

Upgrade

Proportional Triads in Mos (13 Jul 97)  
 (after Callum Johnston's bagpipe scale) © 1997 by Erv Wilson

+4	+1	+5	+2	+6	+3	0	+4
0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17						

	S		L		S		L		S		L		S	
a														
														b

$\frac{a+b}{2}$

(Proportional major)

also:

+4	+1	+5	+2	+6	+3	0	+4
0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17						

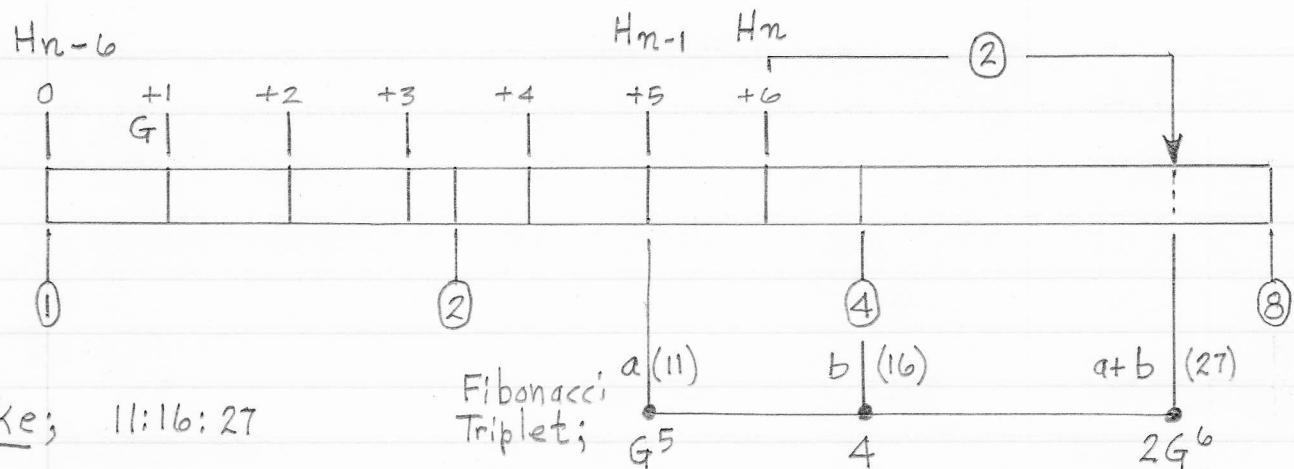
	L		S		L		S		L		S		L		S	
a															b	

$\frac{2ab}{a+b}$

(Sub-contrary, Proportional minor)

P2

27 Sep 97. EW



$$(4H_{n-6} + H_{n-1})/2 = H_n \quad \Rightarrow \quad G = ((4 + G^5)/2)^{(1/6)}$$

Proportional Triads in MOS Continued  
 (after Callum Johnston's bagpipe scale) 15.JJ/97 p.20  
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$$\begin{array}{ccccccccc}
 0 & +1 & +2 & +3 & +4 & +5 & +6 \\
 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & \% & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & \% & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & \% \\
 \textcircled{1} L & | S & | L & | S & | L & | S & | \textcircled{2} L & | S & | L & | S & | L & | S & | \textcircled{3} L & | S & | L & | S & | L & | S & | \textcircled{4} L & | S & | L & | S & | L & | S & | \textcircled{5} L
 \end{array}$$

or  $| L | L | L | L | L | S |$

$a$        $\frac{a+b}{2}$        $b$        $a+b$   
 $\uparrow$        $\uparrow$        $\uparrow$        $\uparrow$  proportional triad

$$(LS)^5 + 4 = 2(LS)^6$$

$$\left\{ \begin{array}{l} \textcircled{1} L = 1.148\dots \\ \textcircled{2} S = 1.071\dots \end{array} \right.$$

This

$$L^6 = (L^5 + 4)/2$$

$$L = \sqrt[6]{(L^5 + 4)/2}$$

iteration

guess start

$$1.231144413\dots$$

% zig-zag Pattern

$$1.225720656\dots$$

$$1.225248496\dots$$

$$1.225087753\dots$$

$$1.225033063\dots$$

$$1.225014458\dots$$

$$1.225008130$$

$$1.225005978$$

$$1.225005246$$

$$1.225004997$$

$$1.225004912$$

$$1.225004883$$

$$1.225004873$$

$$1.225004870$$

$$1.225004869$$

$$1.225004868$$

$$1.22500486823$$

$$1.22500486819$$

$$1.22500486817$$

$$1.22500486817$$

$$G = ((4+G^5)/2)(\frac{1}{6})$$

1/N Pattern

$$.292\dots$$

$$\leftarrow 3 .415 \quad \rightarrow 2 .407$$

$$\leftarrow 2 .456 \quad \rightarrow 2 .189$$

$$\leftarrow 5 .275 \quad \rightarrow 77/263$$

$$3 .636$$

$$1 .571$$

$$1 .749$$

$$1 .334$$

$$2 .993$$

$$1 .0065$$

$$? 152 .682$$

Like 40:49:58 and 20,29,49

or 39:48:57

or 22:27:32

Decimal approx. 1.22500486817

Log<sub>2</sub> .292787482510 GEN

note: this gen gives a good  $\frac{11}{8}$  at -36.

Recurrent Sequence ( $4 \cdot A_{n-6} + A_{n-1}$ ) =  $A_n$

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9 Aug 97 E.W.

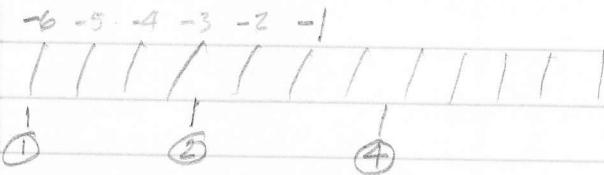
P. 2b

$$\begin{array}{r} 19 \\ 57 \\ \hline 39 \\ 13 \\ \hline 380 \\ 377 \end{array} \quad \begin{array}{r} 29 \\ 58 \\ \hline 40 \\ 20 \\ \hline \end{array}$$

$$A_n = \frac{A_{n-1} + A_{n-6}}{4}$$

$$2 \cdot A_n = 4 \cdot A_{n-6} + A_{n-1}$$

$$G = ((4 + G^5)/2)^{\frac{1}{6}}$$



$$\begin{array}{c} A_{n-6} \\ | \\ \text{Seed} \end{array} \quad \begin{array}{c} A_{n-1} \ A_n \\ | \quad | \\ 22 \quad 27 \quad 32 \end{array} \quad \begin{array}{l} \text{Proportional} \\ \text{Triad} \end{array}$$

$$(72 \times 4) + 198 = 243$$

$$\text{recurrent sequence: } (4 \cdot A_{n-6} + A_{n-1})/2 = A_n$$

$$\Rightarrow G = ((4 + G^5)/2)^{\frac{1}{6}}$$

$$= 1,22500486816\cdots$$

$$\log_2 .292787482498\cdots$$

(Zalzalian)

17-Tone	72	88	108	132	162	198	243	297.5	364.75	446.375	547.1875	669.59375
converging	820.796875	1005.3984375	1,232.19921875	1,508.84960938	1,848.79980469							
MOS												

(Highlandian)

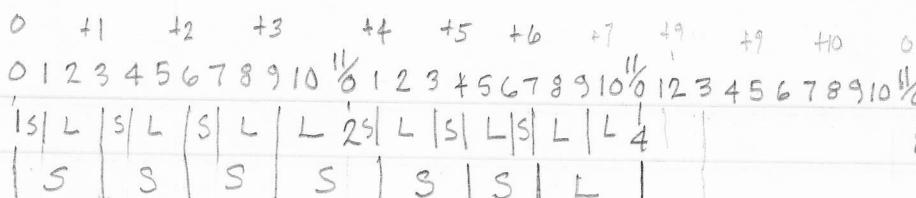
also try:	64	78	96	117	144	175.5	.216	363.25	324
seed							215.75	263.875	323.9375

# Proportional Triads in MOS (continued)

15 Jul 97

P. 3

abababb



1/4 Pattern :  
 $\frac{.276\cdots}{3, \quad .619}$       sub-  
 contrary proportion       $a = \frac{2ab}{a+b}$

$\rightarrow 1, \quad .615$   
 $\leftarrow 1, \quad .624$   
 $\rightarrow 1, \quad .600$   
 $\leftarrow 1, \quad .664$   
 $\rightarrow 1, \quad .504$   
 $\leftarrow 1, \quad .982$   
 $\rightarrow 1, \quad .017$   
 56    .131

Zigzag Pattern

$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{3}{7} \quad \frac{5}{18} \quad \frac{8}{29} \quad \frac{13}{47} \quad \frac{21}{76} \quad \frac{34}{123}$

56 places !

$$S = \sqrt[6]{\frac{2(S^5)4}{S^5+4}}$$

← this

Iteration

1.212326067... guess start

1.211718285...

1.211412159...

1.211257826...

1.211179983...

1.211140711...

1.211120895...

1.211110897...

1.211105851...

1.211103305...

1.211102020...

1.211101372...

1.211101045...

1.211100880...

1.211100796...

1.211100754...

1.211100733...

1.211100722...

1.211100717...

1.2111007162

1.2111007158

1.2111007156

1.2111007155

1.2111007154

1.2111007153

1.211100714...

1.211100713...

1.211100712...

1.21110071189

$$G = (8 - 4G)^{\left(\frac{1}{6}\right)}$$

$$= 1.21110071153\cdots$$

1.21110071171  
 1.21110071162  
 1.21110071158  
 1.21110071156  
 1.21110071155  
 1.21110071154  
 1.21110071153

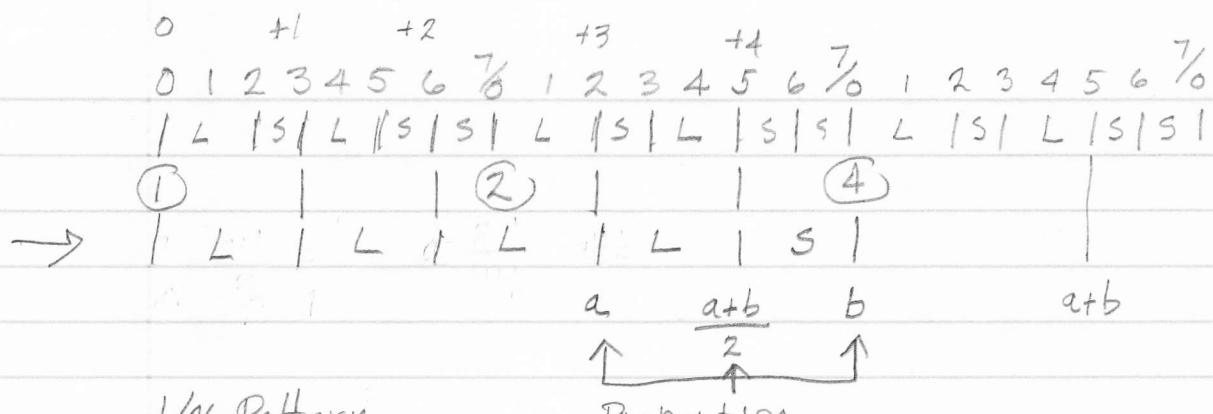
Decimal approx. 1.21110071154

MOS gen Log<sub>2</sub> 276318840257...

16 Jul 97 E.W.

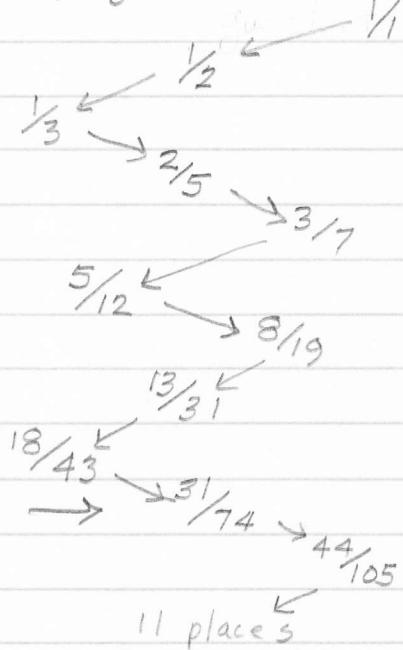
P. 4a

LSLSS



$\leftarrow$	2	.387
$\rightarrow$	2	.583
$\leftarrow$	1	.712
$\rightarrow$	1	.403
$\leftarrow$	2	.478
$\rightarrow$	2	.089
$\leftarrow$	1	.180
$\leftarrow$	5	.544
$\leftarrow$	1	.836
$\leftarrow$	1	.194
$\leftarrow$	?	5
		.131

ZigZag Pattern



decimal approx 1.33693994609

$\log_2$  .418934662571

(like 1/5 comma meantone)!

2/9?

$354/845 \leftarrow !$

$385/919$

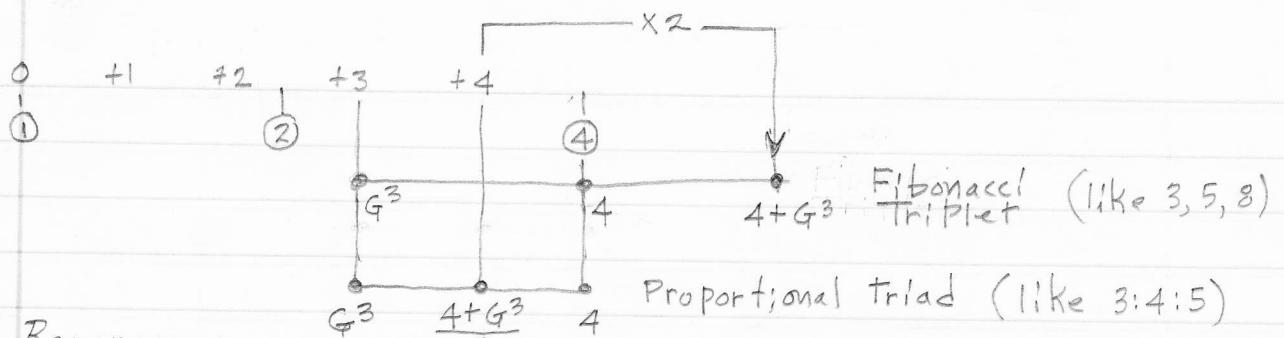
5 places

16 Aug 97, E.W.

$A_{n-4}$

$A_{n-1}$   $A_n$

P.4b



Recurrence:

$$4A_{n-4} + A_{n-1} = A_n$$

$$\Rightarrow G = ((4 + G^3)/2)^{\left(\frac{1}{4}\right)}$$

Example

$A_{n-4}$   $A_{n-1}$   $A_n$

Seed; 54 72 96 128 172

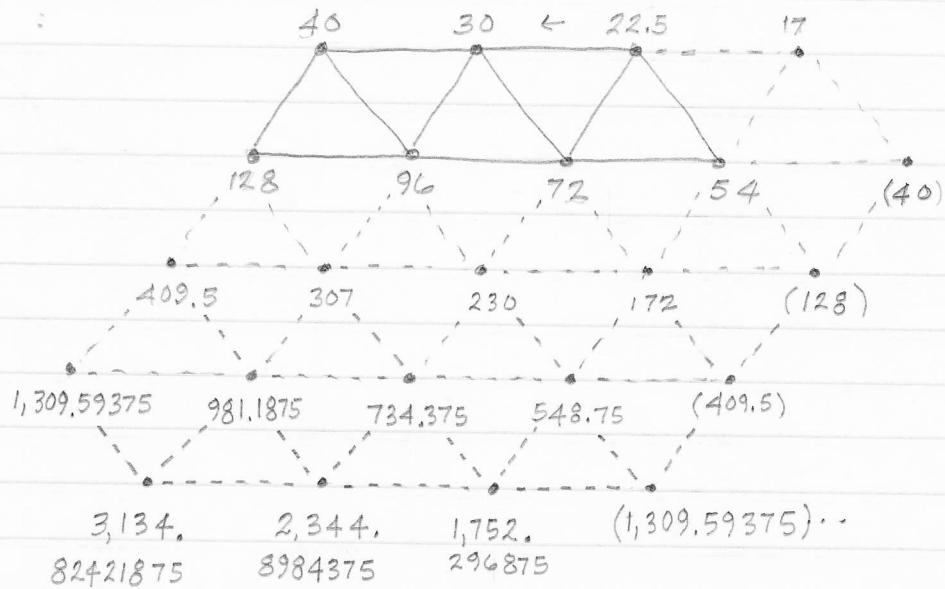
$$= 1.33693994609\dots$$

$$\log_2 = .418934662571\dots$$

Similar to 2/9-comma tuning

etc (3.90625) (5.375) (7) (9.375)  
 (12.5) (17) (22.5) (30) (40) - interesting - try starting at  $2 \times 22.5 = 45$  60 80 108 etc  
 (43)

(30)(40) 54 72 96 128 172 230 307 409.5 548.75 734.375 981.1875  
 1,309.59375 1,752.296875

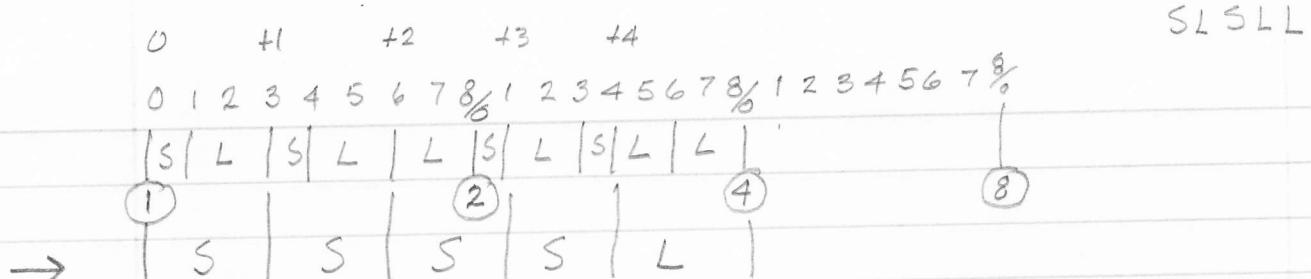


19-Tone Scale where  $4A_{n-4} + A_{n-1} = A_n$

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P.5a



$$S = \left( \frac{2(S^3)4}{S^3 + 4} \right)^{\left(\frac{1}{4}\right)}$$

RCL 1  
 $y^{\frac{1}{4}}$ 

3

x

2

 $\frac{1}{4}$  Pattern

x

.373...

4

 $\leftarrow 2 .674$ 

)

 $\rightarrow 1 .478$ 

%

÷

 $\leftarrow 2 .091$ 

(

 $\rightarrow 10 .929$ RCL  $\leftarrow 1 .075$  $y^{\frac{1}{4}}$ 

13 .271

3

3 .687

+

1 .453

4

)

)

 $y^{\frac{1}{4}}$ 

(

1

÷

4

)

= STO 1

iterate

Zig-Zag Pattern

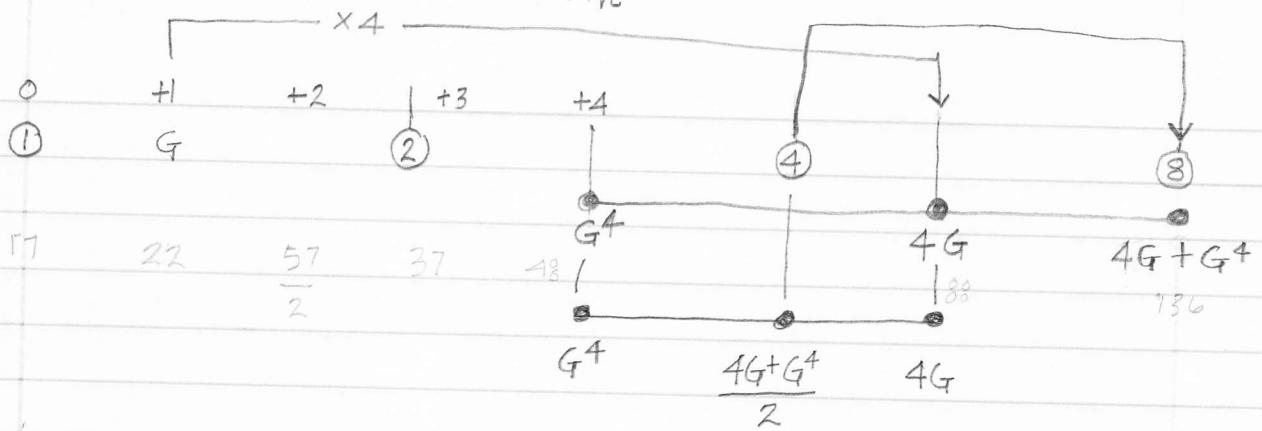
 $\frac{1}{1}$  $\frac{1}{2}$  $\frac{1}{3}$  $\frac{2}{5}$  $\frac{3}{8}$  $\frac{4}{11}$  $\frac{7}{19}$  $\frac{10}{27}$  $\frac{13}{35}$  $\frac{16}{43}$  $\frac{19}{51}$  $\frac{22}{59}$  $\frac{25}{67}$  $\frac{28}{75}$   
 $\frac{31}{83}$  $\frac{34}{91}$ 

→

 $\frac{65}{174}$ 

→ 13 places

$A_{n-4}$   $A_{n-3}$



$$8A_{n-4} - 4A_{n-3} = A_n$$

$$\Rightarrow G = (8 - 4G)^{\frac{1}{4}}$$

$$= \underline{1.29559774252}$$

3.59375

4,656,25 6,031,25 7,812,5 10,125 13,125

$\log_2 = \underline{.373617859462}$

NO GOOD? this does not converge, at least not in  $\rightarrow$  This direction

Seed: 17 22 28.5 37 48 62 80 104 136 176 224 288 384 512 640 768 1024  
 is converging  $\leftarrow$  this way. 24 31 40 52 68 72 28 36 48 64 80 96 128  
 In reverse, however! Recalcitrant

1536 2048 2048

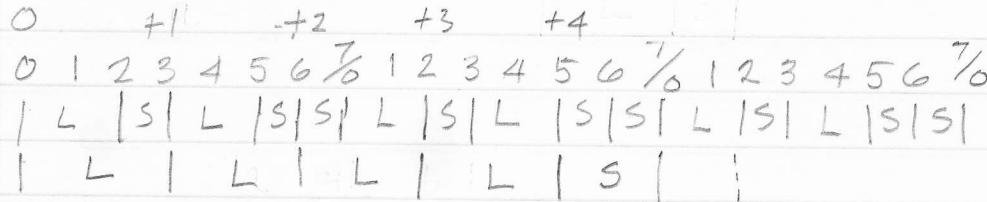
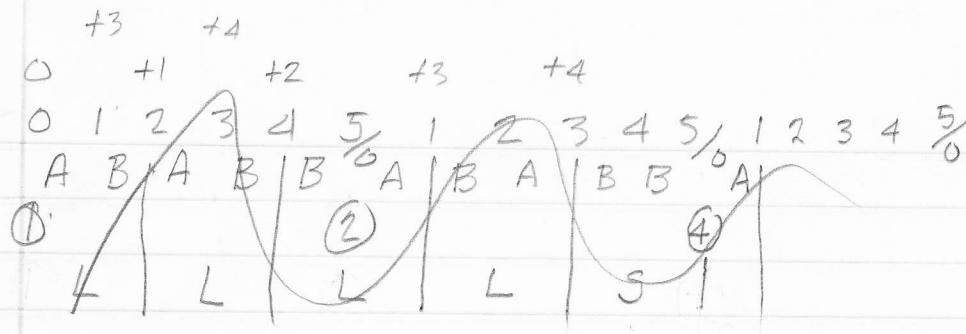
$(A_{n-4} + 4A_{n-1})/8 = A_n$ ,  $\leftarrow$  This runs the whole thing backwards!

