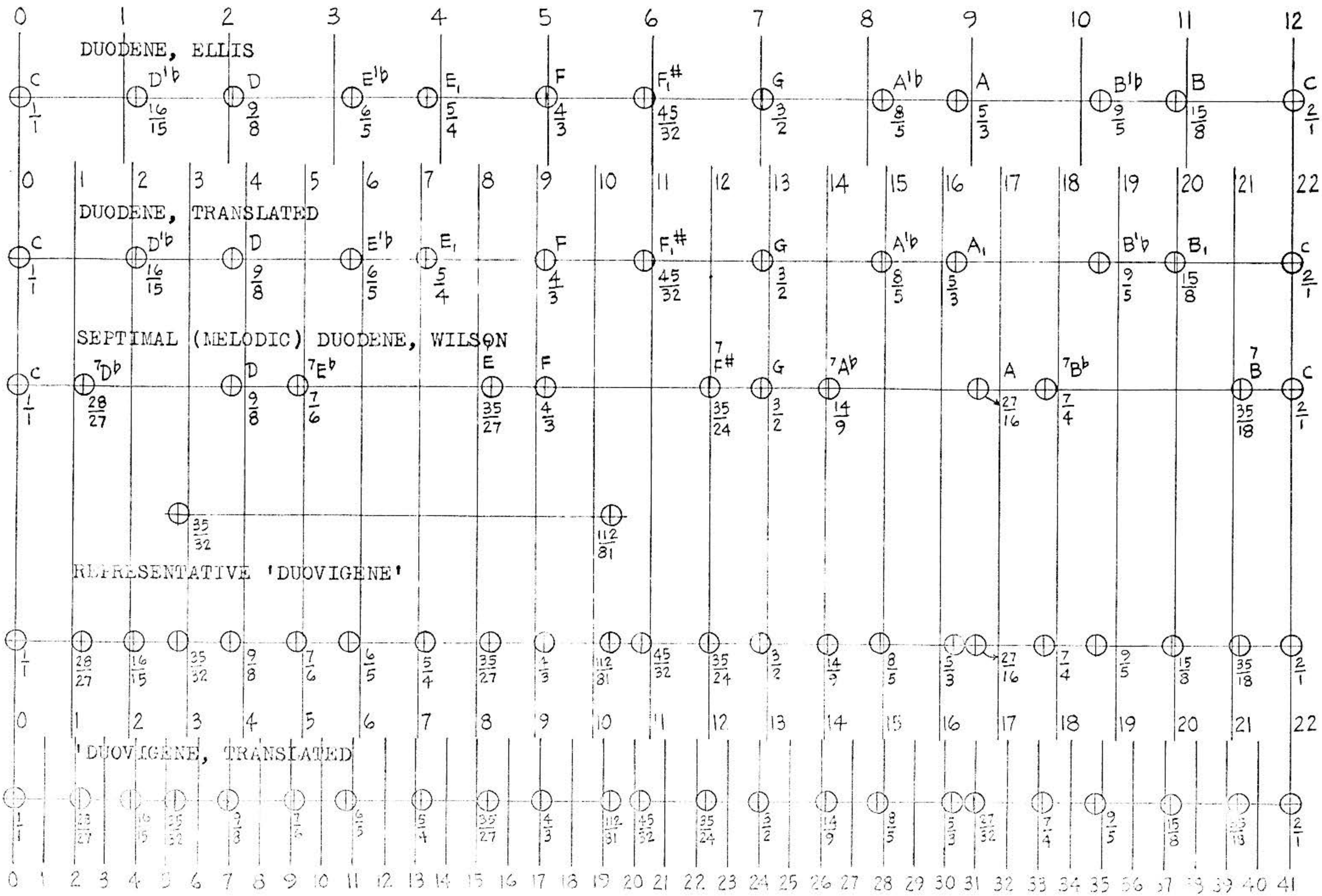
John,
Greetings
Erv

ACOUSTICAL STUDY

Issued 5 Aug 64 by E. Wilson



n	$\sqrt[22]{2}^{\,n}$		$\frac{50.50}{\sqrt[22]{2}^{\,n}}$	$\frac{25.25}{\sqrt[22]{2}^{\,n}}$	$\frac{12.625}{\sqrt[22]{2}^{\,n}}$
0.	1.0000	00000	50.500	nut → 25.250	12.625
1.	1.0320	08280	48.934	24.467	12.233
2.	1.0650	41090	47.416	23.708	11.854
3.	1.0991	31223	45.945	22.973	11.486
4.	1.1343	12521	44.520	22.260	11.130
5.	1.1706	19914	43.140	21.570	10.785
6.	1.2080	89444	41.802	20.901	10.450
7.	1.2467	58309	40.505	20.252	10.126
8.	1.2866	64898	39.249	19.624	9.812
9.	1.3278	48827	38.031	19.016	9.508
10.	1.3703	50984	36.852	18.426	9.213
11.	1.4142	13562	35.709	17.854	8.927
12.	1.4594	80106	34.601	17.301	8.650
13.	1.5061	95554	33.528	16.764	8.382
14.	1.5544	06282	32.488	16.244	8.122
15.	1.6041	60154	31.481	15.740	7.870
16.	1.6555	06560	30.504	15.252	7.626
17.	1.7084	96478	29.558	14.779	7.390
18.	1.7631	82511	28.641	14.321	7.160
19.	1.8196	18948	27.753	13.876	6.938
20.	1.8778	61820	26.892	13.446	6.723
21.	1.9379	68947	26.058	13.029	6.514
22.	2.0000	00000	25.250	12.625	6.312

