Born Lauri Allan Törni, in Viipuri, Finland, he joined the Finnish Army in September 1938. Rising quickly through the ranks, eventually obtaining the rank of Captain, he commanded the Finnish Alpine Ski Troops during the early years of WWII. These Ski Troops fought the Russians deep behind enemy lines for extended periods of time. Recruited for German military service to continue the fight against the Russians in June 1941, Törni volunteered and was assigned to the SS from June until the end of July when he returned to Finland as an excess officer.

In 1943, the Finns created "Detachment Törni" under his command. The infantry unit penetrated and fought deep behind enemy lines, inflicting such heavy casualties on the Russian units that the Soviet Union set a bounty equivalent to 650,000 US Dollars for his capture. Lauri Törni received every Finnish medal for bravery, including the 144th Knight of the Mannerheim Cross which is Finland's equivalent to the US Medal of Honor.

After Finland withdrew from the war, Törni, dissatisfied with the terms of the Finnish peace treaty with the Soviets, went to Germany in 1945 for saboteur training with the goal of organizing resistance in Finland if it was absorbed by the Soviet Union. Although he surrendered to British troops in the last stages of the war, he escaped, eventually returning to Finland whereupon he was promptly arrested by the ValPo (State police) and sentenced to six years in prison for treason for having joined the German Wehrmacht. After escaping from prison in December 1948, he was pardoned by the Finnish President, one of his men from Detachment Törni.

In 1949, Törni left Finland for Sweden bound for Venezuela. When the South American cargo ship was in the Gulf of Mexico, he jumped overboard and swam ashore in the US, making his way to New York City where he got a job as a carpenter and a cleaner. In 1953, Törni was granted a permit of residence through the Lodge Act. He joined the US Army in 1954 and changed his name to Larry Allen Thorne. Joining other highly decorated Finnish American officers who were in Special Forces at the time, he became an instructor in skiing, survival, mountaineering, and guerrilla tactics. He was commissioned in 1957, assigned to 10th SFG(A) at Bad Toelz. He was promoted to Captain in 1960. His first tour in Vietnam, from 1963 to 1964, was as the Detachment Commander of SFODA-734 in the Mekong Delta. In February 1965, assigned to MACV, he was instrumental in establishing the SOPs employed by the fledgling Studies and Observations Group (MACV-SOG).

On October 15, 1965, Thorne was inserted as an observer on the very first MACV-SOG cross-border operation. When the team was inserted, Thorne, who had planned the mission, remained in the area in case the team ran into trouble. Once he received word that the team was safe, he radioed that he was on its way back to base. His helicopter crashed. Although the crash site was located, he was listed as Missing in Action. He was promoted to the rank of Major in December 1965.

MAJ Thorne's remains were found and his DNA verified in 1999. He was laid to rest in Arlington National Cemetery with the South Vietnamese aircrew on June 26, 2003.