APPENDIX C

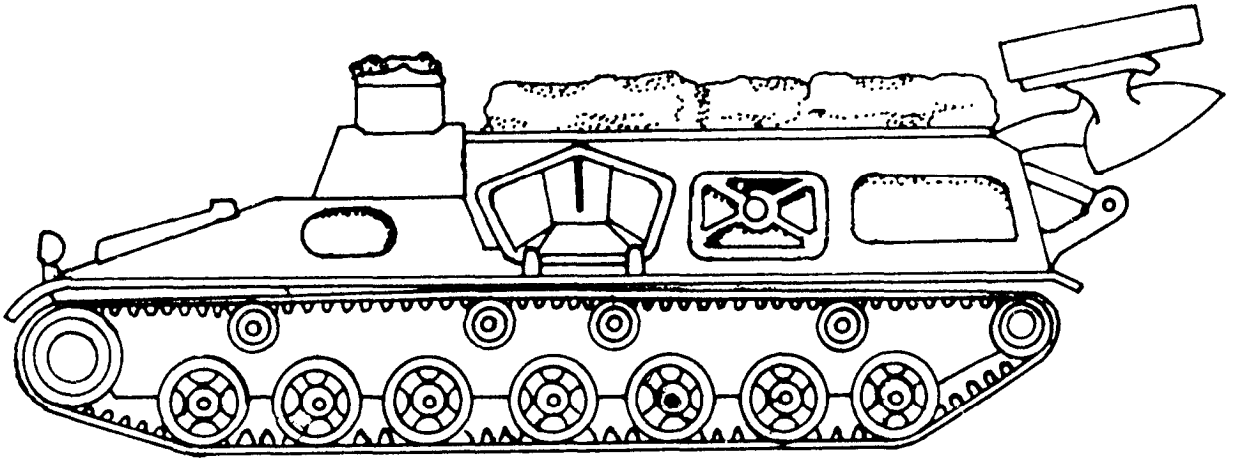
SOVIET MINE/COUNTERMINE OPERATIONS

This appendix is intended to complement the information presented in other field manuals on Soviet tactics obstacle warfare. It applies to most Soviet-style armies and their surrogates. Commanders should use the information to give added realism to unclassified staff and combined arms team training, although obstacle employment norms can change with METT-T factors for a given area of operation. Therefore, preoperational training on templating, intelligence, reconnaissance, and reduction procedures must be based on the best information available before deployment.

MINE OPERATIONS

Soviet formations contain considerable organic minefield emplacement capability. Soviet rapid-mining capability presents a serious challenge to friendly maneuver. Figure C-1 summarizes mechanical minelayer assets organic to Soviet regiments and divisions.

To rapidly lay mines and place obstacles during offensive operations, the Soviets form a special



GMZ

Allocation

3 per Soviet division
3 per motorized rifle and tank regiment
15 GMZs total per Soviet division

Figure C-1. Soviet armored tracked minelayer (GMZ)

team from regimental and division assets. This Soviet mobile obstacle detachment team is called a Podvizhnyy Otryad Zagrazhdeniya (POZ). POZs place AT mines on the most likely avenues for armored attacks or counterattacks. They are positioned on the flanks of a march formation for rapid deployment and are normally in close proximity to AT reserves. During the march, POZs reconnoiter avenues into the flanks and identify the most likely avenues for tank movement. At secured objectives, POZs reinforce existing obstacles and place new obstacles to help defeat counterattacks.

The combined arms commander orders the organization of a POZ and determines its composition based on the combat situation and available troops. The engineer elements in a division POZ come from the divisional engineer battalion and consist of three armored, tracked minelayers known as Gusenichnyy Minо-Zagraditeli (GMZs). This platoon-size element has two or three trucks that carry mines for immediate resupply. For the regimental POZ, the regimental engineer company provides a platoon-size unit equipped with two or three GMZs. The platoon travels in BTR-50/60s and has 600 AT mines.

The GMZ dispenses mines at intervals of 4 to 6 meters. Mine-laying helicopters also support the POZ. The HIP and HIND-D helicopters carry two or three dispenser pods of AP or AT mines. Artillery-fired scatterable mines can also support the POZ. Three GMZs can lay a 1,200-meter, three-row minefield containing 624 mines in 26 minutes (doctrinally, this minefield is broken into several minefields that are 200 to 300 meters long).

The Soviets use obstacles extensively throughout the depth of their defense, and their tactics are chosen well. Shallow obstacles can be breached quickly and easily.

