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Solution to Problem 1024.

$$\sqrt{2002 + b\sqrt{c}} + \sqrt{2002 - b\sqrt{c}} = 64$$

Square both sides to obtain

$$2002 + b\sqrt{c} + 2002 - b\sqrt{c} + 2\sqrt{2002^2 - b^2c} = 64^2$$

Simplifying the above to get

$$\sqrt{2002^2 - b^2c} = 46$$

Take the square of both side again

$$2002^2 - b^2c = 2116$$

Or

$$b^2c = 4005888 = 2^{13} \times 3 \times 163$$

To maximize b , we have $b = 2^6 = 64$ and $c = 2 \times 3 \times 163 = 978$.

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