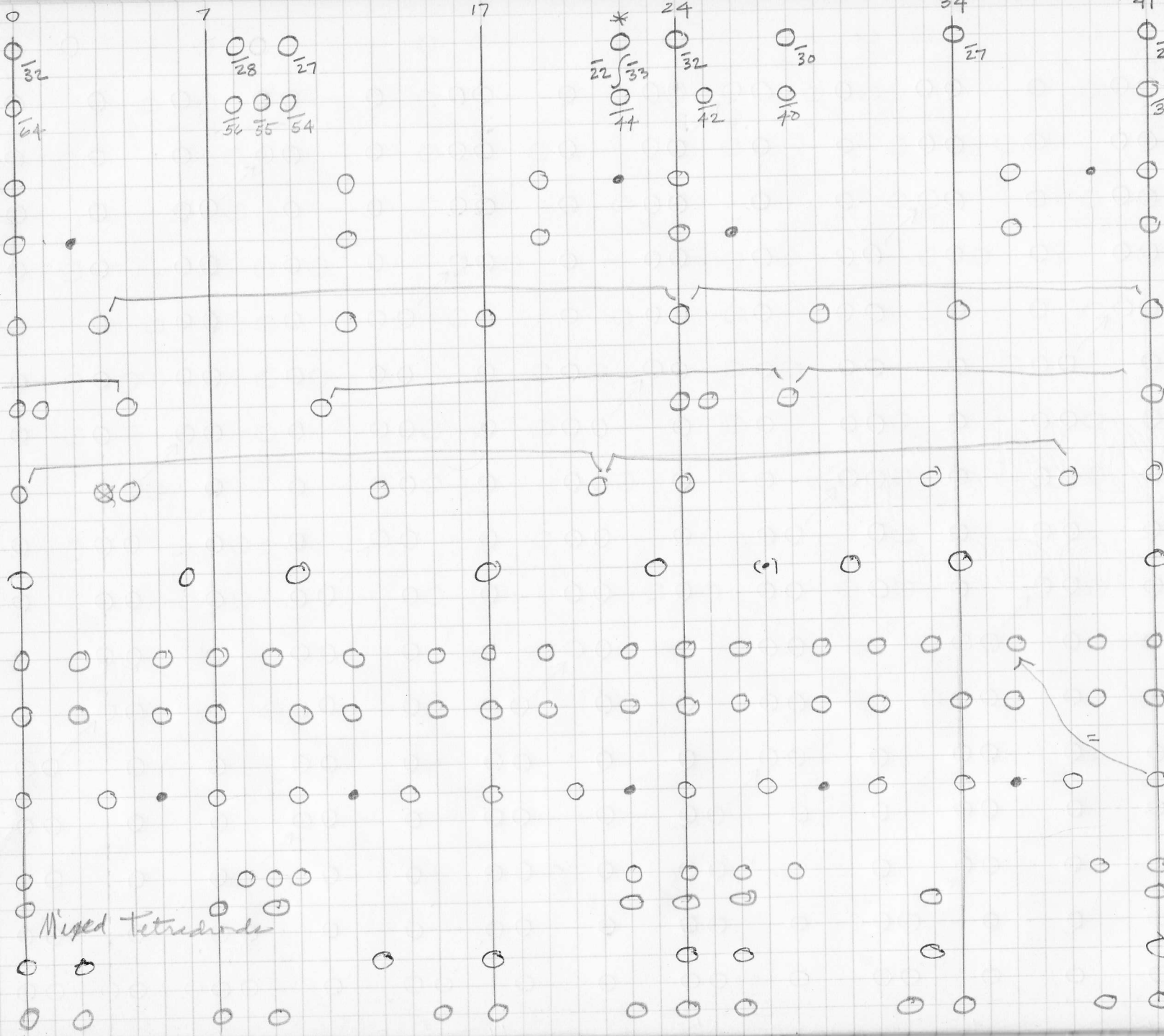
$\frac{1 \cdot 3^2 \cdot 7}{1 \cdot 3^2 \cdot 5 \cdot 11}$  Factorad

1	$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{11}$	$\frac{1}{3^2}$	$\frac{1}{3 \cdot 5}$	$\frac{1}{3 \cdot 11}$	$\frac{1}{3 \cdot 5 \cdot 11}$	$\frac{1}{3^2 \cdot 5 \cdot 11}$	$\frac{1}{5 \cdot 11}$
3		$\frac{3}{5}$	$\frac{3}{11}$						$\frac{3}{5 \cdot 11}$
7	$\frac{7}{3}$	$\frac{7}{5}$	$\frac{7}{11}$	$\frac{7}{3^2}$	$\frac{7}{3 \cdot 5}$	$\frac{7}{3 \cdot 11}$	$\frac{7}{3 \cdot 5 \cdot 11}$	$\frac{7}{3^2 \cdot 5 \cdot 11}$	$\frac{7}{5 \cdot 11}$
3 <sup>2</sup>		$\frac{3^2}{5}$	$\frac{3^2}{11}$						$\frac{3^2}{5 \cdot 11}$
3 <sup>2</sup> · 7		$\frac{3^2 \cdot 7}{5}$	$\frac{3^2 \cdot 7}{11}$						$\frac{3^2 \cdot 7}{5 \cdot 11}$
3 <sup>2</sup> · 7		$\frac{3^2 \cdot 7}{5}$	$\frac{3^2 \cdot 7}{11}$						$\frac{3^2 \cdot 7}{5 \cdot 11}$



4 MAR 65

\* YES!



K III

YI w/ alteration Arabian?

C V

NO

EXODUS ?

Septimal

Pythagorean + Neutral

good May 2, 65

Apr 21 65

yes May 1, 65

Mixed tetrads

# 41 TONE SHRUTI SCALES

Poona

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41									
	C	D <sup>b</sup>	D <sup>b</sup>	D	D	E <sup>b</sup>	E <sup>b</sup>	E	E <sup>#</sup>	F	F <sup>#</sup>	F <sup>#</sup>	G	A <sup>b</sup>	A <sup>b</sup>	A	A <sup>#</sup>	A	A <sup>#</sup>	B <sup>b</sup>	B <sup>b</sup>	B	B <sup>#</sup>	B	B <sup>#</sup>	C																								
1.	○																																																	
4.	○																																																	
5.	○																																																	
7.	○																																																	
8.	○																																																	
11.	○																																																	
12.	○																																																	
13.	○																																																	
15.	○																																																	
18.	○																																																	
19.	○																																																	
20.	○																																																	
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41.	○																																																	
42.	○																																																	
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← !  
 ( = = )

Compare w #7  
 12: tone scale!

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 26

24

44. 0  
45. 0  
46. 0  
47. 0  
49. 0  
50. 0  
51. 0  
55. 0  
58. 0

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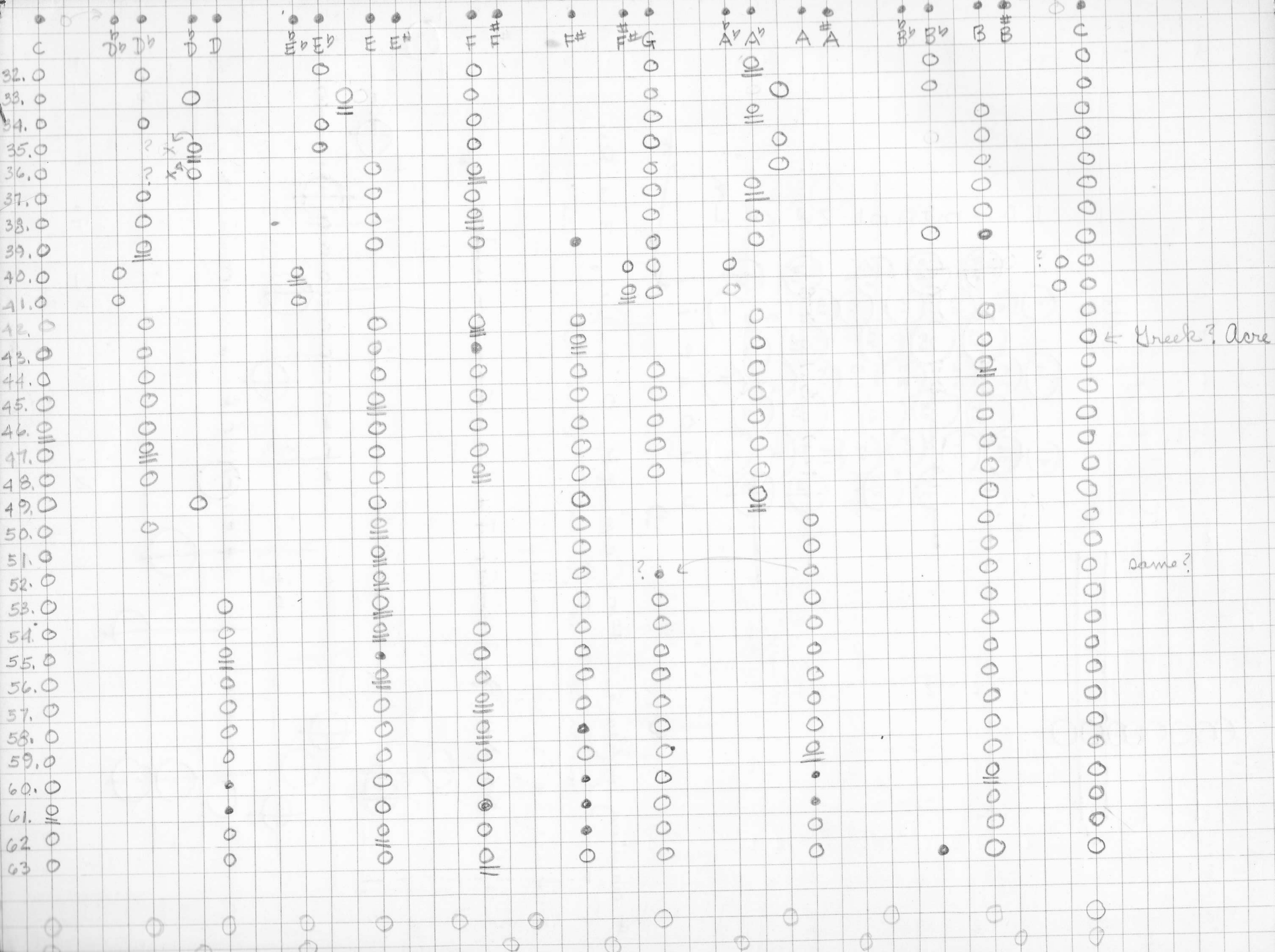
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\* wow  
Exquisite!





← Greek? Ave

Same?