(Continuing)

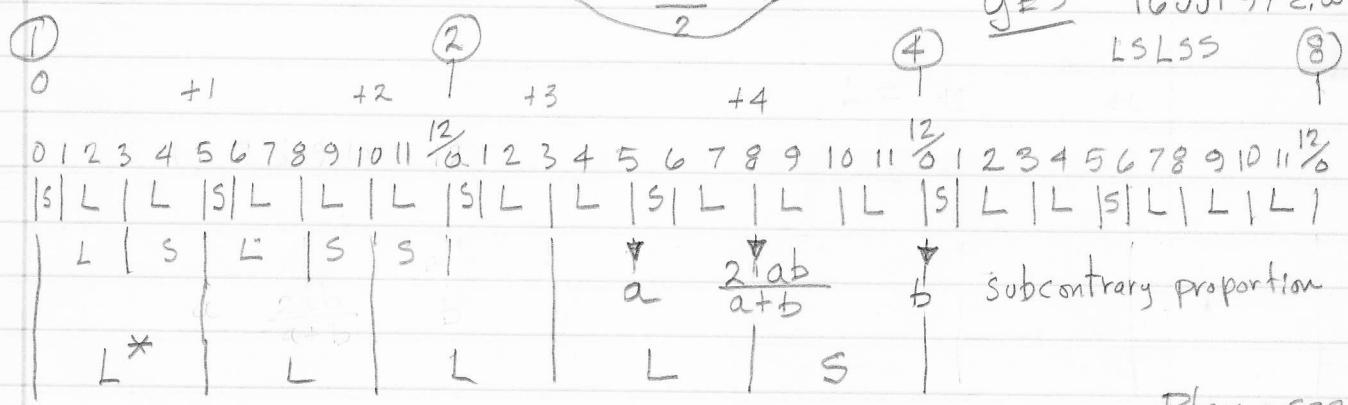
Notes on Meta-Meantone

16 Jul 97 E.W.

P.6a



16 Jul 97 E.W.

Please see  
P.6b ↗  
↙ this

RCL1

+4      1/4 pattern

C

.420...

C

) ← 2 .379

2<sub>x</sub>

Y" → 2 .637

C

( ← 1 .569

RCL1

X      1 → 1 .755

2

÷ ← 1 .323

X

4 → 3 .088

4

)      11 .320 %

)

=      3 .125

)

STO 1      8 .096

÷

iterate

$$*L = \sqrt[4]{\frac{2(L \cdot 2 \cdot 4)}{2L + 4}}$$

$$\left( \frac{2(L \cdot 2 \cdot 4)}{2L + 4} \right)^{\frac{1}{4}}$$

decimal approx = 1.338213318975...

log<sub>2</sub> = 4.20307968965...

ZigZag pattern

1/2 —————— 1/1

1/3 —————— 2/5

3/7

5/12 —————— 8/19

13/31 —————— 21/50

→ 29/69 —————— 37/89

11 places ↗

2 Ref; Linear Tuning of the 4-5-6 Arithmetic Mean (+4:5), 1989, E.Wilson

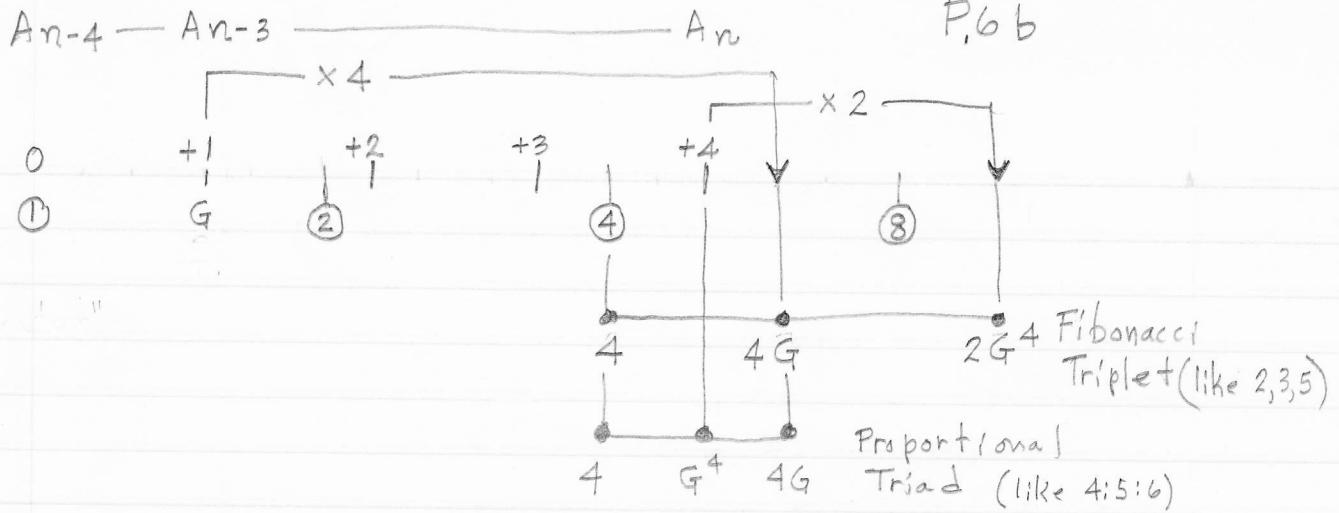
X

RCL1 compare with Harrison's 97 tuning.

# Notes on Meta-Meantone

17 Aug 97 - E.W.

P.6 b



Recurrence:

$$(4A_{n-4} + 4A_{n-3})/2 = A_n \quad G = ((4 + 4G)/2)^{\frac{1}{4}}$$

$$= (2A_{n-4} + 2A_{n-3}) = A_n \quad \Rightarrow = (2 + 2G)^{\frac{1}{4}}$$

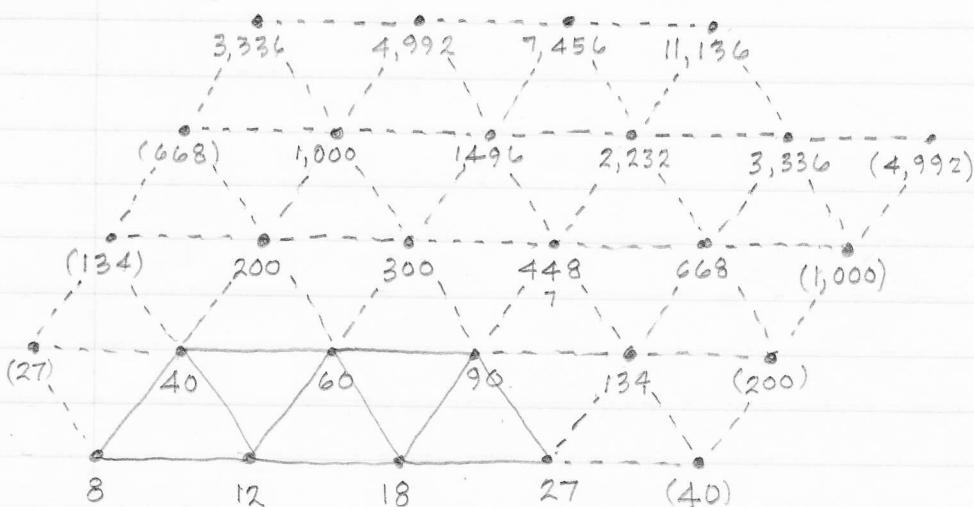
$$\log_2 = \underline{.579692031034}$$

example

Seed: 8 12 18 27 40 60 90 134 200 300 448 668 1,000 1,496

(7)

2,232 3,336 4,992 7,456 11,136



19-Tone Scale where;  $2A_{n-4} + 2A_{n-3} = A_n$  (Meta-Meantone)

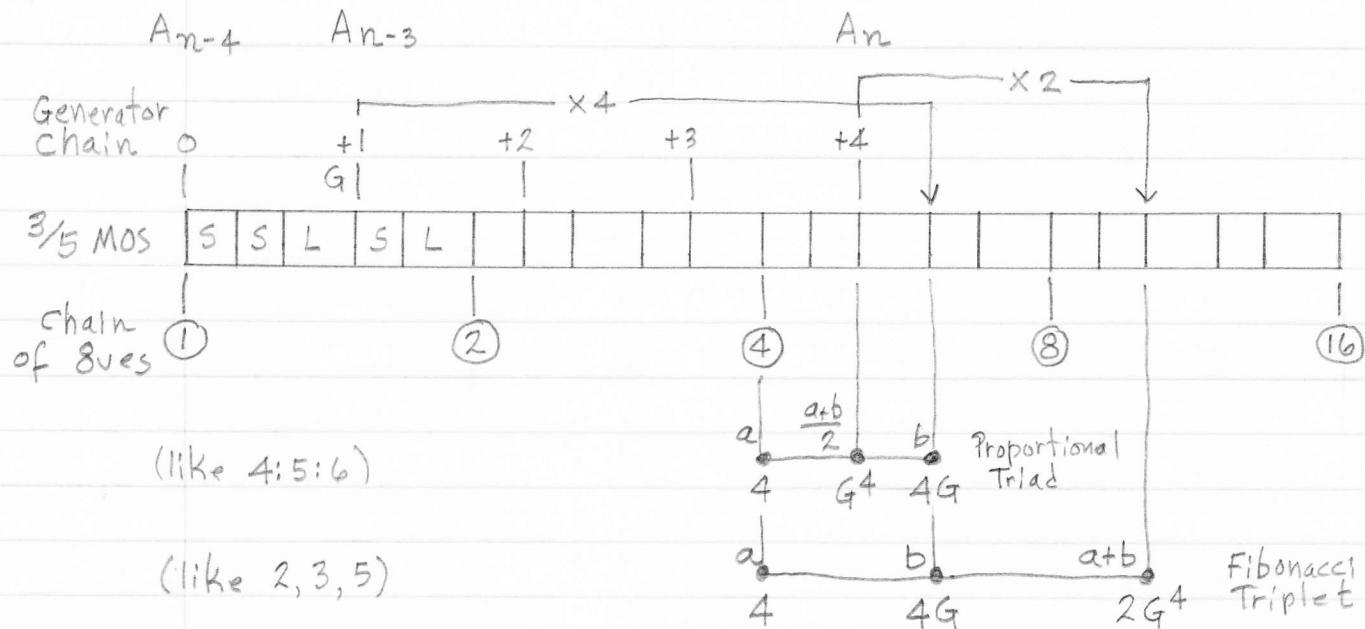
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# Notes on Meta-Mean-tone

This sheet clarifies p.6b

18 Aug 97 - S.W.

p.6c



Recurrence:

$$(4A_{n-4} + 4A_{n-3})/2 = A_n$$

$$\Rightarrow 2A_{n-4} + 2A_{n-3} = A_n$$

$$\begin{aligned} G &= ((4 + 4G)/2)^{\left(\frac{1}{4}\right)} \\ &= (2 + 2G)^{\left(\frac{1}{4}\right)} \end{aligned}$$

$$= \underline{1.49453018048}$$

$$\log_2 = \underline{.579692031034}$$

Example  
Seed: 8 12 18 27 40 60 90 134 200 300 448 668 etc

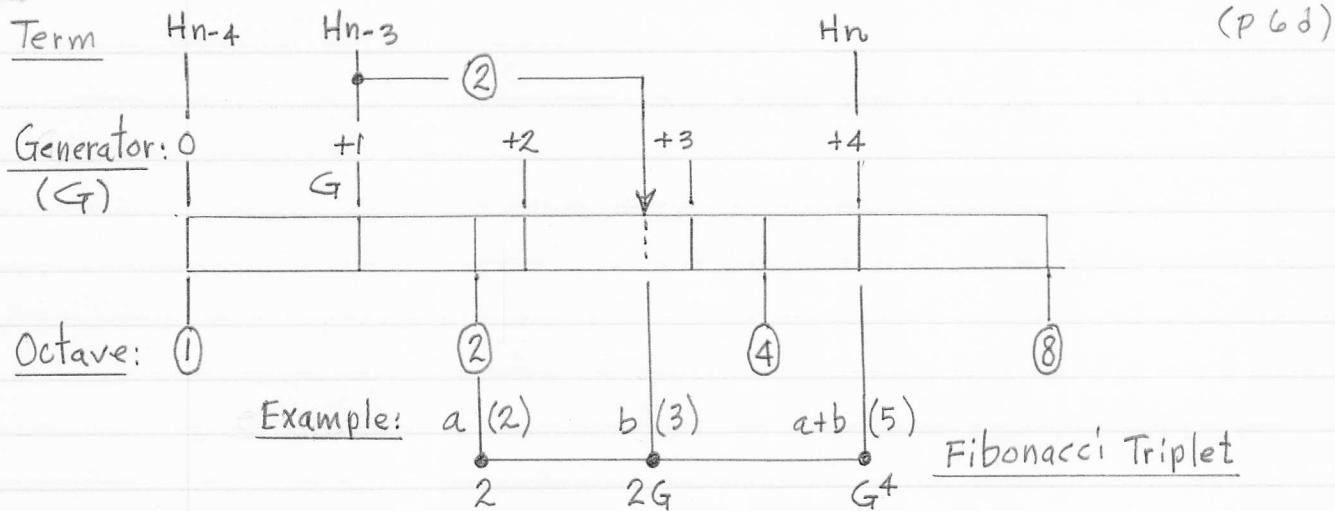
Please see p.6b



$$G = (2 + 2G)^{\left(\frac{1}{4}\right)}, \text{ Meta-Meantone}$$

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10.OCT.97-EW,



Recurrence Relation:

$$2H_{n-4} + 2H_{n-3} = H_n$$

G Paraphrase:

$$\Rightarrow G = (2 + 2G)^{\left(\frac{1}{4}\right)}$$

$$= \underline{1.49453018048}$$

$$\log_2 = \underline{.579692031034}$$

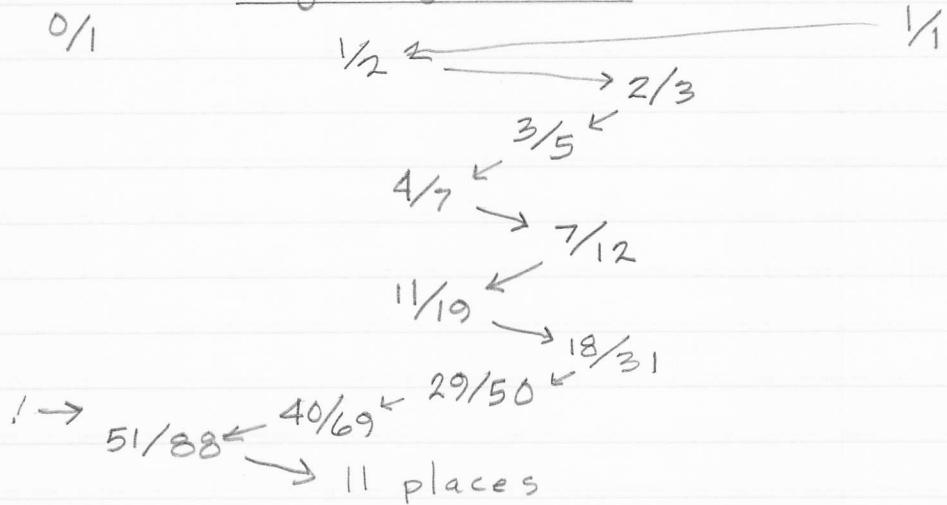
Example re-seed:

8 12 18 27 40 60 90 134 200 300 448 668 1000 1496 2232  
3336 4992 7456 11136 etc, \*

1/4 Pattern

	.57969...	0/1
← 1	.725	
→ 1	.379	
← 2	.637	
→ 1	.569	
← 1	.755	
→ 1	.323	
← 3	.088	! → 51/88 ← 40/69 ← 29/50 ←
11	.320	11 places
3	.123	

Zig-Zag Pattern



Ref: Linear Tuning of 4-5-6 Arithmetic Mean ( $+4 = "5"$ ), 1989, Erv Wilson

\* 1, 1, 1, 1, 4, 4, 4, 10, 16, 16, 28, 52, 64, 88, 160, etc NLIS.

# (Continuing) Notes on Meta-Mavila

16 Jul 97 E.W.

	L*	L		L		L		S
0	8 <sup>2n+1</sup>		+1	12		+3		+4
1	0	1	2	3	4	5	6	7
2	1	2	3	4	5	6	7	8
3	%	%	%	%	%	%	%	%
4	L   S   L   S   S   L   S   S							
5	①		②					④
6	—			a	<u>a+b</u>	b		
7	C				$\frac{2}{2}$			
8					↑			
9								

P.7a

2s2ss

$$\text{gen. } *L = \left( (2 \cdot L + 4) / 2 \right)^{\left(\frac{1}{4}\right)}$$

Please see  
P.7b ↗

RCL 1

+

4

) 1/N pattern

÷ .436...

2 ← 2 , 291

) → 3 , 429

$\sqrt[N]{x}$  ← 2 , 325

( → 3 , 068

) 14 , 688

÷ 1 , 452

4 2 , 209

) 4 , 782

= 1 , 277

STO 1

— — —

decimal approx. = 1.35320996420...

