

FM 100-2-3



THE SOVIET ARMY

TROOPS,
ORGANIZATION,
AND EQUIPMENT

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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The Soviet Army: *Troops, Organization, and Equipment*

Preface

This field manual is part of FM series 100-2, The Soviet Army. The other volumes in this series are FM 100-2-1, The Soviet Army: Operations and Tactics, and FM 100-2-2, The Soviet Army: Specialized Warfare and Rear Area Support. The three volumes complement each other. Used together, they provide a thorough reference on the Soviet Army.

These manuals are the US Army's definitive source of unclassified information on Soviet ground forces and on their interaction with other services in combined arms warfare. The Threats Directorate, Combined Arms Command, Fort Leavenworth, Kansas, updates these manuals periodically to provide the most current unclassified information available.

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Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

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CHAPTER 1

Soviet Ground Forces

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The Soviet armed forces include five separate components: the strategic rocket forces, the ground forces, the air forces, the air defense forces, and the naval forces. The generic term "Soviet Army" normally includes all but the naval forces. This manual concentrates on the largest of these

components, the Soviet ground forces. Highly modernized organization and equipment combine to make the present Soviet ground forces the most powerful land army in the world, with unprecedented flexibility, mobility, and firepower.

ADMINISTRATIVE CONTROL

The Commander in Chief (CINC) of the Ground Forces is a Deputy Minister of Defense. He is equal in status to the CINCs of the other components. His duties include supervision of technical affairs and research and development, direct control of nonoperational training, and supervision of ground forces administrative organs. He does not have direct operational control over the troops.

This lack of operational control is not immediately apparent from the composition of the Ground Forces Headquarters. Its composition includes the Main Staff and several technical directorates. The Main Staff, however, apparently fills a traditional role of coordinating, planning, and maintaining liaison with the Ministry of

Defense (MOD) General Staff on ground forces matters. It also acts as a consolidation point for the work of the ground forces directorates. Among the principal directorates of the Ground Forces Headquarters are the Political Directorate, the Combat Training Directorate, and the Military Educational Institutions Directorate, all of which have counterparts at MOD level.

Large technical directorates exist for those troop branches peculiar to the ground forces. Each troop branch directorate acts as a branch or service headquarters which prescribes the organization, equipment, tactics, and training for its branch and operates the career management program for its leading personnel.

TROOP CATEGORIES

For administrative purposes, the Soviet ground forces comprise three categories: combat arms branches (troops), special troops, and services. These are administrative categories pertaining to personnel, not organization categories pertaining to units. Thus, troops of one combat arms branch, such as artillery, may organizationally be in support units subordinate to a unit made up of troops of another combat arms branch (for example, motorized rifle or tank). These support units may also include special troops and services.

COMBAT ARMS BRANCHES

The firing elements of the ground forces comprise combat arms branches (troops). They differ from one another in organization, armament, tactics, and role in combat. Directorates of Ground Forces Headquarters administer the troop branches peculiar to the ground forces.

Motorized Rifle

Motorized rifle troops generally parallel the infantry and mechanized infantry of other armies. These troops constitute the basic arm of the ground forces; therefore, various agencies under the Ground Forces CINC, rather than one special organization, administer their affairs. These agencies prescribe motorized rifle and combined arms tactics and organization. They prepare training schedules for motorized rifle and combined arms units. They also administer motorized rifle schools and manage motorized rifle officer personnel. Other arms and services provide them with logistic support.

Tank

The Chief of Tank Troops in Ground Forces Headquarters heads this branch. A Main Directorate of Tank Troops supports him. The Main Directorate is an intricate organization which acts as an administrative headquarters. Tank troop officers command tank units at all levels. Combined arms formations feature a special staff officer as chief of tank troops. He commands subordinate tank elements and reports to the combined arms commander.

Missile Troops and Artillery

This is one of the most prestigious branches of the ground forces or the MOD. Artillery troops have long held an honorable position in Russian military annals. In recent decades, technological advances in missile weaponry have enhanced that position. Since missile armaments have also

become important to other components, the MOD generally oversees missile equipment development. However, a Chief of Missile Troops and Artillery is present in Ground Forces Headquarters. His supporting administrative agency is large and contains a coordinating staff. Also, chiefs of missile troops and artillery appear in the special staffs of combined arms units down to, and including, regiments. At regimental level, this official is simply called the chief of artillery.

Air Defense Troops (*Voyska PVO*)

This branch recently became a separate component combining air defense elements formerly under the National Air Defense Troops (PVO Strany) and the Air Defense Troops of the Ground Forces (PVO Sukhoputnykh Voysk). Although MOD headquarters now administers them, the troops may serve under combined arms command in the field during wartime. They coordinate closely with aviation and radiotechnical elements in operational matters. Air defense schools previously under the ground forces now belong to the Air Defense Troops.

Airborne

Airborne troops form a reserve force of the Supreme High Command (VGK) or the wartime Stavka VGK, although operational control of them specifically belongs to the Chief of the General Staff. The VGK may—

- Control their combat employment directly.

- Place them under the command of a theater headquarters.
- Place them under operational control of a front or army to support operational missions.

The troops are not subordinate to a ground forces field command until the VGK commits them. This definite separation suggests that they have the status of a sixth distinct component of the armed forces, even though they are nominally subordinate to the CINC, Ground Forces, because of this special status.

SPECIAL TROOPS

The special troops provide combat support to the combined arms field forces of the ground forces. They also support the other components of the armed forces. For this reason, they are administered centrally from directorates in the MOD. Ground Forces Headquarters, however, contains specialized directorates or departments in each of

the combat support areas to deal with specific ground forces problems. These directorates act as a ground forces administrative echelon for the superior MOD directorates.

Engineer

As ground elements of the combined arms field forces, engineer troops serve only as combat engineers. The Chief of Engineer Troops of the MOD manages them. These engineers are not part of the engineer-technical service, which comprises the logistic units of the various arms and services. Other Soviet troop branches perform civil engineering, sanitation, and mapping functions; they are comparable to organizations like the US Corps of Engineers. Engineer troops found in units at division level or higher are simply called engineers. Those at a lower level, in closer contact with the enemy, are called sappers.

Signal

Signal troops are organic to all levels using signal equipment that requires special training for operation and maintenance. The Chief of Signal Troops of the MOD administers them because they perform tasks that are common to more than one component of the armed forces. They include radio technical troops that serve mainly in the units whose missions require radar reconnaissance and electronic warfare. They also perform missions such as electronic deception and radioelectronic reconnaissance, which include electronic intelligence (ELINT) or signals intelligence (SIGINT).

Chemical

Chemical troops are organic to all tactical regiments and divisions. They are allocated to armies and fronts. Similar to engineer and signal troops, they are directly subordinate to the MOD. The Chief of Chemical Troops administers them at that level.

Motor Transport

The Chief of the Central Military Transportation Directorate (VOSO), under the Chief of the Rear in the MOD, may administer motor transport troops. The VOSO is primarily responsible for management and planning of defense transportation. It controls the training of all transport officers at and beyond the military college level. The actual operation of the various modes of transport is the duty of the force components, which in this case are the ground forces. At lower levels, the deputy commander for the rear controls these troops.

Railroad

Railroad troops support the field forces by operating the railway links between the front and the central logistical base. They are responsible for the construction, operation, and maintenance of railroads in a theater of operations. Since March 1989, these troops are no longer considered part of the armed forces.

Road

Road troops maintain military roads. They are often called road building troops or road service troops. The troops consist of separate traffic control, road construction, and bridge construction units. Operationally controlled by the chief of the rear at various levels, their administrative subordination has been obscure since World War II. They may be a component of VOSO.

SERVICES

The Soviet concept of services includes all troops, installations, and duty positions which perform rear area support for the combat arms branches and special troops. Such services are not specific to the ground forces, but support the other armed forces components as well; therefore, various agencies in the MOD administer them. These services differ from the special troops because they apparently have no intermediate administrative directorates at Ground Forces Headquarters.

Medical

These units and personnel are organic to all levels of command down through company level. The Central Military Medical Directorate under the Chief of the Rear supervises their activities at the MOD level. The divisional and regimental surgeons supervise personnel at their respective levels.

Veterinary

The Veterinary Service falls under the control of the Chief of the Rear. It inspects the meat used by the armed forces, supervises animal slaughter, and deals with prevention and control of contagious diseases among animals used for meat.

Military Topographic

The Central Military Topographic Directorate of the General Staff of the MOD administers and controls the Military Topographic Service. The General Staff also probably disseminates the products of this service.

Finance

The Finance Service is locally supervised. However, it has a direct technical channel running

vertically to the Central Finance Directorate, under the Deputy Minister for Rear Services in the MOD.

Justice

The military procurator (prosecutor) and the military tribunal are the central elements of the Justice Service. These elements are attached to each major headquarters down to division level. This hierarchy is independent of the military command. It is subordinate to the Procurator General of the USSR and the Supreme Court of the USSR, although its officers are considered active duty military personnel.

Military Band

This service provides bands to headquarters down through division. The Military Band Service Directorate (or Directorate of Military Music) in the MOD administers it.

Intendance

This service corresponds to the US Quartermaster Corps. It uses the same insignia as the Administrative Service.

Administrative

This service may provide clerical and administrative support at higher headquarters. According to Soviet regulation, the highest rank provided for this service is colonel. Personnel doing administrative management, accounting, and similar housekeeping tasks may be members of the administrative service, the management service, or the intendance service. Since there are no exclusively administrative units, these titles are probably just personnel categories with the individuals in them administered by the Main Personnel Directorate of the MOD and supervised locally.

FORCE STRUCTURE

The Soviets have organized and equipped their ground forces to support their defensive doctrine. Moreover, they are constantly strengthening and modernizing their organization and equipment to improve their capabilities to fight either nuclear or nonnuclear war. A nuclear exchange in Europe could easily cause tremendous damage to the Soviet Union. Therefore, the Soviets clearly want to be able to fight and win a war in Europe quickly, before either side employs nuclear weapons.

The Soviets have determined that the only way to win such a war is by offensive operations. The Soviet concept of the offensive emphasizes surprise and high rates of advance combined with overwhelming firepower. The concept of combined arms is at the heart of Soviet combat doctrine.

MAJOR GEOGRAPHICAL AND FORCE GROUPINGS

The Soviets organize ground forces by geographical boundaries into theaters of war (TVs), theaters of military operation (TVDs), and military districts and groups of forces. They can organize forces into large field formations called fronts and armies.

TV

The Soviets envision that hostilities might occur in any of three TVs: the Western, the Southern, and the Far Eastern. A TV is a broad, geographically oriented designation within which Soviet armed forces would function in wartime. A

continental TV can include land, air space, and assorted internal and coastal waterways. The Western TV, for example, includes the European land mass and associated islands, the associated air space, the Baltic and Mediterranean Seas, and portions of the Arctic and Atlantic Oceans. The TVs have political and economic significance in shaping Soviet military goals. They contain one or more TVDs.

TVD

The TVD geographical concept is the focus of planning and control for employment of Soviet armed forces in major theater strategic actions. The Soviet planners divide the world into 14 TVDs: 10 continental TVDs and 4 oceanic TVDs. The continental TVDs include not only the land masses, but also the air space, inland waterways, and a segment of the surrounding oceans and seas. The Western TVD of the Western TV, for example, includes NATO's Central Region plus Denmark and the Danish Straits.

In wartime, the Soviets would employ intermediate High Commands of Forces (HCF) that would be responsible to the VGK. In keeping with the Soviet concept of centralized control and combined arms operations, the TVD HCF not only controls the assets available in the ground forces, but also the naval and air assets. Some, if not all, of the non-Soviet Warsaw Pact forces might also be subordinate to a TVD HCF. The TVD's most important function in wartime would be to

orchestrate and control TVD-wide strategic operations as directed by the HCF in support of VGK campaign plans.

Forces within a TVD can consist of as few as one front or as many as five or six. Other forces allocated to a TVD can include fleets, airborne divisions, tactical aviation, strategic aviation, military transport aviation, air defense forces, and strategic rocket forces.

Military Districts and Groups of Forces

There are 14 military districts in the USSR and 4 groups of forces in Eastern Europe. The Eastern European groups of forces include—

- * The Western Group of Forces (WGF) in Germany.
- The Northern Group of Forces (NGF) in Poland.
- The Central Group of Forces (CGF) in Czechoslovakia.
- The Southern Group of Forces (SGF) in Hungary.

In peacetime, each of these districts and groups of forces is an administrative headquarters directly subordinate to the MOD. In wartime, the Soviets will organize them into fronts for combat operations. The military districts will continue to function as territorial commands, serving as mobilization and training bases and providing logistical and other support services.

Front

The front is the largest field formation in wartime. It is an operational and administrative unit whose size and composition are subject to wide variation depending on its mission and situation. Roughly equivalent to a US/NATO army group, a front can include three to five armies. Other forces organic or attached to a front can include artillery, missile, air defense, engineer, chemical, signal, reconnaissance, and rear service units. They can also include aviation, airborne, air assault, airmobile, and special purpose forces.

Army

The Army is the highest peacetime combined arms formation. The Soviet ground forces designate two types of armies: the combined arms army (CAA) and the tank army (TA). While both types are actually combined arms organizations, a Soviet CAA will normally have a greater number of motorized rifle divisions (MRDs), while a TA will have a greater number of tank divisions (TDs). By altering the mix of MRDs, TDs, and artillery and missile support in the army organizations, the

Soviets gain flexibility in either offensive or defensive roles. An army can operate in different geographical areas and under various operational constraints. Besides its complement of two to five maneuver divisions, a typical army of either type will normally have artillery, missile, air defense, aviation, engineer, chemical, signal, reconnaissance, and rear support units.

MANEUVER DIVISIONS

Soviet maneuver divisions are well-balanced, powerful, and mobile fighting units. They have a combined arms structure as well as a comprehensive array of combat support (CS) and combat service support (CSS) elements. In early 1987, there were 211 active Soviet maneuver divisions: 150 MRDs, 52 TDs, 7 airborne divisions, and 2 static defense divisions. The totals did not include 2 new army corps (NAC) and 5 mobilization divisions.

The basic structures of the three types of divisions (motorized rifle, tank, and airborne) appear in Figure 1-1. While this manual presents "type" Soviet divisions, different configurations and different categories of readiness exist among actual divisions.

Divisions receive new items of equipment according to the priorities established by the MOD. High-priority formations, such as the Soviet forces in the Western TVD, are usually the first to receive modern equipment. When they replace older material, the Soviets send that older equipment to lower-priority units in the interior of the USSR or to reserve stocks. Late-model T-64/72/80 tanks constitute about one-third of the USSR's tanks. While older T-55 and T-62 tanks constitute most of the remainder, over 1,500 T-80s are currently deployed opposite NATO and nearly 75 percent of the 19,000 Soviet tanks in the Western Theater are T-64/72/80 models.

REORGANIZATION AND MODERNIZATION

Since the mid-1960s, the Soviets have been building a force capable of fighting decisively at all levels of conflict. Recent improvements in force capability include—

- * Modernization of nuclear and conventional weapons.
- Marked increases in the quantity and quality of conventional fire support (air and artillery) available to ground maneuver formations.
- Changes in organizational structure that generally make fire support systems (air and artillery) more directly responsive to the supported commander.

Basic organizational comparison of the motorized rifle, tank, and airborne divisions

MOTORIZED RIFLE DIVISION	TANK DIVISION	AIRBORNE DIVISION
Division Headquarters	Division Headquarters	Division Headquarters
Motorized Rifle Regiment (BMP)	Motorized Rifle Regiment (BMP)	Airborne Regiment (BMD)
Motorized Rifle Regiment (BTR)	Tank Regiment	Airborne Regiment (BMD)
Motorized Rifle Regiment (BTR)	Tank Regiment	Airborne Regiment (BMD)
Tank Regiment	Tank Regiment	Assault Gun Battalion
Artillery Regiment	Artillery Regiment	Artillery Regiment
SAM Regiment	SAM Regiment	AA Battalion
SSM Battalion	SSM Battalion	
Antitank Battalion		
Reconnaissance Battalion	Reconnaissance Battalion	Reconnaissance Company
Engineer Battalion	Engineer Battalion	Engineer Battalion
Signal Battalion	Signal Battalion	Signal Battalion
Materiel Support Battalion	Materiel Support Battalion	Transportation and Maintenance Battalion
Maintenance Battalion	Maintenance Battalion	
Chemical Protection Company	Chemical Protection Company	Chemical Protection Company
Medical Battalion	Medical Battalion	Medical Battalion
Artillery Command Battery	Artillery Command Battery	
Helicopter Squadron	Helicopter Squadron	
Other Support Elements	Other Support Elements	Other Support Elements

- NOTES.**
1. In 1989, the Soviets began replacing one tank regiment with an additional BMP-equipped MRR in both the MRD and TD.
 2. Armies in WGF are consolidating division-level SSM battalions into army-level SSM brigades.
 3. Not all MRDs and TDs have a helicopter squadron.

- Refinement and exercise of types of operations that take greater advantage of the increased firepower, mobility, and weapons sophistication of the general purpose forces.

In the 1980s, the Soviets began to form new corps-type structures. These corps are divisions expanded to almost twice the size of a TD. They are ideally suited to act as an operational maneuver group (OMG) for the front, conducting high-speed operations deep in an enemy's rear area. These NAC formations contain around 400 tanks, 750 infantry fighting vehicles (IFVs) and armored personnel carriers (APCs), and 300 artillery pieces and multiple rocket launchers (MRLs). Additional units of this type may appear once testing and operational evaluation end.

Soviet maneuver divisions are continuously undergoing a reorganization that significantly upgrades their combat capability. This manual

includes the main features of the most current organizational changes. The addition of new sub-units and the upgrade of existing elements have expanded both MRDs and TDs. The greatest changes are in the TDs.

The BTR- and BMP-equipped motorized rifle battalions (MRBs) have expanded the mortar battery from six to eight tubs. They have added a machine gun/antitank platoon to each company in the BTR-equipped MRB. The BMP-equipped MRB has added machine gun platoons, with no extra antitank weapons. Also, the Soviets have now consolidated the automatic grenade launcher and antiaircraft (AA) squads in platoons at the battalion level of both BTR- and BMP-equipped MRBs.

In order to support the fast-moving maneuver units envisioned for future battlefields, the Soviets have formed materiel support units within combined arms units from tactical to front levels. Within,

divisions and regiments, respectively, materiel support battalions and companies combine formerly fragmented motor transport, supply, and service functions. The new rear area units will provide a 30-percent increase in motor transport assets and a streamlined command structure. A similar reorganization at army and front levels has created materiel support brigades with centralized control for ammunition, fuel, and other supplies.

The airborne division is now a fully mechanized combined arms organization. Airborne divisions now consist of three regiments equipped with the air-droppable BMD, affording these units greater firepower and mobility. The Soviets have also produced a new 120-millimeter 2S9 airborne self-propelled (SP) howitzer with a mortar capability for airborne and air assault units.

Concurrent with these organizational changes, the Soviets have pursued a comprehensive equipment modernization program that affects many divisional subunits. The main thrusts of the equipment upgrade are in the following areas:

- Medium tanks.
- Armored IFVs.
- Armored command and reconnaissance vehicles.
- Antitank guided missiles (ATGMs).
- Surface-to-surface missiles (SSMs).
- Surface-to-air missiles (SAMs).

Since the late 1970s, the Soviets have developed the tank regiment (TR) into a combined arms team (tank, motorized rifle, and artillery) that promises to be as flexible in its employment as the motorized rifle regiment (MRR). (The MRR already had a tank battalion (TB) and an artillery battalion.) The addition of an MRB to the TR of a TD eliminates the necessity for the TD commander to reinforce each of his TRs with MRR assets. This leaves the TD with four maneuver regiments. The addition of an artillery battalion to the TR places a great deal more firepower under direct control of the regimental commander. The division commander then has greater flexibility in the use of his artillery resources to influence the battle.

Hence, the capability of the TR and TD to conduct largely self-supported combined arms combat has increased greatly.

Large-caliber SP guns and mortars and long-range MRLs have increased the artillery available to army and front commanders. Additionally, some army-level regiments have grown to brigade size with the addition of a fourth artillery battalion. These battalions are currently expanding from 18 to 24 tubes, primarily in units opposite NATO. All of the Soviet's SP and towed guns/howitzers (152-millimeter and larger) are nuclear-capable. The Soviets are also adding newer nuclear-capable pieces such as the 203-millimeter SP gun 2S7 and the 240-millimeter SP mortar 2S4. They are deploying the BM-22 220-millimeter MRL, which can fire deep into the enemy's rear. These improvements greatly enhance area coverage and counter-battery support to subordinate divisions. The new T-64/72/80-series tanks feature improved firepower, with a 125-millimeter main gun and an improved fire control system. Both the T-80 and a variant of the T-64 can fire an ATGM through the main tube. The T-80 can mount reactive armor which further protects against the West's antitank capabilities. At the same time, the establishment of army aviation has given ground forces a vertical dimension. The helicopter now provides CAAs and TAs with a highly maneuverable and versatile platform for reconnaissance, command and control (C2), and fire support. General-purpose and attack helicopter units can move with armies and divisions at the high rates of advance they will need to conduct combined arms operations in depth.

While changes in the organization and equipment of the ground forces are significant in themselves and have serious implications for Western defense planning, they do not take place in isolation. Instead, these shifts appear to be part of a larger change in the concept for employment and organization of the armed forces. This change should greatly enhance the flexibility with which Soviet military planners can apply force to achieve military objectives. (For more information on Soviet operations and tactics, see FM 100-2-1.)

CHAPTER 2 Personnel

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Over 60 million males between the ages of 15 and 49 live in the Soviet Union. About 80 percent of these men are fit for military service. Each year, some 2 to 2½ million young men reach the military registration age of 17. The government will induct at least one-half of them when they become 18 years old. These conscripts constitute approximately 75 percent of Soviet ground force personnel. The remainder, who are deferred for various reasons, serve at a later time on active duty unless they are declared physically unfit for military service. If deferred beyond their twenty-seventh birthday, they remain in the reserves, subject to periodic refresher training. All qualified male citizens remain in the armed forces reserve until their fiftieth birthday.

The quality of military manpower, particularly of the Great Russian element, is generally good. The Great Russians comprise about 53 percent of

the total population. Soviet youths are physically hardy as a result of participation in active sports programs. They are also better educated, more sophisticated, and substantially better trained than their World War II predecessors. Although the conscript receives stern discipline and intensive political indoctrination, works hard, and has few comforts or luxuries and little time to himself, his morale is relatively high. He has a genuine love of his native land. His hatred is easily aroused against an invading enemy, of which there have been many in Russia's and the Soviet Union's history. Moreover, Soviet soldiers and sailors have the capacity to withstand deprivations. The Soviet officer is a well-regarded professional who occupies a high social and economic position in society. The officer corps, with its prestige and privileges, stands apart from the troops. In summary, the Soviet armed forces, loyal to the regime, constitute a serious adversary; they are on a par with their counterparts in the West.

MANPOWER PROCUREMENT

The 1967 Law on Universal Military Service provides for the mandatory semiannual conscription of 18-year old males. This law also governs the system of drafting young men into the armed forces. Those who are not drafted enter immediately into the reserves. On completion of conscript duty, men remain in the reserves until age 50. Women who have medical or other specialized training are also subject to call. Officers enter the armed forces from several sources. Most receive commissions upon graduation from officer schools. Others participate in Reserve Officers' Training Corps

(ROTC)-type programs in institutions of higher education. Enlisted men, noncommissioned officers (NCOs), and warrant officers are eligible to compete for entry into the officer corps by passing an examination for promotion to officer rank.

CONSCRIPTION

The Council of Ministers and the MOD determine the personnel requirements for each semi-annual call-up period. They assign quotas based on the number of draft-age males residing in each of the 16 military districts. A system of draft

boards, called military commissariats, is subordinate to the military district. Military commissariats in Soviet civil jurisdictions roughly correspond to US civil jurisdictions as follows:

- Republic, which is a geographic region similar to the US South, West, or New England; there is no exact US counterpart.
- Kray and oblast, which are provinces similar to US states.
- Gorod, which is a city.
- Rayon, which is similar to a US county or city ward.

Military commissariats at the district level function as overall administrators of the system. They provide supervision to all subordinate officers. Those at republic, kray, oblast, and rayon levels perform administrative functions, though not all republics have military commissariats. Each of these levels also serves as a collection point for inductees. The center of the registration and draft process is the rayon military commissariat. It registers draft-age males, issues draft notices, and processes conscripts. It also transports conscripts to the next higher military commissariat for movement to their assigned units. The rayon offices also have mobilization and reserve management responsibilities. There are about 4,700 military commissariat offices, of which at least 3,600 are at the rayon level.

During February and March of the year in which they reach their seventeenth birthday, young men report to the military commissariat to register. They receive a physical examination and an interview to determine their educational background, family situation, personal interests, attitude toward the military, and special knowledge or skills (if any) that would benefit the military. Each young man receives a booklet as proof of registration. He must report changes in residence, family situation, educational status, or the acquisition of additional skills to the military commissariat so officials can enter the new data in the registration booklet.

Each individual receives a final interview and a physical examination shortly before he is scheduled for conscription. Then the draft commission recommends that the young man be drafted, be deferred for one year because of temporary unfitness for active military service due to illness, be exempted from military service altogether if unfit, or be granted a deferment for family reasons or for continuation of education.

Twice each year—at the end of the spring planting season and at the end of the fall harvest—the military commissariats call males who have reached their eighteenth birthday to active duty. Older men up to age 27 whose periods of deferment have expired also face call-up. In peacetime, women 19 to 40 years of age who have medical or other specialized training may face military service. The 1967 Law on Universal Military Service reduced the required length of active service from three to two years for all except naval personnel.

Within the framework of quotas fixed by the Council of Ministers and the MOD, the commissariats assign inductees to the various branches, arms, and services of the component forces based on their abilities, occupational expertise, or specialties learned in training courses conducted by the Voluntary Society for Cooperation with the Army, Aviation, and Navy (DOSAAF). The DOSAAF is subordinate to the MOD. It conducts pre-military training in secondary schools. Its programs acquaint students with military life. The programs can include tracked- and wheeled-vehicle driver training, parachuting, radio operation and maintenance, along with drill and rifle training. This training is one of the prime considerations for future soldiers' selection to a particular program, such as a military academy.

Draftees report to their military commissariat on the date set. Inductees go directly to their assigned units for a period of orientation, drill, and some refresher training. This lasts approximately a month, after which the conscripts become young soldiers and young sailors by reciting the military oath in a public ceremony. (See figure on next page.)

The Soviets probably only rarely grant permanent exemption from active or reserve duty except for clearly medical reasons. They usually give deferments for stated periods of time and then review them at the expiration of the period. The 1967 Law on Universal Military Service reduced the number of educational deferments and extended hardship or compassionate deferments.

There are three general categories of criteria for deferment: physical reasons, family circumstances, and continuation of education. The authorities may grant three-year deferments for physical problems or one-year deferments for illnesses. After this time, depending on the deferred citizen's state of health, the government will call him up for active duty, enroll him in the reserves, or acknowledge him to be altogether unfit and thus exempt from military service.

The military oath

I, (name), a citizen of the Union of Soviet Socialist Republics, by joining the ranks of the armed forces; take an oath and solemnly swear to be an upright, brave, disciplined, vigilant soldier, to strictly preserve military and government secrets, and to execute without contradiction, all military regulations and orders of commanders and superiors. I swear to learn conscientiously the trade of war, to protect with all means the military and peoples' property, and to be devoted to my people, my Soviet homeland, and the Soviet Government to my last breath. I will always be ready to report, by order of the Soviet Government, as a soldier of the armed forces for the defense of my homeland, the Union of Soviet Socialist Republics. I swear to defend it bravely and wisely with all my strength and in honor, without sparing my blood and without regard for my life to achieve a complete victory over the enemy. Should I break my solemn oath, may severe penalties of the Soviet Law, the overall hatred, and the contempt of the working masses strike me.

An individual who must remain at home to support or care for his family may qualify for a deferment due to family circumstances. The 1967 law set specific criteria for this category. The military commissariat can defer draftees up to 27 years of age.

Military commissariats can also defer full-time students at universities, in high schools (for students up to age 20), and in technical institutions (until graduation). They can also defer students studying in reserve officer training programs at technical institutions. Draftees who receive educational deferments face call-up for active duty before they turn 27.

UPPER RANKS Officers

Officers for the Soviet armed forces enter the service from several sources. The largest number are commissioned upon graduation from military colleges. There are at least 143 military colleges, with average enrollments of 1,000, serving all branches of the armed forces. Besides commissions, graduates receive technical degrees from three-year schools and engineering degrees from schools whose programs can last up to five years.

The Soviets also conduct programs similar to the US ROTC in their universities. These programs give training in subjects of military value and provide the Soviets with a large number of reserve officers. Military training for the duration of the civilian curriculum leads to a reserve commission, but only infrequently does it lead to active duty. Reserve officer graduates of this program remain liable for active duty call-up until age 30; they may face up to three years of service.

A third source of officer recruitment is the rank and file of soldiers and sailors. Upon completion of their active duty service, conscripts who have a secondary or higher education can earn a lieutenant's commission in the reserves by passing a commissioning examination. Warrant officers, too, can use the commissioning examination as a route to active duty officer rank; they can also receive a direct commission after ten years of active service.

Approximately 500,000 officers are on active duty in the Soviet armed forces at any given time. Three to five thousand of these officers are generals and admirals. Nearly 90 percent of Soviet officers belong to the Communist Party or to the Komsomol. Seven percent of the members of the Communist Party of the Soviet Union (CPSU) Central Committee are military officers.

Warrant Officers

In January 1972, the Soviets created the warrant officer ranks of *praporshchik* (army) and *michman* (navy). This action was an attempt to give the career NCO more incentive, to eliminate the extended service conscript (though this action was later rescinded), and to improve the quality of small unit leadership. Conscripts completing their service obligations and desiring to remain on active duty may apply for these positions if they possess the required education, demonstrated ability, and political reliability. The initial term of service for a warrant officer is five years.

These warrant officers serve in close contact with the soldiers and occupy positions as first sergeants, sergeants major, and technical specialists. Although the Soviet press publicizes them as the closest assistants to the officers, the warrant officer ranks are apparently less popular than anticipated. To date, this new program has received too few qualified applicants. The Law of Military Service permits a warrant officer to take an examination to become a lieutenant after five years; after ten years, he may be certified as an officer if he is serving in an officer's position.

Noncommissioned Officers

The majority of NCOs in the armed forces are conscripts. During registration and induction, authorities identify outstanding conscripts as potential NCOs. Immediately after entering active service, these individuals attend NCO schools for six months of training before they report to units for their remaining active duty. Other outstanding individuals missed during this initial screening receive on-the-job NCO training in their units.

Noncommissioned officers also fill the extended service personnel category. To qualify for this category, a candidate for reenlistment must have completed high school or the equivalent; he cannot be over 35 years of age. He may apply (or reapply) for extensions of two, four, or six years. His branch of service then prolongs his tour of duty according to the branch personnel requirements. As with warrant officer selection, acceptance depends on the candidate's political reliability and military record. Recruiting takes place three months before discharge, with screening conducted by a permanent committee. This committee includes the political officer and secretaries of the Communist Party and Komsomol organizations. Final approval rests with the individual's commander. Former service personnel can return to active duty under this program.

The Soviets suspended the extended service program in 1972, after the establishment of the warrant officer ranks. The intention was for warrant officers to fill some of the higher NCO positions; conscripts would then fill the remaining NCO ranks. Because the plan was not completely successful, the Soviets reinstated the extended service category the following year to provide essential personnel for various high qualification specialties. These specialties require long periods of training; they include aviation mechanics, naval specialties, electronics, and personnel management.

WOMEN IN THE ARMED FORCES

The 1967 Law on Universal Military Service provided for compulsory military service for women only in time of war or emergency. The government will draft women with special skills, normally those in the communications and health fields.

Recognizing that the pool of conscripts is dwindling, the Soviet government amended the 1967 Universal Military Service Law in 1985. This

amendment permits officer or enlisted women to voluntarily enter active service at age 19 with duties according to their specialties and general education. It extends the age of eligibility to age 40. Those with medical or technical specialties can register during peacetime and can then conduct military training courses.

Most service regulations for women are identical to those for men. Training is similar in the initial phases, though women stay in special dormitories in garrison. When off duty, women may wear civilian clothes. The military disciplinary regulations specify separate penalties for women commensurate with those for men.

Women enlistees may extend their service and remain on active duty. At least one woman in the medical service field has completed thirty years of military service. Pensions and leave plans are similar to those for servicemen, with the exception of pregnancy leave, which is authorized before and after childbirth.

Women rarely achieve officer rank; therefore, few have attended command and general staff colleges. Most women officers attending midlevel professional schools are in the medical services.

The first women warrant officers came from the Soviet Army Parachute Team, but women should find increasing opportunities in the high technology fields of the Soviet armed forces. Expanding the role of women in the Soviet Military could adversely affect the civilian labor force, however, since women now constitute one-half of that force.

Some military wives have formed women councils which provide a reserve force of dependents available to augment Soviet forces in the forward areas such as WGF. Their training consists of basic courses in weapons use, combat skills, and nuclear, biological, and chemical (NBC) protection. There is an ongoing effort to expand this program to other military installations.

Although Soviet society proclaims equality for men and women, the Soviet armed forces still channel women into well-defined occupational roles. Generally, women do not participate in operational military activity during peacetime. Approximately 10,000 women currently serve in the Soviet armed forces.

CONDITIONS OF SERVICE

Service in the Soviet armed forces offers potential rewards such as promotion, pay, in-service benefits, and a pension. Conversely, it requires

vigorous training, strict discipline, thorough political indoctrination, and adherence to Communist Party policies.

OFFICER PROMOTIONS

After graduation from one of the military colleges, an officer normally rotates through a number of command and staff assignments. Some officers then attend one of the advanced institutes for

officers or a component or branch academy. Promotions to the next higher grade, up through colonel, depend on academic training, service experience, duty assignment, job performance, and political reliability.

