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An L(2,1)-labeling of a graph G is an assignment f of nonnegative integers to the vertices of G such that if vertices x and y are adjacent, $|f(x) - f(y)| \geq 2$, and if x and y are at distance two, $|f(x) - f(y)| \geq 1$. These labelings have been used to model the channel assignment problem when sufficiently different frequencies must be assigned to transmitters operating in close proximity. The λ-number of G is the smallest number k for which G has an L(2,1)-labeling using labels in the set $\{0, 1, ..., k\}$. We determine the λ-numbers of certain generalized Petersen graphs (GPGs). A GPG of order n consists of two disjoint copies of the same cycle C_n together with a perfect matching between the two vertex sets. We designed an algorithm that reduced the computation time required to determine the λ-numbers of GPGs for previously intractable cases. More specifically, we provide exact λ-numbers of all GPGs of orders 9, 10, 11, and 12, bringing down to 6 the known upper bound of 7 for all but one graph. We also provide the λ-numbers of several infinite subclasses of GPGs that have useful representations on Möbius strips. (Received September 22, 2010)