Table C-1. Normal parameters for Soviet minefields

Antitank Minefield	
Front (situation-dependent)	200 to 300 meters
Depth	60 to 120 meters
Distance Between Rows	20 to 40 meters
Number of Rows	3 to 4 rows
Distance Between Mines	4 to 6 meters for antitrack mines; 9 to 12 meters for antihull mines
Outlay, Normal	550 to 750 antitrack mines/kilometer; 300 to 400 antihull mines/kilometer
Outlay, Increased Effect	1,000+ antitrack mines/kilometer; 500+ antihull mines/kilometer
Probability of Destruction	0.57 for antitrack mines (750/kilometer); 0.85 for antihull mines (400/kilometer)
Antipersonnel Minefield	
Front	30 to 300 meters
Depth	10 to 150 meters
Distance Between Rows	5+ meters for blast mines; 25 to 50 meters for fragmentation mines
Number of Rows	2 to 4 rows
Distance Between Mines	1 meter for blast mines; 50 meters or twice the lethal radius of fragmentation for fragmentation mines
Outlay, Normal	2,000 to 3,000 for HE/blast mines (2,000/kilometer); 100 to 300 for fragmentation mines
Outlay, Increased Effect	2 to 3 times normal outlay
Probability of Destruction	0.15 to 0.2 for HE/blast mines (2,000/kilometer); 0.1 to 0.15 for fragmentation mines (100/kilometer)

For example, a shallow, one-row minefield is essentially breached by blowing one or two mines in the row. The Soviets' rapidly placed minefield consists of three or four 200- to 300-meter -long rows, spaced 20 to 40 meters apart, with mines spaced 4 to 6 meters apart. As a rule, the minefield covers the depth of a football field. Table C-1 gives more detailed information on standard Soviet AT and AP minefields, although terrain and tactical situations dictate actual dimensions and distances of minefields. Figure C-2 shows a rapidly placed minefield. The Soviets typically use such a minefield when in a hasty defense (offense is temporarily stalled). Figures C-3 and C-4, page C-4, show standard *antitrack* and *antihull* minefields, respectively. Figure C-5, page C-5, shows a standard AP minefield.

The Soviets also emplace mixed minefields. They are not the same as US mixed minefields. Soviets normally emplace three rows of AT mines, then several rows of AP mines. AT and AP mines are not mixed in the same row.

Soviet engineers use two fundamental drills to emplace mines:

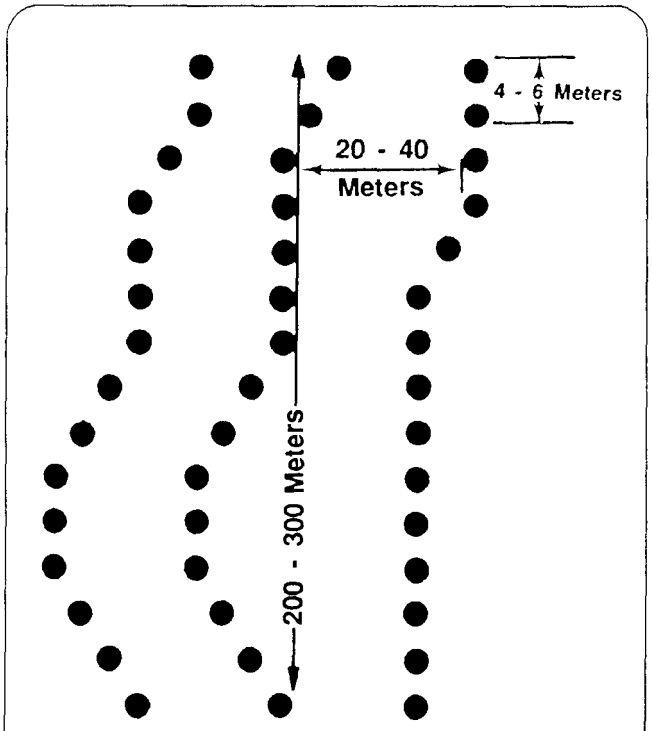


Figure C-2. Soviet rapid minefield

- When emplacing armed mines, the drill uses a crew of five sappers. The first crew member (the senior man and operator) is in the minelayer seat and monitors the operation of the minelayer and the motion of the mines in the guide chute. He also sets the mine spacing and controls the actions of the GMZ. The second and third members remove mines from containers and place them in the intake chute at intervals between the guide tray's drive chain. The GMZ driver steers the vehicle along the indicated route at the established speed.
- When emplacing unarmed mines, two or three additional sappers are assigned to arm the mines. After emplacing the mines, one sapper trails the minelayer, marks emplaced mines with pennants, and partially camouflages the mines. The remaining sapper(s) then arm the mines.

AP minefield emplacement is similar to AT minefield emplacement, but special precautions are taken. Soviet doctrine only allows PMN mines to be surface-laid from minelayers. POMZ-2M mines are emplaced with a truck-and-tray technique (PPMP). Extra effort is required to assemble, emplace, and camouflage the POMZ-2M mine. Extra effort is also required to deploy the POMZ-2M's trip wire.

Using three GMZs, a Soviet POZ can emplace 1,200 meters of a three-row, AT, surface-laid minefield, containing 900 AT mines, in 15 minutes. This does not include the 12- to 15-minute reload or the travel time. Both travel and reload times increase during limited visibility.

