



# IMAGE CONSCIOUS

USAMMA biomedical maintenance technicians' attention to detail minimizes downtime of essential medical imaging systems

**T**hanks to advances in medical imaging, military hospitals can diagnose injuries and render treatment faster than at any time in history. Those doctors and clinicians rely on skilled biomedical maintenance technicians to tend and repair the complex and fragile imaging systems. In an environment where seconds count, there can be no downtime for lengthy repairs.

That's why the U.S. Army Medical Material Agency (USAMMA) Forward Repair Activity-Medical (FRA-M) teams are in high demand.

FRA-M teams serve four-month rotations, deploying to theater in support of medical units. From 2007 to 2010, the teams increased uptime for computed tomography (CT) scanners from less than 55 percent to greater than 90 percent.

## TECHNICIANS AT WORK

(Clockwise from top) Mark Mills works on a CT scanner at the clinic at Camp Arifjan, Kuwait; SPC Timothy Wonky (right) checks on a CT scanner with Mills in Baghdad, Iraq; Mills trains SGT Tiffany Riggs on a computed radiography system in Al Asad, Iraq; and Mills uninstalls an X-ray unit in Baghdad, to reinstall it in a shelter. (Photos courtesy of Mark Mills.)

FRA-M has the expertise required to support all imaging equipment in theater, including CT, computed radiography, and digital teleradiology.

Mark Mills, Imaging Systems Maintenance Manager for Tracy Army Depot, CA, oversees X-ray and radiology maintenance training requirements for the FRA-M team. He provided a close-up of the team's mission, training, and challenges.

## WHAT ARE THE PRIMARY CHALLENGES FACING FRA-M MEMBERS?

This is a war zone, so you have that 24 hours a day, from rocket to mortar attacks. Travel in theater is difficult, to say the least. Also, getting replacement parts sometimes will take six to eight weeks. "Overnight" shipments take anywhere from five to 14 days.



# “ANYBODY CAN FIX A CT. IT TAKES A REAL TECH TO FIX IT IN A WAR ZONE.”

To mitigate the impact of extended shipping times, we looked at all the problems we’ve had with the CTs and assembled a parts kit to satisfy all those problems. We’re now looking at the probability of placing parts kits at the actual location.

## TRAINING POSES ITS OWN CHALLENGES, YES?

Most units are on the ground for 10 to 12 months. We’ll go in and work with the 68 Alphas [Military Occupational Specialty 68A, Biomedical Equipment Specialist], providing hands-on training, showing them things that we have learned over the years and techniques that aren’t covered in their training courses. Before long, that unit is gone, and we’re back to a new unit—new people with the same problems. So we go back in and begin the training process all over again.

The theater has ample basic, apprentice-level, school-trained biomedical maintenance technicians. What they lack is experience. That’s what the FRA-M brings to them—both the experience and the knowledge.

## ISN’T TRAINING ALONE SUFFICIENT?

Before deploying, the unit often sends select biomedical equipment repairers to additional training on specialized systems, such as the CT scanner. However, they

usually just attend the specialized training and go straight into theater. Some unit members have told me they spent almost two years before deployment going to school—one school after the other after the other. They go to some of the same training our FRA-M does, but they don’t have time to work with the equipment or with other people.

Sometimes, they’ve had so much training within such a short period of time that they have trouble separating one system from another; they get too much training without experience. Working with experienced techs gives them critical on-the-job training with real-life scenarios. The instructors can’t teach how something will break down. When I’m in theater, I hear a lot of, “They never taught me that at school!”

## WHY DON’T MORE IN THE FIELD HAVE EXPERIENCE?

As with most technical fields, medical maintenance skills are perishable when not routinely sustained. One would think that with a protracted war, eventually the experience level of our biomedes would increase; however, the on-again, off-again approach of TOE [Table of Organization and Equipment] Soldiers providing maintenance during deployments and being restricted while in garrison inhibits the continuous sustainment of their skills. This is also

compounded by the grade structure associated with TOE- and TDA- [Table of Distribution and Allowances] type organizations. More often than not, the grade structure calls for junior technicians, and the experience level of medical maintainers in deployable units is lacking. What we have are 68As just out of school, but anybody with experience is not there anymore.

The Medical Command recently included the 68As in its Training with Industry Program. The program leverages training opportunities available from major vendors. The primary example is Philips, which provides a lot of radiological and imaging systems, such as CTs and X-rays, that our deployable hospitals use in theater. The Soldiers in the program attend Philips Training Center, going to classes as well as actually participating in the training of official students there in the labs. It drills the information into them.

