Photos by LTC John Paulson

Three Tanks Featured In Russian Arms Show

by Colonel James H. Nunn and Lieutenant Colonel John C. Paulson

In early June, Russia held its third International Exhibition of Military Land Equipment, Armament, and Conversion Products at Omsk, Siberia, more commonly called the Omsk Arms Show. Military representatives from around the world attended, including the Project Manager and TRADOC System Manager - Abrams as part of the U.S. team.

We attended for two reasons, both to know the enemy — since many potential enemies are likely to be using Russian weapon systems — and to know the competition, since both the U.S. and Russia make foreign military sales in order to lower their own unit costs and so enable them to afford the quantity and quality of tanks they want and need. Russia's need to export has improved Western knowledge of Russian systems.

Russia recently closed one of its three tank plants, leaving two, at Nizhniy Tagil, where the T90 is built, and at Omsk, the T80 factory. Cost is the key factor in Russian export success: both T80 and T90 enjoy a significant cost advantage over the M1A2, LeClerc, or Leopard 2. In years past, buyers were concerned with the survivability of Russian tanks after seeing the poor performance of the T72 in Desert Storm, but the passage of time has eased these concerns.

Moreover, Russia has made improvements in the lethality and survivability of their tanks, which improves export prospects. Russian tank design remains strong in areas of armor, firepower, and mobility, and they are also making great improvements in survivability with introduction of systems like the Shtora electronic self-defense suite and the Arena active protection system.

Key systems displayed by Russia at the exposition included: the T-80U improved tank, T-90 tank, Black Eagle tank, BTR 90 wheeled armored personnel carrier, and the tracked BMP-3 APC. They also showed a recovery vehicle based on the T-80 chassis and a mine clearing engineer vehicle.

T-90

The T-90 tank is manufactured at the tank plant in Nizhniy-Tagil, southeast of Moscow. The T-90 is based on the T-72 tank, but the fire control system is similar to the basic T-80. The gunner has a thermal sight and laser rangefinder. Like the T-80, the tank has a hunter-killer system for the tank commander, but the TC's sight at this time is daylight and IR only. There is no independent thermal sight for the commander. The tank comes with the Shtora active protective system as standard equipment, with the Drozd or Arena system optional.

The primary differences between the T-80U and T-90, according to the Russians, is that the T-90 has a diesel engine, a different suspension system, and the ability to start the engine electronically or through an air power system. The latter system improves reliability in cold weather or when battery power is low.

T-80UM1 (Improved)

The T-80UM1, made at the Omsk plant, includes several improvements over the last few years. The T80U on display at Omsk had digital computers for the TC and gunner. It also had a built-in test system and self-tests for various fire control checks. The tank did not appear to have a digital data bus system. The Shtora, Arena, or Drozd system warnings are integrated into the computer's digital displays.

Above, a T-90 races through a mobility demonstration at the Russian arms show at the Omsk proving ground.

The gunner has a thermal sight, and both the TC and gunner have small video screens that display what the gunner is viewing through his thermal sight. The Russians advertised that foreign customers can also choose to add a foreign-made thermal sight to the tank, as the Ukraine has done with its T-84, which demonstrated the incorporation of the French SAGEM second-generation FLIR.

The T80UM1 has the 2A46M-4 main gun, but now there is a muzzle reference sensor (MRS) on the end of the gun tube. The Russians advertise a 20 percent increase in fire effectiveness over the 2A46M-1 main gun in the standard T-80U. The tank is capable of firing APFSDS, HEAT, HE-Frag main gun rounds, and 9M119/9M119M anti-tank laser-guided missiles.

The T80U brochure states that the "REFLEKS" laser-guided missile system is intended to engage land and low-altitude aerial targets at a range of 100-5000M. During the firepower demonstration, both the T-80U and T-90 shot missiles at a range of approximately 4K, and all rounds were dead-center target hits. The tank carries a basic load of 45 rounds, with 28 in the autoloader carousel and 17 stored in the hull.

The T80UM1 has an air conditioning system, a fire-suppression system and NBC protection.

Russia also offers the Shtora electro-optical countermeasures system, which covers a 360-degree arc, and is capable of detecting laser emissions and launching aerosol grenades to screen the tank. The brochures claim Shtora triples the tank's protection.

The more complex Arena-E defensive countermeasures system is an active protection system against rocket grenades and ATGMs. A radar mounted on top of the turret scans 360 degrees. It is linked to a series of grenade launchers mounted on a ring along the frontal 110 degree arc of the turret. Incoming missiles moving at 70 to 700 meters per second are detected at 50M. The automatic system reaction time is .07 seconds. Once a ground- or air-launched missile is detected, the Arena system launches a grenade in that sector at approximately a 70 degree angle. The grenade then shoots down at the incoming missile to destroy or deflect it before it hits the tank. The Russians claim Arena doubles the protection of the tank, and that the combined protection level of a tank with Shtora and Arena increases five-fold. The Arena system is available for the T80 tanks, T-72C, and BMP-3.

