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W. Cary Huffman* (whuffma@luc.edu), Department of Mathematics and Statistics, 6525 N. Sheridan Road, Chicago, IL 60626. *Additive Cyclic Codes over F_4* .

We examine the structure of additive cyclic codes over F_4 of odd length n . We provide a canonical decomposition of these codes. With this decomposition, we can construct and count all such codes, in total and by F_2 -dimension. We can also construct and count all self-orthogonal additive cyclic codes under the trace inner product, in total and by F_2 -dimension. In particular, we can construct and count all self-dual additive cyclic codes. All counts depend only on the sizes of the 2-cyclotomic cosets modulo n . (Received July 30, 2007)