



Underground Combat:

Stereophonic Blasting, Tunnel Rats, and the Soviet-Afghan War

By Lester W. Grau and Ali Ahmad Jalali

The U.S. Army fought subterranean battles in the tunnels of Vietnam. Following a few tear-gas grenades or a charge of C4 plastic explosive, "tunnel rats" would go underground to find Viet Cong or North Vietnamese combatants or materiel. Small, slender soldiers armed with flashlights and .45-caliber pistols would crawl into the Vietnamese tunnels for reconnaissance and possible close combat. Almost all of the Vietnam-era tunnel rats have

left active duty now, but the need to train for this type of underground combat remains. The U.S. Army's experience with tunnels was not unique. From 1979 to 1989, the Soviet 40th Army waged war against the mujahideen in Afghanistan. Part of this war was fought in the tunnels of Afghanistan, which were larger and far more extensive than those in South Vietnam.

Welcome to the Underground

In the Middle East, water is life itself. Over the centuries, the inhabitants of Iran, Afghanistan, and Western Pakistan have taken some extraordinary measures to preserve and conserve this precious resource. Since many of the rivers are seasonal, rural inhabitants have found ways to prolong their agricultural water supply during the dry months. Open-ditch irrigation is used in the northern part of Afghanistan, where the water table is relatively shallow, but in eastern, southern, and southwestern parts of the country the extensive underground *karez* system (a man-made water system) is necessary.¹ When flying over these regions, the neat lines of mounds that lead from the foothills across the desert to the "green zones" of vegetation surrounding towns and villages are a common sight. The mounds are entrances to shafts that intersect the water table and that are connected to each other by tunnels (Figure 1). The deepest shaft highest

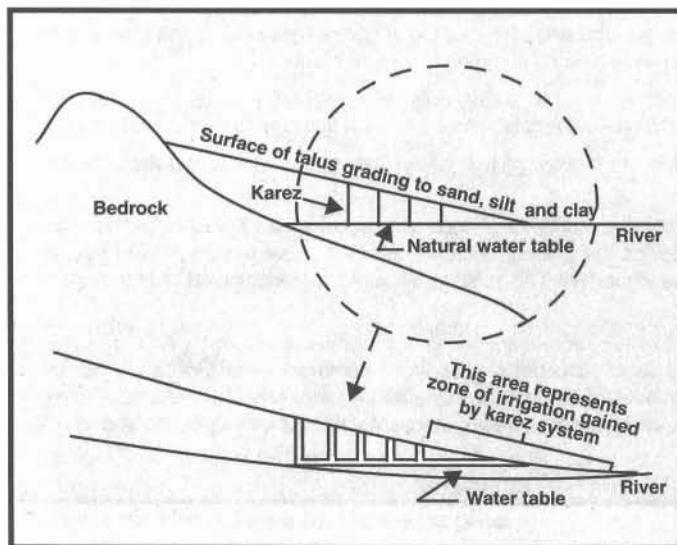


Figure 1. Idealized cross section of a karez system.

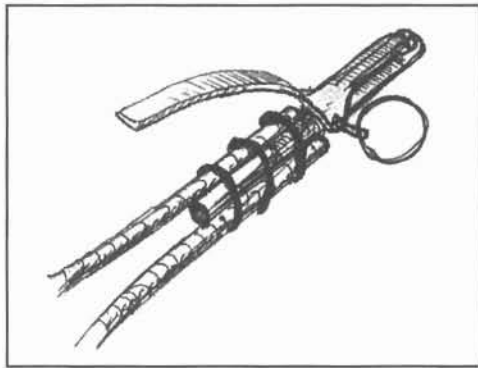


Figure 2

on a hillside intersects the water table. Water moves through the tunnels and into irrigation ditches and fields near the towns and villages.² Some of the karez tunnels stretch for several kilometers underground. Some historians claim that the karez system was already working when Alexander the Great went through Afghanistan in 328 B.C.³

The karez tunnels are dug by farmers. Occasionally they use large ceramic tile drainpipes to shore up weak sections of the strata. Digging the tunnels is dangerous work because the shafts usually range from 9 to 15 meters deep, with some more than 30 meters deep. The tunnels are labor- and maintenance-intensive. Silt that collects in them must be cleaned out annually and hauled to the surface by a windlass equipped with goatskin bags.⁴

The karez tunnels also have another use. Since ancient times, villagers have used these underground waterways for shelter against invading armies. Chroniclers of Afghan history in medieval times refer to the use of the karez by civilians and combatants during the invasion of Genghis Khan's Mongol armies in 1221 A.D. The Mongols set out to destroy all major cities in Afghanistan and neighboring areas and made every effort to massacre the inhabitants to the last man.⁵ The Mongols did not go into tunnels after the refugees. Rather, a day or two after destroying a town, the Mongols sent a small detachment back to the area to cut down any resurfaced survivors. They did this to ensure that no potential resistance against Mongol rule remained. The Mongols had learned during earlier campaigns that the official surrender of a city did not guarantee permanent submission of the area, because the inhabitants often rose against the invader after his main force moved on.

