Pharaoh's Battery

The 3d Battalion, 116th Field Artillery (Multiple-Launch Rocket System), Florida Army National Guard (FLARNG), recently participated in a Battalion/Brigade Battle Staff (BBS) exchange program with the Egyptian Army. During the 3-116th's annual training in July, six Egyptian FA officers observed training and support techniques of our battalion. In August, six US FA officers visited the Egyptian Field Artillery. The following are some of our observations.

The Egyptian Army's 122-mm self-propelled gun is a combination of the Russian-designed, Egyptian-built 122-mm D-30 towed howitzer and our M109 chassis/drive train.

Equipment. We were surprised to find the Egyptians use the AN/TPQ-37 Firefinder radar, M109A2 howitzers and M981 fire support team vehicles (FIST-Vs) and how competent they were with these systems. The Egyptian Army also developed a 122-mm self-propelled gun, which is a combination of the Russian-designed, Egyptian-built 122-mm D-30 towed howitzer using our M109 chassis/drive train.

The Egyptians use Russian plotting boards and aiming circles calibrated in the "DC" system for observation (360 degrees equals 6,000 DC), but they use American M2 aiming circles calibrated in mils (360 degrees equals 6,400 mils) to lay the battery. The battery we visited had four M109A2s, one M113 armored personnel carrier (APC) for the battery commander and forward observers (FOs), one M992 FA ammunition support vehicle (FAASV), two locally produced two-and-one-half ton wheeled trucks for wire communications and maintenance, and one M992 FAASV configured as a fire direction center (FDC). The FAASV is infinitely superior to the M577 as an FDC. It has more room for maps, charts, radios and personnel.

The Egyptians developed a laptop computer running locally designed user-friendly fire direction software that serves as their battery computer system (BCS). The computer lacks a radio frequency modem, so fire commands are still done by voice. Also, it can't exchange data with higher headquarters/adjacent units or receive battlefield geometry or computer meteorological data. The Egyptians use programmable calculators that function similarly to our backup computer system (BUCS). Their radios are our AN/PRC-25/77 and AN/VRC-46/47 radios.

The FOs had the civilian night-vision scope (NVS) 900 and the US Marine Corps AN/GVS-5 laser rangefinder. Both are mounted on Russian tripods calibrated in the DC measurement system. The Egyptian battery equipment reflects this mix of western and Russian equipment and off-the-shelf hardware.

Technical Computations. The FDC we saw had a chart posted with the charges and quadrant elevations for achieving standard ranges. It had no BCS, graphical firing tables or methods for computing Met data. The brigade has an Egyptian version of our position and azimuth determining system (PADS) for survey and European instruments for calculating Met conditions. I did not see where in the process the correction for standard conditions entered computations.

The Egyptians consider artillery to be an area-fire weapon and the desert to be a big area. That is, they sacrifice some accuracy to get improved response times. To do this, they fire four-round abbreviated registrations immediately after occupation. This allows them to get steel on target quickly while compensating for non-standard conditions without a lot of manual computations and corrections. The drawback is that it's only effective for approximately two square kilometers around the registration point. Also, this type of registration can't be transferred to adjacent units.

However, it seems to work. In the desert, Met conditions change slowly, if at all, and in the large flat desert, unobserved rounds don't happen often. The system they use is fairly accurate and very responsive.

The greatest possibility for introducing error into the system appears to be observers' working in one measurement system (DC) and the gunline in another (mils). It encourages technical mistakes from having to constantly convert between the two—a potential for mistakes that can be exacerbated by fatigue and stress. But the Egyptians seem to be quiet adept at calculating the conversions quickly.

They also have developed an interesting method of controlling fires in the featureless desert without using a map or knowing the unit's location. The observer takes a blank firing chart and plots himself in the center. The howitzer fires a round at a point in front of the observation point (OP), and the FO measures the direction and distance to burst. The howitzer checks the range it fired and the azimuth of fire and sends this information to the OP.

The battery commander at the OP plots the howitzer on the back azimuth and distance from the burst. He then has a chart with the battery and OP plotted relative to the impact. The battery commander has the FDC number the grid lines on the map with numbers he designates, creating a crudely surveyed firing chart.

I was amazed at the simplicity and accuracy of this system. That it works so well is probably due to the unobstructed 360-degree view the desert affords the observer from most OPs.

Observed Fire. The Egyptian battery commander goes forward of his unit with the observers and sets up two OPs. The primary OP consists of the battery commander, two FOs and two radio-telephone operators (RTOs).

The secondary OP is about 300 to 700 meters on the flank of the primary OP. It has one observer, one RTO and an aiming circle. The two OPs triangulate the location of targets on the battlefield. There is no "fire support team" as we know it; the battery commander coordinates with the supported unit from the OP. The system works well and results in exceptionally accurate target locations.

The Egyptians do not use global positioning systems (GPS)dependent on foreign satellites or any other hardware or systems not under their control. They take great pride in being self-sufficient in the operation and repair of their equipment.

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