The type and complexity of an obstacle depends on the installing unit. Maneuver and artillery soldiers install simple, single-system minefields that are usually protective in nature. Engineer soldiers install complex obstacles that can include AHDs. Engineer obstacle placement is usually equipment-intensive. Soviet engineer effort generally concentrates on tactical obstacles unless maneuver soldiers are unable to employ necessary protective obstacles. The Soviets continue to improve obstacles supporting their positions by marking obstacles on the friendly side, burying mines, and adding AHDs.

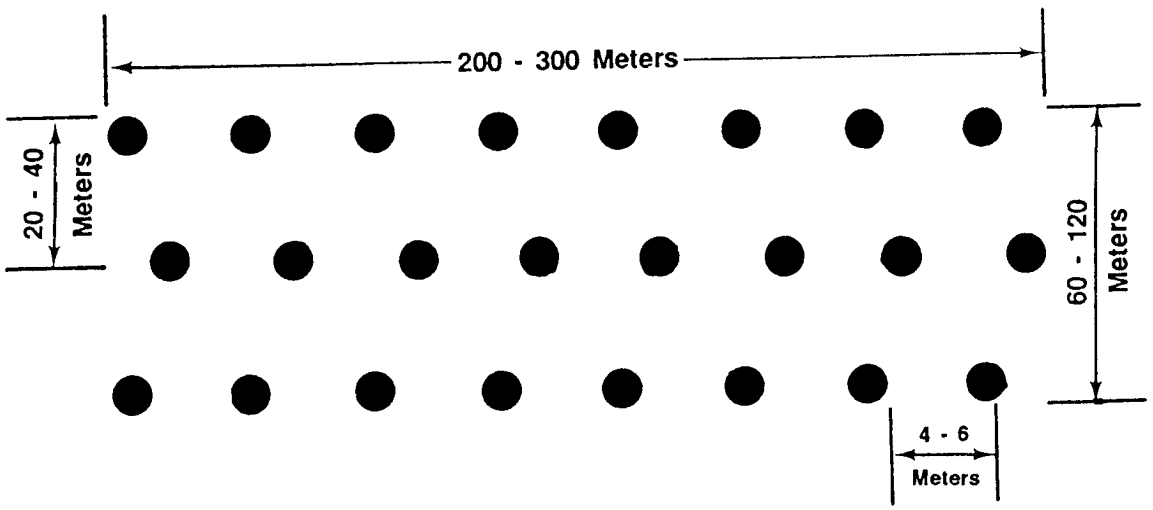


Figure C-3. Soviet antitrack minefield

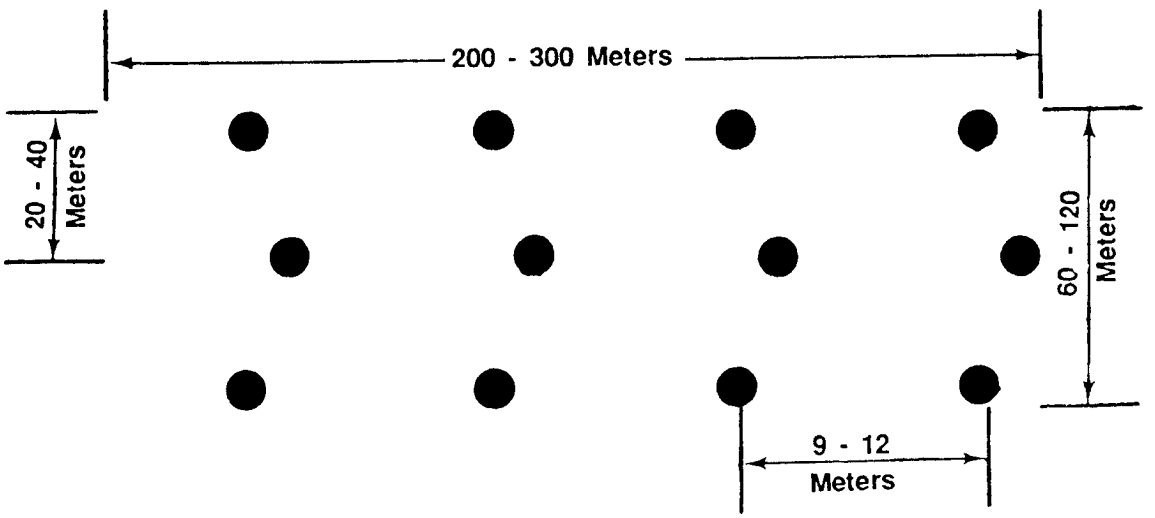


Figure C-4. Soviet antihull minefield

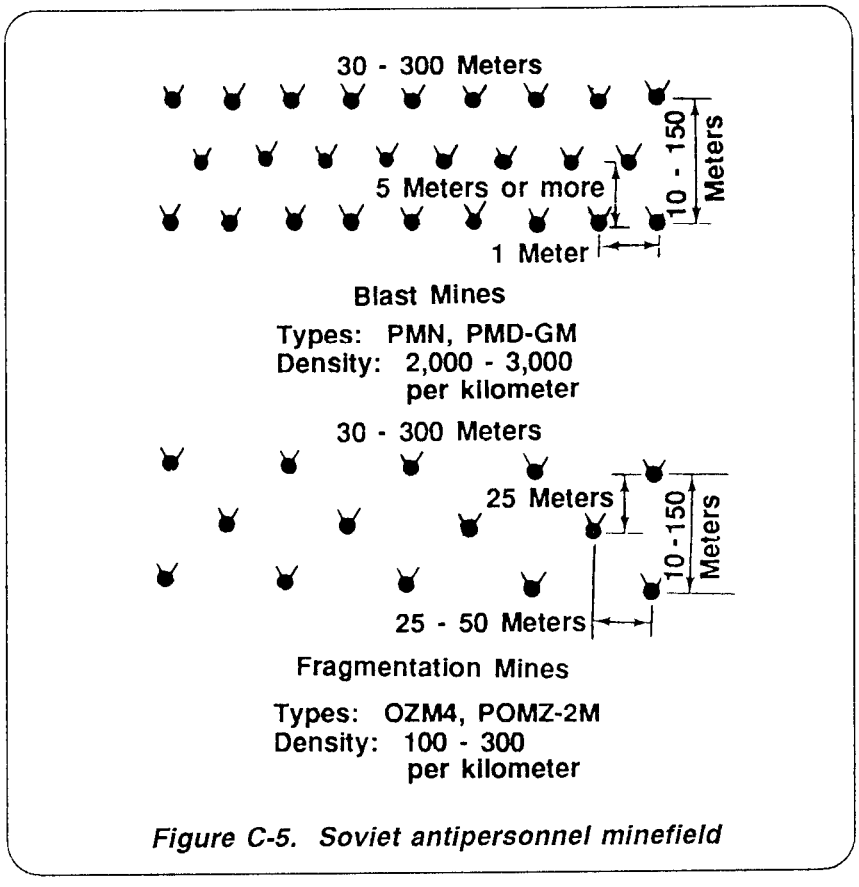


Figure C-5. Soviet antipersonnel minefield

COUNTERMINE OPERATIONS

In offensive operations, Soviet engineers clear passages through obstacles whenever they cannot be bypassed. Although clearing obstacles applies to the march and defense, the most critical performance of this task occurs during the attack. Engineers can be required to clear mines delivered by air, artillery, and rockets well ahead of NATO's forward edge. They must also breach obstacles contained within NATO strongpoints. The Soviets must also clear their own minefields when making the transition from defense to offense. In the offense, Soviet forces breach or bypass remotely delivered minefields in their form-up areas or routes of movement to the attack line. They also breach obstacles along the forward edge of the battle area (FEBA) and deep within NATO defenses.

Although clearing passages through obstacles is a primary task for Soviet engineers, any maneuver element can encounter mines delivered by air, artillery, or rockets. Engineers cannot respond to every encounter, so maneuver troops are also required to breach remotely emplaced obstacles.

Organization

A movement support detachment (Otryad Obespecheniya Dvizheniya (OOD)) supports the movement of maneuver forces. It is task organized from division or regimental engineer assets, the OOD can be from platoon- to company-size. The OOD is equipped with route and mine-clearing vehicles and devices. Depending on the mission, which comes directly from the combined arms commander or the NIS (chief of engineer services), an OOD is capable of filling craters, clearing minefields, preparing bypasses around major obstructions, and identifying NBC-contaminated areas.

