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D'Alembert's functional equation on groups

D'Alembert's functional equation is studied in detail and completely solved on compact connected groups. Based on the structure theorem of compact connected groups G , we prove that if G has no any direct factors isomorphic to $SU(2)$ then d'Alembert's equation has only classical solutions; otherwise, non-classical solutions exist and can be factored through one of those direct factors. Our main tools are from representation theory.