To find $c = a * b$, where n is the maximum number of digits in a, b, B is the base of a, b, and a_0, a_1 are the least and most $n/2$-digit part of a respectively, and the same goes for b with b_0, b_1:

$$c_0 = a_0 * b_0$$
$$c_1 = a_1 * b_0 + a_0 * b_1 = (a_1 + a_0) * (b_1 + b_0)$$
$$c_2 = a_1 * b_1$$
$$c = a * b = c_2 B^n + (c_1 - c_2 - c_0) B^{n/2} + c_0$$

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Let's try $2205 * 1132$ (where $n = 4$, $B = 10$):

$$c_0 = 5 * 32$$
$$c_1 = (22 + 5) * (11 + 32) = 27 * 43$$
$$c_2 = 22 * 11$$

$c_0 = 5 * 32$ (where $n = 2$). Since we end up with $n/2 = 1$, we can calculate these single-digit-operand products in the traditional way:

$$c_0 = 5 * 2 = 10$$
$$c_1 = (0 + 5) * (3 + 2) = 5 * 5 = 25$$
$$c_2 = 0 * 3 = 0$$
$$c = 0 * 10^2 + (25 - 0 - 10)10^{2/2} + 10 = 160$$

We'll save $c_0 = 160$ for the final calculation.
$c_1 = 27 * 43$. Again, we're multiplying single digits:

$$c_0 = 7 * 3 = 21$$
$$c_1 = (2 + 7) * (4 + 3) = 9 * 7 = 63$$
$$c_2 = 2 * 4 = 8$$
$$c = 8 * 10^2 + (63 - 8 - 21)10^{2/2} + 21 = 1161$$

Which means $c_1 = 1161$.
$c_2 = 22 * 11$:

$$c_0 = 2 * 1 = 2$$
$$c_1 = (2 + 2) * (1 + 1) = 4 * 2 = 8$$
$$c_2 = 2 * 1 = 2$$
$$c = 2 * 10^2 + (8 - 2 - 2)10^{2/2} + 2 = 242$$

Which means $c_2 = 242$.
We can come back to our original c:

$$\begin{aligned} c = a * b &= 2205 * 1132 \\ &= c_2 B^n + (c_1 - c_2 - c_0) B^{n/2} + c_0 \\ &= 242 * 10^4 + (1161 - 242 - 160)10^{4/2} + 160 \\ &= 2496060 \end{aligned}$$

Which leaves us with $2205 * 1132 = 2496060$.