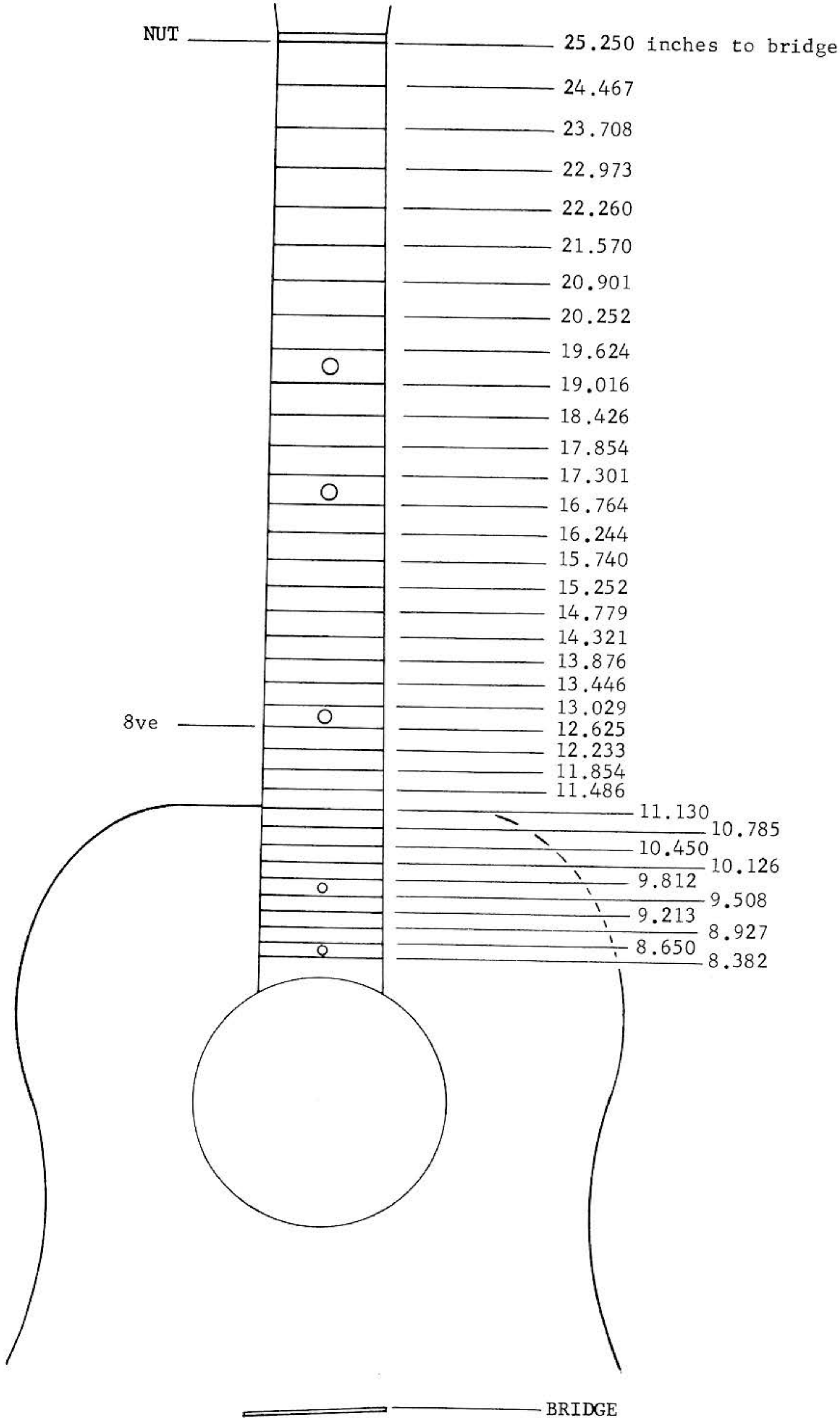
22nd Roots of 2

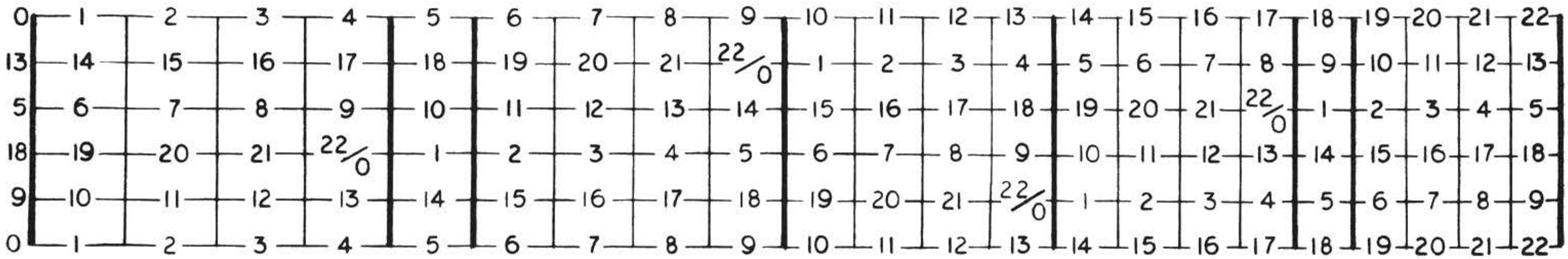
— String lengths 22T —

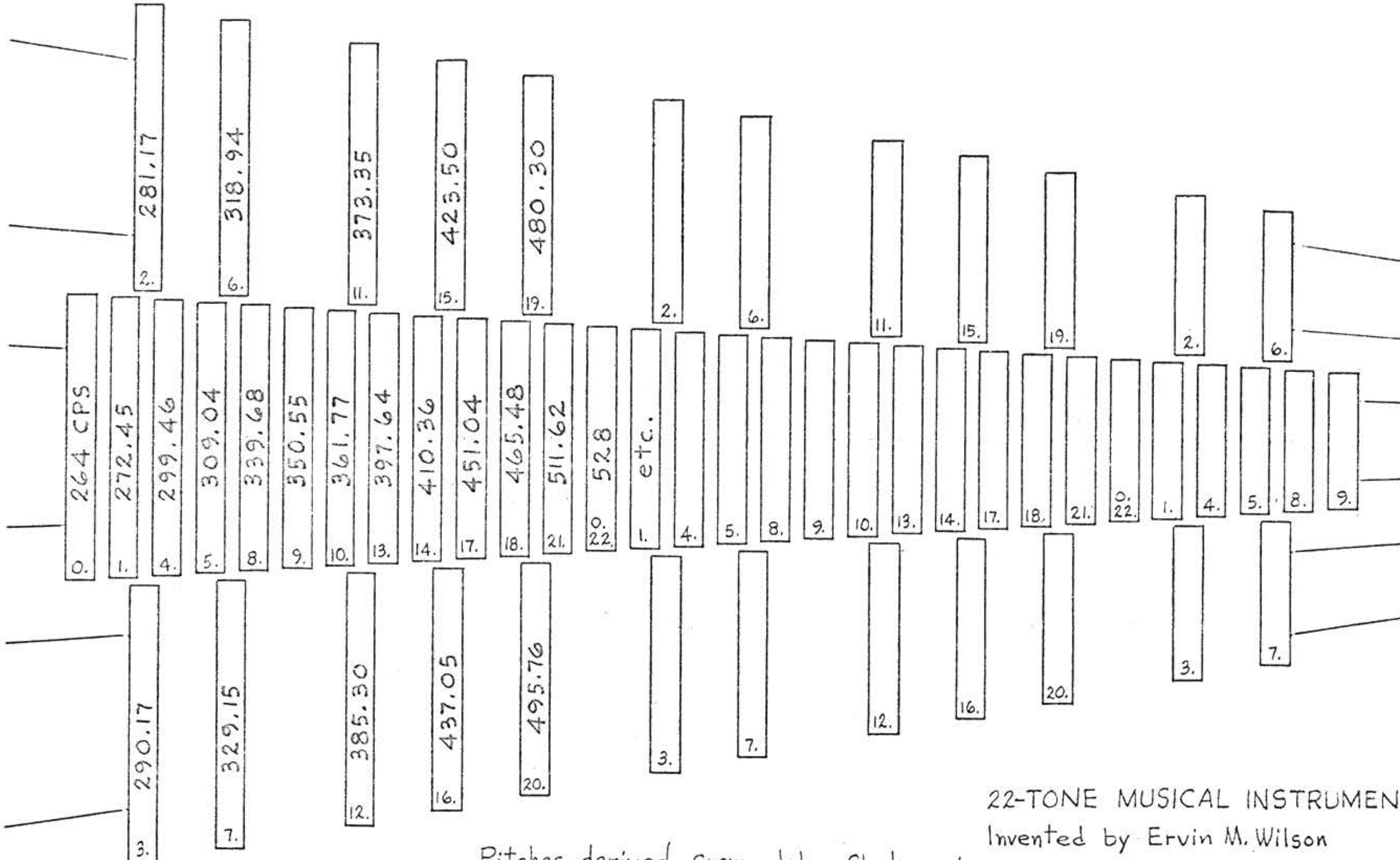
Issued: Erv Wilson 10 JAN 64

22-TONE GUITAR

Issued by Erv Wilson 14 Jan 64




0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
13 14 15 16 17 18 19 20 21 22/0 1 2 3 4 5 6 7 8 9 10 11 12 13
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22/0 1 2 3 4 5
18 19 20 21 22/0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
9 10 11 12 13 14 15 16 17 18 19 20 21 22/0 1 2 3 4 5 6 7 8 9
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22



Pitches derived from John Chalmers' Conversion Tables, 10,000-Tone

22-TONE MUSICAL INSTRUMENT
Invented by Ervin M. Wilson

Issued Oct 6, 1970

19 April 69
1219 Poinsettia Drive
L. A. 90046

John,
Hi; As it so happens, dave Rothenberg is down here. I~~t~~ introduced him to the EMA last tuesday and he told us briefly what he was doing. We are all meeting here at my place this coming Tuesday to continue his discussion. I hope he can give us some kind of audible illustration on the kromafone because, frankly, his math overwhelms me.

I've found ~~for~~ four species of articulate eikosany generating hexads, in 22.

I

1x	0	1	3	12	21	6	(1 2 3 6 9 1)
3x	0	3	9	14	19	18	(3 6 5 4 1 3)
5x	0	5	15	16	17	8	(5 3 7 1 1 5)
7x	0	7	21	18	15	20	(7 8 3 2 1 1)
9x	0	9	5	20	13	10	(5 4 1 3 7 2)

II

1x	0	1	3	7	13	21	(1 2 4 6 8 1)
3x	0	3	9	21	17	19	(3 6 8 2 2 1)
5x	0	5	15	13	21	17	(5 8 2 2 4 1)
7x	0	7	21	5	3	15	(3 2 2 8 6 1)
9x	0	9	5	19	7	13	(5 2 2 4 6 3)

III

1x	0	1	3	11	17	21	(1 2 8 6 4 1)
3x	0	3	9	11	7	19	(3 4 2 2 8 3)
5x	0	5	15	11	19	17	(5 6 4 2 2 3)
7x	0	7	21	11	9	15	(7 2 2 4 6 1)
9x	0	9	5	11	21	13	(5 4 2 2 8 1)

! IV

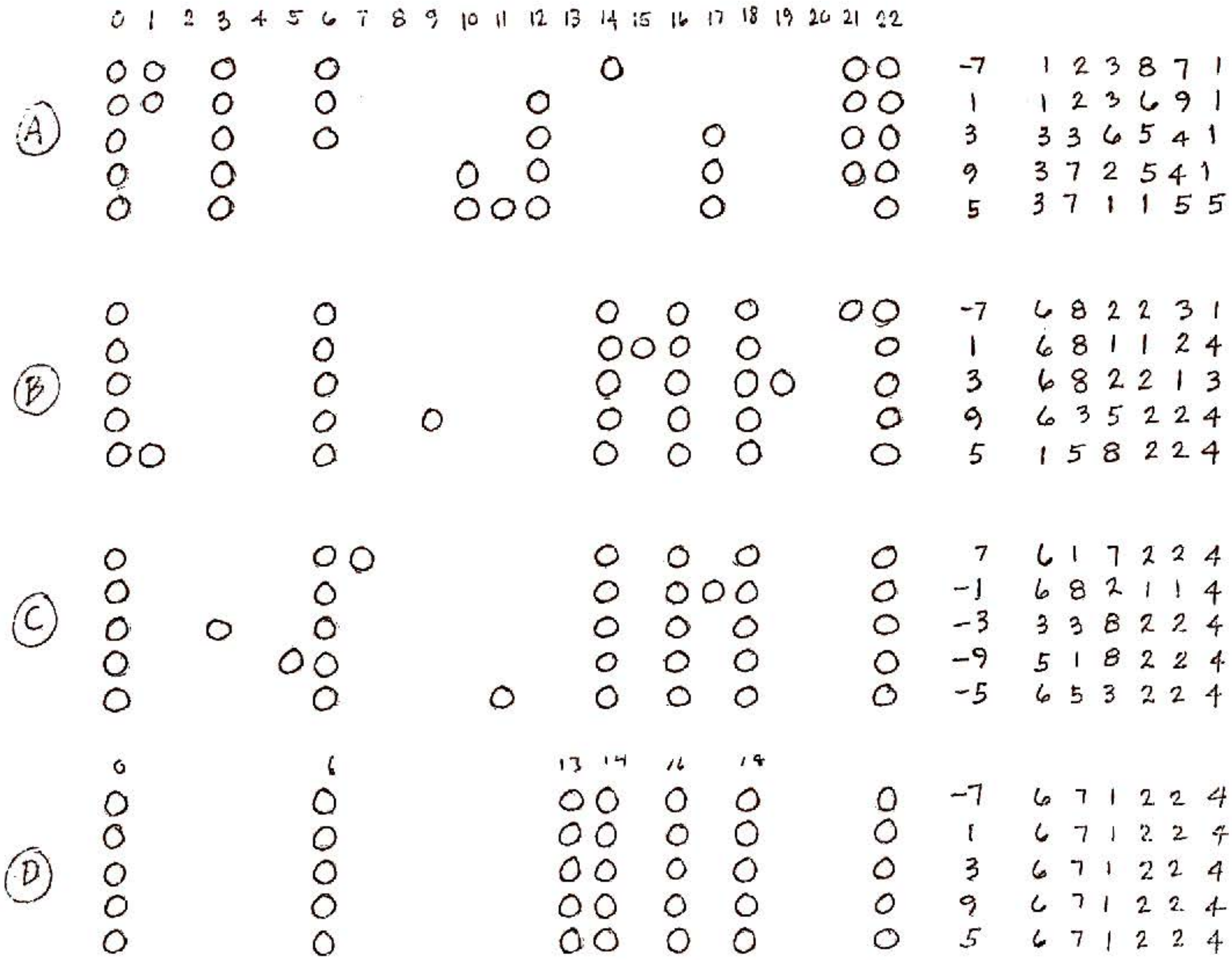
1x	0	1	3	5	9	15	(1 2 2 4 6 7)
3x	0	3	9	15	5	1	(1 2 2 4 6 7)
5x	0	5	15	3	1	9	(1 2 2 4 6 7)
7x	0	7	21	13	19	17	(7 6 4 2 2 1)
9x	0	9	5	1	15	3	(1 2 2 4 6 7)

By jugling and superposing the hexads in each specie a notable homogeneity can be observed. This homogeneity reaches its maximum in group IV where, quite surprisingly, the transforms are identical in melodic sequence (or reciprocal in the case of 7x).