The division engineer battalion can form two or three OODS. During marches, OODs travel

in advance of the main body and clear obstructions reported by division reconnaissance elements. When they are deployed on main routes, they are under the protection of an advance guard or forward security element. When deployed on other routes, leading regiments provide OODS from organic engineer assets. An OOD at this level might consist of an engineer platoon with one or two dozers and up to three tanks fitted with dozer blades. OODs can be protected by a platoon of infantry or tanks and are usually accompanied by chemical reconnaissance personnel. They can detect, mark, and breach hasty minefields that are not properly covered by fire. If OODs encounter properly defended minefields, their clearing capabilities are limited.

Each battalion forms an obstacle-clearing group to create gaps in explosive and nonexplosive obstacles. Normally a part of a battalion-level OOD, the group follows first-echelon companies in APCs and creates gaps for those forces. These units can be equipped with BAT vehicles that have BTU bulldozer blades (Figure C-6) or with KMT-series mine plows (Figure C-7).

An obstacle-clearing detachment is created when more resources are needed to clear obstacles and debris. This usually occurs in urban environments and under conditions of massive destruction. An obstacle-clearing detachment is similar to an OOD, but its sole mission is to clear debris. Like an OOD, its composition depends on the mission scope and objective and on the tempo of the offensive.

The divisional engineer battalion of a motorized rifle or tank division has a sapper company to clear obstacles. The company commander receives a mission to clear minefield from the combined arms commander or the NIS. He then determines the exact location of the obstacle, ascertains the assets to devote to the task, and plans the methodology for success. Teams can be created to manually breach lanes using probes, hand-held mine detectors (Figure C-8), and shovels. Larger tasks may necessitate the use of vehicle-mounted DIM mine detectors (Figure C-9, page C-8), armored vehicle mine plows and rollers (Figure C-10, page C-8), and explosive line charges. When necessary or more practical, mines are explosively destroyed in place.

