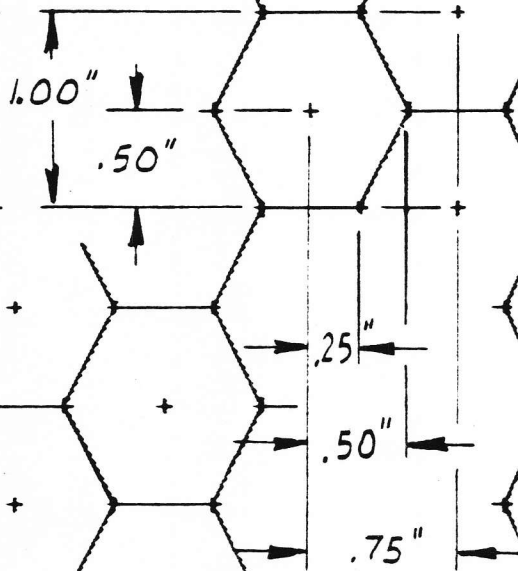


Multi-Keyboard Gridiron

© 1987 by Erv Wilson

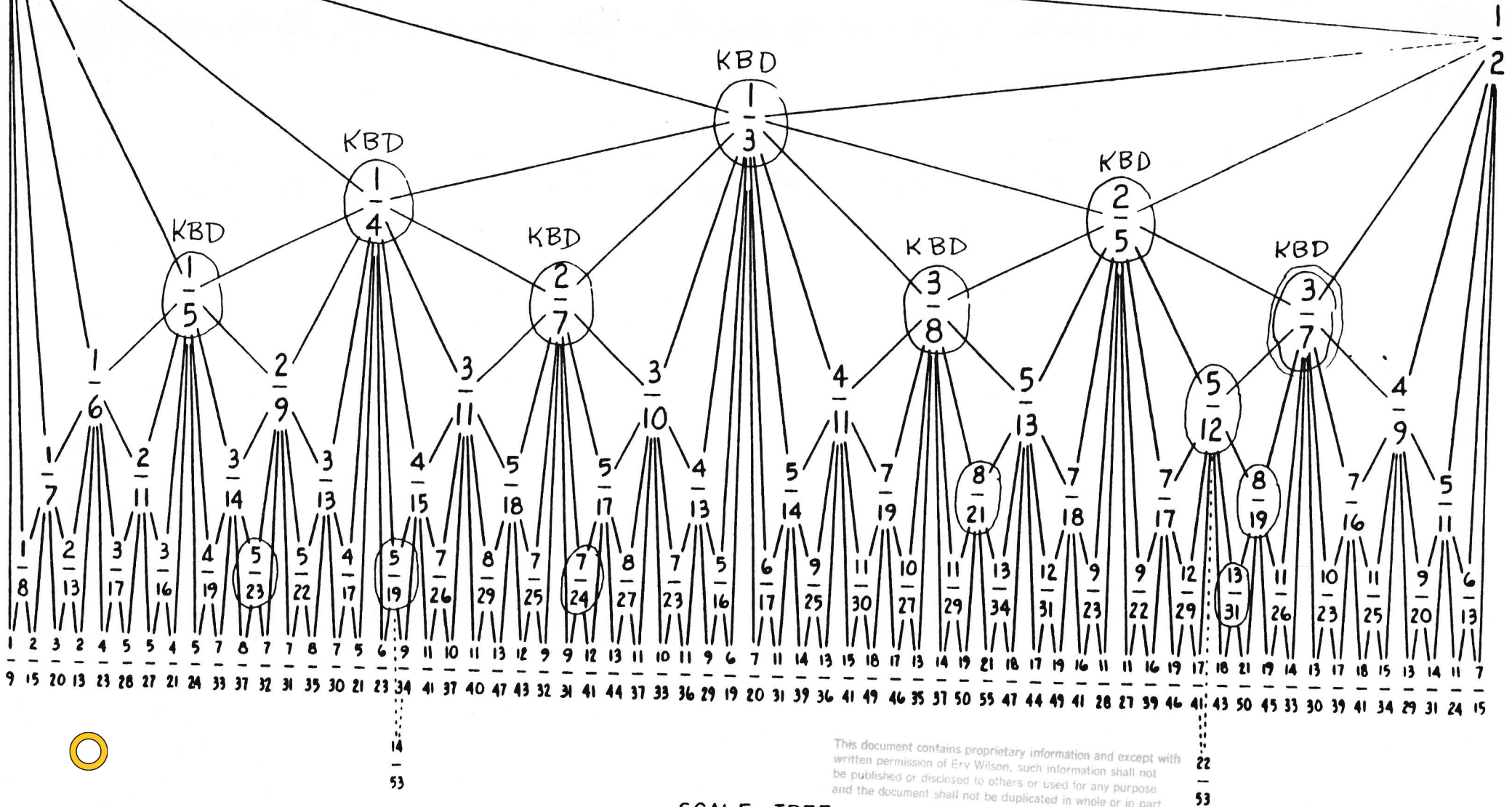
Fred returned

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Notice; The contents of this drawing are the proprietary design of Ervin M. Wilson, 844 N. Ave 65, Los Angeles CA90042, Phone: (213) 256-2624.

The following keyboard (KBD) examples are enclosed. Each Keyboard is analogous to a linear (chain of intervals) scale, and can accommodate, also, each of the linear scales falling below it in the scale-tree linear hierarchy. As a consequence of this spectrum of keyboards, all possible linear tunings may be realized.



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SCALE TREE

© 1986 by Erv Wilson

The scale examples are circled in blue. The denominator expresses the number of tones in the scale. The numerator expresses the fraction (of the respective scale), which forms the linear tuning sequence.

Yours, Erv Wilson

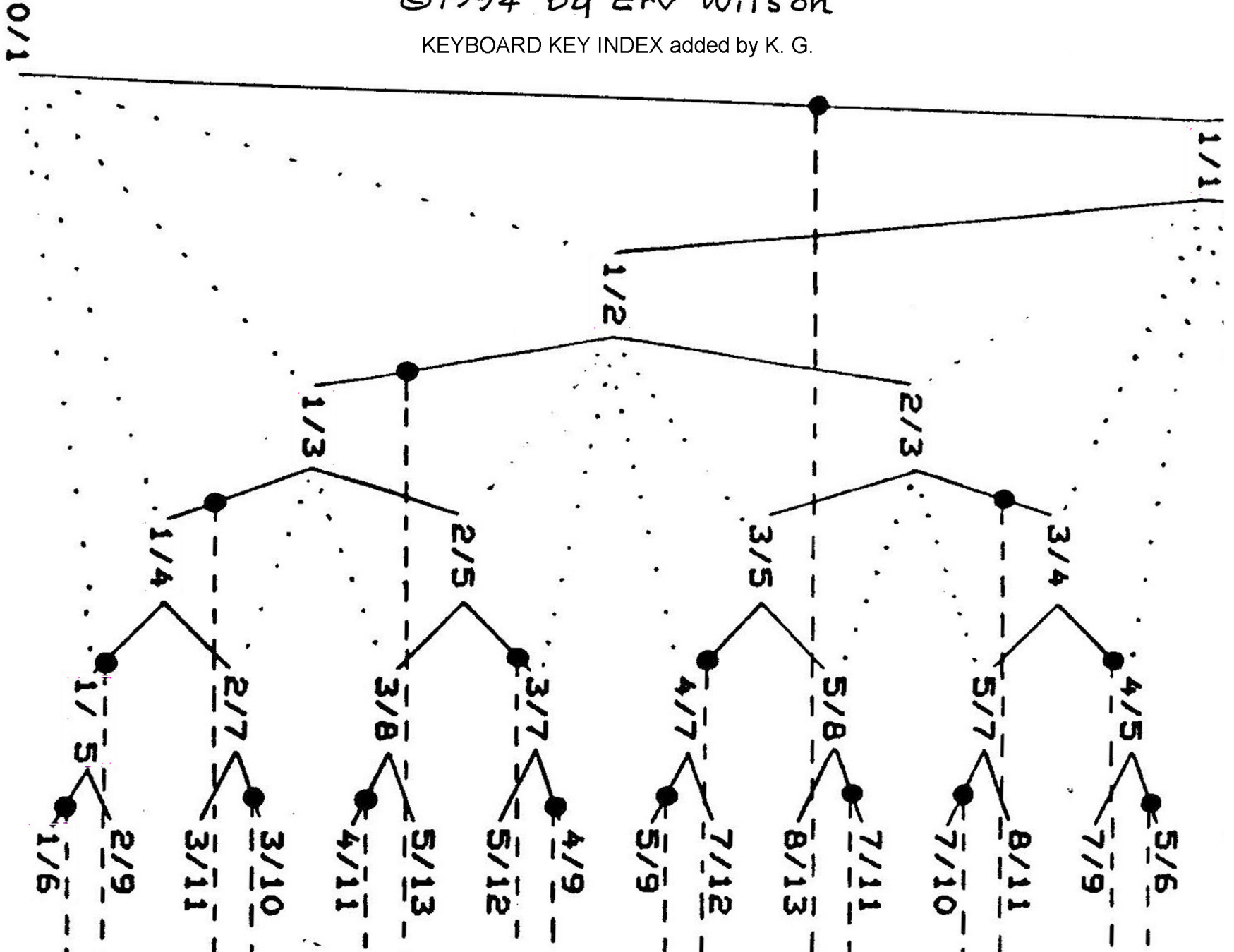


Scale-Tree (Peirce Sequence)