This could very well represent all the articulate eikosanys in 22, but it will be a very tedious job proving it. On the other hand it is not unthinkable that I have slipped up on a whole set.

I was thinking the other day about Wm Lyman Young's suggestion that the semi-Fifth be used as a measuring rod, and his proposed 7-10-7 quartertone keyboard; trying to reconstruct it without referring to his document (report to the Swedish Royal Academy of Music) I got this very surprising and interesting result:

24 21
17 14
7 4 1

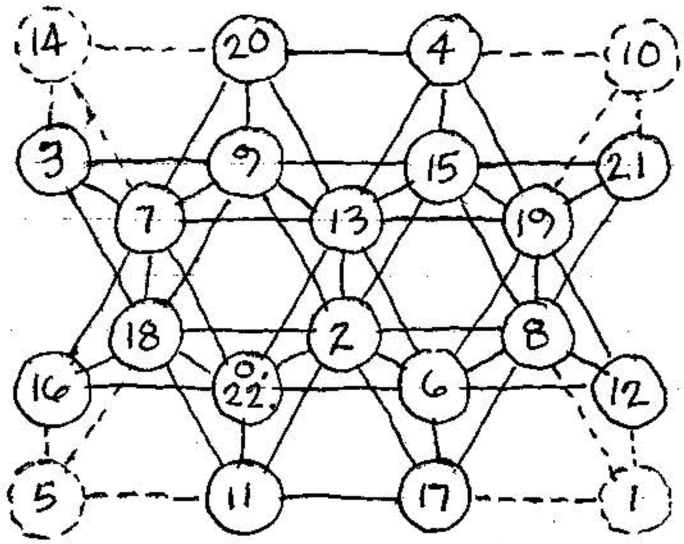


Chains of Hexad Transforms. These hexads generate articulate eikosanys. (See attached sheets cross-referenced A B C D.)

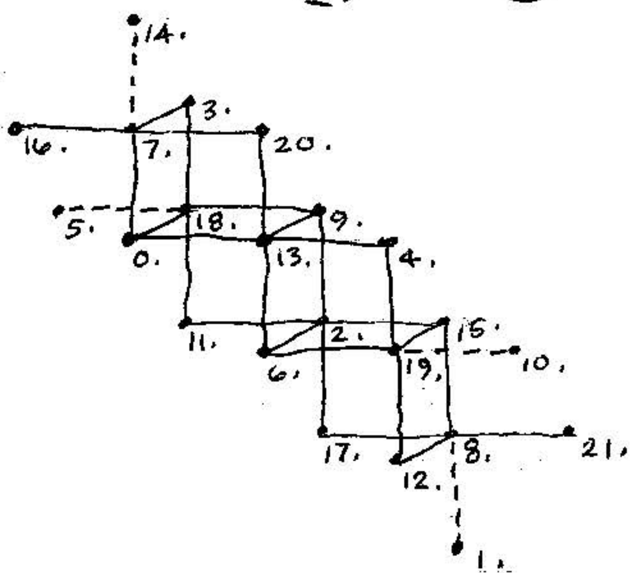
42
28

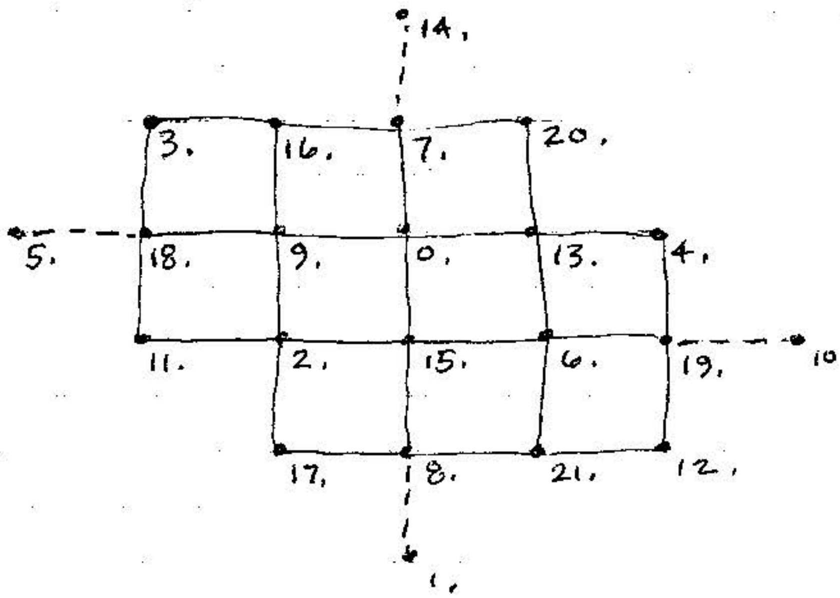
0 6 13 14 16 18

0 20

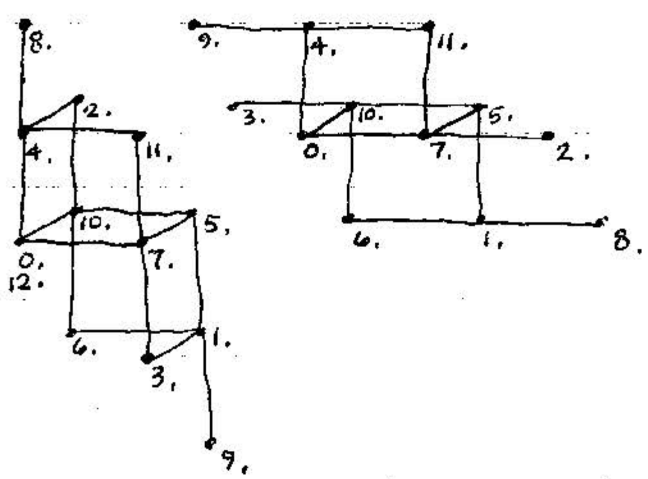


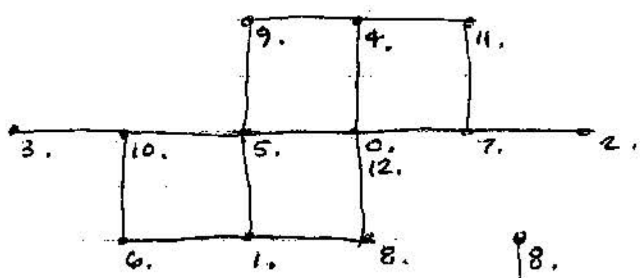
which give latices
(adding degree 14, 10, 5, 1
as shown)

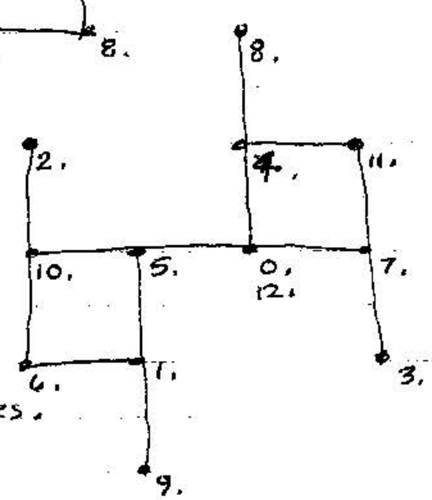




component 12-Tone scales of interest are:

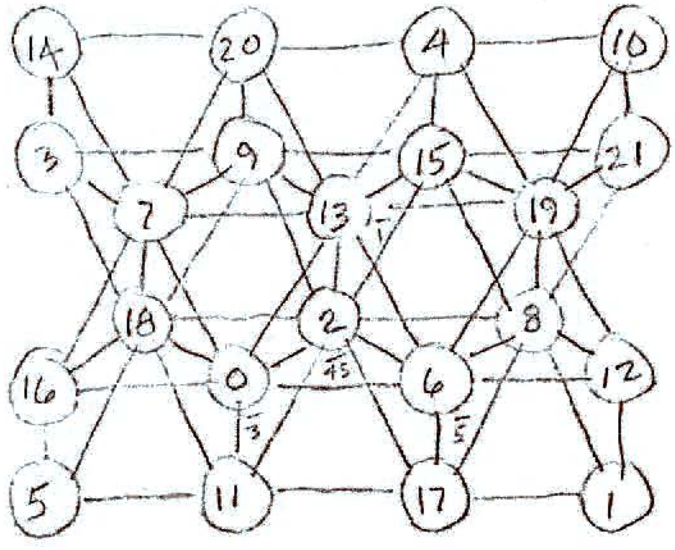




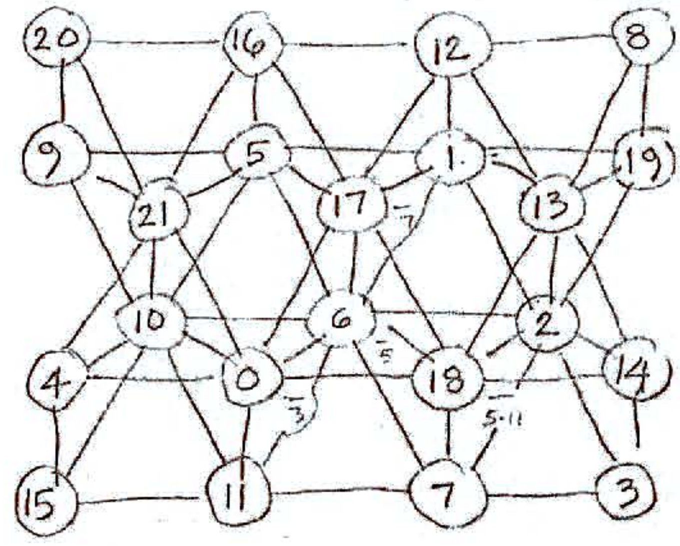


These, like the star-scale duplicate themselves
in there respective 22 tone systems with 6 common Tones.
I'll talk to you later. Yours.

