

# The Hayhanen Cipher

Plaintext: feb/4/havecontactedfred.willconsultbeforeinvestingincoverbusiness.nat

Key: oriental

The Hayhannen cipher begins with substitution according to a keysquare, designed so that some letters encode to 1 digit and some to 2 digits, but are unambiguous when read. Letters in the first row (keyword) are represented by only a single number. Letters in the second and third rows (remainder of plaintext alphabet) use two digits, the one on the left first followed by the one above. Note that the numbered rows use the numbers that are *not* used in the first row.

	3	9	6	4	0	8	5	1	7	2
	o	r	i	e	n	t	a	l		
7	b	c	d	f	g	h	j	k	m	p
2	q	s	u	v	w	x	y	z	/	.

Thus, e encodes to 4, but v encodes to 24.

We substitute all the letters according to this keysquare:

f	e	b	/	4	/	h	a	v	e	c	o	n	t	a	c	t	e
74	4	73	27	444	27	78	5	24	4	79	3	o	8	5	79	8	4
d	f	r	e	d	.	w	i	l	l	c	o	n	s	u	l	t	
76	74	9	4	76	22	20	6	1	1	79	3	0	29	26	1	8	
b	e	f	o	r	e	i	n	v	e	s	t	i	n	g	i	n	
73	4	74	3	9	4	6	0	24	4	29	8	6	0	70	6	0	
c	o	v	e	r	b	u	s	i	n	e	s	s	.	n	a	t	
79	3	24	4	9	73	26	29	6	0	4	29	29	22	0	5	8	

The resulting string of digits is written into a transposition block as follows:

4	7	5	8	2	9	6	1	3
7	4	4	7	3	2	7	4	4
4	2	7	7	8	5	2	4	4
7	9	3	0	8	5	7	9	8
4	7	6	7	4	9	4	7	6
2	2	2	0	6	1	1	7	9
3	0	2	9	2	6	1	8	7
3	4	7	4	3	9	4	6	0
2	4	4	2	9	8	6	0	7
0	6	0	7	9	8	2	4	4
9	7	3	2	6	2	9	6	0
4	2	9	2	9	2	2	0	5
8								

The digits are taken out of the block by columns (in the order of the key numbers) and written into a second block using a route cipher. We fill in the area to the left of the line first, then the areas to the right. The line in block forms a step-like pattern: start to the left of column 1 and step to the right until the edge is reached, jump to the left of column 2, etc.

4	6	2	1	5	3
4	4	9	6	2	9
7	7	8	6	2	4
0	4	6	0	3	2
8	8	4	6	2	3
9	9	9	7	2	0
6	9	4	4	4	6
4	8	6	9	7	2
7	0	7	4	0	7
5	7	4	7	4	2
3	3	2	0	9	7
4	8	4	7	3	6
0	7	0	9	4	2
2	7	2	2	2	5
2	7	5	9	1	6
4	0	3	9	8	3
9	7	2	7	2	2
4	1	1	4		

Finally the digits are transcribed by columns into groups of five.

Ciphertext: 66067 49470 79299 74986 49467 42402 53219 42306 27276 25632 47089 64753  
40224 94223 22470 49342 18247 48998 07387 77071