x

# 41 TONE HARMONIC STUDIES







			$\frac{11}{3 \cdot 13}$	$\frac{11}{13}$	$\frac{3 \cdot 11}{13}$					$\frac{5 \cdot 11}{3}$	5.11	3.5.11				
	$\frac{7}{3 \cdot 13}$	$\frac{7}{3 \cdot 13}$	$\frac{7}{13}$	$\frac{3 \cdot 7}{13}$	$\frac{3^2 \cdot 7}{13}$					$\frac{5 \cdot 7}{3^2}$	$\frac{5 \cdot 7}{3}$	5.7	3.5.7	$\frac{3 \cdot 5 \cdot 7}{13}$		
	$\frac{5}{3^3 \cdot 13}$	$\frac{5}{3^2 \cdot 13}$	$\frac{5}{3 \cdot 13}$	$\frac{5}{13}$	$\frac{3 \cdot 5}{13}$	$\frac{3^2 \cdot 5}{13}$	$\frac{3^3 \cdot 5}{13}$			$\frac{5^2}{3^2}$	$\frac{5^2}{3^2}$	$\frac{5^2}{3}$	5 <sup>2</sup>	3.5 <sup>2</sup>	3.5 <sup>3</sup>	
$\frac{3 \cdot 13}{3^3 \cdot 13}$	$\frac{3 \cdot 13}{3^2 \cdot 13}$	$\frac{3 \cdot 13}{3 \cdot 13}$	$\frac{3 \cdot 13}{3 \cdot 13}$	13	$\frac{3}{13}$	$\frac{3^2}{13}$	$\frac{3^3}{13}$	$\frac{3^4}{13}$	$\frac{5}{3^4}$	$\frac{5}{3^3}$	$\frac{5}{3^2}$	$\frac{5}{3}$	5	3.5	3 <sup>2</sup> .5	
$\frac{3^2 \cdot 13}{3^3 \cdot 5 \cdot 13}$	$\frac{3^2 \cdot 13}{3^2 \cdot 5 \cdot 13}$	$\frac{3^2 \cdot 13}{3 \cdot 5 \cdot 13}$	$\frac{3^2 \cdot 13}{5 \cdot 13}$		$\frac{3}{5 \cdot 13}$	$\frac{3^2}{5 \cdot 13}$	$\frac{3^3}{5 \cdot 13}$		$\frac{5}{3^2}$	$\frac{5}{3^2}$	$\frac{5}{3}$	1	3	3 <sup>2</sup>	3 <sup>3</sup>	
	$\frac{3^2 \cdot 7 \cdot 13}{3^2 \cdot 7 \cdot 13}$	$\frac{3^2 \cdot 7 \cdot 13}{3^2 \cdot 7 \cdot 13}$	$\frac{3^2 \cdot 7 \cdot 13}{7 \cdot 13}$		$\frac{3}{7 \cdot 13}$	$\frac{3^2}{7 \cdot 13}$			$\frac{5}{3^2 \cdot 7}$	$\frac{5}{3 \cdot 7}$	$\frac{5}{7}$	$\frac{3 \cdot 5}{7}$	$\frac{3^2 \cdot 5}{7}$			
			$\frac{3}{3 \cdot 11 \cdot 13}$	$\frac{3}{11 \cdot 13}$	$\frac{3}{11 \cdot 13}$					$\frac{5}{3 \cdot 11}$	$\frac{5}{11}$	$\frac{3 \cdot 5}{11}$				
			$\frac{3}{13^2}$	$\frac{3^2}{3 \cdot 13}$						$\frac{5}{13}$	$\frac{3^2 \cdot 13}{7}$					
			$\frac{3}{3 \cdot 11}$	$\frac{3^2}{3 \cdot 11}$	$\frac{3^3}{3 \cdot 11}$					$\frac{3 \cdot 11}{7}$	$\frac{3^2 \cdot 11}{7}$	$\frac{3^3 \cdot 11}{7}$				
													1	3	3 <sup>2</sup>	
															3 <sup>3</sup>	
															3 <sup>4</sup>	
										$\frac{5}{3 \cdot 7}$	$\frac{5}{7}$	$\frac{3 \cdot 5}{7}$	$\frac{3^2 \cdot 5}{7}$	$\frac{3^3 \cdot 5}{7}$	$\frac{3^4 \cdot 5}{7}$	
1	3	3 <sup>2</sup>	3 <sup>3</sup>	3 <sup>4</sup>	3 <sup>5</sup>	3 <sup>6</sup>	3 <sup>7</sup>	3 <sup>8</sup>	$\frac{3}{3 \cdot 7}$	$\frac{3}{3 \cdot 7}$	$\frac{3}{7}$	$\frac{3}{7}$	$\frac{3^2}{7}$	$\frac{3^3}{7}$	$\frac{3^4}{7}$	
	$\frac{3}{5}$	$\frac{3^2}{5}$	$\frac{3^3}{5}$	$\frac{3^4}{5}$	$\frac{3^5}{5}$	$\frac{3^6}{5}$	$\frac{3^7}{5}$		3.5.7	5.7	5.7	5.7	5.7	5.7	5.7	
		$\frac{3^2}{7}$	$\frac{3^3}{7}$	$\frac{3^4}{7}$	$\frac{3^5}{7}$	$\frac{3^6}{7}$				$\frac{3}{7^2}$	$\frac{3}{7^2}$	$\frac{3^2}{7^2}$	$\frac{3^3}{7^2}$	$\frac{3^4}{7^2}$		
			$\frac{3^3}{11}$	$\frac{3^4}{11}$	$\frac{3^5}{11}$						$\frac{3}{7 \cdot 11}$	$\frac{3^2}{7 \cdot 11}$	$\frac{3^3}{7 \cdot 11}$			
				$\frac{3^4}{13}$								$\frac{3^2}{7 \cdot 13}$				
			3.7.11								$\frac{13}{3}$					
			7.11	3.7.11	3 <sup>2</sup> .7.11					$\frac{11}{3^2}$	$\frac{11}{3}$	11				
	$\frac{7^2}{3}$	7 <sup>2</sup>	3.7 <sup>2</sup>	3 <sup>2</sup> .7 <sup>2</sup>	3 <sup>3</sup> .7 <sup>2</sup>					$\frac{7}{3^3}$	$\frac{7}{3^2}$	$\frac{7}{3}$	7	3.7		
$\frac{5 \cdot 7}{3^2}$	$\frac{5 \cdot 7}{3}$	5.7	3.5.7	3 <sup>2</sup> .5.7	3 <sup>3</sup> .5.7	3 <sup>4</sup> .5.7			$\frac{5}{3^4}$	$\frac{5}{3^3}$	$\frac{5}{3^2}$	$\frac{5}{3}$	5	3.5	3.7	
$\frac{7}{3^3}$	$\frac{7}{3^2}$	$\frac{7}{3}$	7	3.7	3 <sup>2</sup> .7	3 <sup>3</sup> .7	3 <sup>4</sup> .7	3 <sup>5</sup> .7	$\frac{3^5}{3^5}$	$\frac{3^4}{3^4}$	$\frac{3^3}{3^3}$	$\frac{3^2}{3^2}$	$\frac{3}{3}$	1	3	3 <sup>2</sup>
$\frac{7}{3^2 \cdot 5}$	$\frac{7}{3 \cdot 5}$	$\frac{7}{5}$	$\frac{3 \cdot 7}{5}$	$\frac{3^2 \cdot 7}{5}$	$\frac{3^3 \cdot 7}{5}$	$\frac{3^4 \cdot 7}{5}$			$\frac{3^4 \cdot 5}{3^4 \cdot 5}$	$\frac{3^3 \cdot 5}{3^3 \cdot 5}$	$\frac{3^2 \cdot 5}{3^2 \cdot 5}$	$\frac{3 \cdot 5}{3 \cdot 5}$	$\frac{5}{5}$	$\frac{3}{5}$	$\frac{3^2}{5}$	
		$\frac{3}{3^2}$	$\frac{3}{3}$	3	3 <sup>2</sup>	3 <sup>3</sup>			$\frac{3^3 \cdot 7}{3^3 \cdot 7}$	$\frac{3^2 \cdot 7}{3^2 \cdot 7}$	$\frac{3 \cdot 7}{3 \cdot 7}$	$\frac{7}{7}$	$\frac{3}{7}$			
		$\frac{7}{11}$	$\frac{3 \cdot 7}{11}$	$\frac{3^2 \cdot 7}{11}$						$\frac{3^2 \cdot 11}{3^2 \cdot 11}$	$\frac{3 \cdot 11}{3 \cdot 11}$	$\frac{11}{11}$				
			$\frac{3 \cdot 7}{13}$								$\frac{3 \cdot 13}{3 \cdot 13}$					

			$\frac{3^2 \cdot 11}{5}$	$\frac{3^3 \cdot 11}{5}$	$\frac{3^4 \cdot 7}{5}$						$\frac{11^2}{3}$	$11^2$	$3 \cdot 11^2$			
		$\frac{3 \cdot 7}{5}$	$\frac{3^2 \cdot 7}{5}$	$\frac{3^3 \cdot 7}{5}$	$\frac{3^4 \cdot 7}{5}$	$\frac{3^5 \cdot 7}{5}$				$\frac{7 \cdot 11}{3^2}$	$\frac{7 \cdot 11}{3}$	$7 \cdot 11$	$3 \cdot 7 \cdot 11$	$3^2 \cdot 7 \cdot 11$		
	1	3	$3^2$	$3^3$	$3^4$	$3^5$	$3^6$			$\frac{5 \cdot 11}{3^3}$	$\frac{5 \cdot 11}{3^2}$	$\frac{5 \cdot 11}{3}$	$5 \cdot 11$	$3 \cdot 5 \cdot 11$	$3^2 \cdot 5 \cdot 11$	$3^3 \cdot 5 \cdot 11$
$\frac{3 \cdot 5}{5}$	$\frac{3}{5}$	$\frac{3^2}{5}$	$\frac{3^3}{5}$	$\frac{3^4}{5}$	$\frac{3^5}{5}$	$\frac{3^6}{5}$	$\frac{3^7}{5}$	$\frac{11}{3^4}$	$\frac{11}{3^3}$	$\frac{11}{3^2}$	$\frac{11}{3}$	11	$3 \cdot 11$	$3^2 \cdot 11$	$3^3 \cdot 11$	$3^4 \cdot 11$
		$\frac{3}{5^2}$	$\frac{3^2}{5^2}$	$\frac{3^3}{5^2}$	$\frac{3^4}{5^2}$	$\frac{3^5}{5^2}$	$\frac{3^6}{5^2}$		$\frac{11}{3^2 \cdot 5}$	$\frac{11}{3 \cdot 5}$	$\frac{11}{3 \cdot 5}$	$\frac{11}{5}$	$\frac{3 \cdot 11}{5}$	$\frac{3^2 \cdot 11}{5}$	$\frac{3^3 \cdot 11}{5}$	
		$\frac{3}{5 \cdot 7}$	$\frac{3^2}{5 \cdot 7}$	$\frac{3^3}{5 \cdot 7}$	$\frac{3^4}{5 \cdot 7}$	$\frac{3^5}{5 \cdot 7}$				$\frac{11}{3^2 \cdot 7}$	$\frac{11}{3 \cdot 7}$	$\frac{11}{7}$	$\frac{3 \cdot 11}{7}$	$\frac{3^2 \cdot 11}{7}$		
			$\frac{3^2}{5 \cdot 11}$	$\frac{3^3}{5 \cdot 11}$	$\frac{3^4}{5 \cdot 11}$						$\frac{11}{3}$	11	3			
				$\frac{3^3}{5 \cdot 13}$								$\frac{11}{13}$				

$3 \cdot 5 \cdot 11$     $3^2 \cdot 5 \cdot 11$     $3^3 \cdot 5 \cdot 11$

$5 \cdot 7$     $3 \cdot 5 \cdot 7$     $3^2 \cdot 5 \cdot 7$     $3^3 \cdot 5 \cdot 7$     $3^4 \cdot 5 \cdot 7$

$\frac{3 \cdot 5}{5^2}$	$\frac{3 \cdot 5}{5}$	$5^2$	$3 \cdot 5^2$	$3^2 \cdot 5^2$	$3^3 \cdot 5^2$	$3^4 \cdot 5^2$	$3^5 \cdot 5^2$
$\frac{3}{5}$	5	35	$3^2 \cdot 5$	$3^3 \cdot 5$	$3^4 \cdot 5$	$3^5 \cdot 5$	$3^6 \cdot 5$
	1	3	$3^2$	$3^3$	$3^4$	$3^5$	
	$\frac{5}{7}$	$\frac{3 \cdot 5}{7}$	$\frac{3^2 \cdot 5}{7}$	$\frac{3^3 \cdot 5}{7}$	$\frac{3^4 \cdot 5}{7}$		
	$\frac{5}{11}$	$\frac{3^2 \cdot 5}{11}$	$\frac{3^3 \cdot 5}{11}$				
		$\frac{3^2 \cdot 5}{13}$					

This could go on forever  
 Suppose we did this with the  
 tri-dimensional matrix A 5x5!

1.000 (1)  $\frac{3.7}{11}$  1.000 (1)

0.925 (1)  $\frac{3.7}{11}$  .9329 ( $\frac{3.7}{11}$ )

1.00000 (1)

392.9512 (1) .9456  $\frac{13}{27}$

$\frac{3.13}{3.27}$

$\frac{13}{27}$   $\frac{3.13}{3.27}$

Probably this Pelog, see p 5 (89)

← Generally 41-ton approximates these ratios better than the natives did, (assuming they were influenced by this sequence of ratios)

0.683 (1)  $\frac{3.7}{13}$  .6919 ( $\frac{3.7}{13}$ )

292.7073 (1) .7004 13  $\frac{3}{13}$

0.572 (1)  $\frac{3.7}{7}$  .5850 (3)

240.5854 (1) .5850 3  $\frac{3}{13}$

0.479 (1)  $\frac{3.7}{15}$  .4854 ( $\frac{7}{15}$ )

202.4878 (1) .4780  $\frac{3.13}{7}$   $\frac{7}{7}$

0.372 (1)  $\frac{3.7}{10}$  .3923 (3.7)

165.3902 (1) .3785  $\frac{13}{5}$   $\frac{3.5}{3.5}$

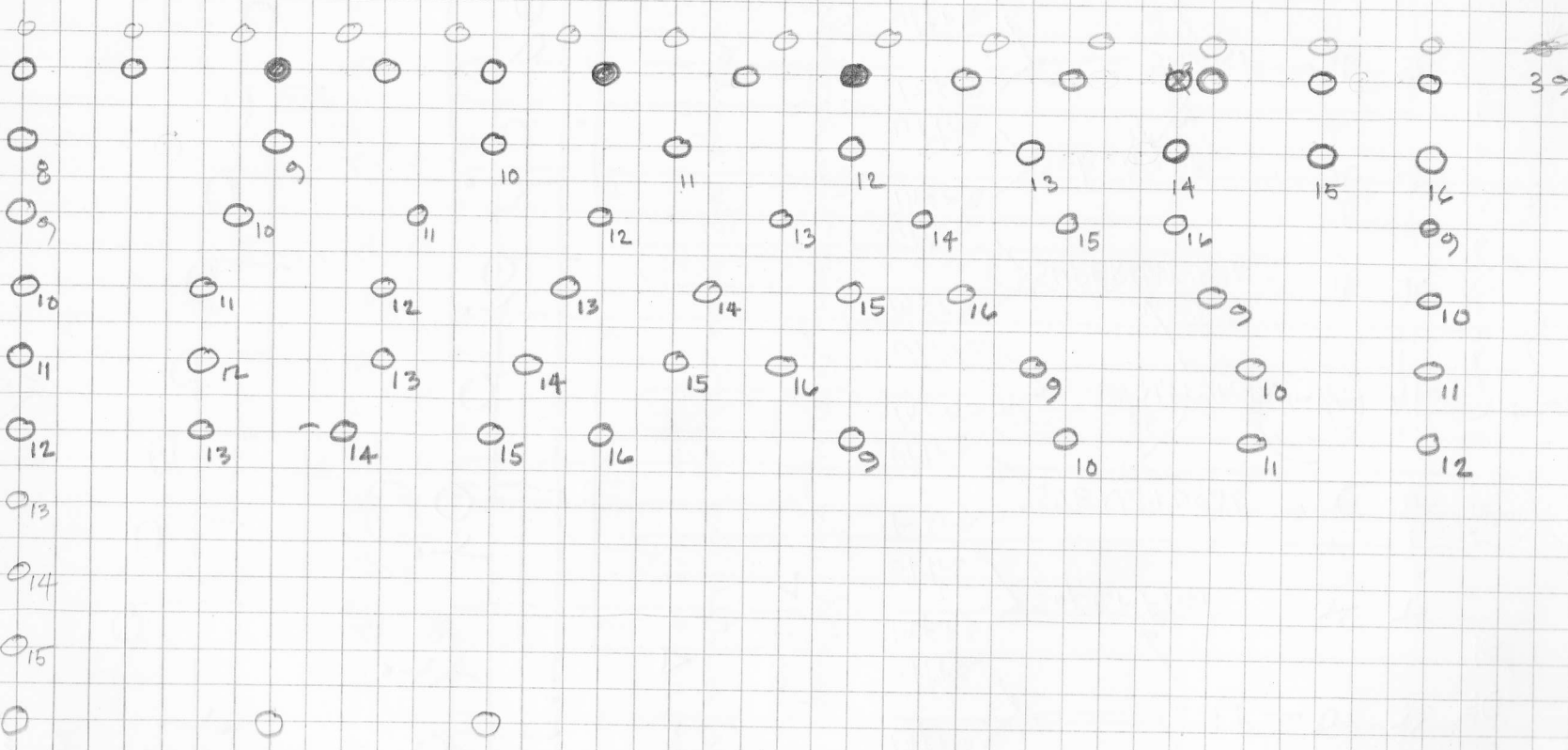
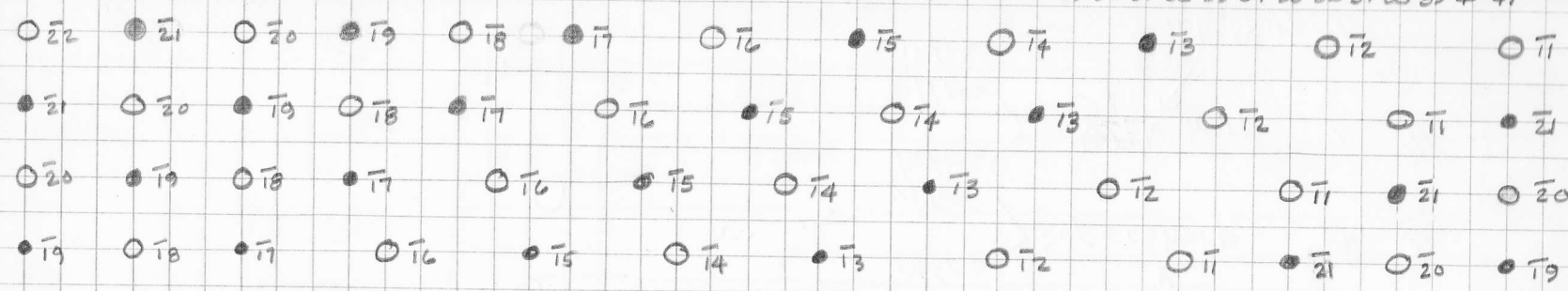
0.114 (1)  $\frac{3.13}{13}$  .1069 ( $\frac{7}{13}$ )