Minimum time-in-grade requirements for officer promotion

GRADE	TIME
Junior lieutenant to lieutenant and equivalent ranks	2 years
Lieutenant to senior lieutenant and equivalent ranks	3 years
Senior lieutenant to captain and equivalent ranks	3 years
Captain to major and equivalent ranks	4 years
Major to lieutenant colonel and equivalent ranks	4 years
Lieutenant colonel to colonel and equivalent ranks	5 years
To ranks above colonel	No fixed minimum

Promotions up to and including the rank of colonel follow procedures determined by the USSR Council of Ministers. They probably result from the recommendations of an officer's immediate superior and branch chief. The Council of Ministers grants promotions to generals and admirals, while the Presidium of the USSR Supreme Soviet must approve promotions to the ranks of army general, marshals of arms of the service, fleet admirals, chief marshals of arms of the service, Fleet Admirals of the Soviet Union, Marshals of the Soviet Union, and Generalissimo of the Soviet Union. The USSR Minister of Defense can order the awarding of the next higher rank before the end of the prescribed period of service in the previous rank. He may do this when an officer has demonstrated excellence in combat training, has successfully

fulfilled national goals, or has been assigned to a higher position.

An officer's immediate superior, in consultation with his political deputy, prepares the officer's efficiency report. He evaluates the officer's work and rates his political and job qualities. Officers receive reports once every two or three years, upon either transfer or recommendation for promotion.

Officers remain on active duty until reaching the statutory age for retirement, which varies according to grade. (See "Statutory age for retirement," below.) Officers who reach these respective age limits without being promoted must leave active duty and transfer to the reserves. If granted an exception, however, an officer may serve an additional ten years in his grade before being discharged.

Statutory age for retirement

RANK	AGE
Junior lieutenants, lieutenants and equivalent ranks	40
Senior lieutenants, captains, and equivalent ranks	40
Majors and equivalent ranks	45
Lieutenant colonels and equivalent ranks	45
Colonels and equivalent ranks	50
Generals and admirals up to lieutenant general and equivalent ranks	55
Generals, admirals, and marshals below Marshal of the Soviet Union, and equivalent ranks	Exempted

PAY

Basic pay for members of the Soviet armed forces is the sum of pay for rank, position assignment, and length of service. Unlike the US which pays all service personnel of the same rank the same salary, the Soviets do not pay conscripts as much as career personnel serving in the same position. Typically, conscripts receive less than the equivalent of \$10 per month.

Rank pay is a constant factor. Only officers and warrant officers receive it. Position pay is the major factor in the system. Its level may vary greatly, reflecting the command responsibility or technical requirement. Position pay does not vary with rank; thus, it is not unusual for the incomes of personnel of the same rank to be substantially different. Although tables of organization specify nominal ranks for certain positions, personnel of different ranks may frequently fill the positions. There is a growing tendency to place majors in command of battalions, lieutenant colonels in command of regiments, and colonels in command of divisions.

The Soviets do not publish pay scales for military personnel. The estimated average pay for officers in 1975 was about 150 rubles a month. (A ruble is officially equal to \$1.66.) A lieutenant may realize a combined pay of about 150 rubles a month, a major about 225, and a lieutenant colonel about 250. Marshals may earn as much as 2,000 rubles a month.

IN-SERVICE BENEFITS

The provision of housing, rations, and other service benefits depends on whether one is a conscript or a career serviceman. Conscripts cannot marry while serving. If already married, they cannot be accompanied by their families.

Since 1984, wives of noncareer military personnel have received a payment for the education of children. Another benefit which they, along with members of their families, receive is retention on the waiting list for living space. Families retain the living area that they occupy before the service man went into service for the effective length of military service. In 1986, privileges for families of noncareer military personnel increased to allow a monthly payment of 35 rubles per child.

Officers, warrant officers, and extended service personnel receive free living quarters, assigned according to marital status, position, assignment, and size of family. When housing is not available, they get a small allowance instead. Also, the armed

forces pays career personnel a subsistence subsidy at the rate of about 20 rubles per month when rations are not available, per diem when on temporary duty (TDY), and a dislocation allowance based on the distance traveled when making a permanent change of station. Conscripts receive only daily subsistence allowance when on TDY. Families of first-time servicemen receive free postal privileges for letters sent to soldiers at their duty station.

Career personnel with less than 25 years of active duty may take 30 days of annual leave; those with over 25 years' service receive 45 days of leave. Conscripts serving their normal tour of duty may take no leave except for verified family emergencies or for outstanding performance in military or political training. They may have only one such leave during their period of service. Pass policy depends on the local commander. He will issue conscripts stationed within the Soviet Union passes perhaps once a week. Passes are a luxury for conscripts assigned outside the country.

The armed forces provide service personnel and their families with free medical and health care, including treatments at sanatoria-resorts when prescribed. The resorts also are available at reduced rates on a nonprescription basis to career personnel.

PENSIONS

Military personnel receive pensions for long service or disability. After 25 years of service, all servicemen are eligible for pensions amounting to at least 50 percent of their rate of pay at the time of discharge. Personnel separated from service with between 20 and 25 years of retirement credit qualify for benefits at a reduced rate of 30 to 40 percent of their last military pay. Disabled veterans receive pensions of up to 75 percent. When nonregular servicemen die, their families receive a pension and retain for six months all privileges to which they were entitled. The All-Union Pension Fund, which is similar to other national retirement programs, handles pensions; pensions are not part of the Soviet defense budget.

POLITICAL INDOCTRINATION

The Party exerts its control over the armed forces through the Main Political Directorate (MPA). The MPA has subordinate branches throughout the military chain of command. These branches serve as political directorates at force component, military district, and group of forces levels. Political departments are their equivalents at army and division

levels. Below division, MPA affairs are the responsibility of the deputy commander for political affairs, the zampolit. A zampolit is present in each regiment, battalion, and company. His authority exists independently of that of the military commander. The next higher agency appoints the best trained and most experienced political workers to these political organs.

Besides handling MPA affairs, the zampolit organizes and conducts both nonmilitary and military political work in his unit. His responsibilities include—

- Supervising the activities of the Communist Party and Komsomol organizations.
- Improving combat readiness and political loyalty of the troops.
- Explaining Soviet domestic and foreign policies.
- Strengthening discipline.
- Instilling patriotism.
- Participating in the development of combat training programs and in the selection, placement, and rating of officers.

At the MOD, military district, army, and fleet levels, the Party organizations are responsible for improving the efficiency of the command apparatus by ensuring that the headquarters and other command bodies strengthen military discipline. They are also responsible for promoting progress and innovation in training and equipment. Under the direction of the political officer, all military elements and units participate in activities such as compulsory lectures and meetings, publication

of unit newspapers, and other cultural events with propaganda potential. Political indoctrination is a scheduled part of the training curriculum.

The Communist Party and Komsomol organizations for military personnel who are members are the most visible and prevalent instruments of political control in the military. They involve the largest number of personnel and exist at almost every level in the chain of command, even down to platoon and squad. The basic element of Party membership is the primary Party organization (PPO). The Party may establish a PPO wherever three Party members are present. A PPO with fewer than **15** members elects a secretary; one with **15** or more elects a bureau and a secretary to direct its activities. The Party and Komsomol organizations politicize the military by recruiting as many personnel as possible for membership and by involving them in political activities. While the Party encourages all military personnel to join, membership for officers is virtually required.

There are presently some **16** million Party members and **30** million Komsomol members in the Soviet Union. This represents a little over 20 percent of the total population. In contrast, over 80 percent of all military personnel and 90 percent of the officer corps are Party or Komsomol members. The USSR subjects the majority of its citizens to indoctrination for their entire lives; military personnel, because they are a captive audience, receive constant exposure to it. Occasionally irritating, mostly taken for granted, but nonetheless effective, propaganda and indoctrination, both in and out of the military, are established fixtures of the Soviet society.

RANKS

The highest military rank in the Soviet Union is that of Generalissimo. Only Stalin ever held that rank. All other military ranks fall into five categories:

- Marshals, generals, and admirals.
- Officers.
- Warrant officers.
- Sergeants and petty officers.
- Soldiers and sailors.

(The figure on page 2-7 represents the basic rank structure of the Soviet armed forces, translated into US terms.)

The Minister of Defense, other top personnel of the MOD, and high-level combined arms field

commanders normally hold the rank of Marshal of the Soviet Union. Only combined arms officers can achieve this rank. The equivalent Navy rank is Admiral of the Fleet of the Soviet Union.

The armed forces further classify officers as senior or junior. The warrant officer group includes the ranks of praporshchik for nonnaval personnel and michman for naval warrant officers. Sergeants and petty officers comprise the NCO ranks, and the term soldiers and sailors refers to the two ranks of private and seaman.

The ground/aviation ranks apply to all ground-based servicemen, including nonseagoing naval personnel and all aviation personnel in the air force, naval aviation, and fighter aviation of air defense. The naval ranks are for shipboard personnel.

Soviet military ranks (translated into US terms)

GROUND/AVIATION	NAVY
Generalissimo of the Soviet Union	
MARSHALS. GENERALS. AND ADMIRALS	
Marshal of the Soviet Union/Chief Marshal (of specific arm)	Admiral of the Fleet of the Soviet Union
Army General/Marshal(of specific arm)	Fleet Admiral
Colonel General (3-star)	Admiral
Lieutenant General (2-star)	Vice Admiral
Major General (1-star)	Rear Admiral
SENIOR OFFICERS	
Colonel	Captain 1st Rank
Lieutenant Colonel	Captain 2nd Rank
Major	Captain 3rd Rank
JUNIOR OFFICERS	
Captain	Captain-Lieutenant
Senior Lieutenant	Senior Lieutenant
Lieutenant	Lieutenant
Junior Lieutenant	Junior Lieutenant
WARRANT OFFICERS	
Praporshchik	Michman
SERGEANTS AND PETTY OFFICERS	
Master Sergeant	Ships Chief Petty Officer
Senior Sergeant	Chief Petty Officer
Sergeant	Petty Officer 1st Class
Junior Sergeant	Petty Officer 2nd Class
SOLDIERS AND SAILORS	
Private 1st Class	Seaman 1st Class
Private	Seaman

Officer personnel in the ranks of major general through chief marshal in aviation, artillery, engineer troops, and signal troops and major general through colonel general in tank troops carry the designation of the branch as part of their rank; for example, chief marshal of aviation, marshal of armored troops, colonel general of tank troops (who, upon promotion, would become a marshal of armored troops), lieutenant general of signal troops, and major general of engineer troops. The same criteria apply to technical troops (chemical, railroad, road, motor transport, and units of military topographic service). There is, however, no chief marshal or marshal rank for these troops; for example, colonel general of technical troops.

Likewise, generals and officers of special services (intendance (quartermaster), administrative, medical, veterinary, and justice) use the special service designation. These special services have no marshals or chief marshals. So, one refers to a colonel general of intendance service, a colonel of medical service, a major of veterinary service, and a junior lieutenant of justice. There are, however, no general officers in the administrative service and no colonel general of veterinary service.

Special rank designations also apply to engineer officer ranks of all branches of the armed forces. Officers who complete studies at a higher engineer officer school or a military engineering academy

earn the title of engineer, which is combined with the rank; for example, lieutenant-engineer, colonel-engineer, or colonel general-engineer. In the navy, the equivalent ranks would be lieutenant-engineer, captain 2nd rank-engineer, and admiral-engineer. Officers with a secondary military technical edu-

cation use the title technical service combined with the rank; for example, junior lieutenant of technical service, captain of technical service, and colonel of technical service. There are no general officers of the technical service.

RESERVE SYSTEM

The Soviet reserve system ensures that all citizens fit for military service have a definite reserve commitment when not on active duty or deferred for a specific reason. The military commissariats, in conjunction with other administrative organs, manage the system at the lower levels to make evasion of this responsibility practically impossible. The military service booklets issued to all reservists are necessary for residence permits when changing locale and for work permits when changing jobs.

All former service personnel released from active duty for reasons other than retirement or disability transfer to the reserves. These personnel, together with individuals who for various reasons serve in the reserves exclusively, form the Soviet reserve force. There are no reserve units as such. The closest equivalents to US reserve units are the transport, repair, and construction groups that function as normal parts of the economy in peacetime and move as a whole when mobilized. Reservists called to active duty receive assignments based on their occupational specialties.

In any five-year period, an estimated 3,500,000 Soviets complete military training. Under a system where reserve obligations for NCOs run to age 50 and for officers as high as age 65, the reserve capability reaches into the tens of millions. The reserve manpower pool currently comprises more than 55 million men subject to call-up, of which 9 million have been discharged within the past five years. Noncommissioned servicewomen remain in the reserves to age 40.

ENLISTED OBLIGATIONS

Enlisted and NCO reserve personnel fall into two categories according to experience and three groups according to age. Category I includes those with at least one year of active duty, twelve months of accumulated reserve refresher training, or combat experience of any duration. Category II consists of all personnel with less than one year of active military duty, men subject to military service who for various reasons have not been drafted into active military service, and all women reservists. Each category divides into three groups on the

basis of age: 18 to 35 years of age, 36 to 45 years of age, and 46 to 50 years of age.

Air reservists in Category I, Group I, must participate in up to five 40-day refresher flying training sessions, as well as in the required refresher training. All reservists may have to attend examination periods lasting up to ten days. This is in addition to the required refresher training.

In the past, few reservists have been called for training at the maximum level provided for by law. However, because of the shortened active duty tours enacted in 1967, the Soviets have accelerated their reserve training programs. (See "Training periods," below.)

OFFICER OBLIGATIONS

The officer reserve comprises the graduates of university reserve officer training programs; the body of soldiers, sailors, sergeants, and petty officers who have qualified for, and passed, commissioning examinations upon completion of active duty; and a small number of officers who have

Training periods

CATEGORY I	
Group I	Up to four periods of up to three months each
Group II	Up to two periods of up to two months each
Group III	One period of one month
CATEGORY II	
Group I	Up to six periods of up to three months each
Group II	Up to two periods of up to two months each
Group III	One period of one month

left active service before the expiration of their full obligation. Rank and age are the determinants of an officer's reserve class. (See the figure below for maximum ages.) Women officers accepted for military service with an acquired specialty enter in Reserve Group III, regardless of the military ranks they hold. The age limit for their reserve status is 50.

Reserve officers train more frequently than conscripts. Those in Group I may be called up every year for a period of up to three months; those in Group II, up to two sessions lasting up to three months each; and those in Group III, up to one two-month session. The Minister of Defense has the authority to detain reserve officers at training sessions for up to two months longer than the periods established by law. He can increase the number of training sessions without exceeding the total amount of time required for all three classes. The maximum time spent at the various reserve sessions cannot exceed thirty months. Besides active duty refresher training, reserve officers must attend 30 to 60 hours of refresher training in evenings and on weekends at military facilities near their place of work. Officers in Group I receive this training between annual active duty refresher tours. All others must attend sessions every three years.

MOBILIZATION

In the Soviet Union, the Presidium of the USSR Supreme Soviet orders mobilization. The MOD

orders all call-ups for mobilization based on resolutions of the USSR Council of Ministers. At the time of mobilization, all personnel of the armed forces stay active until further notice. Reservists subject to military service receive notification of the places and times to report in their mobilization instructions, in call-up notices, or in orders of the rayon military commissariats. Mobilization may be partial or universal, open or secret; it may involve all the armed forces or only part of them. In peacetime, only a few members of the reserves may mobilize for training purposes; but in wartime, mobilization affects the whole economy. Only about 2.1 million reservists, or about 5 percent of the total reserve manpower pool, are needed to bring the Soviet armed forces to full wartime strength. Thus, a substantial base would remain available to create new units and provide replacements. Military law in the Soviet Union also subjects women to conscription during wartime, thereby ensuring a large reservoir for expanding the force and releasing men for active duty.

The General Staff of the army and navy, through its Organization and Mobilization Directorate, controls military mobilization. The Directorate plans and directs the mobilization of the armed forces and supervises the mobilization planning activities of the military districts and subordinate military commissariats. It also may be responsible for mobilization supply stockpiles in the armed forces.

Officer reserve classes: maximum ages

RANKS	RESERVE GROUP I	RESERVE GROUP II	RESERVE GROUP III
Junior lieutenants, lieutenants, and equivalent ranks	40	45	50
Senior lieutenants, captains, and equivalent ranks	45	50	55
Majors and equivalent ranks	45	50	55
Lieutenant colonels and equivalent ranks	50	55	60
Colonels and equivalent ranks	55		60
Generals and admirals up to lieutenant general, vice-admiral, and corresponding ranks	60		65
Colonel generals, admirals, and corresponding ranks, generals of the army, marshals of arms of service, and fleet admirals			65

Soviet law does not prescribe an age limit for these groups

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The personnel mobilization plan contains two phases. The first involves the call-up of fully trained reservists (Category I) to bring active units up to authorized strength and to man additional line divisions as well as new nondivisional service and support units. The second phase deals generally with the induction, assembly, and training of partially trained reservists (Category II) for further expansion of the forces, replacement, and related activities.

The Soviets use a number of methods to mobilize and expand units. First, a peacetime unit may expand and convert to the next higher level. So an MRB may become a regiment. Second, a peacetime unit may retain its organization, release part

of its personnel as cadre for new units, and expand to wartime strength. Finally, new units may form directly from the reserves.

The Soviet mobilization system also provides for the mobilization directly from the civilian economy of cargo trucks and other specialized equipment interchangeable for military and civilian use. In August 1968, for example, the Soviet Union freely announced in the press that it would call up reservists and mobilize equipment from the civilian economy for participation in a largescale rear services exercise called NEMAN. As it turned out, the exercise, though carried out as announced, was a method of mobilizing reservists and civilian equipment to support the Soviet troops that moved into Czechoslovakia in late August of that year.

CHAPTER 3 Training

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Military training in the Soviet Union includes civilian premilitary training, in-service training, and reserve training. The 1967 Law on Universal Military Service established a compulsory system of premilitary training for all young men and women aged 16 through 18. The government conducts this training in the final two grades of the ten-year public high schools; in specialized secondary schools; in professional trade schools; and, for those who have left school, in the factories, offices, or farms where they work. These young people gain a fundamental knowledge of the military and basic military-technical skills which make their transition from civilian to military life easier. The training helps them master modern military equipment more quickly after they are drafted.

In-service training of a conscript begins when he arrives at a tactical unit. It normally continues throughout his tour of service. Designed to bring all

military personnel to a peak of combat effectiveness, the training programs are usually identical from year to year. Their major elements are tactics, firing, physical education, and political indoctrination. Field training is frequent and rigorous.

A system of military high schools and colleges, command and staff schools, and a general staff academy provides career military personnel with professional and formal academic training. Qualified conscripts receive a less formalized education for NCO positions.

Reservists prepare for military service while attending civilian schools and universities or while working in the national economy. Refresher training through drills, classes, and active duty call-ups continues until individuals pass out of the reserve at age 50. (Chapter 2 of this manual discusses maximum ages for the officer reserve classes.)

PREMILITARY PROGRAMS

The MOD, together with the DOSAAF, manages, implements, and conducts premilitary training. Formed in mid-1968, the MOD's Directorate for Premilitary Training has assumed responsibility for planning and organizing the Ministry's input into the premilitary and specialist training programs. It is the logical organ to transmit the future needs of the armed forces to the premilitary and specialist training system in the form of quotas. Its tasks embrace the implementation of the MOD mandate to supervise and support the DOSAAF premilitary training mission.

Under the technical guidance of the Directorate for Premilitary Training, the military districts and the military commissariats within the districts assume responsibility for basic military training in the schools and enterprises. They base the types

and number of programs on the quotas of the Organization and Mobilization Directorate, for which they keep records. The military districts and commissariats plan the overall program. They select the training cadres; they organize individual training groups according to the nature of the local population; and they establish evening training sessions, military libraries, weapons rooms, and military-technical training courses for local training centers. The directors of the schools and enterprises control the physical operation of the centers, while DOSAAF conducts the actual training.

The Directorate for Premilitary Training is subordinate to the Central Committee of DOSAAF. It has overall responsibility for premilitary training. Also, the DOSAAF Central Committee contains, among others, separate directorates for

military-technical training and sports, naval training and sports, and aviation training and sports. The DOSAAF operates its program through a hierarchy of committees at all levels from the republics down to the rural counties and urban wards (rayon), which supervise most of the day-to-day work.

Likewise, both the Ministry of Education and the State Committee for Vocational and Technical Education of the USSR Council of Ministers have departments for pre-military training. They cooperate with the MOD and DOSAAF in implementing the pre-military training courses in their respective civilian educational institutions. They develop the courses that make up the pre-military as well as civil defense training programs. They provide DOSAAF with logistical support such as training sites, equipment, visual and other aids, and resource funds. They also participate in the training of instructors. Apparently, all Soviet ministries must provide support for pre-military training programs conducted for their 16- to 18-year-old employees by territorial DOSAAF committees and training centers at factories, farms, institutes, and other locations.

The pre-military training program presented to high school students and working youth at training points and centers provides them with the equivalent of the basic training formerly given to recruits after they were drafted. Phased into operation in 1968, its results have been uneven. The Soviets have continuously expressed concern over the quality of this program. They complain about the large differences in skills and knowledge acquired by youths throughout the country. The differences make it necessary for many new draftees to be retrained after they enter active military service. This significantly reduces the training time for concepts and usage of complex, modern equipment.

The standard program of pre-military basic training provides 140 hours of familiarization with military organization and regulations, small arms use, and civil defense techniques. School students typically spend two hours weekly during two 35-week school years studying these topics. Workers, on the other hand, attend three week-long, full-time sessions at training centers. These sessions are spaced over a year; this minimizes the time workers spend away from their jobs. Both young men and women participate in the standard program. The curriculum for females, however, requires more hours spent in civil defense and first aid training and, in compensation, fewer hours in practical military training.

In their basic pre-military studies, trainees attend field exercises varying in duration from five to fifteen days. These camps provide facilities for practical training in weapons familiarization and other areas. They operate with the maximum possible cooperation of local military forces.

There has been a trend to offer courses to local pre-induction trainees using the facilities of the more than 130 Soviet military colleges scattered throughout the country. Professional military college instructors present the standard 140-hour program, encouraging those selected for the training to enroll in commissioning schools.

Besides requiring basic pre-military training, the 1967 Law on Universal Military Service also directed that educational institutions of the technical-vocational system and DOSAAF organizations annually train specialists for the armed forces. The USSR Council of Ministers, in conjunction with the MOD, determines the number and types of specialists to be trained. Youths in their second year of pre-military training (generally 17 years old) are eligible.

The 1972 DOSAAF regulations state that DOSAAF will provide leadership for the development of military-technical skills. Among these skills are the following: aircraft and glider use and maintenance, parachuting, automobile and motorcycle use and maintenance, radio communications, underwater diving, motorboating, marksmanship, and modeling. Thus, DOSAAF has the basic responsibility for creating, guiding, and assisting in the operation of the extensive network of clubs, schools, and other training organizations. These organizations prepare specialists in military knowledge and skills for service in the armed forces. At the same time, they train individuals in the technical professions for eventual employment in the national economy.

Entry into DOSAAF specialist training programs, conducted at specialized DOSAAF schools, is either voluntary or as directed by local commissariats. Military commissariats receive their annual quotas for the training of various groups of specialists according to the MOD's projected requirements. They then screen the individuals who have registered for the draft for special aptitudes and assign those selected for specialist training to the DOSAAF programs.

The recently revised curriculum for training youths to drive freight trucks with a cargo capacity exceeding 3.5 tons is one example of a specialist

program. The DOSAAF conducts this program, which reduces the total number of hours from the previous program, over a ten-month period. (See figure below.) Instructors give a program in three nonconsecutive sessions to youths engaged in productive work. There are two nonconsecutive sessions for youths still in school. The course attempts to give the students as much experience as possible in driving, maintaining, and repairing trucks. Although the program does not devote any

special time to general military training, the instructors still have the responsibility to teach students primary military skills.

For each training session, there are eight groups of 30 to 34 students. Each automotive school has 15 to 17 training trucks. In many instances, the program changes to compensate for the school's lack of equipment or space (or both). This creates wide variation in the quality of training.

DOSAAF specialist training curriculum freight truck driver

SUBJECT	TOTAL HOURS	HOURS IN		
		Theory	Lab	Practice
Political Training	20	20	0	0
Equipment and Use of Vehicle	326	0	0	0
Theoretical Classes	0	116	0	0
Practical Shopwork-Equipment	0	0	88	0
Practical Shopwork-Maintenance	0	0	122	0
Traffic Rules	80	80	0	0
Traffic Safety	46	40	6	0
Driving	60	0	0	60
Examinations	18	0	0	0
TOTALS	550	256	216	60

An extensive program of physical toughening and training in endurance, dexterity, and courage for draft and predraft-age youths accompanies the premilitary and specialist training conducted in schools and training centers. The physical education classes are held in schools, enterprises, and DOSAAF clubs. They conform to a general system of physical training known as the All-Union Sports-

Technical Complex Ready for Labor and Defense of the USSR (GTO).

Within the framework of the GTO complex, there are five stages of national physical training standards. The entire complex encompasses not only draft-age youth, but also the rest of the population.

National physical training

STAGE	PROGRAM NAME	AGE GROUP (MALE AND FEMALE)
1st	Courage and Skill	10-13 ("Pioneers")
2d	Young Sportsmen	14-15
3d	Strength and Courage	16-18
4th	Physical Perfection	19-34 (females) 19-39 (males)
5th	Cheerfulness and Health	34 plus (females) 39 plus (males)

The appropriate Committees for Physical Culture and Sports, under the Council of Ministers, provide overall guidance of the third-level GTO program for draft-age youth. The third level consists of ten types of exercises. Participants receive points for meeting minimum standards and

badges and certificates for passing. The DOSAAF clubs and training centers administer the examination, while DOSAAF committees supervise particular aspects, such as grenade throwing, small arms marksmanship, and 500- and 1,000-meter cross-country running.

MILITARY EDUCATIONAL INSTITUTIONS

OFFICER

The Soviet Union possesses the world's most extensive network of military schools and reserve officer commissioning programs. The total annual output of all its officer candidate establishments is approximately 60,000 students. Over the forty years between the end of World War II and the present, the schools have trained nearly one and one-half million officers, 500,000 of whom form the regular officer corps of the Soviet armed forces.

The first stage of the formal system of Soviet military schools is the military high school; this includes the Suvorov schools for the army components and Nakhimov schools for the navy. These institutions conduct two-year programs for boys 15 years of age and older who have completed eight grades of public education. There are presently nine Suvorov schools and one Nakhimov school, with average student bodies of 900 young men. Cadets wear uniforms, live at the schools, and receive a well-rounded civil and military education, as well as liberal doses of Marxist-Leninist theory. Graduates of these schools may enter Soviet military colleges without taking competitive examinations.

The military colleges are the backbone of the Soviet commissioning program. On a par with civilian technical colleges, they offer degrees in a wide variety of specialties. (See figure on next page.) There are at least 6 military colleges or schools (three-year, mostly technical schools) and 136 higher military colleges or schools (four- to five-year schools). Graduates of both types of colleges are commissioned lieutenants.

For one and one-half months each year, students at these institutions train in an appropriate troop unit in the field. Generally, the higher military schools devote 60 percent of their curriculum to specialized military subjects such as regulations, branch tactics, weapons and equipment, and physical training; 30 percent to academic subjects, including mathematics, physics, methods and principles of teaching, psychology, various technical studies (depending on the school's specialty), and

a foreign language; and at least 10 percent to political studies.

Graduates of Suvorov and Nakhimov schools, reserve and regular enlisted personnel, and individuals undergoing preinduction military training may apply for the officer commissioning schools. Civilians and reservists apply through their local commissariats. Active duty personnel apply through their immediate commanders.

Besides the commissioning schools, the force components and arms and services operate advanced courses designed to improve the professional qualifications of officers; to familiarize them with the latest developments in tactics and equipment; and to prepare them for command and staff positions at battalion, regimental, and equivalent levels. These courses generally use the facilities of the higher military schools or academies. Officers selected for attendance normally are captains, majors, or lieutenant colonels who are not scheduled to attend a service or a branch academy. The advanced courses run from four to ten months, with approximately 10 percent of the time allotted to tactical and staff work on the company level, 70 percent on the battalion level, and 20 percent on the regimental level.

Soviet military academies are roughly equivalent to a combined US staff and war college. They are the highest formal institutions of Soviet military education. Their commanders are senior general officers. The USSR maintains 17 of these academies, which exist on all-service levels and in each armed forces component in a manner similar to specialized military colleges. They train selected officers for command and staff positions from regimental to army or equivalent levels. Besides providing three- to five-year resident instruction, the academies conduct and supervise nonresident extension and correspondence courses. They also are responsible for research and development in tactical doctrine and equipment engineering in their particular fields. They disseminate tactical and technical information through service journals and periodicals.

Schools per specialty

SPECIALTY	NUMBER OF SCHOOLS
Combined Arms	9
Air Defense of the Country	14
Air Defense of Troops	5
Air Force	23
Navy	10
Strategic Rocket Forces	5
Political	9
Airborne	1
Artillery	10
Automotive	4
Chemical	3
Construction	4
Engineering	3
Railroad/Military Transport	1
Rear Services/Finance	4
Signal/Communication	11
Tank	8
Technical	1
Topographic	1
MVD	5
KGB	3
Miscellaneous	8

The senior academy of the Soviet army and navy, which represents the ultimate in military education in the Soviet Union, is the Voroshilov Military Academy of the General Staff of the USSR Armed Forces. It trains carefully selected officers, usually colonels and major generals (captains first rank and rear admirals for the Navy), for the highest command and staff assignments. The course length is two years.

Military educational institutions offer extension and correspondence courses in over 100 specialties to interested personnel throughout the armed forces who pass a qualification examination or meet prerequisites. Students supplement these courses through resident retraining of up to one month per year at the parent school. Consultation teams of instructors visit all major garrisons to give advice and assistance. Personnel enrolled in extension and correspondence courses receive three evenings each week free of unit duties, three duty

days off each month for study, and time away from some unit training activity. They may also receive up to four months' free time to research a diploma thesis. Upon successful completion of all requirements, the enrollee graduates with a diploma of the same status as that granted to resident students.

WARRANT OFFICER

Coincidental with the introduction of the warrant officer grades in 1972, the military districts and groups of forces organized six to nine-month courses to train extended service personnel to become warrant officers. Subjects covered in these schools include political education, tactics, training regulations, and physical training. At the same time, the armed forces made provisions for warrant officers and warrant officer candidates to attend departmental courses at officers' schools. The 1985 guidelines on the service

of warrant officers emphasized the importance of their political and professional training. The guidelines also stressed mastering the techniques of small unit military instruction.

NONCOMMISSIONED OFFICER

The Soviets select their NCOs from conscript classes based on the initial screening at military commissariats or based on the commander's recommendations. The components and arms and

services operate specialized technical schools instructing NCOs in various military-technical skills. The courses range from a few weeks to a year in duration. On-the-job NCO training is almost continuous in regimental-sized units, which provide refresher courses and equipment familiarization exercises. Due to the cyclical nature of the Soviet conscription process, most NCO training lasts for six months to allow for overlapping resources required by the semiannual draft.

INDIVIDUALS AND UNITS

INITIAL PROCESSING AND INSTRUCTION

Twice each year, the local military commissariat calls up its quota of recruits based on the requisitions received from the military district. On a specified day, each commissariat sends its inductees to the next higher military commissariat office, which then transports the recruits to specific units designated by military district headquarters.

When the recruits arrive at a camp, they undergo medical examinations, receive their clothing issue, and begin intensive initial military training that lasts an average of four weeks. This period of training is known as the course of the young soldier. At its close, each recruit takes the soldier's oath of allegiance. By this time, recruits presumably have a basic knowledge of military life, and they know how to fire a rifle. The combination of preinduction training and the initial military instruction may be very loosely compared to basic training in the US Armed Forces.

TRAINING CHARACTERISTICS

Soviet training is repetitive. All soldiers, sailors, and airmen undergo individual training each year of their military service, regardless of rank. The aim of such repetitive training is the development of instinctive reflexes to cope with any situation.

Soviet trainine concentrates on field exercises under realistic conditions. While training in NBC warfare, the troops sometimes use live chemical agents under credible conditions. They must wear protective masks and clothing for several hours at a time and practice decontamination techniques in actual contamination situations.

The Soviet ground forces conduct small unit training in habitual combat situations focusing upon squad, platoon, and company levels, but sometimes involving an entire battalion. Battle drills are not stereotypes; they produce a known asset that the commander can apply in an anticipated combat situation. Large unit training in

regiments and divisions will involve live field firing and night training. Artillery and close air and/or attack helicopters will support tactical live fire exercises. These exercises include evaluations by the next higher headquarters based upon established training objectives.

The Soviets place great importance on physical conditioning. Exercise, calisthenics, diet, and organized sports are all factors in their integrated training concept.

They also believe that proper mental conditioning is necessary for effective combat action. To achieve such conditioning, Soviet commanders emphasize realism during long combat training, especially during field exercises. They apparently try to teach techniques which soldiers can use to cope with battlefield conditions. To achieve the proper attitude among all military personnel, the services conduct political training and discussions on a rigorous schedule of at least five hours per week. Political officers are organic to all units down to company and equivalent levels. These officers are devoted Communists, the products of special training schools. Their tasks are to create the desired attitudes in the minds of all personnel and to work closely with the commanders in motivating soldiers.

Above all, Soviet military training fosters professionalism. Self-improvement is a constant requirement for career personnel who desire to remain on active duty. An extensive array of publications dealing with practical matters of every part of the defense establishment is available at little or no cost. Besides taking extension and correspondence courses, servicemen can participate in organized evening study, in the evening university. Due to an annual output of officers which is greater than the active requirement, all personnel must strive to improve their professional knowledge to preserve their tenure.

Soviet training also has negative aspects. These include the uneven quality of academic training caused by incompetent teachers (the inevitable result of a military educational program the size of the Soviet one) and the stifling of young leaders' initiative by overbearing superiors. Since over 100 languages are spoken among the many various ethnic groups in the Soviet Union, the Soviet Army has some difficulty in training the large numbers of non-Russian-speaking conscripts. This problem will grow in the future as the Soviet Army must rely more on nonethnic Russian manpower. An additional training problem results from the government's power to divert the conscripts to complete economic tasks such as construction projects and harvesting crops. This lost training time can hinder the efforts of the cadre to achieve the required training objectives; but it is not yet a significant weakness in providing a well-trained soldier for the Soviet Army.