work in progress, all rights reserved

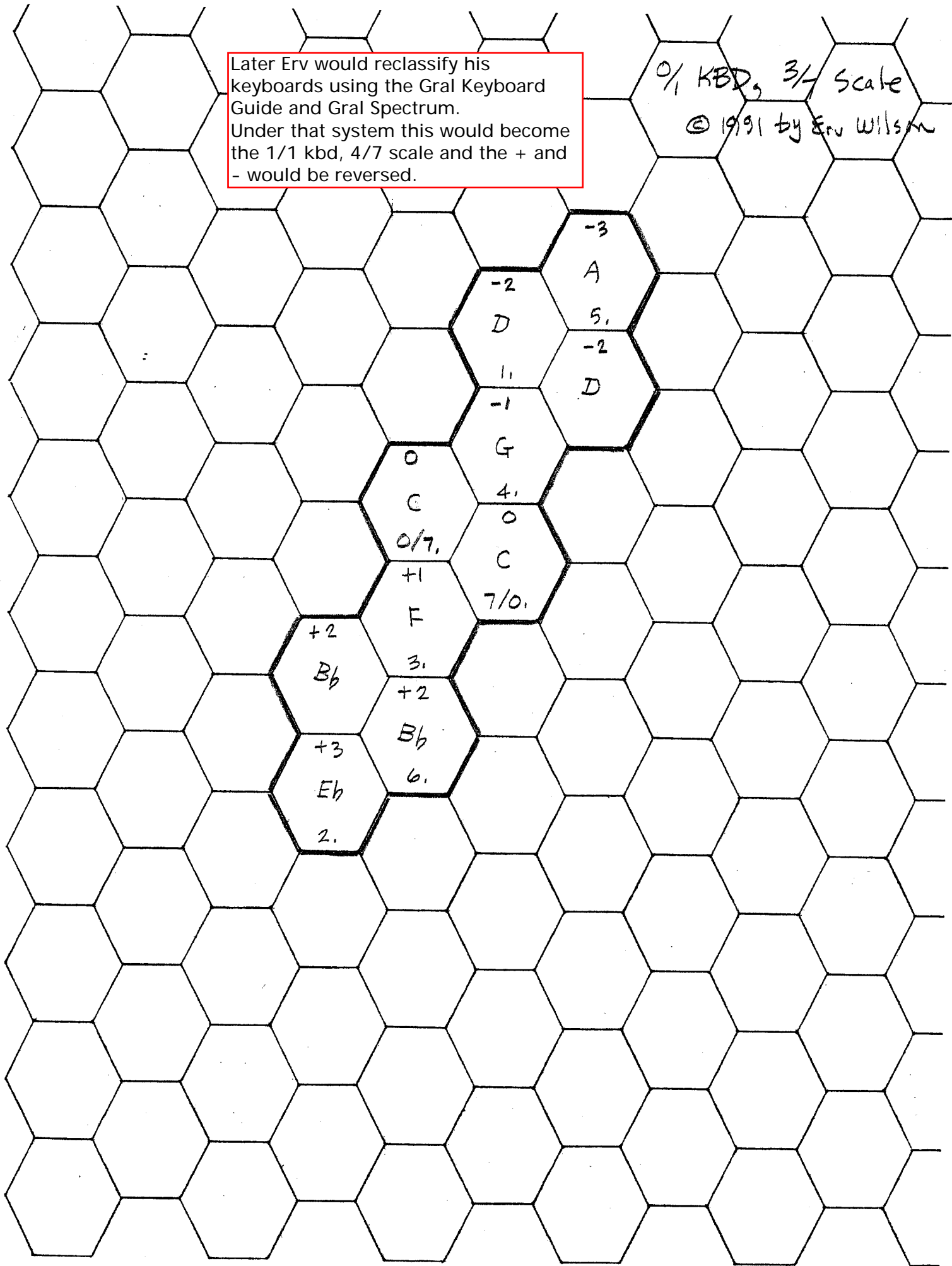
©1994 by Erv Wilson

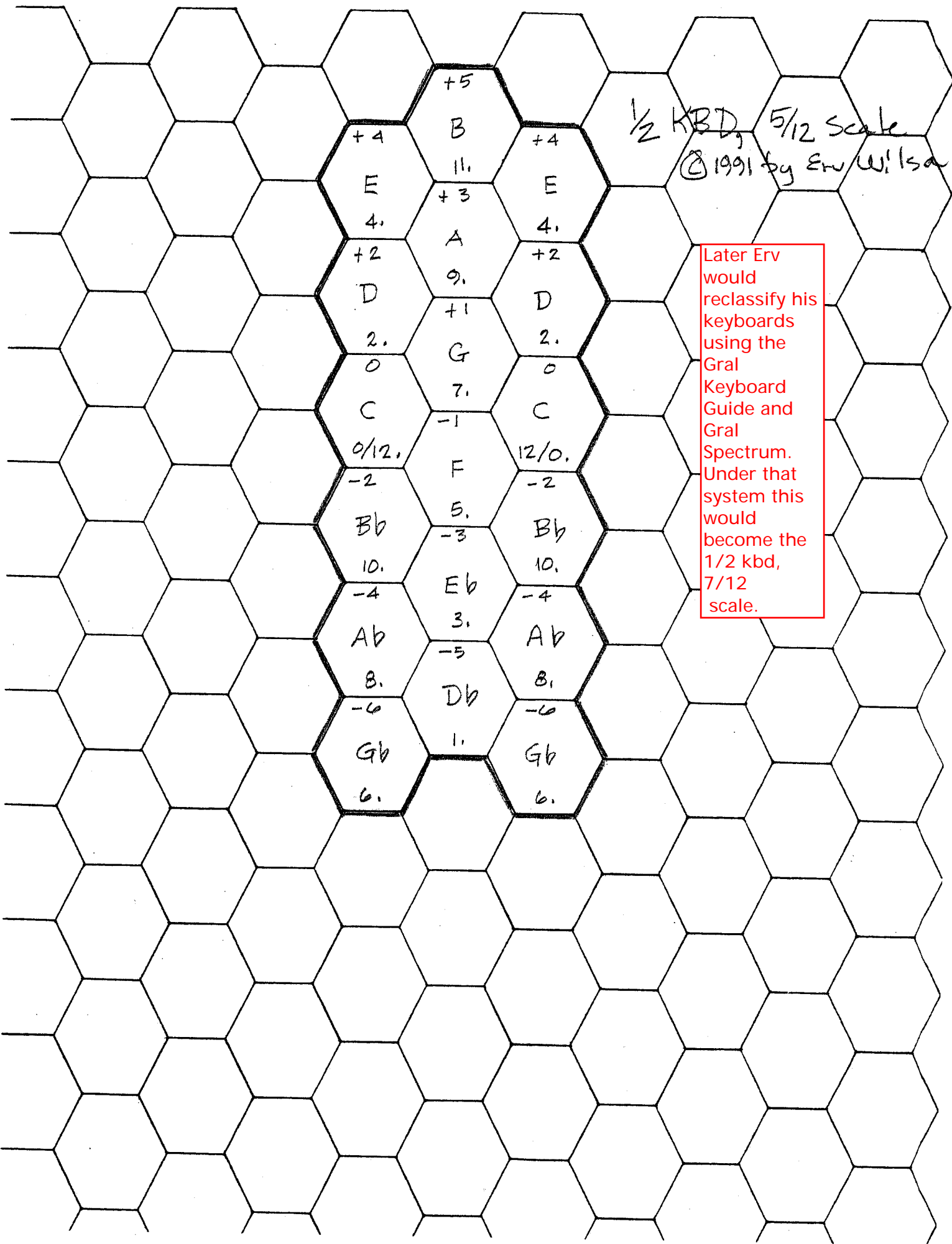
KEYBOARD KEY INDEX added by K. G.



Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 1/1 kbd, 4/7 scale and the + and - would be reversed.

0/1 KBD, 3/4 Scale
© 1991 by Erv Wilson

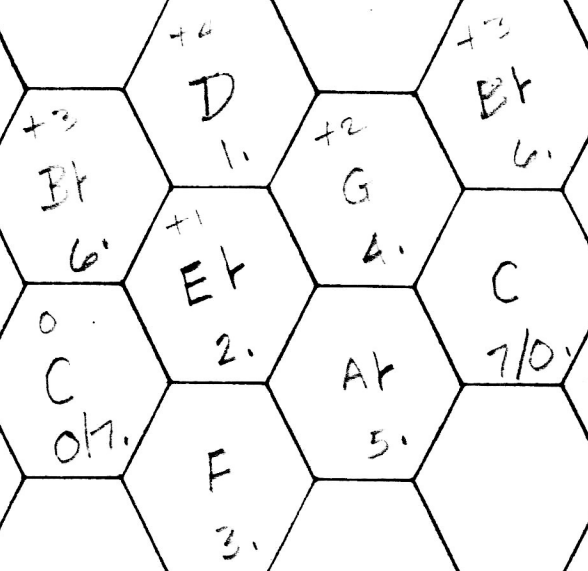
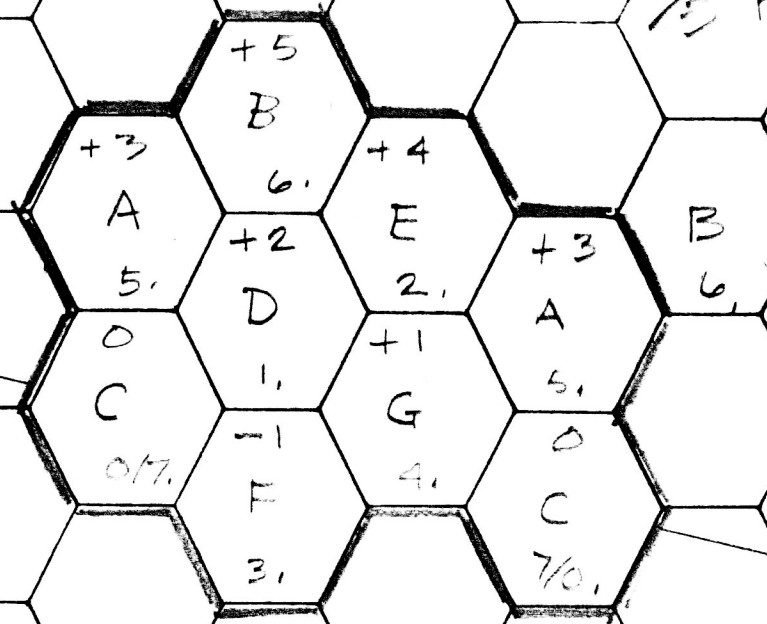




1/2 kbd, 5/12 scale
 © 1991 by Erv Wilson

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 1/2 kbd, 7/12 scale.

1/3 kbd, 4/7 scale
© 1987 by Erv Wilson



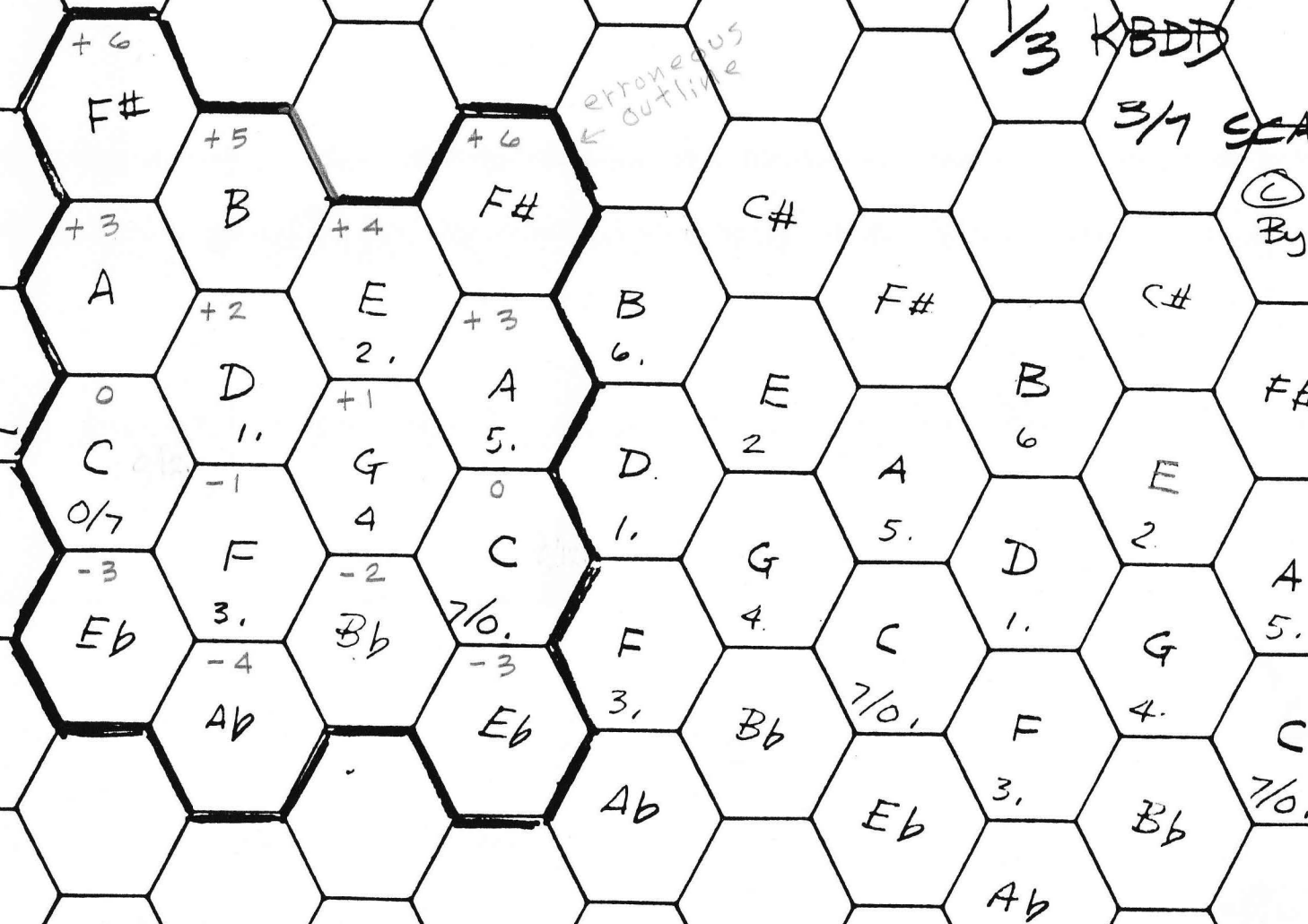
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 2/3 kbd, 4/7 scale above and the 1/3 kbd, 3/7 scale below

1/3 KBDD

~~3/7 SCALE (5/12 scale)~~

© 1987
By Erv Wilson

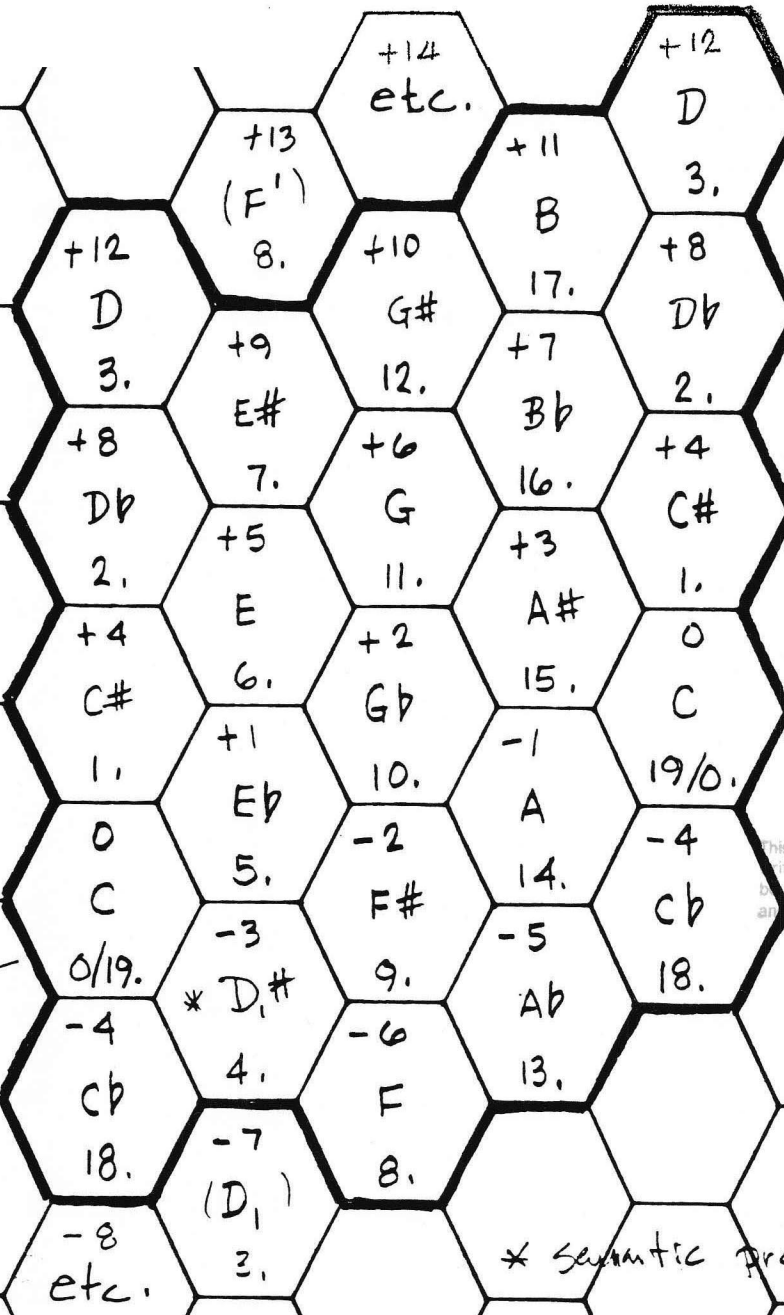
erroneous
← outline



This is the most compact version of the Bosanquet. It allows the hand to span 3 Octaves!

