

Lawrence was commissioned 6 January 1962, and sponsored by Mrs. Fernie C. Hubbard, the great-great-grand-daughter of Captain James Lawrence. Commander Thomas W. Walsh became Lawrence's first Commanding Officer.

After a shakedown cruise on the Great Lakes, Lawrence proceeded to Norfolk for duty in the Atlantic Fleet. Following the rapid development of the Cuban Missile Crisis in October 1962, the warship deployed with Task Group 136.1, a surface quarantine group of cruisers Canberra (CAG-2) and Newport News (CA-148), three guided-missile destroyers including Lawrence and twelve escorts. The group took up a blocking position north of Cuba on 24 October, two days into the crisis. On Friday the 26 of October, Lawrence and MacDonough (DLG-8) began shadowing Grozny, a tanker proceeding towards Cuba. The next day, the Soviet Union agreed to defuse the crisis and military forces on both sides began standing down. Lawrence returned to Norfolk on 6 December 1962.