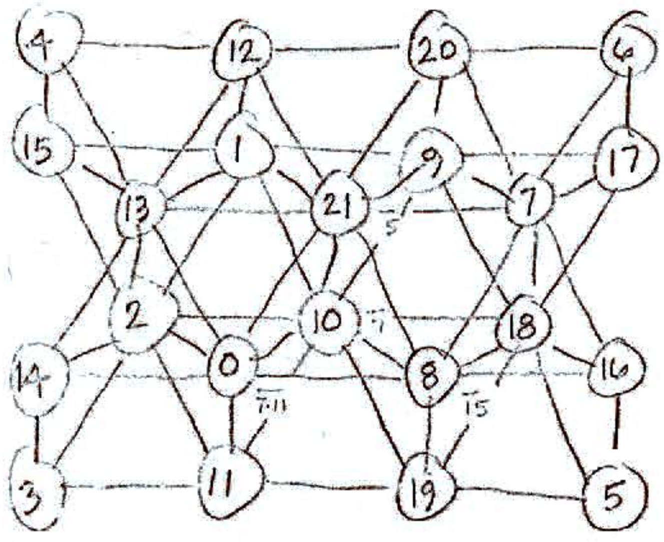
Erv



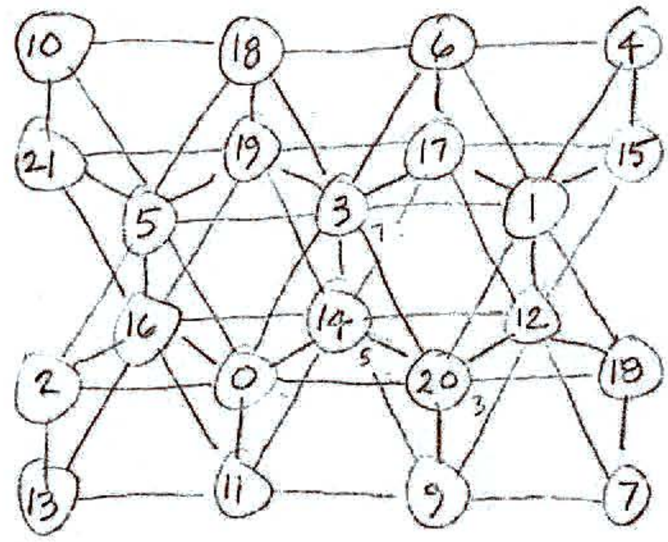
1



[1, 3]

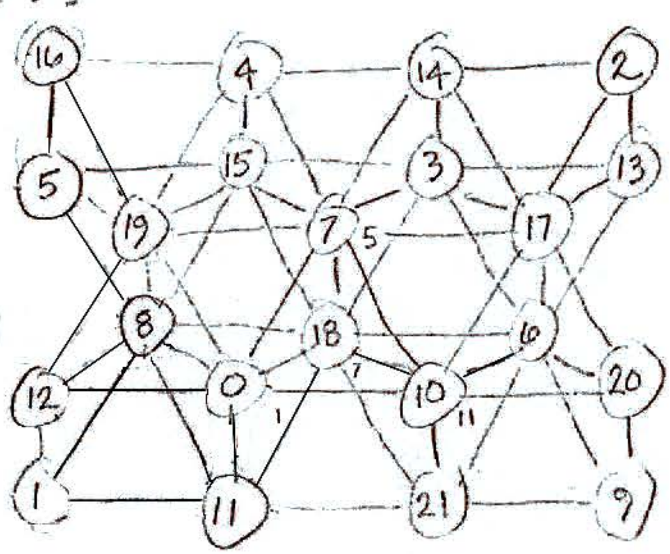


[1, 5]



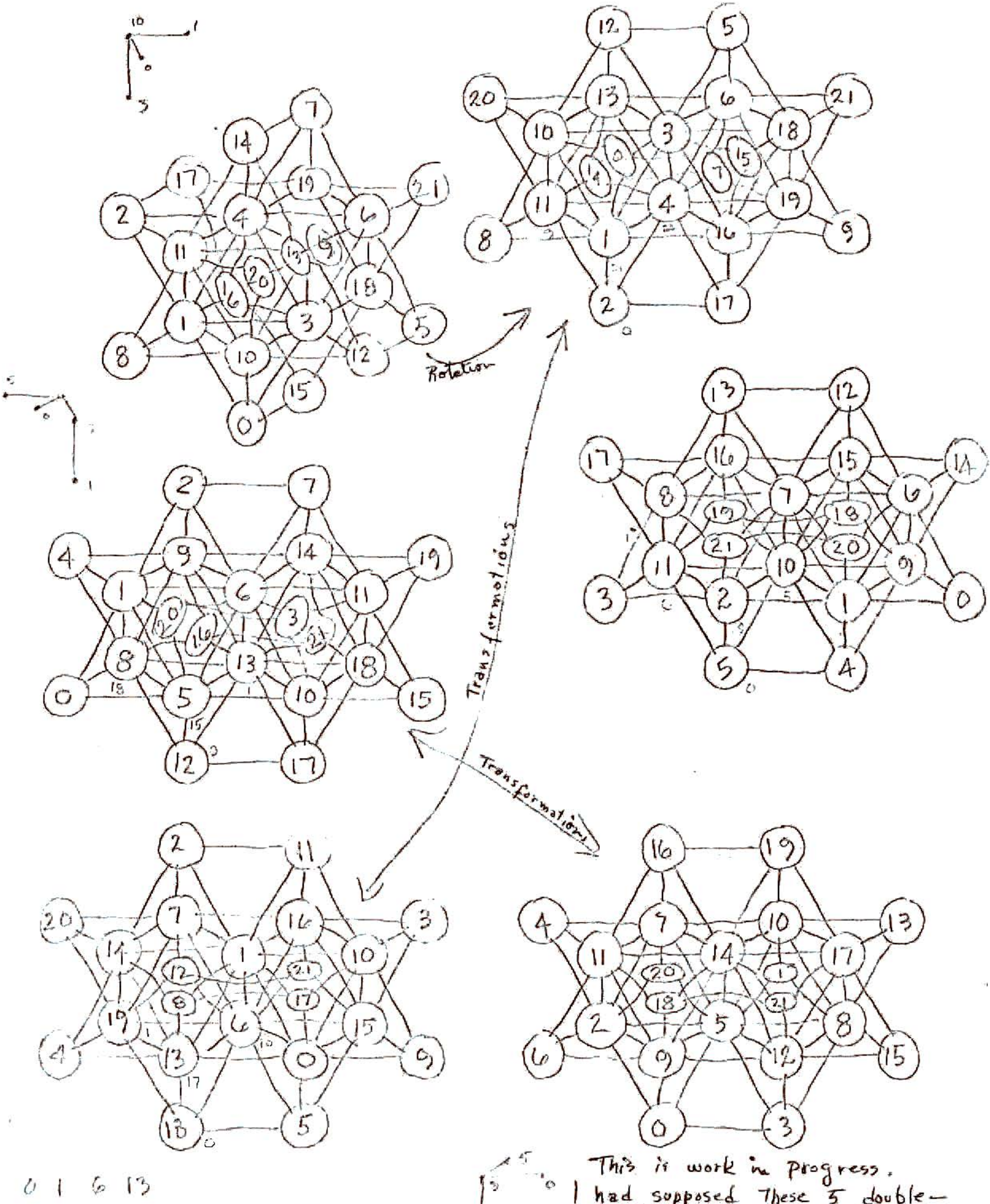
[1, 7]

[1, 9]



Here the tetrad 0 2 6 13 was put thru its transformations and extrapolated into a set of identical crystallographs. These are respectively identical with the transformations of the entire crystallograph '1'. That they are each also articulate is important, but inevitable.

Pr.