51.1220 (1) .1155  $\frac{13}{13}$   $\frac{3.3}{3.3}$

0.000 (1)  $\frac{3.7}{37}$  .0000 (1)

0.0000 (1) .0000 1  $\frac{3.13}{3.13}$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

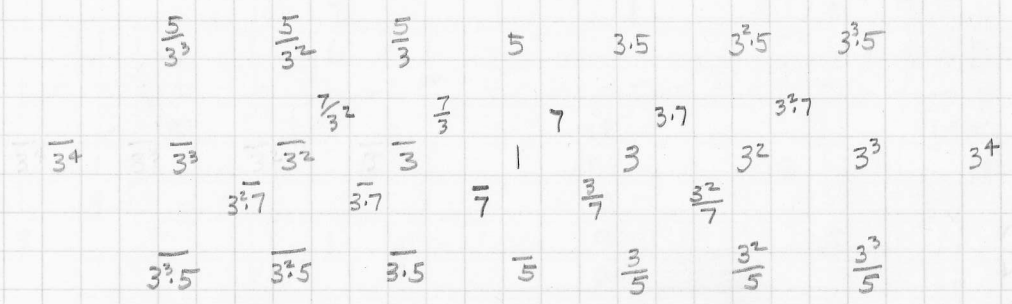


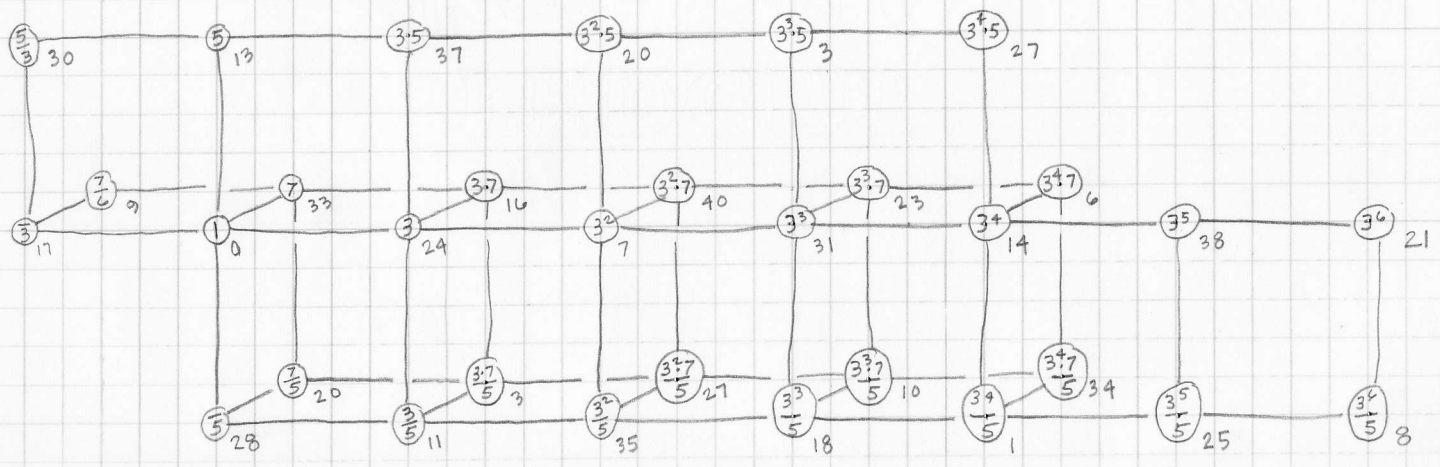
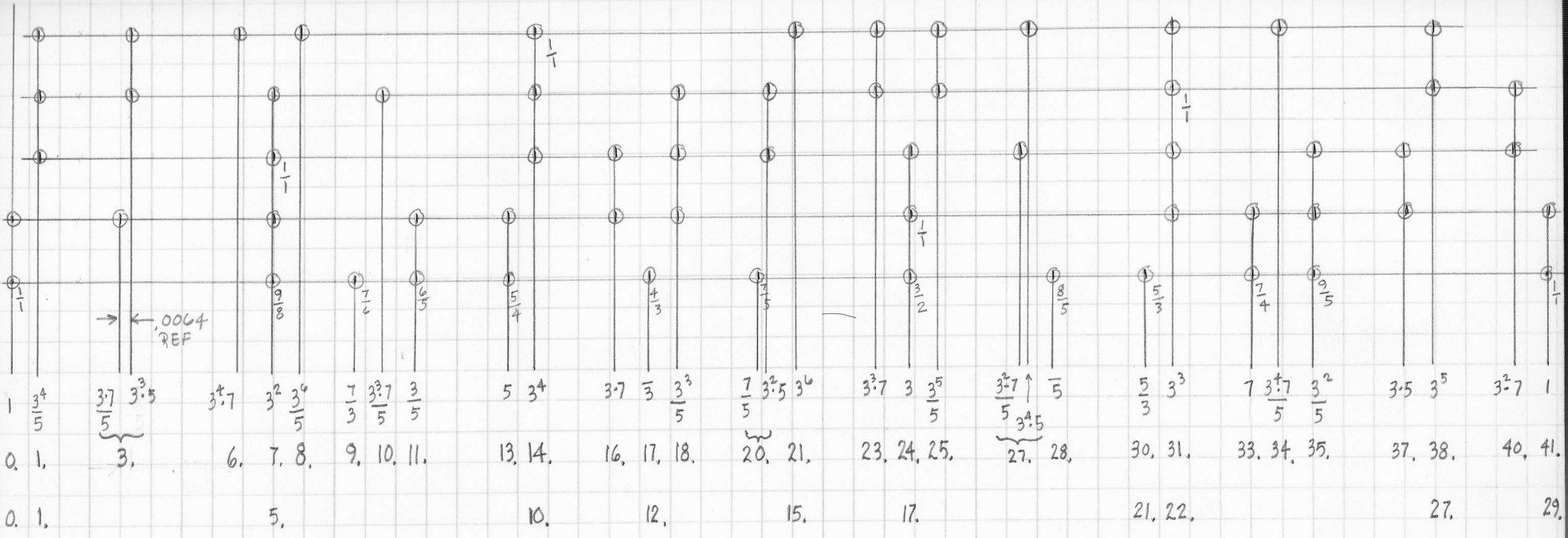
39



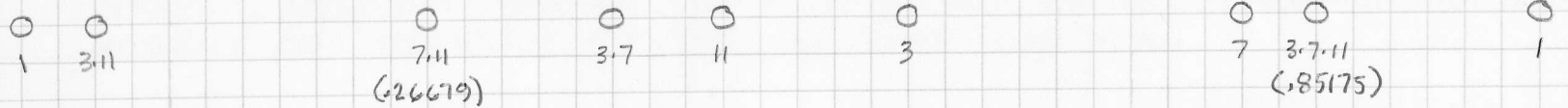
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

$\frac{7}{33}$

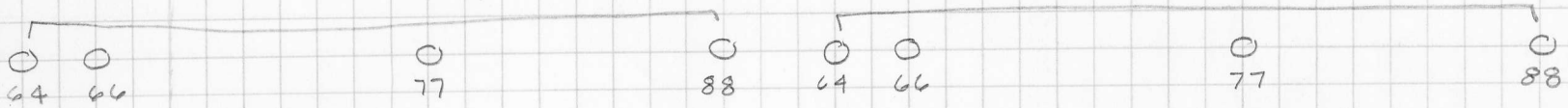




0 . . . . . 7 . . . . . 17 . . . . . 24 . . . . . 34 . . . . . 41



Ref  
 3 · 7 · 11 cluster  
 (see 31T & 22T)



Nov 14, C4

48  
 1

54 55 56  
 3<sup>2</sup>  $\frac{5 \cdot 11}{3}$   $\frac{7}{3}$

72  
 54 55 56  
 3<sup>2</sup>  $\frac{5 \cdot 11}{3^2}$   $\frac{7}{3^2}$

72  
 1  
 Total AI  
 Factored  $\frac{3^2 \cdot 5 \cdot 7 \cdot 11}{3^2}$

$\frac{81}{80}$   $\frac{32}{32}$   $\frac{21}{20}$   $\frac{16}{15}$   $\frac{12}{11}$   $\frac{10}{9}$   $\frac{9}{8}$   $\frac{8}{7}$   $\frac{7}{6}$   $\frac{32}{27}$   $\frac{6}{5}$   $\frac{11}{9}$   $\frac{5}{4}$   $\frac{14}{11}$   $\frac{9}{7}$   $\frac{21}{16}$   $\frac{4}{3}$   $\frac{27}{20}$   $\frac{11}{8}$   $\frac{7}{5}$   $\frac{10}{7}$   $\frac{16}{11}$   $\frac{20}{21}$   $\frac{3}{2}$   $\frac{32}{21}$   $\frac{14}{9}$   $\frac{11}{7}$   $\frac{8}{5}$   $\frac{18}{11}$   $\frac{5}{3}$   $\frac{27}{16}$   $\frac{12}{7}$   $\frac{7}{4}$   $\frac{16}{9}$   $\frac{9}{5}$   $\frac{11}{6}$   $\frac{15}{8}$   $\frac{40}{21}$   $\frac{64}{33}$   $\frac{160}{81}$   $\frac{2}{1}$

$\frac{81}{80}$   $\frac{55}{54}$   $\frac{56}{55}$   $\frac{64}{63}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{49}{48}$   $\frac{64}{63}$   $\frac{81}{80}$   $\frac{55}{54}$   $\frac{45}{44}$   $\frac{56}{55}$   $\frac{99}{98}$   $\frac{49}{48}$   $\frac{64}{63}$   $\frac{81}{80}$   $\frac{55}{54}$   $\frac{56}{55}$   $\frac{50}{49}$   $\frac{56}{55}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{49}{48}$   $\frac{99}{98}$   $\frac{56}{55}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{49}{48}$   $\frac{64}{63}$   $\frac{81}{80}$   $\frac{55}{54}$   $\frac{45}{44}$   $\frac{64}{63}$   $\frac{81}{80}$   $\frac{55}{54}$   $\frac{45}{44}$   $\frac{64}{63}$   $\frac{56}{55}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{55}{54}$   $\frac{81}{80}$

$\frac{56}{55}$   $\frac{28}{27}$   $\frac{21}{20}$   $\frac{16}{15}$   $\frac{12}{11}$   $\frac{10}{9}$   $\frac{9}{8}$   $\frac{7}{6}$   $\frac{32}{27}$   $\frac{6}{5}$   $\frac{27}{22}$   $\frac{5}{4}$   $\frac{14}{11}$   $\frac{35}{27}$   $\frac{21}{16}$   $\frac{4}{3}$   $\frac{224}{165}$   $\frac{112}{81}$   $\frac{7}{5}$   $\frac{64}{45}$   $\frac{16}{11}$   $\frac{40}{27}$   $\frac{3}{2}$   $\frac{84}{55}$   $\frac{14}{9}$   $\frac{63}{40}$   $\frac{8}{5}$   $\frac{18}{11}$   $\frac{5}{3}$   $\frac{27}{16}$   $\frac{140}{81}$   $\frac{7}{4}$   $\frac{16}{9}$   $\frac{9}{5}$   $\frac{81}{44}$   $\frac{15}{8}$   $\frac{21}{11}$   $\frac{35}{18}$   $\frac{63}{32}$   $\frac{2}{1}$

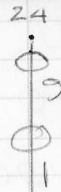
$\frac{56}{55}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{56}{55}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{56}{55}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{81}{80}$   $\frac{64}{63}$   $\frac{45}{44}$   $\frac{55}{54}$   $\frac{81}{80}$

$\frac{4}{3}$

$\frac{3}{2}$



13

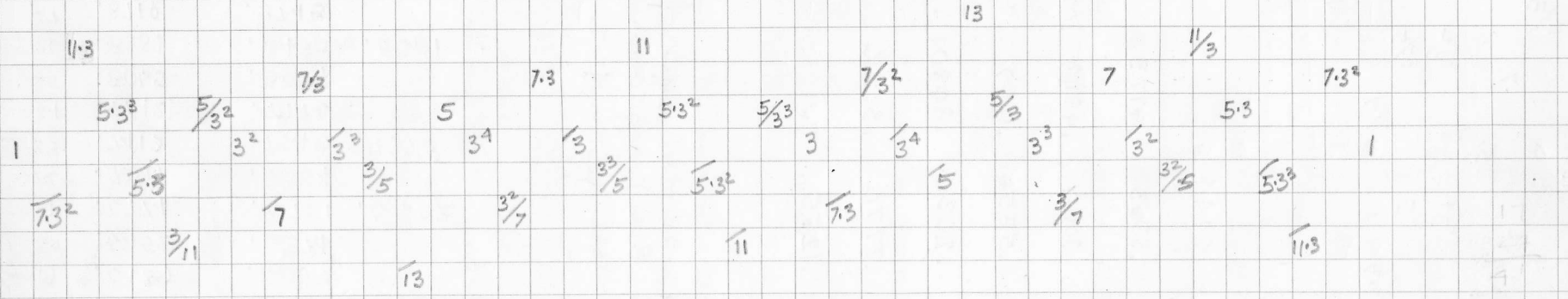


Row  
11 aug 64

What would happen in a 41-tone equal temperament

$\begin{array}{r} 3 \\ 585 \\ \hline 41 \\ 585 \\ \hline 2340 \\ \hline 23985 \end{array}$	$\begin{array}{r} 322 \\ \hline 41 \\ 322 \\ \hline 1288 \\ \hline 18202 \end{array}$	<del><math>\begin{array}{r} 3074 \\ \hline 41 \\ 3074 \\ \hline 32226 \\ \hline 33034 \end{array}</math></del>	$\begin{array}{r} 8074 \\ \hline 41 \\ 8074 \\ \hline 32296 \\ \hline 331034 \end{array}$	$\begin{array}{r} 31 \\ 4594 \\ \hline 41 \\ 4594 \\ \hline 18376 \\ \hline 188354 \end{array}$	$\begin{array}{r} 7004 \\ \hline 41 \\ 7004 \\ \hline 28016 \\ \hline 287164 \end{array}$	$\begin{array}{r} .02466 \\ 41 \overline{) 1.00000} \\ 82 \\ \hline 180 \\ 164 \\ \hline 260 \\ 246 \\ \hline 1240 \end{array}$
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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41



