1093-11-340 **Abdul-Nasser El-Kassar*** (abdulnasser.kassar@lau.edu.lb), Lebanese American University, P.O. Box 13-5053, Beirut, 1102 2801, Lebanon, and **Therrar El-Kadri**. *Finite Commutative Rings Having a Boolean kth Group of Units.*

Let $(R, +, .)$ be a finite commutative ring with identity and let $(U(R), .)$ be its group of units. El-Kassar and Chehade [Math. Balkanica 20 (2006), no. 3-4, 275–286; MR2269732 (2007g:16048)] showed that $U(R)$ supports a ring structure $(U(R), ., *)$ isomorphic to a ring $R^1 = \mathbf{Z}_{n_1} \oplus \mathbf{Z}_{n_2} \oplus ... \oplus \mathbf{Z}_{n_i}$. The second group of units of the ring $R$, denoted by $U^2(R)$, is defined to be $U(U(R))$. The operations of $U^2(R)$ are described using the isomorphism $U^2(R) \cong U(R^1)$. The $k$th group of units of the ring $R$ is defined iteratively by $U^k(R) = U(U^{k-1}(R))$. Since $U^k(R)$ eventually becomes a Boolean ring, we define the class of $R$, denoted by $C(R)$, to be the positive integer $k$ such that $U^k(R)$ is Boolean. In this paper, we consider the problem of determining all rings $R$ having $C(R) = k$, where $k$ is a fixed positive integer. In particular, we show that the class of all rings $\mathbf{Z}_n$ with $C(\mathbf{Z}_n) = k$ is determined in terms of the divisors of certain integer $B_k$. Algorithms for finding $B_k$ are developed.

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