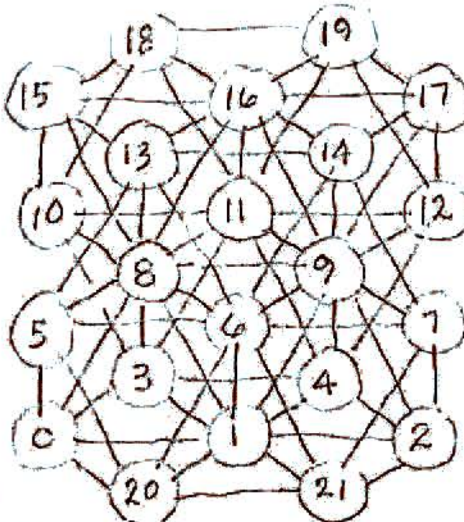


0 1 6 13

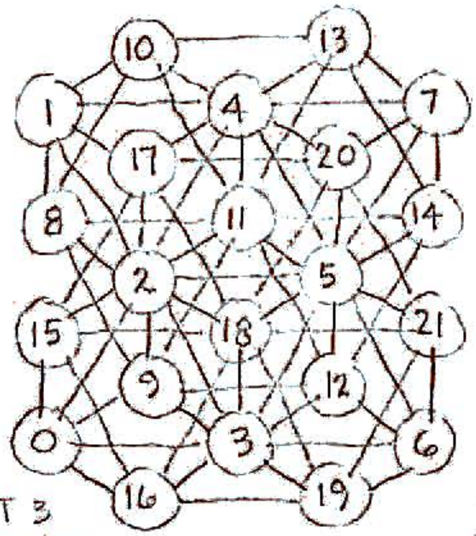
P. S.

This is work in progress.
I had supposed these 5 double-mandalas to be all, but Transformation Techniques indicate otherwise.
(over)

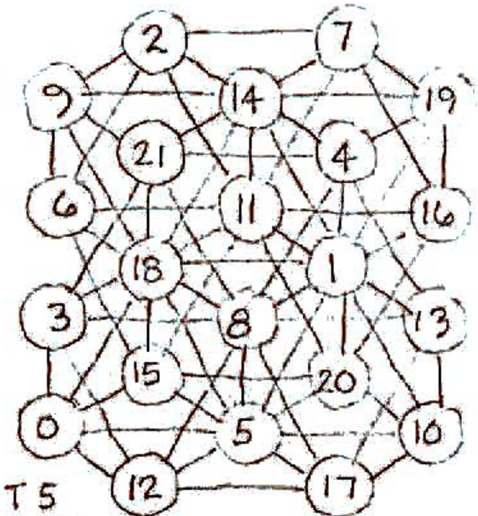
Since I have 3 transformation species (unless I have erred) I must have at least 15 double-diamonds. (This also points up how vulnerable to error hand-searching techniques can be) more on these later.



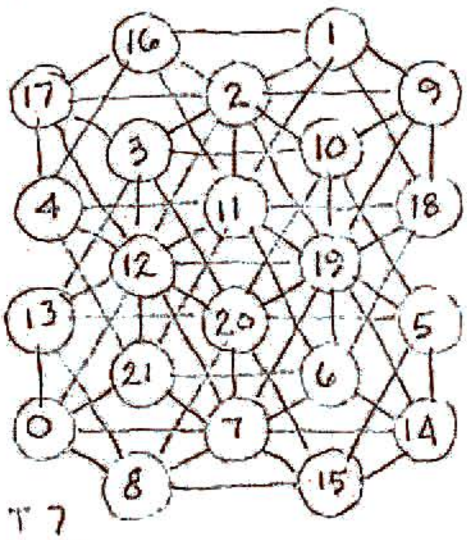
T1
T21R



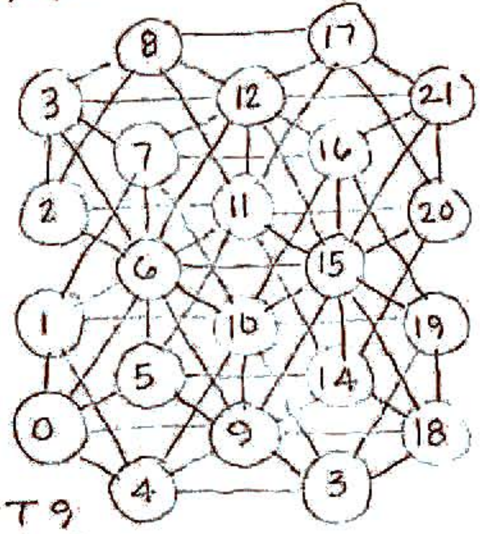
T3
T19R



T5
T17R



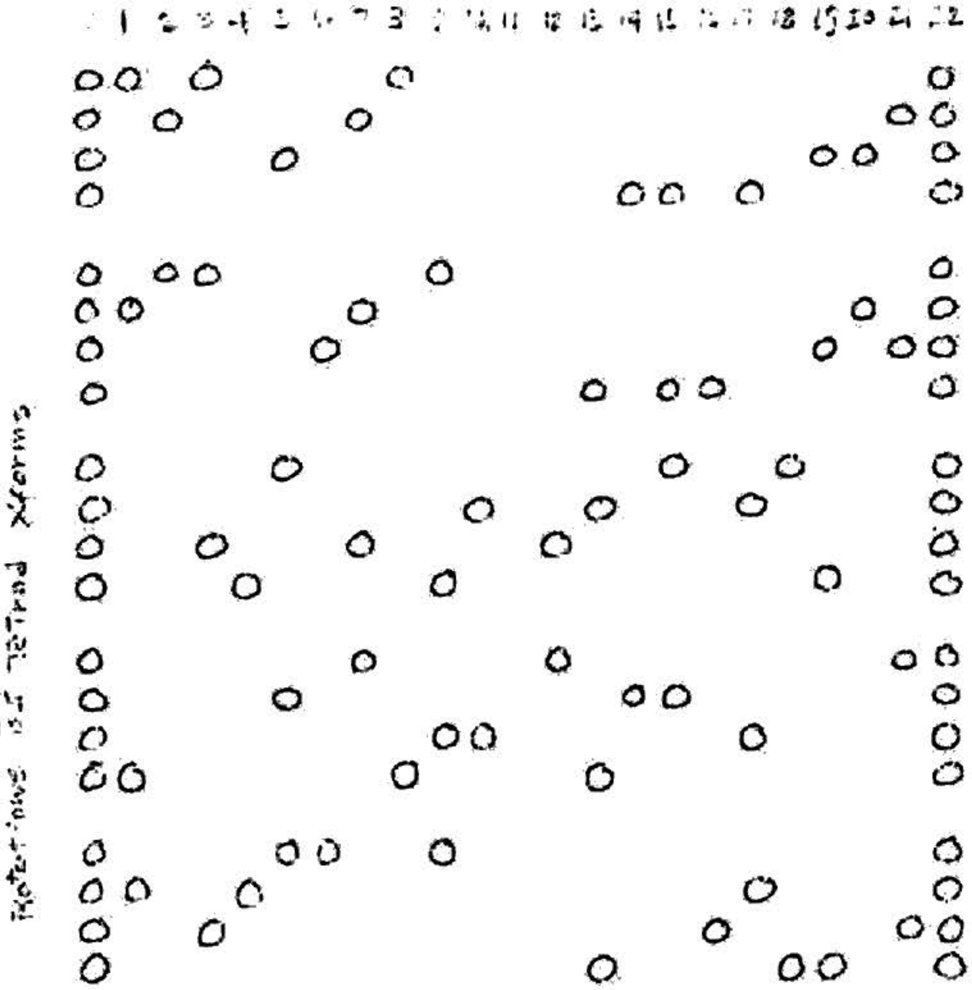
T7
T15R



T9
T13R

Another exemple of the transformations of an articulated structure to likewise articulate structures in identical crystallographs.

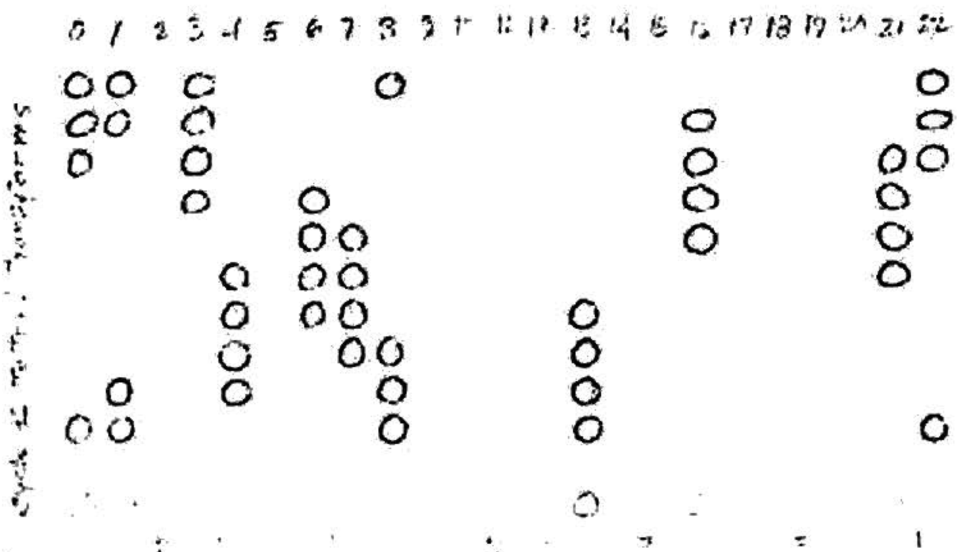
T. S.