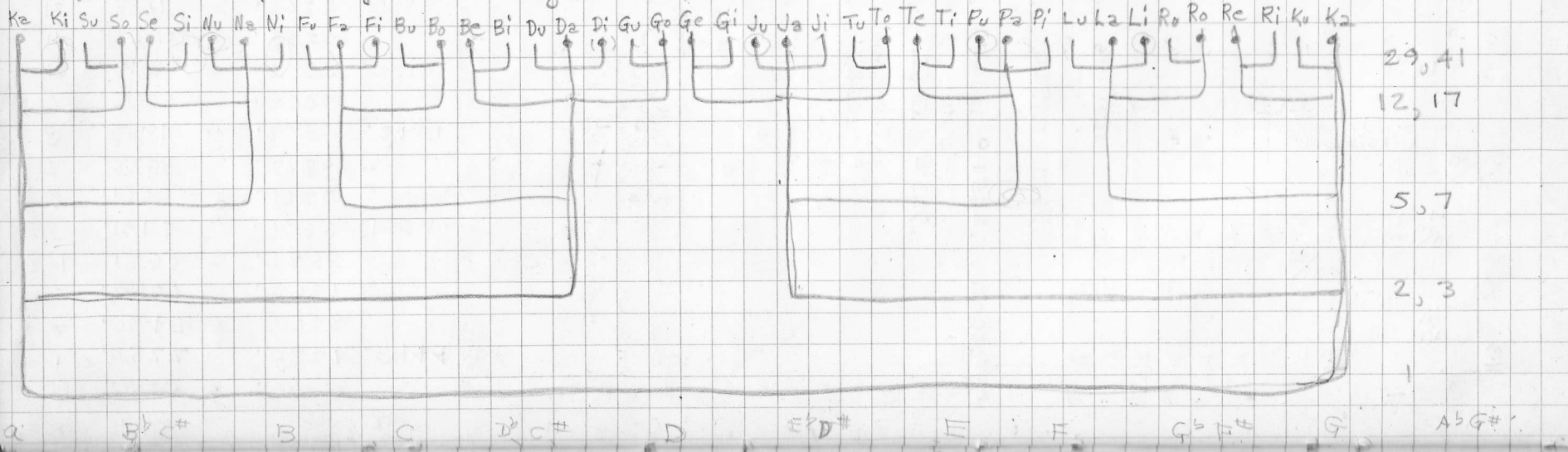
Absolutely articulate to the matrix on page 25

Total discrepancy through 13h in relation to 1h; .0194

Discriminates the 31:80 Exploited by Near East, Alien to the West, Exploited by Greeks

Perfect organic development:

Lends itself to systematic keyboard & notation (alternate rows 5-7-5-7-5-7-5) & 12-17-12



	1.0000	1.0000			
	40. 9756	.9773	7.3 <sup>2</sup> ) *		
	39. 9512	.9556	11.3		
A	38. 9268	.9232	5.3 <sup>3</sup> )	B	.9411 3/5 <sup>2</sup> #39
	37. 9024	.9049	5.3 - .0045	B	.9296 5/3.7 #38
	36. 8780	.8745	11/3	B	.9005 7/3.5 #37
	35. 8536	.8480	3 <sup>3</sup> /5	B <sup>b</sup>	.8707 5.7 #36
B	34. 8293	.8301	3 <sup>2</sup> )	B <sup>b</sup>	.8625 5/11 #35
	33. 8049	.8074	7 - .0025		.8138 3 <sup>2</sup> .5 <sup>2</sup> #33
	32. 7805	.7776	3/7	(#)	.7814 5.11 #32
H	31. 7561	.7549	3 <sup>3</sup> )	A ?	.7712 3.52 #32
G	30. 7317	.7370	5/3	A	
	29. 7073	.7004	13 + .0069		.7142 3.5.7 #29
	28. 6829	.6781	15	A <sup>b</sup>	
I	27. 6585	.6602	3 <sup>4</sup> )	A <sup>b</sup>	.6439 5 <sup>2</sup> #26
	26. 6341	.6374	7 <sup>3</sup> 2		.6147 7 <sup>2</sup> #25
	25. 6098	.6077	7.3		
II	24. 5854	.5850	3 + .0004	G	
	23. 5610	.5670	5/3 <sup>3</sup> )	F#	
	22. 5366	.5406	11		.5443 5.7/3 #23
	21. 5122	.5082	5.3 <sup>2</sup> )	F#	.5261 3 <sup>2</sup> /5 <sup>2</sup> #23
	20. 4878	.4918	5.3 <sup>2</sup> )	F#	.5146 5/7 #21
	19. 4634	.4594	11 + .0040		.4854 7/5 #20
	18. 4390	.4330	3 <sup>3</sup> /5	(#F)	.4739 5 <sup>2</sup> /3 <sup>2</sup> #19
A	17. 4146	.4150	3	F	.4557 3/5.7 #19
	16. 3902	.3923	7.3		.3853 7 <sup>2</sup> #10
	15. 3658	.3626	3 <sup>3</sup> /1		.3561 5 <sup>2</sup> #15
#	14. 3415	.3398	3 <sup>4</sup> )	(#E)	
B	13. 3171	.3219	5 - .0048	E	.2858 3.5.7 #12
	12. 2927	.2996	13		
	11. 2683	.2630	3/5	ED	
C	10. 2439	.2451	3 <sup>3</sup> )	E <sup>b</sup>	.2288 3.5 <sup>2</sup> #7
	9. 2195	.2224	7/3		.2186 5.11 #9
	8. 1951	.1926	4		.1862 3 <sup>2</sup> .5 <sup>2</sup> #8
B	7. 1707	.1699	3 <sup>2</sup> + .0008	D	
	6. 1463	.1520	5/3 <sup>2</sup> )	D	.1375 11/5 #6
	5. 1220	.1255	3/11		.1293 5.7 #5
#	4. 0976	.0931	5.3	D <sup>b</sup>	.0995 3.5/7 #4
D	3. 0732	.0768	5:3 <sup>3</sup> )	D <sup>b</sup>	.0704 3 <sup>2</sup> /5 #3
	2. 0488	.0444	11.3		.0589 5 <sup>2</sup> /3 #2
	1. 0244	.0227	7.3 <sup>2</sup> )		
2	0. 0000	.0000	1	C	

Approximation to the Indian scale of 22 tones per Oct - Semitone

\* fused in 31

41 TONE DIAMONDS

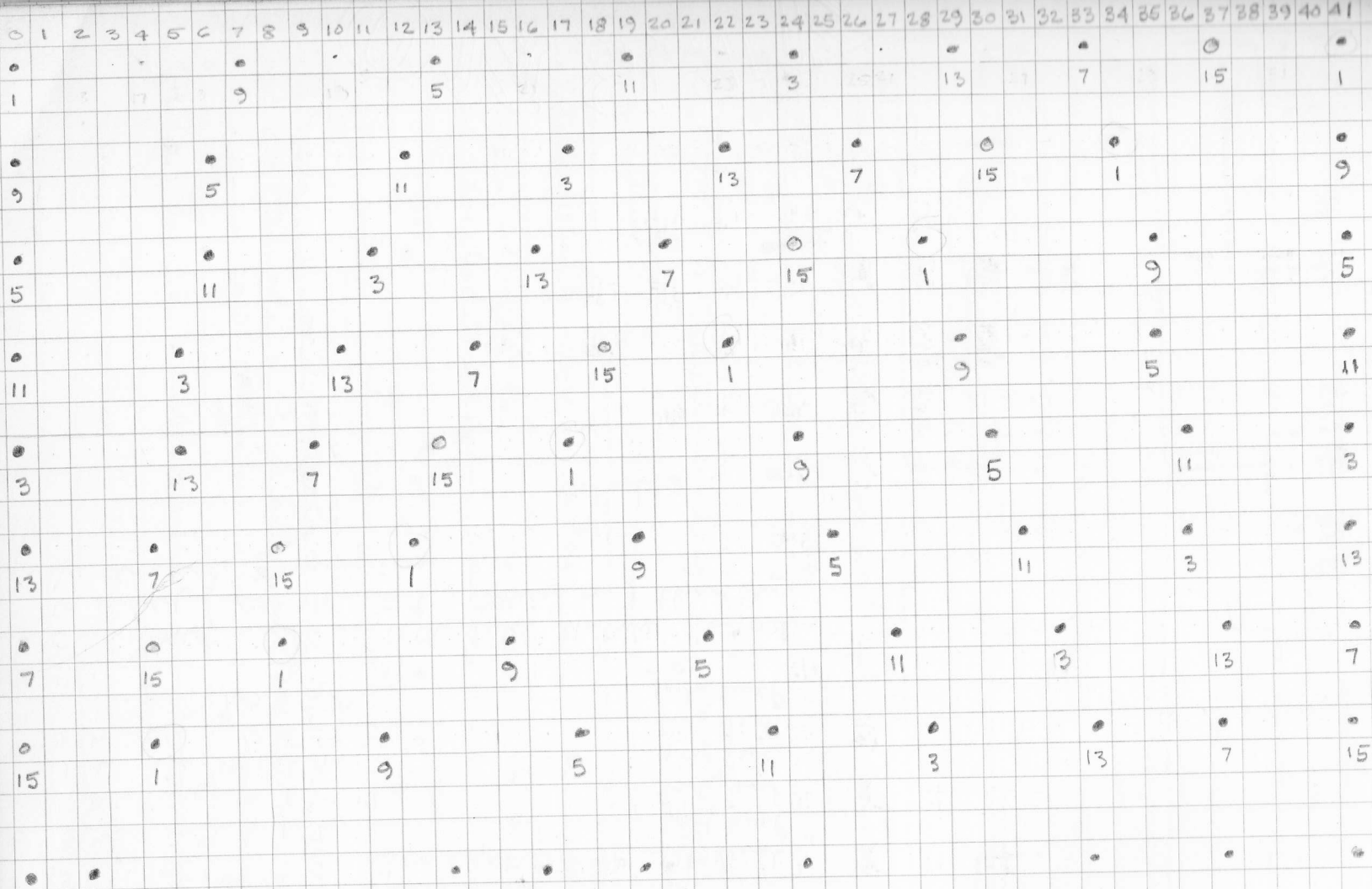


0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41																
0											0									0								0								0						0															
5											3									7								1								9																					
0																	0						0								0																										
3																																																									
0																																																									
7																																																									
0																																																									
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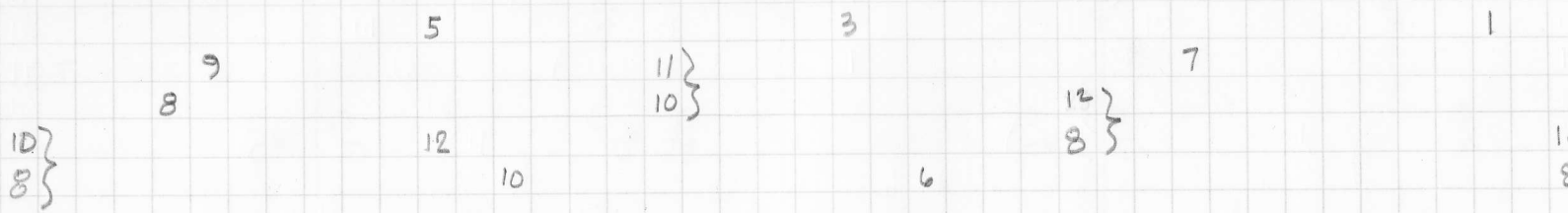




"Main" scale  
 by Dave  
 Rothberg  
 good July 8, 65



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41



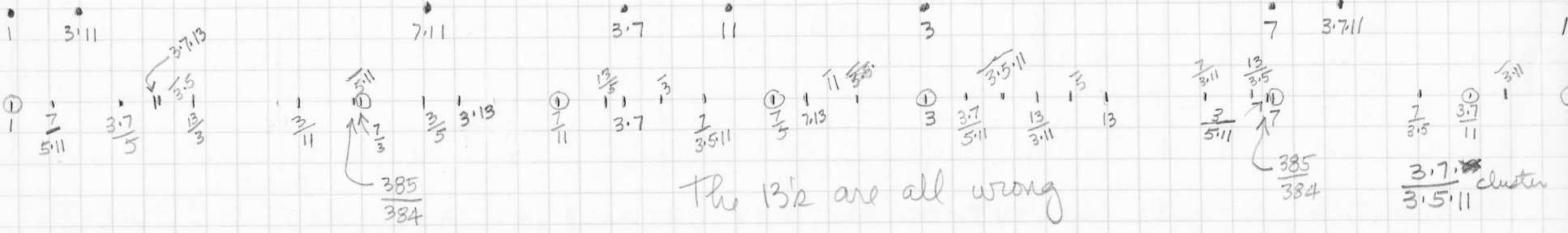
Progression  
 } Subdominant  
 } Diamond  
 }  
 } Tonic  
 } Diamond

Good Lord! we must get some way of notation fast!

