Steve Harding

Ken Schroeder processes film in one of the center's minilabs.

THE CUTTING E

Story by Mike Cast, Photos by SSG John Valceanu

IMAGINE being able to clearly read the stenciled letters on an artillery or tank round as it hurtles downrange at several thousand feet per second, or see fine details within an explosion that lasts a fraction of a second. The International Imaging Center at Aberdeen Proving Ground, Md., makes these feats possible with an array of state-of-the-art digital and film cameras.

The IIC uses high-tech imaging equipment to provide images and information about the performance of weapons and military hardware during tests. It also supports units with a range of photographic, graphic and multimedia services.

With some 50 photographers, electronic and lab technicians and multimedia specialists, the IIC is a part of the Army's Aberdeen Test Center, which tests military equipment for the Army and the Defense Department. But the IIC also offers its products and expertise on a cost-reimbursable basis to other military organizations, research facilities and government agencies.

"We work in three main areas — technical photography, the image-processing laboratory and the multimedia-production group," said David Jennings, chief of the IIC. "The main thrust of the center is technical photography — providing high-speed and ultra-high-speed imaging throughout the visible and invisible spectrum."

The technical photography team has some of the most sophisticated imaging systems currently available, some of which operate in "extremely hostile ballistic environments," said Mark Stern, the technical photography team leader.

A laser-illumination system, for example, enables cameras on ranges to capture images of ultra-high-speed events such as shaped-charge explosions and tests to verify dual warhead timing. An IIC digital imaging system can capture such events at a rate of up to 100 million frames per second. High-speed film cameras, both 16mm and 35mm, can record events at 40,000 frames per second. For some tests, the IIC uses cine-radiography, a process that enables testers to obtain X-ray images of test events that reveal data other types of photography can't record.

The images captured by these systems allow test customers to see the performance characteristics of small- and large-caliber projectiles — in the bore, as they exit the muzzle, during their flight trajectories and at impact with the target. They also allow testers to gauge the ability of armored vehicles to withstand the impact of projectiles, and they reveal how components of military vehicles or other types of equipment perform.

IIC photographers also use gyro-stabilized cameras to record air-to-air and air-to-ground tests. And they use night-vision systems to record test events in low-light conditions. A photographic diving team is certified to dive to depths of 130 feet to record underwater images.

Both Jennings and Stern said the trend at IIC and elsewhere is to move away from film photography and replace it with digital imaging.

"We have one of the most diverse collections of digital imaging systems in the Department of Defense, according to a survey that was done a few years ago at

Mike Cast is a public affairs officer for the U.S. Army Developmental Test Command at Aberdeen Proving Ground, Md.

Interns work on both conventional and digital photographs at the center.

Kristopher Brewer *(left)* and Jim Aguilar capture a test in progress at Aberdeen using both digital and video cameras.

Tarah Parekh, one of several IIC student interns, scans film images at the center.

DGE OF IMAGING

a range commanders' conference," Jennings said.

The benefits of digital imaging include reduced time to get results, substantial cost savings and reduced environmental impacts.

"Using film was very labor intensive because we had to change it after shooting 100- or 400-foot rolls," Jennings said. "We had to stop the whole test while everyone waited for someone to change the film, and if we had five cameras, we were waiting five times as long. The film would have to come back to the lab and be processed before the test could resume, to make sure everything was working correctly. So the test would be down for hours with a whole crew standing by."

"Now, with the high-speed video, the engineer can play back the video right after the shot, and the customer can make decisions on whether to proceed with the test or not, which is a big cost savings," Stern added. "We might have fired 30 to 50 rounds in a day. Now we can see if there is a problem after firing one round and stop if there is."

Although technical photography on ranges is not art, the IIC employs photographers, graphics artists and multimedia specialists who strive to produce visual images, reports and presentations that are both accurate and of high quality, Jennings said.

"Years ago, the group here saw the need for taking the data they recorded and using it to produce video and multimedia briefings and test reports," he said. "People saw the quality of the work, and that developed into a whole production group, which now does command videos. We're called on to do video documentaries of testing throughout the world as well. We've had video crews as far away as Korea and Kosovo."

The IIC and its multimedia group also produce interactive computer CDs, including training programs such as the CDs used to teach soldiers how to install combat-identification panels on tracked and wheeled vehicles. The multimedia team also produces marketing presentations and websites.

IIC graphics designers produce original technical art and illustrations using traditional methods, as well as through computer systems and equipment. Graphic work includes conceptual depictions of weapon systems and two- and three-dimensional computer-generated illustrations that support exhibits, publications and presentations.

The IIC's image-processing lab produces prints and images of various sizes from film and digital files, and makes photo CDs. Like the IIC in general, the lab is moving away from film-based processing and printing to expand its digital support capabilities, while retaining the ability to provide traditional film-based services when those are more appropriate.

Reducing the chemical use that comes with traditional printing is a big money saver for the Army as a whole, said lab chief Robert Hagan, adding that environmental regulatory agencies closely monitor the wastes from operations such as photo labs. The cost of hazardous-waste disposal for film-based photo labs can be substantial.

Jennings, Stern and Hagan all agreed that test instrumentation, including imaging systems, will have to be increasingly accurate and sophisticated for the high-tech Army of the 21st century. □