$\log_2 = \underbrace{.436385705396...}$

ZigZag Pattern

$\frac{1}{1}$  ←  $\frac{1}{2}$  ←

$\frac{1}{3}$  ←  $\frac{2}{5}$  ←

$\frac{3}{4}$  ←  $\frac{4}{9}$  ←

$\frac{7}{16}$  ←  $\frac{10}{23}$  ←

$\frac{17}{39}$  ←  $\frac{24}{55}$  ←

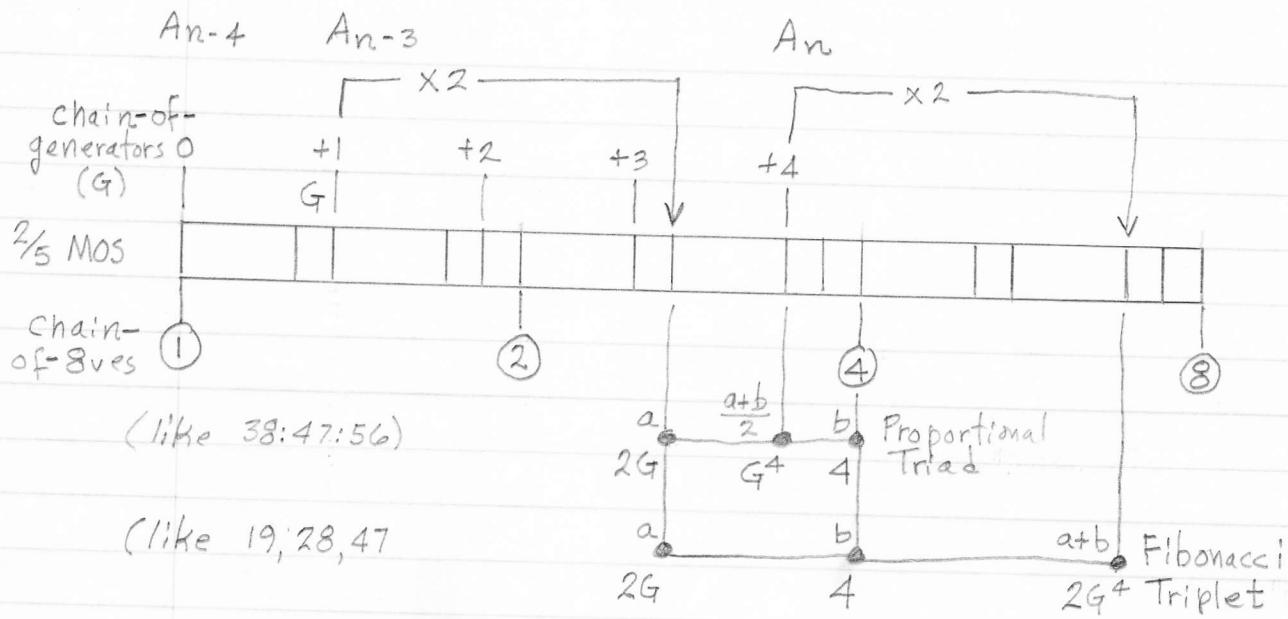
$\frac{31}{71}$  ←

14 Places

Ref; Linear Tuning of 4-5-6 arithmetic mean (-3=5), 1989 Er. Wilson

## Notes on Meta-Mavila

18 Aug 97 - E.W.  
P. 7b



## Recurrence;

$$\begin{aligned} & (4A_{n-4} + 2A_{n-3})/2 = A_n \quad G = ((4+2G)/2)^{\left(\frac{1}{4}\right)} \\ & \Rightarrow 2A_{n-4} + A_{n-3} = A_n \quad = (2+G)^{\left(\frac{1}{4}\right)} \end{aligned}$$

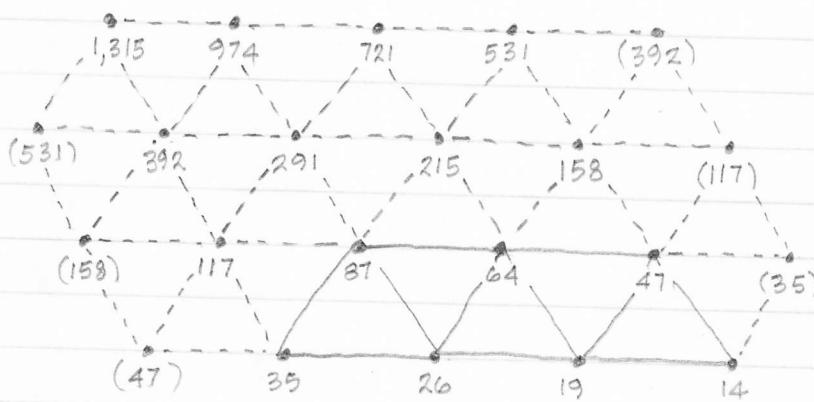
$$\Rightarrow = (2 + G) \left(\frac{1}{4}\right)$$

$$= \underline{1.35320996420\dots}$$

$$\log_2 = \underline{.436385705396\dots}$$

## Example

Seed: 14 19 26 35 47 64 87 117 158 215 291 392 531 721 974 1,315  
1,783 2,416 3,263 4,413 5,982 8,095 10,939 14,808 20,023 27,129



16-Tone Scale where;  $2A_{n-4} + A_{n-3} = A_n$  (Meta-Mavila)  
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See also; On Complementary Proportional Triads, 1995 by Eric Wilson

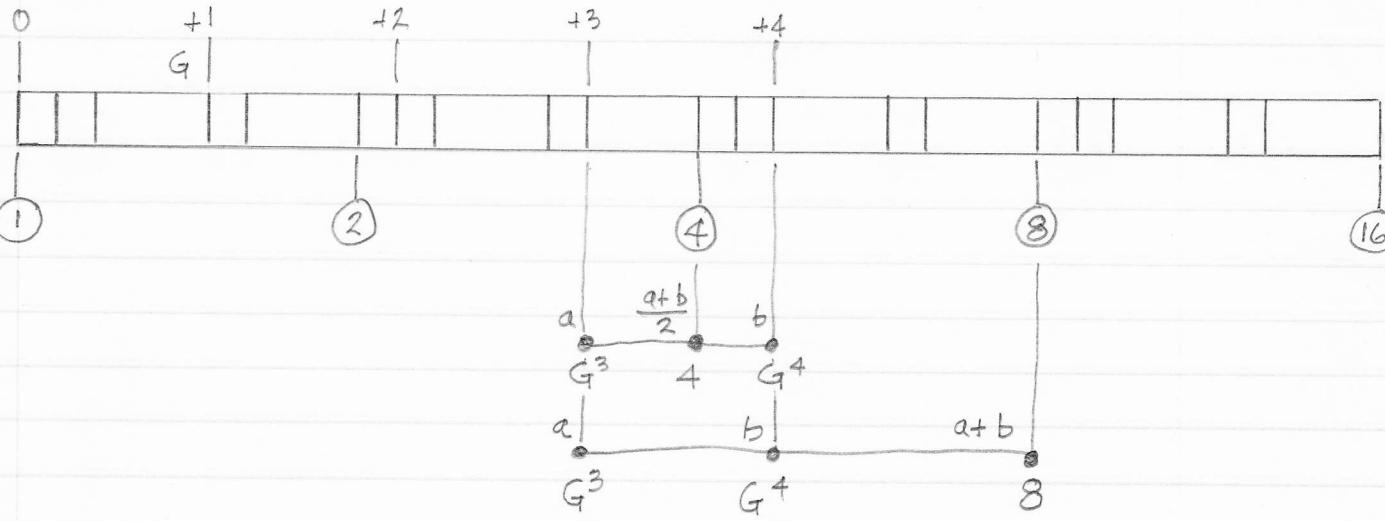
# Notes on Meta-Mavila

19 Aug 97 - E.W.

P.7c

This is an interesting try, - see P.7b for an elegant approach, and fundamental.

$A_{n-4}$



$$8A_{n-4} - A_{n-1} = A_n$$

$$\begin{aligned} & (8-G^4)(\frac{1}{3}) \quad \text{No compute} \\ \Rightarrow G &= (8-G^3)^{\frac{1}{4}} \quad \text{OK} \\ & = 1.47796724301\dots \\ \log_2 &= \underline{.563614294605\dots} \end{aligned}$$

32 47 70 104 152 224 336 496 720 1,072

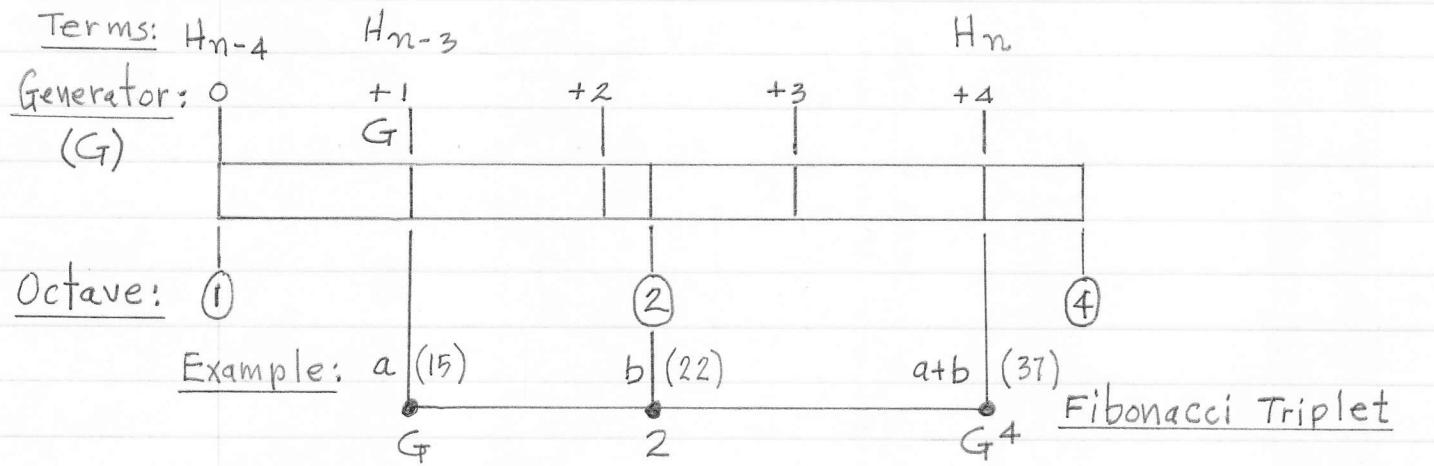
32 47 70 104 152 224 (21) 31 45 67

$G = (2 + G)^{1/4}$ , Meta-Mavila

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10-Oct-97-E.W.

(P. 7d)



Recurrence Relation:

$$2H_{n-4} + H_{n-3} = H_n$$

(1, 1, 1, 1, 3, 3, 3, 5, 9, 9, 11, 19, 27, 29, 41)

-NL15-

Re-Seed Example:

6, 8, 11, 15, 20, 27, 37, 50, 67, 91, 124, 167, 225, 306, 415, 559, 756, etc.

G Paraphrase:

$$\Rightarrow G = (2 + G)^{1/4}$$

$$= 1.35320996420 \dots$$

$$\log_2 = \underline{.436385705396}$$

1/N Pattern

$$.43638 \dots \quad \%$$

← 2	.291
→ 3	.429
← 2	.325
→ 3	.068
14	.688
1	.452
2	.290
4	.782
1	.277

Zig-Zag Pattern

1/3 → 2/5 → 3/7 → 4/9  
 7/16 ← 10/23 → 17/39 → 24/55 → 31/71  
 14 places

Ref. Linear Tuning of 4~5~6 Arithmetic Mean (-3 = 5), 1989, Erv Wilson

16 Jul 97 E.W.

P.8

AB

0

+1

①

0

②

1/2

④

1/2

| A | B |

a  $\frac{a+b}{2}$  ba  $\frac{2ab}{a+b}$  b

$$A = (1+2)/2 = 3/2$$

$$A = (2 \cdot 1 \cdot 2) / (1+2) = 4/3$$

0

+1

+2

ABB

0

1/2

1/2

3/2

1/2

3/2

| A | B |

B | A | B | B |

$$L = ((L+4)/2)^{\left(\frac{1}{2}\right)} \quad \leftarrow$$

①

②

④

$$\underline{1.68614066164\dots} \text{ dec appr.}$$

→ | L |

L

S

1

1

a

 $\frac{a+b}{2}$ 

b

$$\underline{.753724894160\dots} \text{ log}_2$$

---

1/4 Pattern

(

.753...

%

Zig-Zag

1

C

 $\leftarrow 1, 326$ 

1/2

RCL |

 $\rightarrow 3, 060$ 

2/3

+

 $\leftarrow 16, 529$ 

3/4

4

 $\rightarrow 1, 890$ 

4/5

)

 $\leftarrow 1, 123$ 

7/9

÷

8 .120

10/13

2

8 .290

13/17

)

3 .440

16/21

(

2 .34/45

19/25

y<sup>4</sup>

(

ref

$$G = ((4+G)/2)^{\left(\frac{1}{2}\right)}$$

$$\frac{49}{65}, \frac{46}{61}$$

43/57

1

$$\frac{52}{69}, \frac{101}{134}$$

÷

$$\frac{22}{29}, \frac{153}{203}$$

2

$$\frac{25}{33}, \frac{8}{11}$$

)

$$\frac{28}{37}, \frac{37}{45}$$

=

$$\frac{31}{41}, \frac{40}{49}$$

8 places

STO 1  
(iterate)Unusual definition of the diminished triad!  
16:27:38 or nearly so.

16 Jul 97 S.W.

P. 9a

ABB

0	$+1$	$+2$		
0	1	2	$\frac{3}{6}$	1
A	B	B	A	B
①		②		④
S	S	L		
a	$\frac{2ab}{a+b}$	b		
↑	↑	↑		

$$S = ((2 \cdot s \cdot 4) / (s + 4))^{(\frac{1}{2})}$$

approx.dec. 1.46410161514...log<sub>2</sub> .550015686526...

---

1/x pattern.550...      0/1C     $\leftarrow 1 .818$ 2     $\rightarrow 1 .222$ X     $\leftarrow 4 .498$ RCL1     $\rightarrow 2 .006$ X     $158 .922$ 4     $!$ 

)

÷

(

RCL 1

+

4

Note:  $(1 \div 1.46410161514) \times 2 = 1.36602540378\dots$ 

) (which is the Octave complement), the first

) Pélog Phi I ever solved, see  $\star$ Y<sup>x</sup>( 1.3660... has a root notation - See  $\star$ 

1

÷

2

)

=

STO 1

wrong

$$G = ((2(1+G))^{\frac{1}{2}})/2 = 1.3660\dots$$

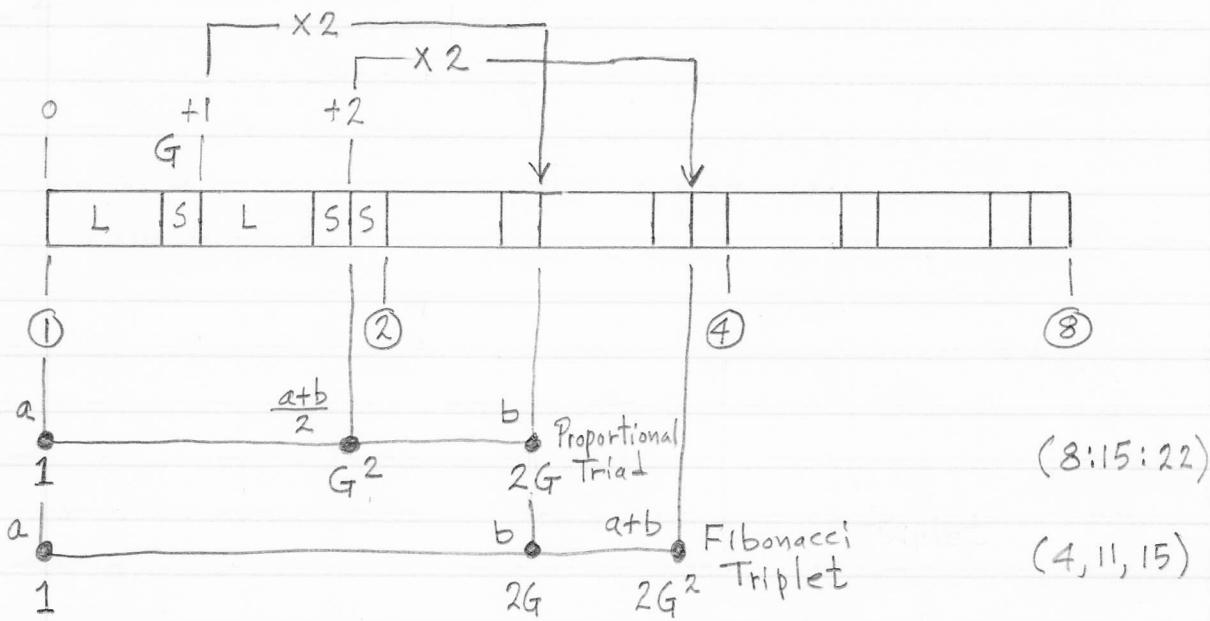
Please see  
P. 9b

---

Notes on the First Pelog,  
 $(H_{n-2} + 2H_{n-1})/2 = H_n$

22 Aug 97 - E.W.  
P. 9 b

$H_{n-2}$     $H_{n-1}$     $H_n$    ©1997 by Ervin Wilson



## Recurrence!

$$\frac{H_{n-2} + 2H_{n-1}}{2} = H_n \Rightarrow G = \frac{((1+2G)/2)^{1/2}}{1.36602540378\cdots}$$

$$\log_2 = \underbrace{.449984313472\dots}$$

4 4 6 8 11 15 20.5 28 38.25 52.25 71.375 97.5 133.1875  
181.9375 248.53125 339.5 463.7656025 633.515625 865.3984375  
1,182.15625 1,614.85546875 2,205.93359375 3,013.36132812  
4,116.328125

$$\underline{H_{n-2} + 2H_{n-1} = H_n}$$

22 Aug 97 - E.W.  
P.9c

$$H_{n-2} + 2H_{n-1} = H_n$$

1 1 3 7 17 41 99 239

$$G = (1+2G)^{(\frac{1}{2})}$$

$$= \frac{2.41421356237\ldots}{\log_2 \underbrace{1.27155330316\ldots}}$$

$\frac{1}{n}$  Pattern

$$\begin{array}{ll} \rightarrow & 1 .271\ldots \\ \leftarrow & 3 .682 \\ \rightarrow & 1 .465 \\ \leftarrow & 2 .149 \\ \rightarrow & 6 .676 \\ \leftarrow & 1 .479 \\ \rightarrow & 2 .087 \\ 11 & .417 \\ 2 & .397 \end{array} \quad \begin{array}{l} \downarrow \\ 1 \end{array}$$