(very accurate)

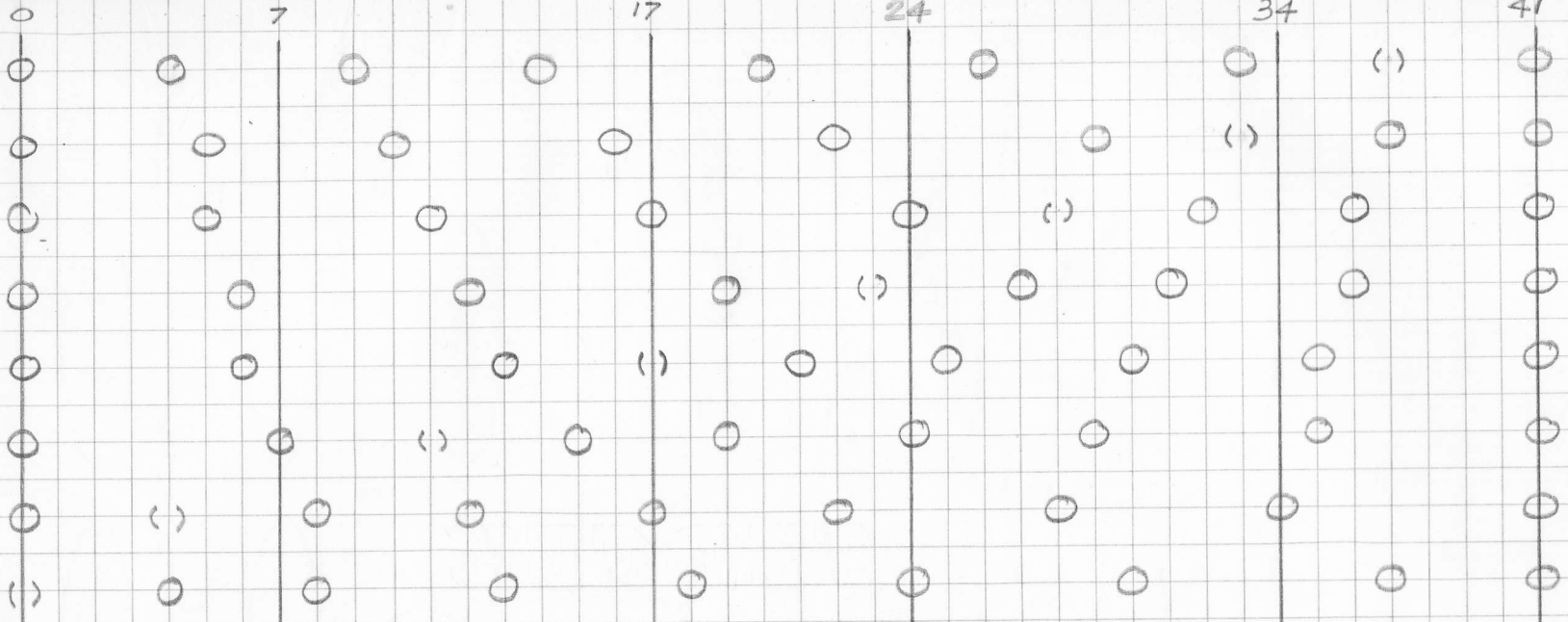
0	0	0	0	0	0	0	0	0	3.7.11
1	3.11	7.11	3.7	11	3	7	3.7.11	1	Cluster
1/3	33/32	17/16	2/16	11/8	3/2	7/4	231/128	2/1	

Plotting



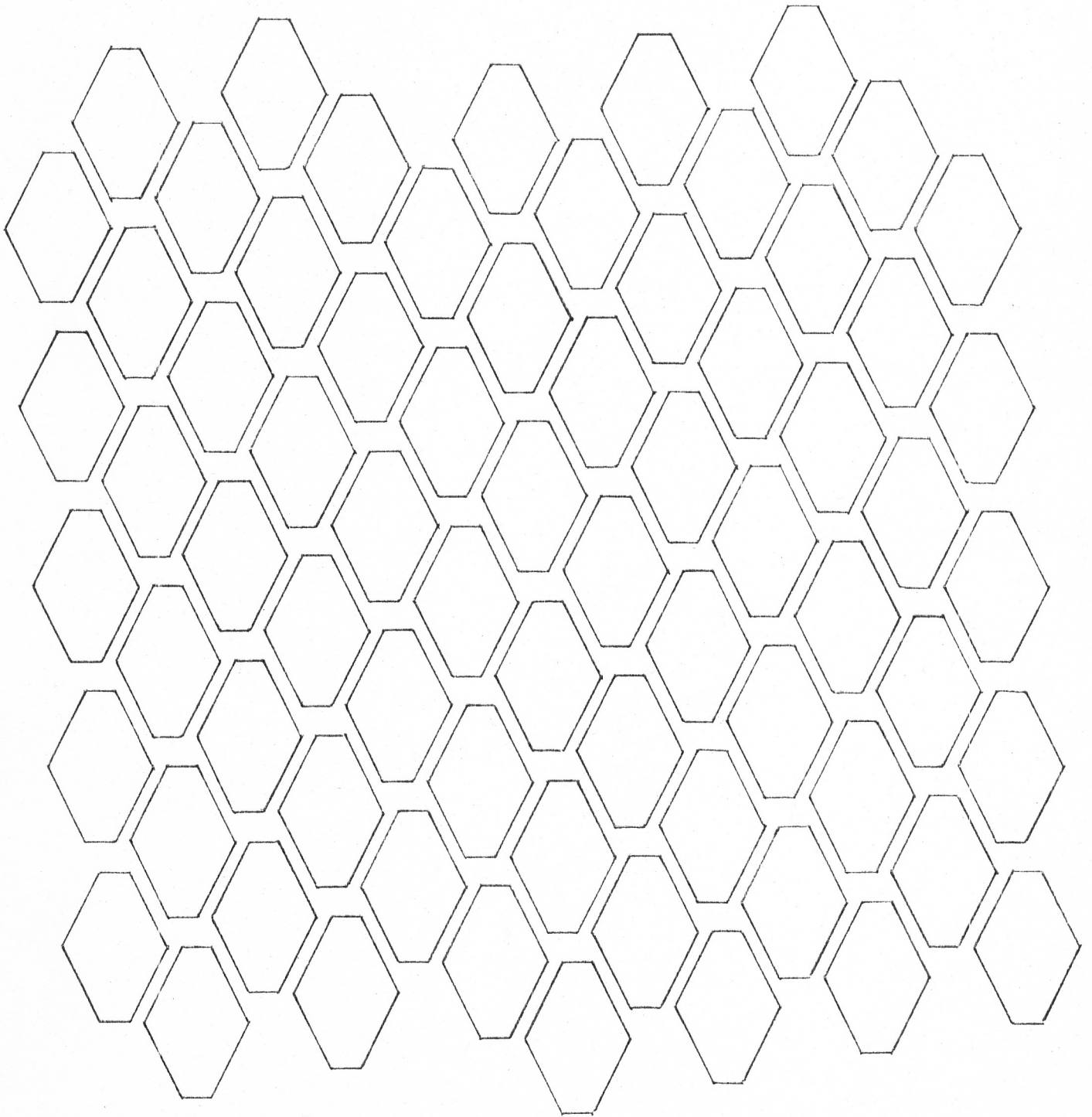
The 13's are all wrong

- C \*
- D<sup>b</sup>
- D \*
- E<sup>b</sup>
- F<sup>b</sup> \*
- F \*
- G<sup>b</sup>
- G \*
- A<sup>b</sup>
- B<sup>bb</sup> \*
- B<sup>b</sup>
- C<sup>b</sup> \*
- C \*
- \* Major



41 TONE KEYBOARDS

VARIATION ON BOSANQUET  
DESIGN © 1978 BY ERV WILSON  
ALL RIGHTS RESERVED



Ro 0	Fam 2	Mu 6	Tau 9	Zu 13	Gu 14	Hau 19	Vu 23	Kau 24	Du 30	Sau 33	Pu 37	Pu 40
Ra 0	Fo 3	Ma 7	To 10	Za 14	Ga 17	Ho 20	Va 24	Ro 27	So 34	Pa 38	Ra 41	
Ri 1	Fe 4	Mi 8	Te 11	Zi 15	Gi 18	He 21	Vi 25	Ke 28	Di 32	Si 35	Pi 39	Ri 42
	Fia 5		Tia 12		Hia 22		Kia 29		Sia 36			



5 4 4 4 4 4 4 4 4 4

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

35 2.	38 7.	41 12.	37 19.	40 24.	36 31.	39 36.	35 2.
----------	----------	-----------	-----------	-----------	-----------	-----------	----------

25 40.	28 4.	31 9.	34 14.	27 16.	30 21.	33 26.	26 28.	29 33.	32 38.	25 40.
-----------	----------	----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

18 1.	21 6.	24 11.	20 18.	23 23.	19 30.	22 35.	18 1.
----------	----------	-----------	-----------	-----------	-----------	-----------	----------

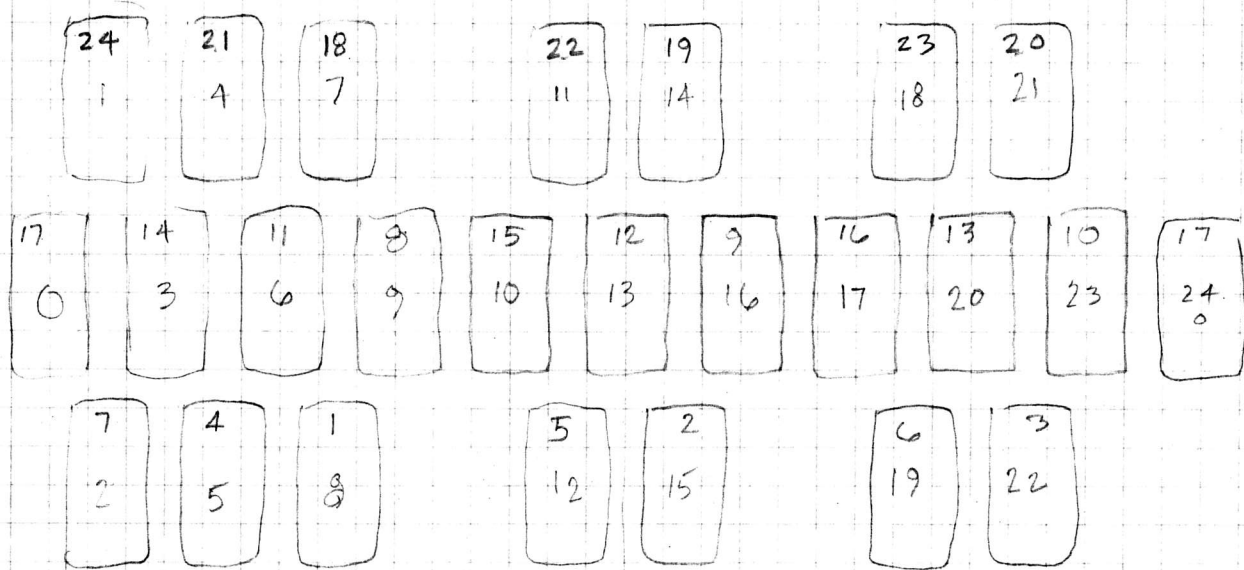
8 39.	11 3.	14 8.	17 13.	10 15.	13 20.	16 25.	9 27.	12 32.	15 37.	8 39.
----------	----------	----------	-----------	-----------	-----------	-----------	----------	-----------	-----------	----------

1 0.	4 5.	7 10.	3 17.	6 22.	2 29.	5 34.	1 0. 41.
---------	---------	----------	----------	----------	----------	----------	----------------

←

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41  
 1 4 7 3 6 2 5 1  
 1 4 7 10 3 6 9 2 5 8 1  
 1 11 4 14 7 17 10 3 13 6 16 9 2 12 5 15 8 1  
 1 18 11 4 21 14 7 24 17 10 3 20 13 6 23 16 9 2 19 12 5 22 15 8 1  
 0 35 28 38 31 41 34 27 37 30 40 33 26 36 29 39 32 25  
 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Trip!  
18 Apr 69

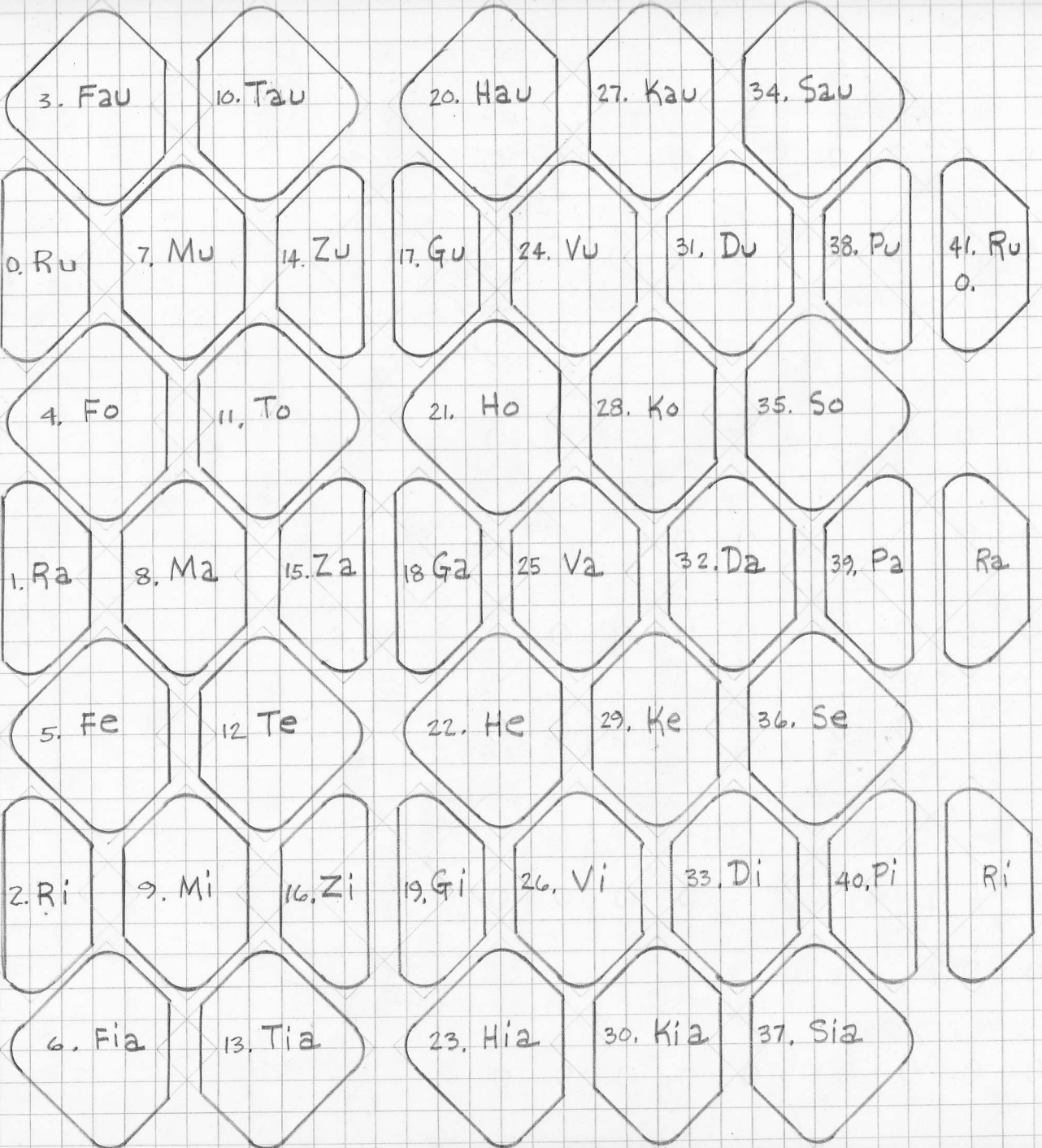


	Lu	L2x	Li	
	Pu	P2	Pi	
Tu	Tu	T2	Ti	Tux
	Ju	J2	Ji	
	Gu	G2x	Gi	
	Du	D2	Di	
Bu	Bo	Be	Bi	
	Fu	Fe	Fi	
	Nu	Ne	Ni	
Su	So	Se	Si	
	Ku	Ke	Ki	
	Ro	Re	Ri	
	40	41	42	
	37	38	39	
	33	34	35	
	30	31	32	
	26	27	28	
	23	24	25	
	19	20	21	
	16	17	18	
	13	14	15	
	9	10	11	
	6	7	8	
	2	3	4	
				5