Although several of the big-ticket items may be manufactured by Philips, there are numerous items and various makes and models of imaging systems and equipment deployed in the theater today—for example, Ziehm C-arms, VERTX CR systems, MinXray portable X-ray systems, Fuji CR Systems, Hologic C-arms, Siemens portable X-ray systems, Chloride CT UPS systems, and GE portable X-ray systems. Our goal is to have these Training with Industry technicians assigned to USAMMA’s Center of Excellence for imaging systems at Tracy, where they receive additional training and experience on the many types of equipment they can expect to come across in theater.

This program is new to the biomedical equipment maintenance field. The first 68A Soldier to complete it just left for Qatar in June. It’s exciting. If it continues to work, we can get a stream of Soldiers in these positions.



**HOW MODERN ARE THE FACILITIES IN THEATER?**

The Armed Forces constantly update hospitals. Things change, especially for pulmonary and laboratory systems, whereas our CTs have a longer lifespan; they're in theater for six to eight years. Equipment doesn't get stagnant or old and decrepit. The doctors want the best equipment available out there. Saving Soldiers' lives is the number one priority. It is their only priority.

**WHO FUNDS REPAIRS? HOW ARE BUDGETS TRACKED?**

Each medical treatment facility maintains its own records. Most locations have a co-op parts contract funded by the theater to support the CT scanners. It prepays for parts. So when the medical treatment facility at Kandahar needs an X-ray tube, the facility can call Philips for the part. Philips charges that contract, which the

theater prepaid, and ships the part right out. Units without a contract in place are required to order parts through the standard medical supply chain.

If a site doesn't have a contract, that part might be \$20,000. But when I order that same part for a site with a contract, the cost might be \$2,000. It's a substantial difference. The benefits of having a co-op parts contract are immeasurable when it comes to ensuring that the systems are available for patient care. We're also looking at potential parts kits for non-Philips vendors to push out there, so we can get discounts and save money.

**DO YOU DISCUSS WITH MANUFACTURERS WAYS THEY MIGHT IMPROVE?**

Manufacturers want to know how equipment is holding up and how they can

improve support. There is concern there, especially for companies that want to continue to do business with DOD. And I do see some changes actually being implemented. One example is tailoring their training and support programs: The advice they give techs in theater is now different than in fixed hospitals.

For many companies, selling their product to an Army at war is an eye-opener on reliability, especially for equipment that may not have been designed to endure the harsh desert environment. Soldiers put equipment through rigorous treatment in places that most noncombatants can only try to imagine. It is also difficult for the manufacturers to create an environment for testing that mirrors the conditions in Southwest Asia. So it's a learning process for all the vendors. Fortunately, they've been listening to us.

**TRAINING THE TEAM**

Mills joins the Medical Logistics Warehouse and Command and Control Team in Bagram, Afghanistan. (Front row, from left) SGT Anna Salas, SPC Kelly Griffith, SGT Mandy Mendelkow, SGT Neil Davidson, and SPC Jennifer Laboe; (back row, from left) Mills, SGT Gregory Nieuwenhuis, SPC Jamaal Abdulhamid, SSG Omar Verdi, SGT Alven Haulmark, and SPC Zachariah Serna.





**HANDS-ON TRAINING**

Mills trains SGT Tiffany Riggs and SPC Joshua Whitehead on a CT scanner in Al Asad, Iraq.

**WHAT ARE THE BIGGEST THREATS TO EQUIPMENT UPTIME?**

Sandstorms are so bad in theater. The air conditioners and the CTs' cooling fans suck the sand in. Inside the CT, the sand blasts the fiber optics that data is sent through. It's a mess. Technicians take tarps and cover up systems when they're not in use. We encourage preventive maintenance and regular cleaning. We do everything possible to keep the sand and dust out. It's a constant battle because it's so fine.

Intense heat is also a problem. It can reach 140 degrees in Iraq. We have to keep the systems at or below 74 degrees. The temperature can't fluctuate more than 10

degrees. Reliable, stable power is a challenge, too. The power is run by commercial generators, and there's a lot of fluctuation in voltage, which contributes to failures.

And when you're working on a CT and all of a sudden you hear an incoming alarm that a rocket attack is happening. ... Well, I've always said, "Anybody can fix a CT. It takes a real tech to fix it in a war zone."

**DO YOU FIND YOUR WORK REWARDING?**

Yes. Everyone makes you feel welcome. I get the same question, "Can you be based out of our site?" I was in Tallil, Iraq, working on a CT, and the unit asked me, "If we build you a house, would you stay?"

When I was in Al Asad, Iraq, every time I would submit a travel request, they'd have their command disregard them, so I wouldn't leave. In Tikrit, they named a hall after me. It's all their way of showing us how glad they are we're there.

At USAMMA, we support the organization and don't always see the end user. But on the FRA-M, we work with those who actually use the equipment. You see them, you talk to them—it's amazing. There's so much appreciation you're there. And they're so happy you came, and it's nice to feel welcome. It reconnects us to why we do what we do.

—USAMMA staff