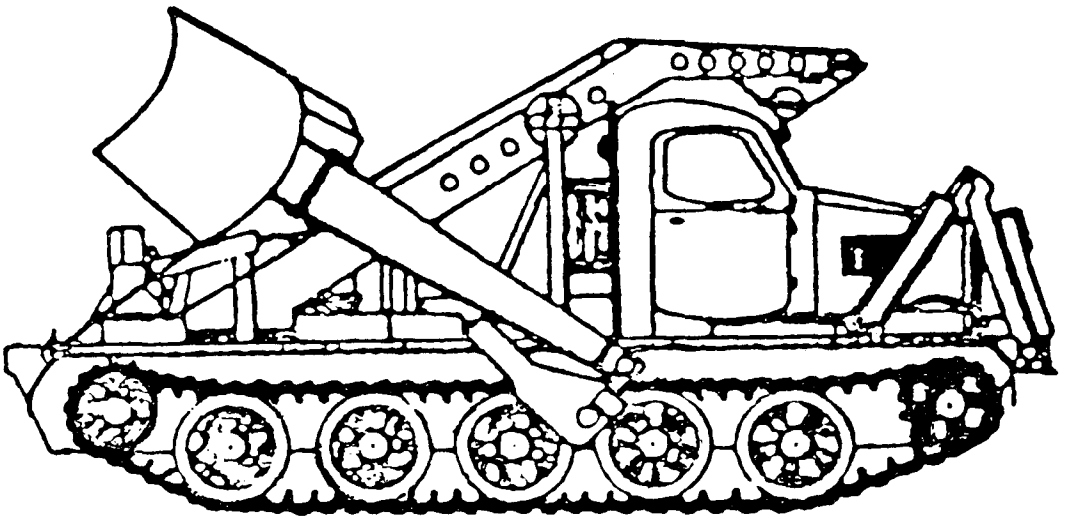


Figure C-6. BAT-M

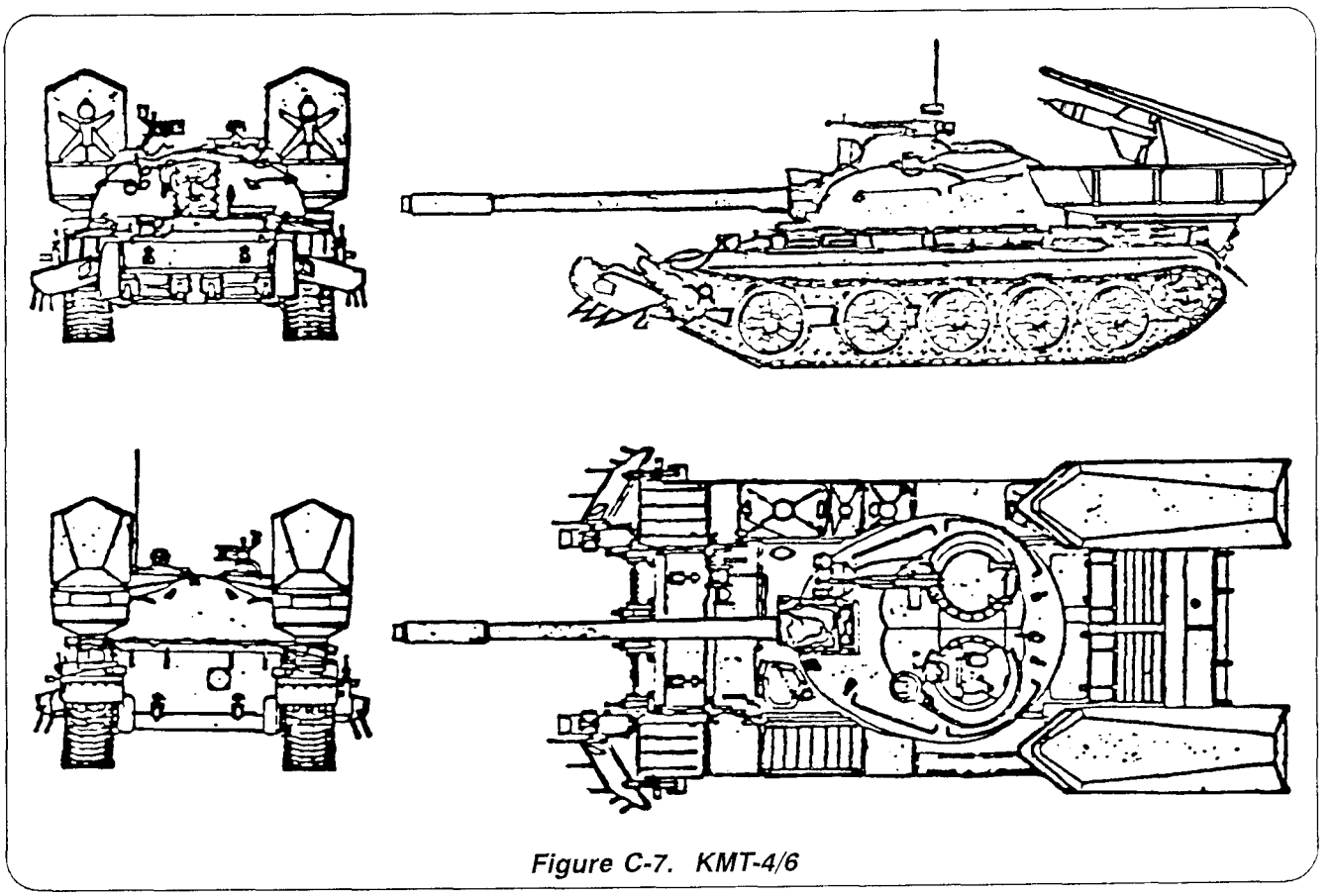


Figure C-7. KMT-4/6

Figure C-8. IMP (portable mine detector)

The engineer company of the motorized rifle or tank regiment has breaching equipment such as the KMT-series mine plows and rollers and the BTU dozer blades located in its technical platoon. Because of limited assets in the technical platoon, coupled with the responsibility of forming its own OOD, the regiment can receive a sapper section from the divisional sapper company. An additional IMR (Figure C-11, page C-9), BTR-50/60, and M1979 (Figure C-12, page C-10), as well as manual breaching equipment, come with the sapper section.

