

## On the Subject of The Black Button

*This is a button. It is black.*

Read the resistance of each resistor as follows:

- The first 3 color bands form a 3-digit number:
  - Black = 0
  - Brown = 1
  - Red = 2
  - Orange = 3
  - Yellow = 4
  - Green = 5
  - Blue = 6
  - Violet = 7
  - Gray = 8
  - White = 9
- The 4th color band expresses a power of 10 (for example: orange =  $10^3 = 1000$ ).

Calculate the total resistance  $R$  of the three resistors ( $R_1, R_2, R_3$ ) connected in parallel as follows:

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

Multiply this resistance (in ohms) with the capacitance of the capacitor (in farads) to obtain the amount of time required to fully charge it (in seconds).

Hold the button for the correct amount of time to fully charge the capacitor. Each component has a tolerance of  $\pm 10\%$ , so any amount of time within that leeway is permissible. Ignore the bomb timer.

