

# RAYTHEON PATRIOT PROJECT PROFILE

For more than four decades the US ARMY has been training soldiers on Raytheon's Patriot Missile System using videos, manuals, paper tests and eventually hands-on testing. With the current generation of war fighters learning in a new style,

the ARMY approached Raytheon to create a virtual training program for maintenance engineers. In Raytheon's search for a partner in developing the training program they found Heartwood, a team of technical experts that focuses on developing custom, PC-based, turnkey solutions. Heartwood's initial objective for the training program, now called PMET, was to create 3D models of all system equipment and make each piece look and work as in real-life, i.e. lights turn on when a switch is activated and cables are able to move from place to place as necessary.

When Heartwood started the project in November 2006, Heartwood personnel traveled to the client site for accurate measurements and photos, rather than the client assigning extra resources for this task. Heartwood's team of highly technical 3D modelers, texture artists, animators, and game engine programmers made these images come to life in the form of 3D models that were then inserted in the XNA game engine. The next task was to animate the equipment. Heartwood received instructions of how the pieces interacted and was able to duplicate movement of cables, switches, doors, etc. This was also programmed into the game engine.



In July 2008, Heartwood started animating for individual 'faults', more specifically the items that the engineers would be fixing on the equipment. Throughout this process there were many troubleshooting opportunities, namely an issue with the cable movements

being interpreted properly by the game engine. Heartwood's artists and programmers were able to solve this issue by modeling the cables in an alternative way that was compatible with Raytheon's programming.

As Raytheon made progress deliveries to the US ARMY, the need arose for introductory and summary videos to explain to the engineers what fault they would be fixing. While continuing to work on individual faults, in May 2009 Heartwood began creating 30-60 second animations with graphics, sound, and voiceover depicting why the engineer was being called to fix the system.

Raytheon came to Heartwood in August





## HEARTWOOD



2009 requesting a secondary virtual training program for the Patriot Missile System named PIVT. The main requirements for this advanced training were to apply lessons learned from PMET to the PIVT Initiative, which has less functionality but web-enabled and deployment ready. Heartwood's team determined the best engine for Raytheon's requirements and is currently in the process of programming for this new training program.

PMET: Patriot Multi-Echelon Training  
PIVT: Patriot Interactive Video Trainer  
XNA: Microsoft's game engine

## KEY BENEFITS TO THE CLIENT THROUGHOUT DEVELOPMENT

- Quick and effective troubleshooting methods were applied by Heartwood's unique technical artists and programmers resulting in smooth program schedules and on-time program delivery
- Raytheon's evolving needs were satisfied by Heartwood's deep virtual training and animation experience, which minimized program disruption and risks.
- Heartwood's solutions-oriented approach was fully utilized in these challenging, mission-critical training applications.

## CLIENT TESTIMONIAL

*"Heartwood has developed excellent three-dimensional models for our project. The quality of Heartwood's deliverables has been outstanding and they have delivered all products ahead of requested schedules. Heartwood has been very responsive to all requests and very professional to work with on our project."*

Scott Gavin, Raytheon

To see a full scope demonstration of this compelling customer application, contact Heartwood at 888-781-0274 or on the web at [www.hwd3d.com](http://www.hwd3d.com)