Other negative features include performance parameters which encourage faculties to inflate grades and pad exercise results to make the

organization look good. In other words, Soviet training shortcomings are the same as those found in any army throughout the world. There is no doubt, however, that the Soviet armed forces are among the world's most professional and best-trained military organizations.

THE YEARLY CYCLE

The yearly training program includes a winter and a summer period. Each period, in turn, divides into several stages. Every stage stresses a specific theme or objective. The cycle stays basically unchanged for several consecutive years. To ensure that they cover all material in sufficient detail, instructors may conduct different levels of training simultaneously. Young soldiers in their first year of service may receive more elementary instruction, while senior servicemen get advanced training in their occupational skills. Instructors also conduct unit training on various levels at the same time. Both winter and summer periods contain all levels of training activity as well as division maneuvers, where possible.

Yearly training cycle

September-October	Summer training period in progress. Newly commissioned junior officers arrive from military schools and civilian universities.
November	Summer training period ends. Newly trained NCOs arrive from the training division. New conscripts arrive and receive four weeks of basic training. Soldiers who complete their two-year active duty obligation are released and transferred to the reserves. Preparations begin for the coming winter training period. Training year ends.
December	New training year begins. Winter training period begins.
January-April	Winter training period continues.
May	Winter training period ends. Newly trained NCOs arrive from the training division. New conscripts arrive and receive four weeks of basic training. Soldiers who complete their two-year active duty obligation are released and transferred to the reserves. Preparations begin for the coming summer training period.
June	Summer training period begins.
July-August	Summer training period continues.
September-October	Summer training period continues. Newly commissioned junior officers arrive in the divisions from military schools and civilian universities.
November	Summer training period ends. Newly trained NCOs arrive from the training division. New conscripts arrive and receive four weeks of basic training. Soldiers who complete their two-year active duty obligation are released and transferred to the reserves. Preparations begin for the coming winter training period. Training year ends.
December	New training year begins. Winter training period begins.

The number of hours of daily training is the same in winter and summer. Intense instruction throughout the year leaves the soldier little free time. The Soviets devote at least six hours of each training day exclusively to scheduled instruction. Most of the remaining time goes to political indoctrination, maintenance of clothing and equipment, and personal needs. The training schedule for Saturdays is two to four hours shorter to allow time for cleaning and inspection of unit equipment. Finally, required participation in organized sports and cultural activities on weekends keeps free time to a minimum. (See figure below.)

Following the annual celebration of the Bolshevik Revolution on 7 November, the Soviets make preparations for the new training year. During this time, incoming recruits begin their initial training; instructors and students hold critiques of the previous year's program; and soldiers inspect and overhaul training facilities, equipment, and vehicles. The appropriate directorates formulate all necessary training plans for the winter period while command personnel

receive special instructions and prepare for the coming term.

The winter period lasts five to six months, depending upon the type of unit, its location, and the length of the winter season. It usually ends by the beginning of May. Units in warm climates may start moving to summer camps earlier than units in the central USSR. Winter training takes place mainly in garrison, with local training areas providing firing ranges, classrooms, workshops, and other facilities. Most garrisons are on the outskirts of towns, using the adjoining countryside for command post exercises, field training, and marches.

Summer training usually begins on the day after May Day, a Soviet national holiday. It is similar to the winter training in content. The major difference is that soldiers spend a greater amount of time out of garrison during the summer period. The summer training activity usually culminates in autumn divisional maneuvers, which may be part of a combined Warsaw Pact exercise.

Typical Soviet armed forces training schedule

	ACTIVITY	HOUR	TIME ELAPSED
1)	Reveille	0600-0605	5 minutes
2)	Physical Training	0610-0640	30 minutes
3)	Personal Hygiene	0640-0700	20 minutes
4)	Roll Call and Inspection	0700-0715	15 minutes
5)	Breakfast	0715-0745	30 minutes
6)	Training	0800-1400	6 hours
7)	Lunch	1400-1440	40 minutes
8)	Afternoon Rest	1440-1510	30 minutes
9)	Care of Personal Equipment	1510-1530	20 minutes
10)	a) Political Education (Monday and Thursday)		
	b) Equipment Maintenance (Tuesday and Friday)		
	c) Organized Sports (Wednesday and Saturday)	1530-1830	3 hours
11)	Self-Study	1830-1940	70 minutes
12)	Supper	1940-2010	30 minutes
13)	Free Time (Supervised)	2010-2140	90 minutes
14)	Roll Call	2140-2155	15 minutes
15)	Taps	?	7

CHAPTER 4 Organization

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Although one expects to find many organizational variations in a force the size of the Soviet ground forces, descriptions in this chapter present a single model for each type of organization. The structures portrayed here mirror forward-deployed Soviet forces such as those found in the Western TVD as of the end of 1988. They include all known structural elements, full assessed war-authorized strengths, and the most modern equipment. The text and tables note several structural variations.

PRESENTATION OF INFORMATION

The organization charts in this chapter focus on maneuver units, starting at the lowest level (motorized rifle squad and tank squad) and building up to the highest level (army and front). At each level, the chapter breaks down subordinate CS and CSS units and subunits whenever possible for greater detail.

The chapter begins with the structure of the MRRs, the most common type in the Soviet ground forces. Among these regiments, the BTR-equipped units are the most numerous. The chapter discusses them first. Then it addresses the BMP-equipped units. Discussion of the MRD and its support units follows. Next the chapter repeats the process for the TR and the TD. Organizations above division (army and front) complete the description of purely ground force organizations. The next set of charts deals with the airborne regiment and the airborne division. These are not technically part of the ground forces but may fall under the control of a ground forces front. The final set of charts addresses the amphibious forces: the naval infantry regiment/brigade and the naval infantry division.

Stacked blocks in the charts indicate multiple, identical elements subordinate to a particular organization. Dashed blocks indicate elements which may or may not be present in the type of organization shown.

Figures inside the organization blocks reflect the assessed total war-authorized personnel strength of the organization. At lower levels, the chapter often divides personnel figures between officers (at the left) and enlisted personnel (at the right). At battalion level and above, the chapter gives a single figure for the officers and enlisted personnel combined.

Personnel totals, as well as equipment lists, are cumulative, although recapitulation tables for larger units may show the breakdown among subordinate units and subunits. Otherwise, the user may determine the distribution of personnel and equipment by consulting cross-referenced charts for lower-level organizations.

Ground Forces

With approximately one-sixth of the earth's land surface within its boundaries, the Soviet Union has traditionally maintained large, well-equipped ground forces as a primary instrument of military power. The Soviet ground forces are the largest of the five components of their armed forces. Ground forces organizations may be either tactical (division level and below) or operational (army and front).

Tactical-Level Organizations

The basic tactical units in the Soviet ground forces are the MRRs and TRs. There are two distinct types of MRR: those equipped with BTRs (APCs) and those equipped with BMPs (infantry vehicles). The MRR and TR normally operate as part of a MRD or TD.

Operational-Level Organizations

Soviet ground forces organizations at levels of command between division (tactical) and TVD (strategic) constitute the operational level. These large formations include armies and fronts.

There is no fixed organizational structure above division level.

The army is the largest peacetime combined arms formation. It normally consists of two to five divisions and numerous nondivisional CS and CSS elements. Armies are capable of independent operations, but normally fight as part of a front, in which case their CS elements will be supplemented with front assets.

There are two types of armies. While both types are actually combined arms organizations, a Soviet combined arms army (CAA) will normally have a greater number of MRDs, and a tank army (TA) will normally have a greater number of TDs. Of the armies identified, no two are exactly alike. The number of divisions, as well as the numbers and types of nondivisional elements, can vary greatly depending on the mission, the situation, and the area of operations.

The front is the largest operational-level organization. When formed in wartime, a typical front may have three to five armies.

MOTORIZED RIFLE REGIMENT STRUCTURE (BTR)

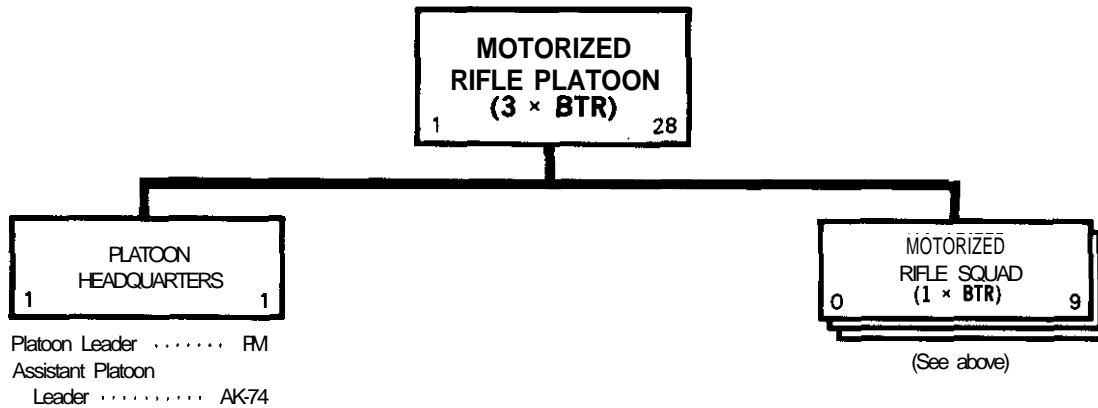
Motorized Rifle Squad (BTR)



Personnel	Equipment	Personnel	Equipment
Squad Leader/BTR Commander	AK-74	Senior Rifleman/Asst. Squad Leader	AK-74
BTR Driver/Mechanic	PM	Rifleman/Assistant Grenadier	AK-74
BTR Machine Gunner	PM	Rifleman/Medic	AK-74
Machine Gunner	RPK-74	Rifleman	AK-74/SVD
Grenadier	RPG-7V, PM		

- NOTES. 1. The dismounted squad element consists of seven personnel. The BTR driver/mechanic and BTR machine gunner remain with the BTR to provide fire support. The dismounted squad does not have a portable radio.
 2. One squad in each platoon has an **SVD** sniper rifle.

Motorized Rifle Platoon (BTR)

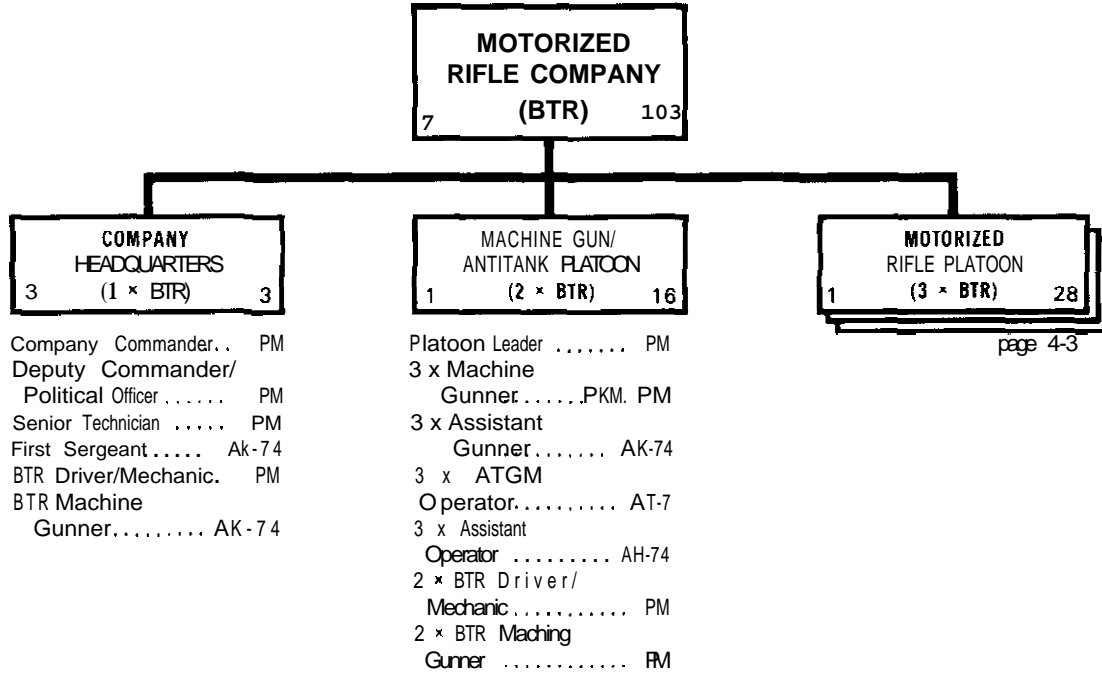


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol, PM	10	APC, BTR-60/70/80	3
5.45-mm Assault Rifle, AK-74	16	Radios:	
5.45-mm Light Machine Gun, RPK-74	3	VHF, Portable, Low-Power, R-148	1
7.62-mm Sniper Rifle, SVD	1	VHF, Vehicle Mount, Medium-Power, R-123 ...	3
Antitank Grenade Launcher, RPG-7V	3		

- NOTES. 1. With a standard nine-man squad, each BTR has one empty seat (threeper platoon) which can accommodate the platoon leader and the assistant platoon leader.
 2. One squad in each platoon has an **SVD** sniper rifle.
 3. Firepower calculations should include the 14.5-mm and 7.62-mm coaxial machine guns mounted on each BTR.

Motorized Rifle Company, Motorized Rifle Battalion,
 Motorized Rifle Regiment (BTR), MRD

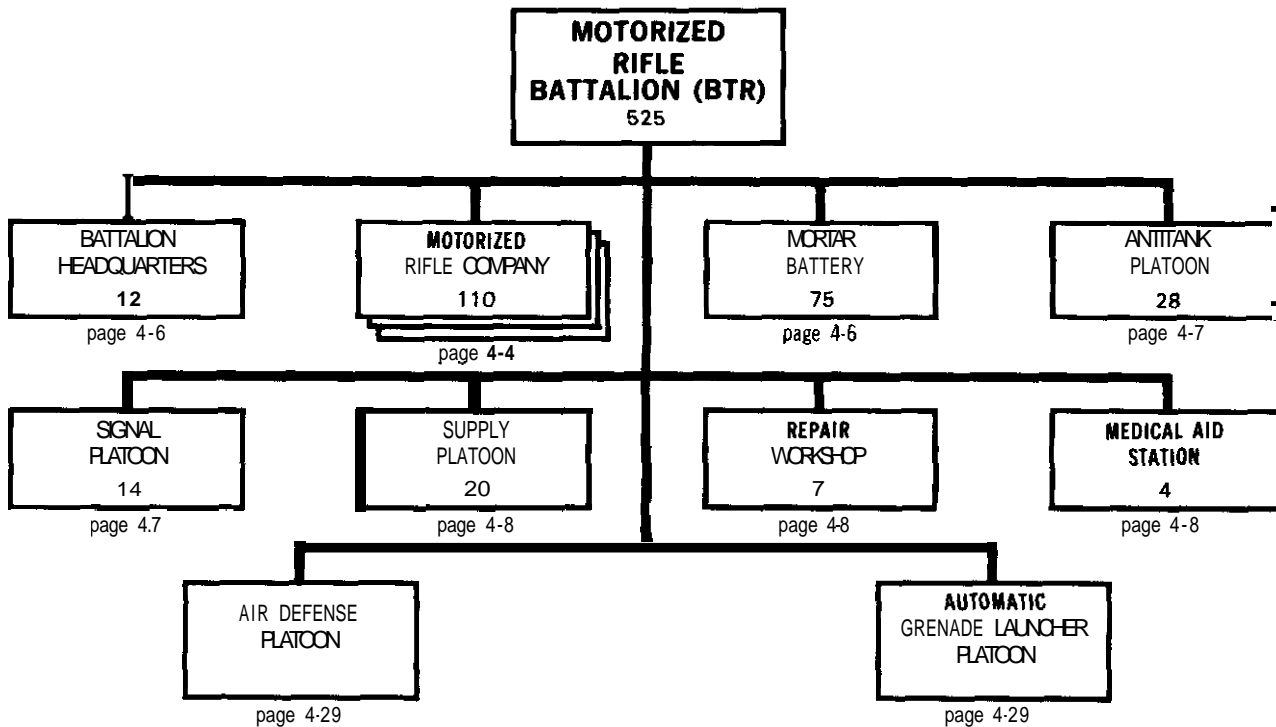


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol. PM	42	ATGM, Manpack Launcher, AT-7/SAXHORN	3
5.45-mm Assault Rifle, AK-74	56	APC. BTR-60/70/80	12
5.45-mm Light Machine Gun, RPK-74	9	Radios:	
7.62-mm Sniper Rifle. SVD	3	VHF. Portable. Low-Power, R-148	5
7.62-mm General Purpose MG, PKM	3	VHF. Manpack, Low-Power, R-107	1
Antitank Grenade Launcher. RPG-7V	9	VHF. Vehicle Mount. Medium-Power, R-123 ..	12

NOTE. The company commander's RTO comes from the battalion signal platoon and is not part of the BTR company personnel total.

Motorized Rifle Battalion,
Motorized Rifle Regiment (BTR), MRD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
120-mm Mortar M1943/M-120 or 82-mm		Truck. POL (4,000 or 5,000-Liter)	2
Automatic Mortar. 2B9	8	Truck. Ambulance, UAZ-450A/452	
7.62-mm General Purpose MG, PKM	9	Trailer. POL. 1-Axle	1
ATGM, Manpack Launcher, AT-7/SAXHORN	9	Trailer. Cargo, 1-Axle	2
ATGM, Manpack Console, AT-3/SAGGER		Trailer, Generator, 1-Axle	1
or AT-4/SPIGOT	4	Trailer. Water	1
73-mm Recoilless Gun. SPG-9	2	Trailer. Kitchen	3
ATGL, RPG-7V	37	Rangefinder	1
SAM, SA-7/GRAIL or SA-14/GREMLIN or		Radios:	
SA-16	9	HF. Vehicle Mount. Medium-Power, R-130	2
30-mm Automatic Grenade Launcher, AGS-17 ...	6	VHF. Portable. Low-Power. R-148	24
5.45-mm LMG. RPK-74	27	VHF, Manpack. Low-Power, R-107	14
APC, BTR-60/70/80	47	VHF. Vehicle Mount, Medium-	
ACV. BTR	3	Power. R-123	50
Truck. UAZ-69/469	3	Warning Receiver, R-311	1
Truck, GAZ-66	15	Radio Transceiver, Portable,	
Truck, ZIL/Ural	4	Very-Low-Power, R-147	4
Truck. Van, ZIL (Maintenance)	1		
Truck, Van. Kitchen, PAC-170/200	1		

FM 100-2-3

Battalion Headquarters, Motorized Rifle Battalion,
Motorized Rifle Regiment (BTR), MRD

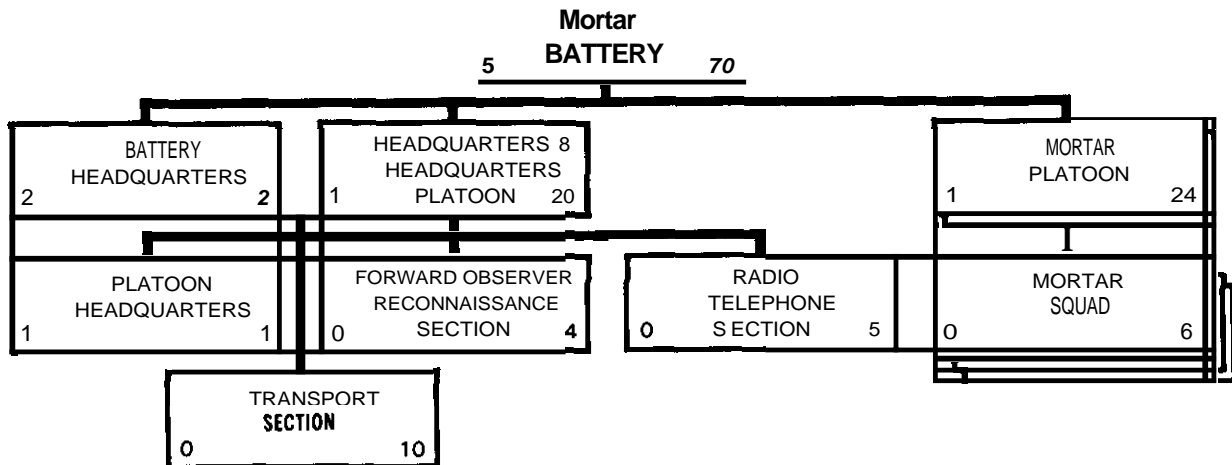


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol, PM	4	Radios:	
5.45-mm Assault Rifle, AK-74	8	HF. Vehicle Mount. Medium-Power, R-130	1
ACV, BTR-6OPU	1	VHF. Portable, Low-Power, R-148	1
Truck, UAZ-69/469	1	VHF. Manpack. Low-Power, R-107	2
Truck. GAZ-66	1	VHF. Vehicle Mount. Medium-Power, R-123 ...	1
		Warning Receiver, R-311	1

NOTE. The signal platoon leader is also the battalion communications officer. The praporshchik in charge of the supply platoon and the fel'dscher in charge of the medical aid station are also part of the battalion staff. However, these three positions are not part of the personnel figures for the battalion headquarters.

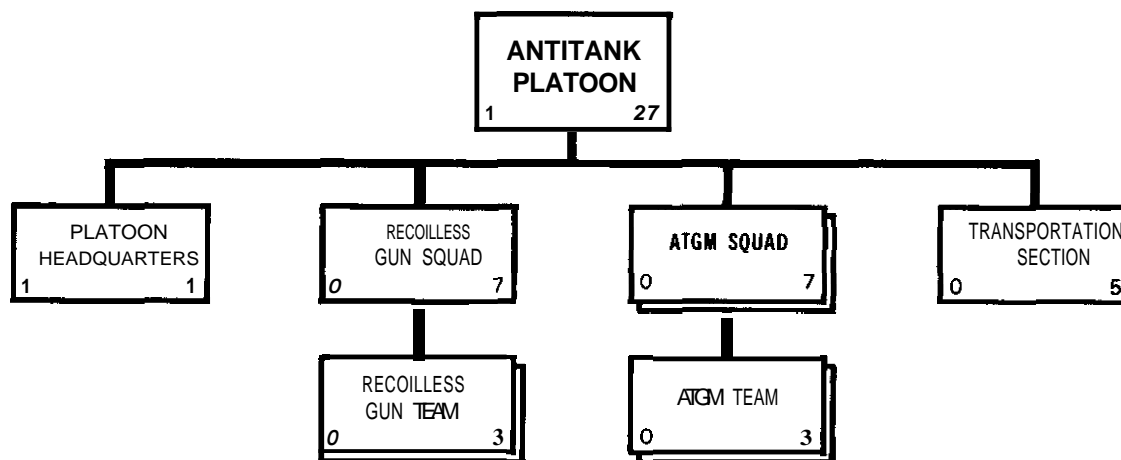
Mortar Battery, Motorized Rifle Battalion,
Motorized Rifle Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol, PM	15	Stereoscopic Rangefinder, DS-1 or	
5.45-mm Assault Rifle. AK-74	62	DM-09/DAK-1	1
ATGL. RPG-7V	8	Periscope Aiming Circle, PAB2A	1
Truck, UAZ-69/469	1	Collimator (Aiming Stakes)	8
Truck, GAZ-66	9	Radio:	
120-mm Mortar M1943/M-120 or 82-mm		VHF, Manpack. Low-Power, R-107	4
Automatic Mortar. 289	8		

Antitank Platoon, Motorized Rifle Battalion,
Motorized Rifle Regiment (BTR), MRD

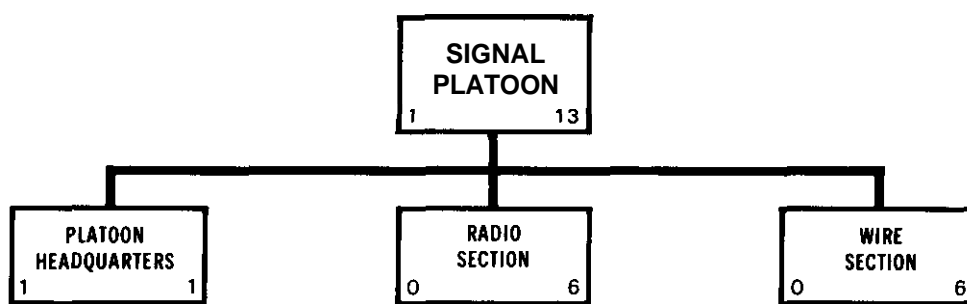


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGM, Manpack, Console, AT-3/SAGGER or AT-4/SPIGOT	4	APC. BTR	5
73-mm Recoilless Gun, SPG-9	2	Radios:	
ATGL, RPG-7V	2	VHF, Vehicle Mount, Medium-Power, R-123	5
		VHF, Portable, Low-Power, R-148	4

NOTE. High-readiness BTR-equipped MRBs may have six AT-4 SPIGOTS and three SPG-9s

Signal Platoon, Motorized Rifle Battalion,
Motorized Rifle Regiment, MRD end TD

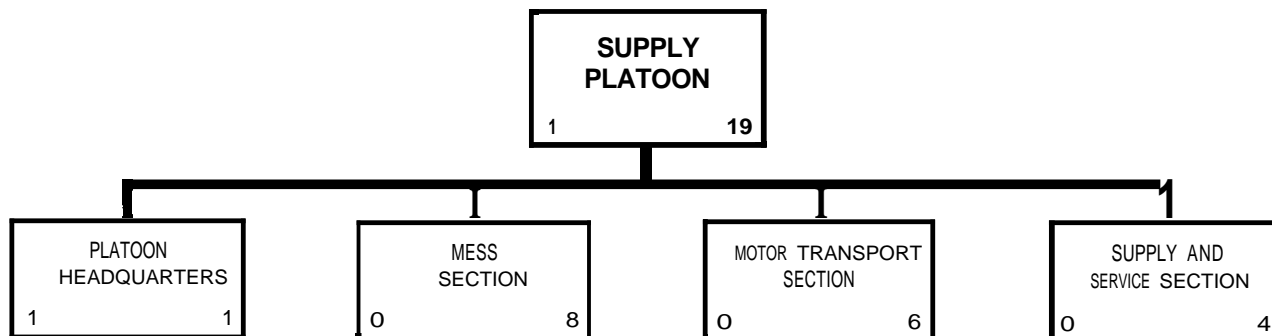


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol. PM	1	Radios:	
5.45-mm Assault Rifle. AK-74	13	HF, Vehicle Mount, Medium-Power, R-130	1
ACV. BTR	2	VHF, Manpack, Low-Power, R-107	3
Truck. UAZ-69/469	1	VHF, Vehicle Mount, Medium-Power, R-123	2
Truck. GAZ-66	1		

FM 100-2-3

Supply Platoon. Motorized Rifle Battalion,
Motorized Rifle Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol. PM	1	Trailer, POL, 1-Axle	1
5.45-mm Assault Rifle, AK-74	19	Trailer, Cargo, 1-Axle	1
Truck,GAZ-66	4	Trailer, Water, 1-Axle	1
Truck, ZIL-130/131/151/157 or Ural-375	4	Trailer, Field Kitchen, KP-125	3
Truck. POL (4,000 or 5,200-Liter)	2	Radio:	
Truck, Van, Field Kitchen. PAC-170/200	1	VHF. Manpack, Low-Power, R-107	1

Repair Workshop, Motorized Rifle Battalion.
Motorized Rifle Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck. Van. ZIL (Maintenance)	1
Trailer, Generator, 1-Axle	1

Medical Aid Station, Motorized Rifle Battalion.
Motorized Rifle Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck. Ambulance, UAZ-450A/452	1
Trailer. Cargo, 1-Axle	1
Radio:	
VHF, Manpack, Low-Power. R-107	1

Motorized Rifle Regiment (BTR), MRD

The MRR is the basic combined arms organization and most common maneuver element of the Soviet ground forces. Motorized rifle, tank, artillery, antiaircraft, antitank, engineer, signal, and CSS assets are organic to the MRR. The regiment is the smallest organization which has all of these elements.

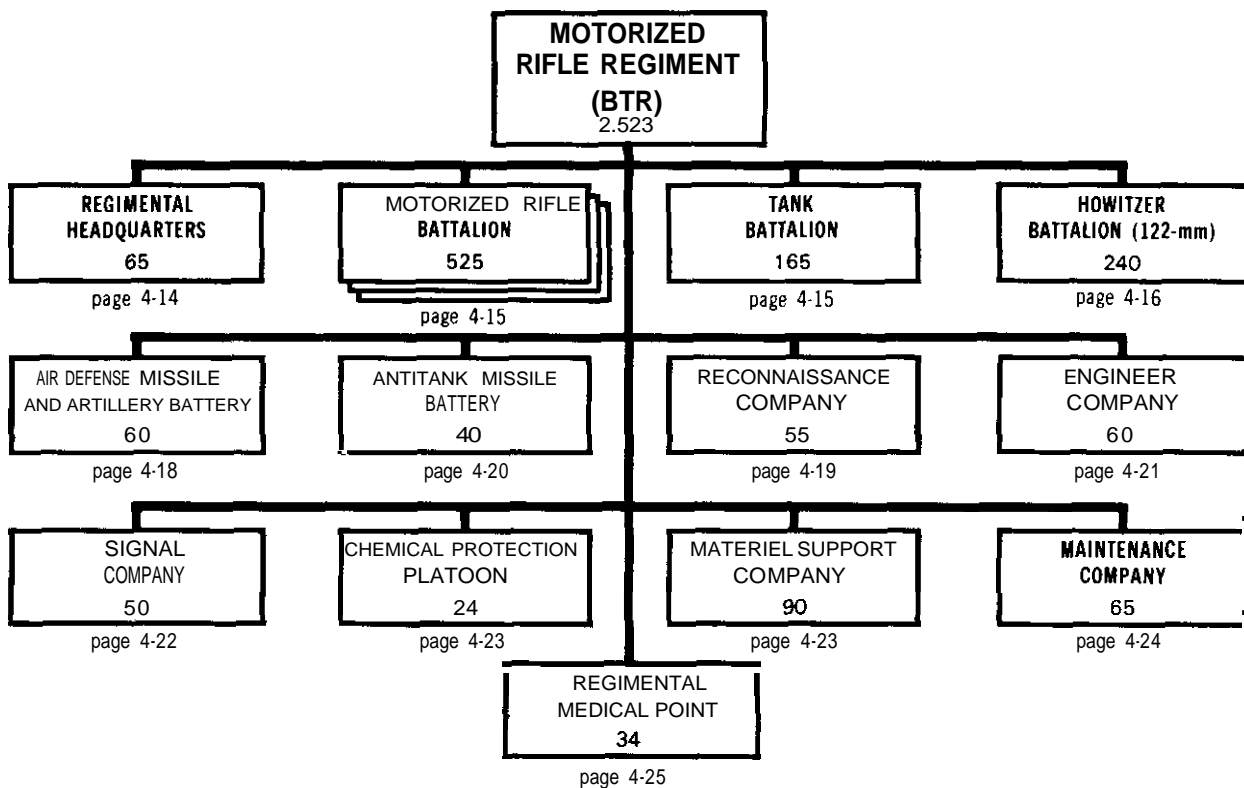
Regimental organization includes three MRBs and one TB. A 122-mm howitzer battalion and three 120mm mortar batteries or 82-mm automatic mortar batteries provide fire support. While battalion-sized elements support the division, corresponding company-sized units support MRRs.

The MRRs have either the BMP amphibious infantry combat vehicle (AICV) or one of the BTR series of APCs as the primary troop-carrying vehicle. Another key difference between the two

types of MRRs has been that BMP-equipped regiments had an organic battalion of 122-mm SP howitzers (2S1s), while BTR-equipped regiments had a battalion of 122-mm towed howitzers (D-30s). However, some BTR regiments, especially those in the forward area, now have the 2S1. Also, BTR regiments have antitank platoons within the MRBs, a feature not found in the BMP regiments.

The TBs of both BMP- and BTR-equipped MRRs have 31 medium tanks. This chapter lists all tanks within the MRR as T-64/72/80, but older types are often present outside the Western TVD.

Although the regiment normally operates as part of the division, it is capable of short-term independent operations. It has the assets to react independently to changes in the combat situation. Much of its equipment is amphibious.



- NOTES.
1. If the TB of this regiment has T-54/55/62 tanks, regimental strength will increase by 31 or 40 enlisted personnel.
 2. Approximately 220 personnel are officers.
 3. In some BTR-equipped regiments, the howitzer battalion may have the 122-mm SP howitzer 2S1. (See p. 4-36 for the organization and equipment of a 2S1-equipped battalion.)
 4. In the late 1980s, forces in Eastern Europe began to standardize tank battalions at 31 tanks. (See p. 4-108.)

Personnel and Equipment Recapitulation

MOTORIZED RIFLE REGIMENT (BTR), MRD															
	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL	
PERSONNEL	65	1,575	165	240	60	40	55	60	50	24	90	65	34	2,523	
TANKS															
Medium Tank, T-64/72/80			40											40	
WEAPONS															
122-mm Howitzer D-30				18										18	
120-mm Mortar, M1943/M-120 or 82-mm Automatic Mortar, 2B9		24												24	
SAM, SA-9/GASKIN TEL or SA-13/GOPHER TELAR **					4									4	
SPAA Gun, ZSU-23-4 or 2S6					4									4	
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3	27												30	
ATGM Launcher Vehicle (BRDM-2), AT-3/5						9								9	
ATGM Manpack Console, AT-3/4		12												12	
ATGM Manpack Launcher, AT-7		27												27	
73-mm Recoilless Gun, SPG-9		6												6	
ATGL, RPG-7V		111	2	18		9	4	4				4		152	
30-mm Automatic Grenade Launcher, AGS-17		18												18	
5.45-mm LMG, RPK-74		81		18			3							102	
7.62-mm GPMG, PKM		27												27	
ACV/AICV/APC/ASC															
ACV, BMP/BRDM/BTR		9	2		3	4			3					21	
ACV, BRM-1*							1							1	
APC, BTR-60/70/80	2	141						3						146	
APC, BTR-60PA (FAC)	1													1	
MRP, PRP-3 (BMP M1975)***				1										1	
ASC, BRDM-2							4							4	

FOOTNOTES. *This vehicle includes the TALL MIKE radar, which appears separately in this list.

