21. The Groups $J_G(*)$ for Compact Abelian Topological Groups G*)

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§1. **Introduction.** In [4], we defined $J_G(X)$ for a compact group G and for a compact G-space X. When X is a point, we denote it by $J_G(*)$. Similar groups $JO(G)$ were defined and studied by Atiyah and Tall [2], Snaith [7], and Lee and Wasserman [5]. Our definition is more rigid than those of $JO(G)$ in [2], [5], [7] and is given from the geometrical point of view as follows.

Two orthogonal representation spaces V, W of a compact topological group G are said to be J-equivalent if there exist an orthogonal representation space U and a G-homotopy equivalence $f: S(V\oplus U) \to S(W\oplus U)$ where $S(V\oplus U)$ and $S(W\oplus U)$ denote the unit spheres in $V\oplus U$ and $W\oplus U$ respectively. Then the group $J_G(*)$ is defined as the quotient of the orthogonal representation ring $RO(G)$ by the the subgroup

$$T_G(*)=\{V-W \mid V \text{ is } J\text{-equivalent to } W\}.$$

The natural epimorphism $RO(G)\to J_G(*)$ is also denoted by J_G.

The purpose of the present paper is to announce the group structure of $J_G(*)$ for G an arbitrary compact abelian topological group (Theorem 1).

In a forthcoming paper, we shall study $J_G(*)$ for G an arbitrary p-group.

The full exposition and proofs will also appear later.

§2. **The groups $J'_{Z_n}(*)$.** Let n be an integer greater than one and $n=2^k\cdot p_1^{r(1)}\cdots p_t^{r(t)}$ be the prime decomposition of n. Denote by Z_n the cyclic group Z/nZ of order n. Then we define a group $J'_{Z_n}(*)$ as follows.

Case 1. $k\geqq 2$. We set

$$J'_{Z_n}(*)=Z\oplus Z_{2^{k-2}}\oplus\bigoplus_{i=1}^{t} Z_{(p_i^{r(i)}-p_i^{r(i)-1})}.$$

Case 2. $k=0$ or 1. we set

$$J'_{Z_n}(*)=Z\oplus\left\{\bigoplus_{i=1}^{t} Z_{(p_i^{r(i)}-p_i^{r(i)-1})}\right\}/Z_2$$

where the inclusion of Z_2 into

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