During the Soviet occupation, both villagers and local mujahideen guerrillas used the karez system as a hiding place. Since the towns and villages are close to the karez, they provide ready-made shelters from bombing and artillery attacks. Guerillas dug caves in the sides of the shafts, where they hid weapons and themselves, and used the karez tunnel network to move undetected to and from ambush sites and attack positions. According to mujahideen eyewitness accounts, Soviet forces passing through an area usually did

not try to flush out the refugees and guerrillas hiding in tunnels. However, in major cordon-and-search actions, the Soviets and Afghan communist forces made special attempts to destroy the underground mujahideen.⁶

Underground Warfare 101

In the mid-1980s, the Soviets conducted a tunnel-neutralization course in Paghman Province, about 14 kilometers northwest of the capital city of Kabul. The course was designed for Afghan special-forces soldiers and was similar to courses provided for Soviet sappers in Afghanistan. The training was necessary because men do not readily go underground to fight. Tunnels are ideal locations for booby traps, knives thrust from a side tunnel, and cave-ins.⁷ Additionally, tunnels teem with snakes, scorpions, and other creatures.⁸ After a short course in theory, participants in the tunnel-neutralization course moved to the field for practical applications.

The soldiers conducted a reconnaissance to find shaft entries, which usually were marked by mounds. The Soviets taught the soldiers to form into two covering groups and hold two adjacent shafts simultaneously. Since civilians often hid in the karez, the first step was to yell into the shaft and demand that anyone sheltering inside come out.⁹ The soldiers were taught to yell without exposing themselves to answering gunshots from inside the karez. If no one answered or came out, the next step was to throw two RGD-5 concussion grenades in the karez.¹⁰ After the grenades exploded, it was customary to again demand that the occupants surrender because the karez was about to be blown up.¹¹

The depth of a shaft was determined from the sound of a falling rock tossed inside. After determining the depth, soldiers used a mirror to reflect sunlight down into the shaft and examine it. If there were areas they could not examine, the soldiers tied a cord to a grenade, lowered the grenade to the suspect area, and detonated it. Only then would soldiers lower a blasting charge on detonating cord. They usually used captured TC-2.5 or TC-6.1 Italian antitank blast mines because many of them were available.¹² The soldiers then lowered the first charge to the bottom of the shaft. Next they prepared a second charge using three or four meters of detonating cord and 800 grams (two and three-quarters pounds) of high explosive. Then they tied or taped the detonation cord to a standard hand-grenade fuze (Figure 2). They would weight the firing assembly with a rock or wedge it near the mouth of the shaft. Two trained soldiers could prepare a 20-meter shaft for detonation in about three minutes. All that remained was to pull the ring on the firing assembly. After four seconds, the charges would explode. During the explosion, it was necessary to stand at least five or six meters from the mouth of the shaft, because the explosion caused rocks to fly from the shaft like a volcano.¹³

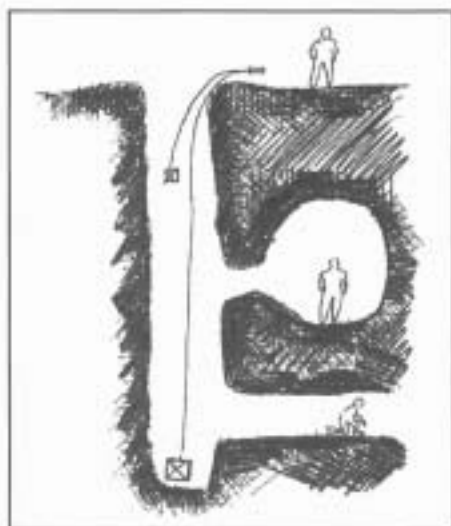


Figure 3

The Soviets' placement of the charges was particularly effective because the top charge exploded a fraction of a second earlier than the bottom charge. The top explosion tightly plugged the shaft with gases. When the bottom charge exploded, shock waves from it would rebound off the higher gas mass and rush back down and against the sides of the shaft and tunnels. This movement created a deadly overpressure between the two charges. The Soviets called this the "stereophonic effect" (Figure 3).¹⁴