Zig-Zag Pattern

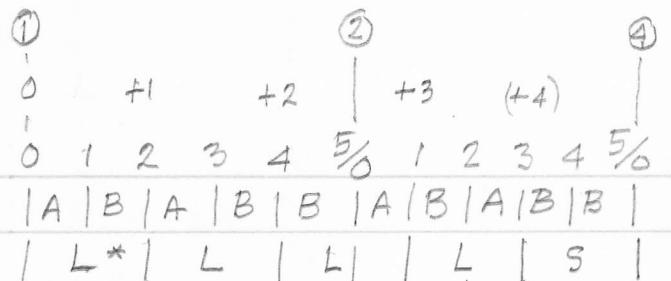
$$\begin{array}{c} 2/1 \\ 3/2 \\ 4/3 \\ 5/4 \\ 6/5 \\ 7/6 \\ 8/7 \\ 9/8 \\ 10/9 \\ 11/10 \\ 12/11 \\ 13/12 \\ 14/13 \\ 15/14 \\ 16/15 \\ 17/16 \\ 18/17 \\ 19/18 \\ 20/19 \\ 21/20 \\ 22/21 \\ 23/22 \\ 24/23 \\ 25/24 \\ 26/25 \\ 27/26 \\ 28/27 \\ 29/28 \\ 30/29 \\ 31/30 \\ 32/31 \\ 33/32 \\ 34/33 \\ 35/34 \\ 36/35 \\ 37/36 \\ 38/37 \\ 39/38 \\ 40/39 \\ 41/40 \\ 42/41 \\ 43/42 \\ 44/43 \\ 45/44 \\ 46/45 \\ 47/46 \\ 48/47 \\ 49/48 \\ 50/49 \\ 51/50 \\ 52/51 \\ 53/52 \\ 54/53 \\ 55/54 \\ 56/55 \\ 57/56 \\ 58/57 \\ 59/58 \\ 60/59 \\ 61/60 \\ 62/59 \\ 63/62 \\ 64/63 \\ 65/64 \\ 66/65 \\ 67/66 \\ 68/67 \\ 69/68 \\ 70/69 \\ 71/70 \\ 72/71 \\ 73/72 \\ 74/73 \\ 75/74 \\ 76/75 \\ 77/76 \\ 78/77 \\ 79/78 \\ 80/79 \\ 81/80 \\ 82/81 \\ 83/82 \\ 84/83 \\ 85/84 \\ 86/85 \\ 87/86 \\ 88/87 \\ 89/88 \\ 90/89 \\ 91/90 \\ 92/91 \\ 93/92 \\ 94/93 \\ 95/94 \\ 96/95 \\ 97/96 \\ 98/97 \\ 99/98 \\ 100/99 \\ 101/100 \\ 102/101 \\ 103/102 \\ 104/103 \\ 105/104 \\ 106/105 \\ 107/106 \\ 108/107 \\ 109/108 \\ 110/109 \\ 111/110 \\ 112/111 \\ 113/112 \\ 114/113 \\ 115/114 \\ 116/115 \\ 117/116 \\ 118/117 \\ 119/118 \\ 120/119 \\ 121/120 \\ 122/121 \\ 123/122 \\ 124/123 \\ 125/124 \\ 126/125 \\ 127/126 \\ 128/127 \\ 129/128 \\ 130/129 \\ 131/130 \\ 132/131 \\ 133/132 \\ 134/133 \\ 135/134 \\ 136/135 \\ 137/136 \\ 138/137 \\ 139/138 \\ 140/139 \\ 141/140 \\ 142/141 \\ 143/142 \\ 144/143 \\ 145/144 \\ 146/145 \\ 147/146 \\ 148/147 \\ 149/148 \\ 150/149 \\ 151/150 \\ 152/151 \\ 153/152 \\ 154/153 \\ 155/154 \\ 156/155 \\ 157/156 \\ 158/157 \\ 159/158 \\ 160/159 \\ 161/160 \\ 162/161 \\ 163/162 \\ 164/163 \\ 165/164 \\ 166/165 \\ 167/166 \\ 168/167 \\ 169/168 \\ 170/169 \\ 171/170 \\ 172/171 \\ 173/172 \\ 174/173 \\ 175/174 \\ 176/175 \\ 177/176 \\ 178/177 \\ 179/178 \\ 180/179 \\ 181/180 \\ 182/181 \\ 183/182 \\ 184/183 \\ 185/184 \\ 186/185 \\ 187/186 \\ 188/187 \\ 189/188 \\ 190/189 \\ 191/190 \\ 192/191 \\ 193/192 \\ 194/193 \\ 195/194 \\ 196/195 \\ 197/196 \\ 198/197 \\ 199/198 \\ 200/199 \\ 201/200 \\ 202/201 \\ 203/202 \\ 204/203 \\ 205/204 \\ 206/205 \\ 207/206 \\ 208/207 \\ 209/208 \\ 210/209 \\ 211/210 \\ 212/211 \\ 213/212 \\ 214/213 \\ 215/214 \\ 216/215 \\ 217/216 \\ 218/217 \\ 219/218 \\ 220/219 \\ 221/220 \\ 222/221 \\ 223/222 \\ 224/223 \\ 225/224 \\ 226/225 \\ 227/226 \\ 228/227 \\ 229/228 \\ 230/229 \\ 231/230 \\ 232/231 \\ 233/232 \\ 234/233 \\ 235/234 \\ 236/235 \\ 237/236 \\ 238/237 \\ 239/238 \\ 240/239 \\ 241/240 \\ 242/241 \\ 243/242 \\ 244/243 \\ 245/244 \\ 246/245 \\ 247/246 \\ 248/247 \\ 249/248 \\ 250/249 \\ 251/250 \\ 252/251 \\ 253/252 \\ 254/253 \\ 255/254 \\ 256/255 \\ 257/256 \\ 258/257 \\ 259/258 \\ 260/259 \\ 261/260 \\ 262/261 \\ 263/262 \\ 264/263 \\ 265/264 \\ 266/265 \\ 267/266 \\ 268/267 \\ 269/268 \\ 270/269 \\ 271/270 \\ 272/271 \\ 273/272 \\ 274/273 \\ 275/274 \\ 276/275 \\ 277/276 \\ 278/277 \\ 279/278 \\ 280/279 \\ 281/280 \\ 282/281 \\ 283/282 \\ 284/283 \\ 285/284 \\ 286/285 \\ 287/286 \\ 288/287 \\ 289/288 \\ 290/289 \\ 291/290 \\ 292/291 \\ 293/292 \\ 294/293 \\ 295/294 \\ 296/295 \\ 297/296 \\ 298/297 \\ 299/298 \\ 300/299 \\ 301/300 \\ 302/301 \\ 303/302 \\ 304/303 \\ 305/304 \\ 306/305 \\ 307/306 \\ 308/307 \\ 309/308 \\ 310/309 \\ 311/310 \\ 312/311 \\ 313/312 \\ 314/313 \\ 315/314 \\ 316/315 \\ 317/316 \\ 318/317 \\ 319/318 \\ 320/319 \\ 321/320 \\ 322/321 \\ 323/322 \\ 324/323 \\ 325/324 \\ 326/325 \\ 327/326 \\ 328/327 \\ 329/328 \\ 330/329 \\ 331/330 \\ 332/331 \\ 333/332 \\ 334/333 \\ 335/334 \\ 336/335 \\ 337/336 \\ 338/337 \\ 339/338 \\ 340/339 \\ 341/340 \\ 342/341 \\ 343/342 \\ 344/343 \\ 345/344 \\ 346/345 \\ 347/346 \\ 348/347 \\ 349/348 \\ 350/349 \\ 351/350 \\ 352/351 \\ 353/352 \\ 354/353 \\ 355/354 \\ 356/355 \\ 357/356 \\ 358/357 \\ 359/358 \\ 360/359 \\ 361/360 \\ 362/361 \\ 363/362 \\ 364/363 \\ 365/364 \\ 366/365 \\ 367/366 \\ 368/367 \\ 369/368 \\ 370/369 \\ 371/370 \\ 372/371 \\ 373/372 \\ 374/373 \\ 375/374 \\ 376/375 \\ 377/376 \\ 378/377 \\ 379/378 \\ 380/379 \\ 381/380 \\ 382/381 \\ 383/382 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\\ 657/656 \\ 658/657 \\ 659/658 \\ 660/659 \\ 661/660 \\ 662/661 \\ 663/662 \\ 664/663 \\ 665/664 \\ 666/665 \\ 667/666 \\ 668/667 \\ 669/668 \\ 670/669 \\ 671/670 \\ 672/671 \\ 673/672 \\ 674/673 \\ 675/674 \\ 676/675 \\ 677/676 \\ 678/677 \\ 679/678 \\ 680/679 \\ 681/680 \\ 682/681 \\ 683/682 \\ 684/683 \\ 685/684 \\ 686/685 \\ 687/686 \\ 688/687 \\ 689/688 \\ 690/689 \\ 691/690 \\ 692/691 \\ 693/692 \\ 694/693 \\ 695/694 \\ 696/695 \\ 697/696 \\ 698/697 \\ 699/698 \\ 700/699 \\ 701/700 \\ 702/701 \\ 703/702 \\ 704/703 \\ 705/704 \\ 706/705 \\ 707/706 \\ 708/707 \\ 709/708 \\ 710/709 \\ 711/710 \\ 712/711 \\ 713/712 \\ 714/713 \\ 715/714 \\ 716/715 \\ 717/716 \\ 718/717 \\ 719/718 \\ 720/719 \\ 721/720 \\ 722/721 \\ 723/722 \\ 724/723 \\ 725/724 \\ 726/725 \\ 727/726 \\ 728/727 \\ 729/728 \\ 730/729 \\ 731/730 \\ 732/731 \\ 733/732 \\ 734/733 \\ 735/734 \\ 736/735 \\ 737/736 \\ 738/737 \\ 739/738 \\ 740/739 \\ 741/740 \\ 742/741 \\ 743/742 \\ 744/743 \\ 745/744 \\ 746/745 \\ 747/746 \\ 748/747 \\ 749/748 \\ 750/749 \\ 751/750 \\ 752/751 \\ 753/752 \\ 754/753 \\ 755/754 \\ 756/755 \\ 757/756 \\ 758/757 \\ 759/758 \\ 760/759 \\ 761/760 \\ 762/761 \\ 763/762 \\ 764/763 \\ 765/764 \\ 766/765 \\ 767/766 \\ 768/767 \\ 769/768 \\ 770/769 \\ 771/770 \\ 772/771 \\ 773/772 \\ 774/773 \\ 775/774 \\ 776/775 \\ 777/776 \\ 778/777 \\ 779/778 \\ 780/779 \\ 781/780 \\ 782/781 \\ 783/782 \\ 784/783 \\ 785/784 \\ 786/785 \\ 787/786 \\ 788/787 \\ 789/788 \\ 790/789 \\ 791/790 \\ 792/791 \\ 793/792 \\ 794/793 \\ 795/794 \\ 796/795 \\ 797/796 \\ 798/797 \\ 799/798 \\ 800/799 \\ 801/800 \\ 802/801 \\ 803/802 \\ 804/803 \\ 805/804 \\ 806/805 \\ 807/806 \\ 808/807 \\ 809/808 \\ 810/809 \\ 811/810 \\ 812/811 \\ 813/812 \\ 814/813 \\ 815/814 \\ 816/815 \\ 817/816 \\ 818/817 \\ 819/818 \\ 820/819 \\ 821/820 \\ 822/821 \\ 823/822 \\ 824/823 \\ 825/824 \\ 826/825 \\ 827/826 \\ 828/827 \\ 829/828 \\ 830/829 \\ 831/830 \\ 832/831 \\ 833/832 \\ 834/833 \\ 835/834 \\ 836/835 \\ 837/836 \\ 838/837 \\ 839/838 \\ 840/839 \\ 841/840 \\ 842/841 \\ 843/842 \\ 844/843 \\ 845/844 \\ 846/845 \\ 847/846 \\ 848/847 \\ 849/848 \\ 850/849 \\ 851/850 \\ 852/851 \\ 853/852 \\ 854/853 \\ 855/854 \\ 856/855 \\ 857/856 \\ 858/857 \\ 859/858 \\ 860/859 \\ 861/860 \\ 862/861 \\ 863/862 \\ 864/863 \\ 865/864 \\ 866/865 \\ 867/866 \\ 868/867 \\ 869/868 \\ 870/869 \\ 871/870 \\ 872/871 \\ 873/872 \\ 874/873 \\ 875/874 \\ 876/875 \\ 877/876 \\ 878/877 \\ 879/878 \\ 880/879 \\ 881/880 \\ 882/881 \\ 883/882 \\ 884/883 \\ 885/884 \\ 886/885 \\ 887/886 \\ 888/887 \\ 889/888 \\ 890/889 \\ 891/890 \\ 892/891 \\ 893/892 \\ 894/893 \\ 895/894 \\ 896/895 \\ 897/896 \\ 898/897 \\ 899/898 \\ 900/899 \\ 901/900 \\ 902/901 \\ 903/902 \\ 904/903 \\ 905/904 \\ 906/905 \\ 907/906 \\ 908/907 \\ 909/908 \\ 910/909 \\ 911/910 \\ 912/911 \\ 913/912 \\ 914/913 \\ 915/914 \\ 916/915 \\ 917/916 \\ 918/917 \\ 919/918 \\ 920/919 \\ 921/920 \\ 922/921 \\ 923/922 \\ 924/923 \\ 925/924 \\ 926/925 \\ 927/926 \\ 928/927 \\ 929/928 \\ 930/929 \\ 931/930 \\ 932/931 \\ 933/932 \\ 934/933 \\ 935/934 \\ 936/935 \\ 937/936 \\ 938/937 \\ 939/938 \\ 940/939 \\ 941/940 \\ 942/941 \\ 943/942 \\ 944/943 \\ 945/944 \\ 946/945 \\ 947/946 \\ 948/947 \\ 949/948 \\ 950/949 \\ 951/950 \\ 952/951 \\ 953/952 \\ 954/953 \\ 955/954 \\ 956/955 \\ 957/956 \\ 958/957 \\ 959/958 \\ 960/959 \\ 961/960 \\ 962/961 \\ 963/962 \\ 964/963 \\ 965/964 \\ 966/965 \\ 967/966 \\ 968/967 \\ 969/968 \\ 970/969 \\ 971/970 \\ 972/971 \\ 973/972 \\ 974/973 \\ 975/974 \\ 976/975 \\ 977/976 \\ 978/977 \\ 979/978 \\ 980/979 \\ 981/980 \\ 982/981 \\ 983/982 \\ 984/983 \\ 985/984 \\ 986/985 \\ 987/986 \\ 988/987 \\ 989/988 \\ 990/989 \\ 991/990 \\ 992/991 \\ 993/992 \\ 994/993 \\ 995/994 \\ 996/995 \\ 997/996 \\ 998/997 \\ 999/998 \\ 1000/999 \\ 1001/1000 \\ 1002/1001 \\ 1003/1002 \\ 1004/1003 \\ 1005/1004 \\ 1006/1005 \\ 1007/1006 \\ 1008/1007 \\ 1009/1008 \\ 1010/1009 \\ 1011/1010 \\ 1012/1011 \\ 1013/1012 \\ 1014/1013 \\ 1015/1014 \\ 1016/1015 \\ 1017/1016 \\ 1018/1017 \\ 1019/1018 \\ 1020/1019 \\ 1021/1020 \\ 1022/1021 \\ 1023/1022 \\ 1024/1023 \\ 1025/1024 \\ 1026/1025 \\ 1027/1026 \\ 1028/1027 \\ 1029/1028 \\ 1030/1029 \\ 1031/1030 \\ 1032/1031 \\ 1033/1032 \\ 1034/1033 \\ 1035/1034 \\ 1036/1035 \\ 1037/1036 \\ 1038/1037 \\ 1039/1038 \\ 1040/1039 \\ 1041/1040 \\ 1042/1041 \\ 1043/1042 \\ 1044/1043 \\ 1045/1044 \\ 1046/1045 \\ 1047/1046 \\ 1048/1047 \\ 1049/1048 \\ 1050/1049 \\ 1051/1050 \\ 1052/1051 \\ 1053/1052 \\ 1054/1053 \\ 1055/1054 \\ 1056/1055 \\ 1057/1056 \\ 1058/1057 \\ 1059/1058 \\ 1060/1059 \\ 1061/1060 \\ 1062/1061 \\ 1063/1062 \\ 1064/1063 \\ 1065/1064 \\ 1066/1065 \\ 1067/1066 \\ 1068/1067 \\ 1069/1068 \\ 1070/1069 \\ 1071/1070 \\ 1072/1071 \\ 1073/1072 \\ 1074/1073 \\ 1075/1074 \\ 1076/1075 \\ 1077/1076 \\ 1078/1077 \\ 1079/1078 \\ 1080/1079 \\ 1081/1080 \\ 1082/1081 \\ 1083/1082 \\ 1084/1083 \\ 1085/1084 \\ 1086/1085 \\ 1087/1086 \\ 1088/1087 \\ 1089/1088 \\ 1090/1089 \\ 1091/1090 \\ 1092/1091 \\ 1093/1092 \\ 1094/1093 \\ 1095/1094 \\ 1096/1095 \\ 1097/1096 \\ 1098/1097 \\ 1099/1098 \\ 1100/1099 \\ 1101/1100 \\ 1102/1101 \\ 1103/1102 \\ 1104/1103 \\ 1105/1104 \\ 1106/1105 \\ 1107/1106 \\ 1108/1107 \\ 1109/1108 \\ 1110/1109 \\ 1111/1110 \\ 1112/1111 \\ 1113/1112 \\ 1114/1113 \\ 1115/1114 \\ 1116/1115 \\ 1117/1116 \\ 1118/1117 \\ 1119/1118 \\ 1120/1119 \\ 1121/1120 \\ 1122/1121 \\ 1123/1122 \\ 1124/1123 \\ 1125/1124 \\ 1126/1125 \\ 1127/1126 \\ 1128/1127 \\ 1129/1128 \\ 1130/1129 \\ 1131/1130 \\ 1132/1131 \\ 1133/1132 \\ 1134/1133 \\ 1135/1134 \\ 1136/1135 \\ 1137/1136 \\ 1138/1137 \\ 1139/1138 \\ 1140/1139 \\ 1141/1140 \\ 1142/1141 \\ 1143/1142 \\ 1144/1143 \\ 1145/1144 \\ 1146/1145 \\ 1147/1146 \\ 1148/1147 \\ 1149/1148 \\ 1150/1149 \\ 1151/1150 \\ 1152/1151 \\ 1153/1152 \\ 1154/1153 \\ 1155/1154 \\ 1156/1155 \\ 1157/1156 \\ 1158/1157 \\ 1159/1158 \\ 1160/1159 \\ 1161/1160 \\ 1162/1161 \\ 1163/1162 \\ 1164/1163 \\ 1165/1164 \\ 1166/1165 \\ 1167/1166 \\ 1168/1167 \\ 1169/1168 \\ 1170/1169 \\ 1171/1170$$

# Notes on Meta-S'lenadro

17 Jul 97 E.W.

P.10 a

ABABB



$$*L = ((2+2L)/2)^{\left(\frac{1}{3}\right)}$$

Please see  
P.10b ↗  
this

decimal approx. 1.32471795724...

$\log_2 .405685231370 \dots$

Same as Meta-S'lenadro off  
Pascal's Triangle. Ref. below

1/n pattern  
.405...

Zig-Zag Pattern

2 ← 2 .464      0/1  
X → 2 .150

$\frac{1}{2}$  ---  
 $\frac{1}{3}$        $\frac{2}{5}$        $\frac{3}{7}$   
---      1

RCL 1 ← 6 .635

$\frac{1}{2}$  ---

) → 1 .572

(

+ ← 1 .745

1

2 → 1 .341

+

) ← 2 .929

RCL 1

Y<sup>4</sup> → 1 .075

)

( 13 .276

$\frac{1}{2}$

1 ÷

1

3 )

÷

= STO 1

3

---  
(iterate)

$$G = (1+G)^{\left(\frac{1}{3}\right)}$$

use this; drops everything  
down an 8ve

---  
STO 1  
iterate

Reference: Recurrent Sequences and Pascal's Triangle, Thomas M. Green, Mathematics Magazine Vol 41, 1968

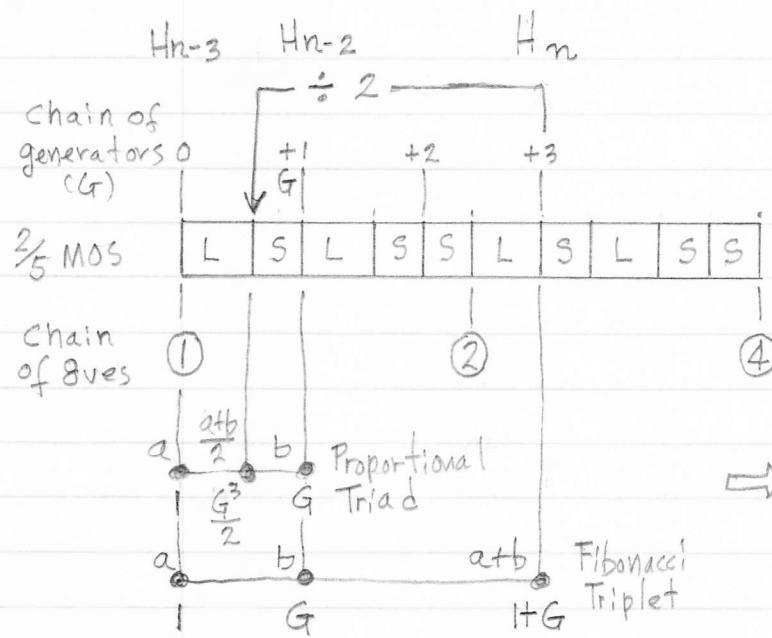
The Scales of Mt. Meru, Ervin M. Wilson, 1993

# Notes on Meta-S'lendro

©1997 by Ervin M. Wilson

19 Aug 97 - E.W.

P. 10 b



$$\Rightarrow G = (1+G)^{\left(\frac{1}{3}\right)}$$

$$= 1.32471795724\dots$$

$$\log_2 = .\underline{405685231370\dots}$$

Recurrences:

$$H_{n-3} + H_{n-2} = H_n$$

Seed: 9 12 16 21 28 37 49 65 86 114 151 200 265 351 465  
616 816 1081 1,432 1,897 2,513 3,329 4,410 5,842 7,739 10,252  
13,581

(5,482) 7,739 10,252 13,581  
(2,513) 3,329 4,410 5,842 (7,739)

Fibonacci-Triplets (1,081) 1,432 1,897 2,513 (3,329)

Display (465) 616 816 1081 (1,432)

(200) 265 351 465 (616)

(86) 114 151 200 (265)

(37) 49 65 86 (114)

(16) 21 28 37 (49)

9 --- 12 --- 14 (21)

A 27-Tone Scale where;  $H_{n-3} + H_{n-2} = H_n$

Nested MOS  $\frac{1}{1}, \frac{1}{2}, \frac{1}{3}, \frac{2}{5}, \frac{3}{7}, \frac{5}{12}, \frac{7}{17}, \frac{9}{22}, \frac{11}{27}, (\frac{13}{32}), (\frac{15}{37}), (\frac{28}{69}), (\frac{43}{106})$

# Notes on Iso-S'endro

17 Jul 97 E.W.

P. II a

ABABB

①

②

④

0 1 2 3 4 5% 1 2 3 4 5%

$\left\{ \begin{array}{|c|c|c|c|} \hline A & B & A & B \\ \hline S^* & S & S & S \\ \hline \end{array} \right\}$

0 +1 +2 +3 +4 0

$\downarrow$   $a$   $\frac{2ab}{a+b}$   $b$

(Sub-contrary)

$$\text{gen. } S = ((2 \cdot 2 \cdot 2S) / (2 + 2S))^{(1/3)}$$

decimal approx. 1.31459621227...

$\log_2 : 394619733349 \dots$

C

C

8 1/x Pattern

X .394...

RCL 1 ← 2 , 534

) → 1 , 872

÷ ← 1 , 146

( → 6 , 834

2 ← 1 , 198

+ → 5 , 045

2 22 , 191

X 5 , 232

RCL 1 4 , 301

)

) ← √x

(

1 P. II b

÷  $\Rightarrow G = (2+G)^{(1/3)}$

3

)

=

STO 1

—

iterate

Zig-Zag Pattern

$1/1 \leftarrow$

$1/2 \leftarrow$

$2/5 \rightarrow$

$3/8 \leftarrow$

$5/13 \rightarrow$

$7/18 \leftarrow$

$9/23 \rightarrow$

$11/28 \leftarrow$

$13/33 \rightarrow$

$15/38 -$

$28/71 \leftarrow$

$43/109 \rightarrow$

$58/147 \leftarrow$

$73/185 \rightarrow$

$88/223 \leftarrow$

$103/261 \rightarrow$

22 places

# Notes on Iso-Stenstro

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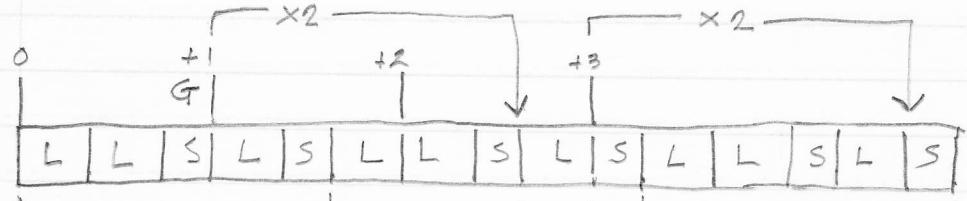
20 Aug 97 - E.W.

P.11b

$H_{n-3}$

$H_{n-2}$

$H_n$



(32:37:42) ref

(16, 21, 37) ref

Recurrence:

$$4H_{n-3} + 2H_{n-2} = H_n$$

$$\Rightarrow 2H_{n-3} + H_{n-2} = \frac{H_n}{2}$$

$$G = ((2G + 4)/2)^{\left(\frac{1}{3}\right)}$$

$$\Rightarrow = (2 + G)^{\left(\frac{1}{3}\right)}$$

$$= \frac{1.52137970680}{\sqrt[3]{2}} \quad \text{8ve complement: } \frac{1}{2} \times 2 = 1.31459621228\cdots$$

$$\log_2 = \underbrace{.605380266640}_{\sim}$$

Sample

Seed:

21 32 49 74 113 172 261 398 605 920 1,401 2,130 3,241  
4,932 7,501 11,414 17,365 26,416 40,193 61,146 93,025 141,532  
215,317 327,582 498,381 758,216 1,153,545 1,754,978 2,669,977

Example of 3/5 Moment of Symmetry, converging  $\rightarrow$

215,317 141,532 (93,025)

(141,532) 93,025 61,146 40,193 (26,416)

(40,193) 26,416 17,365 11,414 (7,501)

(11,414) 7,501 4,932 3,241 (2,130)

(3,241) 2,130 1,401 920 (605)

Triplet Display where

$$(2 \times 21) + 32 = 74 \text{ } \notin$$

so forth, in accord

with the Recurrence:

A 23-Note Scale

where:  $2H_{n-3} + H_{n-2} = H_n$

(920) 605 398 261 (172)

(261) 172 113 74 (49)

(74) 49 --- 32 --- 21 (14)

$2H_{n-3} + H_{n-2} = H_n$

(21) 14 9 6 4

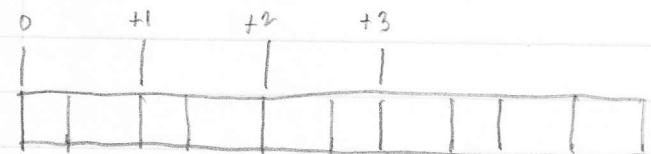
60 4 2.5 1.75 1.125  
1.75 1.125 .6875 1.0625 .03125

Nested MOS

NO GOOD - Please see P. IIc

P. IIc

$H_{n-3}$        $H_{n-1}$        $H_n$



①

②

④

32 37 42

16 21 37

$$(4 - G^3)^{\left(\frac{1}{2}\right)}$$

Error Func.

