Challenge 9B — A Concise Guide

Arranging the message such that there are 28 characters in a row,

2s appear only in the third quarter of each row.

Each row may be rearranged into 7 blocks of 4; for each block, there are $2 \times 2 \times 3 \times 2 = 24$ possibilities.

(an alphabet excluding J and Z)

These blocks can be tackled like any substitution cipher to yield the message below.

```
1110100 1010000 1211221 0001101
1100101 1000101 1110021 0110111
1111010 1101001 0101121 0011100
0010110 1000000 1221222 1001111
0100100 0010011 0201000 0011101
1001001 0110001 2002120 0011010
0001101 0111000 0002002 1100100
0100110 1011011 0000210 0001000
0110100 0001000 2200110 0010110
1011000 1011000 0210011 1110010
0100100 0001011 1020200 0101001
0101001 1100001 0222121 0000010
0110101 0100010 2102002 1110010
0001101 1101100 0021012 0111011
0011001 1000001 0021100 1101101
0110000 0110000 2100111 1100100
1001001 0010110 0200002 1000010
1010010 1001001 1000221 0110001
1101111 0000001 2012102 0100110
0011001 0101100 1021020 1101111
0010100 0001000 1100222 0000001
```

```
1110 1020 1110 0011 1021 0020 0011
1110 1011 0011 0000 1101 0021 1111
1100 1110 1001 1111 0011 1020 0110
0111 0020 1020 0011 1021 1021 0021
0000 1020 0101 0011 1001 0100 0101
1020 0100 0101 1021 0010 0021 1100
0001 0101 0100 1120 1001 0000 1020
0100 1000 0100 0101 1020 1110 0100
0020 1020 1001 0100 1011 0011 0000
1101 0021 1111 1100 0000 0011 0010
0010 1001 0020 0101 1020 0100 0101
0100 1120 0020 1020 0010 0021 1110
0021 1111 1001 0020 1000 0101 1020
0100 0101 0021 1111 1100 0011 1021
0101 0001 1020 1011 0011 0000 1101
0021 1111 1100 0000 0011 0010 0010
1001 0020 0100 1000 0100 0101 1020
1110 0001 1001 0100 0020 1020 0111
1020 1001 0010 1020 1011 1001 1120
0011 0101 1020 1111 0101 0021 1001
0010 0010 1000 0100 1020 0020 0021
```

```
M E M O F R O
M D O C K I N
G M A N O E U
V R E O F F I
C E T O A S T
E S T F L I G
H T S P A C E
S Y S T E M S
R E A S D O C
K I N G C O L
L A R T E S T
S P R E L I M
I N A R Y T E
S T I N G O F
T H E D O C K
I N G C O L L
A R S Y S T E
M H A S R E V
E A L E D A P
O T E N T I A
L L Y S E R I
```

With a combination of frequency analysis, trigram analysis, and guessing words, the key below can be found:

0000 C	0020 R	0110 U	1000 Y	1020 E	1110 M
0001 H	0021 I	0111 V	1001 A	1021 F	1111 N
0010 L	0100 S	0120 W	1010 B	1100 G	1120 P
0011 O	0101 T	0121 X	1011 D	1101 K	1121 Q

* This idea can be motivated by spreading the twos evenly.