

Use of the Quantum Optics Holography™ Three-Dimensional Process for Maintenance Training

By Stanley H. Kremen

It takes many hours to train an expert mechanic or maintenance engineer. The equipment to be maintained is very expensive, and mistakes by a trainee could be very costly. Consequently, prospective mechanics or maintenance engineers go through long classroom hours as well as an apprentice program where they are supervised so that they gradually achieve proficiency. Initially, the expert does almost all of the work while the student dabbles here and there. Eventually, the student is allowed to perform simple tasks, ultimately graduating to maintain simple equipment. It takes a long time for a student to become an expert. Such a program takes many hours. It uses up expert resources that could be used elsewhere.

A hologram of an engine or other device to be maintained would show that device in true three-dimensions such that a viewer could not perform a visual test to determine whether the device is real. He could look around objects to see what is behind. He could look over, under, and around the device. If he tries to touch the device, the image of the device would look more real than his own hands.

Unfortunately, due to limitations of the methods of making a hologram, holography provides no advantage over viewing the actual device. You cannot manipulate a holographic image, and programmable moving holograms are impractical. Holography itself cannot be used for maintenance training.

However, the Quantum Optics Holography™ Three-Dimensional Process is like holography in that a viewer cannot perform a visual test to determine whether what he is looking at is real. It is different in that images may be programmably animated. Therefore, with the proper motion sensing detectors and appropriate software, a three-dimensional image may be manipulated. While the feel of touching an actual device is missing, such feeling can be simulated. Students can manipulate simulated screwdrivers and pliers, and they would get the same look and feel as if they were handling the real tools.

If the organization wants to teach a student how to maintain an engine, the Quantum Optics Holography™ Three-Dimensional Process would generate a realistic three-dimensional animated cartoon image of the engine. The student would retrieve realistic cartoon tools within the animated scene, and would use them on the engine. Based upon what the student did, the image of the engine would react accordingly. Because the image is computerized, every possible scenario could be programmed into the software.