Recurrence:

$$\frac{4H_{n-3} - H_{n-1}}{4} = H_n$$

37 49 64

37	49	64	84	112	144	192	256	320	448	576	704	1088
32	42	56	72	96	128	168	224	288	352	544		
16	21	28	36	48	64	84	112	144	176	272		

not converging →

14 18 24 32 42 56 72 88 136  
68

This is a good example of what not to do!

$$G = (4 - G^2)^{\left(\frac{1}{3}\right)}$$

$$= 1.31459621228 \dots$$

$$\log_2 = \underline{.394619733359} \dots$$

17 Jul 97 E.W.

P.12

AABAB, AABAB, AB

①	②	④	③	⑩	⑫
0 5 10 3 8 1 6 11 4 9 2 7 0	0 1 2 3 4 5 6 7 8 9 10 11 12 0	0 1 2 3 4 5 6 7 8 9 10 11 12 0	0 1 2 3 4 5 6 7 8 9 10 11 12 0	0 1 2 3 4 5 6 7 8 9 10 11 12 0	0 1 2 3 4 5 6 7 8 9 10 11 12 0
A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A	A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A	A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A	A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A	A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A	A A B A B A   A A B A B A   A B A A B   A B A B A   A B A B A   A B A B A   B A B A   B A B A   B A B A   B A B A   B A B A   B A B A
S*   S   S   S   S   S   S   S   S   S   S   L	S   S   S   S   S   S   S   S   S   S   S   0	S   S   S   S   S   S   S   S   S   S   S   0	S   S   S   S   S   S   S   S   S   S   S   0	S   S   S   S   S   S   S   S   S   S   S   0	S   S   S   S   S   S   S   S   S   S   S   0
0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (4+10) (4+11) 0

C  $\Rightarrow \text{gen. } * S = ((8S+16)/2)^{\left(\frac{1}{9}\right)}$

C Decimal approx. 1.33350830845...

8 Log<sub>2</sub> .415226813657...

RCL 1 1/R Pattern

+ .415... %

16  $\leftarrow 2 .408$

)  $\rightarrow 2 .449$

$\div$   $\leftarrow 2 .226$

2  $\rightarrow 4 .406$

)  $\leftarrow 2 .460$

$y^x$   $\rightarrow 2 .169$

(  $\leftarrow 5 .892$

1  $\rightarrow 1 .120$

$\div$   $8 .324$

9  $3 .082$

)  $=$

STO 1

Ref: Linear Tuning of the 8-10-12

Arithmetic Mean, 1989, Erv Wilson

iterate

$G = (8 + 4G)^{\left(\frac{1}{9}\right)}$

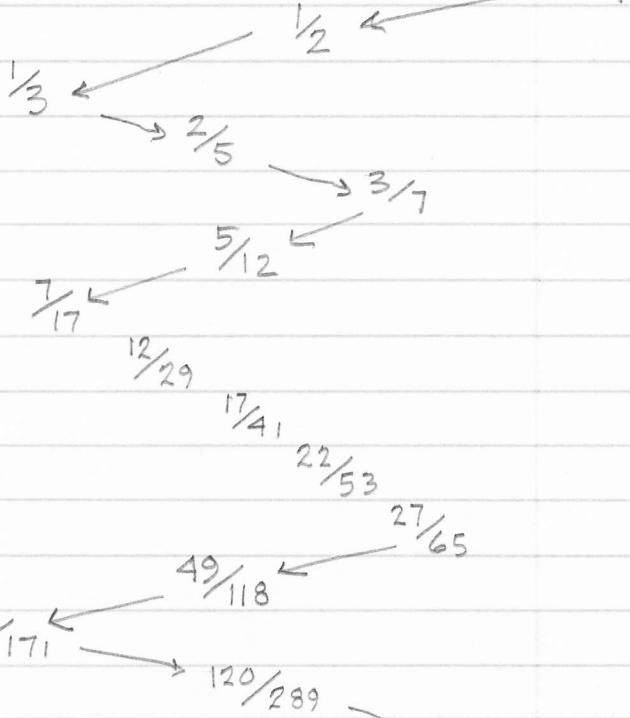
= 1.333...

$\rightarrow \frac{769}{1852}$

8 places

$$\begin{array}{c} a \\ | \\ 8S \\ \hline \end{array} \quad \begin{array}{c} \frac{a+b}{2} \\ | \\ \frac{8S+16}{2} \\ | \\ 16 \end{array}$$

Zig-Zag Pattern





18 Jul 97 E.W.

P.14 a

AB<sub>1</sub>AB<sub>2</sub>ABB<sub>3</sub>

①

0	1	2	3	4	5	6	7	8	9	10	11	0	1	2	3	4	5	6	7	8	9	10	11	0	1	2	3	4	5	6	7
A	B	A	B	A	B	B	A	B	A	B	A	B	A	B	B	A	B	A	B	B	A	B	A	B	A	B	A	B	A		
S*	S	S	S	S	S	S	S	S	S	S	L																				

0

+1

+2

+3

+4

+5

+6

0

+1

+2

---

C

C

16

X

RCL 1

)

÷

(

2

x

RCL 1

1/14 Pattern

.264...<sup>11</sup>

← 3 .783

→ 1 .275

← 3 .623

→ 1 .604

← 1 .654

→ 1 .527

← 1 .894

→ 1 .118

← 8 .472

→ 2 .114

0/1

1/1

2/1

3/11

4/15

5/19

6/34

7/53

8/87

9/140

10/227

11/140

12/140

13/140

14/140

15/140

16/140

17/140

18/140

19/140

20/140

21/140

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211/140

212/140

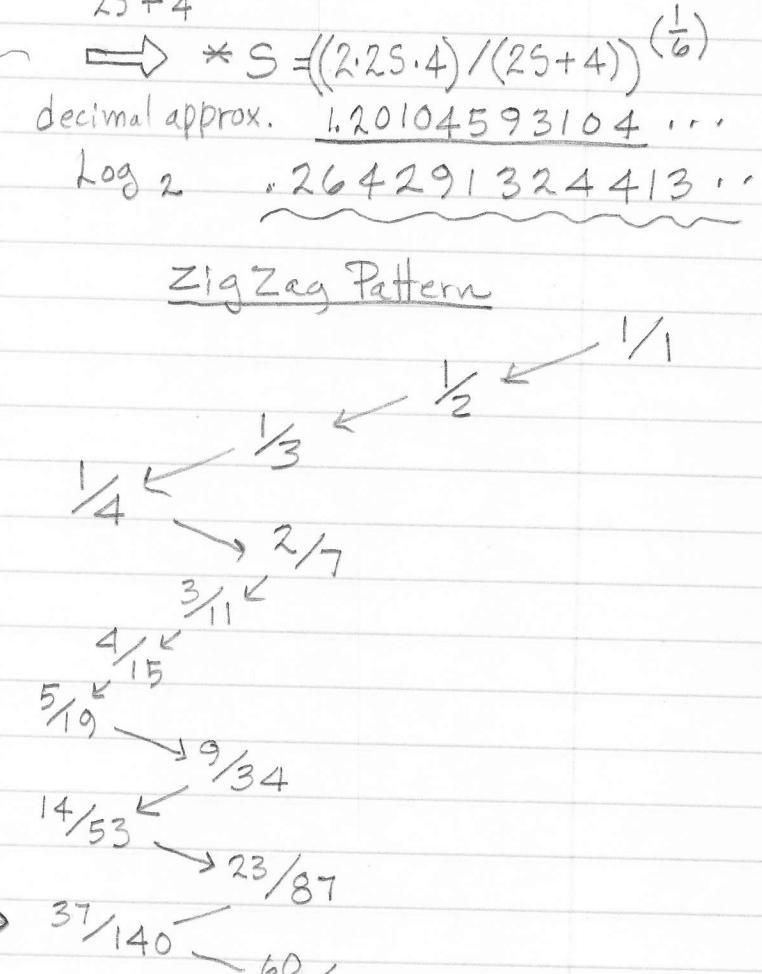
213/140

214/140

215/140

216/140

8 places



STO1

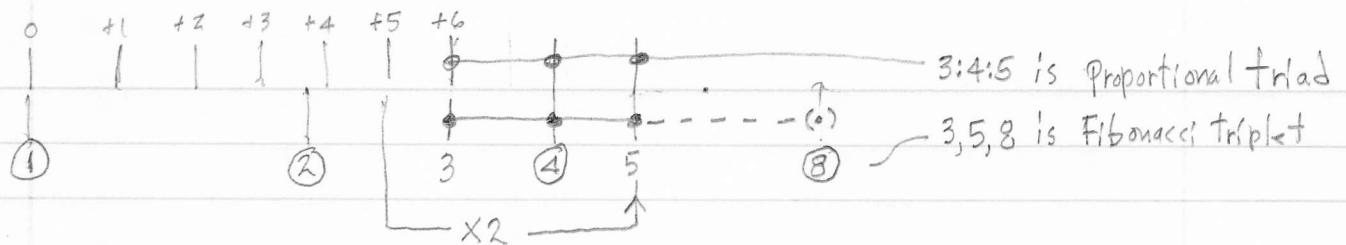
Iterate

This is a new! solution of Hanson's strategy ( $+6=3$ )  
 Restated, the proportional triad is 3:4:5, and the  
 Fibonacci triplet is 3:5:8, the 13 (+14) is very good.

Refi: Development of a 53-Tone Keyboard Layout, 1989, by Larry A. Hanson, Xenharmonikon 12, Frog Peak.

15 Aug 97 E.W.

P. 14 b



$$\Rightarrow G = ((8 - G^6)/2)^{1/5}$$

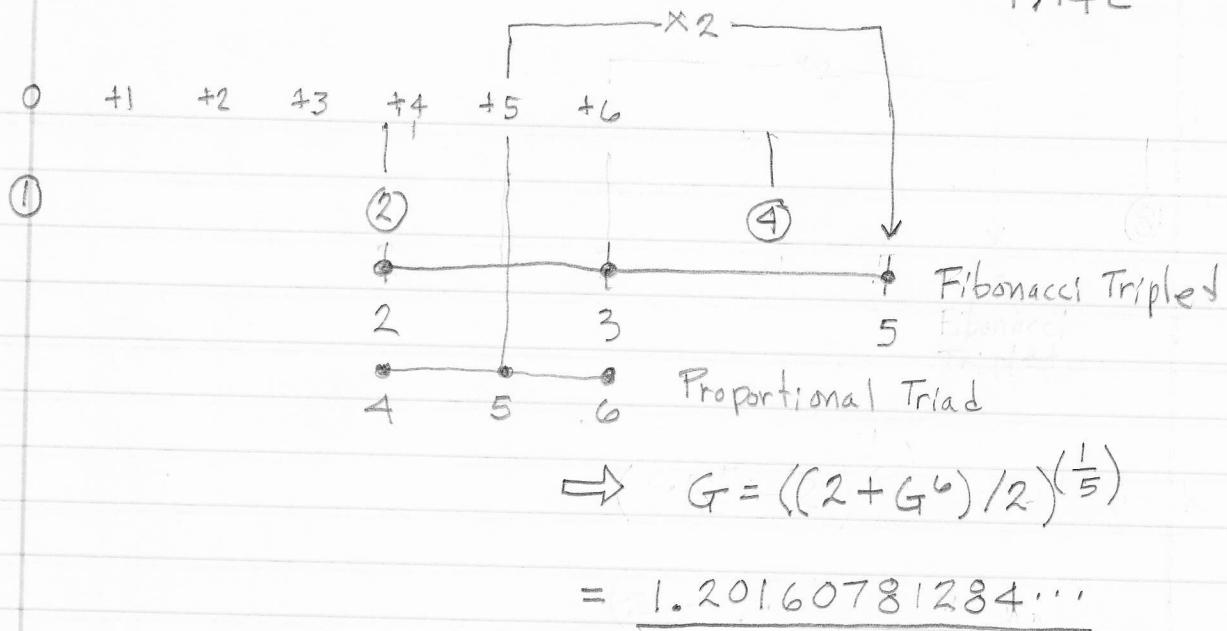
$$= \underline{1.20104593104\dots}$$

$$\log_2 = \underline{264291324413\dots}$$

0 +1 +2 +3 +4 +5 +6

15 Aug 97 E.W

P. 14c

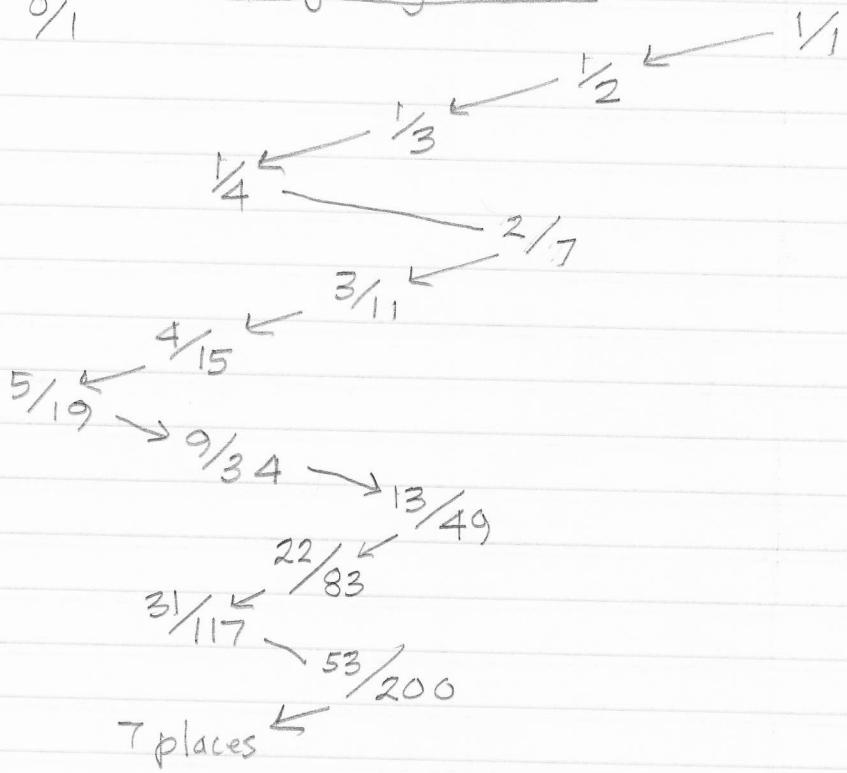


$$\log_2 = .\underline{264966098381\dots}$$

### 1/10 Pattern

	.	264...	%
←	3	.774	
→	1	.291	
←	3	.426	
→	2	.346	
←	2	.883	
→	1	.132	
7	.	.560	
1	.	.784	
1	.	.275	
3	.	.633	

### Zig-Zag Pattern

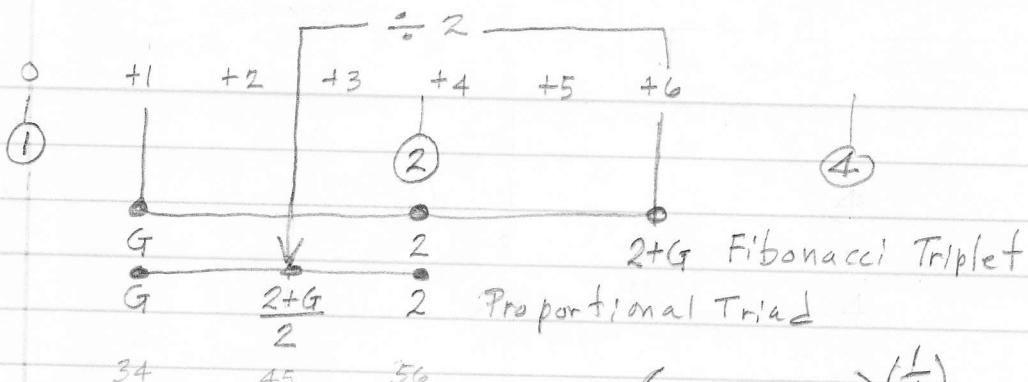


see Hanson and Wilson in 1989



15 Aug 97 - S.W.

P. 15 b



$$G = (2 + G)^{\left(\frac{1}{6}\right)}$$

$$= \underline{1.21486232249\dots}$$

about  $\frac{17}{14}$

like 34:45:56 (33:44:55)

and 17, 28, 45

$$\log_2 = \underline{.280792825835}$$

Recurrence:

$A_{n-6} \quad A_{n-5}$

$A_n$

$$2A_{n-6} + A_{n-5} = A_n$$

Trial	0	+1	+2	+3	+4	+5	+6
Seed;	14	17	21	25	30	37	45
Try;	14	17	21	25	<u>31</u>	37	45

25 July 97 EW  
P.16

$$G = \left(2(1+G)\right)^{\frac{1}{4}} = 1.49453018048 \text{ meta-mean tone}$$

$$\textcircled{1} \quad \textcircled{2} \quad |G = (2+G)\left(\frac{1}{4}\right) = 1.35320996420 \\ 0 \quad +1 \quad +2 \quad +3 \quad +4 \quad \dots \quad Y_N \times 2 = 1.47796724301$$

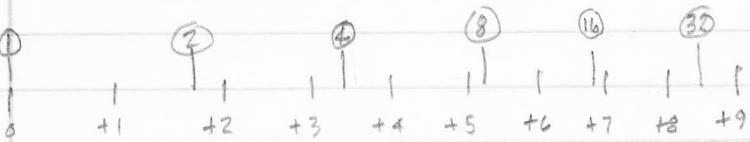
$$G = (2+G)^{\frac{1}{3}} = 1.52137970680 \quad 1/\alpha \times 2 = 1.31459621228\cdots$$

inside out Meta-S'lendro

$$G = (1+G)^{\left(\frac{1}{3}\right)} = 1.32471795724 \text{ Meta-Slendro, see p 10}$$

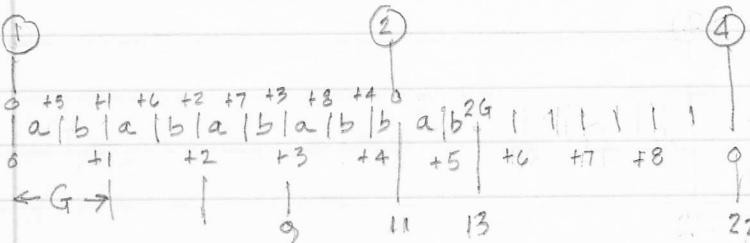
$$G = \frac{(8+4G)^{\left(\frac{1}{9}\right)}}{(1)} = 1.33350830845\ldots \quad \text{very like } \varphi \text{ skhisma}$$

$$G = \sqrt{4 + G} \approx 1.33350830845\cdots$$



$$G = (16(1+G))^{(\frac{1}{9})} = 1.50710537587, \quad \frac{1}{2} \times 2 = 1.32704722047\cdots$$

inside-out of above



$$\hookrightarrow G = (4 - 2G)^{\left(\frac{1}{3}\right)} = 1.17950902460\ldots \quad \frac{1}{x} \times 2 = 1.69562076956\ldots$$

Ref; Linear Tuning for Arithmetic 9-11-13, 1989, Eric Wilson

$$G^2 + 2 = G^3$$

$$G = (2 + G^2)^{\left(\frac{1}{3}\right)}$$

25 July 97 EW  
P.17

$$\left\{ \begin{array}{l} G = ((4+G^5)/2)^{\left(\frac{1}{5}\right)} = 1.22500486816\dots \quad 1/\kappa \times 2 = 1.63264657307\dots \\ \text{Meta-Bagpipe, see p.2} \\ \\ G = (8-4G)^{\left(\frac{1}{6}\right)} = 1.21110071153\dots \quad 1/\kappa \times 2 = 1.65139032696\dots \\ \text{Counter-Bagpipe See p.3} \end{array} \right.$$

$$G = ((2+G)/2)^{\left(\frac{1}{2}\right)} = \underline{1.28077640640}$$

27 July 97 EW  
P. 18

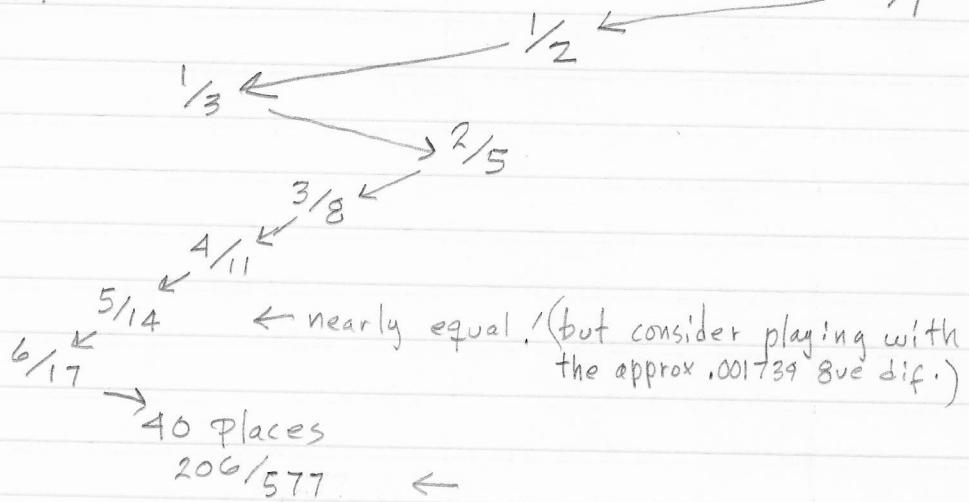
$$\log_2 = \underline{.357018636856}$$

(8ve complement = 1.56155281281...)