Maneuver units usually breach remotely emplaced obstacles by themselves using attached, built-in breaching equipment (BTUs and KMTs). In order to successfully carry out this task, all subunit commanders organize constant reconnaissance, notify subordinates about mined areas in a timely manner, train personnel on the means and methods for handling remotely emplaced mines, and clear terrain in a timely manner. They must also train

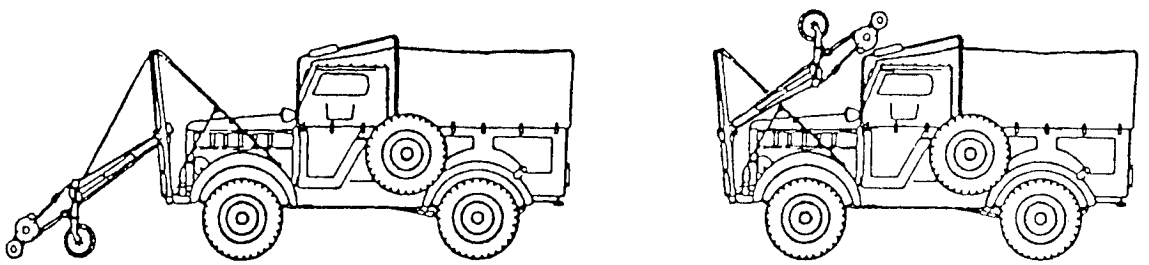


Figure C-9. DIM vehicle-mounted mine detector

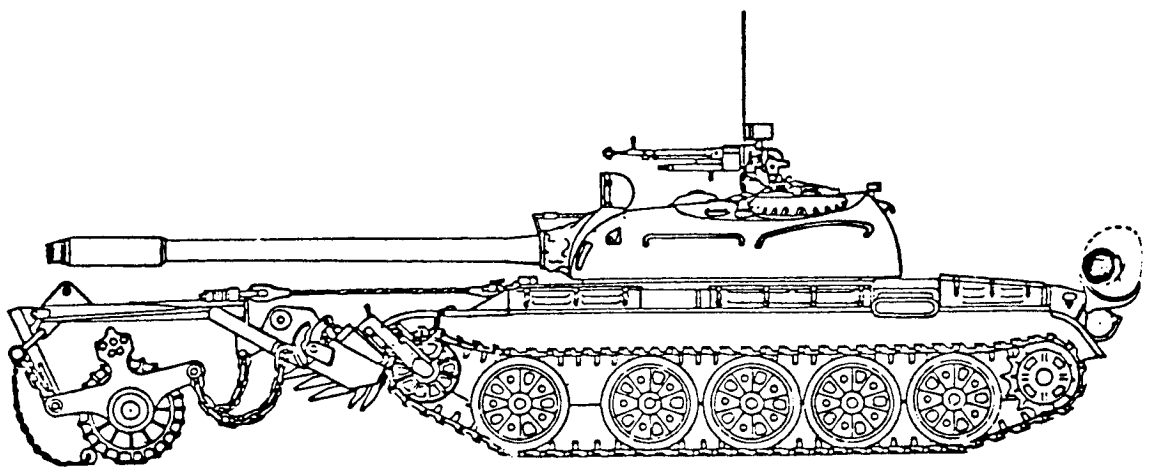


Figure C-10. KMT-5 plow-roller combination

their own teams for independent actions when removing combat equipment from mined areas. Soviet plows are considered maneuver-force assets, and one plow is assigned to each tank platoon. Recently, the BMP has been equipped with track-width mine plows, but the allocation has not been determined.