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 2/3 kbd, 4/7 scale.

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1/4 KBD,
5/19 SCALE

© 1987
by Erv Wilson

HORIZONTAL

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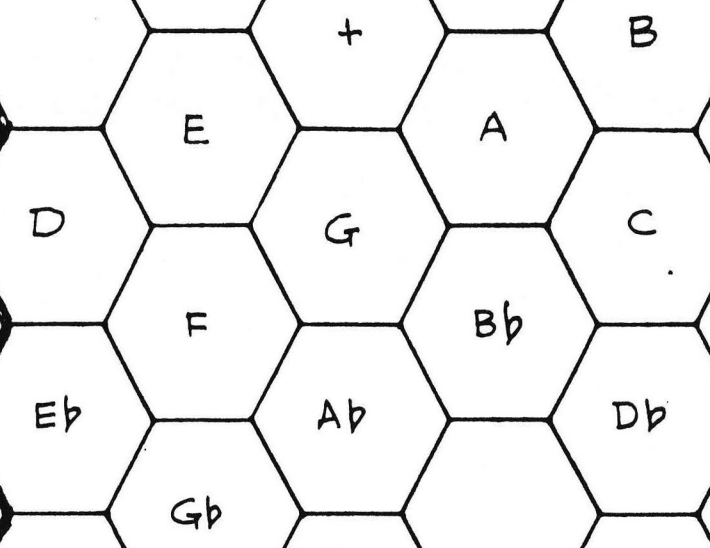
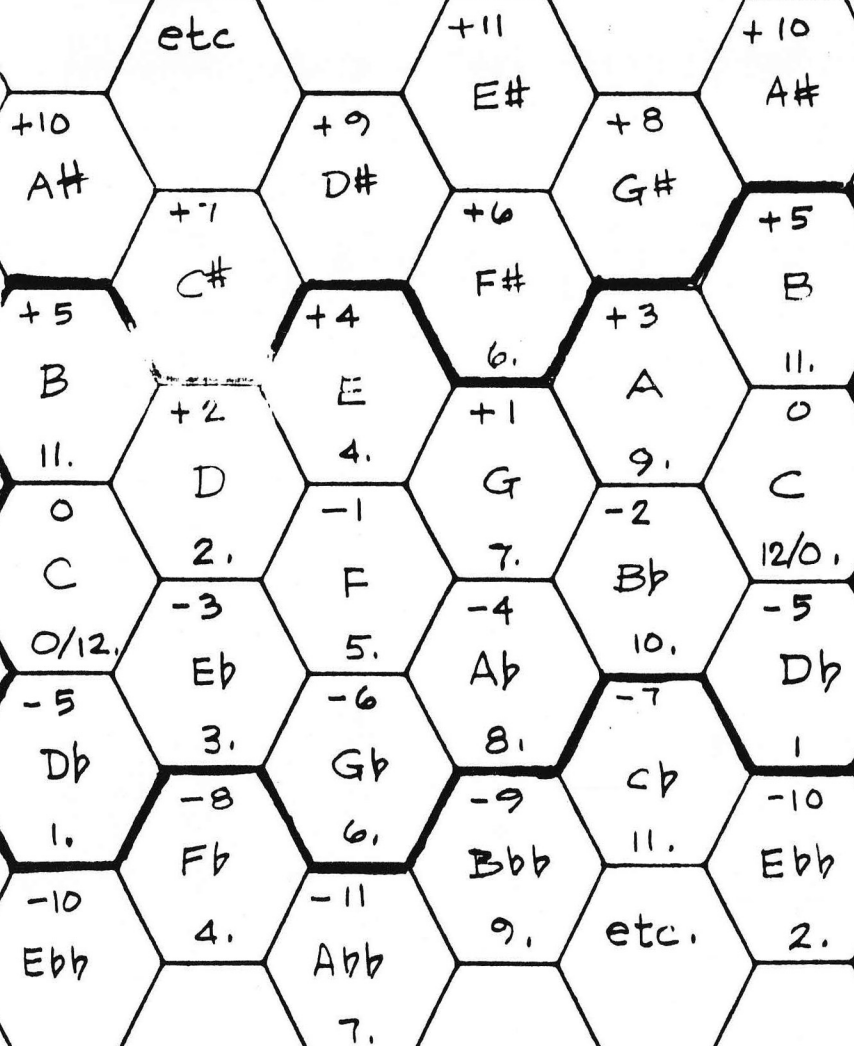
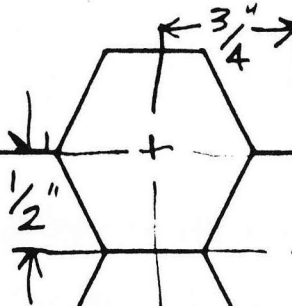
* semantic problem with notation

This extremely compact keyboard is amenable to tuning by $\frac{6}{\sqrt{3}}$, (an uncommonly good idea).

2/5 KBD

5/12 SCALE

©1987 by Erv Wilson



Horizontal

This is an extremely compact version of the Bosanquet Keyboard, and may prove interesting to those interested in scales of 5, 7, 12, 17, 19, 22 tones.

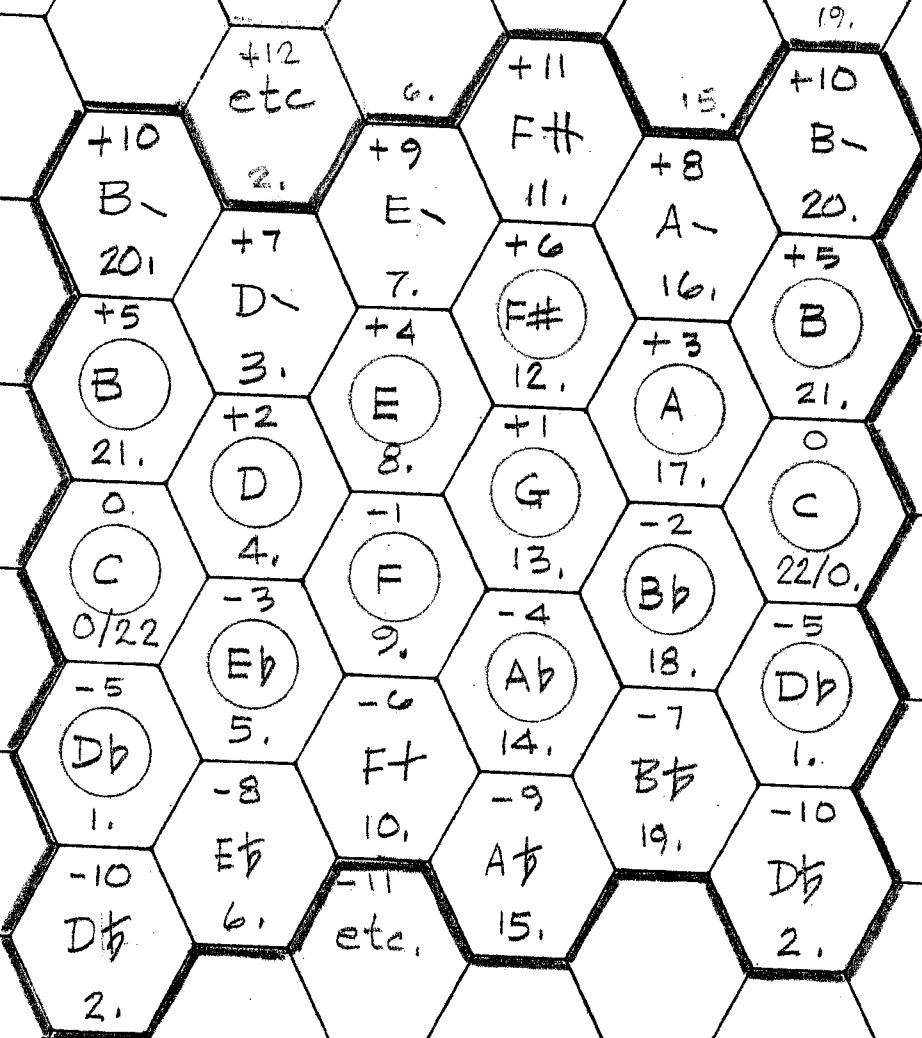
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 3/5 kbd, 7/12 scale.

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Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 3/5 kbd, 13/22 scale.

2/5 KBD 13/22 SCALE

© 1987 by Erv Wilson



2/7 Kbd., 4/15 scale

+14

11.

+7

+11

14.

+4

13.

0

1.

0/15

+12

3.

+5

2.

+1

5.

4.

+9

6.

+2

9.

8.

+13

7.

+6

+10

10.

+3

12.

12.

+14

11.

+7

13.

0

15/0

2/7 Kbd., 3/11 scale

+7

10.

0

0/11.

+8

2.

+1

1.

3.

+9

5.

+2

4.

6.

+10

+6

8

+3

7.

9.

+7

10

11/0.

2/7 Keyboard, 2/7 scale

+4

0

0/7.

+5

+1

1.

2.

+2

3.

4.

+6

+3

5.

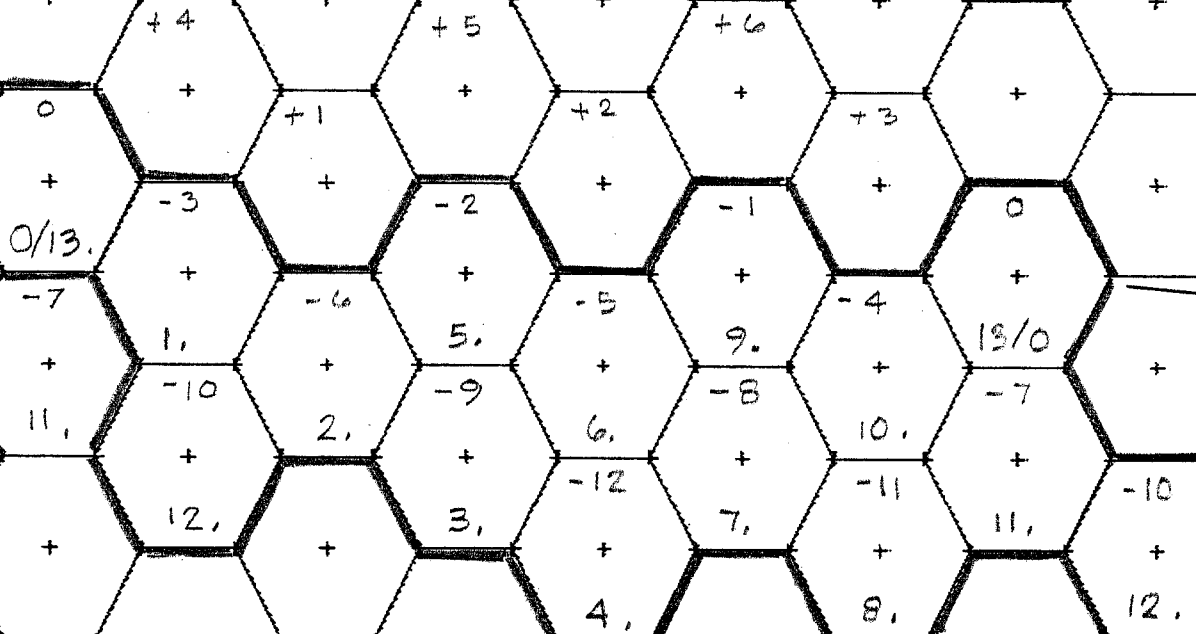
6.

0

7/0.

2/7 KBD, 4/13 SCALE

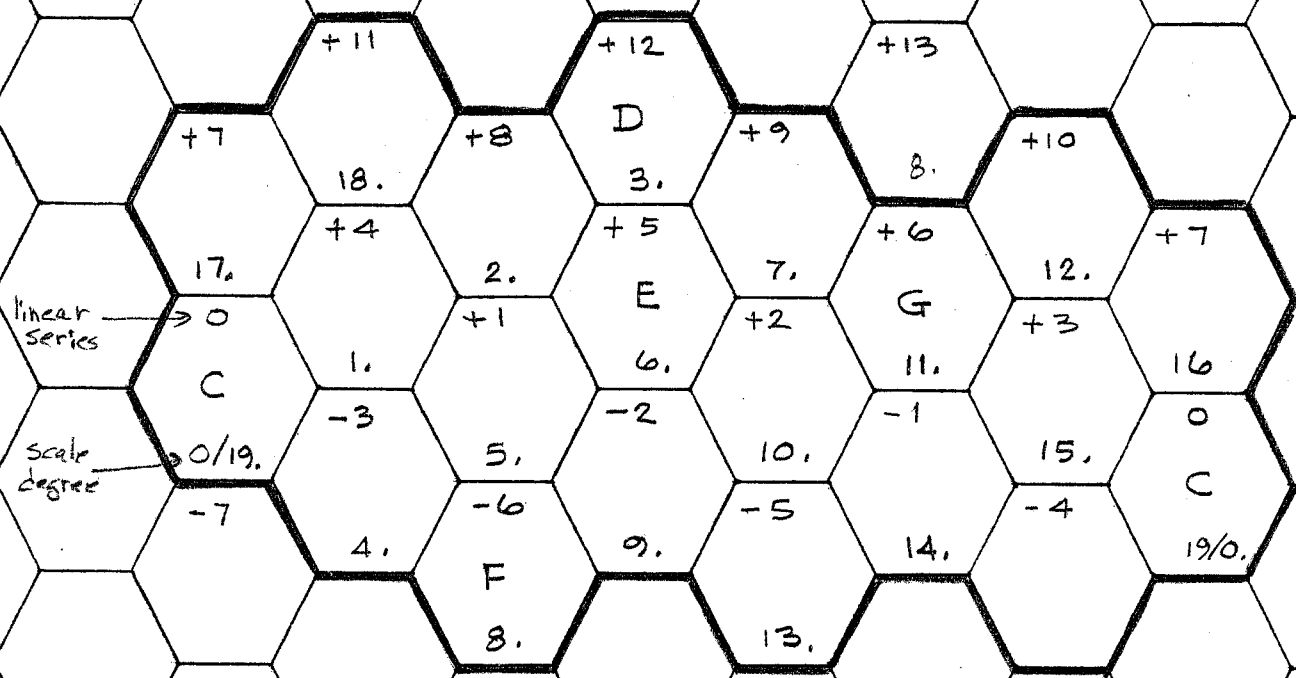
© 1987 by Eric Wilson



This fingering is easier for the left hand

$2/7$ KBD, $5/19$ scale

© 1988 by Eric Wilson



Linear series →

Scale degree →

Reference; Verbal communication with Larry Hanson, and his unpublished works.