$\frac{1}{\sqrt{2}}$  Pattern

	.357...
←	2 .800
→	1 .248
←	4 .024
	40 .858
	1 .165
	6 .054
	18 .471
	2 .118

Zig-Zag Pattern



This gives a "7:9:11"-like proportion with notable economy!

0	1	2	3	4	5	6	7	8	9	10	11	12	13	$\frac{14}{2}$
0 +3		+1 +4			+2					0				5-tone MOS
"7"		"9"			"11"									consider "23"

↑ Try tonic here - very India

Note: an early calculation of this is dated 1992

$$G = (4 - 2G)^{\frac{1}{2}} = \underline{1.23606797752\dots}^*$$

27 July 97 EW  
P.19

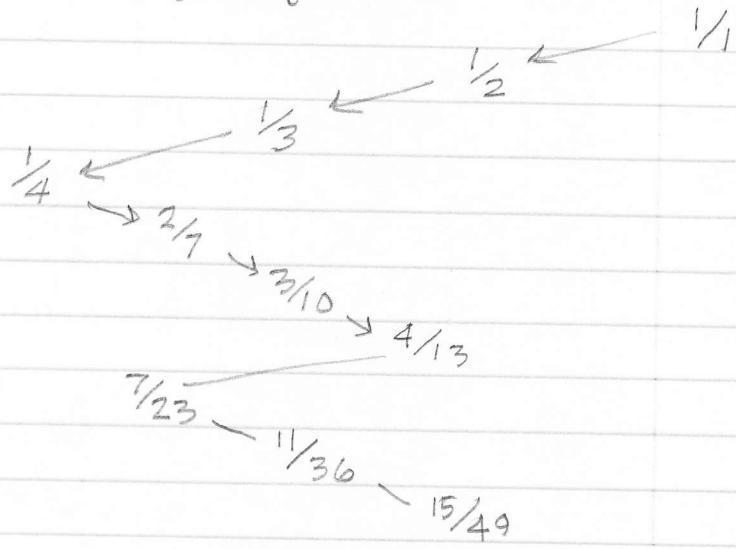
\*this mantissa shows up on L.A. Hansons, Simple Repeating zigzag patterns on the Wilson Scale Tree, 1991

$$\log_2 = .\underline{305758086393}$$

$\frac{1}{4}$  Pattern

	$\cdot 305\dots$	$0/1$
←	3.	.270
→	3	.696
←	1	.436
2		.289
3		.448
2		.228
4		.373
2		.676
1		.478
2		.091

Zig-Zag Pattern



Note:  $1.23606797752 \times 2 = 1.61803398872$ , its 8ve complement!  
(Too easily overlooked.)

Note: an early calculation of this is dated 1992

$$G = ((2+G^2)/2)^{\left(\frac{1}{3}\right)} = \underline{1.19742933693}$$

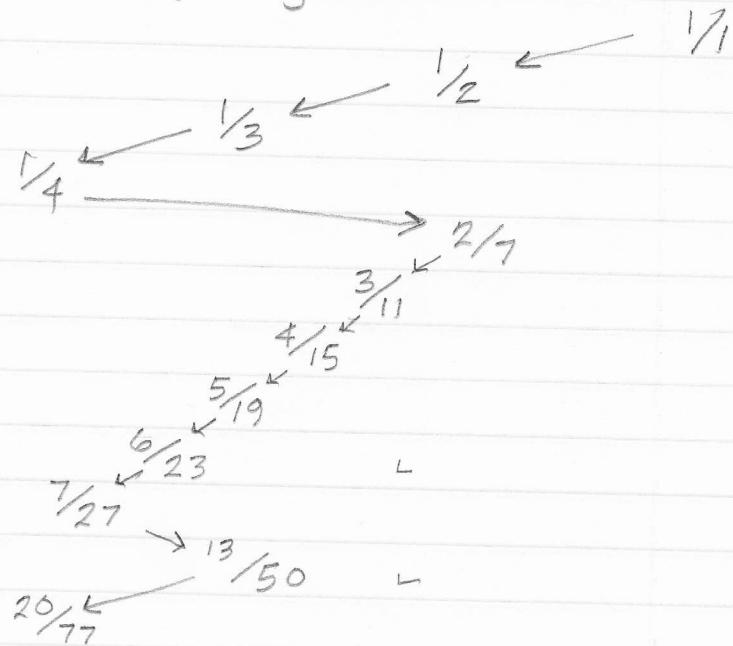
27 Jul 97 E.W.  
P.20

$$\log_2 = \underbrace{.259940521708\dots}_{\sim}$$

$\frac{1}{N}$  Pattern

	$\frac{.259\dots}{3}$	$0/1$
$\leftarrow$	1 .180	
$\leftarrow$	5 .537	
$\rightarrow$	1 .860	
$\leftarrow$	1 .161	
6	.185	
5	.401	
2	.492	
2	.031	
?	31 .852	

Zig-Zag Pattern



Like "5:6:7" proportion  
(see 1992)

$$G = (4 - 2G)^{\frac{1}{3}} = \underline{1.17950902460}$$

27 Jul 97 E.W.

P.21a

$$\log_2 = \underline{.238186456895}$$

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Ref

$$G = (2 + G^2)^{\frac{1}{3}}$$

1/N Pattern

$$\begin{array}{r} .238\dots \\ \leftarrow 4 .198 \\ \rightarrow 5 .040 \\ ( ) 24 .668 \\ \rightarrow 1 .496 \\ 2 .013 \\ 74 .768 \\ 1 .300 \\ 3 .325 \\ ? 3 .075 \end{array}$$

Zig-Zag Pattern

$$\begin{array}{c} \frac{1}{1} \leftarrow \\ \frac{1}{2} \leftarrow \\ \frac{1}{3} \leftarrow \\ \frac{1}{4} \leftarrow \\ \frac{1}{5} \leftarrow \\ \frac{2}{9} \\ \frac{3}{13} \\ \frac{4}{17} \\ \leftarrow \frac{5}{21} \\ \frac{6}{25} \end{array}$$

Like "14:17:20", or "32:39:46"

see 1992

also like "9:11:13,

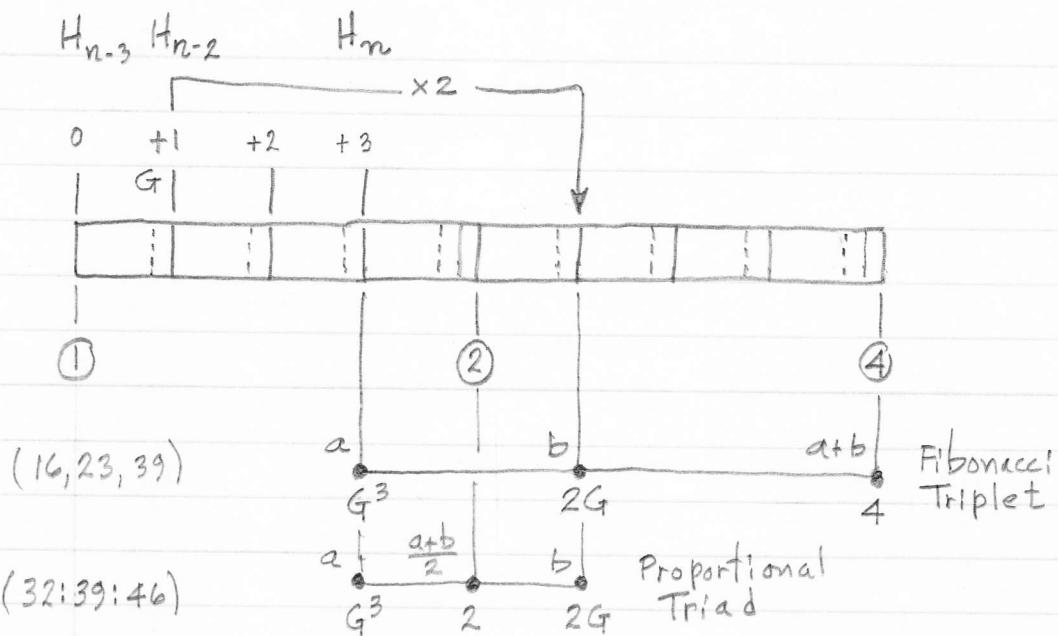
reference;

Linear Tuning for Arithmetic 9-11-13,  
1989, by Erv Wilson

$$\begin{array}{c} \frac{121}{508} \\ \leftarrow \frac{126}{529} \quad \rightarrow \frac{247}{1037} \\ \leftarrow \frac{373}{1566} \\ \frac{499}{2095} \quad \rightarrow 74 \text{ places} \end{array}$$

25 Aug 97

P. 21 b



1,437,5236

Please see below

$$4 \cdot H_{n-3} - 2 \cdot H_{n-2} = H_n$$

← converges left  $(64 + (2 \times 46))/4 = 1,17950902460$

-1 -2 -3

$16 + 23/4$

→

Please see below  $G = (4 - 2G)^{\frac{1}{3}}$

23,75 28 33 39 46 54 64 76 88 104 128 144 60 diverging

224 132 78 46 27 16

--- 78 46 27 16

SAME THING

Converges right →

$$2 \cdot H_{n-3} + H_{n-1} = H_n$$

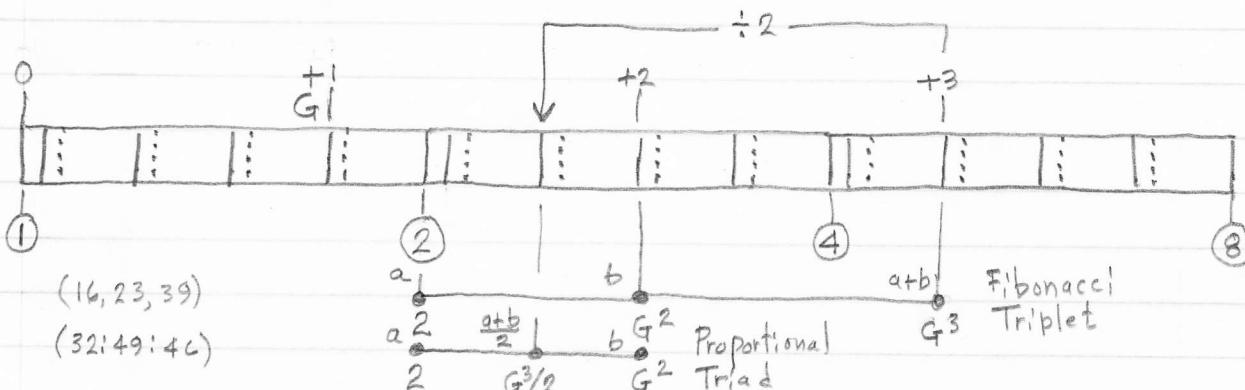
$$\Rightarrow G = (2 + G^2)^{\frac{1}{3}}$$

$$= 1.69562076956 \dots$$

16 27 46 78 132 224 380 644 1,092 1,852 3,140 5,324 9,028

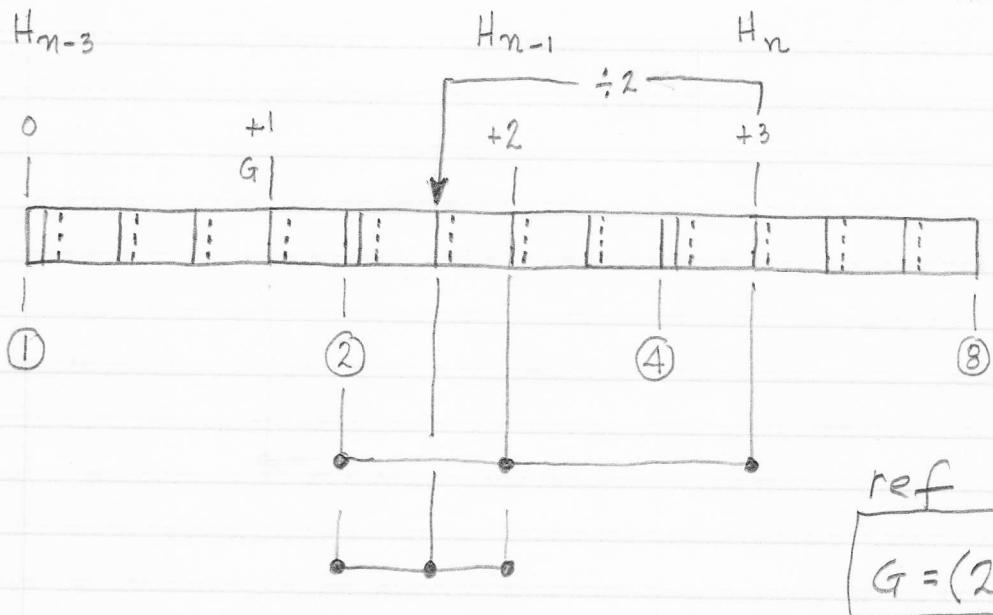
15,308 25,956 44,012 74,628 126,540 214,564 363,820 616,900 1,046,028 1,773,668

$H_{n-3} \ H_{n-2} \ H_n$



25 Aug 97 E.W.

P. 21c



$$\frac{2H_{n-3} + H_{n-1}}{\downarrow \quad \downarrow \quad \downarrow \quad 3} = H_n$$

See Sloane M2419 ! \*

1	1	1	3	5	7	13	23	37	63	109	183	309	527	893
1511	2565	4351	7373											

Difference Tones Series; (These are all approaching the limit chain)!.

1s 0 0 2 2 2 6 10 14 26 46 8ves of original series

2s 0 2 4 4 8 16 24 40 72 120 200

3s  $\sqrt{}$  2 4 6 10 18 30 50 86 146 246 418

$\div 2 =$  1 2 3 5 9 15 25 43 73 123 209

4s  $\sqrt{}$  4 6 12 20 32 56 96 160 272 464 784

$\div 2 =$  2 3 6 10 16 28 48 80 136 232 392

$\div 2 =$  1 1.5 3 5 8 14 24 40 68 116 196

$\div 2 =$  4 7 12 20 34 58 98

$\div 2 =$  6 10 17 29 49

5s 6 12 22 34 58 102 170 286 496 830 1402

$\div 2 =$  3 6 11 17 29 51 85 143 245 415 701

\* The Encyclopedia of Integer Sequences, N.J.A. Sloane, Simon Plouffe  
 1995, Academic Press, Inc., ISBN 0-12-558630-2, Phone 1-800-321-5068  
 for computer readable index

26 Aug 97 E.W.

P. 21d

orig 16 27 46 78 132 224 380 644 1092 1852 3140 5324

dif-tones  
by 1s = 11 19 32 54 92 156 264 448 760 1288 2184 3704  
2s = 30 51 86 146 248 420 712 1208 2048 3472 5888 9984  
3s = 62 105 178 302 512 868 1472 2496 4232 7176 12168 20632  
4s = 116 197 334 566 960 1628 2760 4680 7936 13456 22816 38688  
5s = 208 353 598 1014 1720 2916 4944 8384 14216 24104 40872 69304  
6s = 364 617 1046 1774 3008 5100 8648 14664 24864 42160 71488 121216  
7s = 628 1065 1806 3062 5192 8804 14928 25312 42920 72776 123400 209240

$$G = ((2+G)/2)^{\left(\frac{1}{3}\right)} = \underline{1.16537304306\dots}$$

27 Ju 97 EW  
P. 22

$$\log_2 = \underline{220791844343\dots}$$

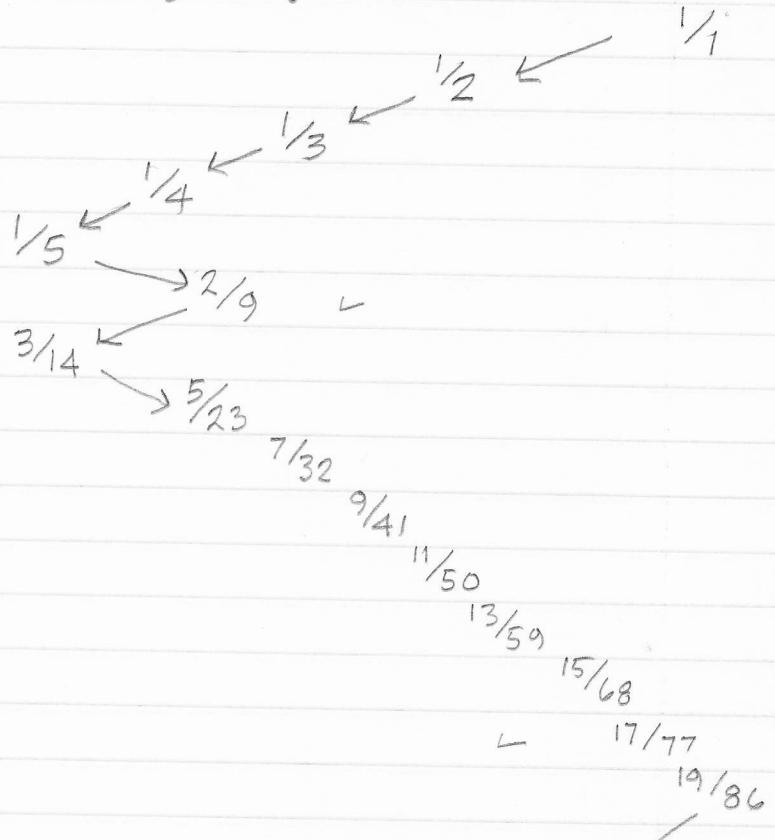
$\frac{1}{n}$  Pattern

	$\cdot 220$
←	4 . 529
→	1 . 889
←	1 . 123
8	. 075
13	. 244
4	. 097
10	. 241
4	. 135

Like "11:15:19"

See 1992

Zig-Zag Pattern



$$G = ((4 - G^3)/2)^{\left(\frac{1}{2}\right)} = \underline{1.13039543477\dots}$$

27 Jul 97 E.W.  
P. 23

$$\log_2 = \underline{176827544309}$$

1/N Pattern

←	.176...	
←	5 , 655	0/1
→	1 , 526	
←	1 , 900	
→	1 , 110	
←	9 , 046	
21	, 462	
2	, 160	
6	, 223	
4	, 480	

like "8:11:14"

Zig-Zag Pattern

21 places

Was this calculation done in 92? Where?

$$G = ((4 + G^3)/2)^{\left(\frac{1}{4}\right)} = \underline{1.33693994610\dots}$$

28Jul97EW  
P.24

.418..

$$\log_2 = .\overbrace{418934662581\dots}$$

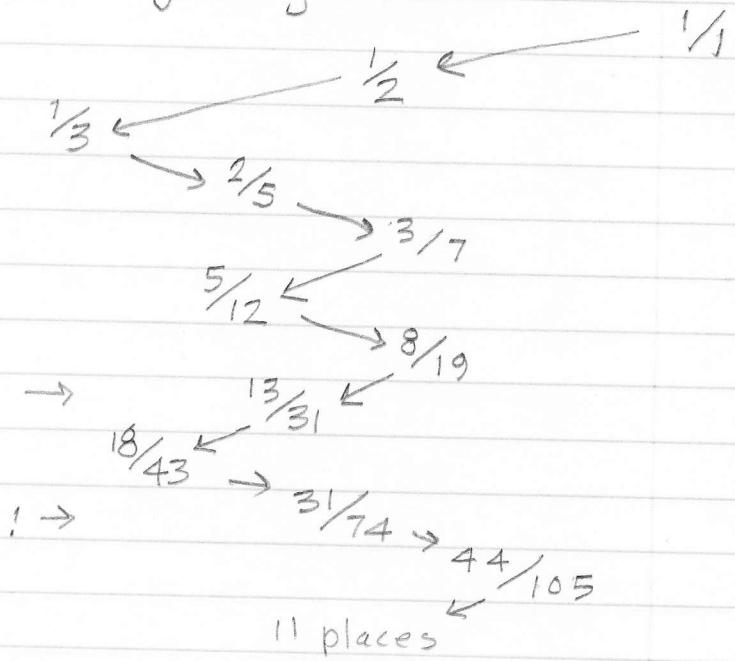
1/10 Pattern

	0/1
← 2	.387
→ 2	.583
← 1	.712
→ 1	.403
← 2	.478
→ 2	.089
11	.180
5	.544
1	.836

Like "3:4:5" proportion

See 1992

Zig-Zag Pattern



11 places

$$G = (8 - 4G)^{\frac{1}{4}} = \underline{1.29559774252\cdots}$$

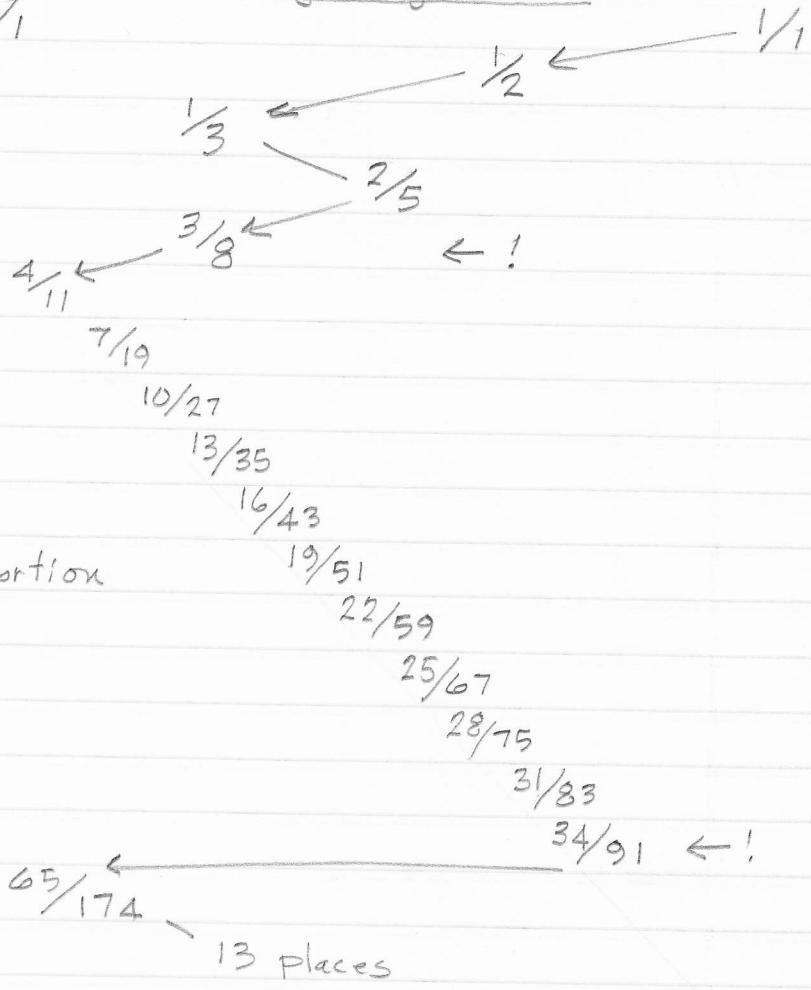
28 Ju 1978 w  
P. 25

$$\log_2 = \underline{.373617859462\cdots}$$

1/4 Pattern

.	.373...	%
← 2	.676	
→ 1	.478	
← 2	.091	
→ 10	.929	
1	.075	
13	.271	
3	.688	
1	.453	

