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CLASSES OF NONABELIAN, NONCOMPACT, LOCALLY COMPACT GROUPS

T. W. PALMER*

1. **Introduction.** A great deal is known about locally compact abelian groups and about compact groups. Frequently the same result has been proved in both cases. Thus it is natural to look for a common generalization of these two quite different hypotheses—abelian and compact. This article surveys the literature on this idea. In some respects it may be regarded as an extension and updating of the second part of the important paper by Grosser and Moskowitz [23]. However, it is only meant to provide orientation in this subject, and thus in order to simplify the presentation we frequently do not quote results in their maximum generality. We will also omit most proofs. The extensive bibliography and detailed references to it, will allow the reader to find these when he wishes. At the same time we will try to explain enough to keep the formal prerequisites to a minimum. An acquaintance with the simplest facts about locally compact groups and convolution multiplication in their L^1-group algebras and about operator algebras on Hilbert space is all that is needed. We will use some standard results from [31] § 5 without comment.

In this article locally compact groups are always assumed to satisfy the Hausdorff separation axiom. The identity element of a group is usually denoted by e. We use $\mathbf{Z}$, $\mathbf{R}$, $\mathbf{C}$, $\mathbf{T}$ to denote the sets of integers, real numbers, complex numbers, and complex numbers of modulus 1 respectively, with their usual structures as topological groups or rings, etc.

The paper is organized as follows. § 2 contains definitions together with sufficient comments to orient the reader. More complete comments and more detailed references for all these matters are contained in § 4. § 3 contains four diagrams summarizing the known inclusions among the twenty classes which we discuss fully. These diagrams give

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