



AIRCREWMAN™

vr simulator



AVRS: Game-Based Software Technology, Reconfigurable Hardware

The heart of the AVRS is an aircraft mock-up that can be reconfigured to suit a range of airframes, including the S-70A Blackhawk, MRH-90, and CH-47D Chinook. Up to four trainees may be situated within a single mock-up, each equipped with a 'Virtual Reality' (VR) headset. Crew positions are tracked in three dimensional space via a six degree of freedom (6DF) tracking device that is accurate to the millimetre. Through VR headsets, trainees are immersed in a high-fidelity virtual environment in which both the aircraft and the surrounding environment are rendered at high levels of detail.



Background to AVRS

In 2006 Bohemia Interactive was selected by the Australian Defence Force (ADF) to develop six Aircrewman Virtual Reality Simulators (AVRS), which combine cutting-edge simulation technology with the latest in Virtual Reality tracking and display systems. Bohemia Interactive has since delivered a system that is arguably the most successful simulation project in Australian Simulation Wing (ASW) history: an affordable turnkey solution for aircrewman training delivered both on time and budget.

The AVRS offers a proven solution for the conduct of aircrewman training and assessment. It leverages the dynamic, large scale and high fidelity virtual environment provided by Bohemia Interactive's own simulation software, VBS2. The AVRS provides an affordable, easy to use, deployable and networked simulation solution by combining commercial-off-the-shelf (COTS) software and reconfigurable hardware.

Trainees are free to move around the cabin and operate in the same manner as they would in a real aircraft.

Instructors operate the AVRS from a dedicated instructor station located outside the mock-up, controlling the virtual aircraft through a specially modified version of the VBS2 Real-Time Mission Editor. Many new AVRS-specific features have been integrated into VBS2 including enhanced artificially-intelligent pilots that fly in a realistic manner.



The instructor has precise control over the aircraft and is capable of initiating a range of pre-defined maneuvers to present trainees with a variety of challenging situations, from basic low-level flight through to advanced ship landings, rotor strikes and slung loads. The AVRS highlights the flexible nature of VBS2, and the ease in which the simulation can shift from purely desktop-based training to driving a complex human-in-the-loop simulation system.

www.virtualbattlespace.com

www.vbs2.com

 **Bohemia
Interactive**

AVRS Features

- Very easy to operate: a system administrator is not required to operate the simulation; the aircrewman instructor and/or student can operate the AVRS through the intuitive VBS2 graphical user interface
- Based on commercial PCs: the entire system can be started in less than 2 minutes with the press of a single button
- Proven reliability: 10 months of trouble-free in-service operation
- Reconfigurable for multiple aircraft types
- Supports Formation Flying and Combined Arms via a variety of network options (DIS, HLA, LAN, WAN)
- Supports linkage with the VBS2 Desktop Trainer (a classroom LAN, for example)
- Supports procedural training in door gunnery
- Comprehensive After-Action Review (AAR) capability
- Supports ship and confined space landings (including slung loads)
- Comprehensive range of Instructor features via the VBS2 Real Time Editor, such as object distance indicators and rotor strike range
- Includes a custom-designed instructor keyboard to initiate complex manoeuvres by a single key press
- Advanced night vision goggle (NVG) simulation and thermal imaging (under development)
- Support for external loads (including an accurate simulation of rope tension)
- Dynamic weather and support for naval operations
- Realistic environments, for example rendering of shadows and simulation of day/night cycles
- Voice Over IP (under development): Crew will be able to use the same intercom toggle switch as they do in a real aircraft, with all voice communication recorded for inclusion in the AAR
- Hoisting (under development): Crew will be able to operate the winch on helicopter types that support hoisting



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VR SIMULATOR



The AVRS by Bohemia Interactive has significant advantages over similar systems, including:

- **Flexibility.** Numerous aircraft types are supported, yet the mock-up is lightweight and highly transportable (set-up in under a day). The system is configurable to suit a range of aircrewman training requirements and trainees may move freely within the simulated aircraft.
- **Networking.** Multiple AVRS may be linked together or to any other VBS2 session over a LAN or WAN. Up to four crew members may train in a single aircraft, and multiple simulators may be linked for practice in formation flight or Combined Arms exercises. The AVRS may also be linked to other simulations (such as a pilot trainer) via DIS or HLA.
- **Affordability.** The AVRS employs the latest commercial-off-the-shelf Virtual Reality hardware and software technology, requiring very little custom-built hardware.

Comments from End Users

- "Since March 2007, the results have been amazing. Three training rotations will have 100% pass rates, which is unheard of - traditionally we have around a 25% failure rate. The AVRS training solution has been a huge success." (*Senior Aircrewman instructor, Oakey, ADF*)
- "Students are now at a far more advanced level before even entering the real aircraft. This saves time and allows the trainees to be much better prepared." (*Senior Aircrewman instructor, Oakey, ADF*)

The AVRS - a cost-effective alternative for the training and assessment of aircrewman - is now available worldwide.

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