Zig-Zag Pattern



Like "12:17:22" proportion

See 1992

$$G = (1 + G^2)^{\frac{1}{3}} = \underline{1.46557123187\dots}$$

28 Jul 97 E.W.

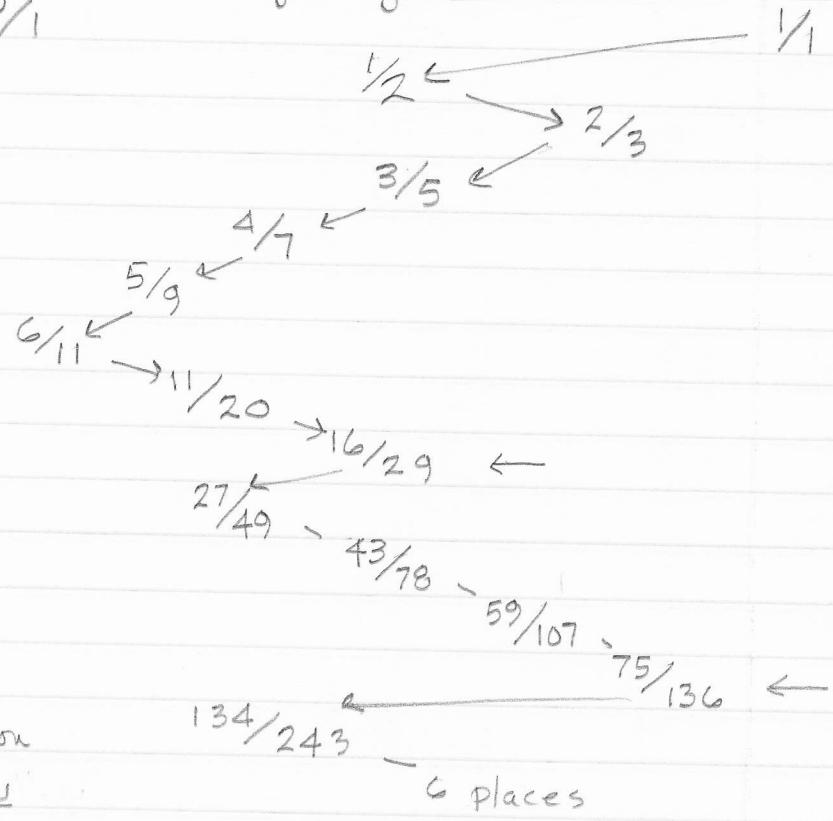
P.26

$$\log_2 = \underline{.551463089738\dots}$$

1/n Pattern

	.551...	0/1
← 1	, 813	
→ 1	, 229	
← 4	, 357	
→ 2	, 794	
← 1	, 258	
→ 3	, 865	
← 1	, 155	
6	, 423	
2	, 361	
2	, 765	

Zig-Zag Pattern



This is Meta-Pélog

Like "12:19:26" proportion

See; The Scales of Mt Meru

1993 by Erv Wilson

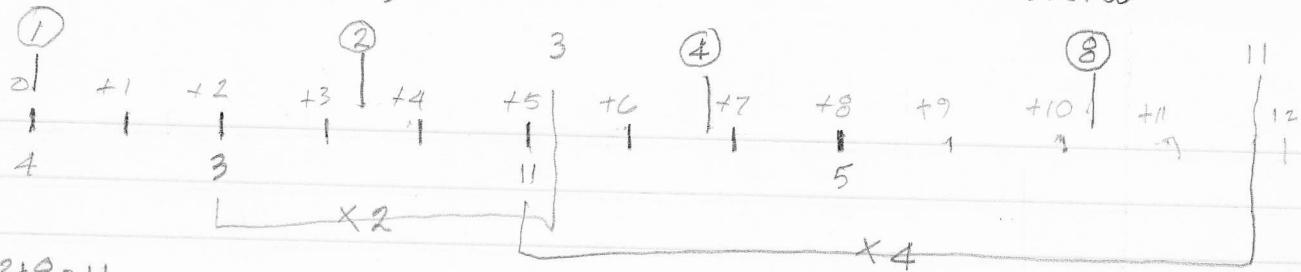
134/243 ← 6 places

$$G = ((8 + 2 \cdot G^2) / 4)^{\left(\frac{1}{5}\right)} = 1.22417813290\ldots$$

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Aug 10, 97 E.W.

P. 27a



$$\text{base: } 3+8=11$$

$$A_n = (8 \cdot A_{n-5} + 2 \cdot A_{n-3}) / 4 \Rightarrow G = ((8 + 2 \cdot G^2) / 4)^{\left(\frac{1}{5}\right)}$$

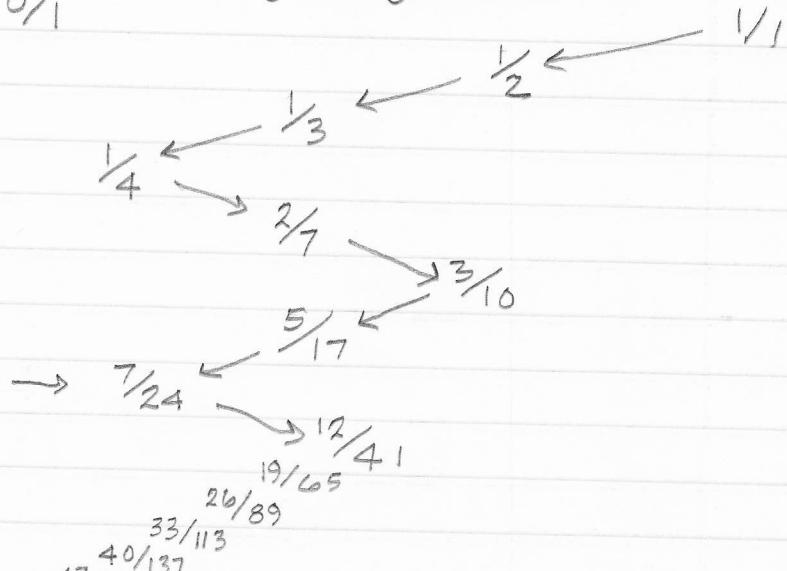
$$= 1.22417813290\ldots$$

$$\log_2 = \underbrace{.291813503090\ldots}_{\dots}$$

1/x Pattern

	.291111	-	0/1
←	3	.	426
→	2	.	342
←	2	.	917
→	1	.	089
←	11	.	115
→	8	.	687
1	.	453	
2	.	203	
4	.	907	

Zig-Zag Pattern



Like 3, 8, 11

and 6:11:16

75/257  
68/233  
82/281  
89/305  
171/586  
253/867

335/1148

417/1429

499/1710

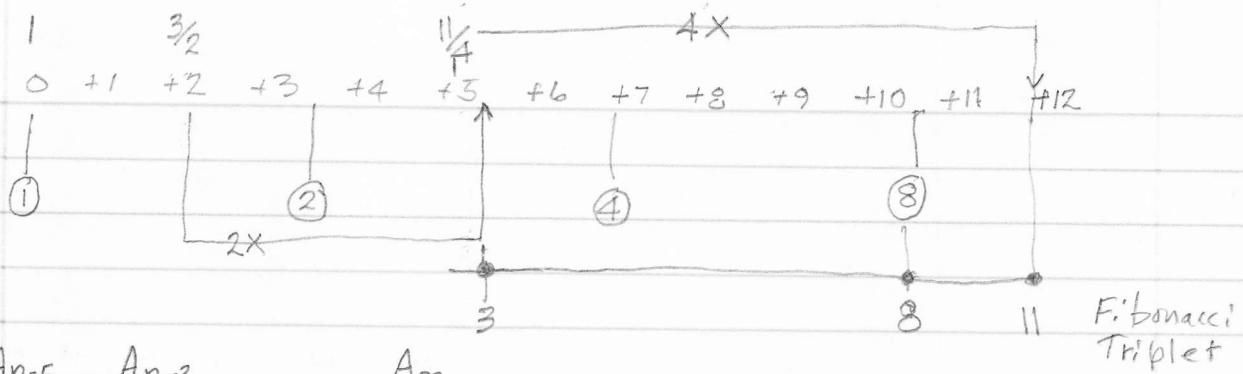
581/1991

663/2272

745/2553

Notes on 3, 8, 11,  $G = ((8+2G^2)/4)^{1/5}$  cont.

11 Aug 97 E.W.  
P. 27b



seed: 72 88 108 132 162 198 242 297 363 445 544.5 665.5 816.5  
998.25 1,222.75 1,497.25 1,830.125

examples  $((8 \cdot 72) + (2 \cdot 108))/4 = 198$

Recurrence  
 $(8 \cdot A_{n-5} + 2 \cdot A_{n-3})/4 = A_n$

u  $((8 \cdot 88) + (2 \cdot 132))/4 = 242$

(12)

.694241913631 2-interval Patterns
 $(\log_2 1.618\dots)$  © 1996 by Err Wilson

.694\dots

←	1	.440	0/1
→	2	.270	
←	3	.696	
→	1	.436	Ref. $A_n = A_{n-2} + A_{n-1}$
←	2	.289	
→	3	.448	
←	2	.228	
→	4	.373	
←	2	.676	
?	1	.478	

Zig-Zag Pattern

1/1

$\frac{1}{2}$        $\frac{2}{3}$        $\frac{3}{4}$   
 $\frac{5}{7}$        $\frac{7}{10}$   
 $\frac{9}{13}$        $\frac{16}{23}$   
 $\frac{25}{36}$   
 $\frac{34}{49}$        $\frac{59}{85}$   
 $\frac{84}{121}$        $\frac{109}{157}$   
 $\frac{193}{278}$   
 $\frac{277}{399}$        $\frac{470}{677}$   
 $\frac{663}{955}$   
 $\frac{856}{1233}$        $\frac{1049}{1511}$   
 $\frac{1905}{2744}$   
 $\frac{2761}{3977}$

RCL 2

+

RCL 1

=

STO 2

R/S

+

RCL 1

=

Reseed example

STO 1

-2 -1

4 9 13 22 35 57 92 149 241 390 631 1,021 1,652 2,673 4,325 6,998

11,323 18,321 29,644 47,965 77,609 125,574 203,183 328,757 531,940 860,697

1,392,637 2,253,334 3,645,971 5,899,305 9,545,276 15,444,581 24,989,857

40,434,438 65,424,295 105,858,733 171,283,028 277,141,761 448,424,789

554,283,522 1,002,708,311 1,556,991,833 2,559,700,144 4,116,691,977 6,676,392,121

725,566,550 1,173,991,339 1,899,557,889 3,073,549,228 4,973,107,117 8,046,656,345

MOS of 1.46557123188 ( $\log_2 = .551463089748$ )

(13)

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.551...

Zig-Zag Pattern

← 1 .813  
→ 1 .229  
← 4 .357  
→ 2 .794  
← 1 .258  
→ 3 .865  
← 1 .155  
6 .423  
2 ? .360

0/  
1/2  
 $\frac{3}{5}$   
 $\frac{4}{7}$   
 $\frac{5}{9}$   
 $\frac{11}{20}$   
 $\frac{16}{29}$   
 $\frac{27}{49}$   
 $\frac{43}{78}$   
 $\frac{59}{107}$   
 $\frac{75}{136}$   
 $\frac{134}{243}$   
6 pl

RCL 1  
+

Ref:  $B_n = B_{n-3} + B_{n-1}$

RCL 3  
=

STO 3,

R/S

-3 -2 -1

Meta-Pe<sup>l</sup>og

+

1 1 1 2 3 4 6 9 13 19 28 41 60 88 129 189 277 406 595 872

RCL 2

1,278 1,873 2,745 4,023 5,896 8,641 12,664 18,560 27,201 39,865

=

58,425 85,626 125,491 183,916 269,542 395,033

STO 2,

R/S

+

RCL 1

Example of re-seed:

=

1 2 2 3 5 7 10 15 22 32 47 69 101 148 217 318 466 683 1,001

STO 1,

1,467 2,150 3,151 4,618 6,768 9,919 14,537 21,305 31,224

45,761 67,066 98,290 144,051 211,117 309,407 453,458 664,575

973,982 1,427,440 2,092,015 3,065,997 4,493,437 6,585,452

9,651,449 14,144,886 20,730,338 30,381,787 44,526,673

65,257,011 95,638,798 140,165,471

1.3247179572447461 M.H.

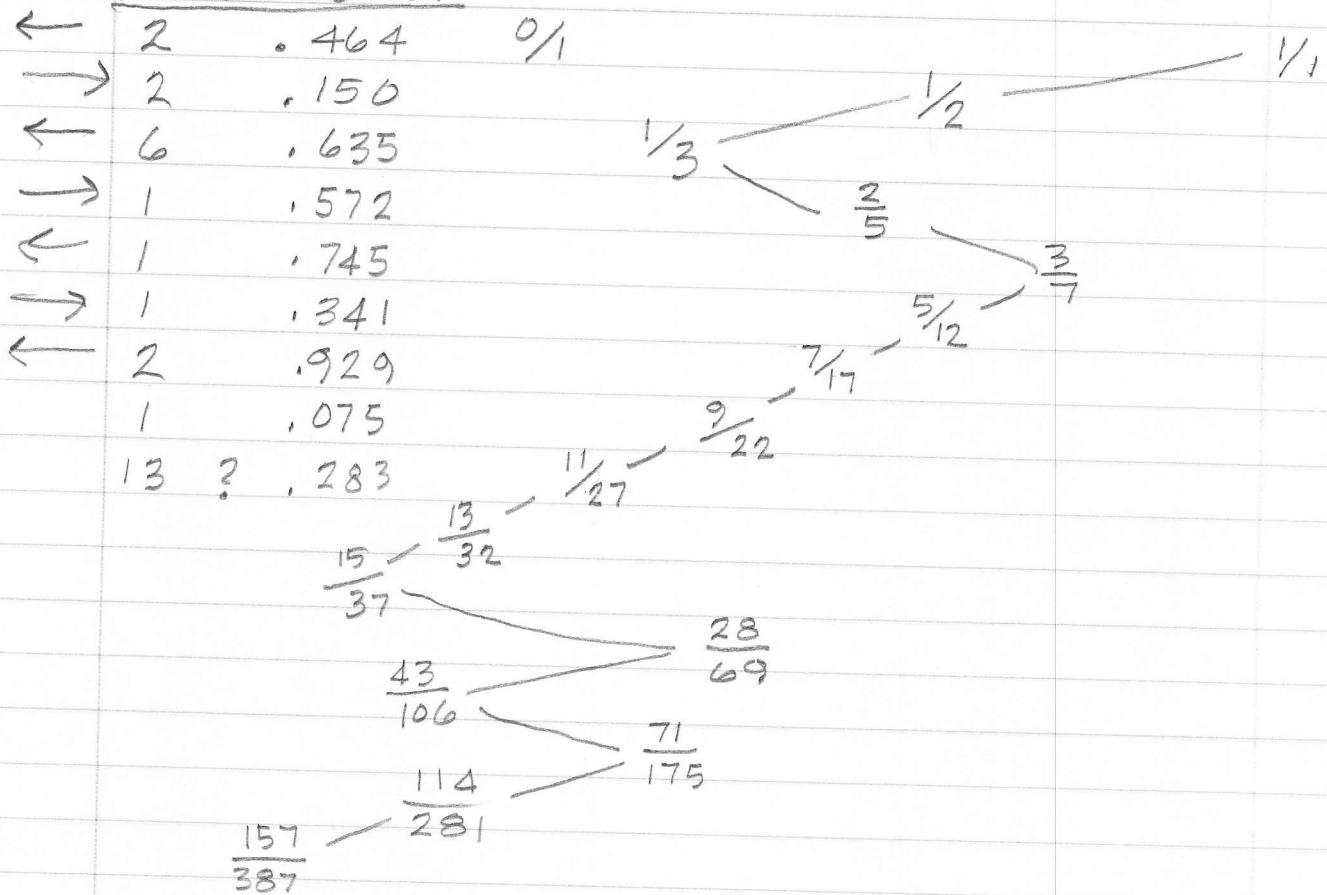
MOS of 1.324717957 (ref  $C_n = C_{n-3} + C_{n-2}$ ) \*

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(14)

$\log_2 =$

.405685231



\* Also ref:  $F_n = F_{n-5} + F_{n-1}$  ! ←

(Are there any more duplicates like this?)

MOS of 1.38027756910 (ref.  $D_n = D_{n-4} + D_{n-1}$ )

(15)

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$\log_2 =$

.464958417219 0/1

1/1

← 2. .150 (1/4)

1/2

→ 6. .634 etc

1/3

1/2

← 1 .576

2/5

→ 1 .735

3/7

← 1 .360

4/9

→ 2 .774

5/11

← 1 .290

6/13

3 .440

7/15

2 ? .267

13/28

20/43

33/71

53/114

73/157

126/271

RCL 1

+

RCL 4

=

STO 4

+

RCL 3

Reseed Dec 23, 1996

= example:

STO 3 ↑ ↓ ↓

+ -4 -3 -2 -1

RCL 2 8 11 15 21 29 40 55 76 105 145 200 276 381 526 726 1,002

=

STO 2 1,383 1,909 2,635 3,637 5,020 6,929 9,564 13,201 18,221 25,150 34,714

+

RCL 1 47,915 66,136 91,286 126,000 173,915 240,051 331,337 457,337 631,252

=

STO 1 871,303 1,202,640 1,659,977 2,291,229 3,162,532 4,365,172 6,025,149

8,316,378 11,478,910 15,844,082 21,869,231 30,185,609 41,664,519 57,508,601

79,377,832 109,563,441

MOS of 1.220744085 (ref.  $E_n = E_{n-4} + E_{n-3}$ ) (16)

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$\log_2 =$

.287760788

← 3 , .475      0/1

→ 2 , .104

← 9 , .543

→ 1 , .839

← 1 , .191

→ 5 , .227

← 4 , .390

2 , .562

1 ? , .779

$\frac{1}{4}$  ←  $\frac{1}{3}$  ←

$\frac{2}{7}$  ←

$\frac{3}{10}$

$\frac{5}{17}$

$\frac{7}{24}$

$\frac{9}{31}$

$\frac{11}{38}$

$\frac{13}{45}$

$\frac{15}{52}$

$\frac{17}{59}$

$\frac{19}{66}$

$\frac{21}{73}$

$\frac{40}{139}$

$\frac{61}{212}$

$\frac{101}{351}$

$\frac{141}{490}$

$\frac{181}{629}$

$\frac{221}{768}$

$\frac{261}{907}$

$\frac{482}{1675}$

$\frac{703}{2443}$

$\frac{924}{3211}$

$\frac{1145}{3979}$

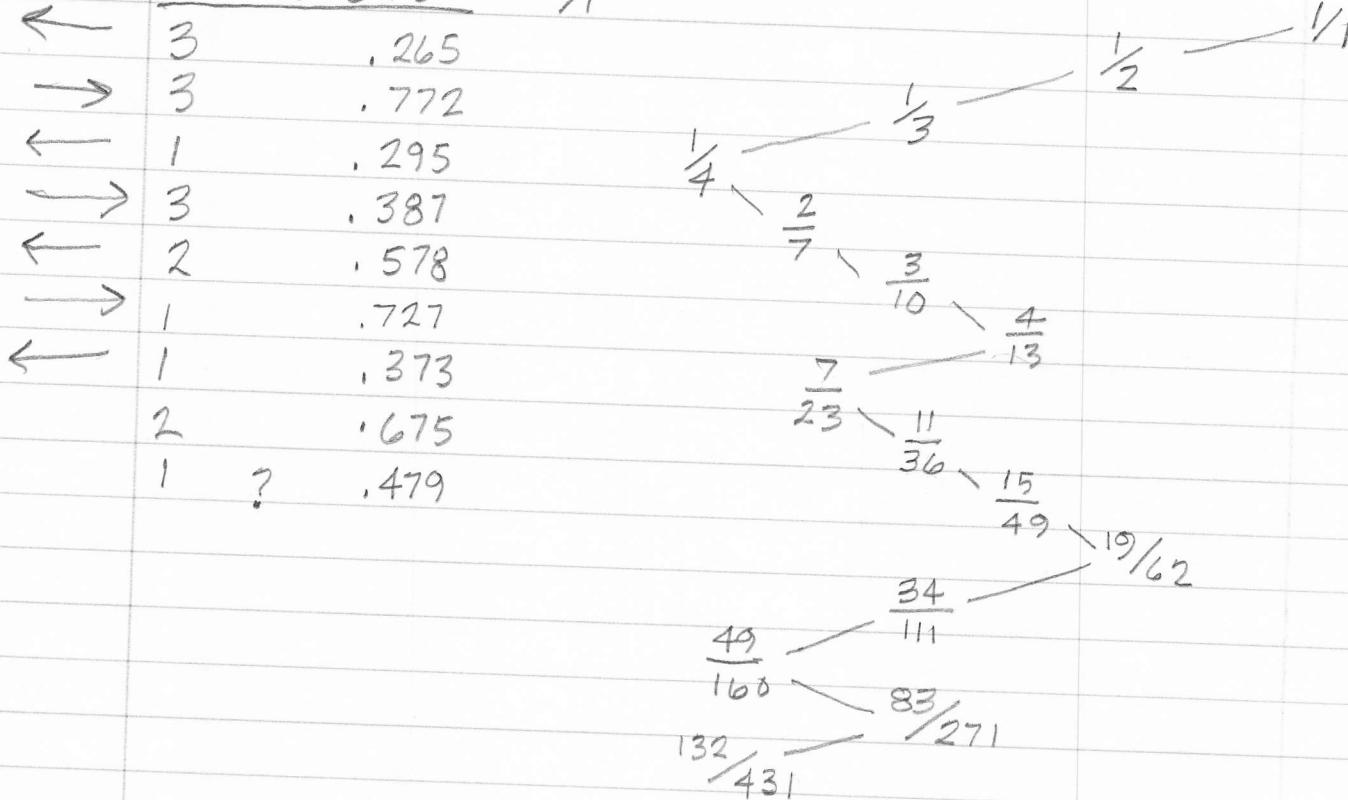
MOS of 1.236505703 (ref.  $G_n = G_{n-5} + G_{n-2}$ ) (17)