**The SA-9 system has a transporter-erector-launcher (TEL), while the SA-13 system has a transporter-erector-launcher and radar (TELARI).

***This vehicle includes the SMALL FRED radar, which appears separately in this list.

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE REGIMENT (BTR). MRD														
	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PLATOON	MATERIEL PROTECTION COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
AICV. BMP-1/BMP-2							3							3
ACRV M1979 (1/2/3)				8										8
GENERAL PURPOSE TRUCKS														
Truck, UAZ-69/469	3	9		1			1	5		2	1			22
Truck, GAZ-66		45		12	2			3		4		1		67
Truck, ZIL-130/131/151/157			7		4						1	2		14
Truck, KrAZ/ZIL/Ural		12		34		3	8							57
VAN TRUCKS														
Truck, Van, GAZ				2				3				1		6
Truck, Van, ZIL/Ural (Command)	3													3
Truck, Van, ZIL (Signal)								2						2
Truck, Van, ZIL (Maintenance)		3	2	1			1			1	12			20
Truck, Van, Kitchen PAC-170/200		3	1											4
Truck, Van, ZIL (AT-3/5 Simulator)						1								1
POL TRUCKS														
Truck, POL, ZIL/Ural/KrAZ		6	3	2						15				26
DECONTAMINATION TRUCKS														
Truck, Decontamination									4			1		5
CHEMICAL RECONNAISSANCE VEHICLES														
Chemical Reconnaissance Vehicle BRDM-2rkh/RKhM									3					3
SPECIAL PURPOSE TRUCKS														
Truck, Water Tank										4				4
Truck, Ambulance, UAZ-450A/452		3	1	1								4		9
Truck, Crane, K-61							1							1
Truck, Crane Shovel, E-305V							2							2
Truck, Dump, MMZ-555							2							2
Sedan, GAZ-24	1													1
SPECIAL PURPOSE EQUIPMENT														
Motorcycle						3		3						6

(continued)

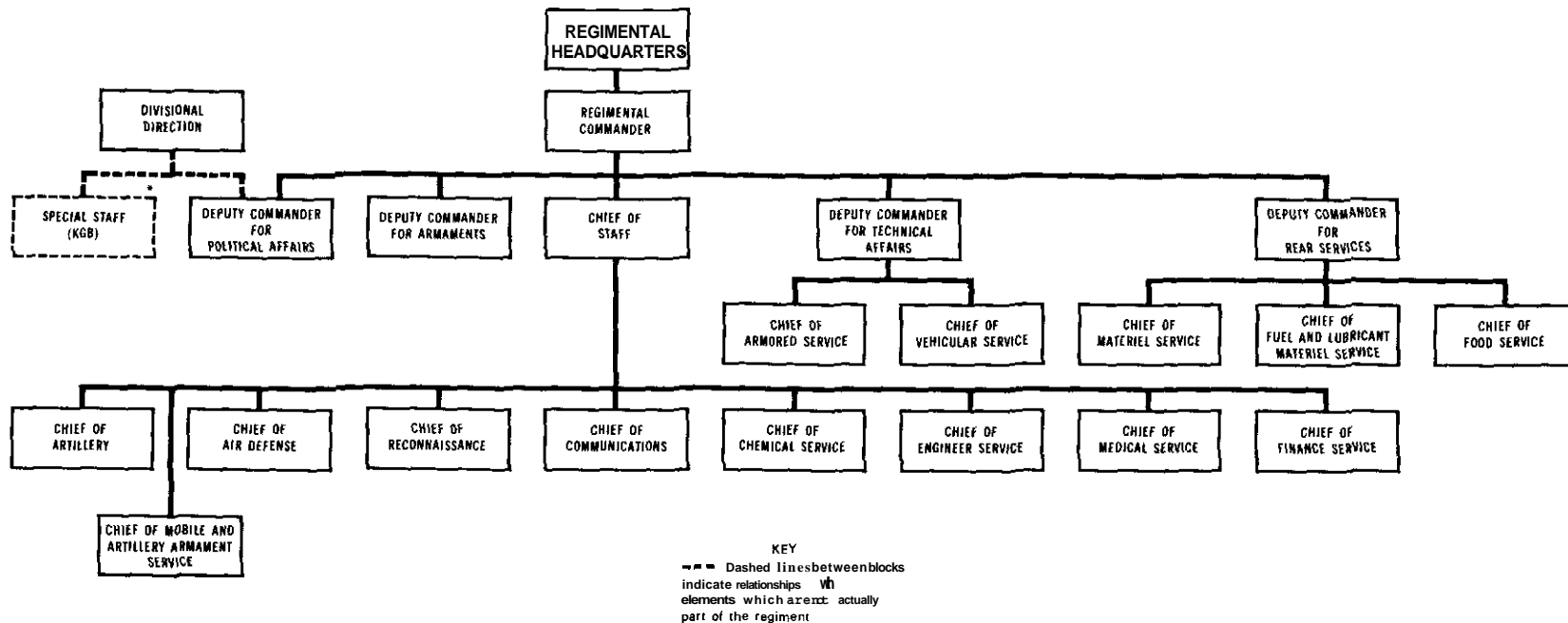
Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE REGIMENT (BTR). MRD														TOTAL
	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	
Armored Recovery Vehicle												3		3
ENGINEER EQUIPMENT														
Bridge, Tank-Launched, MTU/MT-55							1							1
Bridge, Truck-Launched, TMM							4							4
Ditching Machine, BTM/MDK							1							1
Dozer, BAT/BAT-M/PKT							1							1
Dozer Blade, BTU							3							3
Bucket Excavator, PZM							3							3
Mineclearing Plow, KMT-4/6							9							9
Mine Roller-Plow, KMT-5M							3							3
Minelayer, Towed, PMR-3							3							3
Water Filtration Set, MAFS							1							1
TRAILERS														
Trailer, POL	3		2							15				20
Trailer, Cargo, 1-Axle	6	1												7
Trailer, Cargo, 2-Axle		8	11				2			30	6			57
Trailer, Generator, 1-Axle	3	1								1	2			7
Trailer, Generator, 2-Axle				2				1			1			4
Trailer, Water	3	1	1							1		1		7
Trailer, Field Kitchen	9		4							2		1		16
ARTILLERY ASSOCIATED EQUIPMENT														
Rangefinder	3		4		1									8
RADARS														
Battlefield Surveillance, TALL MIKE							1							1
Battlefield Surveillance, SMALL FRED				1										1
RADIOS														
HF or VHF, Manpack, Low-Power, R-104M or R-107							4							4
HF, Manpack, Low-Power, R-104M		2				1		2	1					6
HF, Vehicle-Mount, Medium-Power, R-130	6	5				1		2						14

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE REGIMENT (BTR). MRD														
	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL PROTECTION COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
HF, Van-Mount. High-Power. R-118								1						1
HF/VHF, Vehicle-Mount, Medium-Power				4				2						6
HF/VHF, Vehicle-Mount, High-Power								2						2
VHF, Portable, Low-Power, R-148		72		2										74
VHF, Manpack, Low-Power, R-107	3	42	1	20	2	4	3	7		1	1	1		85
VHF, Vehicle-Mount, Medium-Power, R-123	2	150	41		11	13	7	4	2	4		3		237
Radio Transceiver, Portable, Very-Low-Power, R-147		12												12
Warning Receiver, R-311		3	1	2	3		1	3						13
Radio Relay, VHF/UHF, R-401/405								2						2

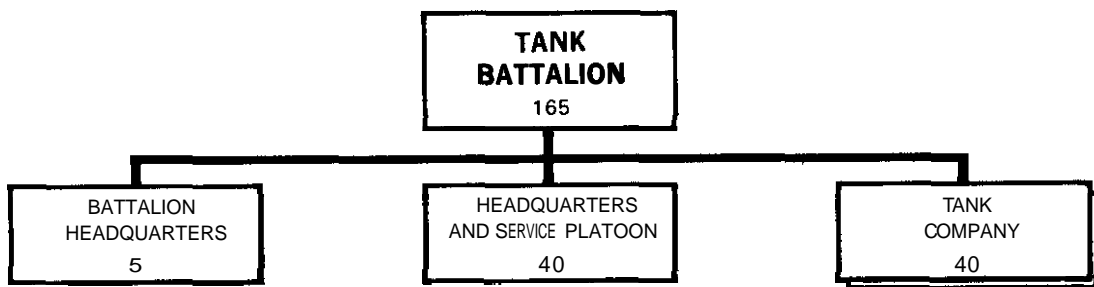


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	MRR (BTR)	MRR (BMP)	TR	Equipment	MRR (BTR)	MRR (BMP)	TR
SAM, SA-7/GRAIL or SA-14/ GREMLIN or 511-16	3	3	3	Truck. Van. ZIL (Command)	3	3	3
Medium Tank. T-64/72/80 (Command Vehicle)	0	0	1	Sedan. GAL.24	1	1	1
APC, BTR-60/70/80	2	1	1	Radios			
ACV. BMP-1 KSh	0	1	0	HF. Vehicle Mount. Medium-Power. A-130	0	0	1
APC. BTR-60P/FACI	1	1	1	VHF, Manpack, Low-power, R-107	3	3	2
Truck. UAZ-69/469	3	3	3	VHF. Vehicle Mount, Medium-Power, R-123	2	2	2
Truck. Ural-375	1	1	1				

FOOTNOTES The Special Staff normally consists of about seven KGB personnel. They are no subordinate to the regimental commander and are not part of their personnel total for the regimental headquarters. *Usually the First Deputy Commander

Tank Battalion, Motorized Rifle Regiment, MRD and TD

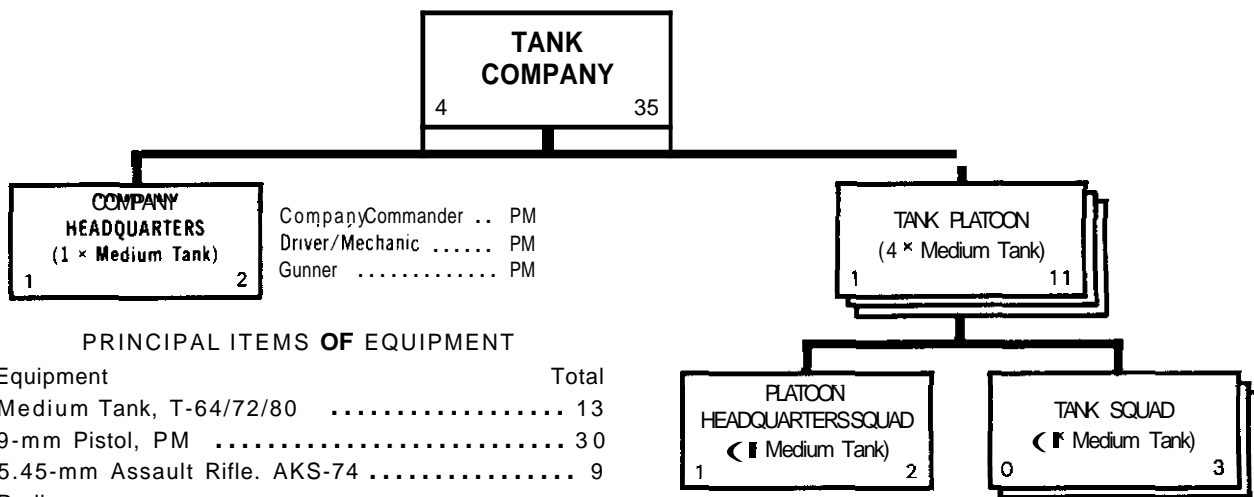


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Medium Tank, T-64/72/80	40	Trailer, Cargo, 1-Axle	1
ATGL, RPG-7V	2	Trailer, Generator	1
ACV, BTR-50/60	2	Trailer, Water	1
Truck, ZIL-157 or Ural-375	7	Radios:	
Truck, POL	3	HF, Manpack, Low-Power, R-104M	2
Truck, Van, ZIL (Maintenance)	2	HF, Vehicle Mount, Medium-Power, R-130	5
Truck, Van, Kitchen, PAC-170/200	1	VHF, Manpack, Low-Power, R-107	1
Truck, Ambulance, UAZ-450A	1	VHF, Vehicle Mount, Medium-Power, R-123..	41
Trailer, Cargo, 2-Axle	8	Warning Receiver, R-311	1

- NOTES.** 1. TBs equipped with T-54/55/62 tanks have 31 or 40 additional enlisted personnel.
 2. In the late 1980s, forces in Eastern Europe began to standardize tank battalions at 31 tanks. (See p. 4-108.)

Tank Company, Tank Battalion, Motorized Rifle Regiment, MRD and TD

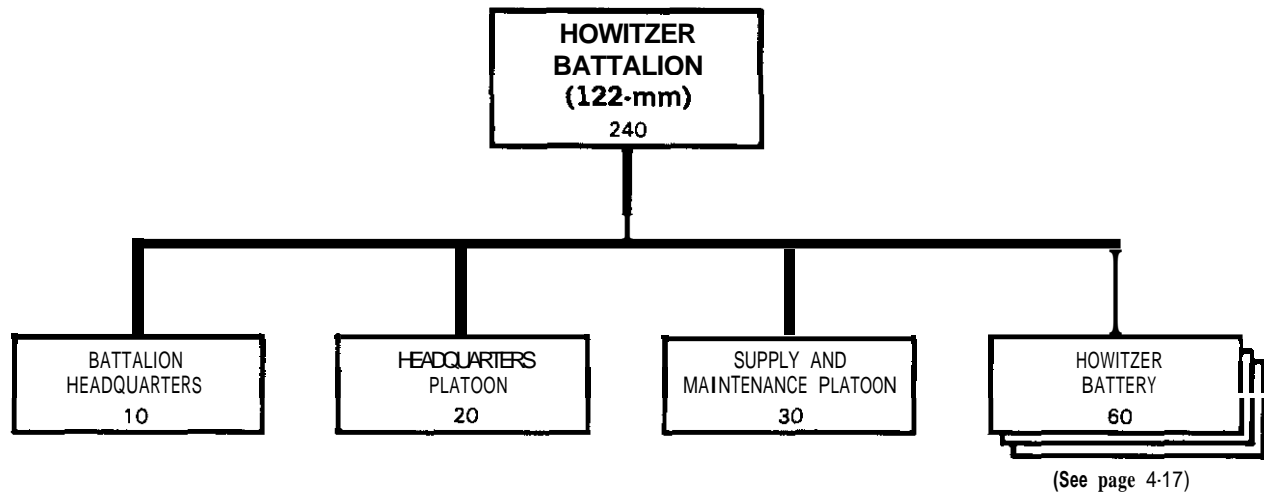


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Medium Tank, T-64/72/80	13	Platoon Leader/ Tank Commander ...	PM
9-mm Pistol, PM	30	Driver/Mechanic	PM
5.45-mm Assault Rifle, AKS-74	9	Gunner	PM
Radios:		Tank Commander ..	AKS-74
HF, Vehicle Mount, Medium-Power, R-130	1	Driver/Mechanic	PM
VHF, Vehicle Mount, Medium-Power, R-123	13	Gunner	PM

- NOTES.** 1. The personnel total of 39 will be rounded off to 40 in the organization chart for the TB, MRR. Tank companies with T-54/55/62 tanks have 10 or 13 additional enlisted personnel.
 2. In the late 1980s, forces in Eastern Europe began to standardize tank companies at 10 tanks. (See p. 4-107.)

122-mm Howitzer Battalion,
 Motorized Rifle Regiment (BTR), MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

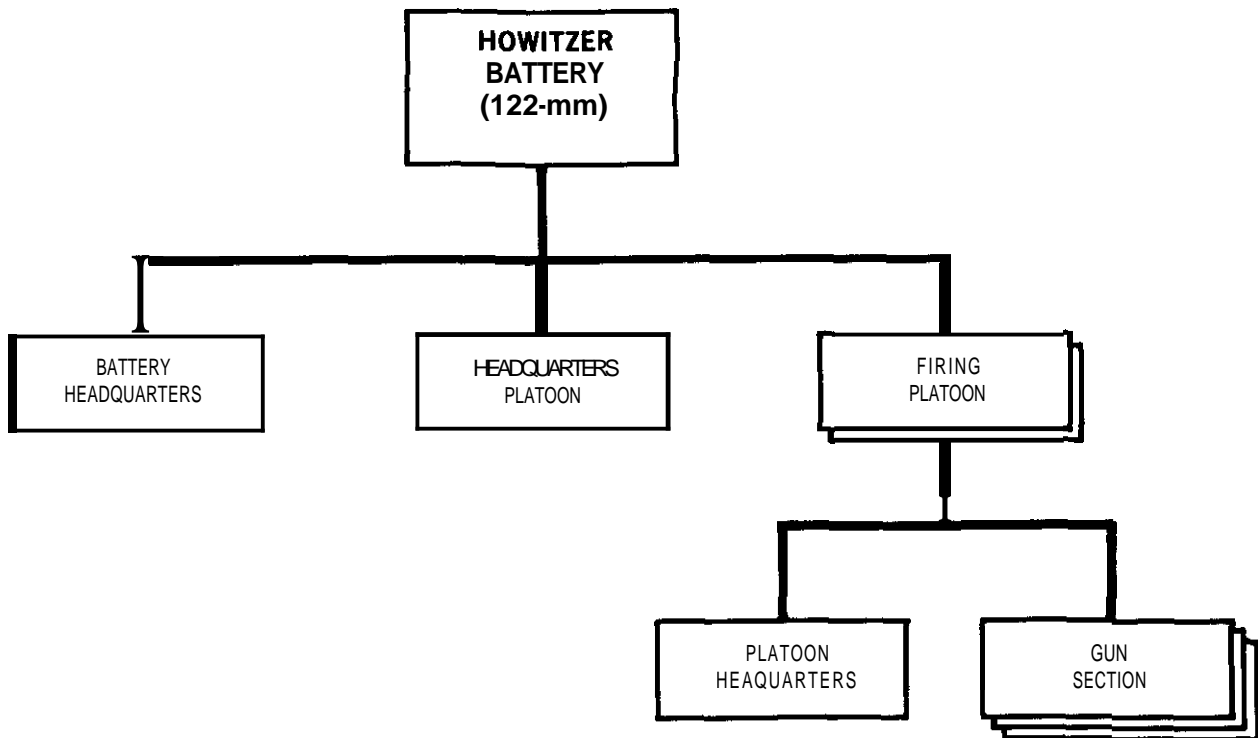
Equipment	Total
122-mm Towed Howitzer. D-30	18
ATGL. RPG-7V	18
5.45-mm LMG. RPK-74	18
ACRV, M1979 (1)	3
ACRV. M 1979 (2)	4
ACRV. M 1979(3)	1
Mobile ReconPost, PRP-3 (BMP M1975)*	1
Truck, UAZ-69/469	1
Truck. GAZ-66	12
Truck. ZIL/Ural	34
Truck, POL (4,000 or 5.200-Liter)	2
Truck, Van. GAZ	2
Truck. Van. ZIL (Maintenance)	1

Equipment	Total
Truck, Ambulance, UAZ-450/452a	1
Trailer. Cargo. 2-Axle	11
Trailer. POL	2
Trailer. Water	1
Trailer, Field Kitchen	4
Rangefinder. Laser. SAGE GLOSS	4
Radar. Battlefield Surveillance, SMALL FRED	1
Radios:	
HF/VHF, Vehicle Mount, Medium-Power	4
VHF. Portable. Low-Power. R-148 or Very-	
Low Power R-126	2
VHF, Manpack, Low-Power. R-107	20
Warning Receiver. R-311	2

NOTE. This howitzer battalion may also be found in the artillery regiment of a **MRD. TD.** or airborne division.

FOOTNOTE. This vehicle includes the SMALL FRED radar, which appears separately in this list.

122-mm Howitzer Battery. 122-mm Howitzer Battalion,
 Motorized Rifle Regiment (BTR), M R Dand TD

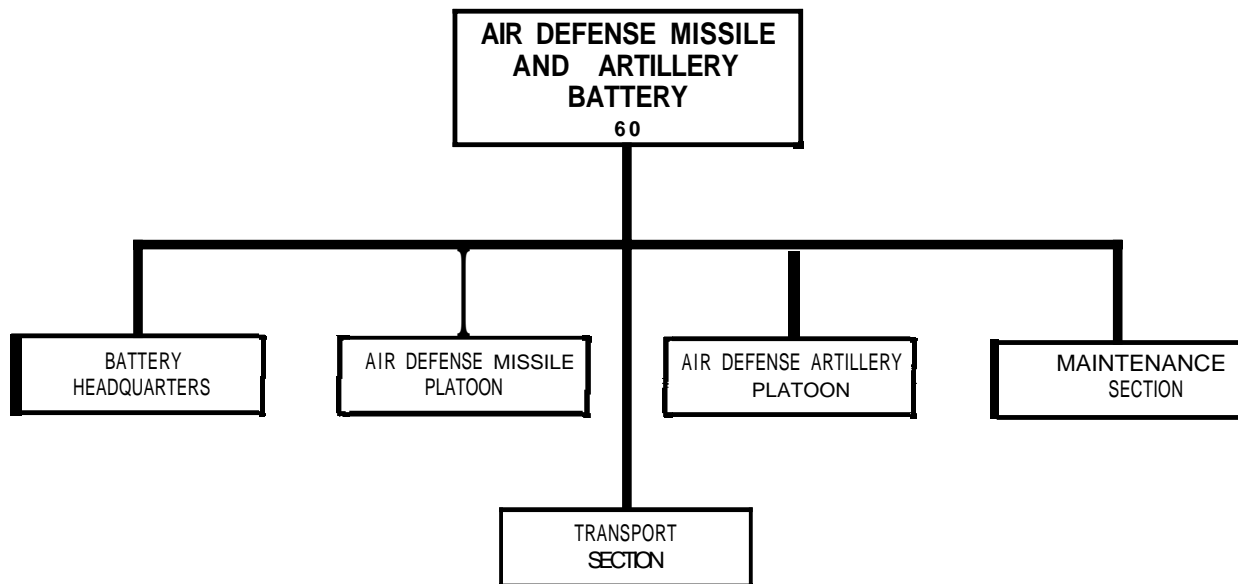


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
122-mm Towed Howitzer. D-30	6
ATGL. RPG-7V	6
5.45-mm LMG, RPK-74	6
Truck. GAZ-66	1
Truck. ZIL/Ural	8
ACRV. M1979(1)	1

Equipment	Total
ACRV, M1979 (2)	1
Trailer. Cargo	1
Rangefinder, Laser. SAGE GLOSS	1
Radios:	
VHF, Manpack, Low-Power. R-107	5
VHF, Vehicle Mounted. Medium-Power	1

Air Defense Missile and Artillery Battery,
 Motorized Rifle and Tank Regiment, MRD and TD

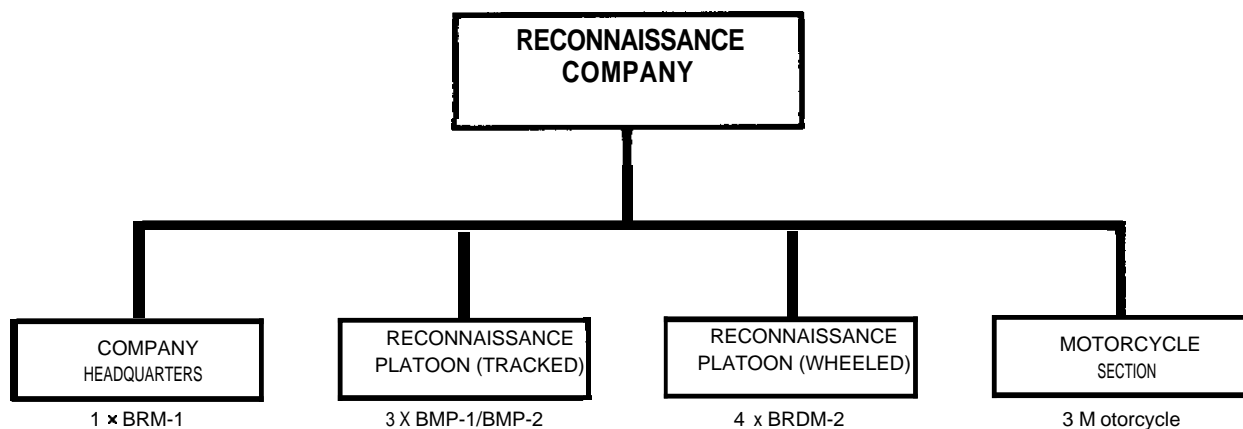


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
SAM. SA-9/GASKIN TEL or SA-13/GOPHER		Trailer, Generator, 2-Axle	2
TELAR	4	Radios:	
SPAA Gun, ZSU-23-4 or 2 S 6	4	VHF, Manpack, Low-Power. R-107	2
ACV, BTR-60	3	VHF, Vehicle Mount, Medium-Power.	
Truck. GAZ-66	2	R-123	11
Truck, ZIL-131/157 or Ural-375	4	Warning Receiver. R-311	3

NOTE, instead of this battery, some MRRs and TRs now have an air defense battalion consisting of a battery of six 2S6 30-mm SP antiaircraft systems and a battery of six BMP-2 ICVs(with each BMP-2 carrying three SA-16 SAM launchers).

Reconnaissance Company.
 Motorized Rifle and Tank Regiment, MRD and TD

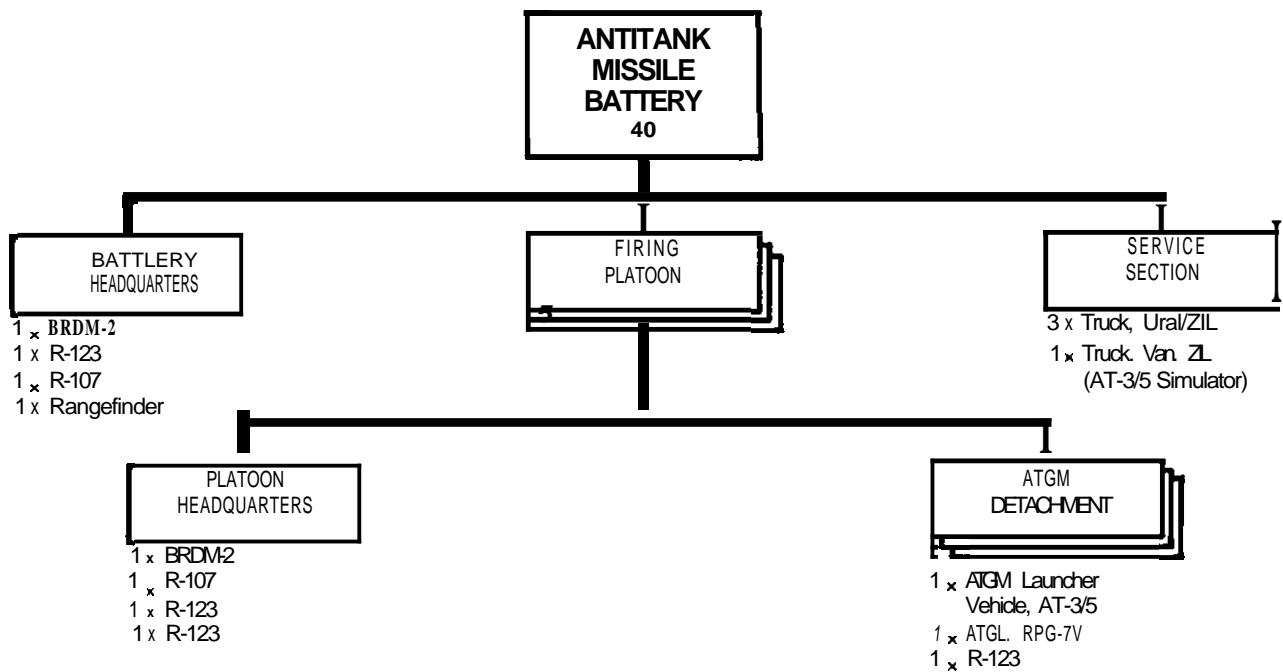


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-7V	4	Radios:	
5.45-mm LMG, RPK-74	3	HF, Manpack, Low-Power, R-104M	1
ACV, BRM-1*	1	HF, Vehicle Mount, Medium-Power, R-130	1
AICV, BMP-1/BMP-2	3	VHF, Manpack, Low-Power, R-107	3
ASC, BRDM-2	4	VHF, Vehicle Mount, Medium-Power, R-123 ...	7
Motorcycle, M-72/K-750V/Ural-3	3	Warning Receiver, R-311	1
Radar, Battlefield Surveillance, TALL MIKE	1		

FOOTNOTE. *This vehicle includes the TALL MIKE radar, which appears separately in this list.

Antitank Missile Battery.
 Motorized Rifle Regiment, MRD and TD

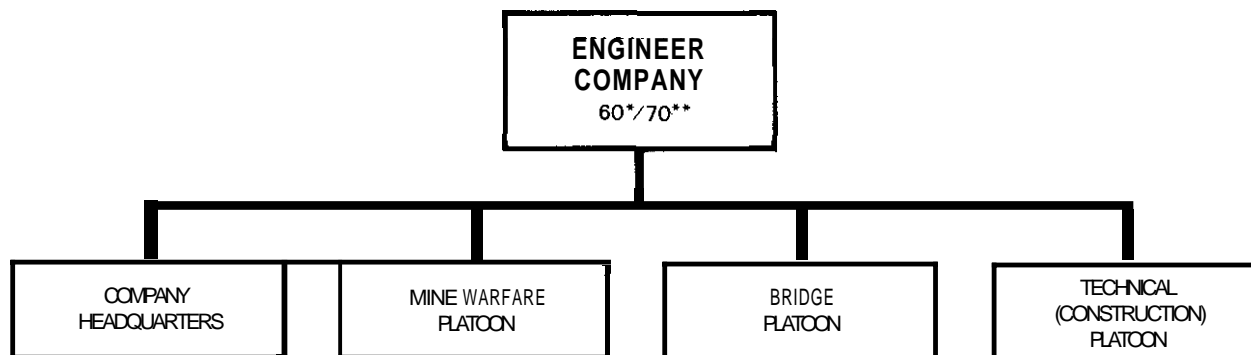


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGM Launcher Vehicle (BRDM-2). AT-3/ SAGGER or AT-5/SPANDREL	9	Rangefinder	1
ATGL, RPG-7V	9	R a d i o s :	
ACV, BRDM-2	4	VHF. Manpack, Low-Power, R-107	4
Truck, Ural/ZIL	3	VHF. Vehicle Mount, Medium-Power, R-123	13
Truck, Van, ZIL(AT-3/5 Simulator)	1		

NOTE. In the late 1980s. MRRs began to add 100-mm AT guns (MT-12) to expand the battery

Engineer Company,
 Motorized Rifle and Tank Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGL. RPG-7V	4
APC. BTR-60	3
Truck. UAZ-69/469	1
Truck, KrAZ/Ural/ZIL	8*/9**
Truck, Dump, MMZ-555	2
Truck. Van. ZIL (Maintenance)	1
Truck. Crane. K-61	1
Truck. Crane Shovel. E-305V	2
Bridge, Tank-Launched. MTU/MT-55	1*/3**
Bridge. Truck-Launched. TMM	4
Ditching Machine. BTM/MDK	1
Dozer. BAT/BAT-M/PKT	1
Dozer Blade. BTU	3

Equipment	Total
Bucket Excavator. PZM	3
Minelayer, Towed. PMR-3	3
Mineclearing Plow, KMT-4/6	9*/28**
Mine Roller-Plow. KMT-5M	3*/9**
Water Filtration Set. MAFS, on ZIL with Trailer	1
Trailer. Cargo. 2-Axle	2
Radios:	
HF or VHF. Manpack, Low-Power. R-104M or R-107	4
VHF. Vehicle Mount. Medium-Power. R-123	4*/7**

NOTE. The following variations may exist:

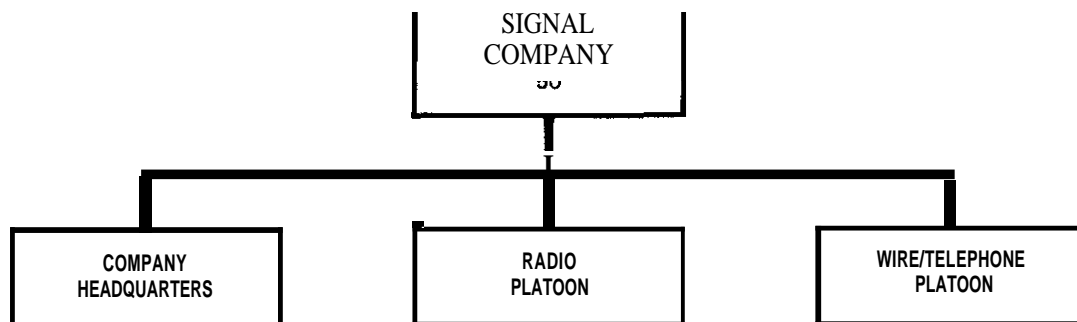
- a. Frogmen may be attached to assist in the reconnaissance of water obstacles.
- b. Some companies may have five KMM truck-launched bridge spans instead of four b. TMM bridge spans.
- c. Trucks normally tow PMR minelayers. Some units may have BTR-152s for this purpose. Some units may have GMZ armored tracked minelayers instead of PMR towed minelayers.
- d. Some units may have up to six one-axle cargo trailers besides the two-axle cargo trailers.
- e. Some units may have tractor-trailers to carry heavy tracked equipment on long road movements.

FOOTNOTES. "Personnel and equipment levels for the engineer company. MRR. BTR- " BMP-equipped.