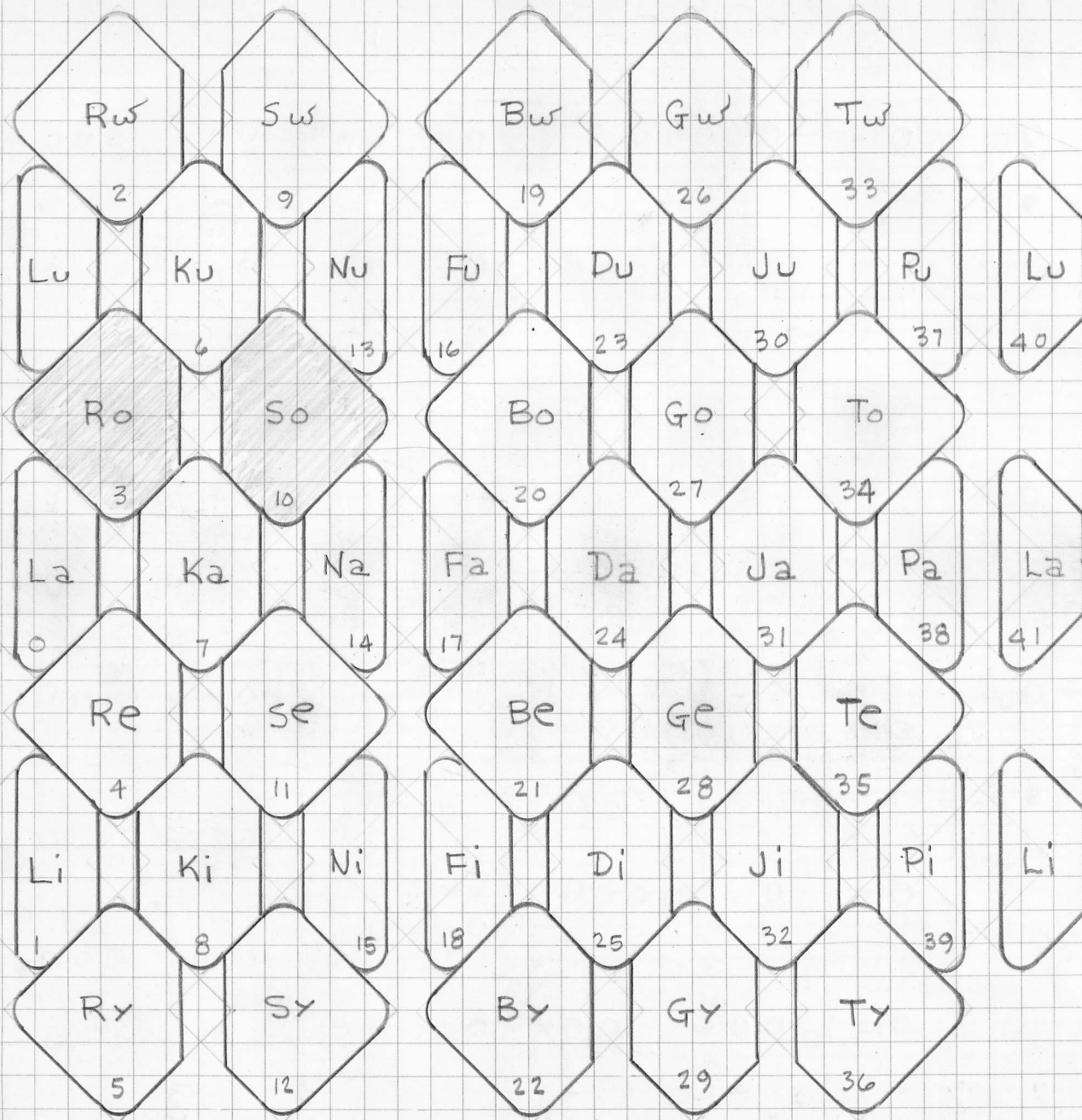
R

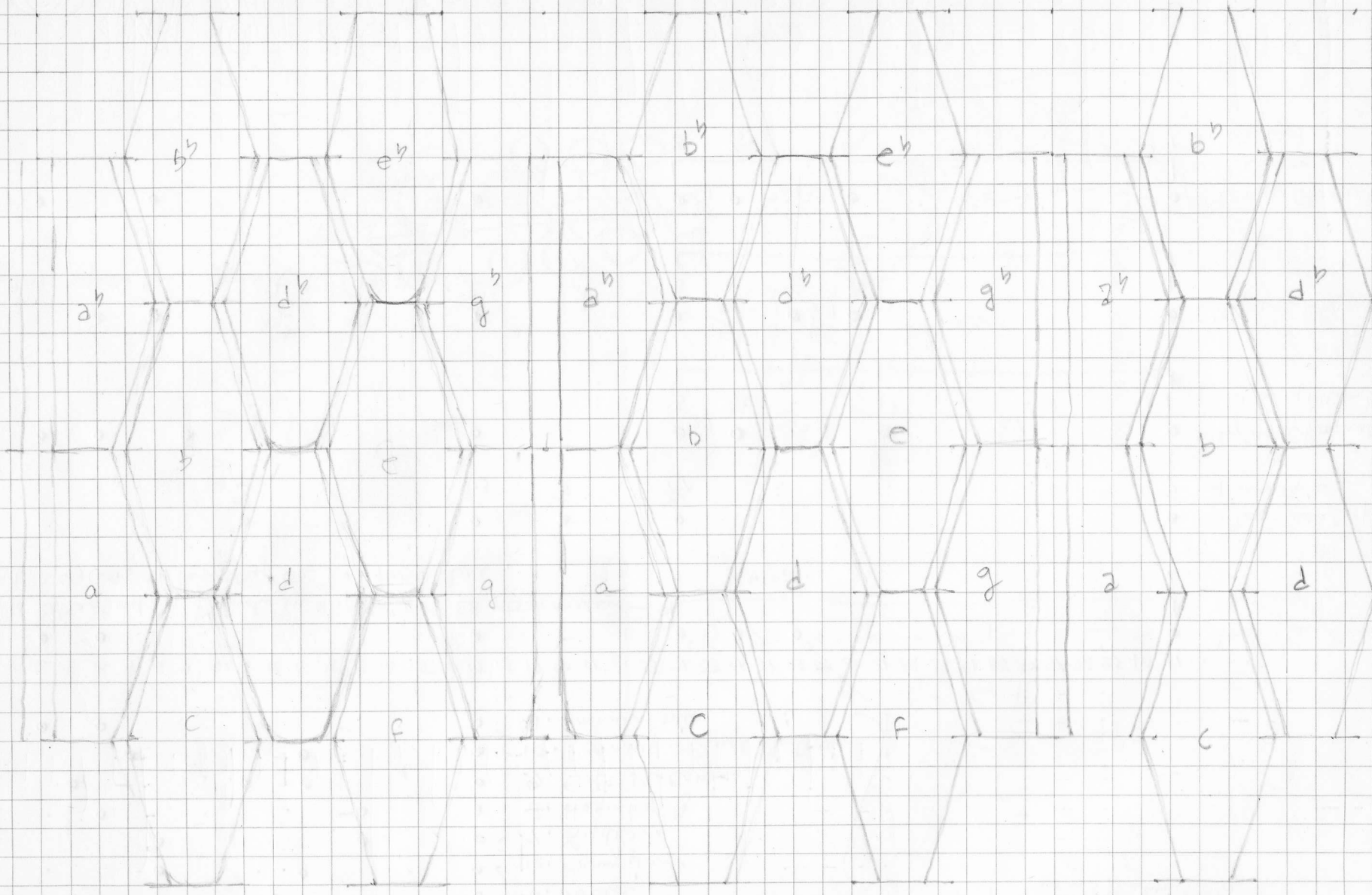
2	6	9	13	16	19	23	26	30	33	37	40 (2)	6	9							
0	3	4	7	10	11	14	17	20	21	24	27	28	31	34	35	38	41 (0)	3	4	7
1	5	8	12	15	18	22	25	29	32	36	39 (1)	5	8							

Too long



Dec 7, 1958





# 41 TONE NOTATION

Fractional  
Signature:

Applicable  
Systems:

Whole	bb	b	4	#	※	5	12	19	...												
$\frac{1}{2}$	bb	b	b	4	#	##	※	10	17	24	31	...									
$\frac{1}{3}$	bb	b	b	b	4	+	##	※	15	22	29	36	43	...							
$\frac{1}{4}$	bb	b	b	b	b	4	ψ	≠	ψ	##	※	...	27	34	41	48	55	...			
$\frac{1}{5}$	bb	b	b	b	b	b	4	€	€	€	€	€	€	※	...	39	46	53	60	67	...
$\frac{1}{6}$	Not Designed										...	51	58	65	72	79	...				

Proposal for a Signature Standardization & Integration  
(Your criticism and suggestions appreciated)

Issued Jan 4, 1965 by Erv Wilson  
651 Huntley Dr., Los Angeles, California 90069

REV JAN 18, 1964



C		D		E		F#		G		A		B		C	Pytl
C		D		E1		F#		G		A		B1		C	M
C		D		E1		F#		G		A1		B1		C	m

C		D		E		F		G		A		B		C	P
C		D		E1		F		G		A1		B1		C	M
C		D1		E1		F		G		A1		B1		C	m

C		D		E		F		G		A		Bb		C	P
C		D1		E1		F		G		A1		Bb		C	M
C		D1		E1		F		G1		A1		Bp		C	m

C		D		Eb		F		G		A		Bb		C	P
C		D1		Eb		F		G1		A1		Bp		C	M
C		D		E1		F#		G		A		B1		C	m

C		D		Eb		F		G		Ab		Bb		C	
C		D		E1		F#		G		A1		B1		C	
C		D		E1		F		G		A1		B1		C	

C	Db			Eb		F		G		Ab		Bb		C	P
C	D1			E1		F		G		A1		B1		C	M
C	D1			E1		F		G		A1		Bp		C	m

O	Db			Eb		F		Gb		Ab		Bb		C	P
C	D1			E1		F		G1		A1		Bp		C	M
C	D1			E1		F		G1		A1		Bp		C	m

C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T

↗ DH  
↘ ED

d	ε	e	f	γ	g	α	a	β	b	c	δ	d
g	α	a	β	b	c	δ	d	ε	e	f	γ	g
c	δ	d	ε	e	f	γ	g	α	a	β	b	c
f	γ	g	α	a	β	b	c	δ	d	ε	e	f
β	b	c	δ	d	ε	e	f	γ	g	α	a	β
ε	e	f	γ	g	α	a	β	b	c	δ	d	ε
α	a	β	b	c	δ	d	ε	e	f	γ	g	α
δ	d	ε	e	f	γ	g	α	a	β	b	c	δ
γ	g	α	a	β	b	c	δ	d	ε	e	f	γ
b	c	δ	d	ε	e	f	γ	g	α	a	β	b
e	f	γ	g	α	a	β	b	c	δ	d	ε	e
a	β	γ	g	α	a	β	b	c	δ	d	ε	a

1/1

256/243  
16/15

10/9  
9/8

32/27  
6/5

5/4  
81/64

4/3  
27/20

1024/729, 45/32  
729/512, 64/45

40/27  
3/2

128/81  
8/5

5/3  
27/16

16/9  
9/5

15/8  
243/128

2/1

-1 0 1 2 3 4 5 6 7 8

↗  
♭ ♯ ≠ ♯ ≠ ≠ ≠ ≠ ≠ ≠  
bb b b b b b b b b  
↖

(This is beautiful!)

This formula <sup>alternately</sup> ~~merely~~ supplements the Fokkerian notation. It takes twice as many degrees to make double-sharp in 41T as in 31T, and foursome as in 12T. The nomenclature is extrapolated, simply,  $\frac{1}{4}$  sharp,  $\frac{1}{2}$  sharp,  $\frac{3}{4}$  sharp, sharp,  $1\frac{1}{4}$  sharp,  $1\frac{1}{2}$  sharp,  $1\frac{3}{4}$  sharp, 2bb sharp;  $\frac{1}{2}$  flat,  $\frac{1}{4}$  flat,  $\frac{3}{4}$  flat, flat,  $1\frac{1}{4}$  flat,  $1\frac{1}{2}$  flat,  $1\frac{3}{4}$  flat; 2bb flat. & with the applicable signs being identical in 12-, 31-, & the 41-tone system.

22T involves a  $\frac{1}{3}$  sharp concept, and had best employ a different set of signs.

"Sharp" is neither a melodic nor a harmonic concept; it is a structural concept.

bb                    b                    4                    #                    ✕ whole

bb      k      b      r      4      ≠      #      ##      ✕ 1/2

bb    r    b    b    r    r    4    f    ≠    #    ##    ###    ✕ 1/3

bb    k    k    b    b    r    r    r    4    ψ    ≠    ψ    #    ##    ###    ####    ✕ 1/4  
alteration

OR

bb    k    b    b    r    r    4    ψ    ψ    #    ##    ###    ✕ 1/3

bb    r    k    b    b    r    r    4    f    ≠    f    #    ##    ###    ####    ✕ 1/4

bb                    b                    4                    #                    ✕

bb      k      b      r      4      ≠      #      ##      ✕

bb    k    b    b    r    r    4    ψ    ψ    #    ##    ###    ✕

bb    r    k    b    b    r    r    4    f    ≠    f    #    ##    ###    ####    ✕

Fractional Signatures:

Applicable Systems

whole	bb	b		b		#		*					5	12	19	...				
$\frac{1}{2}$	bb	b	b	b	b	#	#	#	#	*			10	17	24	31	...			
$\frac{1}{3}$	bb	b	b	b	b	b	b	#	#	#	#	*	15	22	29	36	43	...		
$\frac{1}{4}$	bb	b	b	b	b	b	b	b	b	#	#	#	#	*	27	34	41	48	55	...
$\frac{1}{5}$	Not Designed												39	46	53	60	67	...		
													51	58	65	72	79			

A Suggested Integration and Standardization of Signature  
 (comment, contribution, or criticism appreciated)

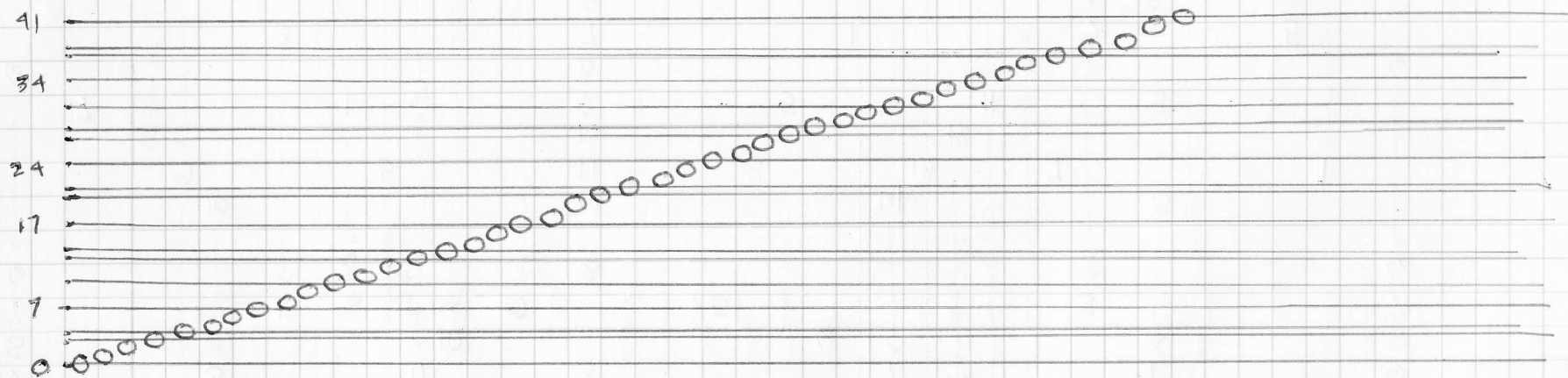
63 70 77 84 91

Issued By Eric Wilson 4 Nov 64

89 96

OBSOLETE  
 SEE FURTHER ON

GRAPHIC NOTATION ~~BASI~~ - STAFF IS BASED ON THE ~~DECEMIST~~ SEPTENDECIMAL  
MOMENT OF SYMETRY OF THE 41-TONE SYSTEM.