Equipment

The following items of equipment are used by the Soviet Army to detect and clear mines:

- BAT-M. The BAT-M dozer is a modified artillery tractor with a hydraulically operated

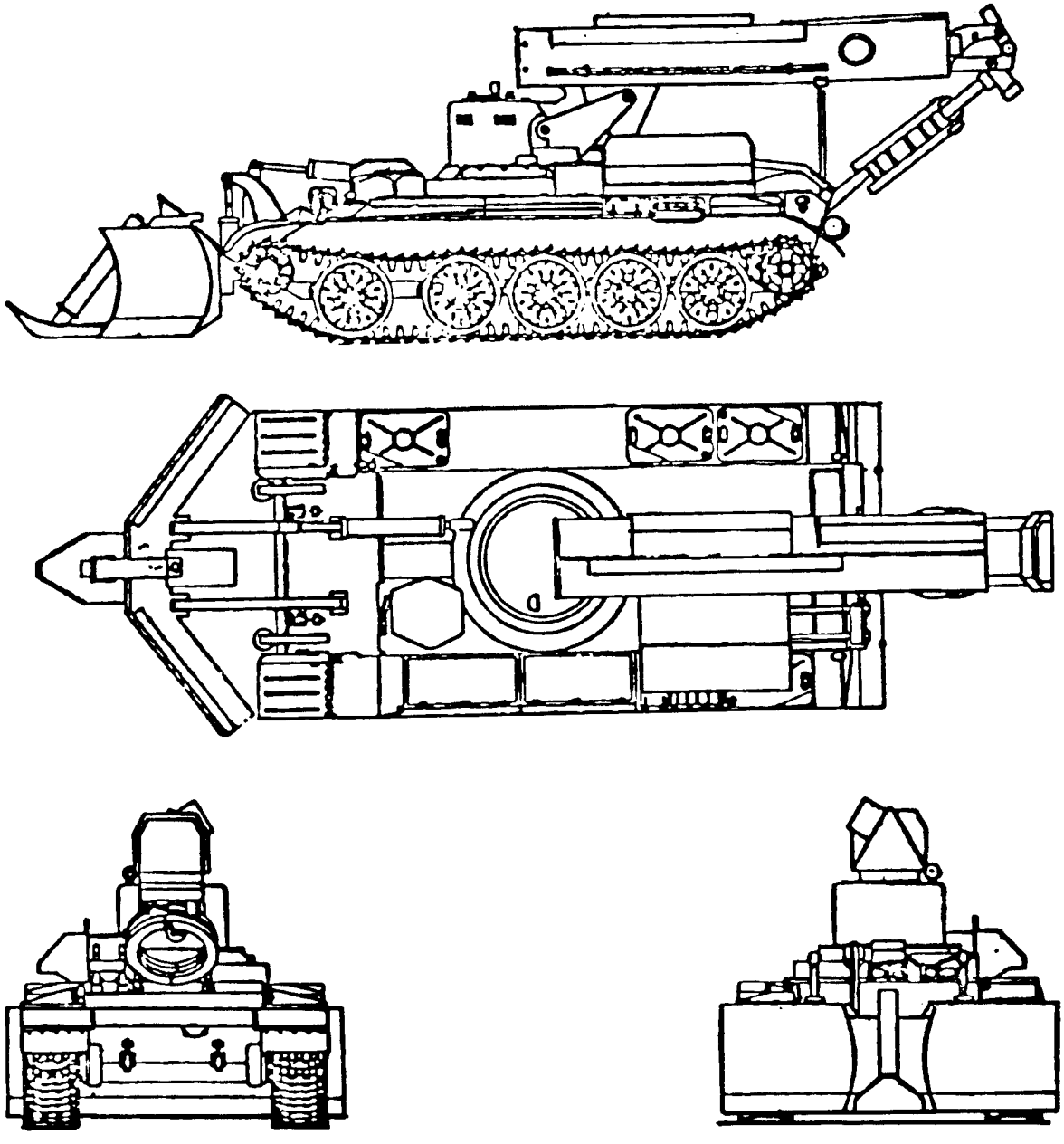


Figure C-11. IMR armored engineer tractor

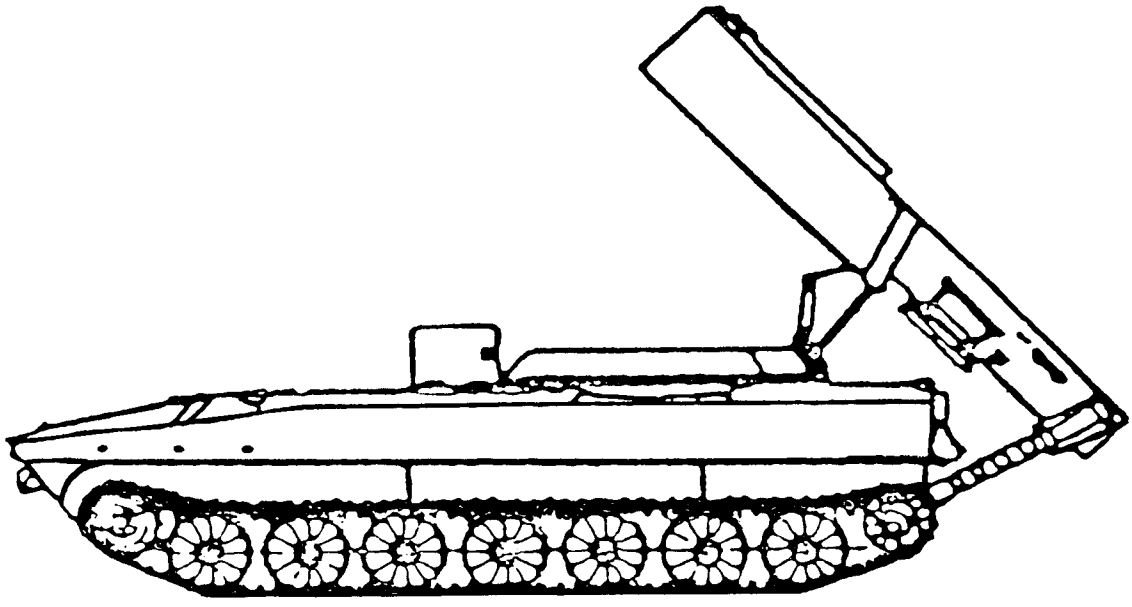


Figure C-12. M1979 armored mine clearer

bulldozer blade and crane. Sometimes called *roaders* by the Soviets, BAT-M dozers clear obstacles, fill craters, prepare bridge approaches, and do other heavy pioneer tasks. They can also be configured for snowplowing. The second generation BAT-M is the BAT-2. The BAT-2 can carry an 8-man engineer squad and operate in an NBC environment. The BAT-2 is replacing the BAT-M.

- KMT-Series.
  - The KMT-4 mine-clearing plow was developed in the 1960s to fit on a T-54/55 tank. It actually consists of two plows, and each plow has five attached teeth. One plow is mounted in front of each tank track. When the plow is lowered, the teeth dig into the ground and remove mines from the path of the tank. (Mine rollers simply detonate mines.) The plow is lighter than the roller and permits tanks to retain their cross-country mobility. Estimated clearing speed is 10 kph and the depth of clearance is 10 centimeters. Three plows are issued to each tank company (one per platoon). However, these assets are normally held in the engineer company of a tank or motorized rifle regiment.
  - The KMT-5 plow/roller combination consists of two plows and two rollers attached to the front of a tank hull. The plows or the rollers can be used, depending on terrain features, type of soil, and the mine fuze. Plows and rollers cannot be used simultaneously. The rollers function against pressure-fuze mines. The system can survive 5 or 6 kilograms of explosives five or six times. The KMT-5 also includes a luminous lane-marking device for night operations.
  - The KMT-6 mine-clearing plow was introduced along with the T-64 and T-72 tanks in the early 1970s. It has operating characteristics similar to those of the KMT-4.