$\log_2$

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.3062688937

0/1

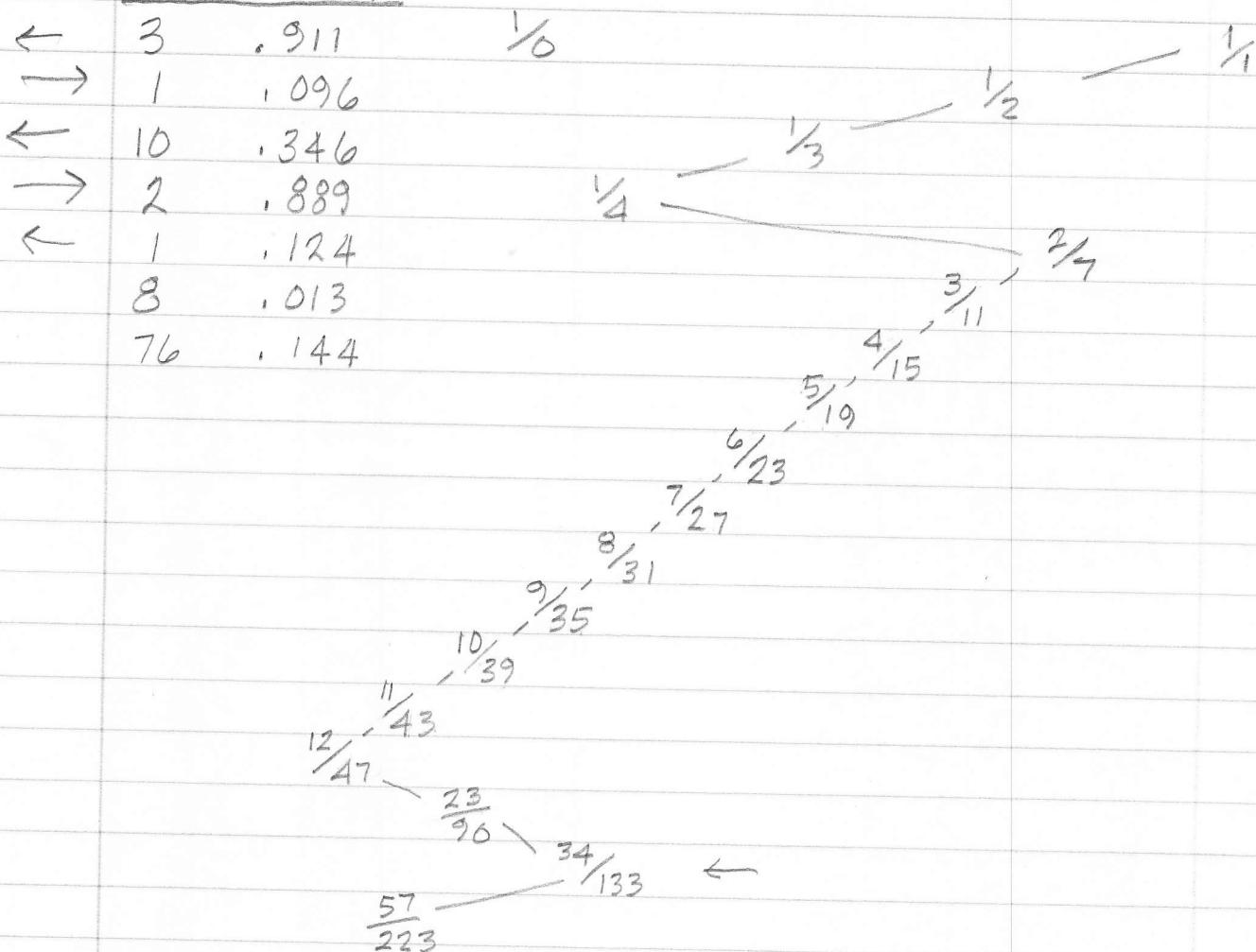


MOS of 1.193859111 (ref.  $H_{n-5} + H_{n-3} = H_n$ ) (18)

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$\log_2$

255632592

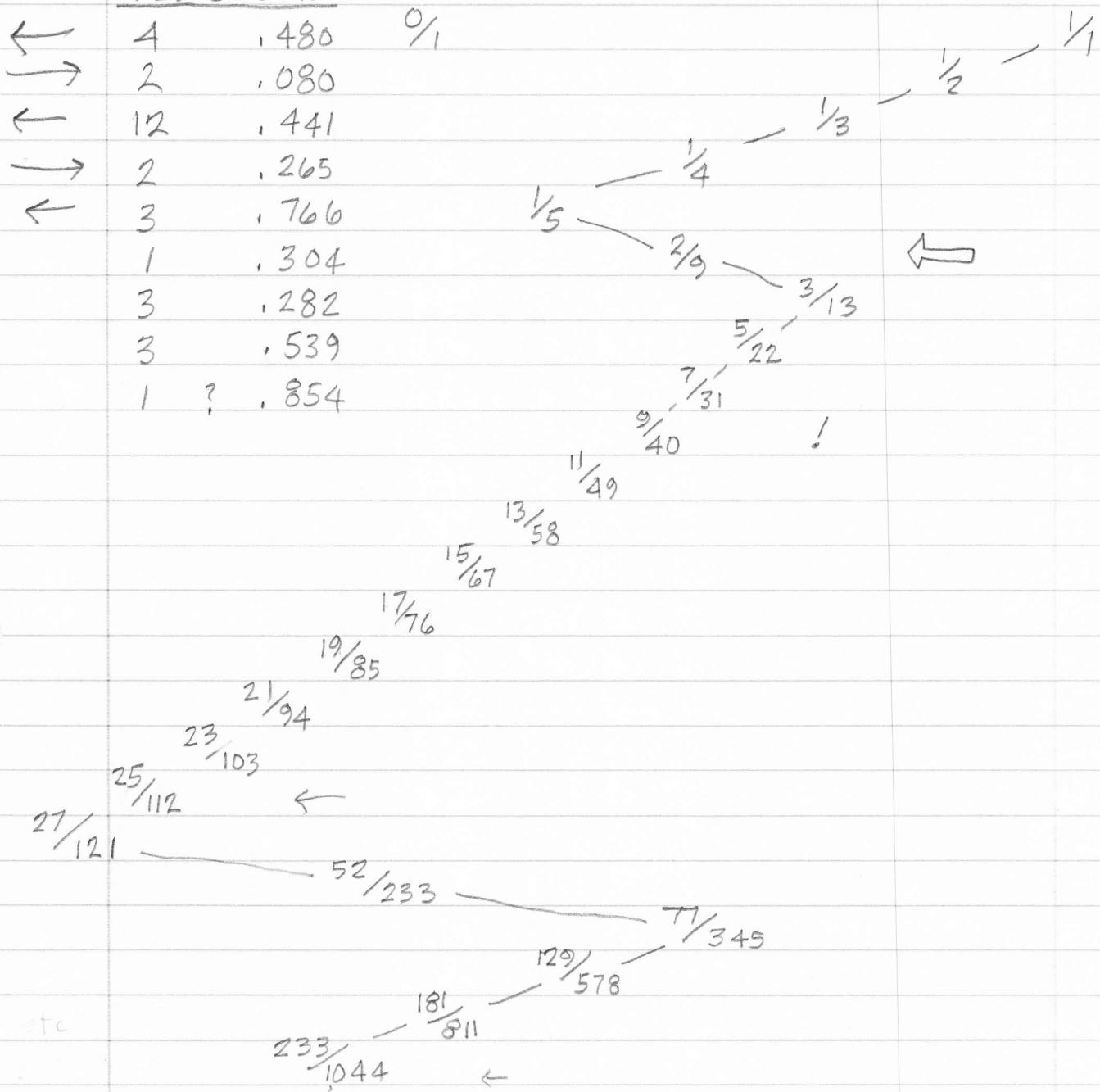


MOS of 1.167303978 (ref.  $I_n = I_{n-5} + \frac{1}{n-4}$ ) (19)

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$\log_2$

.2231803026



12 14      reseed examples Nov 19, 1996

6 19 23 26 30 35 42 49 56 65 77 91 105 121 142 168

$$(\div 4 = 42)$$

196 226 263 310 364 422 489 573 674 786 911 1,062 1,247

$$(\div 4 = 49)$$

$$(\div 4 = 91)$$

OR this! 10 12 14 16 19 22 26 30 35 41 48 56 65 76 89 104 121 141 165 !

5/12

32/77

27/65

49/118

22/53

61/147

39/94

56/135

17/41

80/193

63/152

109/263

46/111

121/292

75/181

104/251

· 29/70 ·

- 99/239 -

· 70/169 ·

111/268

· 41/99 ·

94/227

53/128

65/157

12/29

(1,1,2)

.581138830083

$$53 \times 5 = 265!$$

1.	7207
1.	3874
2.	581      08

### 1/4 Pattern

.581      0/1

← 1 .720

→ 1 .387

← 2 .581

→ 1 .720

1 .387

2 .581

1 .720

1 .387

2 .581

1 .720

1 .387

2 .581

1 .720

1 .387

2 .581

1 .720

1 .387

2 .581

1 .720

1 .387

### Zig-Zag Pattern

1/2      ↙      ↖ 1/1

2/3

3/5

4/7

7/12

11/19

18/31

25/43

43/74

68/117

111/191

154/265

265/456

5x53 / 24x19

419/721

684/1177

949/1633

1633/2810

2582/4443

4215/7253

5848/10,063

10063/17316

1.720759217

15,911/27,379

25974/44695

1.581138831

1.632455532

36037/62011

62011/106706

1.387425897

1.720759220

98048/168717

160059/275,423

1.581138830

1.632455532

222,070/382,129

382,129/168717

1.387425887

and so forth

a period 382129/62011 = 6.162277660!

↙

$$(\sqrt{7}+1)/2$$

1.82287565553...

1/16 pattern

1	,822
1	,215
4	,645
1	,548
1	,882
1	,215
4	,645
1	,548

Dear Warren Burt,

Diagram for Meta-Pelog  $G = (1 + G^2)^{\frac{1}{3}}$  Aug 1, 1997  
and Phi;  $G = (1+G)^{\frac{1}{2}}$ ; and Meta-Slendro,  $G = (1+G)^{\frac{1}{3}}$

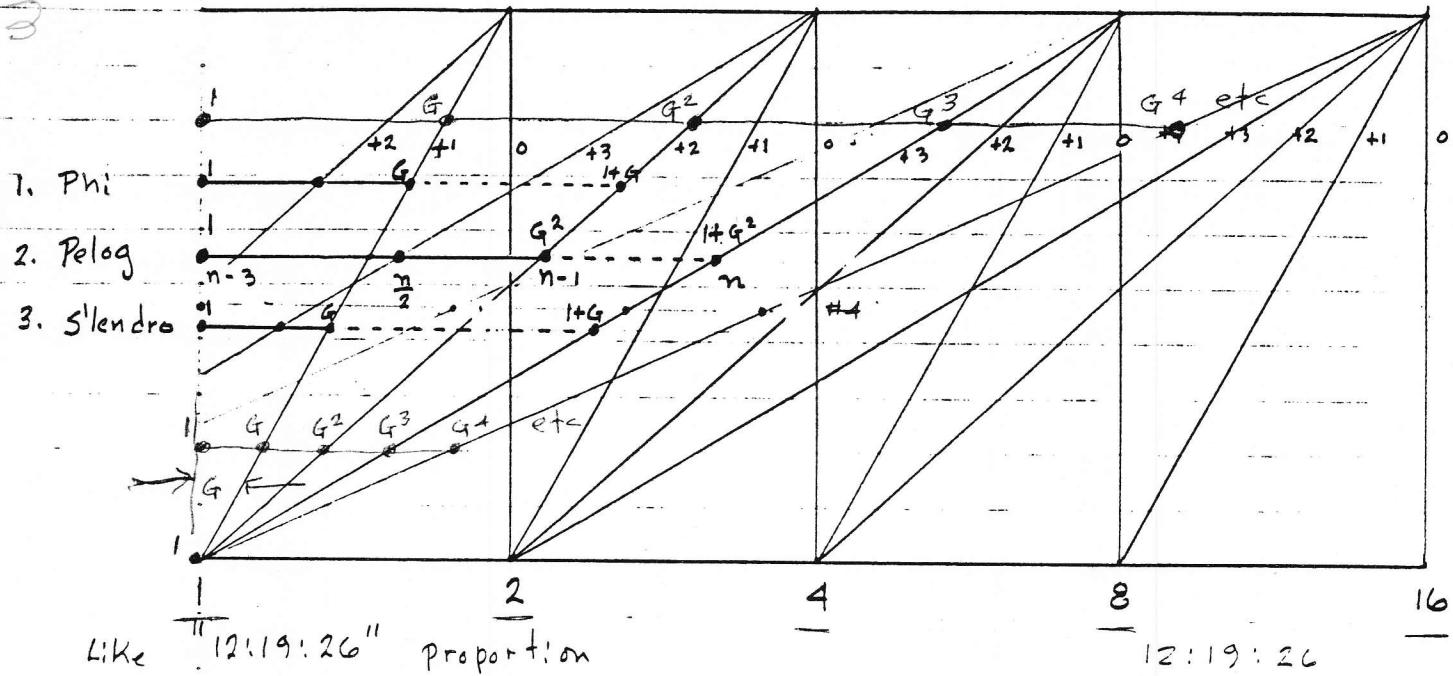
(0)

(1 8ves)

(2 8ves)

(3 8ves)

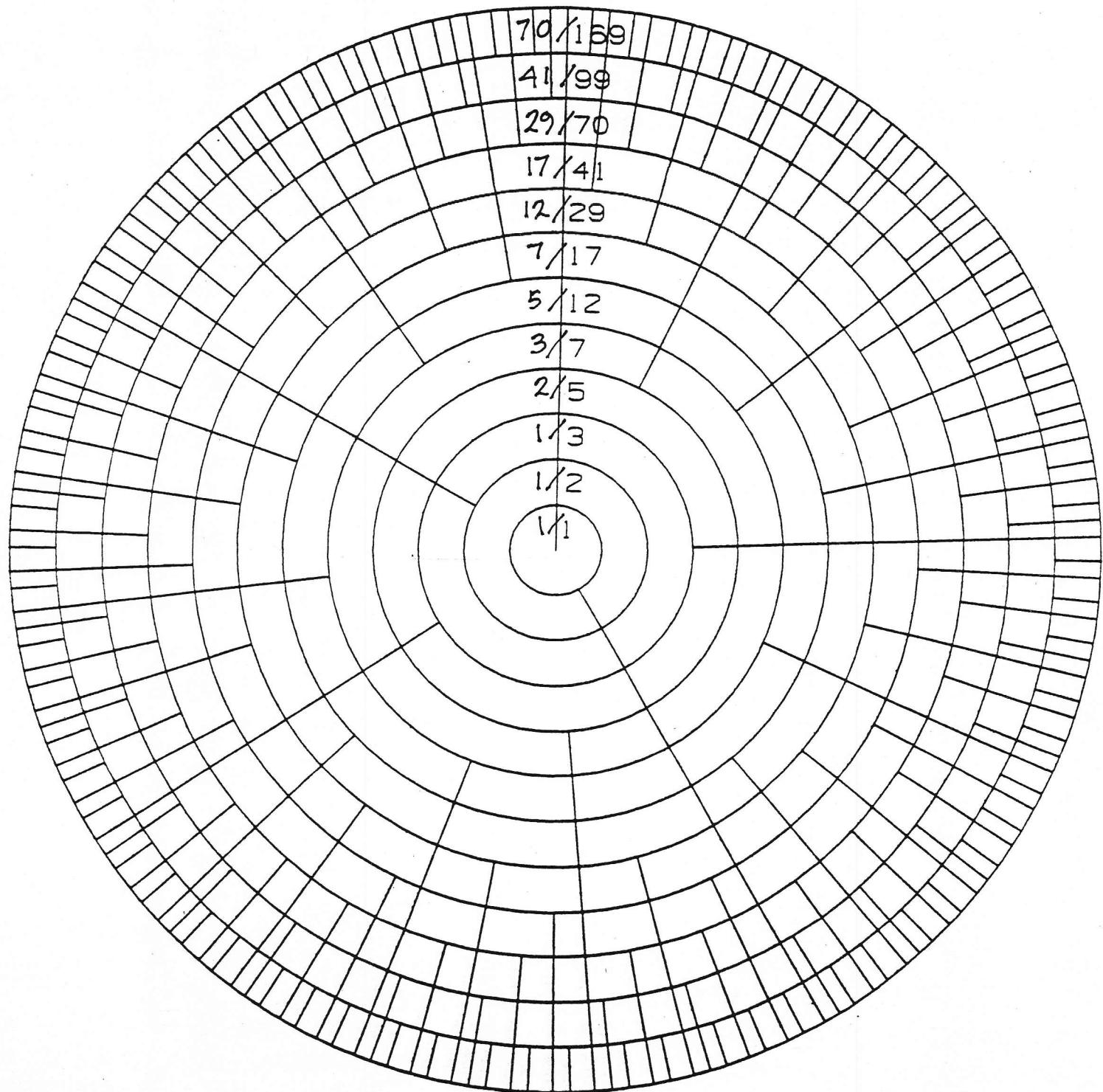
(4 8ves)



#4 5:9:13:(18)

Ultimately - the respective recurrent sequences taken from the sums-of-the-diagonals thru Pascals Triangle (Meru Prastara) converge upon a limit-chain of logarithmically equal intervals, designated here by generator ( $G$ ). Fig 12 shows a sample of the variability in magnitude of  $G$ . A continuum of the  $G$ -chain can be mapped to a straight-line pattern as shown. It is notable that discreet points,  $\phi$ -like in derivation, along the continuum, are imbued with Fibonacci triplets  $[1, G, (1+G)]$ ,  $[1, G^2, (1+G^2)]$  which the ear can perceive. As the diagonals are taken from larger and larger triangles  $G$  gets smaller and smaller. And as the triangle gets endlessly large the chain-of- $G$  reduces endlessly toward a point.  $G$  in a sense then is the meta-Phi Continuum, which in the process of expansion produces a Chain-of- $G$  whose imbedded Fibonacci triplets undulate dramatically between very simple and very complex Meta-Phi signatures. This shows up in the wave-form display. Great great stuff!

Regards, Emerson



33

2-ZIG/2-ZAG

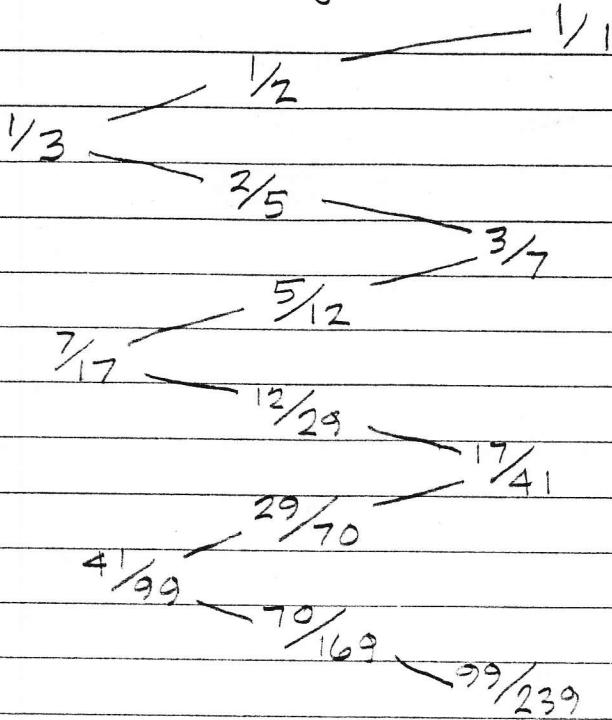
.414213563

(149.1168827)

.414213562374 Sequence

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Dec 22, 1996



This progression was my answer to Yasser, at about 1950!