(Linear subsets of 1-, 2-, 3-, 4-, 7-, 11-, & 15-tones.)

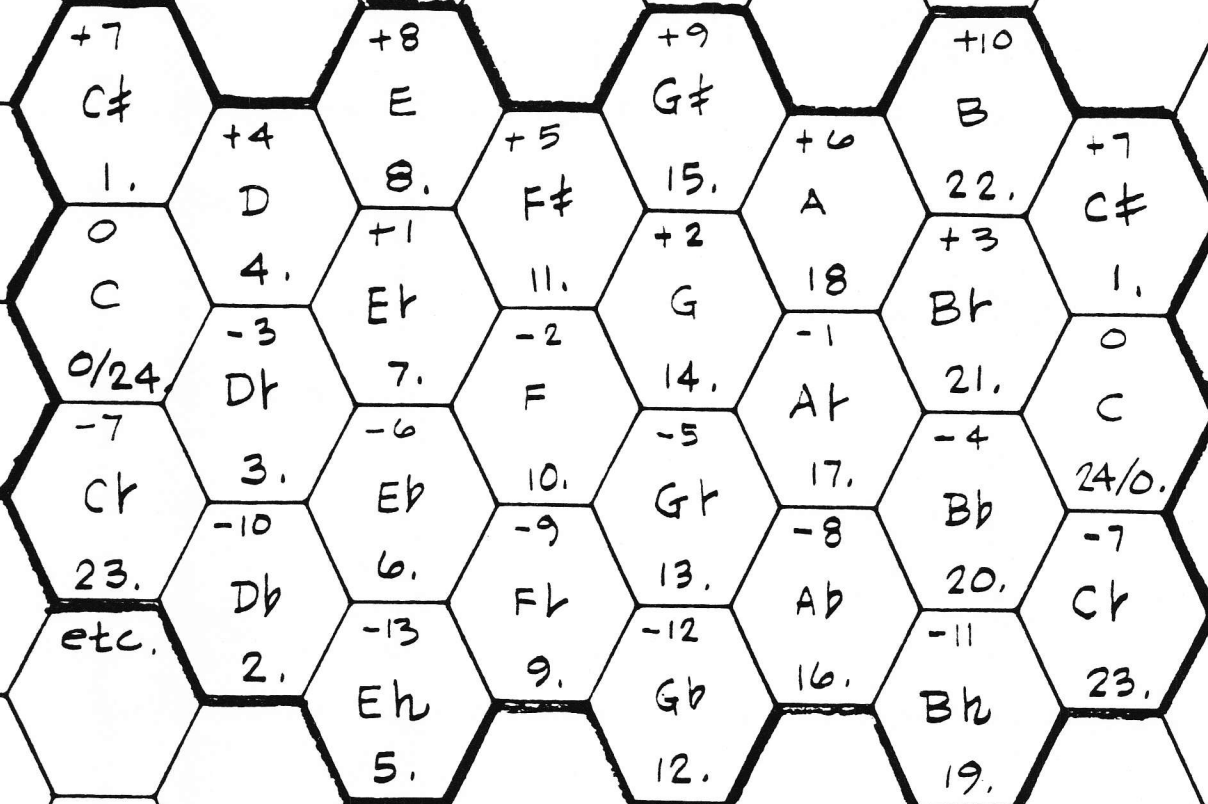
The generating interval of the linear series may vary between $1/4$ 8ve and $4/15$ 8ve. This will include $9/34$, $14/53$, and $19/72$; all admirable tonal systems where linear $t_6 \neq 3/2$ or its functional equivalent. (giving the 19-tone scale)

2/7 KBD, 7/24 SCALE

©1987 ERU WILSON

etc.

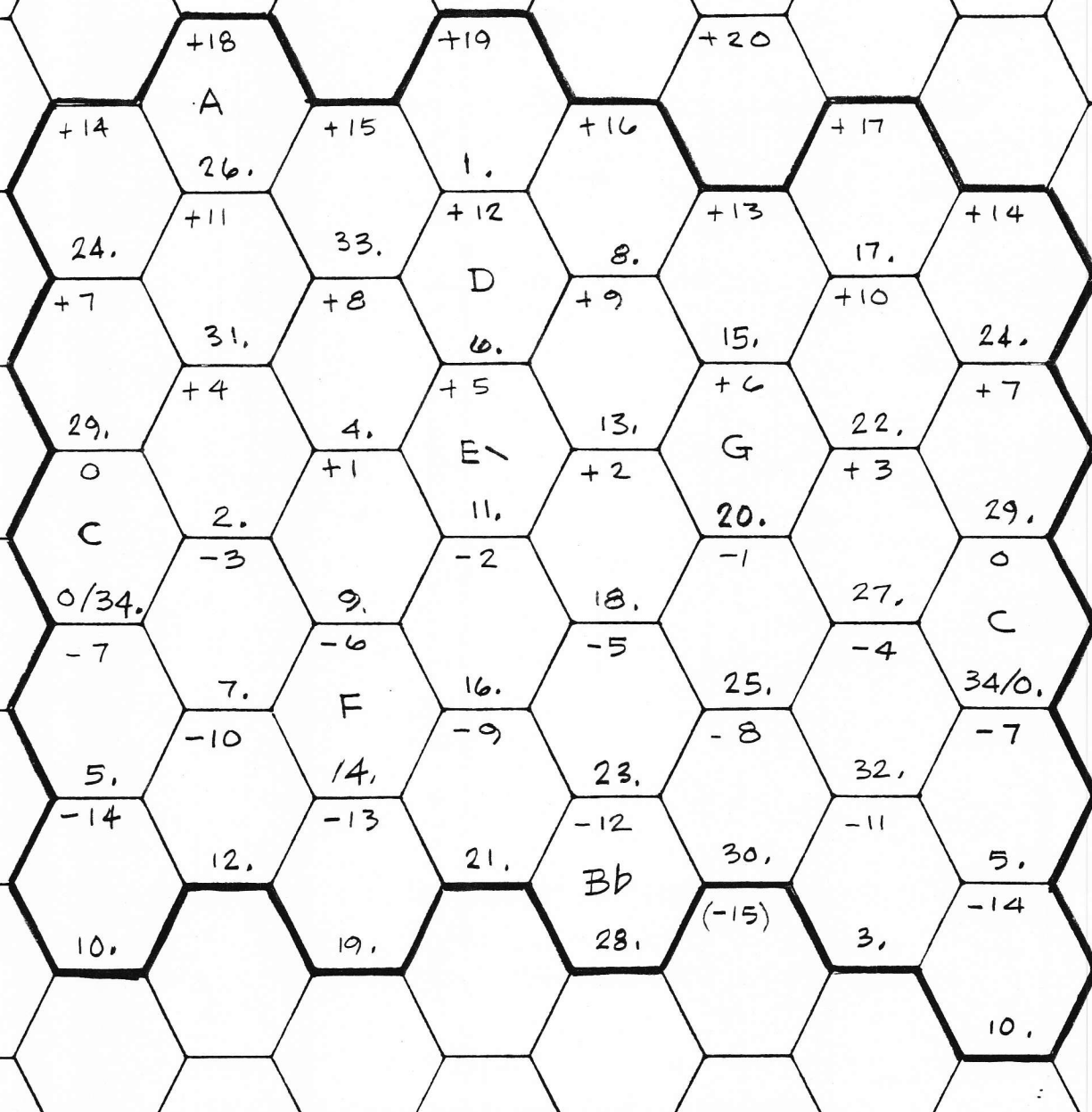
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This is the best "quarter-tone" keyboard ~~key~~ around. It works beautifully for near-eastern scales and bag-pipe scales (where the minor third and/or the perfect Fifth is frequently divided into half, it is well suited to any tuning that can be expressed as a chain of Thirds. (I. E. Collin Brown's tuning scheme) a good keyboard for 17.

2/7 KBD, 9/34 Scale

©1988 by Eric Wilson



7-rank variation of Hanson Keyboard Geometry
used by permission

2/7 HBD, 1/36 SCALE, Fibonacci Series

©1988 by Eric Wilson

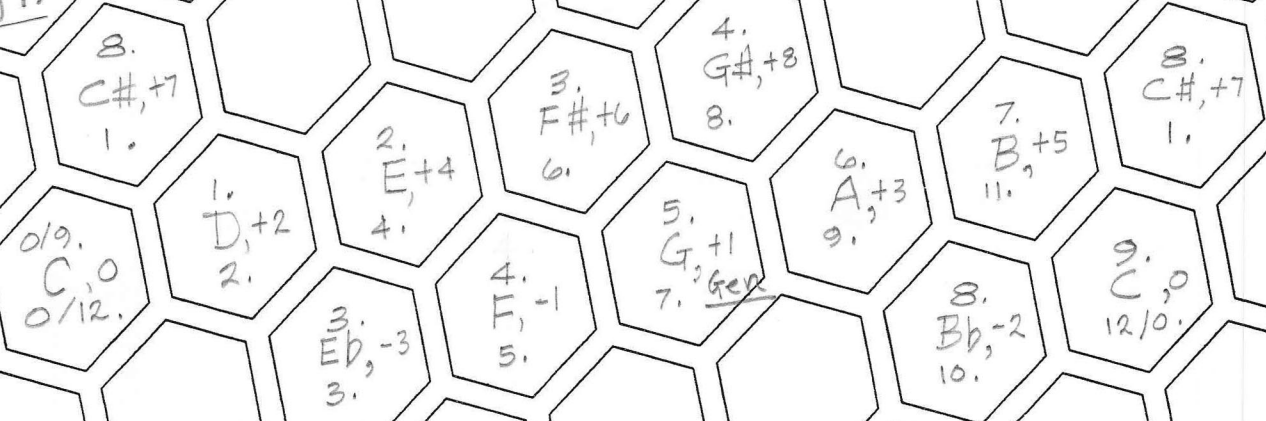
0 (1,2) 8 0/36. -7	-3	+1 5 11. -6	-2	+2 3 22. -5	-1	0 8 0/36. -7
233 31. -14	34 3. -10	144 6. -13	14. -9	89 17. -12	13 25. -8	55 28. -11
6765 26. -21	987 34. -17	4181 1. -20	610 9. -16	2584 12. -19	377 20. -15	233 31. -14
196418 21. -28	28657 29. -24	17711 4. -23	121393 32. -27	10946 15. -22	6765 23. -18	233 26. -21
5702887 16. -35	832040 24. -31	514229 35. -30	121393 32. -27	75025 7. -26	46368 18. -25	196418 21. -28
165580141 (11.)	5702887 24. -31	3524578 35. -30	2178309 10. -29	2178309 7. -26	1346269 18. -25	5702887 21. -28
	24157817 19	14930352 27. -34	4930352 2. -33	9227465 2. -33	9227465 13. -32	5702887 16. -35
	102334155 (22.)	63245986 30	63245986 30	63245986 5. -33	39088169 5. -32	165580141 (11.)

Converges on 1.618033989
 Ref: Golden Times, Lorne Tenes, Mathematics & Physics, 1976
 Univ. of Toronto

5/9 & 7/12 Scales on 4/7 Keyboard

© 1997 by Ervin M. Wilson

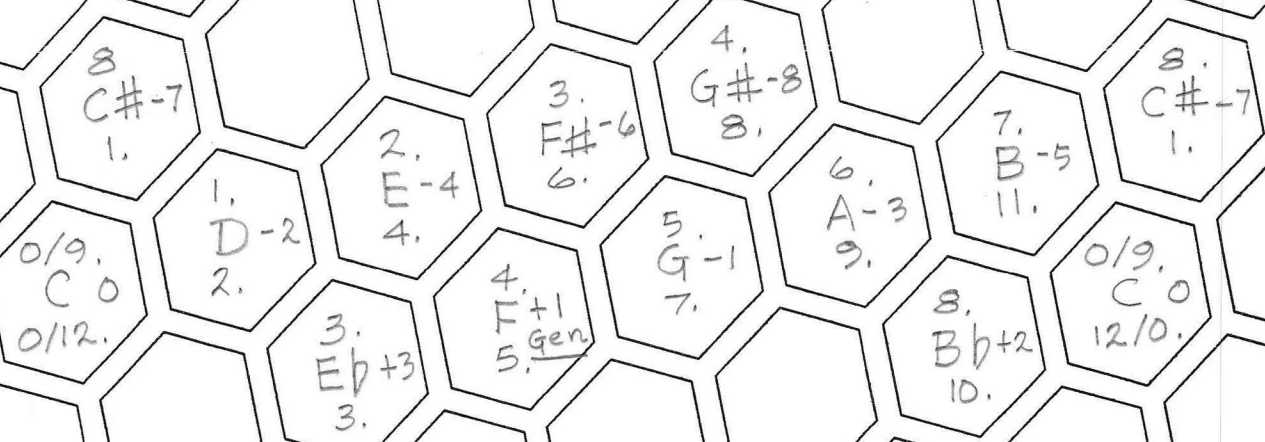
Fig 1.