- The KMT - 10 mine-clearing plow is fitted to the BMP-2 infantry combat vehicle.

- IMP Portable Mine Detector. The IMP portable mine detector has a tubular search head (containing one transmitting and two receiving coils encased in plastic) and a four- section handle. Power is furnished by four flashlight batteries that permit 20 hours of continuous operation. Two tuning controls are mounted on the handle. The coils in the search head compromise an induction bridge and are initially balanced for zero coupling. When the head passes over a metallic object, the induction bridge becomes unbalanced. This produces an audible signal in the headset. This 7.0-kilogram unit can detect mines buried to a depth of 45 centimeters.

- DIM Vehicle-Mounted Mine Detector. The DIM truck-mounted mine detector is primarily used to clear roads during convoys and road marches. It sweeps at a speed of 10 kph with a 2.2-meter width. It can detect metallic mines at a depth of 25 centimeters. The brakes on the DIM automatically engage when a mine is detected. Cross-country use of the DIM is limited.

- IMR Armored Engineer Tractor. This vehicle is mounted on a modified T-54/55 chassis. The turret is removed and a hydraulic crane, which can be fitted with either a grab or an excavator bucket, is emplaced. An adjustable, hydraulically operated blade is mounted on the front. The crane operator is provided with an armored cupola. The IMR can operate in an NBC environment.

- M1979 Armored Mine Clearer. This vehicle is mounted on the chassis of an amphibious 122-millimeter, 2S1 self-propelled howitzer. It has a turret-like superstructure that contains three rockets on launch ramps. These, together with the upper part of the superstructure, are hydraulically elevated for firing. The rocket range is estimated at 200 to 400 meters. Each rocket is connected to 170 meters of mine-clearing hose via a towing line. The hose is folded and stowed in the uncovered base of the turret and connected to the vehicle with a cable. The cable allows the vehicle crew to reposition the hose after launching.