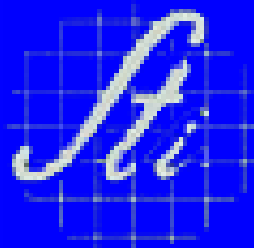
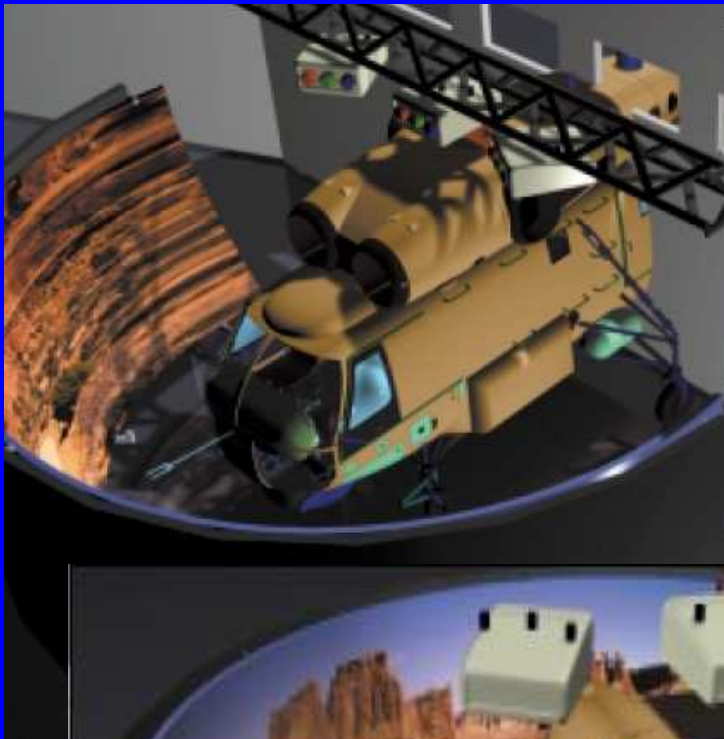


# Military VR Simulation Applications

Noah Brickman and Dr. Edward Bachelder  
Systems Technology, Inc.



# 'Big Iron' Simulators



- Very Realistic but...
- Large and expensive
- Difficult to move and upgrade
- Based on heavy workstation systems

# V-22 Osprey Simulator



# Air Traffic Control



# Compact VR Systems



- Off the shelf technology
- PC based
- Smaller and less expensive
- VR allows immersive outdoor experience
- Mobility allows on-site training

# VR Development Technology



- Image Generator
- Head Mounted Display
- Motion Tracker
- Interface Devices

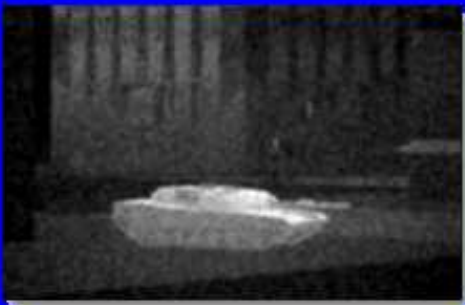
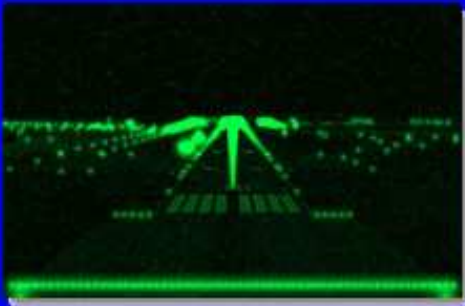


# Image Generators



- Commercial API for graphics development
- Works with industry standard data formats
- Sensor Effects
- Plug-in Modules

# Sensor Effects



- Shader technologies allow physical simulation of...
- Infrared
- NVG
- Radar



# Kaiser HMDs



- 50 degree FOV
- 1024 x 768 VGA
- Dual channel stereo
- Prices from \$10k - \$75k

# Consumer HMDs



- 26 degree FOV
- 800 x 600 S-Video
- Alternating stereo
- ~ \$1000

# 3 DOF Motion Tracking



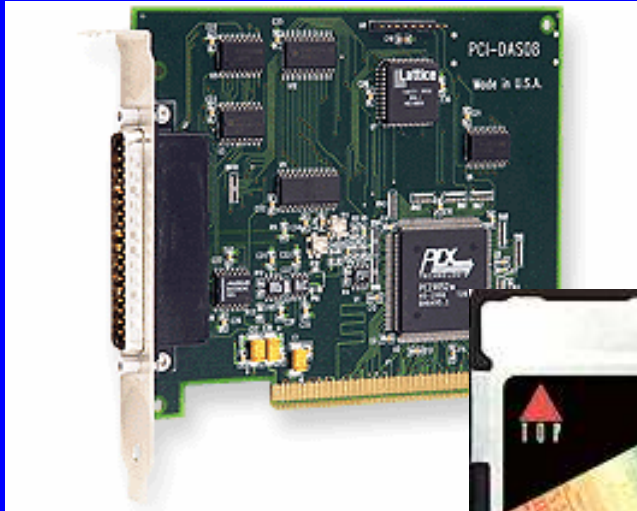
- InterSense InertiaCube
- Orientation tracking
- USB or serial
- Wireless options
- 180 Hz.

# 6 DOF Motion Tracking



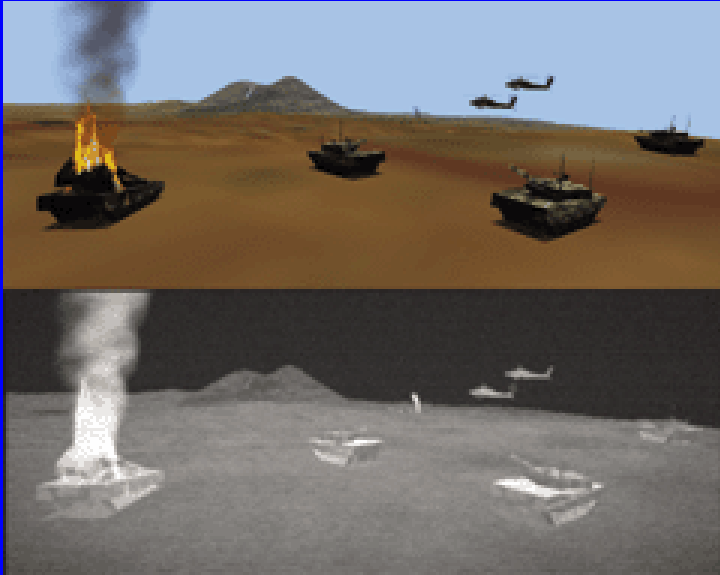
- Polhemus FastTrack
- Position and Orientation
- Uses central emitter
- 120 Hz.
- Other technologies include optical and ultrasonic tracking

# Interface Devices



- Take analog electrical signal input
- Converts to digital data stream
- API provides easy application integration

# Future Advancements



- Faster every year
- Better terrain data
- Standardized sensor data
- HLA compatible simulations



# Future Warrior



- Integration of VR with networked sensors on the battlefield

# ParaSim™



- Parachute operations trainer
- Low cost
- Highly compact
- 30 Parachutes
- 12 Scenes

# ParaSim™ Training



- Canopy control skills
- Equipment malfunction
- Collision avoidance
- Mission preparation and rehearsal





Virtual Reality Milkman