Later Erv would reclassify his keyboards using the Gral Keyboard Guide and the Gral Spectrum. Under that system the lower of these Keyboard designs would prove to be unnecessary. One can see the result is the same

Fig 2.

4/9 & 5/12 Scales on 3/7 Keyboard



3/7 KBD, 7/17 Scale, (Just)

© 1988 by Erv Wilson

Ref R.H.M. Bosanquet

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 7/17 scale.

1/1

0/17.

9/8

3.

135/128

1.

81/64

6.

1215/1024

4.

10/9

2.

729/512

9.

4/3

7.

5/4

5.

3/2

10.

45/32

8.

27/16

13.

405/256

11.

5/3

12.

243/128

16.

2/1

17/0.

16/9
3645/2049

14.

15/8

15.

2/7 KBD, 5/7 Scale
(the same scale as above)
© 1988 by Erv Wilson

1215/1024

4.

135/128

1.

9/8

3.

1/1

0/17.

10/9

2.

81/64

6.

5/4

5.

729/512

9.

45/32

8.

4/3

7.

405/256

11.

3/2

10.

3645/2049

14.

27/16

13.

5/3

12.

243/128

16.

15/8

15.

16/9

14.

135/128

1.

2/1

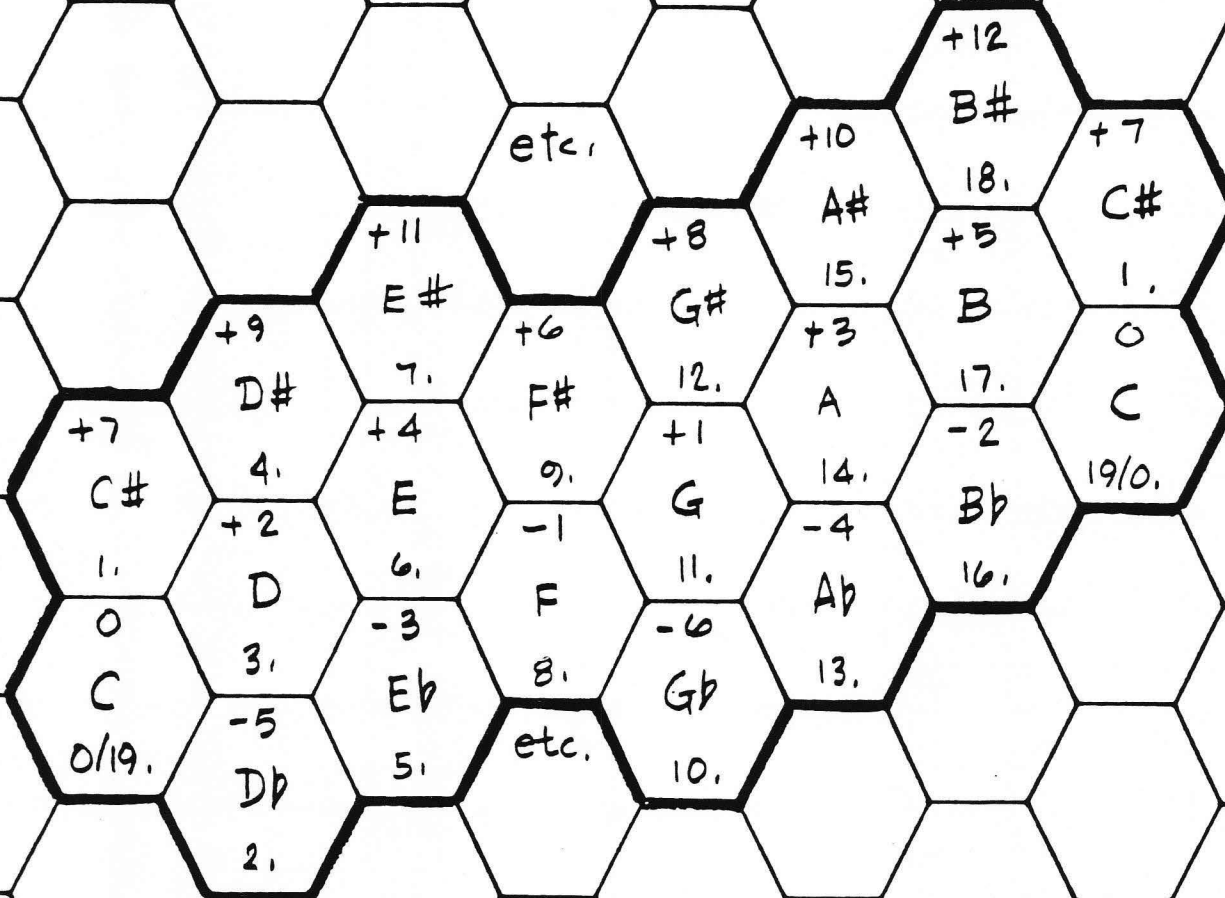
17/0.

ref: Colin Brown

Dorian quiet

3/7 KBD, 8/19 Scale

© 1987 Erv Wilson



Horizontal

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This is the most classic kind of keyboard, and it does justice to any tuning that can be expressed as a series of Fourths/Fifths. That is 5, 7, 12, 17, 19, 22, 31, 41, 43 etc.

There is a very great amount of interest in these scales.

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 11/19 scale.

3/7 kbd, 9/22 scale

$\frac{75}{64}$ or $\frac{7}{6}$

$\frac{63}{32}$

$\frac{225}{128}$ or $\frac{7}{4}$

$\frac{2}{14}$

(13.)

$\frac{25}{16}$

(18.)

$\frac{50}{27}$

(1.)

$\frac{135}{128}$

(2.)

(9.)

$\frac{25}{18}$

(14.)

$\frac{405}{256}$

(19.)

$\frac{15}{8}$

$\frac{1215}{1024}$

(10)

$\frac{45}{32}$

(15)

$\frac{5}{3}$

20.

$\frac{243}{128}$

3.

$\frac{135}{128}$

(6)

$\frac{5}{4}$

11.

$\frac{243}{128}$ or $\frac{229}{512}$

16.

$\frac{27}{16}$

21.

$\frac{21}{11}$

Horizo

(2)

$\frac{10}{9}$

7.

$\frac{81}{64}$

12.

$\frac{3}{2}$

17.

$\frac{16}{9}$

22.

3.

$\frac{9}{8}$

8.

$\frac{4}{3}$

13.

$\frac{128}{81}$

18.

$\frac{9}{5}$

$\frac{1}{1}$

4.

$\frac{32}{27}$

9.

$\frac{27}{20}$

14.

$\frac{8}{5}$

19.

0.

$\frac{256}{243}$

5.

$\frac{6}{5}$

10.

15.

$\frac{1}{2}$ "

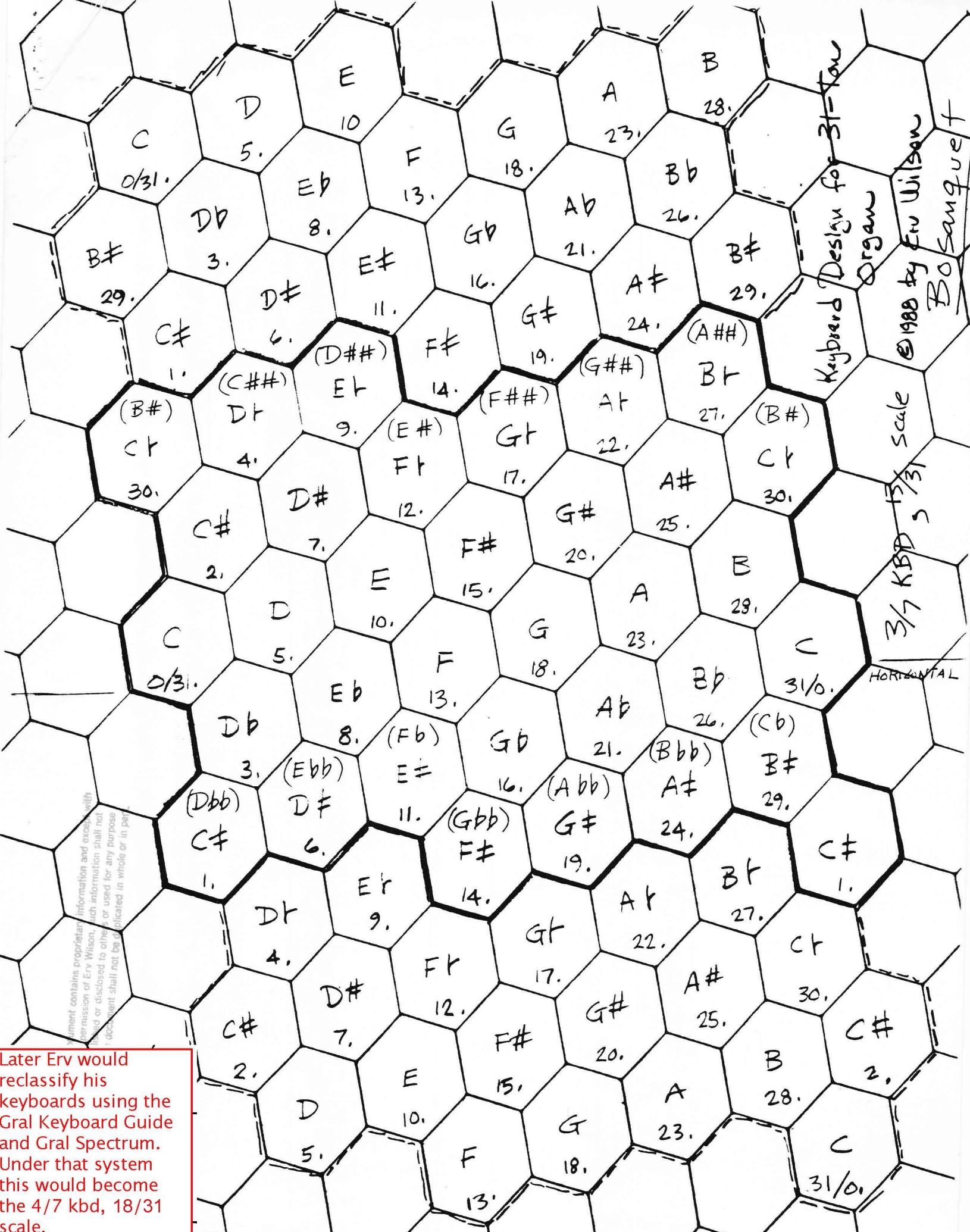
$\frac{16}{15}$

6.

$\frac{3}{4}$ "

Ref; Bosanquet

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 9/22 scale.



Keyboard Design for 31-key Organ
 © 1988 by Erv Wilson
 Bo Sangvet

3/7 KBD 15/31 Scale

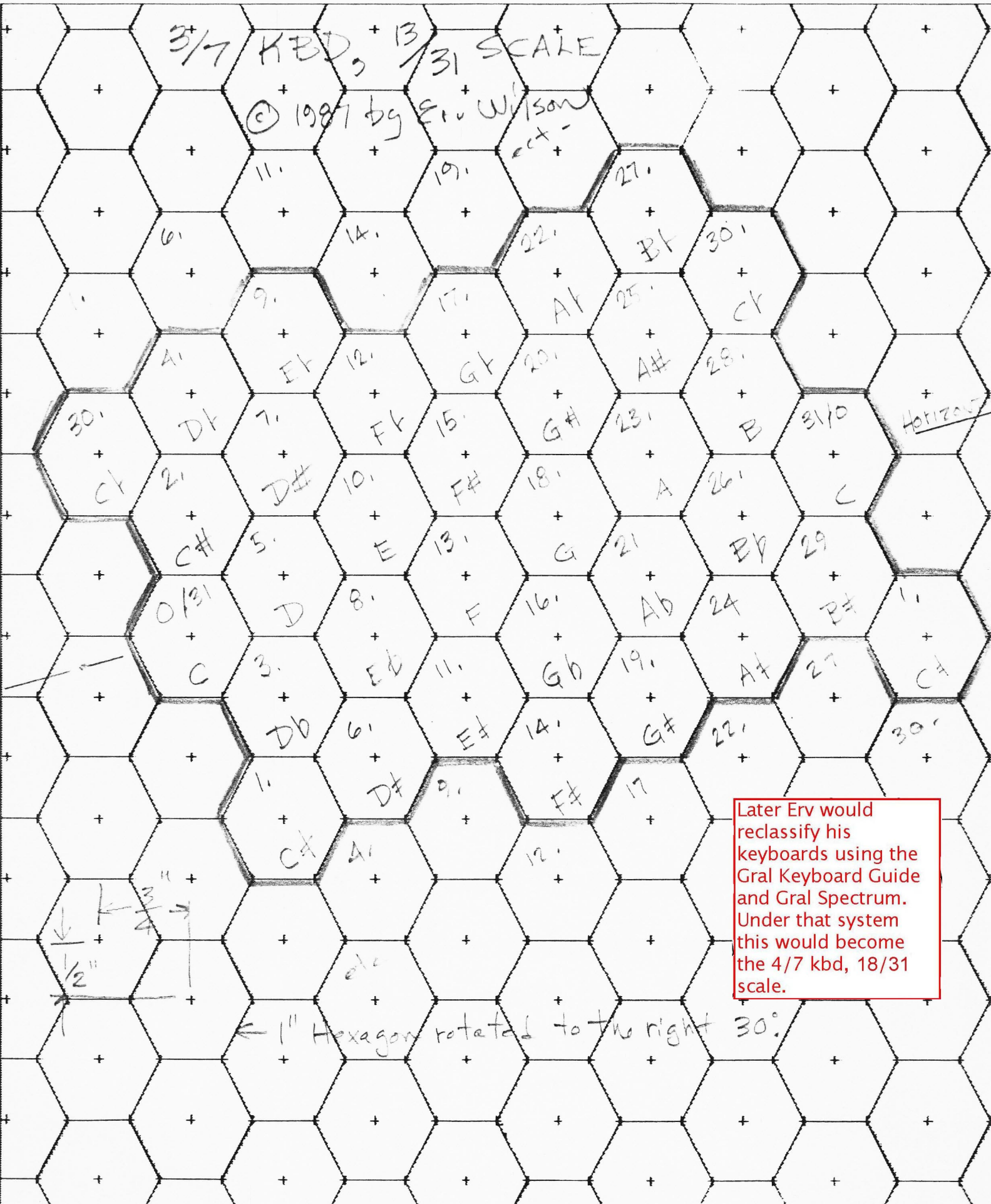
HORIZONTAL

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Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 18/31 scale.