1 2 5 14	
2 5 14 1	1
5 14 1 2	
14 1 2 5	
2 1 6 13	
1 6 13 2	3
6 13 2 1	
13 2 1 6	
5 10 3 4	
10 3 4 5	5
3 4 5 10	
4 5 10 3	
7 5 9 1	
5 9 1 7	7
9 1 7 5	
1 7 5 9	
5 1 3 13	
1 3 13 5	
3 13 5 1	9
13 5 1 3	

4 2 4 2 4 2 4 2 4 2 0 2 4 2 4 2 4 2 4 2 4 Internal frequency *

x	Tetrad 1	2	5	14	code	Hexany						code
1	0	1	3	8	1 2 5 14	1	3	8	4	9	11	2 1 4 1 2 5
3	0	3	9	2	2 1 6 13	3	9	2	12	5	11	1 2 4 2 1 12
5	0	5	15	18	5 10 3 4	5	15	18	20	1	11	4 6 4 2 [illegible] [illegible]
7	0	7	21	12	7 5 9 1	7	21	12	6	19	11	1 4 1 7 [illegible] [illegible]
9	0	9	5	6	5 1 3 13	9	5	6	14	15	11	1 3 2 3 1 12



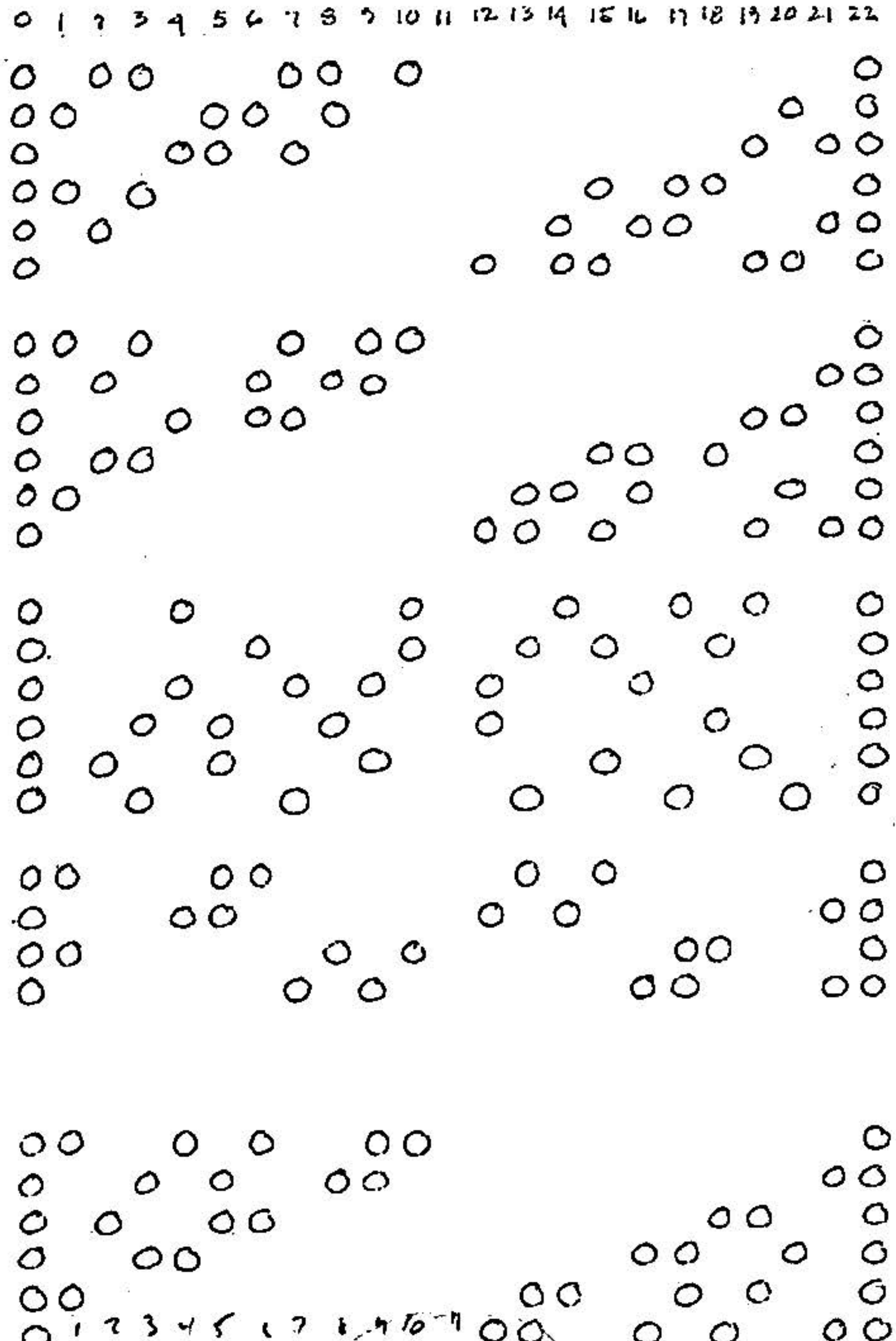
1	1 2 5 14
-3	1 2 13 6
9	3 13 5 1
-5	3 10 5 (4)
-7	1 9 5 (7)
-1	2 1 14 (5)
3	2 1 6 (13)
-9	3 1 5 (13)
5	3 4 5 (10)
7	1 7 5 9

(1) return to beginning

*

cont on sheet (13a)

Cycle of Hexany Transforms

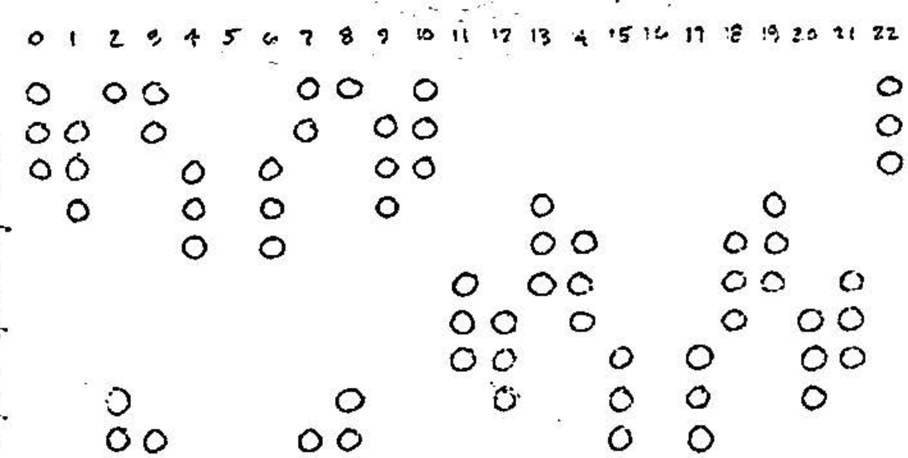


2 1 4 1 2 12		
1 4 1 2 12 2		
4 1 2 12 2 1	1	
1 2 12 2 1 4		
2 12 2 1 4 1		
12 2 1 4 1 2		
1 2 4 2 1 12		
2 4 2 1 12 1		
4 2 1 12 1 2	3	
2 1 12 1 2 4		
1 12 1 2 4 2		
12 1 2 4 2 1		
4 6 4 3 2 3		
6 4 3 2 3 4		
4 3 2 3 4 6	5	
3 2 3 4 6 4		
2 3 4 6 4 3		
3 4 6 4 3 2		
1 4 1 7 2 7		
4 1 7 2 7 1		
1 7 2 7 1 4	7	
7 2 7 1 4 1		
2 7 1 4 1 7		
7 1 4 1 7 2		
1 3 2 3 1 12	9	
3 2 3 1 12 1		
2 3 1 12 1 3		
3 1 12 1 3 2		
1 12 1 3 2 3		
12 1 3 2 3 1		

1 2 3 4 5 6 7 8 9 10 11

8 6 8 7 8 7 7 6 7 6 0 6 7 6 7 7 8 7 8 6 8 Interval frequency ★

Cycle of Hexany Times

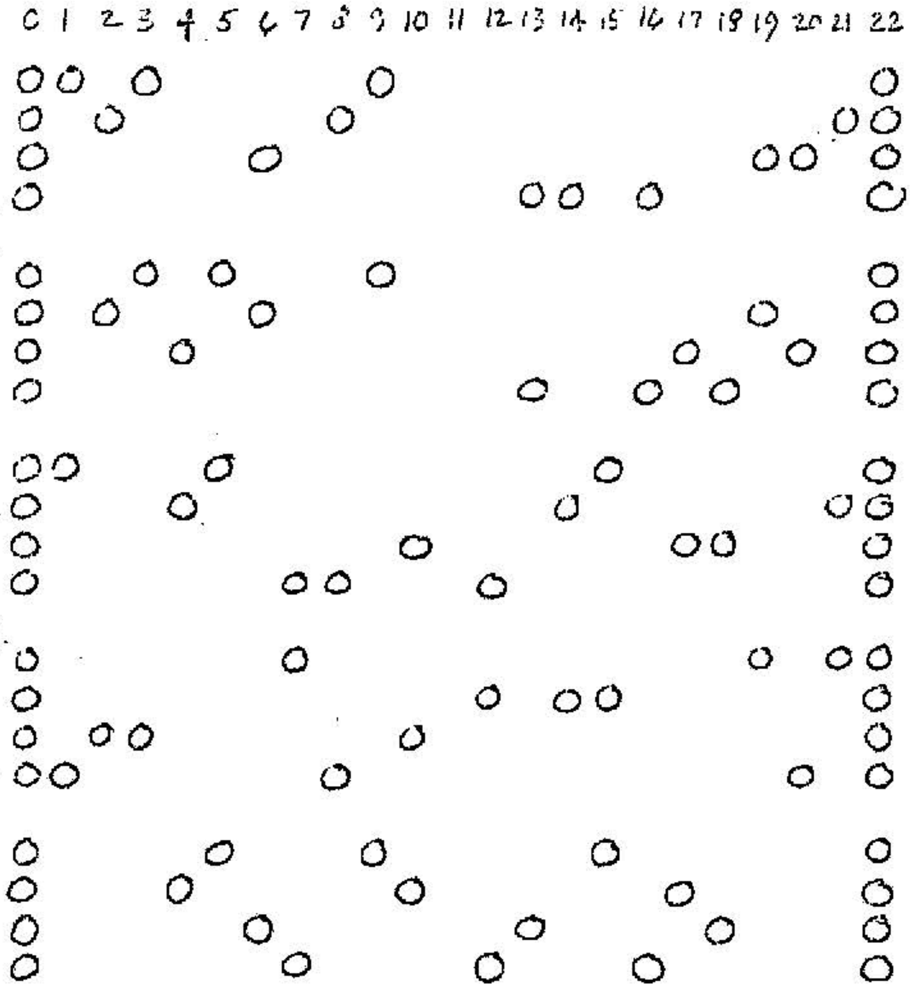


x	
1	2 1 4 1 2 12
-3	1 2 4 2 1 12
9	1 3 2 3 1 12
-5	3 2 3 4 6 (4)
-7	2 7 1 4 1 (7)
-1	2 1 4 1 2 (12)
3	1 2 4 2 1 (12)
-9	1 3 2 3 1 (12)
5	6 4 3 2 3 (4)
7	1 4 1 7 2 (7)