** Personnel and equipment levels for the engineer company. TR.

FM 100-2-3

Signal Company,
 Motorized Rifle and Tank Regiment, MRD and TD

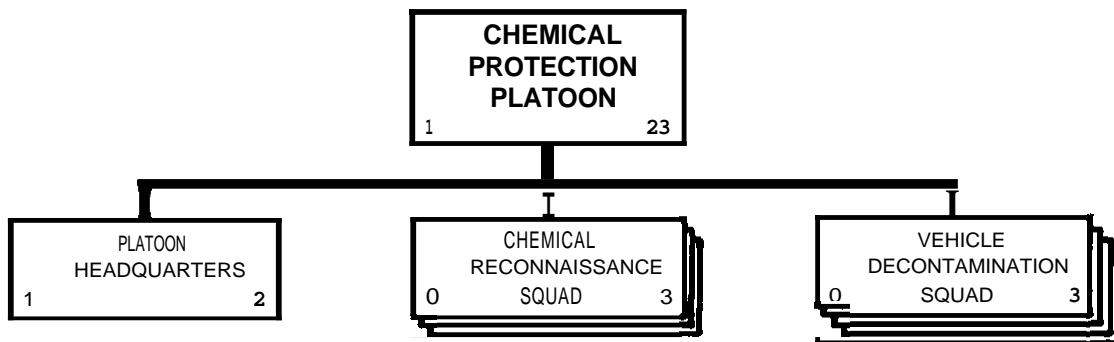


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ACV, BTR	3
Truck, UAZ-69/469	5
Truck, GAZ-66	3
Truck, Van. GAZ (Signal)	3
Truck, Van. ZIL (Signal)	2
Motorcycle. M-72/K-750V/Ural-3	3
Trailer, Generator. 2-Axle	1
Radios:	
HF. Manpack, Low-Power. R-104M	2
HF. Vehicle Mount. Medium-Power. R-130	2
HF. Van Mount. High-Power, R-118	1
HF/VHF. Vehicle Mount. Medium-Power	2
HF/VHF. Vehicle Mount. High-Power	2
VHF, Manpack, Low-Power. R-107	7
VHF, Vehicle Mount. Medium-Power. R-123 ...	2
Warning Receiver. R-311	3
Radio Relay. VHF/UHF, R-401/405	2

- NOTES.**
1. The radios listed support the regimental headquarters.
 2. Motorcycles provide the regimental commander with messenger/courier service.
 3. The TA-57 field telephone and P-193M Switchboard are standard equipment in the wire/telephone platoon.

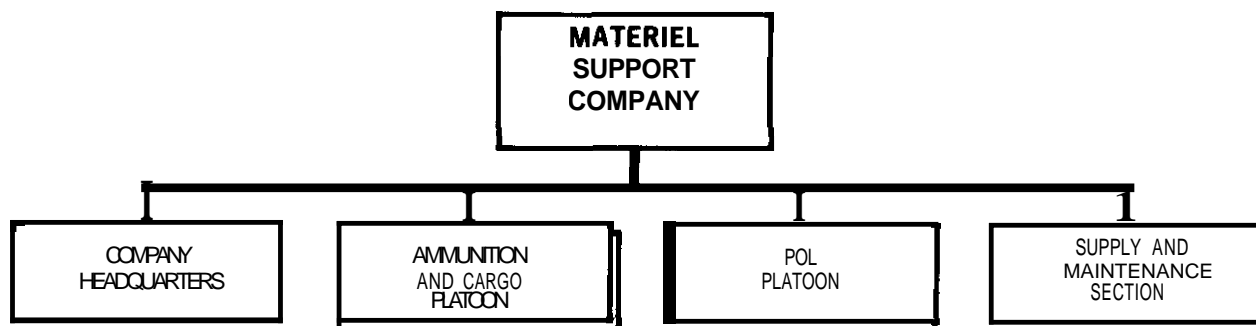
Chemical Protection Platoon.
 Motorized Rifle and Tank Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Chemical Reconnaissance Vehicle, BRDM-Zrkh or RKhM	3	Radios:	
Truck. Decontamination	4	HF, Manpack, Low-Power, R-104M	1
		VHF, Vehicle Mount, Medium-Power. R-123 ...	3

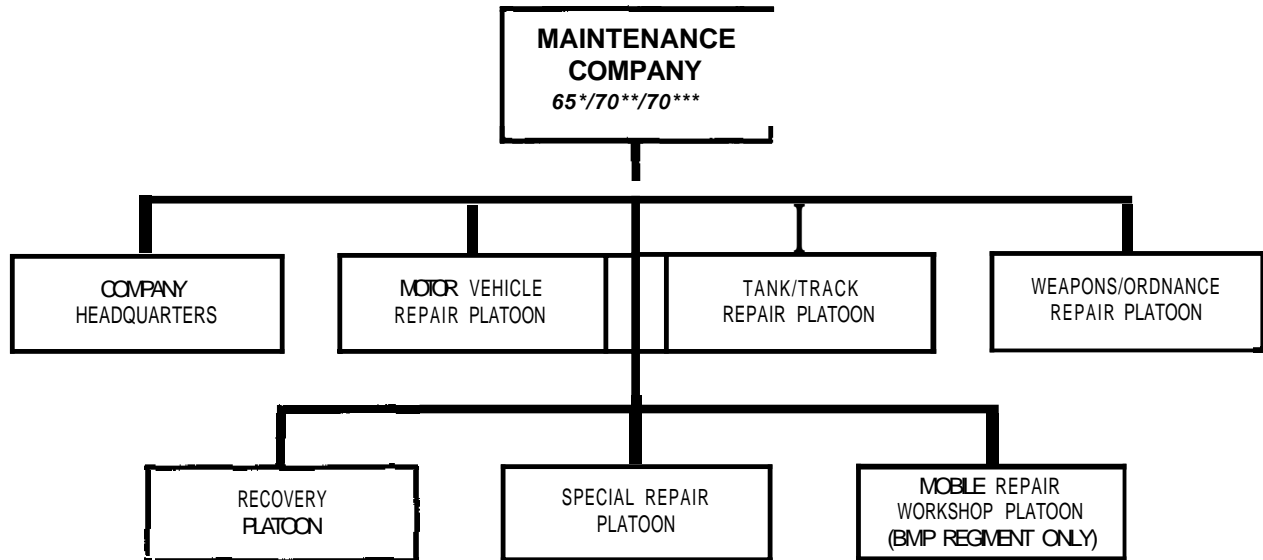
Materiel Support Company,
 Motorized Rifle and Tank Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	2	Trailer. POL	15
Truck. GAZ-66	4	Trailer. Field Kitchen	2
Truck. ZIL-131/157 or Ural-375	45	Trailer, Water	1
Truck. Van. ZIL (Maintenance)	1	Trailer, Generator. 1-Axle	1
Truck. ZIL-130/131 (Water)	4	Radio:	
Truck. POL (4,000 or 5.200-Liter)	15	VHF, Manpack. Low-Power. R-107	1
Trailer, Cargo, 2-Axle	30		

Maintenance Company,
 Motorized Rifle and Tank Regiment, MR D and TD



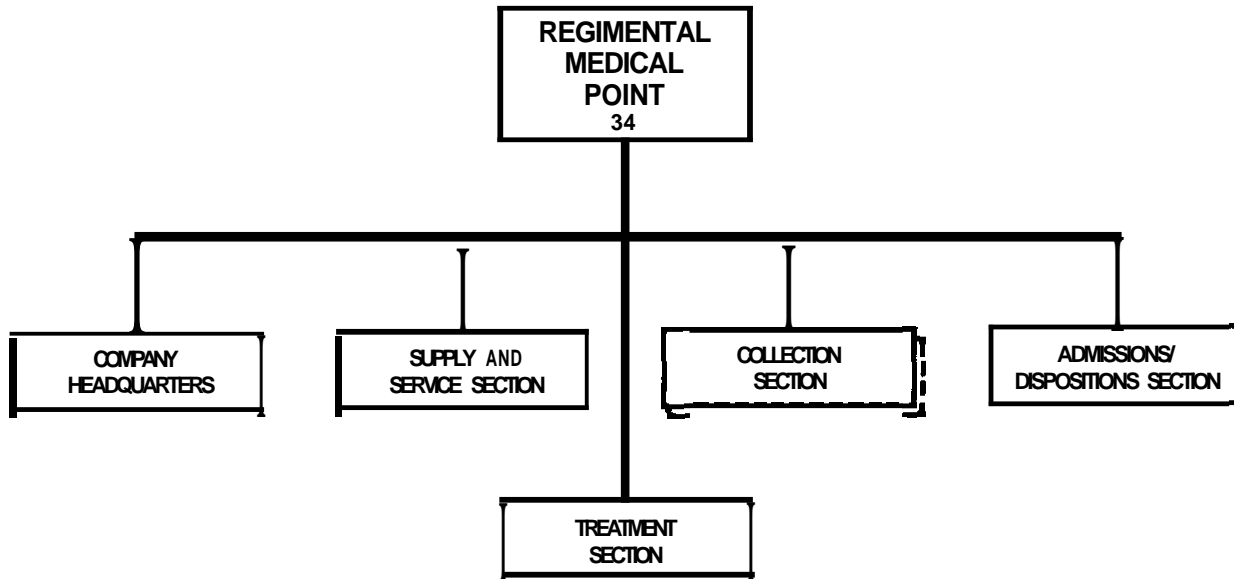
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	MRR' MRR**TR*** (BTR) (BMP)	Equipment	MRR* MRR**TR*** (BTR) (BMP)
ATGL, RPG-7V	4 4 4	Armored Recovery Vehicle	3 3 5
Truck, UAZ-69/469	1 1 1	Trailer, Cargo, 2-Axle	6 6 6
Truck, ZIL	1 1 1	Trailer, Generator, 2-Axle	1 1 1
Truck, Ural-375	1 1 1	Trailer, Generator, 1-Axle	2 2 2
Truck, Van. ZIL-131 (Maintenance)	4 4 4	Radios:	
Truck, Van. ZIL-157 (Maintenance)	8 8 8	VHF, Manpack, Low-Power, R-107	1 1 1
Armored Maintenance Vehicle, MTP	0 3 0	VHF, Vehicle Mount, Medium-Power. R-123	3 6 5

- NOTES.** 1. The special repair platoon consists of an arc and gas welding section, battery repair and recharging section, and electrical repair section.
 2. The mobile repair workshop platoon consists of three sections, each equipped with an MTP armored maintenance vehicle. During field operations, one MTP will support each MRB (BMP).

FOOTNOTES. 'Personnel and equipment levels for the maintenance company. MRR. BTR-equipped.
 **Personnel and equipment levels for the maintenance company, MRR. BMP-equipped.
 **Personnel and equipment levels for the maintenance company. TR.

Regimental Medical Point,
 Motorized Rifle, Tank, and Artillery Regiment. MRD and TD



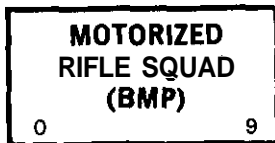
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, Van. GAZ	1	Trailer, Kitchen	1
Truck, ZIL-130/131/151/157	2	Trailer, Water	1
Truck, Decontamination. DDA-53/66	1	Radio:	
Truck. GAZ-66	1	VHF, Manpack, Low-Power, R-107	1
Truck, Ambulance. UAZ-450A/452	4		

- NOTES. 1. The UAZ-450A/452 is a standard ambulance. Other general purpose trucks may serve as ambulances. The regimental medical point may also employ the LuAZ-967 Night evacuation vehicle.
2. There may be two collection sections.

MOTORIZED RIFLE REGIMENT STRUCTURE (BMP)

Motorized Rifle Squad (BMP)

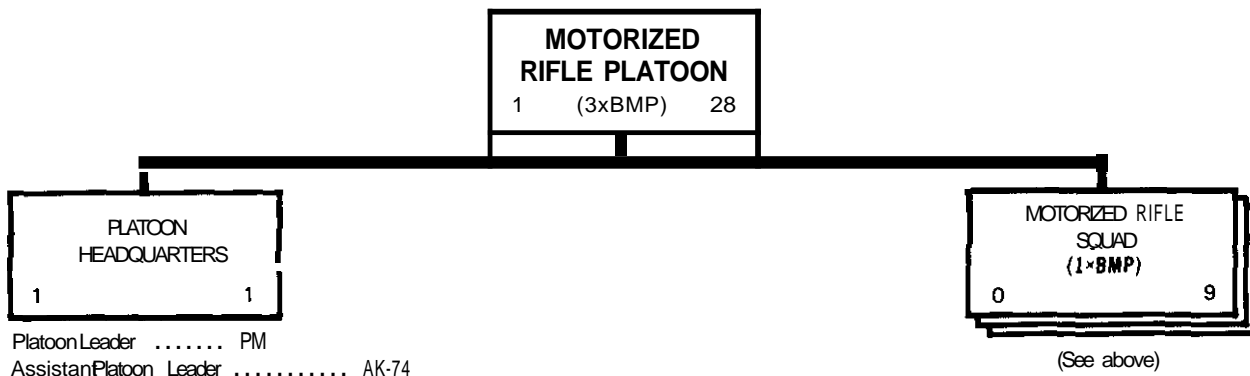


PRINCIPAL ITEMS OF EQUIPMENT

Personnel	Equipment	Personnel	Equipment
Squad LEADER/BMP Commander	AK-74	Grenadier	RPG-7V, PM
Assistant Squad Leader/BMP Gunner	PM	Senior Rifleman	AK-74
BMP Driver/Mechanic	PM	Rifleman/Assistant Grenadier	AK-74
Machine Gunner	RPK-74	Rifleman	AK-74/SVD
Rifleman/Medic	AK-74		

- NOTES. 1. The dismounted squad assault element consists of seven personnel. The BMP driver/mechanic and assistant squad leader/BMP gunner remain with the BMP to provide fire support. The dismounted squad does not have a portable radio.
 2. One squad in each platoon has an SVD sniper rifle.

Motorized Rifle Platoon (BMP)

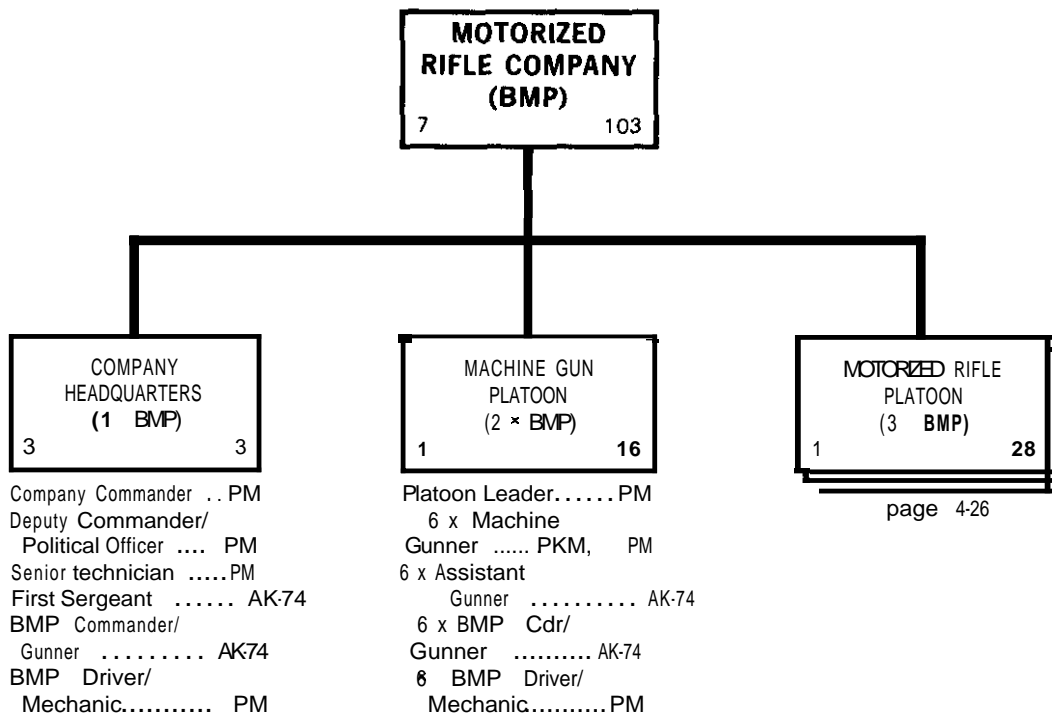


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol, P M	10	Amphibious Infantry Combat Vehicle.	
5.45-mm Assault Rifle. AK-74	16	BMP/BMP-1/BMP-2	3
5.45-mm Light Machine Gun, RPK-74	3	Radios:	
7.62-mm Sniper Rifle. SVD	1	VHF. Portable, Low-Power, R-148	1
Antitank Grenade Launcher. RPG-7V	3	VHF. Vehicle Mount. Medium-Power. R-123 ...	3

- NOTES. 1. With a standard nine-man squad, each BMP has two empty seats (six per platoon), which can accommodate the platoon leader and the assistant platoon leader. The BMP-2 has one empty seat (three per platoon).
 2. One squad in each platoon has an SVD sniper rifle.
 3. Firepower calculations should include the 73-mm smoothbore gun or 30-mm cannon, ATGM, and the 7.62-mm machine gun mounted on each BMP.

Motorized Rifle Company, Motorized Rifle Battalion,
 Motorized Rifle Regiment (BMP). MRD and TD



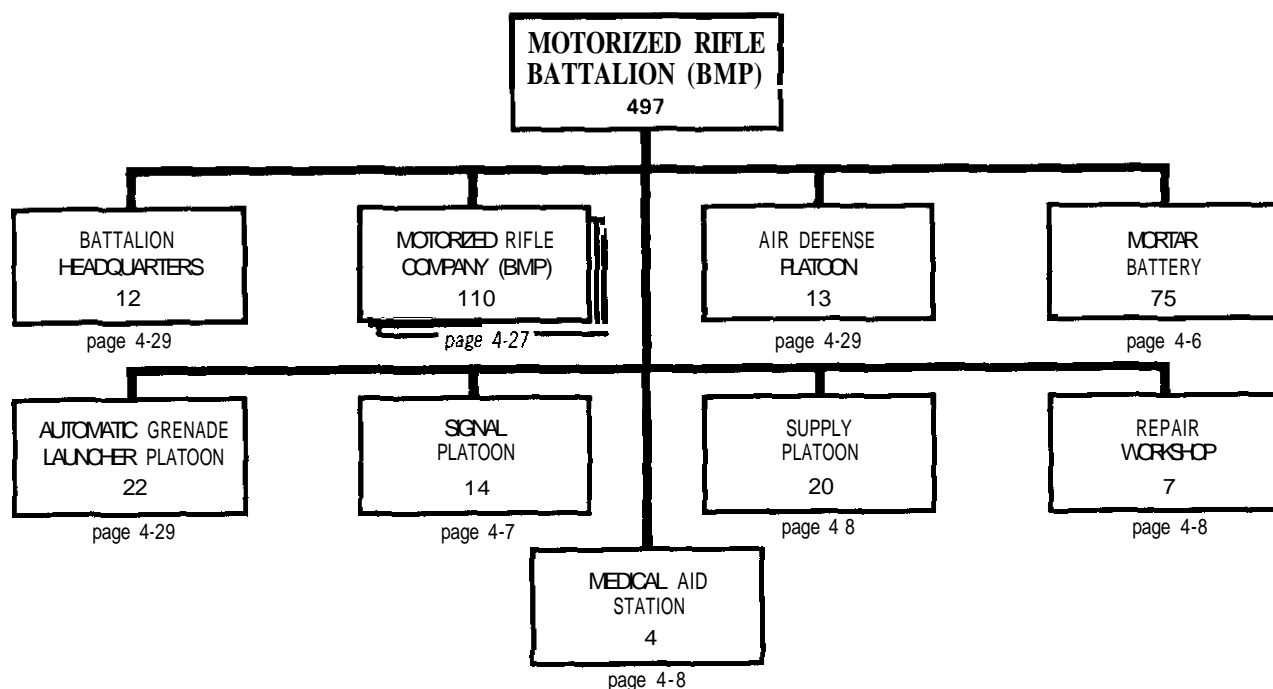
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol, PM	43	7.62-mm General Purpose MG. PKM	6
5.45-mm Assault Rifle. AK-74	58	Radios:	
5.45-mm Light Machine Gun. RPK-74	9	VHF, Portable. Low-Power. R-148	5
7.62-mm Sniper Rifle, SVD	3	VHF, Manpack. Low-Power. R-107	1
Antitank Grenade Launcher. RPG-7V	9	VHF, Vehicle Mount. Medium-Power.	
Amphibious Infantry Combat Vehicle, BMP/BMP-1/BMP-2	12	R-123	

- NOTES. 1. The company commander's RTO comes from the battalion signal platoon and is not part of the BMP company personnel total.
 2. The same BMP company organization is also organic to the MRB (BMP). TR, TD.

FM 100-2-3

Motorized Rifle Battalion,
Motorized Rifle Regiment (BMP), MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
120-mm Mortar. M1943/M120 or 82-mm Automatic Mortar, 289	8	Trailer. POL. 1-Axle	1
7.62-mm General Purpose MG. PKM	18	Trailer. Cargo. 1-Axle	2
ATGL. RPG-7V	35	Trailer. Generator. 1-Axle	1
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	Trailer. Water	1
5.45-mm LMG. RPK-74	27	Trailer, Kitchen	3
30-mm Automatic Grenade Launcher. AGS-17 ...	6	Rangefinder. Stereoscopic, DS-1 or DM-O9/DAK-1	1
AICV, BMP-1/BMP-2	42	Radios:	
ACV, BRDM/BTR/BMP	3	HF. Vehicle Mount. Medium-Power. R-130	2
Truck. UAZ-69/469	3	VHF. Portable. Low-Power. R-148	20
Truck, GAZ-66	15	VHF. Manpack. Low-Power. R-107	14
Truck. ZIL/Ural	4	VHF. Vehicle Mount. Medium-Power, R-123	45
Truck. Van, ZIL (Maintenance)	1	Warning Receiver. R-311	1
Truck, Van, Kitchen. PAC-170/200	1	Radio Transceiver, Portable, Very-Low-Power, R-147	4
Truck. POL (4.000 or 5.200-Liter)	2		
Truck. Ambulance. UAZ-450A/452	1		

NOTE. The same BMP battalion organization is also found in the TR. TD

Battalion Headquarters, Motorized Rifle Battalion,
Motorized Rifle Regiment (BMP), MRD and TD

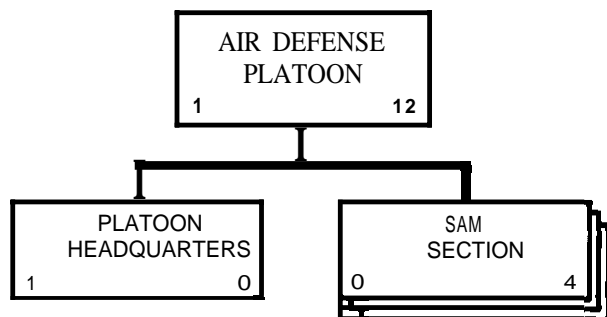


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
9-mm Pistol. PM	4	Radios:	
5.45-mm Assault Rifle, AK-74	8	HF. Vehicle Mount, Medium-Power, R-130	1
ACV. BMP-1K	1	VHF. Portable, Low-Power. R-148	1
Truck, UAZ-69/469	1	VHF, Manpack, Low-Power. R-107	2
Truck, GAZ-66	1	VHF. Vehicle Mount, Medium-Power, R-123 ...	1
		Warning Receiver. R-311	1

NOTE. The signal platoon leader is also the battalion communications officer. The *prapor shchik* in charge of the supply platoon and the *fel'dscher* in charge of the medical aid station are also part of the battalion staff. However, these positions are not part of the personnel figures for the battalion headquarters.

Air Defense Platoon, Motorized Rifle Battalion,
Motorized Rifle Regiment. MRD and TD

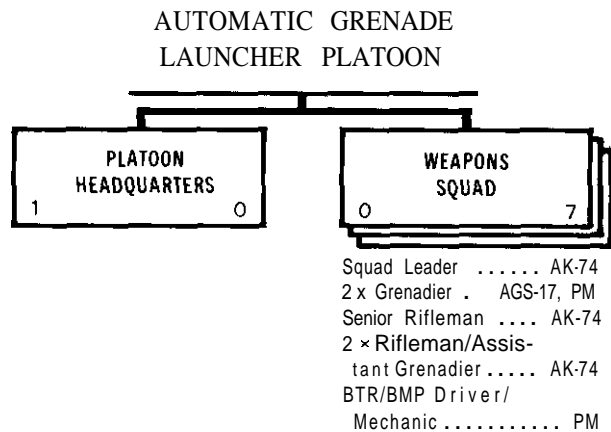


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
SAM Launcher. SA-7/GRAIL or SA-14/ GREMLIN or SA-16	9
AICV. BMP-1/-2/BTR-60/-70/-80	3
Radios:	
VHF. Vehicle Mount. Medium-Power, R-123 ...	3
Radio Transceiver. Portable. Very-Low-Power. R-147	4

NOTE. Each MRC normally has one section attached.

Automatic Grenade Launcher Platoon, Motorized Rifle
Battalion, Motorized Rifle Regiment, MRD and TD



Equipment	Total
PRINCIPAL ITEMS OF EQUIPMENT	
30-mm Automatic Grenade Launcher. AGS-17 ...	6
AICV. BMP-1/-2/BTR-60/-70/-80	3
Radios:	
VHF. Vehicle Mount. Medium-Power. R-123 ...	3
VHF. Portable Low-Power. R-148	4

Motorized Rifle Regiment (BMP). MRD and TD

The MRR is the basic combined arms organization and the most common maneuver element of the Soviet ground forces. Motorized rifle, tank, artillery, antiaircraft, antitank, engineer, signal, and CSS assets are organic to the MRR. The regiment is the smallest organization which has all of these elements.

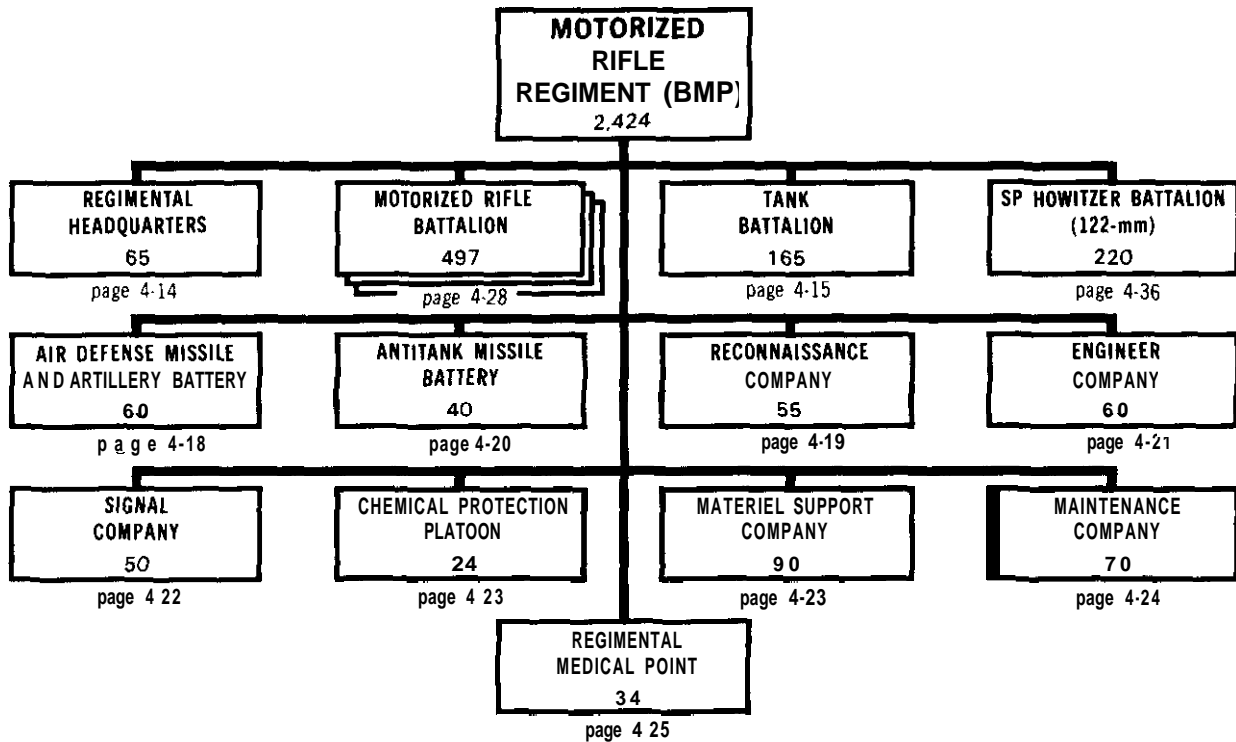
Regimental organization includes three MRBs and one TB. A 122-mm howitzer battalion and three 120-mm mortar batteries or 82-mm automatic mortar batteries provide fire support. While battalion-sized elements support the division, corresponding company-sized units support MRRs.

The MRRs have either the BMP AICV or one of the BTR series of APCs as the primary troop-carrying vehicle. Both BMP and BTR regiments now have the AGS-17 automatic grenade launcher

within MRBs. In most other respects, the two regiments are similar. Exceptions are as follows: BMP-equipped regiments each have an organic battalion of 122-mm SP howitzers (2S1), while BTR regiments may have 122-mm towed howitzers (D-30). Also, BTR regiments have antitank platoons within the MRBs, a feature not found in the BMP regiments.

The TBs of both BMP- and BTR-equipped MRRs have 40 medium tanks. This chapter lists all tanks within the MRR as T-64/72/80, but older types are often present outside the Western TVD.

Although the regiment normally operates as part of the division, it is capable of short-term independent operations. It has the assets to react independently to changes in the combat situation. Much of the equipment is amphibious.



- NOTES. 1. If the TB of this regiment has T-54/55/62 tanks, regimental strength will increase by 31 or 40 enlisted personnel.
2. In the late 1980s, forces in Eastern Europe began to standardize tank battalions at 31 tanks. (See p. 4-108.)

	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
PERSONNEL	65	1,491	165	220	60	40	55	60	50	24	90	70	34	2,424
TANKS														
Medium Tank, T-64/72/80			40											40
WEAPONS														
122-mm SP Howitzer 2S1				18										18
120-mm Mortar, M1943/M-120 or 82-mm Automatic Mortar, 2B9		24												24
SAM, SA-9/GASKIN TEL or SA-13/GOPHER TELAR					4									4
SPAA Gun, ZSU-23-4 or 2S6					4									4
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3	27												30
ATGM Launcher Vehicle (BRDM-2), AT-3/5						9								9
ATGL, RPG-7V		105	2	18		9	4	4				4		146
30-mm Automatic Grenade Launcher, AGS-17		18												18
5.45-mm LMG, RPK-74		81		18			3							102
7.62-mm GPMG, PKM		54												54
ACV/AICV/APC/ASC														
ACV, BMP/BRDM/BTR	1	9	2		3	4			3					22
ACV, BRM-1 *							1							1
APC, BTR-60/70/80	1							3						4

(continued)

FOOTNOTES. *This vehicle includes the TALL MIKE radar, which appears separately in this list.
 **This vehicle includes the SMALL FRED radar, which appears separately in this list.