0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
$\frac{1}{1}$	$\frac{81}{80}$	$\frac{33}{32}$	$\frac{21}{20}$	$\frac{16}{15}$	$\frac{12}{11}$	$\frac{10}{9}$	$\frac{9}{8}$	$\frac{8}{7}$	$\frac{7}{6}$	$\frac{32}{27}$	$\frac{6}{5}$	$\frac{11}{9}$	$\frac{5}{4}$	$\frac{14}{11}$	$\frac{9}{7}$	$\frac{21}{16}$	$\frac{4}{3}$	$\frac{27}{20}$	$\frac{11}{8}$	$\frac{7}{5}$

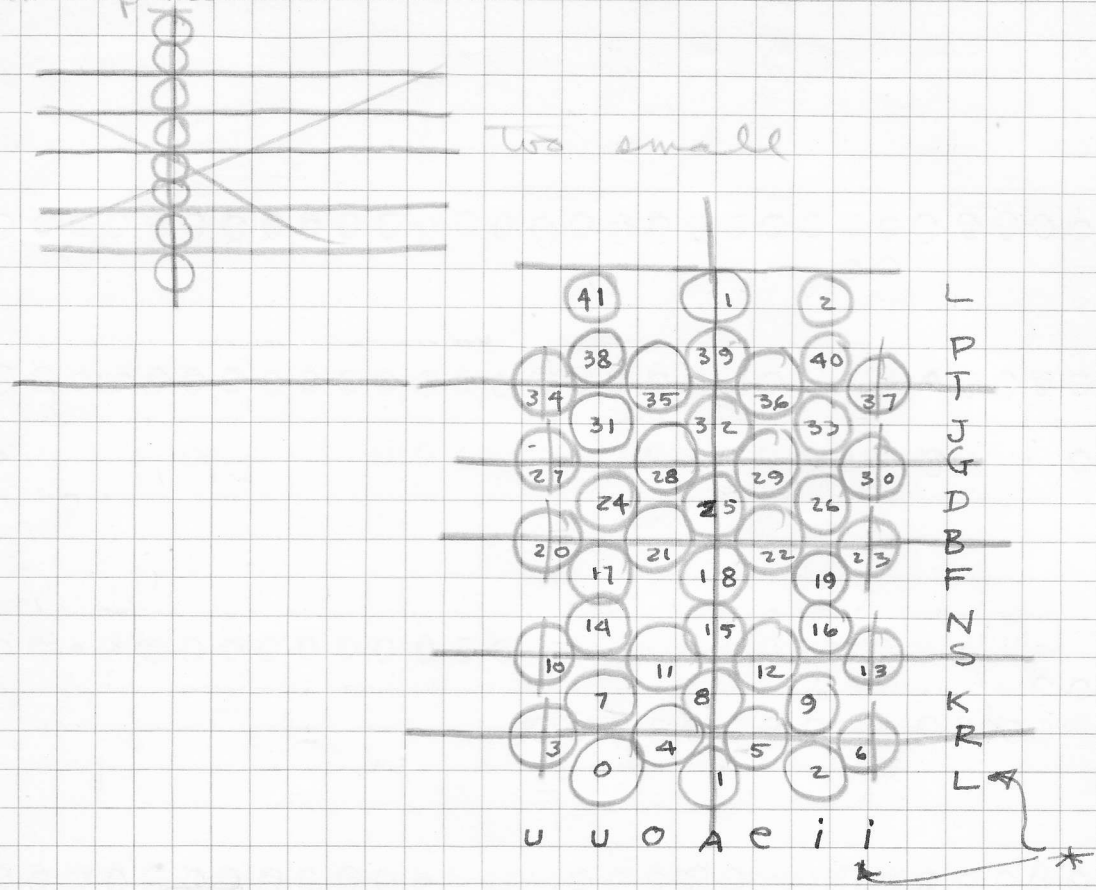
$\sqrt{\frac{11}{10}}$

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
$\frac{10}{7}$	$\frac{16}{11}$	$\frac{40}{27}$	$\frac{3}{2}$	$\frac{32}{21}$	$\frac{14}{9}$	$\frac{11}{7}$	$\frac{9}{5}$	$\frac{13}{11}$	$\frac{5}{3}$	$\frac{27}{16}$	$\frac{12}{7}$	$\frac{7}{4}$	$\frac{16}{9}$	$\frac{9}{5}$	$\frac{11}{6}$	$\frac{15}{8}$	$\frac{40}{21}$	$\frac{64}{33}$	$\frac{160}{81}$	$\frac{2}{1}$

$\wedge \frac{20}{11}$

NEGATIVE

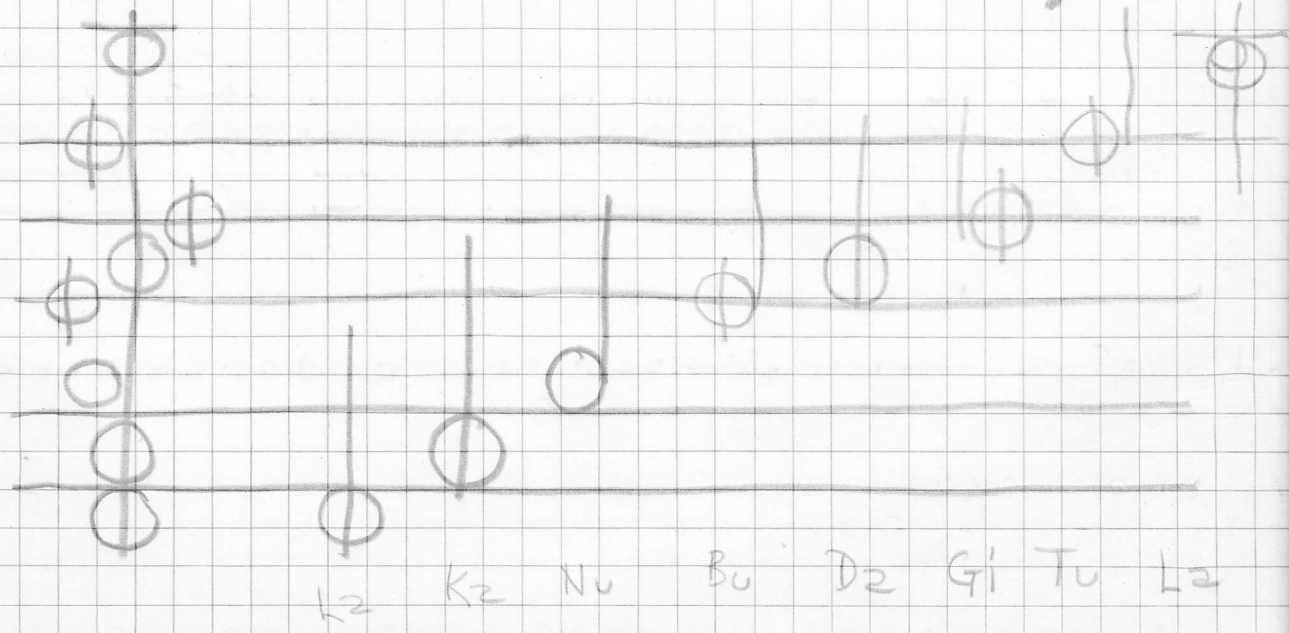
# System of notation 41-ton scale



\* naming schema. For example 0 is Lu, 3 is Ru

Example; Harmonic Heptad on L2

L2 K2 Nu Bu D2 Gi Tu L2 is written





Example: Indian Scale on

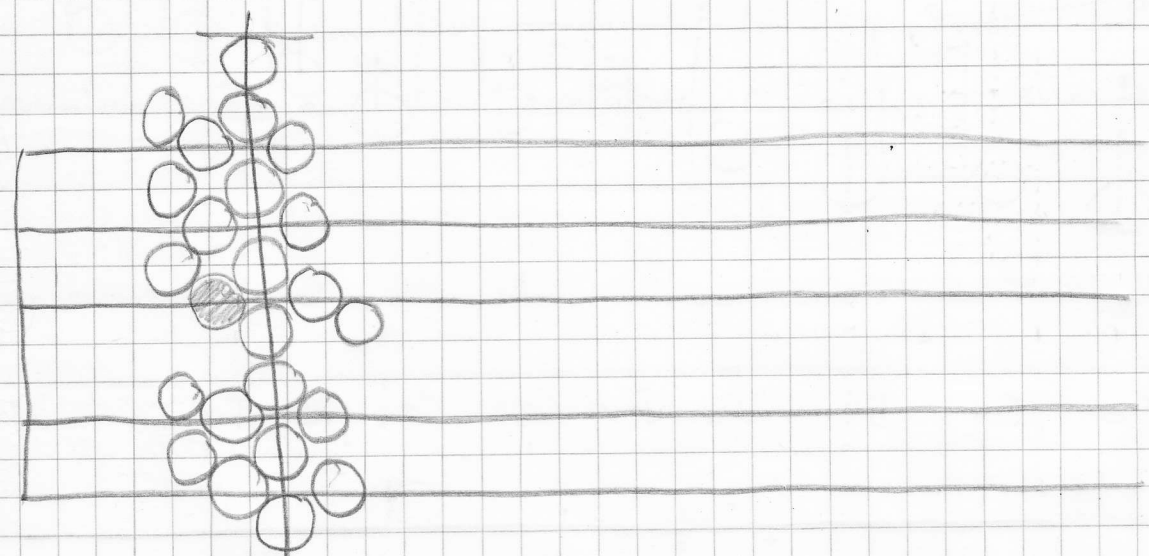
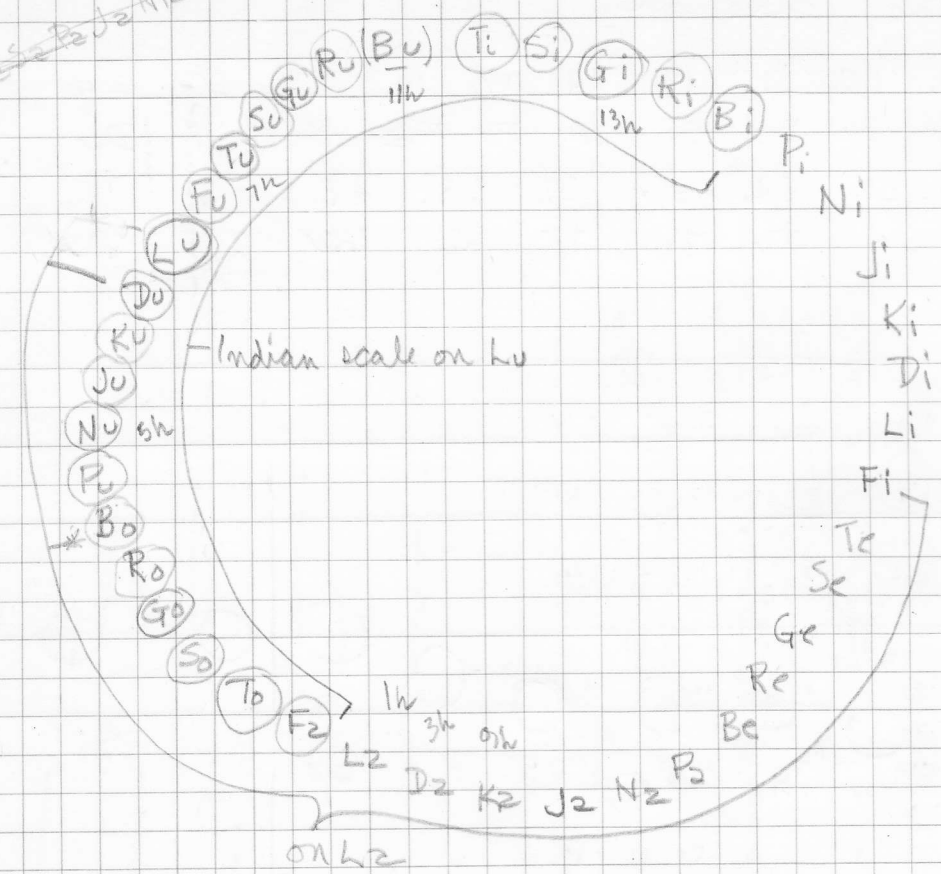
0, 3, 4, 6, 7, 10, 11, 13, 14, 17, 18, 21, 23, 24  
 Lu Ru Ro Ri Ku Su So Si Nu Fu Fa Bo Bi Du  
 27, 28, 30, 31, 34, 35, 37, 38, 41  
 Gu Go Gi Ju Tu To Ti Pu Lu