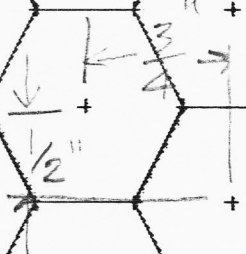
3/7 KBD, 13/31 SCALE

© 1987 by E. W. Wilson
ect.



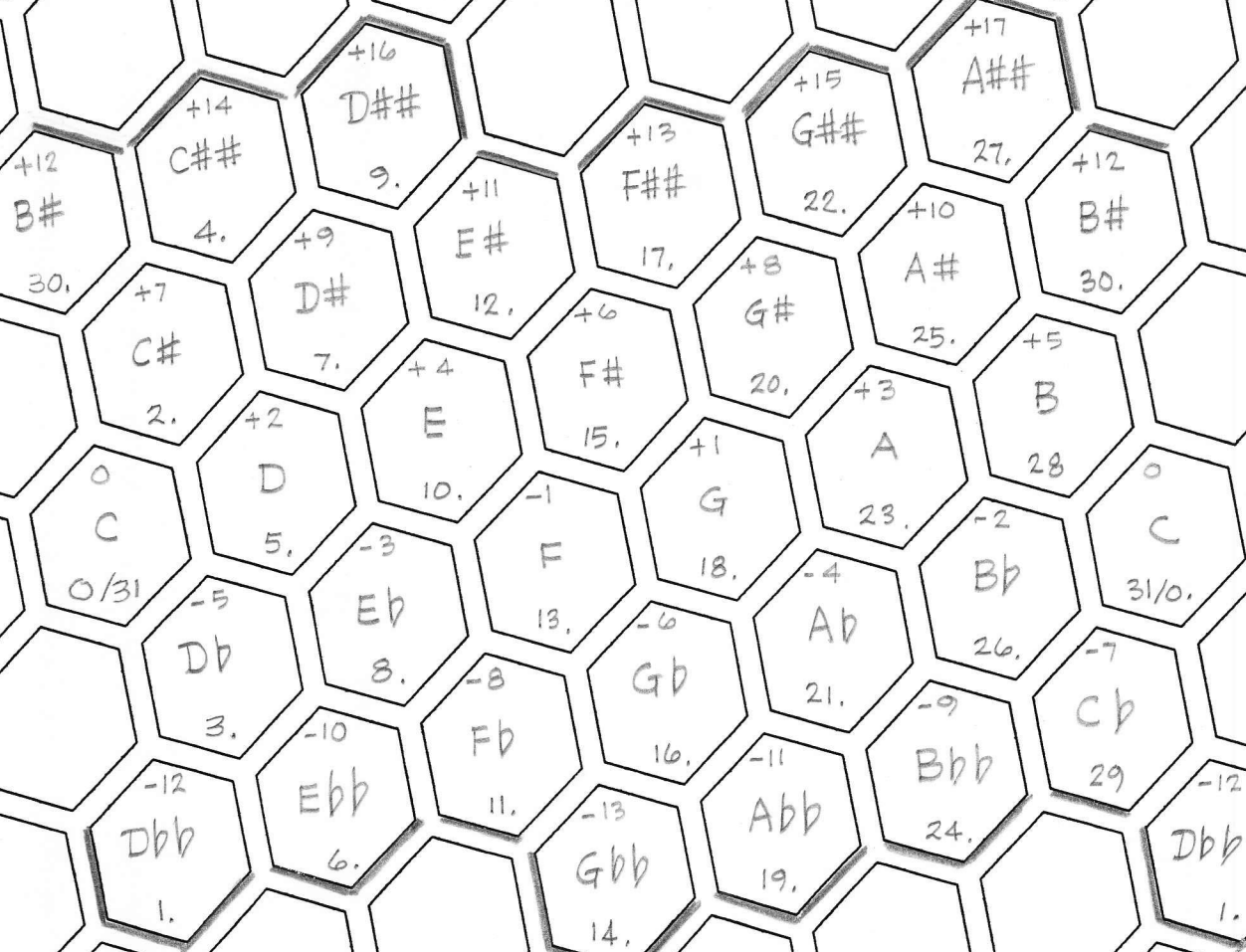
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 18/31 scale.

← 1" Hexagon rotated to the right 30°



3/7 Keyboard, 13/31 Scale

© by Erv Wilson 1994

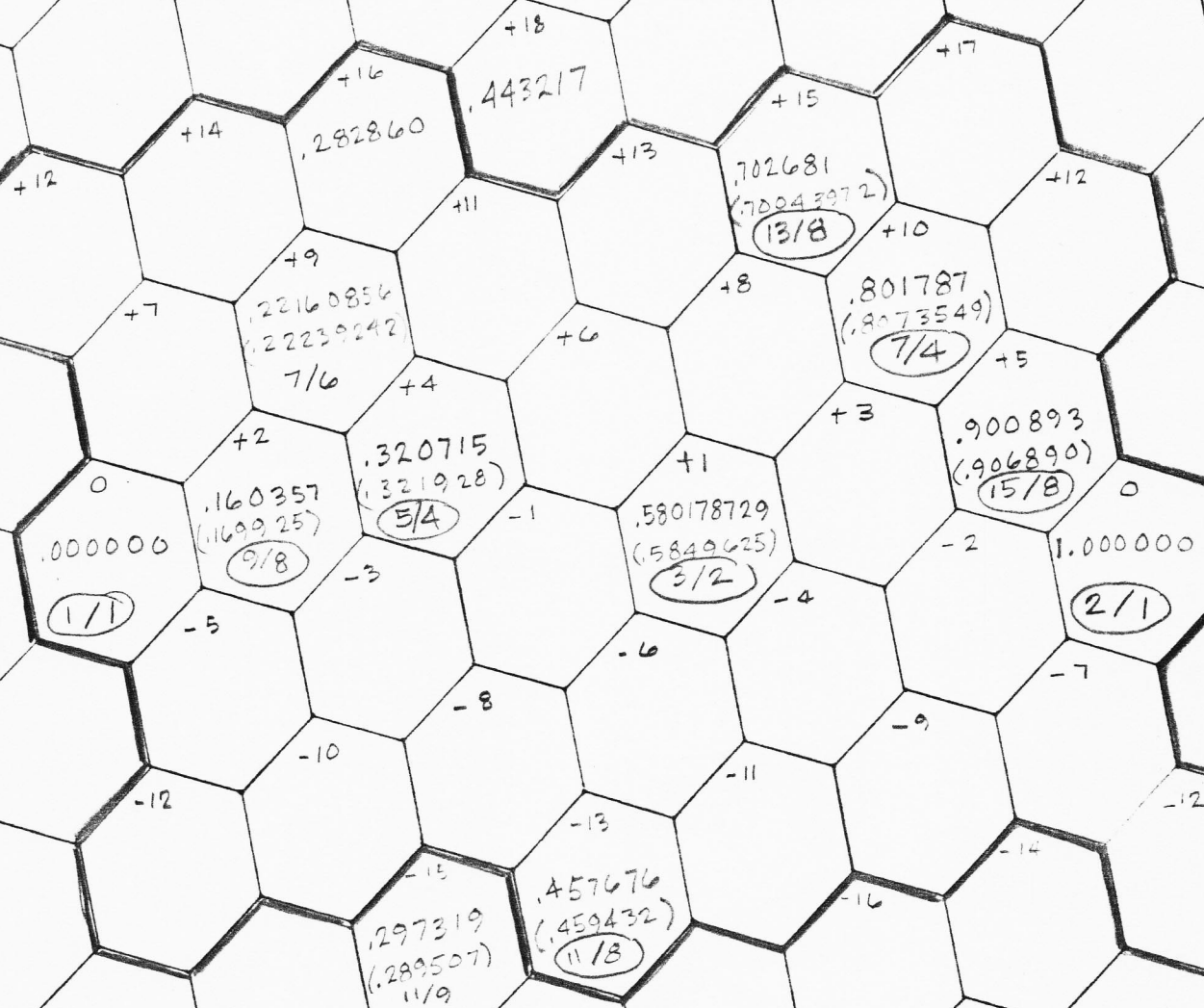


Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 18/31 scale.

Variation on the Bosanquet Keyboard

© by Erv Wilson 1988

Showing Golden Section, Thorvald Kørnerup*,
To 31 Places



* Reference; Das goldene Tonsystem als fundament der theoretischen Akustik, Thorvald Kørnerup, Copenhagen 1935

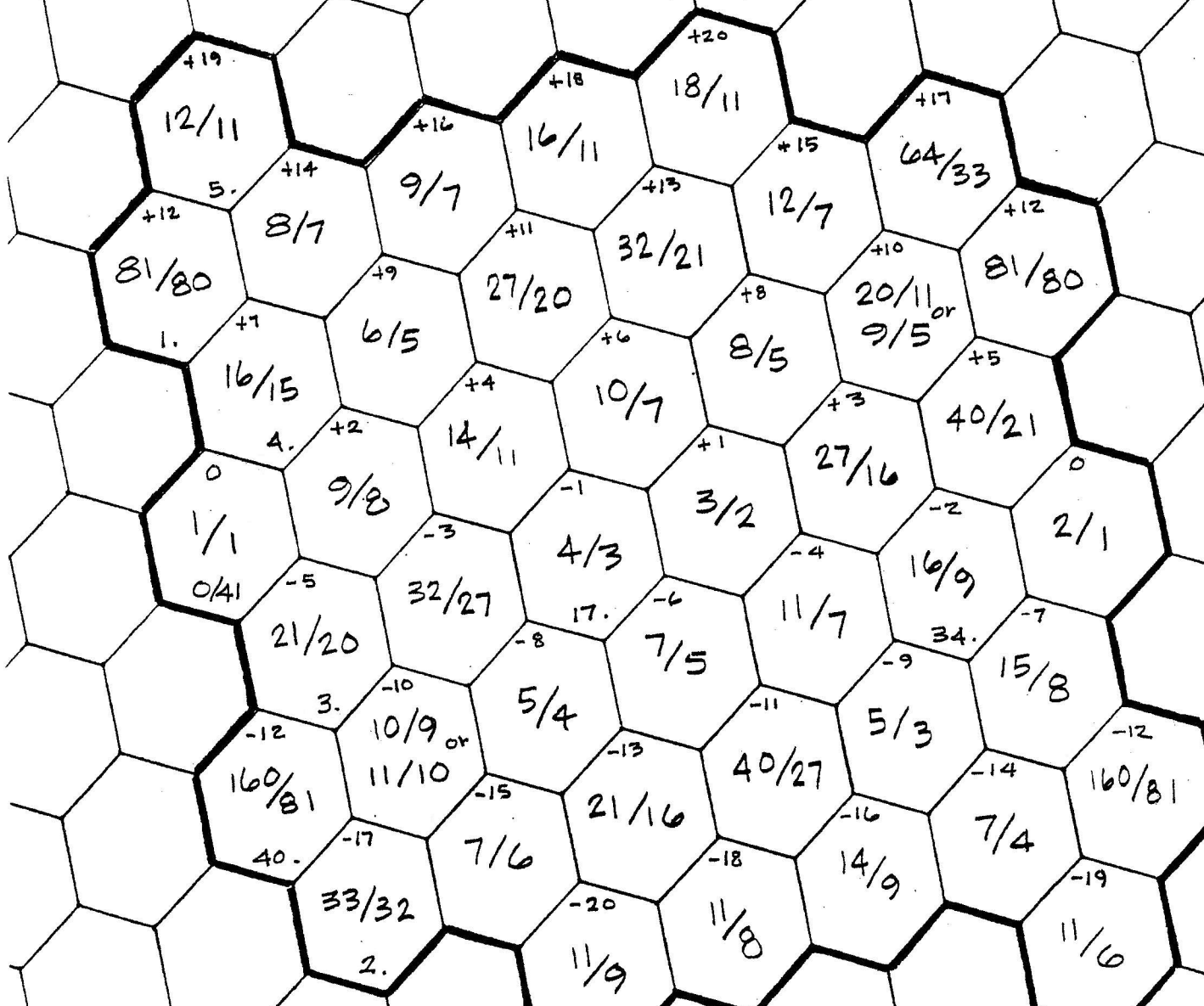
$\frac{16.24100810}{25} = .580036003$

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd,

$\frac{16.24500441}{24100810} = .0037927$

$23. \frac{1}{23} = .590344491$

Keyboard for Harry Partch's 43-tone Scale
 First published in Xeuharmonikon 3, Spring 1975
 Issued 1988 by Erv Wilson