The tank has "dazzle paint" over most of its surface. This paint is an electromagnetic wave deforming/absorbing coating used to prevent radar detection. Another improvement is that the driver's steering laterals have been replaced with a steering wheel.

According to a brochure, the tank's improved GTD 1250G HP multi-fuel gas-turbine engine has a hydraulic volume tuning mechanism that produces a 29 percent increase in average speed on winding routes. Fuel consumption has been trimmed 9 percent over the standard GTD 1250 turbine. The tank is listed at 46 tons. With a 27.2 horsepower-to-ton ratio, the T-80U has a higher power to weight ratio of any modern main battle tank in the world. It was dubbed the "flying tank" at the show.

Other features on the tank include a small turbine 18kW GTA-18 auxiliary power unit. This under-armor APU can operate all the tank's systems when the main engine is switched off. The engine has an automatic air cleaning system, and there is a one-point refueling location for the fuel tanks. Maximum range for the tank is listed at 440 km with external fuel tanks and 335 km without them. Maximum speed is listed as 70 kph highway and 40-45 kph cross-country.

The Black Eagle's blocky turret resembles recent Western designs. The chassis of this Black Eagle was longer, with seven road wheels on each side, compared to the tank identified as the Black Eagle in a 1997 exhibition.

Black Eagle

The Black Eagle tank is also made at Omsk. It was demonstrated during the last five minutes of the live fire mobility demonstration. The Black Eagle represents a major change in Russian tank design. It has a Western tank-style turret with a bustle rack, which appears to be designed to hold main gun rounds. It is the first Russian tank with a bustle, which gives them the capability to make lethality improvements in ammo and increase crew space. The Black Eagle has a turbine engine. Some changes seem to have been made to the hull. When first seen in 1997, the Black Eagle had six road wheels and appeared to be built on a T-80U hull, but in this showing, the hull appeared longer and had seven road wheels. During the mobility demonstration, the tank appeared to have an excellent power-to-weight ratio and suspension system similar to the T80U. The gun stabilization system also appeared to be very good.

In the exhibition hall, the Russians displayed a model of the Black Eagle which appeared to be an exact replica of the mobility demo vehicle, although the top of the tank's turret was covered by a camouflage screen during the demo. A display board indicated it had a three-man crew, autoloader, a weight of 48 tons and a 1,500-hp turbine engine. Exhibitors stated that the current gun tube was the 2A46M-4, 125mm, but that it could be fitted with a 140mm cannon. Not much else is known about the Black Eagle. The

The BMP-3 infantry fighting vehicle goes through its paces on the mobility course. This vehicle can be ordered with the Russians' Arena active protection system, which detects incoming rocket-propelled grenades and AT missiles and shoots them down or deflects them before they hit.

T-80, left, and T-90 on static display, painted with an electromagnetic wave deforming/absorbing coating to prevent radar detection.

The view from the top of the turret of a T-90 is impressive for the sheer number of hatches, boxes and accessories that clutter the turret roof, much of it related to the tank's self-protection system.

