

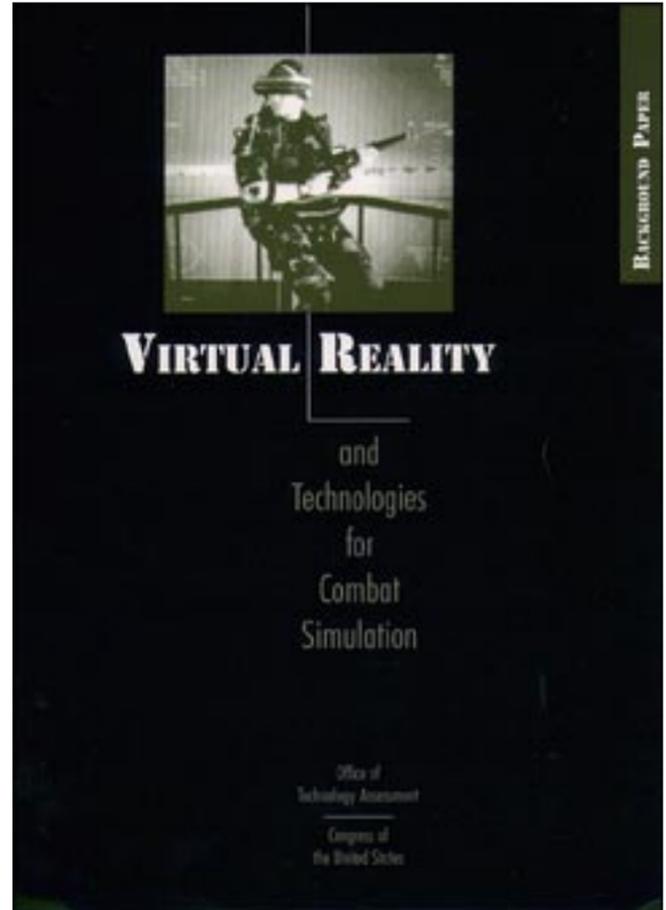
*Virtual Reality and Technologies for
Combat Simulation*

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Foreword

Virtual reality (VR) is the popular name for an absorbing, interactive, computer-mediated experience in which a person perceives a synthetic (i.e., simulated) environment by means of special human-computer interface equipment and interacts with simulated objects in that environment as if they were real. Several persons can see one another and interact in a shared synthetic environment, such as a synthetic battlefield. For over a decade the Department of Defense (DOD) has been developing and expanding virtual battlefields to be used both for training and to develop combat systems and doctrine. This background paper describes applications of synthetic-environment technologies in simulating combat. It traces technology development from the 1929 Link Trainer through the SAGE air defense system, the first head-mounted display, and the Defense Advanced Research Projects Agency's SIMNET simulator networking project.

Synthetic-environment technology is dual-use. Research funded by DOD seeded the field; now there is a large commercial market, and DOD is actively exploiting the dynamism and efficiency of that market. Advances in synthetic-environment technologies such as computer image generation are reducing the costs of cockpit simulators and facilitating other applications. This paper describes technical challenges and discusses issues of validation, standardization, scalability, flexibility, effectiveness, cost-effectiveness, and infrastructure.

This background paper is the first of several publications of the Office of Technology Assessment's (OTA'S) assessment of combat modeling and simulation, which was requested by Representatives Ronald V. Dellums (Chairman) and Floyd Spence (Ranking Minority Member) of the House Committee on Armed Services, Senators Sam Nunn (Chairman) and Strom Thurmond (Ranking Minority Member) of the Senate Committee on Armed Services, and Senators Jeff Bingaman (Chairman) and Bob Smith (Ranking Minority Member) of its Subcommittee on Defense Technology, Acquisition, and Industrial Base.

In undertaking this assessment, OTA sought the contributions of a wide spectrum of knowledgeable individuals and organizations. OTA gratefully acknowledges their contributions of time and intellectual effort. OTA also appreciates the help and cooperation of officials of the Department of Defense and the Department of Energy. As with all OTA publications, the content of this background paper is the sole responsibility of the Office of Technology Assessment and does not necessarily represent the views of our advisors or reviewers.



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Note: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this background paper. OTA assumes full responsibility for the background paper and the accuracy of its contents.

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