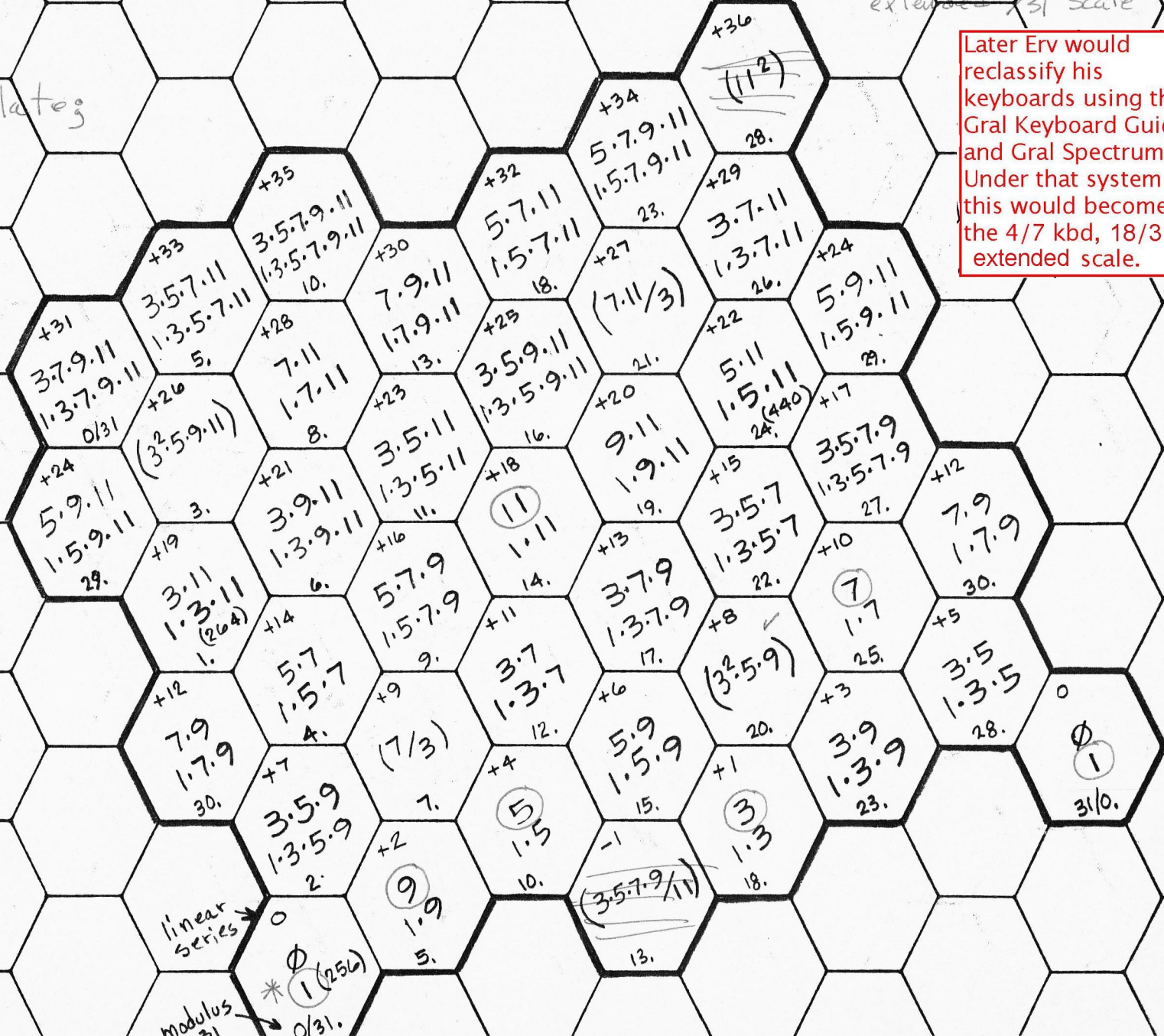


Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 24/41 extended scale.

Dallessandro Keyboard Program, on the Rosanquet (3/7) Kbd
 © Erv Wilson 1988
 extended 13/31 scale

Dallessandro Templates

- * linear
- 1 = 0
 - 3 = +18
 - 5 = +4
 - 7 = +10
 - (9 = +2)
 - 11 = +18



Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 18/31 extended scale.

linear series →
 modulus 31
 * 1 (256)
 0/31

Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/7 kbd, 18/31 extended scale.

+
 $\frac{2079}{2048}$

*
 $\frac{285}{284}$

0
(256) 1
 $\frac{3.7.9.11}{1.3.7.9.11}$
0/31

-12
(c204)
 $\frac{3.11}{1.3.11}$

+12
 $\frac{7.9}{1.7.9}$
30.

+7
 $\frac{3.5.9}{1.3.5.9}$
2.

+2
 $\frac{9.9}{1.9.9}$
*

-3
 $\frac{7.11}{1.7.11}$

-8
 $\frac{3.5.11}{1.3.5.11}$

-13
 $\frac{11}{1.11}$

-9
 $\frac{9.11}{1.9.11}$

-4
 $\frac{5.11}{1.5.11}$

-7
 $\frac{5.9.11}{1.5.9.11}$

-12
 $\frac{3.11}{1.3.11}$

+12
 $\frac{7.9}{1.7.9}$
30.

+7
 $\frac{3.5.9}{1.3.5.9}$
2.

+2
 $\frac{9.9}{1.9.9}$
*

-3
 $\frac{7.11}{1.7.11}$

-8
 $\frac{3.5.11}{1.3.5.11}$

-13
 $\frac{11}{1.11}$

-9
 $\frac{9.11}{1.9.11}$

-4
 $\frac{5.11}{1.5.11}$

-7
 $\frac{5.9.11}{1.5.9.11}$

-12
 $\frac{3.11}{1.3.11}$

+14
 $\frac{5.7}{1.5.7}$
4.

+9
 $\frac{3.5.9}{1.3.5.9}$
7.

+4
 $\frac{5.9}{1.5.9}$
12.

-1
 $\frac{7.9.11}{1.7.9.11}$

-8
 $\frac{3.5.11}{1.3.5.11}$

-9
 $\frac{9.11}{1.9.11}$

-4
 $\frac{5.11}{1.5.11}$

-7
 $\frac{5.9.11}{1.5.9.11}$

-12
 $\frac{3.11}{1.3.11}$

+16
 $\frac{5.7.9}{1.5.7.9}$
9.

+11
 $\frac{3.7}{1.3.7}$
17.

+6
 $\frac{5.9}{1.5.9}$
20.

-1
 $\frac{7.9.11}{1.7.9.11}$

-8
 $\frac{3.5.11}{1.3.5.11}$

-9
 $\frac{9.11}{1.9.11}$

-4
 $\frac{5.11}{1.5.11}$

-12
 $\frac{3.11}{1.3.11}$

+15
 $\frac{3.5.7}{1.3.5.7}$
22.

+10
 $\frac{7}{1.7}$
25.

+5
 $\frac{3.5}{1.3.5}$
28.

0
1.
 $\frac{3.7.9.11}{1.3.7.9.11}$
31/0.

+17
 $\frac{3.5.7.9}{1.3.5.7.9}$
21.

+12
 $\frac{7.9}{1.7.9}$
30.

0
1.
 $\frac{3.7.9.11}{1.3.7.9.11}$
31/0.

1/100

KBD

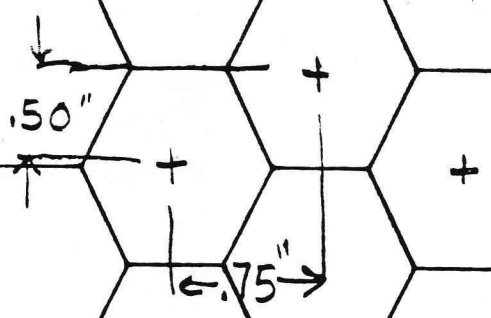
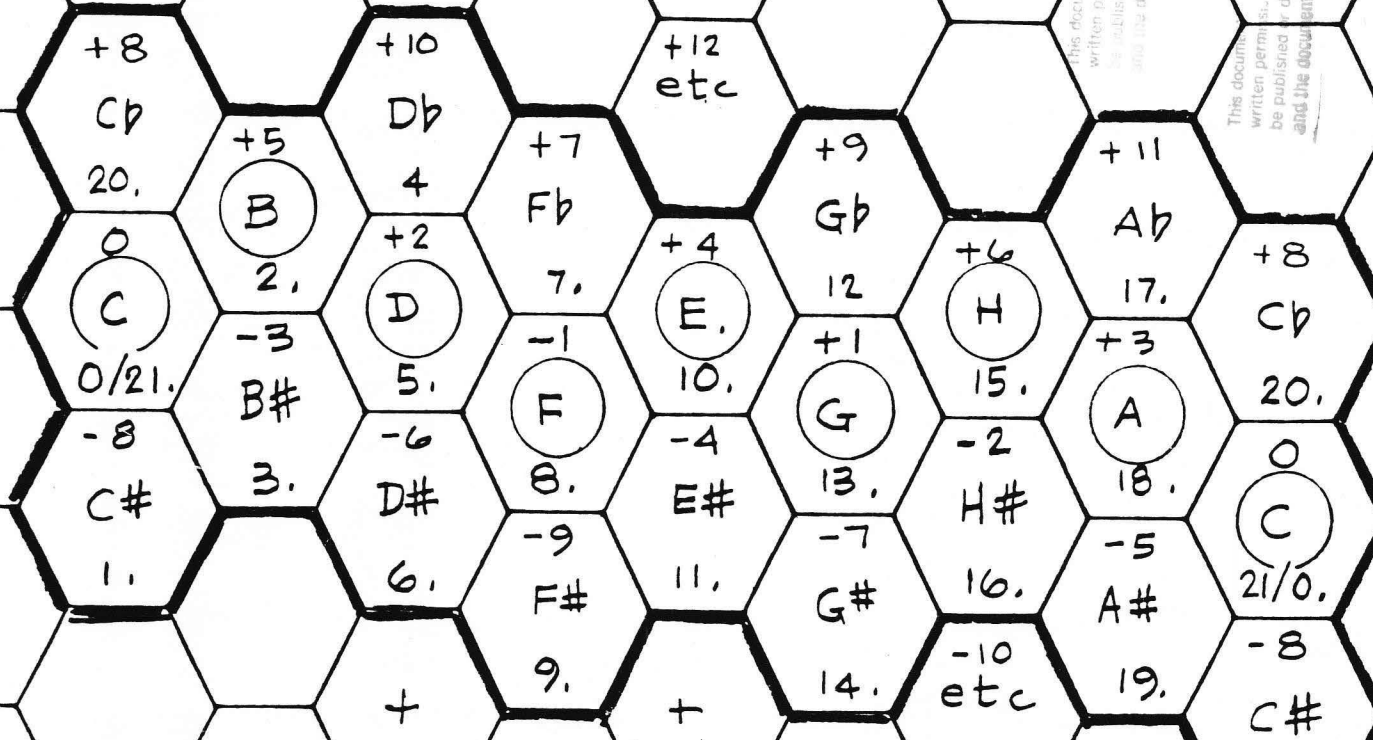
0/21

SCALE

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This document contains proprietary information and except with written permission of Erv Wilson, such information shall not be published or disclosed to others or used for any purpose and the document shall not be duplicated in whole or in part.



Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 5/8 kbd, 13/21 scale.

Only the most hardened experimentalist would have a use for this keyboard. (Myself, for example)

It is especially well suited for scales of the True golden Section of the 8ve yielding scales of 1, 2, 3, 5, 8, 13, 21, 34, 55 etc tones per 8ve.

(*not to be confused with Kornerup's golden section of the Fifth)

3/8 Keyboard, 13/34 Scale

©1994 by Erv Wilson

	+13 C† 1.	+10 E† 6.	+12 F† 14.	+14 G† 22.	
+8 δ† 32.	+5 B 3.	+7 γ† 11.	+9 α† 19.	+11 β† 27.	
0 C 0/34.	-3 ε 5.	+2 D 8.	+4 E 16.	+6 H 24.	+8 δ† 32.
-8 B\ 2.	-11 D\ 7.	-6 γ 10.	-4 α 18.	-2 β 26.	0 C 34/0
-16 ε\ 4.	-19 γ\ 9.	-14 F\ 12.	-12 G\ 20.	-10 A\ 28.	-8 B\ 2.
		-17 α\ 17.	-15 B\ 25.	-18 δ\ 30.	-16 ε\ 4.