The stereophonic effect can be multiplied by preparing two adjoining shafts for simultaneous detonation. The Soviets prepared each site as described above. Then they joined the detonation cord at the midpoint between the two shafts and taped the detonation cord to a standard hand-grenade fuze. When the charges were set off, a wider area of overpressure and destruction occurred. The Soviets called this the "quadrasonic effect" (Figure 4).¹⁵

A Fistful of Roman Candles

After the dust settled, the Soviets tossed a smoke pot down each shaft. The smoke is nontoxic and ventilation in a karez system is excellent. If the smoke disappeared, it meant that some tunnels were intact and that the search team could go in without wearing respirators. Search teams consisted of three or four men. Two of them would search to the front while the rest guarded their backs from a sneak attack from the rear. The lead man had a line tied to his leg. If the lead man found enemy materiel, he tied the line to it and rejoined the team so they could all drag it out. If the lead man was killed or wounded, his team members used the line to drag him back.¹⁶

The search group was armed with knives, entrenching tools, hand grenades, pistols, and

assault rifles.¹⁷ A flashlight was taped to the forestock of the automatic rifles. The magazines of the assault rifles were loaded with tracer ammunition.

The Soviets developed a psychological weapon for underground combat using their SM signal mines. The SM is basically a Roman candle that shoots a series of red, green, or white signal stars from five to 20 meters. The signal mine simultaneously emits a siren-like sound. Although designed for trip-wire release by an unwary enemy, the SM can be safely ignited while holding it in one's hand. The Soviets taped from three to six signal mines together and, holding them in one hand, they ignited and fired them into a tunnel. A brilliant shaft of light, screams of sirens, and a fountain of signal stars filled the tunnel for nine seconds. The signal stars ricocheted off the tunnel walls like tracers. When the mines stopped, the Soviets found the unsuspecting foe covering his head with his arms, even though there was no real danger unless a signal star hit someone in the eye.¹⁸

Flame, Fuel-Air Explosives, and Fuel

Flamethrowers were also used against those hiding in the karez. The Soviets had replaced their short-range LPO-50 backpack flamethrowers with the RPO-A flamethrower. The RPO-A is a disposable system with a maximum range of 1,000 meters, a maximum effective range of 600 meters, and a minimum range of 20 meters. The round is 93 mm in diameter. It has three types of projectile: thermobaric (fuel-air), incendiary, and smoke.¹⁹ The fuel-air round was most effective against the karez. The problem was that flamethrower gunners drew more enemy small-arms fire than radiomen. An incendiary round from an RPO-A could clear out any opposition on the surface around a shaft entrance, but no flamethrower gunner wanted to lean over the mouth of a karez to fire down the shaft—the gunner might be shot before he could fire a round. The Soviets developed the following method for these tunnels: Soldiers first secured the shaft entrance and then locked and cocked an RPO-A

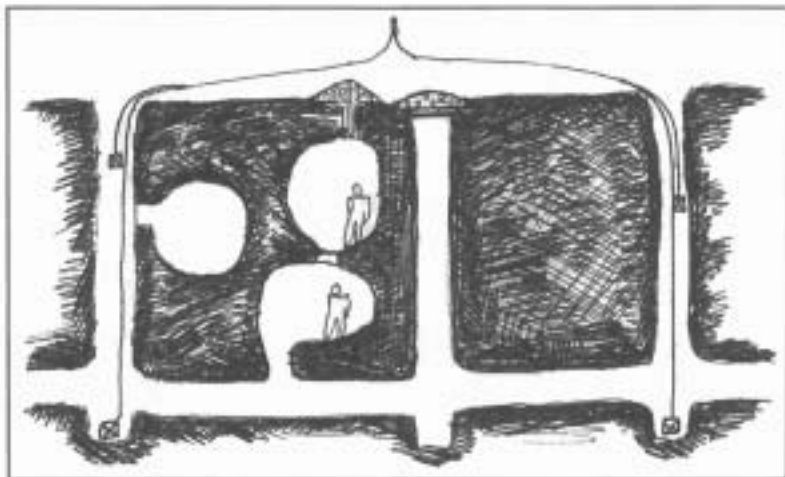


Figure 4

flamethrower with a thermobaric round. After tying two lowering lines on the RPO-A and a string on the trigger, they slowly lowered the RPO-A down the shaft until it faced a tunnel. Then they pulled the trigger string to fire the thermobaric round down the tunnel. The resulting overpressure of the fuel-air round was devastating for anyone in the vicinity.²⁰

