

## On the Subject of The Jumble Cycle

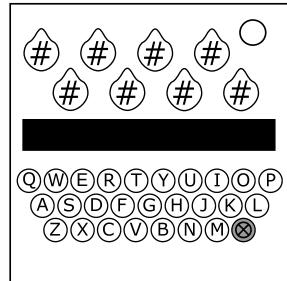
*Ever get that felling of Deja-vu four times at once?*

This module consists of a screen, eight labelled dials, and a QWERTY keyboard.

The labels on the dials, when decrypted and read from left to right, spell out an eight letter word.

Each letter has been encrypted by one of four different ciphers, depending on their colours.

(There will always be a pair of cyan labelled dials.)



Once deciphered, find the word in the table below, the word written below it is the word that should be entered.

Apply the same ciphers to the letters of the response word, and type out the encrypted response word using the keys.

The word is automatically submitted when eight keys are pressed.

The red button can be pressed at any time before the eighth key is pressed to cancel the input.

Inputting any of the eight letters incorrectly will cause a strike to be issued and reset the module.

### White label: Caesar Cipher

The letter has been shifted forwards through the alphabet by the number of  $45^\circ$  clockwise rotations from north to the direction the dial is pointing.

### Yellow label: Affine Cipher

The number  $N$ , for each dial, is the number of  $45^\circ$  clockwise rotations from north to the direction the dial is pointing.

(This number is between 0 and 7.)

Starting from  $A=1$ , the alphabetic position of each letter is multiplied by  $2N+1$ .

26 is subtracted from the product until it falls within the range [1, 26].

This is the alphabetic position of the encrypted letter.

Pink label: Pigpen Cipher

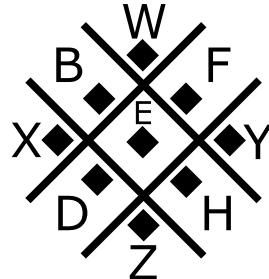
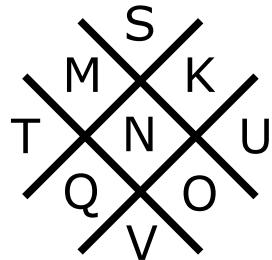
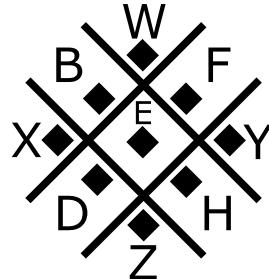
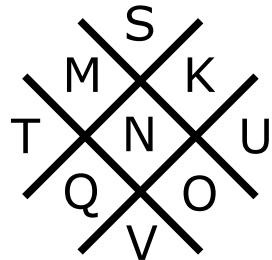
Each letter is translated using the pigpen cipher below.

Starting from north, the pigpen characters are rotated to face the direction the dial is pointing.

The rotated pigpen characters are then translated back, as though they are still facing north, to produce the encrypted letter.

A	B	C
D	E	F
G	H	I

J	K	L
M	N	O
P	Q	R

Cyan label: Playfair Cipher

- The number of  $45^\circ$  rotations, starting from north, of each pair of adjacent dials are interpreted as two digit octal numbers.
- The numbers are converted into decimal and the values congruent to these numbers modulo 26 are calculated.
- Starting from  $A=0$ , the values given by each pair of adjacent dials refer to the alphabetic positions of the first seven letters of a  $5 \times 5$  keysquare in reading order.
- The remaining 18 letters fill the rest of the keysquare in alphabetical order, excluding X, which is never used.
- The word is split into four pairs of letters.  
If a pair contains the same letter twice, the second is changed to a Z.
- Each pair of letters is altered:
  - If both letters belong to the same row of the keysquare, shift both letters one space to the right along the row.
  - If both letters belong to the same column of the keysquare, shift both letters once space down the column.
  - Otherwise, the letters lie on diagonally opposite corners of a rectangle, the encrypted pair consists of the letters in the horizontally opposite corners from the original pair.

## Keyword Table

ADVERTED	ADVOCATE	ALLOTYPE	ALLOTTED	BINORMAL	BINOMIAL	BULLHORN	BULWARKS
ULTRAHOT	DECEIVED	QUITTERS	QUIRKISH	RELAYING	ADVERTED	WEAPONED	ZYMOLOGY

CONNECTS	CONQUERS	COMMANDO	COMPILER	DECEIVED	DECIMATE	DISPATCH	DISCRETE
JUNCTURE	YOURSELF	NUMERATE	HUNTRESS	UNDOINGS	ADVOCATE	HUNDREDS	ALLOTYPE

ENCRYPTS	ENCODING	EQUATORS	EQUALISE	FINALISE	FINNICKY	FORMULAE	FORTUNES
STANDOUT	MONOMIAL	YOKOZUNA	COMPILER	TRIGONAL	LANGUAGE	ILLUSORY	GATEWAYS

GARRISON	GARNERED	GATEPOST	GATEWAYS	HOTLINKS	HOTHEADS	HUNTRESS	HUNDREDS
QUARTICS	TOMAHAWK	WHATNESS	POSTSYNC	POSITRON	REVEALED	ZYGOTENE	JOURNEYS

INCOMING	INDIRECT	ILLUSORY	ILLUDING	JOURNEYS	JOUSTING	JUNKYARD	JUNCTURE
NUMEROUS	ORDERING	VENDETTA	WHATSITS	PROPHASE	BINOMIAL	QUARTILE	INDIRECT

KILOVOLT	KILOBYTE	KNOCKING	KNOWABLE	LANGUAGE	LANDMARK	LINKWORK	LINGERED
DISPATCH	BINORMAL	DECIMATE	REVERSED	VENOMOUS	BULWARKS	STOCKADE	KNOWABLE

MONOMIAL	MONOLITH	MULTITON	MULCTING	NANOWATT	NANOBOTS	NUMEROUS	NUMERATE
JOUSTING	ZYMOGENE	JUNKYARD	HOTLINKS	TRICKIER	STANZAIC	HOTHEADS	GARNERED

ORDERING	ORDINALS	OBSTRUCT	OBSTACLE	PROPHASE	PROPHECY	POSTSYNC	POSITRON
LANDMARK	KILOVOLT	EQUALISE	PROPHECY	MONOLITH	WEAKENED	KILOBYTE	DISCRETE

QUARTILE	QUARTICS	QUIRKISH	QUITTERS	REVERSED	REVEALED	RELAYING	RELATIVE
ENCODING	ILLUDING	EQUATORS	ORDINALS	CONNECTS	FINALISE	FORTUNES	COMMANDO

STANZAIC	STANDOUT	STOCKADE	STOCCATA	TRIGONAL	TRICKIER	TOMOGRAPH	TOMAHAWK
INCOMING	OBSTACLE	FORMULAE	OBSTRUCT	ULTERIOR	CONQUERS	GATEPOST	MULCTING

UNDERWAY	UNDOINGS	ULTERIOR	ULTRAHOT	VENOMOUS	VENDETTA	VOLITION	VOLUMING
KNOCKING	GARRISON	MULTITON	YEARLONG	LINGERED	TOMOGRAPH	ENCRYPTS	BULLHORN

WEAKENED	WEAPONED	WHATNESS	WHATSITS	YEARLONG	YEARNING	YOKOZUNA	YOURSELF
ALLOTTED	UNDERWAY	ZYGOMATA	YEARNING	STOCCATA	FINNICKY	LINKWORK	VOLITION

ZYGOMATA	ZYGOTENE	ZYMOLOGY	ZYMOGENE
NANOBOTS	NANOWATT	RELATIVE	VOLUMING