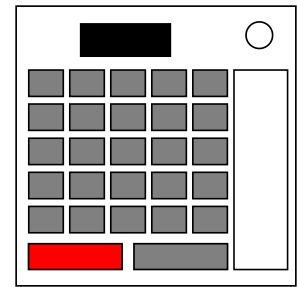# On the Subject of Fast Playfair Cipher

"When Fast Math and Playfair Cipher combine, no one's safe!" – W2S if he played KTaNE

- A message will be displayed on the module screen. Use the 5-by-5 grid of buttons and then the submit button to disarm the module. The module will have 6 – 9 stages before being disarmed.
- Press the "Go!" button to start. You have 8 seconds to submit a two-letter pair (the time can be changed in the Mod settings file).
- If the countdown meter reaches 0 or an incorrect answer is submitted, a strike will be recorded, and the module will reset. Once a stage is complete, the timer will restart, and a new message will show on the display.

Playfair key:

- Your initial Playfair key has no letters. Follow these rules to obtain them:

    - If the total number of battery holders and port plates is less than 4, add A to your keyword.
    - If there are DVI-D, PS/2, RJ-45 and Stereo RCA ports all on the same plate, add B to your keyword.
    - If the sum of the serial number digits is even, add C to your keyword.
    - If there are more lit than unlit indicators, add D to your keyword.
    - If there are exactly 4 AA batteries, add E to your keyword.
    - If there are less than 2 port plates, add F to your keyword.
    - If the serial number has a vowel, add G to your keyword.
    - If there are more unlit indicators than batteries, add H to your keyword.
    - If the last digit of the serial number is odd, add I to your keyword.
    - If there are less letters in the serial number than there are port plates, add K to your keyword.
    - If the third and the sixth character of the serial number match parity, add L to your keyword.
    - If there is a parallel and a serial port on the same plate, add M to your keyword.
    - If the number of ports is prime, add N to your keyword.
    - If there are exactly 3 battery holders, add O to your keyword.
    - If there are no Stereo RCA ports, add P to your keyword.
    - If there are more DVI-D ports than batteries, add Q to your keyword.
    - If the serial number doesn't have a vowel, add R to your keyword.
    - If there is more than one port plate, add S to your keyword.
    - If the alphabetical position of the second letter of the serial number is odd, add T to your keyword.

- If there are exactly 3 D batteries, add U to your keyword.
- If the last digit of the serial number is even, add V to your keyword.
- If there are more than 2 RJ-45 ports, add W to your keyword.
- If the alphabetical position of the first letter of the serial number is inverted, add Y to your keyword.
- If there are exactly 5 batteries, add Y to your keyword.
- If the sum of the digits of the serial number is greater than 17, add Z to your keyword.

Decrypting the message:

- Create the 5x5 matrix of letters. Take each number and lay each letter that is shown in the key.
- If the serial number contains any of the letters in the word "PLAYFAIR", place your alphabet at the end of your key, otherwise place it at the beginning of your key.
- Each letter must occur only once in the matrix, so only add the first occurrence. 'J' and 'I' are interchangeable.
- For each stage, interpret the message as a two-letter pair. If you cannot form a pair, add an 'X'. If the letters are the same, transform the second one into an 'X'.
- For each pair:

  - If the letters appear on the same row of your matrix, replace them with the letters to their immediate left respectively, wrapping around to the right side of the row if necessary.
  - If the letters are on the same column of your matrix, replace them with the letters immediately above, wrapping around to the bottom side of the column if necessary.
  - If the letters are on different rows and columns, replace each of them with the letter on the same row but in the column of the other letter in the original pair.