(1) Return to beginning

★→

Rotations of Tetrad Transforms
(See sheet 14a for rotations of Hexany Xforms)

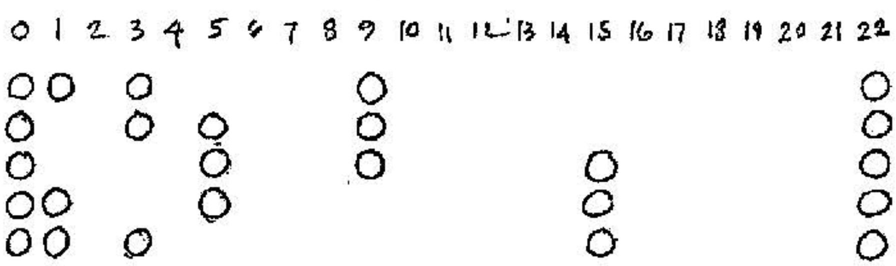


1 2 6 13	
2 6 13 1	1
6 13 1 2	
13 1 2 6	
3 2 4 13	
2 4 13 3	3
4 13 3 2	
13 3 2 4	
1 4 10 7	
4 10 7 1	5
10 7 1 4	
7 1 4 10	
7 12 2 1	
12 2 1 7	7
2 1 7 12	
1 7 12 2	
5 4 6 7	
4 6 7 5	9
6 7 5 4	
7 5 4 6	

3 3 3 3 3 3 3 3 3 3 0 3 3 3 3 3 3 3 3 3 3 Interval Frequency

x	Tetrad 1	2	6	13	code	Hexany						Code
1	0	1	3	9	1 2 6 13	1	3	9	4	10	12	2 1 5 1 2 11
3	0	3	9	5	3 2 4 13	3	9	5	12	8	14	2 3 1 3 2 11
5	0	5	15	1	1 4 10 7	5	15	1	20	6	16	4 1 9 1 4 3
7	0	7	21	19	7 12 2 1	7	21	19	6	4	18	2 1 11 1 2 5
9	0	9	5	15	5 4 6 7	9	5	15	14	2	20	3 4 5 1 5 4

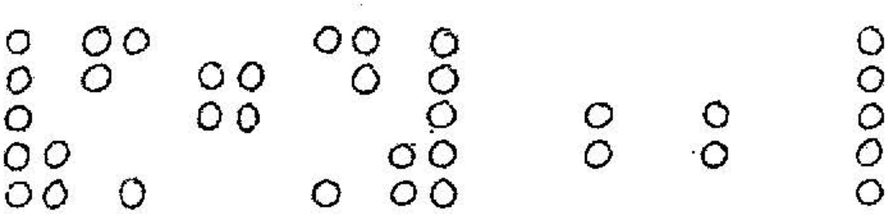
Cycle of Tetrad Xforms



X	
1	1 2 6 13
3	3 2 4 13
9	5 4 6 7
5	1 4 10 7
−7	1 2 12 7

(1) return to beginning

Cycle of Hexany Xforms

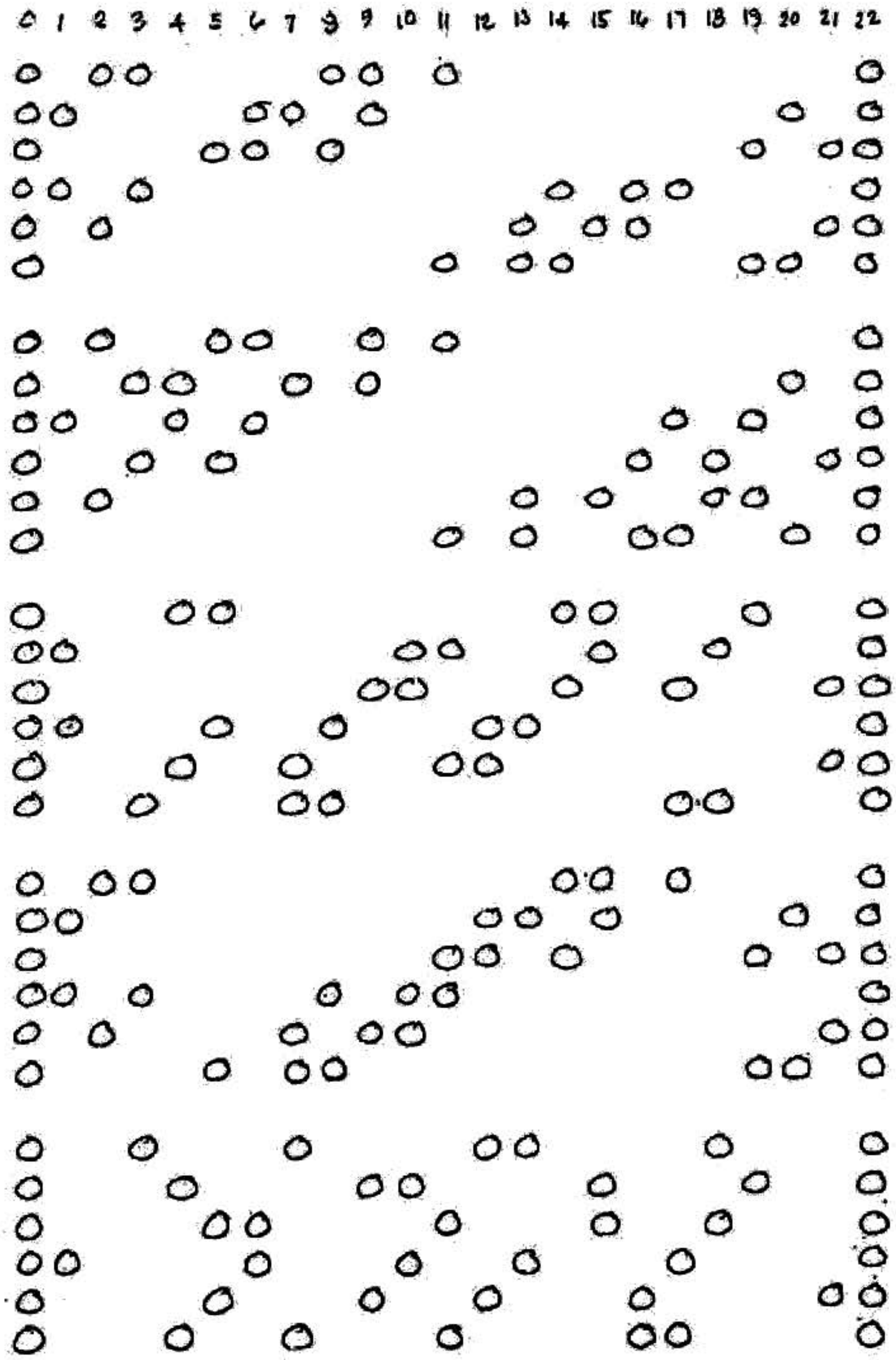


1	2 1 5 1 2 11
3	2 3 1 3 2 11
9	5 1 5 4 3 4
5	1 9 1 4 3 4
−7	1 2 5 2 1 11

(1) return to beginning

cont. on sheet 14a

Rotations of Hexany Transforms



2 1 5 1 2 11
1 5 1 2 11 2
5 1 2 11 2 1
1 2 11 2 1 5
2 11 2 1 5 1
11 2 1 5 1 2

2 3 1 3 2 11
3 1 3 2 11 2
1 3 2 11 2 3
3 2 11 2 3 1
2 11 2 3 1 3
11 2 3 1 3 2

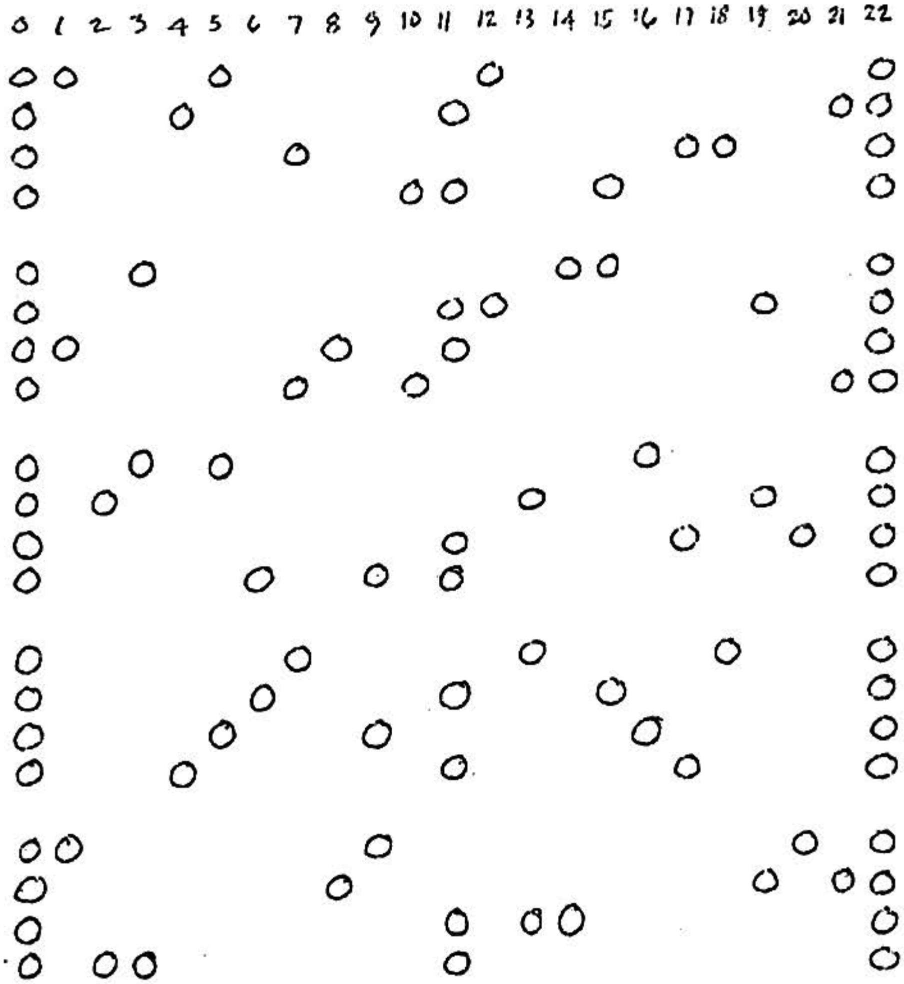
4 1 9 1 4 3
1 9 1 4 3 4
9 1 4 3 4 1
1 4 3 4 1 9
4 3 4 1 9 1
3 4 1 9 1 4

