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The group of odd-weight Boolean complementary pairs

Ternary complementary pairs are pairs of ternary (i.e., having elements $0, 1, -1$) sequences with zero total autocorrelation. Unlocking the mysteries of for which parameters these exist and what their internal structure comprises has proven a tough problem. Many years ago we conceived a divide-and-conquer strategy for such questions in which the first stage was to solve the "boolean" version of the problem by reducing modulo 2, which gives **Boolean complementary pairs**, focussing exclusively on identifying all the possible configurations of zeros. From a highly sporadic class of objects arose complete and simple order, in one case (even weight) and remarkably regular but still complex in the other (odd weight). The members of this class are associated with the elements of an infinite group. This talk is about the solution of the a word problem on that group to yield a straightforward procedure for generating these pairs in sequence with no searching or similarly bulky computational overhead.