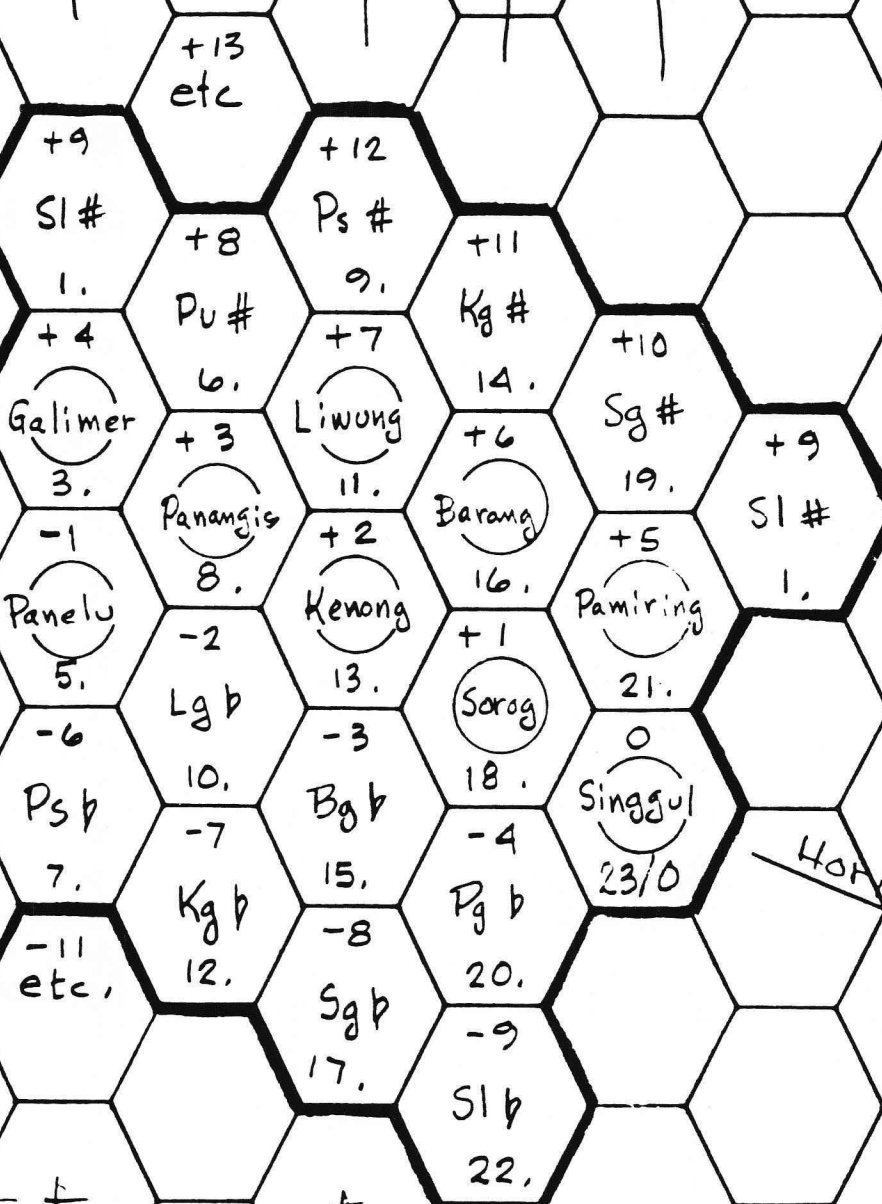
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 5/8 kbd, 13/34 scale.

1/5 KBD 5/23 SCALE

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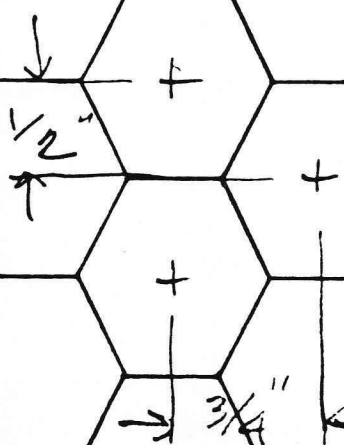
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/5 kbd, 18/23 scale.

0/5 1 2 3 4 5/0 Ranks



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HORIZONTA

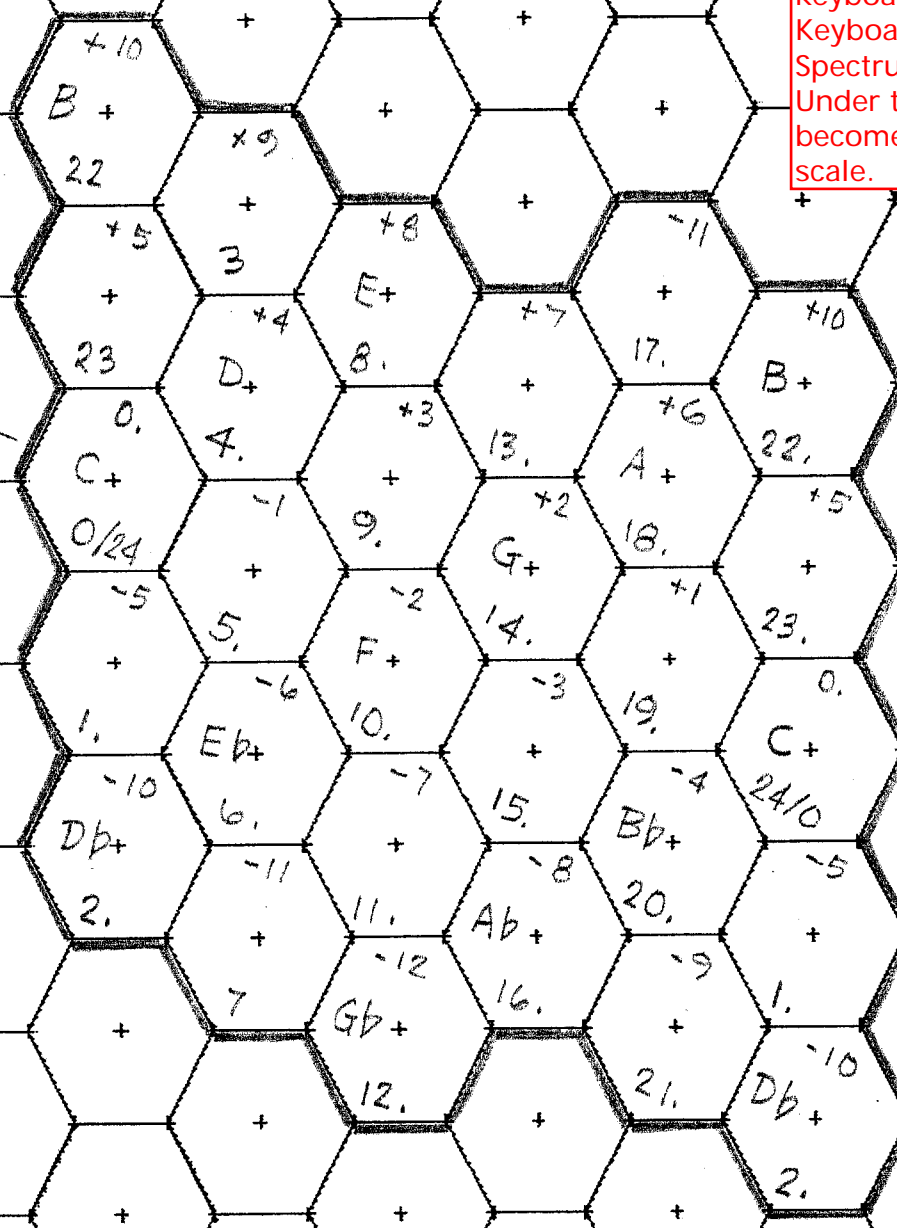


This keyboard may accomodate the Japanese "Pelog" idiom and related tunings. It will with equal ease accomodate the 24 tone scale

1/5 KBD, 5/24 SCALE

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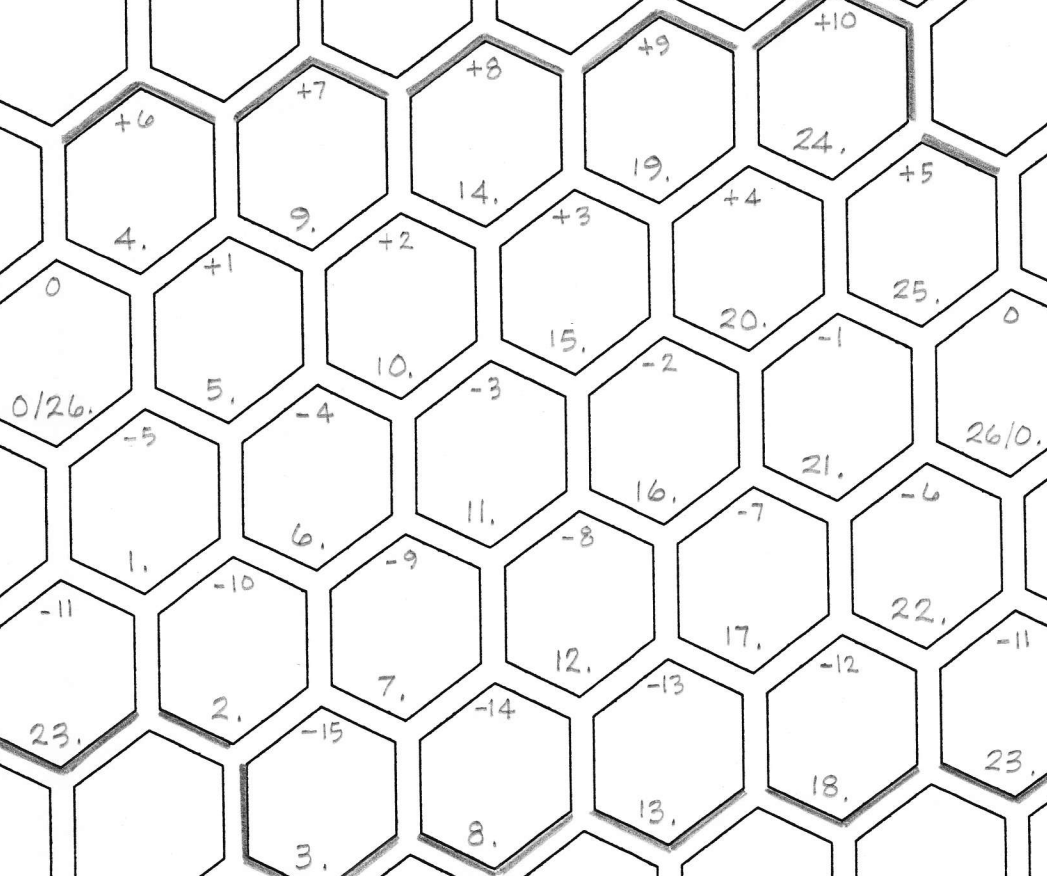
Later Erv would reclassify his keyboards using the Gral Keyboard Guide and Gral Spectrum. Under that system this would become the 4/5 kbd, 19/24 scale.

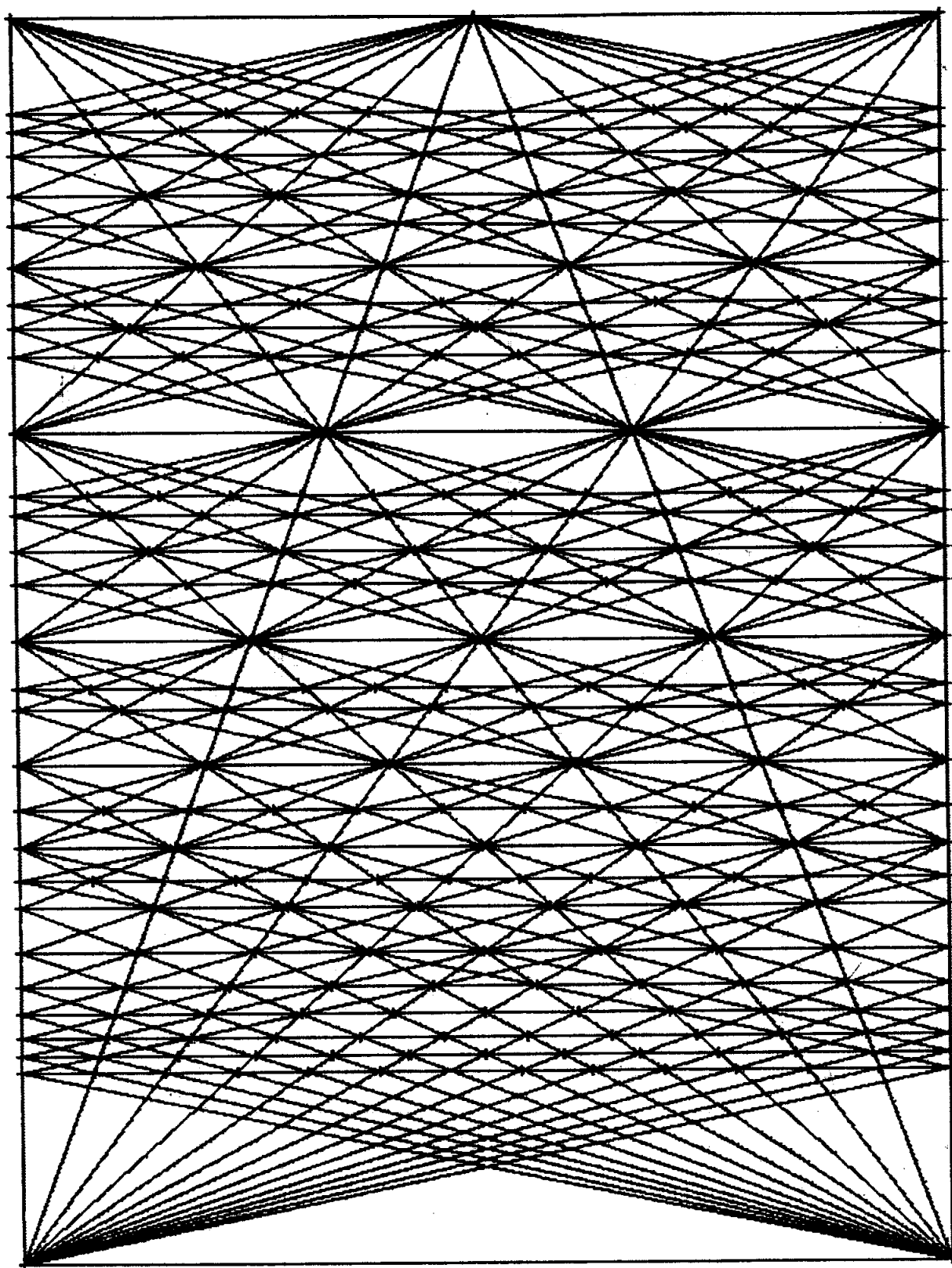


almost all of the fingering on this kbd favors the left hand. The Major scale is the exception. Still, one may prefer to turn it upside-down about the horizontal line.

1/6 Keyboard, 5/26 Scale

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5-7 Linear Spectrum

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