**MOTORIZED RIFLE
REGIMENT (BMP),
MRD AND TD**

	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
APC, BTR-60PA (FAC)	1													1
MRP, PRP-3 (BMP M1975)* *				1										1
ASC, BRDM-2							4							4
AICV, BMP-1/BMP-2		126					3							129
ACRV, IV12 Series				8										8
GENERAL PURPOSE TRUCKS														
Truck, UAZ-69/469	3	9	1				1	5		2	1			22
Truck, GAZ-66		45		7	2				3		4		1	62
Truck, ZIL-130/131/151/157			7		4							1	2	14
Truck, Ural-375	1			20							45	1		67
Truck, KrAZ/ZIL/Ural		12				3		8						23
VAN TRUCKS														
Truck, Van, GAZ									3				1	4
Truck, Van, ZIL/Ural (Command)	3													3
Truck, Van, ZIL (Signal)									2					2
Truck, Van, ZIL (Maintenance)		3	2	2				1			1	12		21
Truck, Van, Kitchen PAC-170/200		3	1								1			5
Truck, Van, ZIL (AT-3/5 Simulator)						1								1
POL TRUCKS														
Truck, POL, ZIL/Ural/KrAZ		6	3	2							15			26
DECONTAMINATION TRUCKS														
Truck, Decontamination										4			1	5

MOTORIZED RIFLE
REGIMENT (BMP).
MRD ANDTD

	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTI-TANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
CHEMICAL RECONNAISSANCE VEHICLES														
Chemical Reconnaissance Vehicle BRDM-2rkh/RKhM										3				3
SPECIAL PURPOSE TRUCKS														
Truck, Water Tank										4				4
Truck, Ambulance, UAZ-450A/452		3	1	1								4		9
Truck, Crane, K-61							1							1
Truck, Crane Shovel, E-305V							2							2
Truck, Dump, MMZ-555							2							2
Sedan, GAZ-24	1													1
SPECIAL PURPOSE EQUIPMENT														
Motorcycle						3		3						6
Armored Recovery Vehicle											3			3
Armored Maintenance Vehicle, MTP											3			3
ENGINEER EQUIPMENT														
Bridge, Truck-Launched, MTU/MT-55							1							1
Bridge, Truck-Launched, TMM							4							4
Ditching Machine, BTM/MDK							1							1
Dozer, BAT/BAT-M/PKT							1							1
Bucket Excavator, PZM							3							3
Mineclearing Plow, KMT-4/6							9							9
Mine Roller-Plow, KMT-5M							3							3

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE
REGIMENT (BMP).
MRD AND TD

	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	ANTITANK MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
Minelayer. lowed. PMR-3							3							3
Water Filtration Set. MAFS							1							1
TRAILERS														
Trailer. POL		3		2						15				20
Trailer. Cargo, 1-Axle		6	1											7
Trailer. Cargo, 2-Axle			8	10			7			30	6			56
Trailer. Generator, 1-Axle		3	1							1	2			7
Trailer. Generator, 2-Axle					2			1			1			4
Trailer. Water		3	1	1						1		1		7
Trailer. Field Kitchen		9		3						2		1		15
ARTILLERY ASSOCIATED EQUIPMENT														
Rangefinder		3		4		1								8
RADARS														
Battlefield Surveillance. TALL MIKE							1							1
Battlefield Surveillance. SMALL FRED				1										1
RADIOS														
HF or VHF, Manpack, Low-Power, R-104M or R-107							4							4
HF, Manpack, Low-Power, R-104M			2			1		2	1					6
HF, Vehicle-Mount, Medium-Power, R-130		6	5			1		2						14
HF, Van-Mount, High-Power, R-118								1						1
HF/VHF, Vehicle-Mount, Medium-Power								2						2

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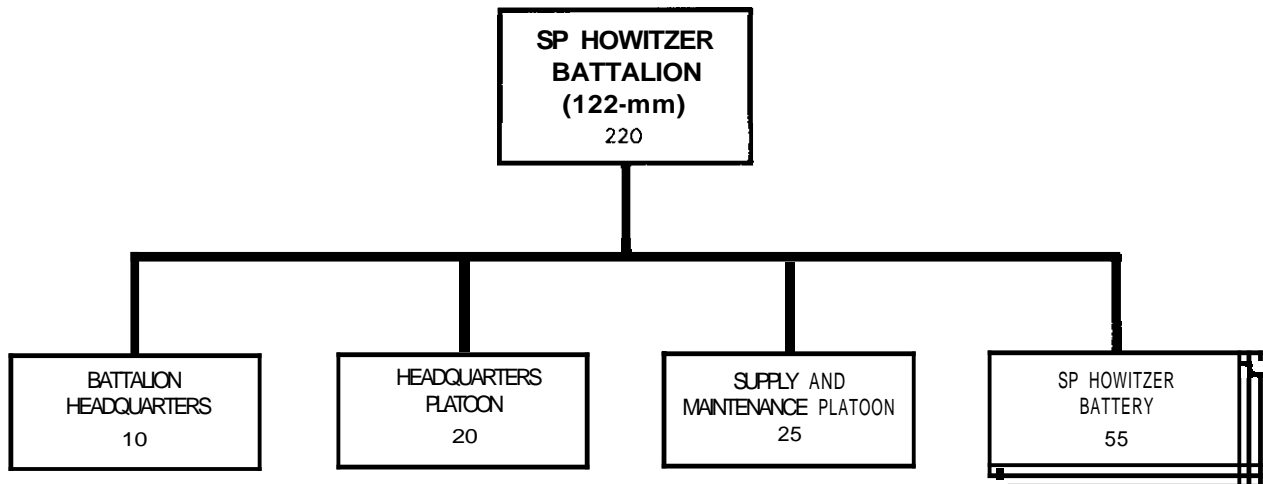
Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE
REGIMENT (BMP).
MRD AND TD

	REGIMENTAL HEADQUARTERS	3 * MOTORIZED RIFLE BATTALION	TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE ARTILLERY BATTERY	ANTITANK MISSILE AND BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
HF/VHF, Vehicle-Mount, High-Power								2						2
VHF, Portable, Low-Power, R-148		60												60
VHF, Manpack, Low-Power, R-107	3	42	1	10	2	4	3	7		1	1	1		75
VHF, Vehicle-Mount, Medium-Power, R-123	2	135	41	28	11	13	7	4	2	3		6		252
Radio Transceiver, Portable, Very-Low-Power, R-147		12												12
Warning Receiver, R-311		3	1	2	3		1	3						13
Radio Relay, VHF/UHF, R-401/405								2						2

FM 100-2-3

SP Howitzer Battalion (122-mm).
 Motorized Rifle Regiment (BMP) and Tank Regiment. MRD and TD



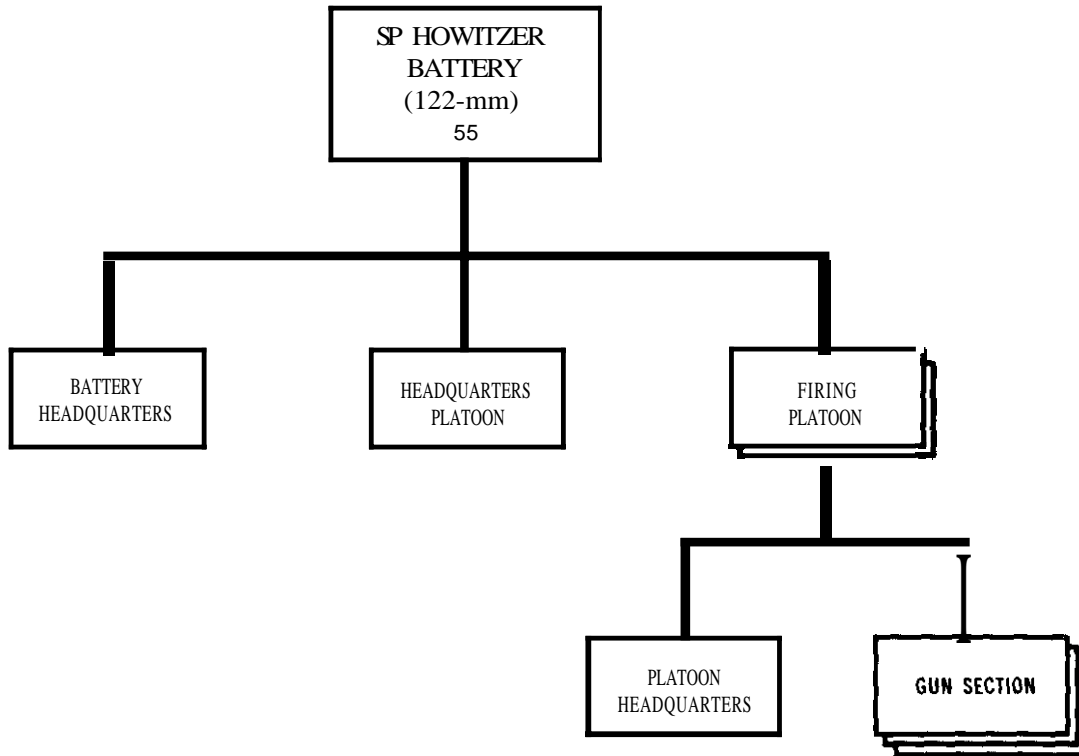
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm SP Howitzer, 2S1	18	Truck, Ambulance, UAZ-450A/452	1
ATGL. RPG-7V	18	Trailer, Cargo, 2-Axle	10
5.45-mm LMG. RPK-74	18	Trailer. POL	2
ACRV 1V13	3	Trailer. Water	1
ACRV 1V14	3	Trailer. Field Kitchen	3
ACRV 1V15	1	Rangefinder. Laser, SAGE GLOSS	4
ACRV 1V16	1	Radar, Battlefield Surveillance. SMALL FRED	1
Mobile Recon Post, PRP-3 (BMP M1975)*	1	Radios:	
Truck, UAZ-69/469	1	VHF. Manpack, Low-Power. R-107	10
Truck. GAZ-66	7	VHF. Vehicle Mount. Medium-Power,	
Truck. Ural-375	20	R-123	28
Truck. POL (4.000 or 5.200-Liter)	2	Warning Receiver, R-311	2
Truck, Van. ZIL (Maintenance)	2		

NOTE. This SP howitzer battalion may also be present in the BTR-equipped MRR in lieu of a battalion of 122-mm towed howitzers (D-30).

FOOTNOTE. This vehicle includes the SMALL FRED radar, which appears separately in this list.

SP Howitzer Battery (122-mm). SP Howitzer Battalion,
 Motorized Rifle Regiment (BMP) and Tank Regiment. MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm SP Howitzer. 2S1	6	Truck. Ural-375	6
ATGL. RPG-7V	6	Trailer. Cargo	1
5.45-mm LMG. RPK-74	6	Rangefinder. Laser. SAGE GLOSS	1
ACRV 1V13	1	Radios:	
ACRV 1V14	1	VHF. Manpack, Low-Power. R-107	2
Truck, GAZ-66	1	VHF. Vehicle Mount. Medium-Power. R-123	8

MOTORIZED RIFLE DIVISION

Motorized Rifle Division

The MRD is organized around a six-regiment structure: three MRRs, one TR, one artillery regiment, and one SAM regiment. An SSM battalion, an antitank battalion, and a helicopter squadron provide additional CS. Other support elements include engineer and signal battalions, a chemical protection company, and an artillery command battery. Materiel support, maintenance, and

medical battalions provide limited but highly mobile CSS.

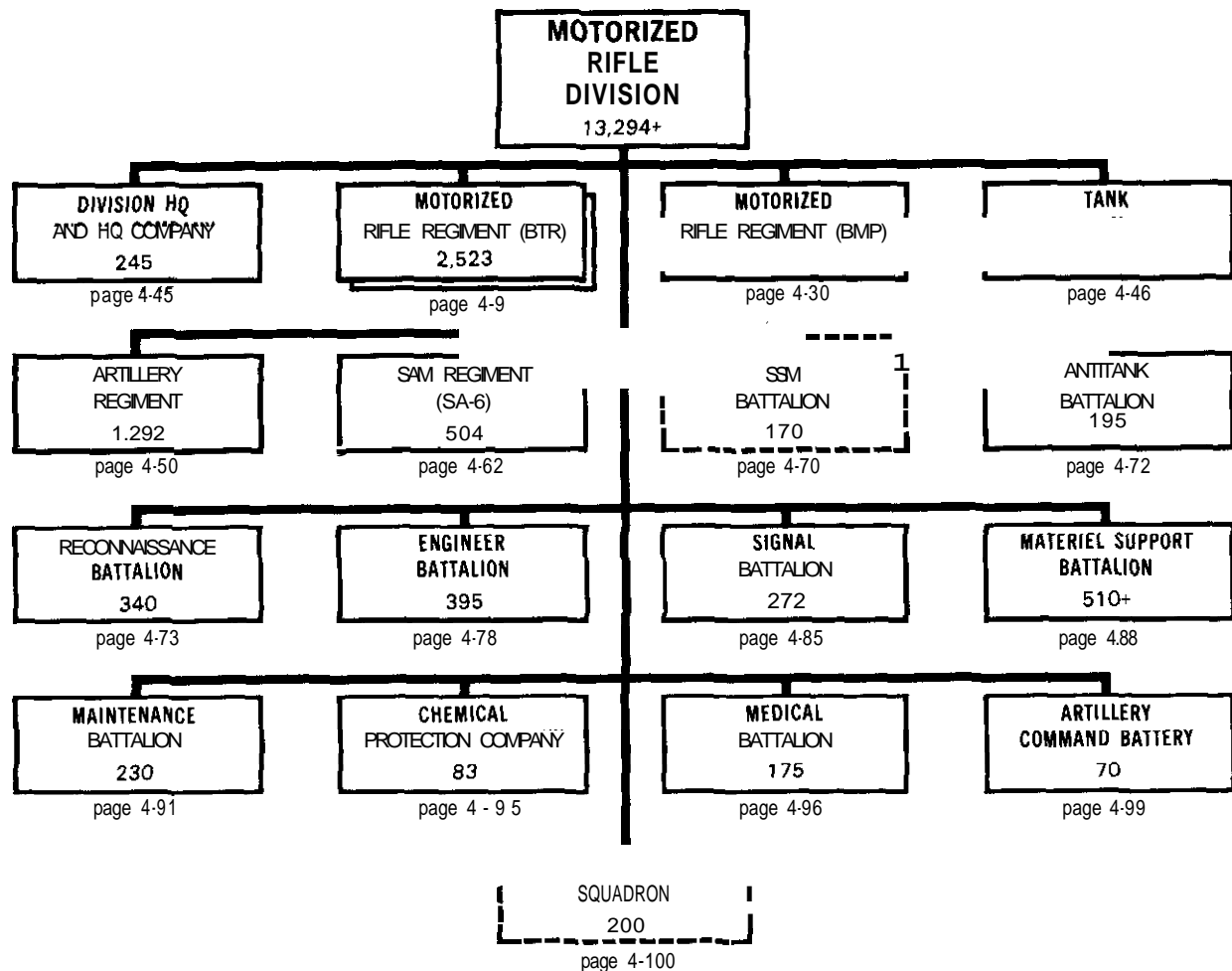
As a result of the reorganization which began in the late 1970s, the TR of the MRD has an SP howitzer battalion, the MRL battalion is part of the artillery regiment, the reconnaissance battalion has medium tanks, and the helicopter squadron provides additional fire support. The

current trend in the MRD is to replace BTR-equipped MRRs with additional BMP-equipped MRRs. The modernization of equipment includes the deployment of increasing numbers of T-64, T-72, and T-80 tanks. It also includes the introduction of SS-21 tactical ballistic missiles to replace free rockets over ground (FROGs).

All subunits benefit from continuous upgrade. The capabilities of the organic support elements

generally keep pace with increases in the firepower and mobility of combat organizations.

With the exception of the MRRs already described, the remaining elements of the MRD appear on the following pages. The organization charts show the latest upgrades in organization and equipment, even though these changes may not have yet occurred in all divisions.



- NOTES.**
1. The MRD may have an independent tank battalion (ITB) (p. 4-105) which is not included in the MRD personnel total.
 2. Normally, one MRR in the MRD is BMP-equipped. Some MRDs have two BMP-equipped MRRs with only one BTR-equipped MRR.
 3. The MRD may have a SAM regiment equipped with the SA-8 SAM (p. 4-101) or an AAA regiment equipped with the S-60 AA Gun (p. 4-104) instead of the SA-6 SAM regiment.
 4. Armies in WGF are consolidating division-level SSM battalions into army-level SSM brigades.
 5. Starting in 1989, the Soviets are converting the TR of the MRD into a fourth MRR.
 6. Not all divisions have a helicopter squadron.

Personnel and Equipment Recapitulation

AUTHORIZED RIFLE DIVISION	UNITS																		
	DIVISION HQ AND HQ COMPANY	2 * MOTORIZED RIFLE REGIMENTS (BTR)	MOTORIZED RIFLE REGIMENT (BMP)	TANK REGIMENT	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	ANTITANK BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL PROTECTION	ARTILLERY BATTALION BATTERY	HELICOPTER SQUADRON	TOTAL	
PERSONNEL	245	5,046	2,424	1,143	1,292	504	170	195	340	395	272	510+	230	83	175	70	200	13,294+	
Armored Cars																			
Armored Tank, T-64/72/80		80	40	94					6									220	
ROCKET LAUNCHERS																			
SSM TEL, G-7/7B or M-1/SCARAB							4											4	
120mm SP Howitzer, 2S3					54													54	
120mm SP Howitzer, 2S1			18	18														36	
120mm Howitzer, D-30		36																36	
120mm Rocket Launcher, BM-21					18													18	
120mm Mortar, M1943/M-120 or 120mm Automatic Mortar, 2B9		48	24															72	
120mm A-6a/GAINFUL TEL or SA-6b/FUL TELAR						20												20	
120mm A-9/GASKIN TEL or SA-13/ER TELAR		8	4	4														16	
120mm A-7/GRAIL or SA-14/GREMLIN -16	6	60	30	3		21												120	
120mm In. ZSU-23-4 or 2S6		8	4	4														16	
120mm Launcher Vehicle (BRDM-2)		18	9					9										36	
120mm Backpack Console, AT-3/4		24																24	
120mm Backpack Launcher, AT-7		54																54	
120mm AT Gun, T-12/MT-12								12										12	
120mm Recoilless Gun, SPG-9		12																12	
120mm G-7V	3	304	146	36	62			9	13	8		19	11			4		615	
120mm Automatic Grenade Launcher.		36	18															54	
120mm LMG, RPK-74	3	204	102	21	56				25							4		415	
120mm GPMG, PKM		54	54															108	
MORTARS																			
81mm MITE																	6	6	
81mm C or MI-17/HIP H																	4	4	

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE DIVISION	MOTORIZED RIFLE DIVISION																TOTAL	
	DIVISION HQ AND HQ COMPANY	2 x MOTORIZED RIFLE REGIMENTS (BTR)	MOTORIZED RIFLE REGIMENT (BMP)	TANK REGIMENT	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	ANTI-TANK BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY BATTERY		HELICOPTER SQUADRON
i-8T/HIP D/G																	2	2
i-24/HIND D/E/F																	6	6
CV/ACRV/AICV/APC/ASC																		
CV, BMP/BRDM/BTR		42	22	12	6	6	5	3	2	8					2		108	
CV, BRM-1*		2	1	1				3									7	
AICV, BMP-1/BMP-2		6	129	3				12									150	
APC, BTR-50/60/70/80	3	292	4	4				0-6	3								306-312	
APC, BTR-60PA (FAC)		2	1	1													4	
MRP, PRP-3 (BMP M1975)***		2	1	1	4												8	
APC, MT-LB M1975**					1												1	
APC, MT-LB, Prime Mover							14										14	
ASC, BRDM-2		8	4	4				6-12									22-28	
ACRV, 1V12 Series			8	8	24												40	
ACRV M1979 (1/2/3)		16															16	
GENERAL PURPOSE TRUCKS																		
Truck, UAZ-69/469	12	44	22	13	22	7	4	3	5	8	12	7	5	2	4	2	172	
Truck, GAZ-66	9	134	62	17	38	19	6	4	2		7	33	4	3	1	5	344	
Truck, ZIL-130/131/151/157		28	14	73	8	3		11	5	22		38	14	5	21	2	244	
Truck, Ural-375		94	67	22	90			1	4	16		120	6	1			421	
Truck, KrAZ-214/255										1							1	
Truck, KrAZ/ZIL/Ural	4	114	23	9	51	38	8				9		1				257	
VAN TRUCKS																		
Truck, Van, GAZ		12	4	4	9		6	2	17	2	21	1	3		1	1	83	
Truck, Van, ZIL/Ural	12	6	3	3	15	18	5		6			2	1		1	2	74	
Truck, Van, ZIL (Signal)		4	2	2	2	4					12						26	
Truck, Van, ZIL (Maintenance)	1	40	21	19	3	11		2	2	4	4	9	40		2		158	
Truck, Van, UAZ-452	2				1	1	4				1	1					10	
Truck, Van, Kitchen PAC-170/200		8	4	3								2					17	

(continued)

*This vehicle includes the TALL MIKE radar, which appears separately in this list.

**This vehicle includes the SMALL FRED radar, which appears separately in this list.

***This vehicle includes the BIG FRED radar, which appears separately in this list.

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE DIVISION	MOTORIZED RIFLE DIVISION																TOTAL	
	DIVISION HQ AND HQ COMPANY	2 * MOTORIZED RIFLE REGIMENTS (BTR)	MOTORIZED RIFLE REGIMENT (BMP)	TANK REGIMENT	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	ANTITANK BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY BATTERY COMMAND		HELICOPTER SQUADRON
Van, ZIL (AT-3/5 Simulator)		2	1					1										4
Van, Hospital															9			9
Van, Mobile Field Bakery												4						4
Van, Generator														1				1
TRUCKS																		
POL, ZIL/KrAZ/Ural	1	52	26	26	16	15	2	2	2	3	1	160	4	2	2			314
DECONTAMINATION TRUCKS																		
Decontamination		10	5	5	5	4								14	4			47
MILITARY RECONNAISSANCE VEHICLES																		
Reconnaissance Vehicle M-2rkh/RKhM		6	3	3	4	3			4					4				27
MULTIPURPOSE VEHICLES																		
Ambulance, UAZ-450A/452	1	18	9	8	8	2	1	1	1	1	1	1	1		20			73
Water Tank		8	4	4	3							6	1		3			29
Tractor, KrAZ-214/255													2					2
Crane, K-61		2	1	1						1		6						11
Crane Ural-375						2	1			2			3					8
Crane Shovel, E-350V		4	2	2						2								10
Pump, MMZ-555		4	2	2						3								11
Recovery, ZIL-157												2						2
Sawmill, Ural-375 (LRV SAW)										1								1
Water Purification										1								1
Gas Detector, DIM										3								3
Tractor, SA-6 Canister Transporter						15												15
Tractor, SA-6 Canister Transporter						15												15
SA-6 Missile Transloader						15												15

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE DIVISION															TOTAL			
	DIVISION HQ AND HQ COMPANY	2 * MOTORIZED RIFLE REGIMENTS (BTR)	MOTORIZED RIFLE REGIMENT (BMP)	TANK REGIMENT	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	ANTITANK BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY		MEDICAL BATTALION	ARTILLERY BATTERY COMMAND	HELICOPTER SQUADRON
...n, GAZ-24	2	2	1	1														6
...rcycle, M-72/K-750V/Ural-3		12	6	6						13		3						40
...ored Recovery Vehicle		6	3	5	1							5						20
.../SSM Transporter Vehicle						4												4
...ored Maintenance Vehicle, MTP			3															3
...or, Artillery, AT-S												1						1
ENGINEER EQUIPMENT																		
...ored Engineer Tractor, IMR									2									2
...ge, Tank-Launched, MTU/MT-55		2	1	3														6
...ge, Truck-Launched TMM		8	4	4					8									24
...ked Ferry, GSP									6									6
...Center Section on KrAZ-214									16									16
...Ramp Section on KrAZ-214									2									2
...Service Truck, KrAZ-214									1									1
...ked Amphibian, K-61/PTS									12			1						13
...hing Machine, BTM/MDK		2	1	1					4									8
...er, BAT/BAT-M/PKT		2	1	1					8									12
...der, D-144									2									2
...cket Excavator, PZM		6	3	3														12
...eclearer, MTK/MTK-2									2									2
...eclearing Plow, KMT-4/6		18	9	27														54
...e Roller-Plow, KMT-5M		6	3	9														18
...e Driver Set, KMS (on 3 ZIL Trucks)									1									1
...verboat, BMK-90/150									6									6
...elaye, SP, Armored, GMZ									3									3
...elaye, Towed, PMR-3		6	3	3														12
...ctor, K-700									2			1						3
...ter Purification Set, MAFS		2	1	1														4

(continued)

Personnel and Equipment Recapitulation (continued)

MOTORIZED RIFLE DIVISION	MOTORIZED RIFLE DIVISION																	
	DIVISION HQ AND HQ COMPANY	2 nd MOTORIZED RIFLE REGIMENT'S (BTR)	MOTORIZED RIFLE REGIMENT (BMP)	TANK REGIMENT	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	ANTITANK BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL PROTECTION	ARTILLERY BATTALION BATTERY	HELICOPTER SQUADRON	TOTAL
Inflatable Boat, NDL-10										10								10
Concrete Mixer										1								1
Generators																		
Generator, Lowboy										1								1
Generator, POL	1	40	20	17	16	7		1	2	2	1	160	4		2			273
Generator, Cargo, 1-Axle		14	7	3						4	10	2						40
Generator, Cargo, 2-Axle	4	114	56	66	101	15	2	10		6		122	13		10	2		521
Generator, 1-Axle	1	14	7	6	2	13				2			6					51
Generator, 2-Axle	2	8	4	4	4		4	1	2	2	10	6	1		2	2		52
Generator, Water	1	14	7	6	6	4	1	1	1	3	1	7	1	4	1			58
Generator, Field Kitchen	3	32	15	6	14	11	1	2	4	5	2		3		4			102
Generator, Decon, DKV/DDP															3			3
Generator, Van, 2-Axle						13												13
Generator, Amphibious, PKP										3								3
Generator, Compressor										1								1
Generator, Saw, 2-Axle										1								1
Generators ASSOCIATED EQUIPMENT																		
Generator, Under		16	8	4	15				3							2		48
Generator, Ranging Set					1													1
Generators																		
Generator, Battlefield Surveillance FRED					1													1
Generator, Battlefield Surveillance SMALL		2	1	1	4													8
Generator, Battlefield Surveillance, TALL		2	1	1					3									7
Generator, Battlefield Surveillance, Man-portable, PSNR-1								3										3
Generator, Counter-Mortar/Counter-rocket					1													1
Generator, Aerial Surveillance/Target Acq. TRACK						2												2

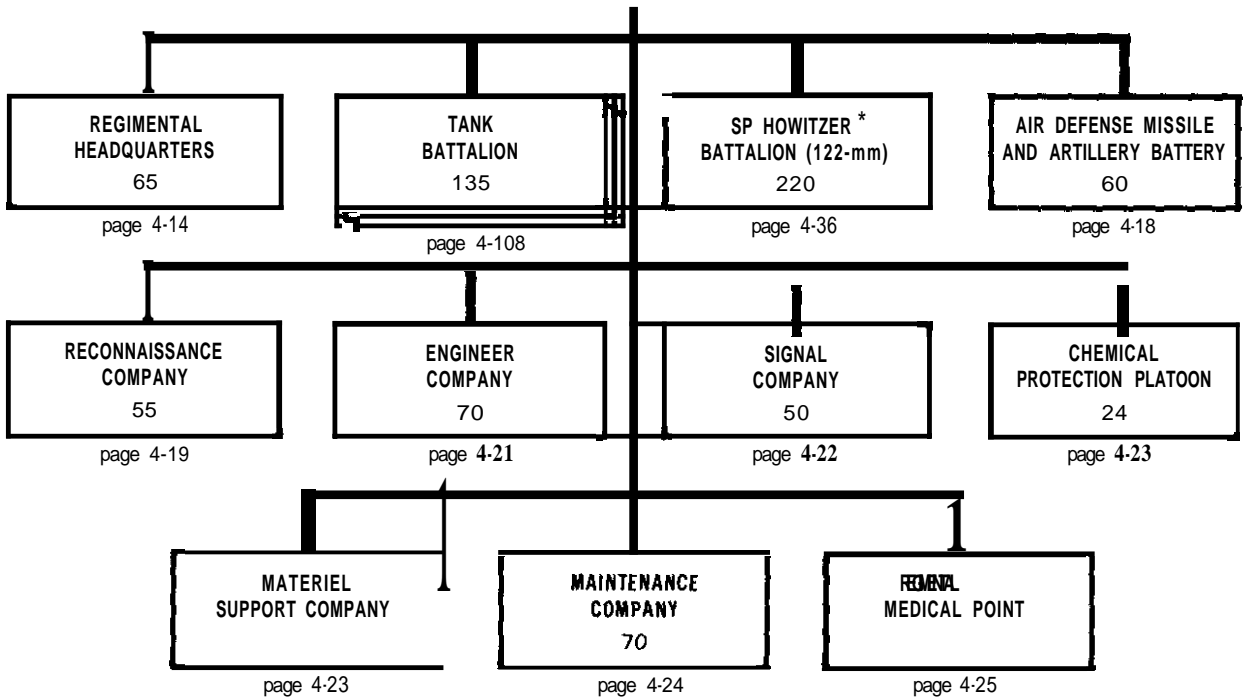
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Tank Regiment (T-64/72/80), MRD

The TR of the MRD provides the division with a highly integrated armor threat in addition to the TBs that are organic to the MRRs. The TR has three TBs of 31 medium tanks each. It also has a battalion of 18 2S1 122-mm SF howitzers.

This TR (of the MRD) lacks organic motorized rifle assets. It does have reconnaissance, air defense, signal, engineer, and chemical protection assets as well as a limited CSS capability similar to that found in the MRR.

REGIMENT

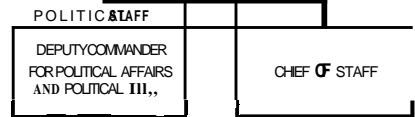
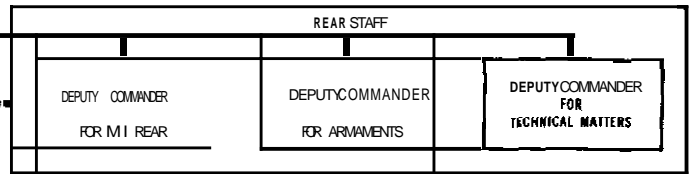
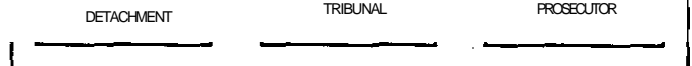
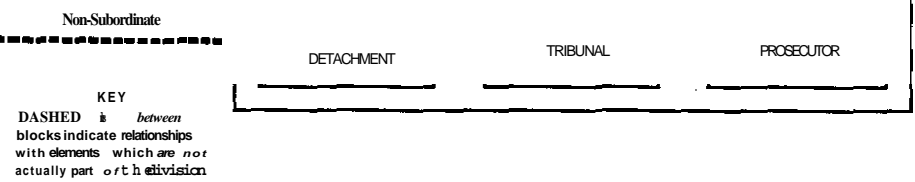
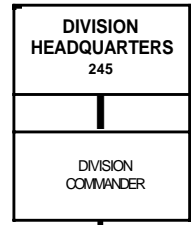


- NOTES.**
1. If this TR has T-54/55/62 tanks, personnel strength will increase by 94 enlisted personnel.
 2. Approximately 150 personnel in the regiment are officers
 3. Starting in 1989, the Soviets are converting the TR, MRD to a BMP-equipped MRR.

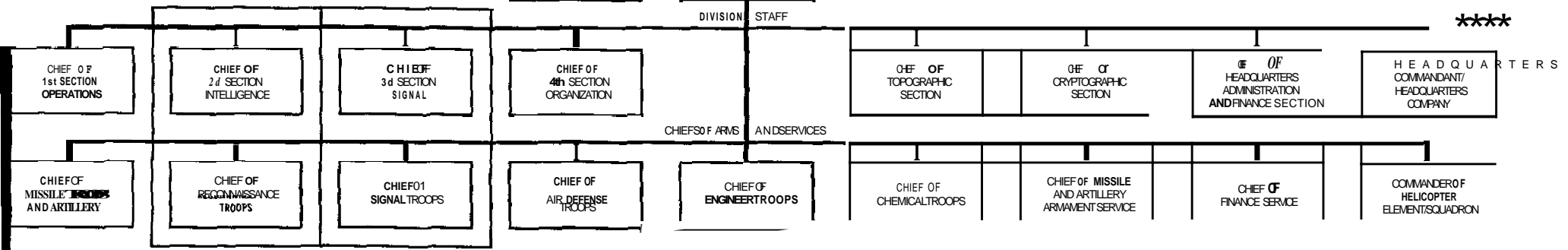
FOOTNOTE. *In some TRs, the howitzer battalion may still have the 122-mm towed howitzer D-30 (See p. 4-16 for the organization and equipment of a D-30 howitzer battalion.)

PRINCIPAL ITEMS OF EQUIPMENT

Total	Equipment	Total
6	Truck, POL	1
1	Truck, Ambulance, UAZ-450A/452	1
3	Sedan, GAZ-24	2
3	Trailer, Cargo, 2-Axle	4
3	Trailer, Generator, 2-Axle	2
12	Trailer, Generator, 1-Axle	1
9	Trailer, POL	1
4	Trailer, Water	1
2	Trailer, Kitchen	3
1	Radio:	
2	VHF, Vehicle Mount, Medium-Power, R-123	3



Signal battalion provides C2 vehicles to the division commander and key members of staff. The division headquarters company (approximately 105 personnel) is equipped to provide administrative/logistic support to headquarters elements.



These three sections assist the division commander, but they are not subordinate to him. Corresponding offices at Army supervise them. The KGB Counterintelligence Detachment (Special Staff) normally consists of about 16 personnel. The personnel totals for the division do not include these personnel.

**The First Deputy Commander is a peace-time position only.

***The chief of the intelligence section is also the chief of reconnaissance troops.

****The chief of the signal section is also the chief of signal troops.

*****The division headquarters company includes personnel who perform traffic control duties.

Personnel and Equipment Recapitulation

TANK REGIMENT
(T-64/72/80). MRD

	REGIMENTAL HEADQUARTERS	3 TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
PERSONNEL	65	405	220	60	55	70	50	24	90	70	34	1,143
TANKS												
Medium Tank, T-64/72/80	1	93										94
WEAPONS												
122-mm SP Howitzer 2S1			18									18
SAM, SA-9/GASKIN, TEL or SA-13/GOPHER TELAR				4								4
SPAA Gun, ZSU-23-4 or 2S6				4								4
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3											3
ATGL, RPG-7V		6	18		4	4				4		36
5.45-mm LMG, RPK-74			18		3							21
ACV/AICV/APC/ASC/ACRV												
ACV, BMP/BRDM/BTR		6		3			3					12
ACV, BRM-1*					1							1
AICV, BMP-1/BMP-2					3							3
APC, BTR-50/60/70/80	1					3						4
APC, BTR-60 PA (FAC)	1											1
MRP, PRP-3 (BMP M1975)**			1									1
ASC, BRDM-2					4							4
ACRV, IV12 Series			8									8
GENERAL PURPOSE TRUCKS												
Truck, UAZ-69/469	3		1			1	5		2	1		13
Truck, GAZ-66			7	2			3		4		1	17
Truck, ZIL-130/131/151/157		21		4					45	1	2	73
Truck, Ural-375	1		20							1		22
Truck, KrAZ/ZIL/Ural						9						9
VAN TRUCKS												
Truck, Van, GAZ							3				1	4
Truck, Van, ZIL (Command)	3											3
Truck, Van, ZIL (Signal)							2					2

(continued)

*This vehicle includes the TALL MIKE radar, which appears separately in this list.

*+This vehicle includes the SMALL FRED radar, which appears separately in this list.