2 1 11 1 2 5
1 11 1 2 5 2
11 1 2 5 2 1
1 2 5 2 1 11
2 5 2 1 11 1
5 2 1 11 1 2

3 4 5 1 5 4
4 5 1 5 4 3
5 1 5 4 3 4
1 5 4 3 4 5
5 4 3 4 5 1
4 3 4 5 1 5

8 6 8 6 8 6 8 6 8 6 10 6 8 6 8 6 8 6 8 6 8 Interval Frequency *

Rotations of Tetrad Transforms

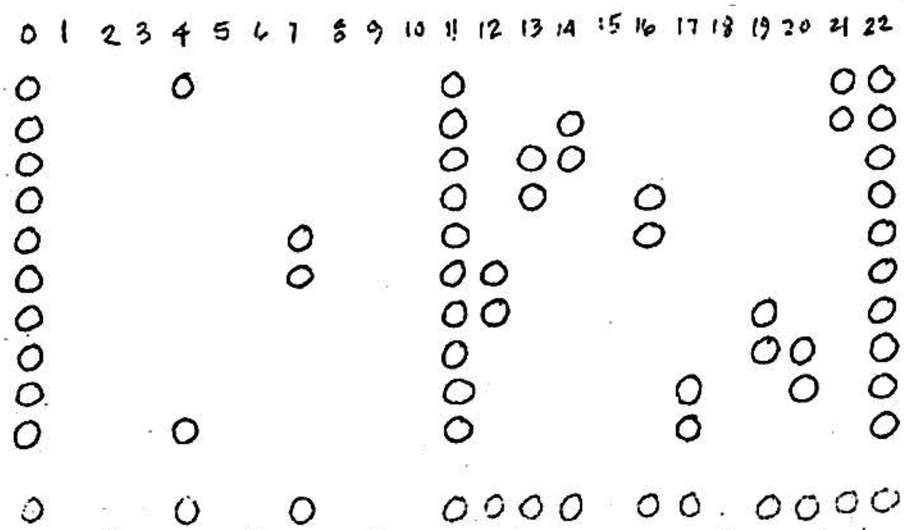


1 4 7 10 4 7 10 1 7 10 1 4 10 1 4 7	1
3 11 1 7 11 1 7 3 1 7 3 11 7 3 11 1	3
3 2 11 6 2 11 6 3 11 6 3 2 6 3 2 11	5
7 6 5 4 6 5 4 7 5 4 7 6 4 7 6 5	7
1 8 11 2 8 11 2 1 11 2 1 8 2 1 8 11	9

3 2 3 2 3 2 3 2 3 2 10 2 3 2 3 2 3 2 3 2 3 Interval frequency

x	Tetrad	1	4	7	10	code	← Hexany					→	code
1	0	1	5	12		1 4 7 10	1	5	12	6	13	17	4 1 6 1 4 6
3	0	3	15	14		3 11 1 7	3	15	14	18	17	7	4 7 1 2 1 7
5	0	5	3	16		3 2 11 6	5	3	16	8	21	19	3 8 3 2 4 2
7	0	7	13	18		7 6 5 4	7	13	18	20	3	9	2 4 5 2 5 4
9	0	9	1	20		1 8 11 2	9	1	20	10	7	21	1 10 1 2 6 2

cycle of Tetrad Xforms

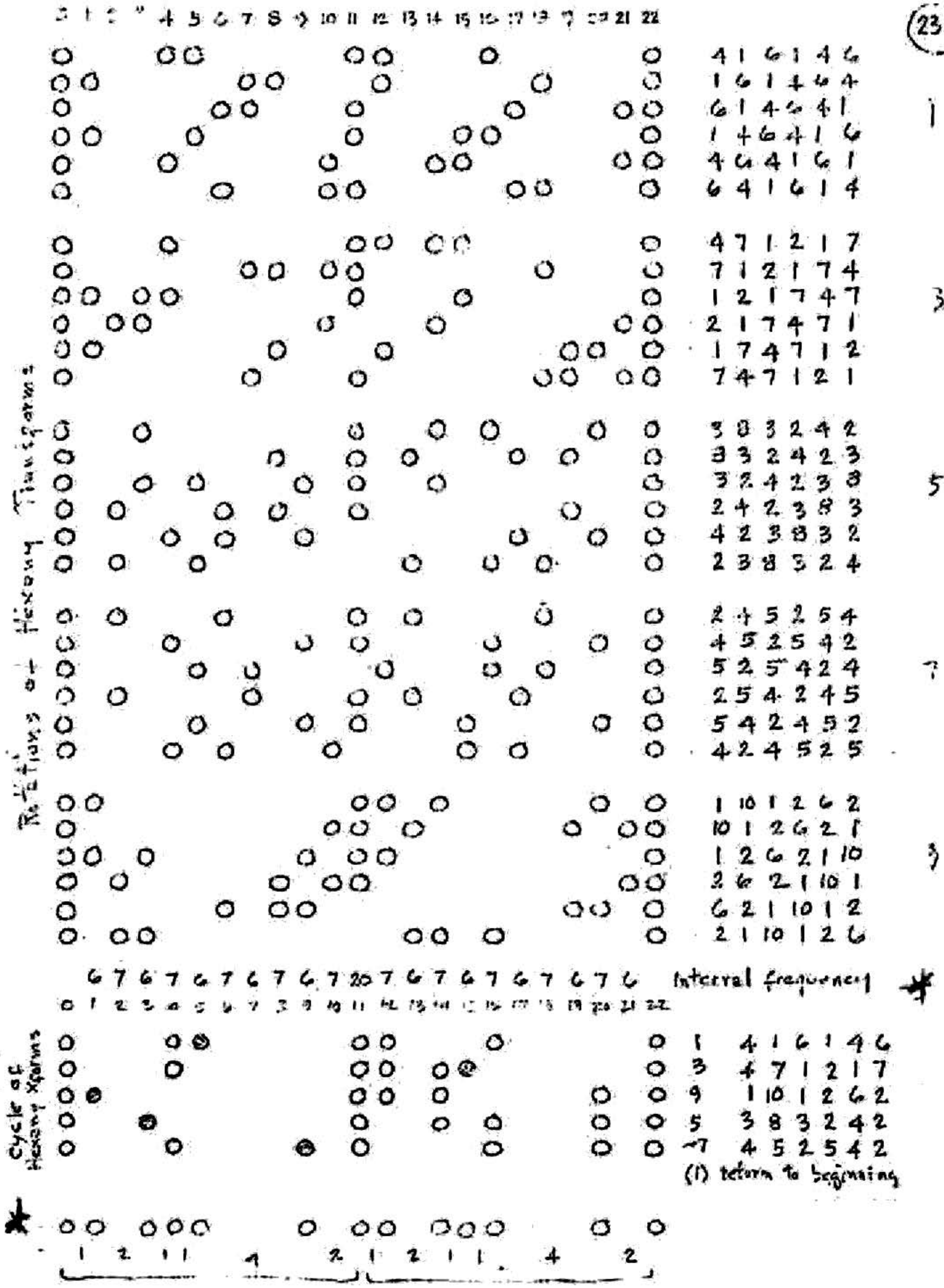


1	4 7 10 1
-3	11 3 7 1
9	11 2 1 8
-5	11 2 3 6
-7	7 4 5 6
-1	7 4 1 10
3	11 1 7 3
-9	11 8 1 2
5	11 6 3 2
7	4 7 6 5

(1) return to beginning

4 3 4 1 1 1 2 1 2 1 1 1

cont. on sheet 23a



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
41 6 1 4 6
1 6 1 4 6 4
6 1 4 6 4 1
1 4 6 4 1 6
4 6 4 1 6 1
6 4 1 6 1 4
1
4 7 1 2 1 7
7 1 2 1 7 4
1 2 1 7 4 7
2 1 7 4 7 1
1 7 4 7 1 2
7 4 7 1 2 1
3
3 8 3 2 4 2
3 3 2 4 2 3
3 2 4 2 3 8
2 4 2 3 8 3
4 2 3 8 3 2
2 3 8 3 2 4
5
2 4 5 2 5 4
4 5 2 5 4 2
5 2 5 4 2 4
2 5 4 2 4 5
5 4 2 4 5 2
4 2 4 5 2 5
7
1 10 1 2 6 2
10 1 2 6 2 1
1 2 6 2 1 10
2 6 2 1 10 1
6 2 1 10 1 2
2 1 10 1 2 6
9
Relations of Hexany Transforms
6 7 6 7 6 7 6 7 6 7 20 7 6 7 6 7 6 7 6 7 6
Interval frequency
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Cycle of Hexany Xforms
1 4 1 6 1 4 6
3 4 7 1 2 1 7
9 1 10 1 2 6 2
5 3 8 3 2 4 2
7 4 5 2 5 4 2
(1) return to beginning
1 2 1 1 4 2 1 2 1 1 4 2