1086-11-2809 **Kjell Wooding*** (kjell@wooding.org) and **H C Williams** (williams@math.ucalgary.ca), Dept. of Mathematics & Statistics, University of Calgary, 2500 University Dr NW, Calgary, AB T2N1N4, Canada. *On computing solutions to* $fx^2 + gy^2 = m$.

Consider the problem of finding $x, y \in \mathbb{Z}$ such that for a given $m, f, g \in \mathbb{Z}^+$, $fx^2 + gy^2 = m$. Define $t \in \mathbb{Z}$ to be a solution for $t^2 \equiv -gf^{-1} \pmod{m}$. In 1848, Hermite and Serret described an algorithm to solve for x and y when $f = g = 1$ using convergents in the simple continued fraction (SCF) expansion of t/m. In 1908, Cornacchia suggested an algorithm that could solve the problem for any f and g using only the remainders in the Euclidean Algorithm applied to t and m. An elementary exposition (due to Nitaj) proving the correctness of Cornacchia's algorithm did not follow until much later, and relied on a modified version of the algorithm which again requires finding the convergents in the SCF expansion of t/m. Our work shows that these convergents can be recovered, via elementary methods, from the sequence of remainders used by Cornacchia's original algorithm. (Received September 25, 2012)