In the early days of the war, the Soviets reportedly used POL (petroleum, oil, and lubricants) products against those hiding in the karez. In the spring of 1982, Soviet soldiers entered the village of Padkhab-e Shana in Logar Province. A karez passes through the village and many villagers took refuge in it. According to eyewitness reports, "...villagers who fled spoke of soldiers wearing gas masks, pouring mysterious things into an underground irrigation canal where villagers, including children, were hiding. Our investigation showed that the soldiers had actually used gasoline, diesel fuel, and an incendiary white powder, an evil-smelling [substance] designed to ensure that the gasoline would properly burn in a tunnel with little oxygen. After the 105 people, including the little children, were burned to death, the population in a panic decided to run away to Pakistan."²¹

There were also many reports that Soviet forces used chemical agents during the early part of the war to flush out or kill mujahideen hiding in the karez.²²

Tunnel Rats and Future Conflicts

Digging the enemy out of tunnels appears to be a constant factor in guerrilla warfare, and the combat engineer always seems to be the first soldier called for the task. Differentiating innocent civilians from combatants underground will prove to be a challenge for combat engineers. Since underground combat will not disappear from the future battlefield, we must prepare for the task. In the quest for high-technology answers to the complex problems of tomorrow's battlefields, there are few high-technology solutions for underground combat. After all the charges are blown, determined soldiers still must go underground to meet equally determined opponents. Specially trained soldiers will be better prepared to cope with future subterranean combat, which will remain the realm of raw courage, cunning, and nerve.



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Photos and artwork courtesy of the Russian Soldier of Fortune magazine, No. 11, 1994.

Endnotes:

¹Karez is the Pashto term for the man-made underground water system. Qanat is the Arabic term used in Iran and Afghanistan. Louis Dupree, *Afghanistan*, New Delhi: Rama Publishers, 1980, page 40. Figure 1 is from page 41.

²Ibid.

³A. Bek, "Smertel'naya volna: Podzemnaya voyna v Afganistane" [Deadly wave: Underground combat in Afghanistan], *Soldat udachi*, [Soldier of Fortune], November 1994, page 4. This article is based on Colonel Bek's article and diagrams 2, 3 and 4 are Colonel Bek's.

⁴Dupree, page 40.

⁵Ali Jalali, *The Military History of Afghanistan*, Volume 1, Kabul, 1964, pages 437-442.

⁶Accounts of mujahideen commanders from Ghazni Province made to Ali Jalali in 1984.

⁷Bek, page 5. Lieutenant Colonel Bek ran this school.

⁸Afghanistan has two species of cobra, the deadly krait, and many types of vipers. Dupree, 53.

⁹Most Afghans would state that they seldom, if ever, gave warning.

¹⁰Fragmentation grenades, such as the cast-iron body Soviet F-1, are fairly ineffective underground.

¹¹Bek, page 5.

¹²The Italian TC 6.1 mine has about six kilograms (13.2 pounds) of explosive. Soviet engineers often used a box of TNT in lieu of a mine.

¹³Bek, page 5.

¹⁴Ibid.

¹⁵Ibid.

¹⁶Ibid, pages 5-6.

¹⁷The entrenching tool was a weapon of choice for Soviet soldiers in hand-to-hand combat. Elite forces normally kept a razor-sharp edge on their entrenching tools.

¹⁸Bek, page 6.

¹⁹Terry J. Gander and Ian V. Hogg, *Jane's Infantry Weapons 1995-1996*, Surrey: Jane's Information Group Limited, 1995, pages 203-204.

²⁰Russian General Staff material that Mr. Grau is translating and editing for publication.

²¹Mike Barry, *International Afghanistan Hearing*, edited by the Committee for International Afghanistan Hearing, Oslo, 1984, as cited by M. Hassan Kakar, *Afghanistan: The Soviet Invasion and the Afghan Response, 1979-1982*, Berkeley, 1995, pages 234-235.

²²State Department Special Report # 106, *Afghanistan: Three Years of Occupation*, Washington: U.S. Government Printing Office, December 1982, page 5.