

Impact of Prior Flight Experience on Learning Predator UAV Operator Skills  
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UAVs (Unmanned/uninhabited aerial vehicles) are an increasingly important part of military operations throughout the world. However, there is no consensus about who should fly these aircraft. The United States Air Force (USAF) has primarily used experienced pilots who have had at least one operational tour of duty in another combat aircraft. By contrast, the U. S. Army's Hunter UAV is flown by enlisted personnel (generally non-pilots) who are given a UAV-specific training program. Other possibilities include students at various stages of military pilot training, or civilian pilots under contract to the military. A USAF Corona South four-star general officer summit in 1997 resulted in tasking the Warfighter Training Research division of the Air Force Research Laboratory (AFRL) to conduct a study to compare the speed and accuracy with which various groups of pilots could learn to fly the RQ-1A Predator UAV.

For this study we used a high-fidelity RQ-1A simulator developed in cooperation with experienced Predator pilots at Indian Springs Air Force Auxiliary Field (AFAF). Seven groups of pilots, varying in amount and kind of flying experience, completed a series of multimedia tutorials on basic principles of flight and procedures for operating the Predator, then flew the simulator. These groups were: (a) experienced USAF Predator pilots; (b) experienced USAF pilots recently selected to fly the Predator; (c) students recently completing USAF T-38 training; (d) students recently completing USAF T-1 training; (e) students recently completing single-engine instrument training at Embry-Riddle Aeronautical University (ERAU); (f) students recently completing requirements for a private pilot's license; and (g) Reserve Officer Training Candidate (ROTC) students at ERAU who intend to be USAF pilots but who had no flying training or experience. Each participant flew basic maneuvers and landings (including difficult crosswind landings) until a very high standard of aircraft control performance was achieved, and then flew 30 reconnaissance scenarios. Detailed measures of performance were continuously and automatically recorded. The results show that experienced Predator operators performed consistently better than other groups, while the non-pilot ROTC students performed worse. This is not surprising, but it confirms that the simulation used in the study was a valid indicator of Predator stick-and-rudder skill. A more surprising finding is that, from a pure aircraft control perspective, T-38 graduates and civilian instrument pilots performed nearly as well as the much more experienced pilots currently selected for Predator training. This is the only study that has used a validated simulation to study UAV piloting skill, and the results of this study have affected the policy for USAF Predator operator selection.

This study applies only to the Predator, and primarily addresses stick-and-rudder skills; we did not measure such operationally relevant factors as communication skills, command experience, knowledge of combat operations, or familiarity with airspace management. Since such knowledge and skills are necessary for a Predator pilot, the current USAF policy of using pilots who have had prior operational tours should only be altered if it can be assured that less experienced pilots can achieve this critical competence in some other way.