

**Effects of the Command and Control Vehicle (C2V) Operational Environment on Soldier Health and Performance (Final rept)**

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*Report Number: ARL-MR-468 , Nov 1999 , 61p*

**Language:** English

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**Contract Number:** 1L161102B74A

**Abstract:** The command and control vehicle (C2V) was developed to support U.S. Army tactical operation centers in heavy forces. The requirements for the C2V stipulate that it must support mobile operations and that it must support command and control (C2) from within the confines of the vehicle. However, in early testing, some human operators exhibited motion sickness during moving operations. As a result, the Human Research and Engineering Directorate of the U.S. Army Research Laboratory, in cooperation with the National Aeronautics and Space Administration's Life Sciences Division, was directed to perform a study to quantify the incidence and severity of motion sickness and any associated performance decrement. The study would discriminate between motion effects in the C2V in parked, moving, and short halt in each seat in three seat configurations. Twenty-four soldiers were exposed to each of 12 seats (four seats in three vehicle configurations) for a 4-hour %cell. During a cell, subjects completed a motion sickness and mood scale and the Delta cognitive battery. Half the subjects were also instrumented to record physiological correlations of motion sickness. Each cell included an initial (parked) administration of the test batteries followed by two test batteries while moving and three test batteries during short halts. Fifty-five percent of the subjects reported an average motion sickness score, indicating moderate to severe symptoms. Symptoms were not mitigated by short halts. One subject was withdrawn from the study because of severe and persistent symptoms. Performance was significantly worse during moving operations than in parked, with a partial recovery during short halts. Performance degradation was comparable to blood alcohol equivalencies at or

above 0.08% in 35% of the soldiers during movement and 22% during short halts. There was no significant difference between seat or vehicles in any of the measurements.

**Subjects:**

- Performance(Human)
- Military vehicles
- Military medicine
- Motion sickness
- Army personnel
- Combat support
- Health
- Command and control systems
- Tactical warfare
- C2v(Command control vehicle)
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