Personnel and Equipment Recapitulation (continued)

TANK REGIMENT (T-64/72/80), MRD	REGIMENTAL HEADQUARTERS	3 * TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
	Truck, Van, ZIL (Maintenance)		3	2		1			1	12		
Truck, Van, Kitchen, PAC-170/200		3										3
POL TRUCKS												
Truck, POL, ZIL/Ural/KrAZ		9	2					15				26
DECONTAMINATION TRUCKS												
Truck, Decontamination							4			1		5
CHEMICAL RECONNAISSANCE VEHICLES												
Chemical Reconnaissance Vehicle BRDM-2rkh/RKhM							3					3
MISC SPECIAL PURPOSE VEHICLES												
Truck, Water Tank								4				4
Truck, Ambulance, UAZ-450A/452		3	1							4		8
Truck, Crane, K-61					1							1
Truck, Crane Shovel, E-350V					2							2
Truck, Dump, MMZ-555					2							2
Sedan, GAZ-24	1											1
Motorcycle				3		3						6
Armored Recovery Vehicle									5			5
ENGINEER EQUIPMENT												
Bridge, Tank-Launched, MTU/MT-55					3							3
Bridge, Truck-Launched, TMM					4							4
Ditching Machine, BTM/MDK					1							1
Dozer, BAT/BAT-M/PKT					1							1
Bucket Excavator, PZM					3							3
Mineclearing Plow, KMT-4/6					27							27
Mine Roller-Plow, KMT-5M					9							9
Minelayer, Towed, PMR-3					3							3
Water Filtration Set, MAFS					1							1
TRAILERS												
Trailer, POL			2					15				17

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Personnel and Equipment Recapitulation (continued)

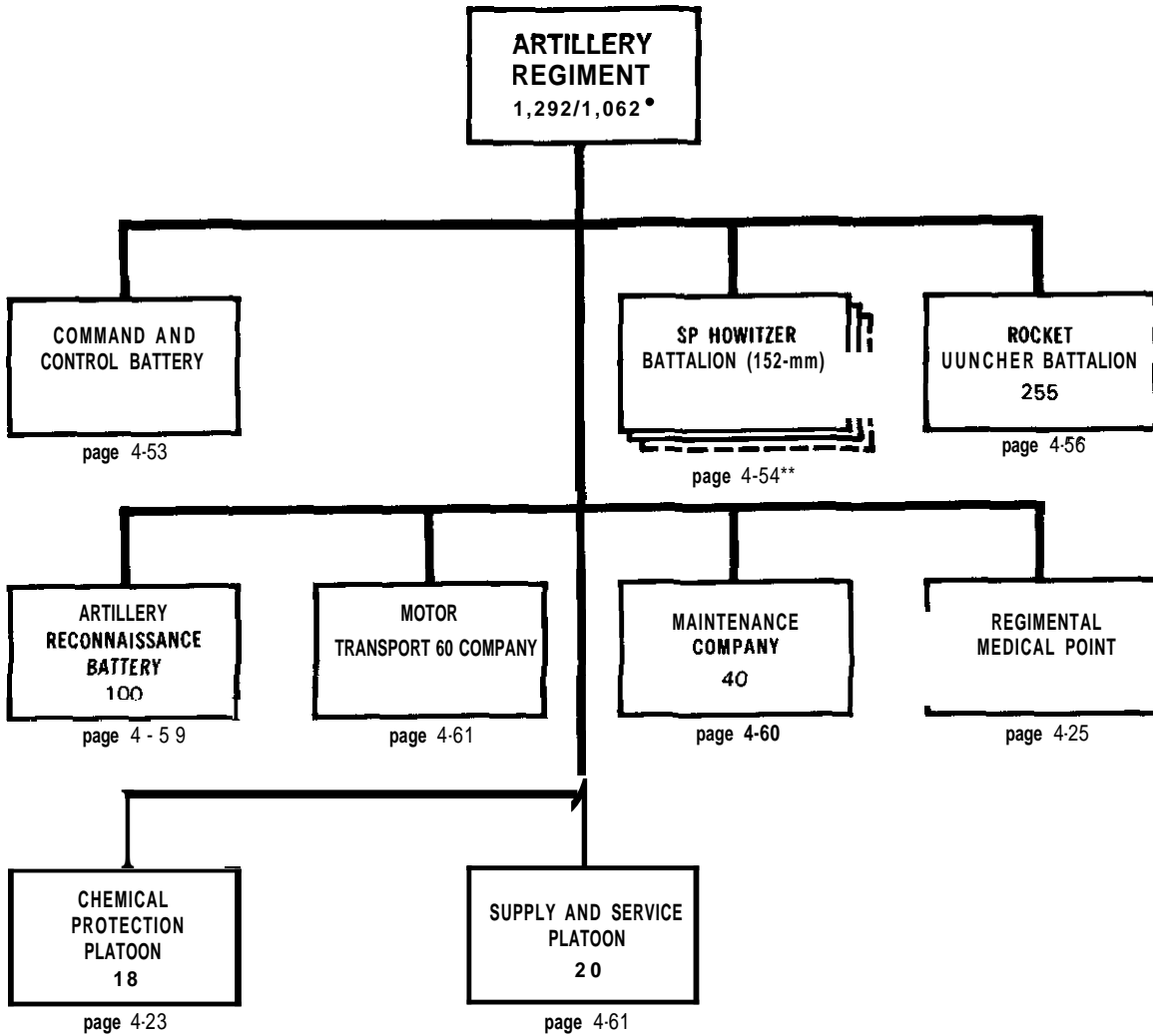
TANK REGIMENT
(T-64/72/80). MRD

	REGIMENTAL HEADQUARTERS	3 x TANK BATTALION	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
Trailer, Cargo, 1-Axle		3										3
Trailer, Cargo, 2-Axle		18	10			2			30	6		66
Trailer, Generator, 1-Axle		3						1	2			6
Trailer, Generator, 2-Axle				2		1				1		4
Trailer, Water		3	1					1			1	6
Trailer, Field Kitchen			3					2			1	6
ARTILLERY ASSOCIATED EQUIPMENT												
Rangefinder			4									4
RADARS												
Battlefield Surveillance, TALL MIKE					1							1
Battlefield Surveillance, SMALL FRED			1									1
RADIOS												
HF or VHF, Manpack, Low-Power, R-104M or R-107						4						4
HF, Manpack, Low-Power, R-104M		6			1		2	1				10
HF, Vehicle-Mount, Medium-Power, R-130	1	15			1		2					19
HF, Van-Mount, High-Power, R-118							1					1
HF/VHF, Vehicle-Mount, Medium-Power							2					2
HF/VHF, Vehicle-Mount, High-Power							2					2
VHF, Manpack, Low-Power, R-107	2	3	10	2	3		7		1	1	1	30
VHF, Vehicle-Mount, Medium-Power, R-123	2	99	28	11	7	7	2	4		5		165
Warning Receiver, R-311		3	2	3	1		3					12
Radio Relay, VHF/UHF, R-401/405							2					2

Artillery Regiment, MRD and TD

The artillery regiment of an MRD normally consists of three battalions of 152-mm SP howitzers (2S3) and one battalion of 122-mm rocket launchers (BM-21). In a TD, it normally has only two battalions of 2S3s and one battalion of BM-21s. How-

ever, some divisions may not yet conform to this standard; such divisions may still have one or more battalions with older weapon systems such as the 122-mm towed howitzer D-30.



FOOTNOTES: *Motorized rifle/tank division.

**See p. 4-16 for the organization of a 0-30-equipped 122-mm howitzer battalion that may still exist in some divisions in place of a 152-mm SP howitzer battalion.

Personnel and Equipment Recapitulation

ARTILLERY REGIMENT.
MRD AND TD

	COMMAND AND CONTROL BATTERY	2 * HOWITZER BATTALION (152-mm) in TD	3 * HOWITZER BATTALION (152-mm) in MRD	ROCKET LAUNCHER BATTALION	ARTILLERY RECONNAISSANCE BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	CHEMICAL PROTECTION PLATOON	SUPPLY AND SERVICE PLATOON	TOTAL TD/MRD
PERSONNEL	75	460 / 690	255	100	60	40	34	18	20	1,062/1,292	
WEAPONS											
152-mm SP Howitzer, 2S3*		36 / 54								36/54	
122-mm Rocket Launcher, BM-21			18							18	
ATGL, RPG-7V	4	36 / 54				4				44/62	
5.45-mm LMG, RPK-74		36 / 54				2				38/56	
ACV/APC/ACRV											
ACRV, M1979 (1/2/3)			8							8	
ACRV, IV12 Series		16 / 24								16/24	
ACV, BTR-60/70/80	3		1	2						6	
APC, MT-LB M1975**				1						1	
MRP, PRP-3 (BMP M1975)***		2 / 3		1						3/4	
GENERAL PURPOSE TRUCKS											
Truck, UAZ-69/469	6	2 / 3	5	6	1	1				21/22	
Truck, GAZ-66	2	14 / 21	6	7	1		1			31/38	
Truck, ZIL/Ural	1	4 / 6			36	3	2		3	49/51	
Truck, ZIL-130/131/151/157			8							8	
Truck, Ural-375		36 / 54	36							72/90	
VAN TRUCKS											
Truck, Van, GAZ	2			4		2	1			9	
Truck, Van, ZIL/Ural	1	4 / 6			2	6				13/15	
Truck, Van, CAZ (Command)			1							1	
Truck, Van, GAZ (Signal)			2							2	
Truck, Van, ZIL (Maintenance)			3							3	

(continued)

FOOTNOTES. *Some artillery regiments may have one battalion of eighteen 122-mm towed howitzers D-30 instead of one of the 2S3 battalions. Some 2S3 battalions may have 24 tubes rather than the 18 shown here.
**This vehicle includes the BIG FRED radar, which appears separately in this list.
***This vehicle includes the SMALL FRED radar, which appears separately in this list.

Personnel and Equipment Recapitulation (continued)

ARTILLERY REGIMENT.
MRD AND TD

	COMMAND AND CONTROL BATTERY	2 * HOWITZER BATTALION (152-mm) in TD	3 * HOWITZER BATTALION (152-mm) in MRD	ROCKET LAUNCHER BATTALION	ARTILLERY RECONNAISSANCE BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	CHEMICAL PROTECTION PLATOON	SUPPLY AND SERVICE PLATOON	TOTAL TD/MRD
POL TRUCKS											
Truck, POL, ZIL/Ural		4 / 6	2		8						14/16
SPECIAL PURPOSE VEHICLES											
Armored Recovery Vehicle						1					1
Truck, Decontamination							1	4			5
Chemical Reconnaissance Vehicle, BRDM-2rkh/RKhM	1							3			4
Truck, Ambulance, UAZ-450A/452		2 / 3	1				4				7/8
Truck, ZIL-130/131 (Water)					3						3
Truck, Van, UAZ-452 (Computer)				1							1
TRAILERS											
Trailer, POL		4 / 6	2		8						14/16
Trailer, Cargo, 2-Axle	1	20 / 30	36		30	3			1		91/101
Trailer, Generator, 1-Axle				2							2
Trailer, Generator, 2-Axle			2			2					4
Trailer, Water		2 / 3	1				1		1		5/6
Trailer, Field Kitchen		6 / 9	3				1		1		11/14
ARTILLERY-ASSOCIATED EQUIPMENT											
Rangefinder, Laser, SAGE GLOSS	1	8 / 12		2							11/15
Sound Ranging Set				1							1
Radar Direction Finder				3							3
RADARS											
Radar, Meteorological, END TRAY				1							1
Radar, Battlefield Surveillance, BIG FRED				1							1
Radar, Battlefield Surveillance, SMALL FRED		2 / 3		1							3/4
Radar, Countermortar/ Counterbattery				1							1
RADIOS											
HF, Manpack, Low-Power, R-104M	1							1			2

(continued)

Personnel and Equipment Recapitulation (continued)

ARTILLERY REGIMENT, MRD AND TD											TOTAL TD/MRD
	COMMAND AND CONTROL BATTERY	2 × HOWITZER BATTALION (152-mm) in TD	3 × HOWITZER BATTALION (152-mm) in MRD	ROCKET LAUNCHER BATTALION	ARTILLERY RECONNAISSANCE BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	CHEMICAL PROTECTION PLATOON	SUPPLY AND SERVICE PLATOON	
HF, Vehicle-Mount, Medium-Power, R-130	5										5
HF/VHF, Vehicle-Mount, Medium-Power	3		2								5
HF/VHF, Vehicle-Mount, High-Power	1										1
VHF, Portable, Low-Power, R-148 or Very-Low-Power, R-126	1										1
VHF, Manpack, Low-Power, R-107	6	20 / 30	18	13	1	1	1				60/70
VHF, Vehicle-Mount, Medium-Power, R-123	3	56 / 84		4				1			64/92
Warning Receiver, R-311	1	4 / 6	1	1							7/9
Radio Relay, VHF/UHF, R-401/405	1										1

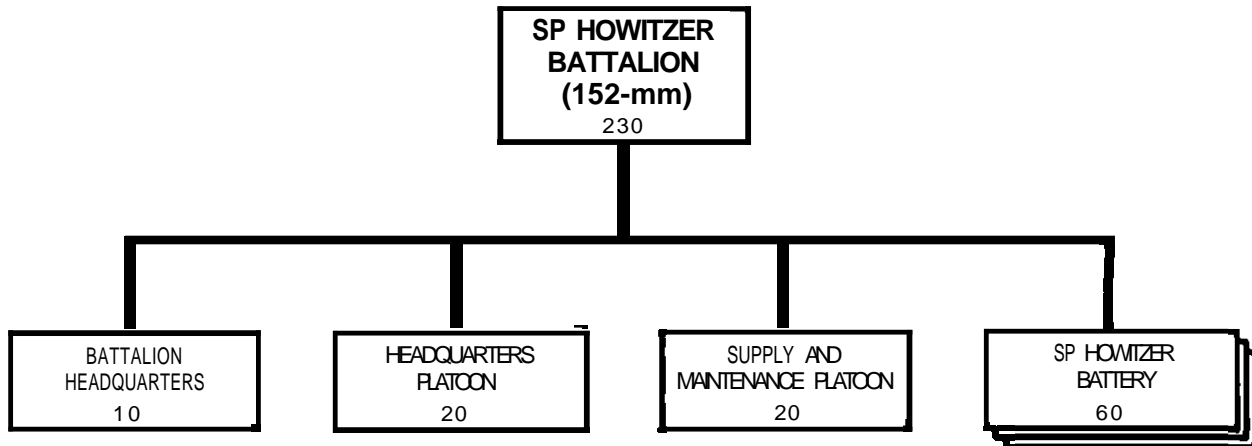
Command and Control Battery. Artillery Regiment. MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-7V	4	Radios:	
ACV. BTR-50/60	2	HF, Manpack, Low-Power, R-104M	1
Truck. UAZ-69/469	6	HF, Vehicle Mount, Medium-Power, R-130	5
Truck. GAZ-66	2	HF/VHF, Vehicle Mount, Medium-Power	3
Truck, ZIL/Ural	1	HF/VHF, Vehicle Mount, High-Power	1
Chemical Recon Vehicle, BRDM-2rkh/RKhM	1	VHF, Portable, Low-Power, R-148 or Very-Low-Power, R-126	1
Truck, Van, GAZ	2	VHF, Manpack, Low-Power, R-107	6
Truck, Van, ZIL	1	VHF, Vehicle Mount, Medium-Power, R-123 ...	3
Trailer, Cargo	1	Warning Receiver, R-311	1
Rangefinder, Laser, SAGE GLOSS	1	Radio Relay, VHF/UHF, R-401/405	1

152-mm SP Howitzer Battalion.
 Artillery Regiment, MRD and TD



Page 4-55

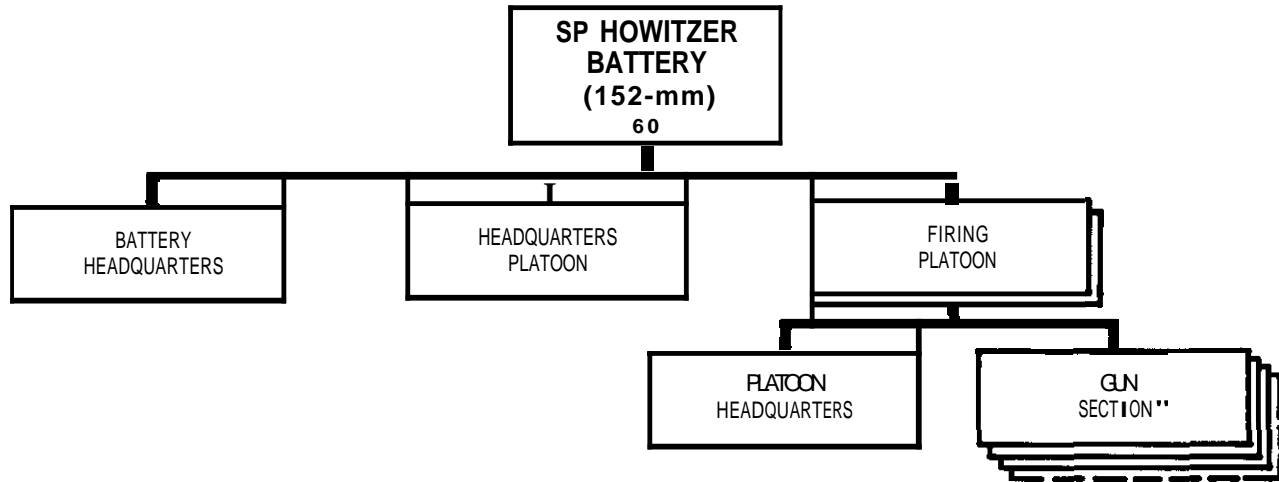
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
152-mm SP Howitzer, 2S3*	18	Truck. POL	2
ATGL, RPG-7V	18	Truck. Ambulance. UAZ-450A/452	1
5.45-mm LMG. RPK-74	18	Trailer, Cargo	10
Mobile Reconnaissance Post, PRP-3 (BMP M1975)**	1	Trailer, Water	1
ACRV, 1V13	3	Trailer, Field Kitchen	3
ACRV, 1V14	3	Trailer, POL	2
ACRV, 1V15	1	Rangefinder, Laser. SAGE GLOSS	4
ACRV, 1V16	1	Radar. Battlefield Surveillance. SMALL FRED	1
Truck. UAZ-69/469	1	Radios:	
Truck, GAZ-66	7	VHF, Manpack, Low-Power, R-107	10
Truck. ZIL/Ural	20	VHF, Vehicle Mount. Medium-Power.	
Truck, Van, ZIL (Maintenance)	2	R-123	28
		Warning Receiver. R-311	2

FOOTNOTES. *Some 2S3 battalions may have 24 tubes rather than the 18 shown here.

**This vehicle includes the SMALL FRED radar, which appears separately in this list.

152-mm SP Howitzer Battery, 152-mm SP Howitzer
 Battalion, Artillery Regiment, M R D and TD

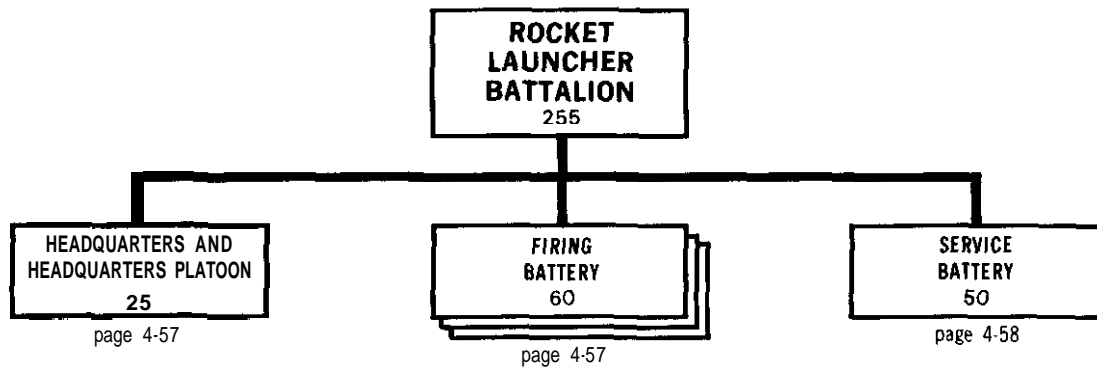


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
152-mm SP Howitzer. 2S3*	6	Truck. Ural-375	6
ATGL, RPG-7V	6	Trailer. Cargo	1
5.45-mm LMG. RPK-74	6	Rangefinder, Laser. SAGE GLOSS	1
ACRV, M 1974(1)	1	Radios:	
ACRV, 1V14	1	VHF. Manpack. Low-Power. R-107	2
Truck. GAZ-66	1	VHF. Vehicle Mount, Medium-Power, R-123 ...	8

FOOTNOTE. *Some 2S3 battalions may have expanded from 6-tube to 8-tube batteries, adding a fourth gun section to each firing platoon.

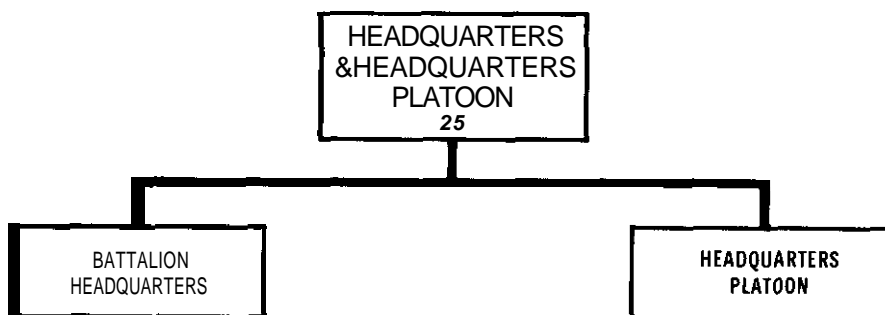
Rocket Launcher Battalion.
 Artillery Regiment. MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm Rocket Launcher (40-Round) BM-21 ...	18	Truck, POL	2
ACV, BTR-60/70/80	1	Truck, Ambulance, UAZ-450A/452	1
ACRV M 1979(1)	3	Trailer, Cargo, 2-Axle	36
ACRV M 079 (2)	4	Trailer, Generator, 2-Axle	2
ACRV M1979 (3)	1	Trailer, Water	1
Truck, UAZ-69/469	5	Trailer, POL, 2-Axle	2
Truck, GAZ-66	6	Trailer, Kitchen	3
Truck, ZIL-130/131/151/157	8	Radios:	
Truck, Ural-375	36	HF/VHF, Vehicle Mount, Medium-Power	2
Truck, Van, GAZ (Command)	1	VHF, Manpack, Low-Power, R-107	18
Truck, Van, GAZ (Signal)	2	Warning Receiver, R-311	1
Truck, ZIL (Maintenance)	3		

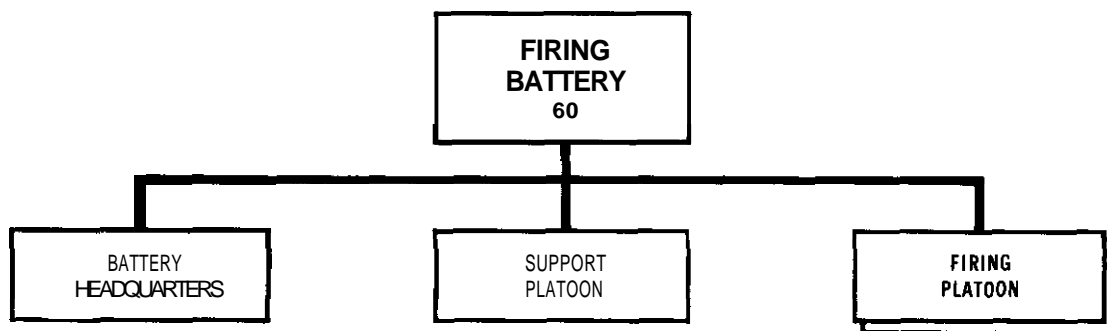
Headquarters and Headquarters Platoon. Rocket Launcher Battalion, Artillery Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV, BTR-60/70/80	1	Truck. Ambulance. UAZ-450A/452	1
ACRV, M1979 (2)	1	Trailer. Generator. 2-Axle	1
ACRV, M 1979 (3)	1	Radios:	
Truck. UAZ-69/469	1	HF/VHF. Vehicle Mount. Medium-Power	2
Truck. ZIL-130/131/151/157	1	VHF. Manpack. Low-Power. R-107	5
Truck, Van, GAZ (Command)	1	Warning Receiver. R-311	1
Truck. Van, GAZ (Signal)	2		

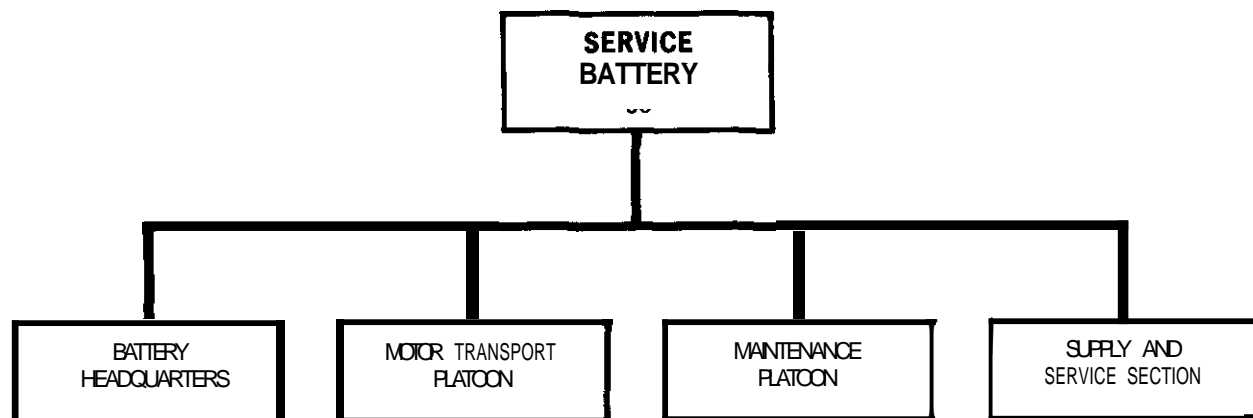
Firing Battery, Rocket Launcher Battalion, Artillery Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm Rocket Launcher (40-Round) BM-21	6	Truck. Ural-375	6
ACRV, M1979 (1)	1	Trailer. Cargo. 2-Axle	6
ACRV, M 1979 (2)	1	Radio:	
Truck. UAZ-69/469	1	VHF. Manpack, Low-Power. R-107	4
Truck, GAZ-66	2		

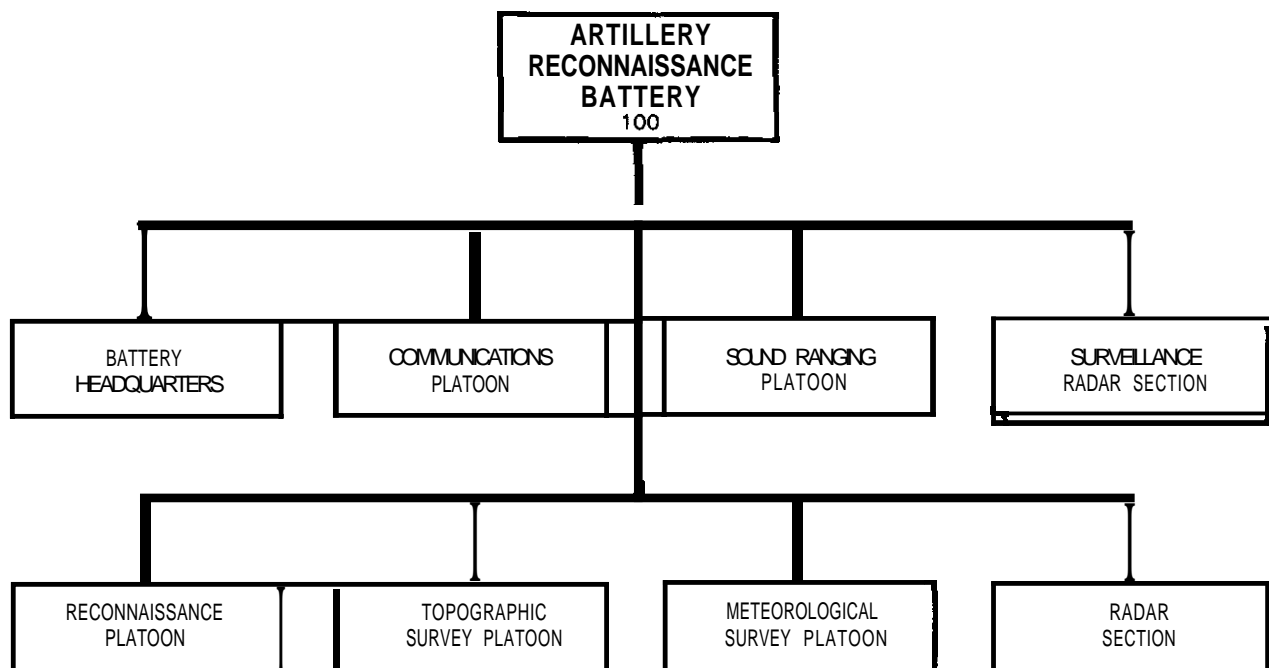
Service Battery, Rocket Launcher Battalion,
 Artillery Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Trailer, Generator, 2-Axle	1
Truck, ZIL-130/131/151/157	7	Trailer, Water	1
Truck, Ural-375	18	Trailer, POL, 2-Axle	2
Truck, Van, ZIL (Maintenance)	3	Trailer, Kitchen	3
Truck, POL.	2	Radio:	
Trailer, Cargo, 2-Axle	18	VHF, Manpack, Low-Power, R-107	1

Artillery Reconnaissance Battery.
 Artillery Regiment, MRD and TD



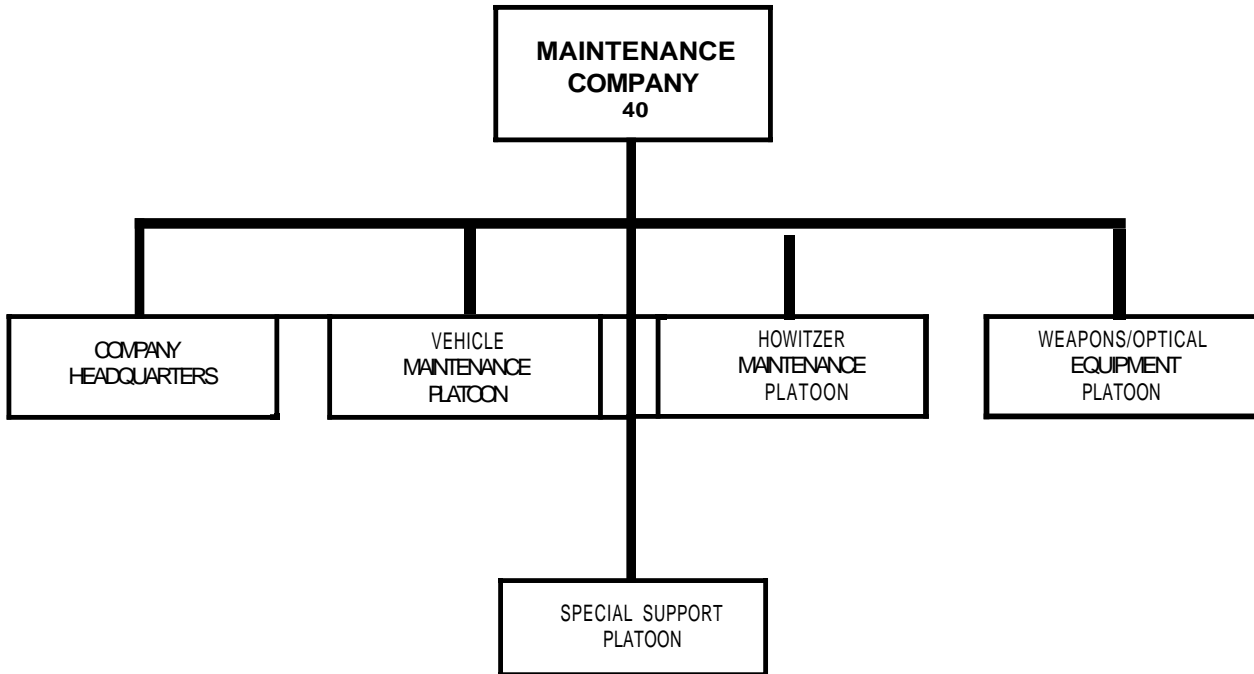
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV, BTR-60/70/80	2	Sound Ranging Set	1
APC. Radar, MT-LB M1975*	1	Radar, Direction Finder	3
Mobile Recon Post, PRP-3** (BMP M1975)	1	Radar, Meteorological, END TRAY	1
Truck, UAZ-69/469	6	Radar, Battlefield Surveillance, BIG FRED	1
Truck, GAZ-66	7	Radar, Battlefield Surveillance, SMALL FRED	1
Truck. Van, GAZ	4	Radar, Countermortar/Counterbattery	1
Truck, Van, UAZ-452 (Computer)	1	Radios:	
Trailer, Generator, 1-Axle	2	VHF, Manpack, Low-Power. R-107	13
Rangefinder. Laser, SAGE GLOSS	2	VHF, Vehicle Mount. Medium-Power. R-123 ...	4
		Warning Receiver, R-311	1

FOOTNOTES. This vehicle includes the BIG FRED radar, which appears separately in this list.