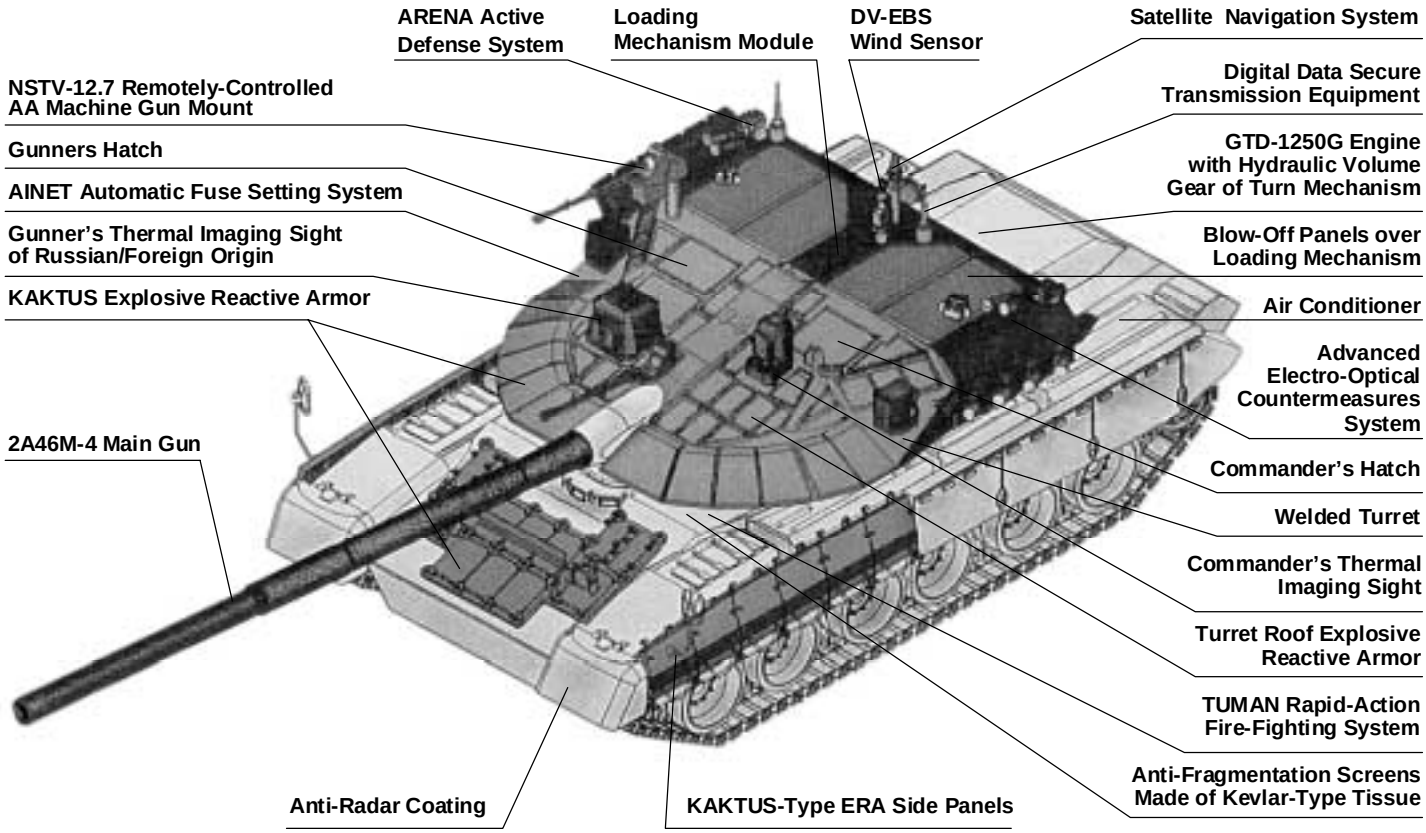
At right, a Russian show card outlining the features of the Black Eagle, although the vehicle on display had another road wheel station. At right below, a T-80 is hooked up for retrieval.

key question is not whether the Russians can design a new tank, but if economic realities will permit them to bring this tank into production.

The Omsk military show was a world-class exhibition. The Russians were excellent hosts and were very open about the improvements to their equipment. The show was well organized and displayed a broad range of the country's military and civilian industrial capability.

COL Jim Nunn is a 1976 ROTC graduate of the University of Florida where he received his Armor commission. He served as a tank platoon leader, battalion S3 and S4 with HHC, 2-32 AR; commander of CSC and A Co, 197th Infantry Brigade; Separate Troop Commander, 15th Cavalry; TRADOC DCST operations and plans training officer; brigade S3, 5ID; and brigade S3 and XO, 2AD; battalion commander of 3-8 Cavalry, 1CD; deputy chief of staff, 1CD; and political-military affairs planner (J5) at EUCOM. Currently, he is the TRADOC System Manager (TSM) for the Abrams tank system, at Ft. Knox, Ky.

LTC John C. Paulson was commissioned as a 2LT of Armor from the U.S. Military Academy at West Point, N.Y. in 1981. He has served in a variety of Armor assignments with 2-64th Armor in Schweinfurt, Germany; 2-10 Cav, 194th Armored Bde, Ft. Knox, Ky.; as the S3 and XO of 3-8 CAV, and G3, Force Modernization, 1st Cavalry Division, Ft. Hood, Texas. He has also served in several acquisition assignments, first as M1A2 Test Officer for PM Abrams, APG, Md.; Training Division Chief, TRADOC Program Integration Office - Army Battle Command System (TPIO-ABCS), Ft. Leavenworth, Kan.; and currently as Assistant Project Manager (Tank Fielding and Foreign Military Sales), Abrams Tank System, Warren, Mich.


ARENA Active Defense System
Loading Mechanism Module
DV-EBS Wind Sensor
Satellite Navigation System
NSTV-12.7 Remotely-Controlled AA Machine Gun Mount
Digital Data Secure Transmission Equipment
Gunners Hatch
GTD-1250G Engine with Hydraulic Volume Gear of Turn Mechanism
AINET Automatic Fuse Setting System
Gunner's Thermal Imaging Sight of Russian/Foreign Origin
Blow-Off Panels over Loading Mechanism
KAKTUS Explosive Reactive Armor
Air Conditioner
Advanced Electro-Optical Countermeasures System
2A46M-4 Main Gun
Commander's Hatch
Welded Turret
Commander's Thermal Imaging Sight
Turret Roof Explosive Reactive Armor
TUMAN Rapid-Action Fire-Fighting System
Anti-Fragmentation Screens Made of Kevlar-Type Tissue
Anti-Radar Coating
KAKTUS-Type ERA Side Panels