Lu Ru Ro Ri Ku Su So Si Nu

Fu Fa Bo Bi Du Gu Go Gi Ju Tu To Ti Lu

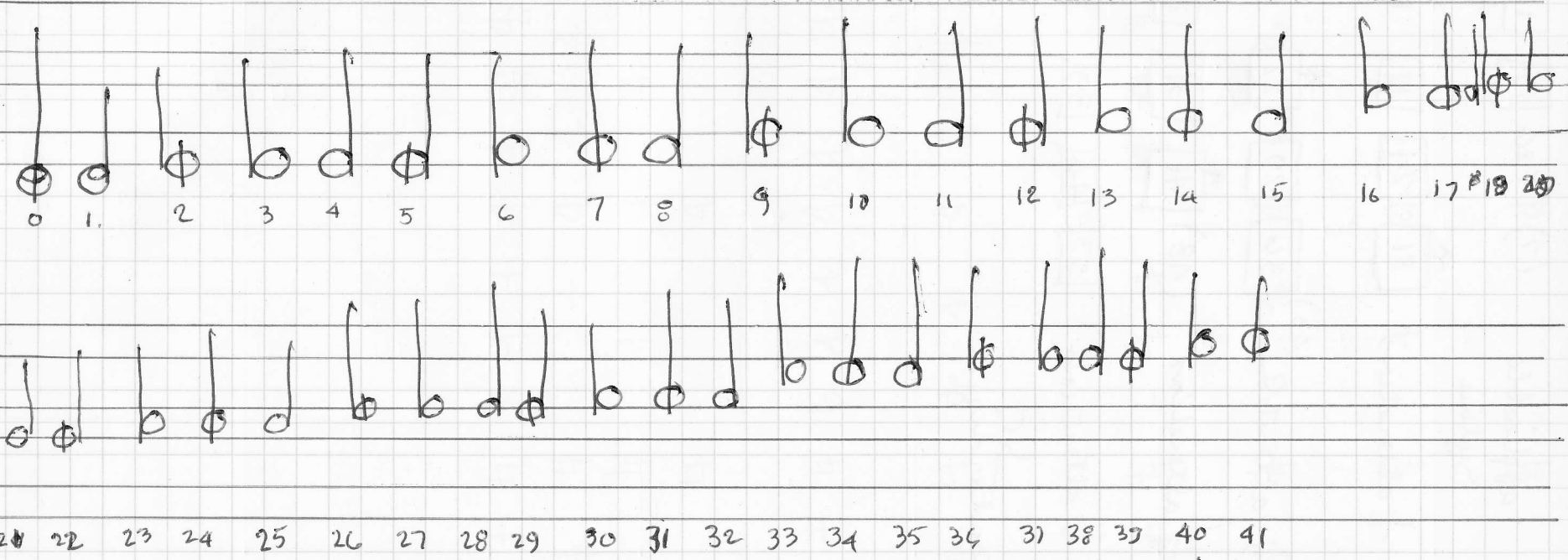
La Re Nu Ama Be Ge Pu (La)

~~Ka La Pa Sa Ja Ha~~

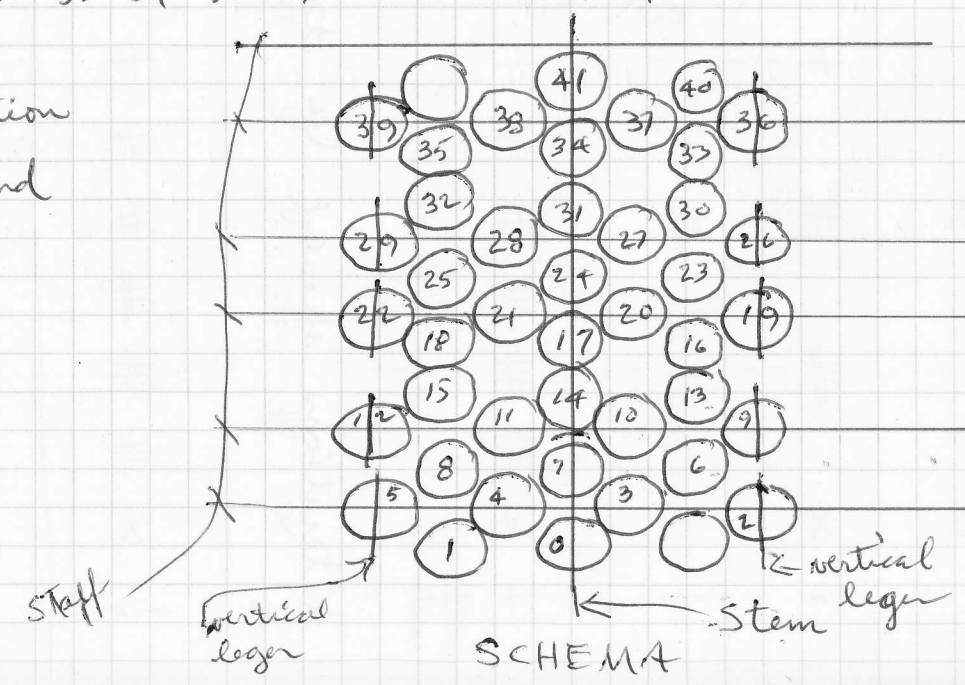


Indian Scale on ha

La Ro Re Ku K2 Sa Se Nu N2 Fa Fi Be Du Da Go Ge Ju Ja To Te Pu Pa La



Keyboard Graphic Notation  
 5-7-5-7-5-7-5 keyboard  
 or Bosanquet equiv



# 41 TONE SOLFEGGE

We should name the intervals in terms of 12  
P = Perfect, - = Minor, + = Major, > = diminished, < = Augmented

41. P12

40. >12

39. <11

38. +11

37. -11

36. >11

35. <10

34. P10

33. >10

32. <9

31. P9

30. >9

29. <8

28. +8

27. -8

26. >8

25. <7

24. P7

23. >7

22. <6

21. +6

20. -6

19. >6

18. <5

17. P5

16. >5

15. <4

14. +4

13. -4

12. >4

11. <3

10. P3

9. >3

8. <2

7. P2

6. >2

5. <1

4. +1

3. -1

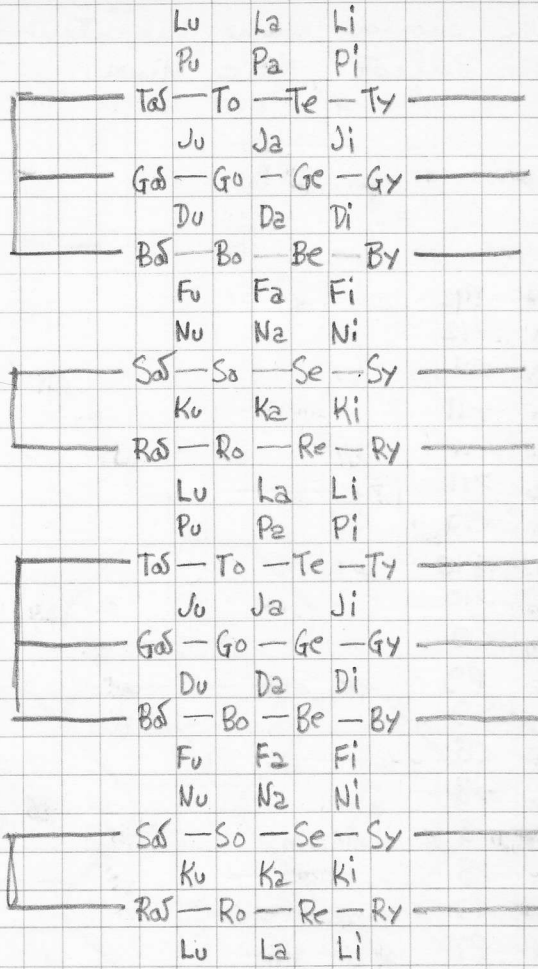
2. >1

1. <0

0. P0



- 0. La Ki Sy Fa - By Ge To La
- 1. Li So Nu Fi - Du Gy Te Li
- 2. Ra So Na Ba - Da Ju Ty Ra
- 3. Ro Se Ni Bo - Di Ja Pu Ro
- 4. Re Sy Fu Be - Ga Ji Pa Re
- 5. Ry Nu Fa By - Go Ta Pi Ry
- 6. Ku Na Fi Du - Ge To Lu Ku
- 7. Ka Ni Ba Da - Gy Te La Ka
- 8. Ki Fu Bo Di - Ju Ty Li Ki
- 9. Sa Fa Be Ga - Ja Pu Ra Sa
- 10. So Fi By Go - Ji Pa Ro So
- 11. Se Ba Du Ge - Ta Pi Re Se
- 12. Sy Bo Da Gy - To Lu Ry Sy
- 13. Nu Be Di Ju - Te La Ku Nu
- 14. Na By Ga Ja - Ty Li Ka Na
- 15. Ni Du Go Ji - Pu Ra Ki Ni
- 16. Fu Da Ge Ta - Pa Ro Sa Fu
- 17. Fa Di Gy To - Pi Re So Fa
- 18. Fi Ga Ju Te - Lu Ry Se Fi
- 19. Ba Go Ja Ty - La Ku Sy Ba
- 20. Bo Ge Ji Pu - Li Ka Nu Bo
- 21. Be Gy Ta Pa - Ra Ki Na Be
- 22. By Ju To Pi - Ro Sa Ni By
- 23. Du Ja Te Lu - Re So Fu Du
- 24. Da Ji Ty La - Ry Se Fa Da
- 25. Di Ta Pu Li - Ku Sy Fi Di
- 26. Ga To Pa Ra - Ka Nu Ba Ga
- 27. Go Te Pi Ro - Ki Na Bo Go
- 28. Ge Ty Lu Re - Sa Ni Be Ge
- 29. Gy Pu La Ry - So Fu By Gy
- 30. Ju Pa Li Ku - Se Fa Du Ju
- 31. Ja Pi Ra Ka - Sy Fi Da Ja
- 32. Ji Lu Ro Ki - Nu Ba Di Ji
- 33. Ta La Re Sa - Na Bo Ga Ta
- 34. To Li Ry So - Ni Be Go To
- 35. Te Ra Ku Se - Fu By Ge Te
- 36. Ty Ro Ka Sy - Fa Du Gy Ty
- 37. Pu Re Ki Nu - Fi Da Ju Pu
- 38. Pa Ry Sa Na - Ba Di Ja Pa
- 39. Pi Ku So Ni - Bo Ga Ji Pi
- 40. Lu Ka Se Fu - Be Go Ta Lu
- 41. La Ki Sy Fa - By Ge To La



as = wa      as  
 y = ai

Te Ty Pu Pa Pi Lu La  
 Ge Gy Ju Ja Ji Ta To  
 By Du Da Di Ga Go Ge  
 Fu Fa Fi Ba Be By  
 Se Sy Nu Na Ni Fu Fa  
 Ro Re Ry Ku Ka Ki So Se Sy  
 Ku Ka Ki So Se Sy  
 Lu La





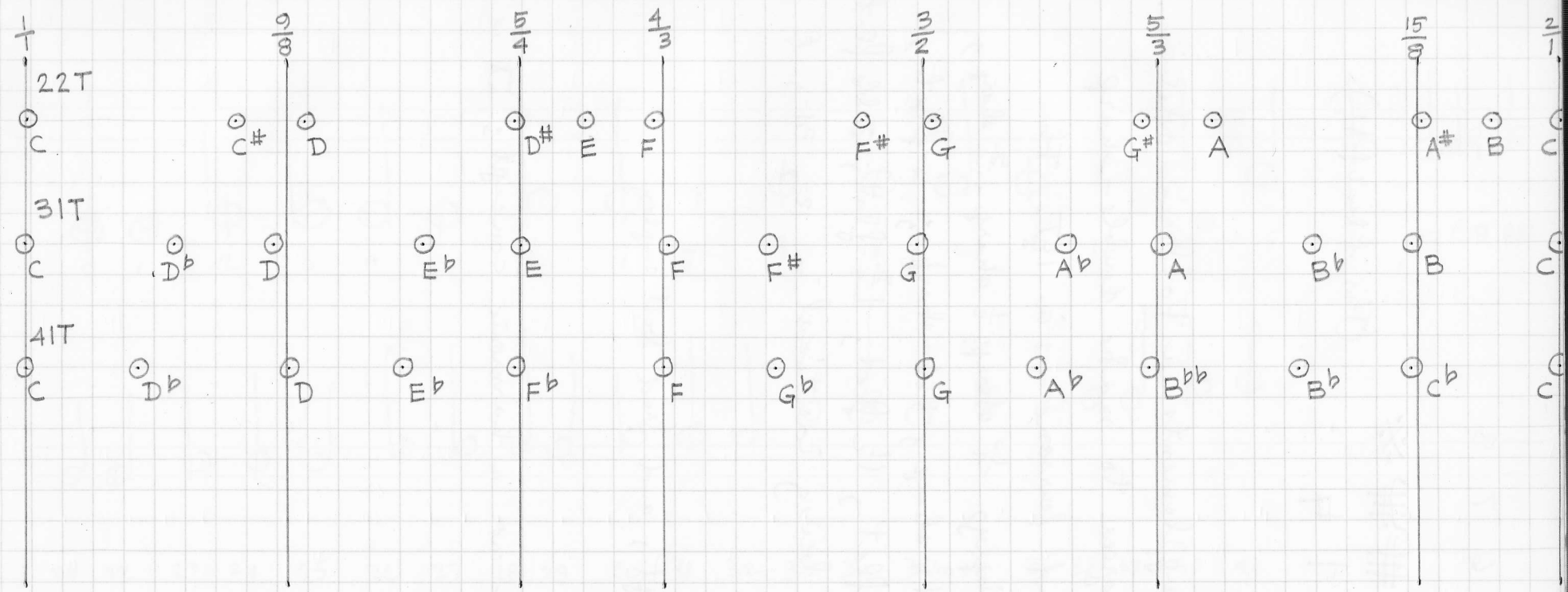
	41	12	41 is
4	264	261.62	+ .0131
5	328,99	329.63	- .0028
6	396.11	392.	+ .0151
7	461.21	466.16	- .0154
(8)	(528.)	(523.25)	+ .0171
9	297.17	293.67	- .0236
11	364.	370.00	

265 .0055  
 264 .0000

+ 0131  
 + 0151  
 + 0171  
 Total 0453 sharp

- 0028  
 - 0154  
 - 0236  
 Total .0418 flat





THREE <sup>LINEAR</sup> 12-TONE SCALES, CONSTRUCTED OF CONTIGUOUS FOURTHS, AND SHOWN IN RELATION TO THE "JUST" DIATONIC. FOR 22T & 41T THERE IS ONLY ONE SOLUTION. FOR 31T THERE IS A GROUP OF 6 RELATED SOLUTIONS. THE 31T SOLUTION IS TRADITIONAL; HOWEVER, THE 22T AND 41T SOLUTIONS DEMONSTRATE THE THEORETICAL POSSIBILITY OF UNUSUAL RELATIONSHIPS BETWEEN THE LINEAR 12-TONE SCALE AND THE DIATONIC SCALE.

Log 2 = .30102,99956,63981,19521

.007342194

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41 | .30102,99956,63981,19521,4

287

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140

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123

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172

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164

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89

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82

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79

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41

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389

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369

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205

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161

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antilog

- antilog .0072 1.01,65787,50095,51559, 5+
- antilog .0073 1.016809012448723215+
- antilog .0074 1.017039274854950707

1.017039274854950707

1.016809012448723215+

---

.000230262406227192+

~~1.016809012448723215+~~

~~1.016575009551559~~

1.016809012448723215+

1.016578750095515595+

---

.000230262363207620+

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

0  
5  
3

5th string

4th str

3rd str

2nd str

1st str

8ve 1st str

41

17

31

7

34

10

34

10

41

17

17

34

7

24

2

3

10

2

24

41

2

31

31

17

34

31

7

34

10

24

41