**This vehicle includes the SMALL FRED radar. which appears separately in this list.

Maintenance Company.
 Artillery Regiment, MRD and TD

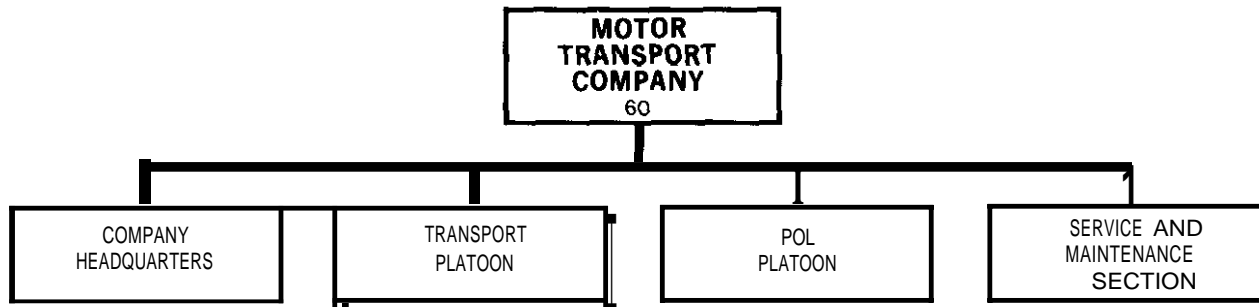


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGL. RPG-7V	4
5.45-mm LMG, RPK-74	2
Truck, UAZ-69/469	1
Truck, ZIL/Ural	3
Truck, Van. ZIL (Maintenance)	6
Truck. Van. GAZ	2

Equipment	Total
Armored Recovery Vehicle	1
Trailer, Cargo, 2-Axle	3
Trailer, Generator. 2-Axle	2
Radio:	
VHF, Manpack, Low-Power, R-107	1

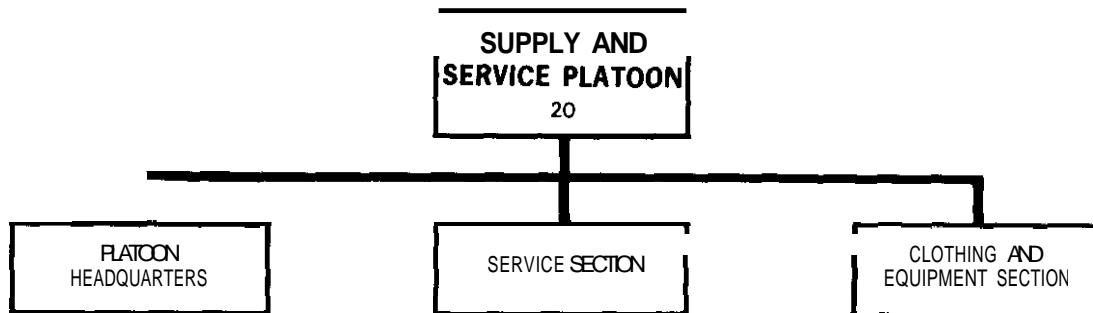
Motor Transport Company,
Artillery Regiment. M R D and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	1	Truck. POL	8
Truck. GAZ-66	1	Trailer, POL	8
Truck. ZIL/Ural	36	Trailer. Cargo	30
Truck. Van. ZIL (Maintenance)	2	Radio:	
Truck. ZIL-130/131 (Water)	3	VHF. Manpack. Low-Power. R-107	1

Supply and Service Platoon,
Artillery Regiment, MRD and TD



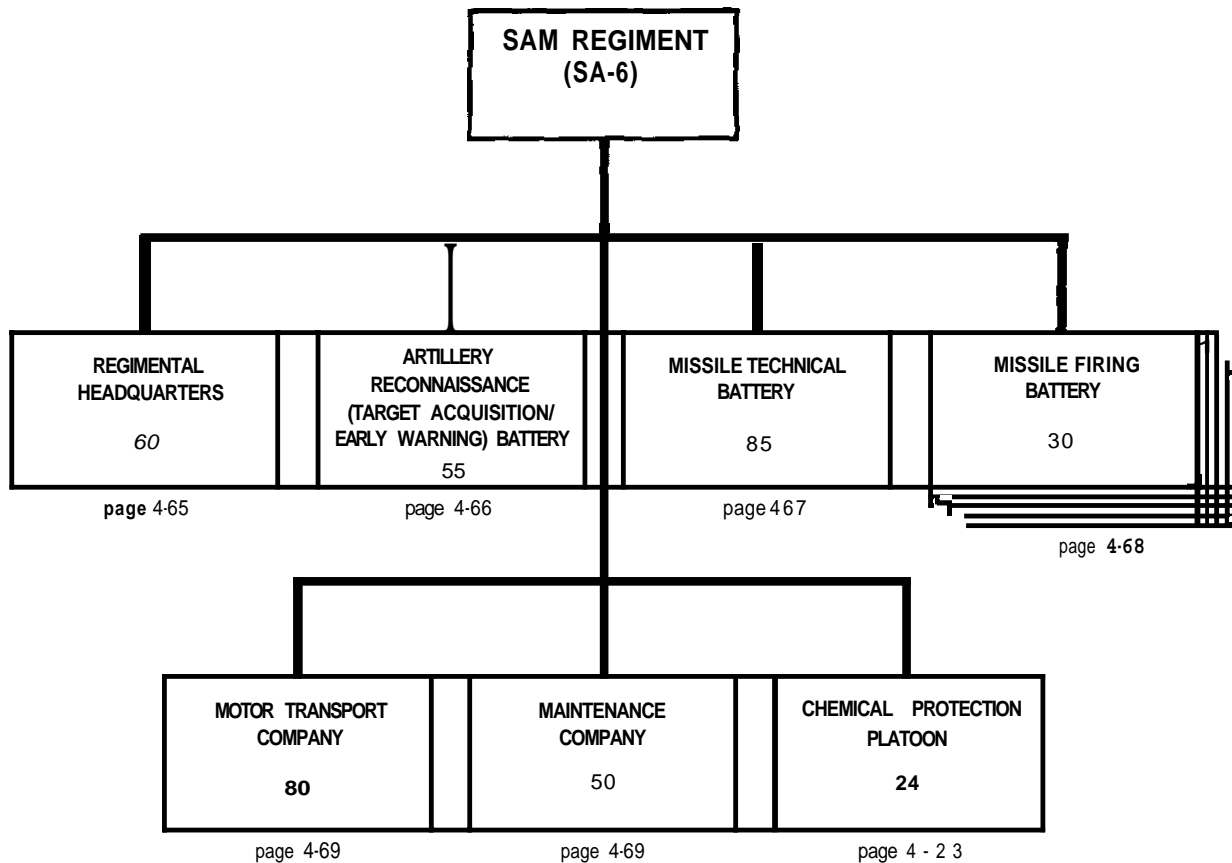
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, ZIL/Ural	3	Trailer. Water	1
Trailer, Cargo	1	Trailer. Field Kitchen	2

SAM Regiment (SA-6). MRD and TD

The SAM regiment makes up an important part of an extensive air defense envelope over the battlefield. This chapter depicts the SA-6 SAM regiment as standard at division level. However, many divisional SAM regiments have the SA-8 as an alternative to the SA-6. Antiaircraft artillery (AAA)

regiments equipped with the 57-mm towed anti-aircraft gun S-60 still exist in some divisions in rear areas. Although the SA-6 SAM regiment appears here, this chapter also provides organization charts and equipment tables for the SA-8 SAM regiment (p. 4-101) and the S-60 AAA regiment (p.4-104).



NOTE. Since 1979, a very limited number of SAM regiments have deployed the new SA-6b SAM alongside the SA-6a.

Personnel and Equipment Recapitulation

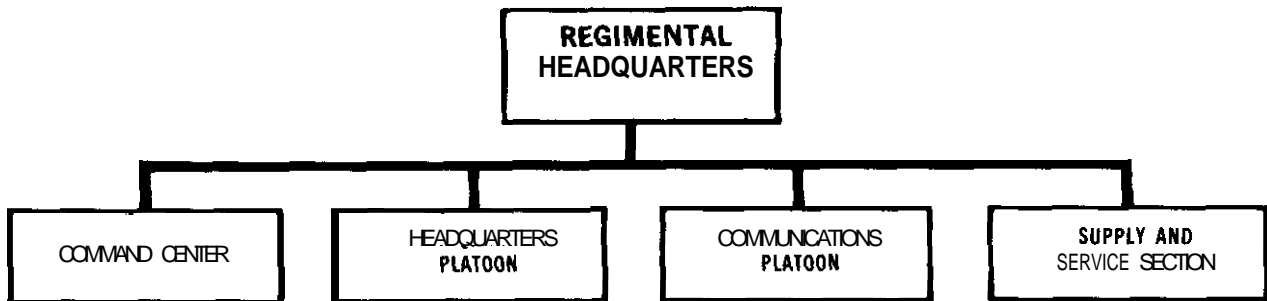
SAM REGIMENT (SA-6), MRD AND TD								
	REGIMENTAL HEADQUARTERS	ARTILLERY RECONNAISSANCE BATTERY	MISSILE TECHNICAL BATTERY	5 * MISSILE FIRING BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	TOTAL
PERSONNEL	60	55	85	150	80	50	24	504
WEAPONS								
SAM, SA-6a/GAINFUL TEL or SA-6b/ GAINFUL TELAR				20				20
SAM, SA-7/GRAIL or SP-14/GREMLIN or SA-16	3		3	15				21
ACV								
ACV, BRDM-2				5				5
ACV, BTR-60PA	1							1
GENERAL PURPOSE TRUCKS								
Truck, UAZ-69/469	1	3	1		1	1		7
Truck, GAZ-66	3	1	6	5	1	3		19
Truck, ZIL-151/157						3		3
Truck, KrAZ/ZIL/Ural			5		33			38
VAN TRUCKS								
Truck, Van, Ural/ZIL	2	1	6	5	4			18
Truck, Van (Signal)	4							4
Truck, Van (Maintenance)					3	8		11
Truck, Van, UAZ-452 (Computer)		1						1
POL TRUCKS								
Truck, POL, ZIL/Ural					15			15
SPECIAL PURPOSE TRUCKS								
Truck, Tractor, Canister Transport			15					15
Truck, Missile Transloader, ZIL-131			5	10				15
Truck, Crane, Ural-375			2					2
Truck, Ambulance, UAZ-450A/452	2							2
Truck, Decontamination							4	4
CHEMICAL RECONNAISSANCE VEHICLES								
Chemical Reconnaissance Vehicle, BRDM-2rkh/RKhM							3	3

(continued)

Personnel and Equipment Recapitulation (continued)

SAM REGIMENT (SA-6), MRD AND TD	REGIMENTAL HEADQUARTERS	ARTILLERY RECONNAISSANCE BATTERY	MISSILE TECHNICAL BATTERY	5 * MISSILE FIRING BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	TOTAL
TRAILERS								
Semitrailer, Canister Transporter			15					15
Trailer, POL, 2-Axle					7			7
Trailer, Van, 2-Axle	4	1	1	5	2			13
Trailer, Cargo, 2-Axle		1	1	5	5	3		15
Trailer, Generator, 1-Axle	2		1		3	7		13
Trailer, Water					3	1		4
Trailer, Kitchen	1	1	2	5	1	1		11
RADARS								
Radar, Aerial Surv/Target Acq., LONG TRACK		2						2
Radar, Height-Finding, THIN SKIN		1						1
Radar, Fire Control, STRAIGHT FLUSH				5				5
RADIOS								
HF, Manpack, Low-Power, R-104M		2					1	3
HF/VHF, Vehicle Mount, Medium-Power	4							4
HF/VHF, Vehicle Mount, High-Power	2							2
VHF, Portable, Low-Power, R-148			3					3
VHF, Manpack, Low-Power, R-107	1	2	1	5	1	1		11
VHF, Vehicle Mount, Medium-Power, R-123	1	3		30			3	37
Warning Receiver, R-311	2			5				7
Radio Relay, VHF/UHF, R-401/405	1							1

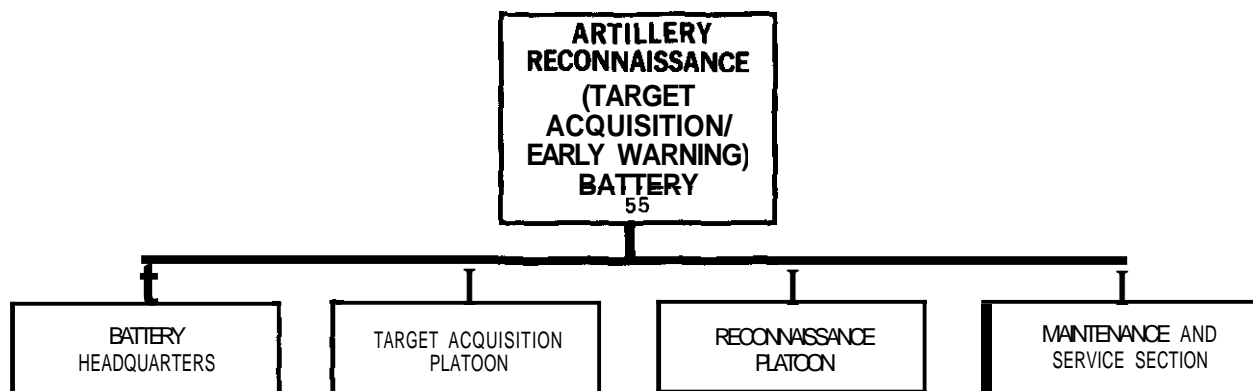
Regimental Headquarters.
 SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
SAM, SA-7/GRAIL or SA-14/GREMLIN		Trailer, Generator, 1-Axle	2
or SA-16	3	Trailer, Kitchen	1
ACV, BTR-60 PA	1	Radios:	
Truck, UAZ-69/469	1	HF/VHF, Vehicle Mount, Medium-Power	4
Truck, GAZ-66	3	HF/VHF, Vehicle Mount, High-Power	2
Truck, Van, Ural-375	2	VHF, Manpack, Low-Power, R-107	1
Truck, Van, Ural-375 (Signal)	4	VHF, Vehicle Mount, Medium-Power, R-123	1
Truck, Ambulance, UAZ-450A/452	2	Warning Receiver, R-311	2
Trailer, Van, 2-Axle	4	Radio Relay, VHF/UHF, R-401/405	1

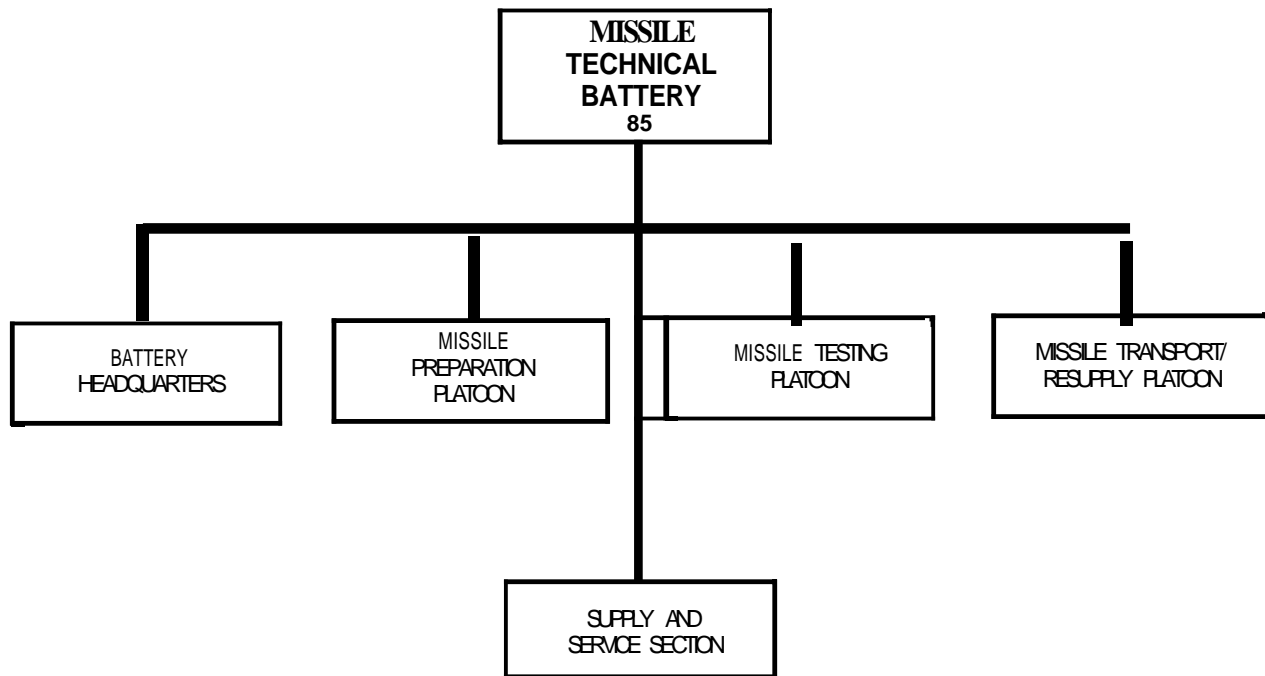
Artillery Reconnaissance (Target Acquisition/Early Warning) Battery.
 SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	3	Radios:	
Truck. GAZ-66	1	HF, Manpack, Low-Power, R-104M	2
Truck, Van. Ural-375 (Maintenance)	1	VHF, Manpack, Low-Power. R-107	2
Truck. Van, UAZ-452 (Computer)	1	VHF. Vehicle Mount, Medium-Power, R-123 ...	3
Trailer. Cargo. 2-Axle	1	Radars:	
Trailer. Van. 2-Axle	1	Radar, Aerial Surveillance/Target Acq.	
Trailer. Kitchen	1	LONG TRACK	2
		Radar, Height Finding, THIN SKIN	1

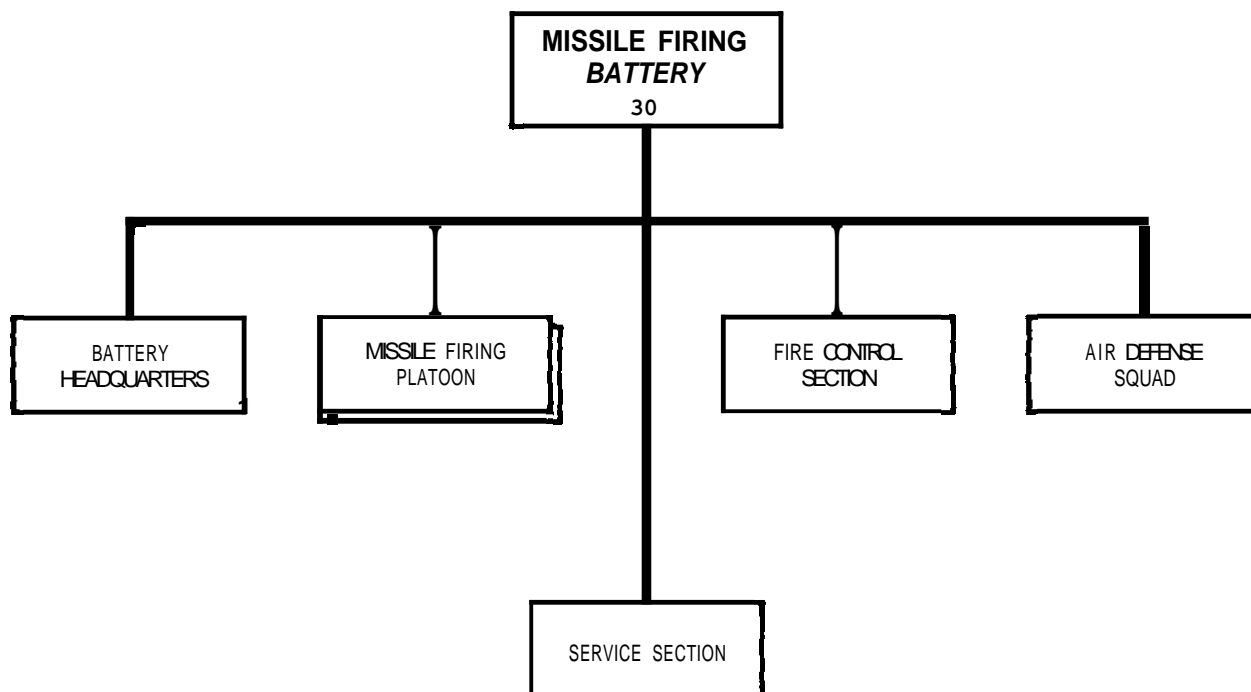
Missile Technical Battery.
 SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3	Trailer. Cargo, 2-Axle	1
Truck. UAZ-69/469	1	Trailer. Generator, 1-Axle	1
Truck, GAZ-66	6	Trailer. Van. 2-Axle	1
Truck, ZIL/Ural	5	Trailer, Kitchen	2
Truck, Crane, Ural-375	2	Semitrailer, SA-6 Canister Transporter	15
Truck, Van. Ural (Missile Testing)	6	Radios:	
Truck-Tractor. SA-6 Canister Transporter, ZIL-157/131V	15	VHF. Portable, Low-Power. R-148	3
Truck, SA-6 Missile Transloader, ZIL-131	5	VHF. Manpack, Low-Power. R-107	1

Missile Firing Battery,
SAM Regiment (SA-6),MRD and TD

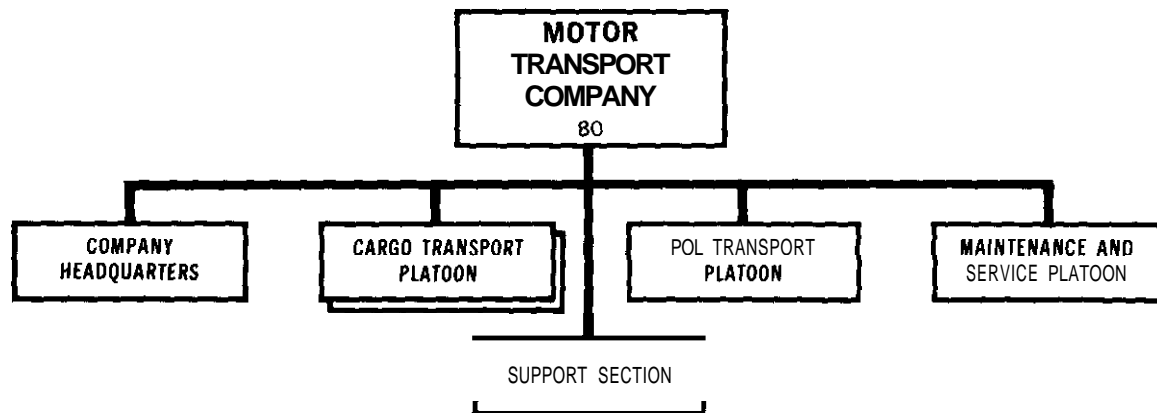


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
SAM. SA-6a/GAINFUL TEL or SA-6b/GAINFUL TELAR	4
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	3
ACV, BRDM-2	1
Truck, GAZ-66	1
Truck. Van, Ural/ZIL	1
Truck. Missile Transloader. ZIL-131	2

Equipment	Total
Trailer, Cargo. 2-Axle	1
Trailer. Van, 2-Axle	1
Trailer, Kitchen	1
Radar. Fire Control. STRAIGHT FLUSH	1
Radios:	
VHF. Manpack, Low-Power, R-107	1
VHF, Vehicle Mount. Medium-Power. R-123	6
Warning Receiver. R-311	1

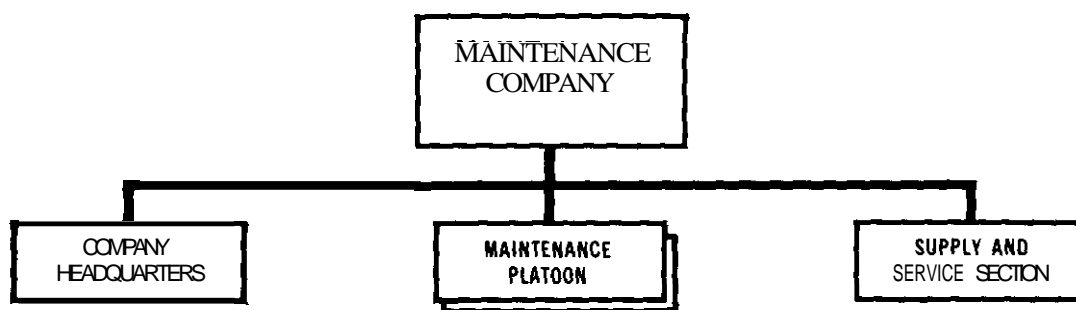
Motor Transport Company.
SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Trailer, POL, 2-Axle	7
Truck, GAZ-66	1	Trailer, Generator, 1-Axle	3
Truck, ZIL/Ural/KrAZ	33	Trailer, Water, 1-Axle	3
Truck, POL, ZIL/Ural	15	Trailer, Kitchen	1
Truck, Van, Ural/ZIL	4	Trailer, Van, 2-Axle	2
Truck, Van (Maintenance)	3	Radio:	
Trailer, Cargo, 2-Axle	5	VHF, Manpack, Low-Power, R-107	1

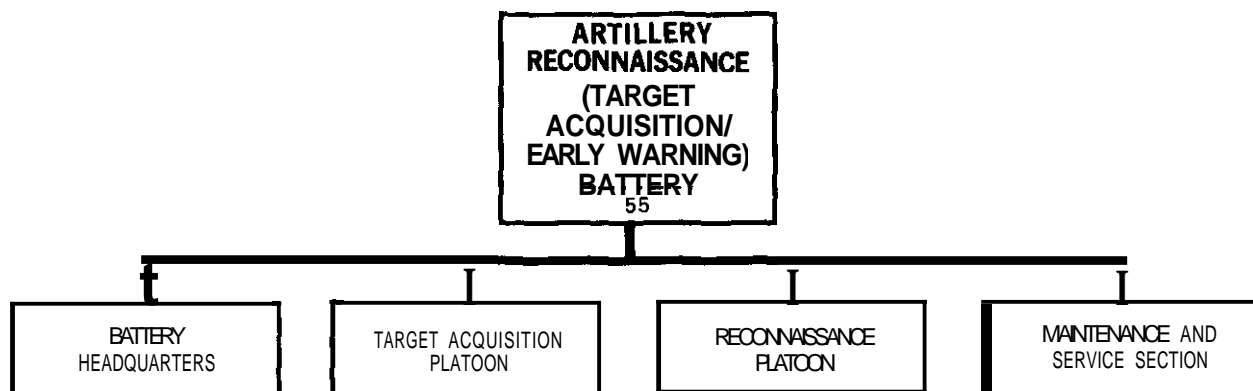
Maintenance Company.
SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Trailer, Generator, 1-Axle	7
Truck, GAZ-66	1	Trailer, Water	1
Truck, ZIL-151/157	3	Trailer, Kitchen	1
Truck, Van, Ural or ZIL (Maintenance)	8	Radio:	
Trailer, Cargo, 2-Axle	3	VHF, Manpack, Low-Power, A-107	1

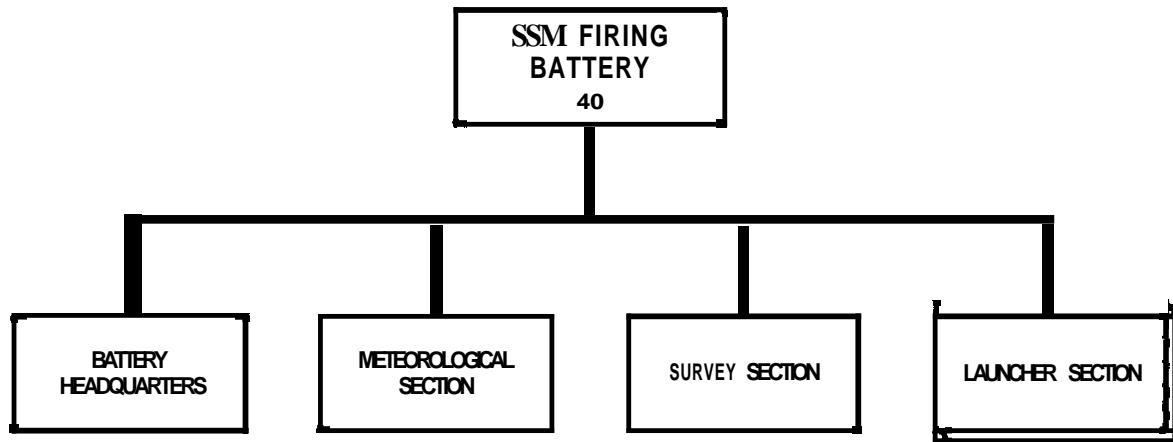
Artillery Reconnaissance (Target Acquisition/Early Warning) Battery.
 SAM Regiment (SA-6). MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	3	Radios:	
Truck. GAZ-66	1	HF, Manpack, Low-Power, R-104M	2
Truck, Van. Ural-375 (Maintenance)	1	VHF, Manpack, Low-Power. R-107	2
Truck. Van, UAZ-452 (Computer)	1	VHF. Vehicle Mount, Medium-Power, R-123 ...	3
Trailer. Cargo. 2-Axle	1	Radars:	
Trailer. Van. 2-Axle	1	Radar, Aerial Surveillance/Target Acq.	
Trailer. Kitchen	1	LONG TRACK	2
		Radar, Height Finding, THIN SKIN	1

SSM Firing Battery, SSM Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

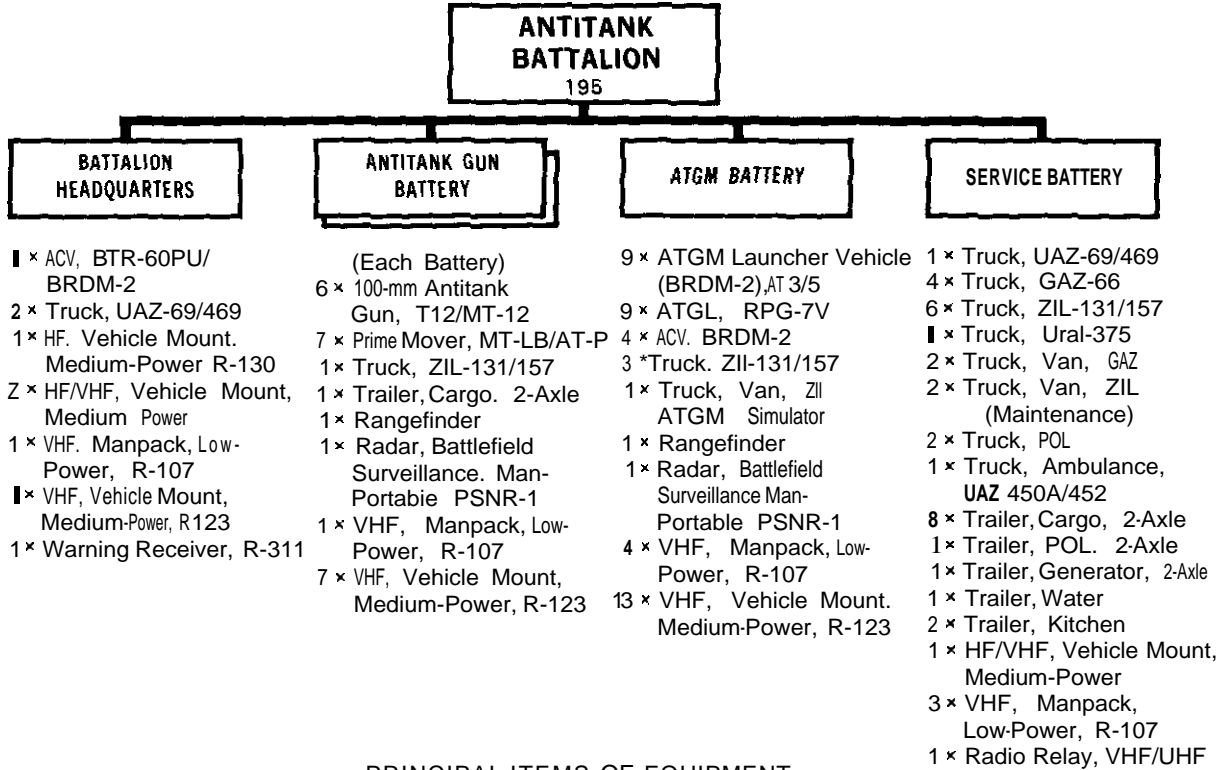
Equipment	Total	Equipment	Total
FROG/SSM TEL, FROG-7/7B or SS-21/		Truck, Van. ZIL	1
SCARAB	2	Truck, Van. UAZ-452	2
Truck, UAZ-69/469	1	Trailer, Generator	1
Truck, GAZ-66	1	Radar, Meteorological, END TRAY	1
Truck, ZIL/Ural	1	Radio:	
Truck, Van. GAZ	1	VHF, Manpack, Low-Power, R-107	6

Antitank Battalion, MRD

The division antitank battalion exists only in the MRD. The standard structure is now two 6-gun batteries of 100-mm antitank guns (T-12/MT-12) and one 9-vehicle battery of mounted ATGM systems. The latter may consist of the AT-3/SAGGER or the newer AT-5/SPANDREL mounted on the

BRDM-2 chassis. The prime mover for the T-12/MT-12 antitank gun is normally the MT-LB.

Some MRDs may not yet have vehicle-mounted ATGMs in the antitank battalion. In such cases, the battalion consists of three 6-gun batteries of T-12/MT-12.

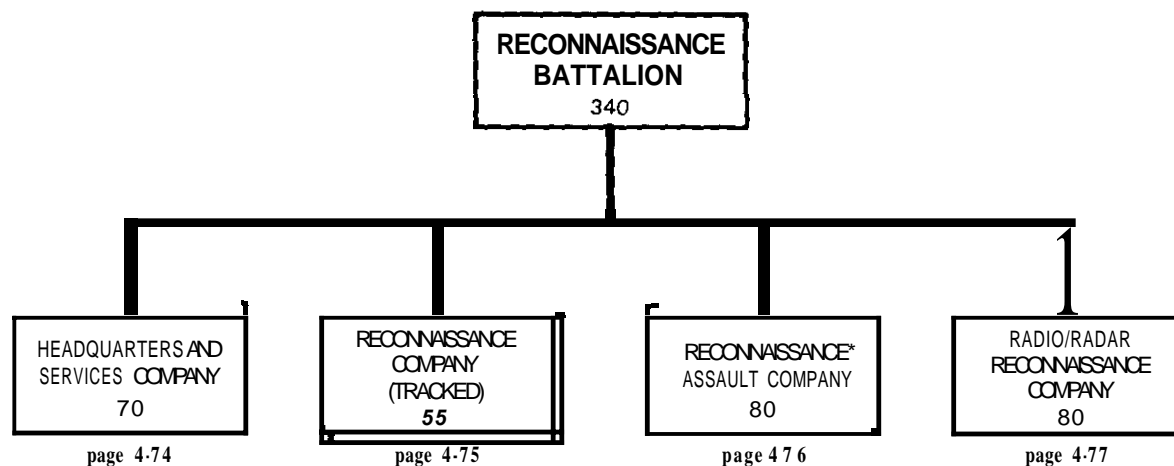


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGM Launcher Vehicle (BRDM-2). AT-3/5	9
100-mm Antitank Gun, T-12/MT-12	12
ATGL, RPG-7V	9
ACV, BTR-60PU/BRDM-2	5
Prime Mover, MT-LB/AT-P	14
Truck, UAZ-69/469	3
Truck, GAZ-66	4
Truck, ZIL-131/157	11
Truck, Ural-375	1
Truck, Van, GAZ	2
Truck, Van, ZIL (Maintenance)	2
Truck, POL	2
Truck, Van, ZIL, ATGM Simulator	1
Truck, Ambulance, UAZ-450A/452	1
Trailer, Cargo, 2-Axle	10

Equipment	Total
Trailer, POL, 2-Axle	1
Trailer, Generator, 2-Axle	1
Trailer, Water	1
Trailer, Kitchen	2
Rangefinder	3
Radar, Battlefield Surveillance, Man-Portable PSNR-1	3
Radios:	
HF, Vehicle Mount, Medium-Power, R-130	1
HF/VHF, Vehicle Mount, Medium-Power	3
VHF, Manpack, Low-Power, R-107	10
VHF, Vehicle Mount, Medium-Power, R-123	28
Warning Receiver, R-311	1
Radio Relay, VHF/UHF, R-401/405	1

Reconnaissance Battalion, MRD and TD

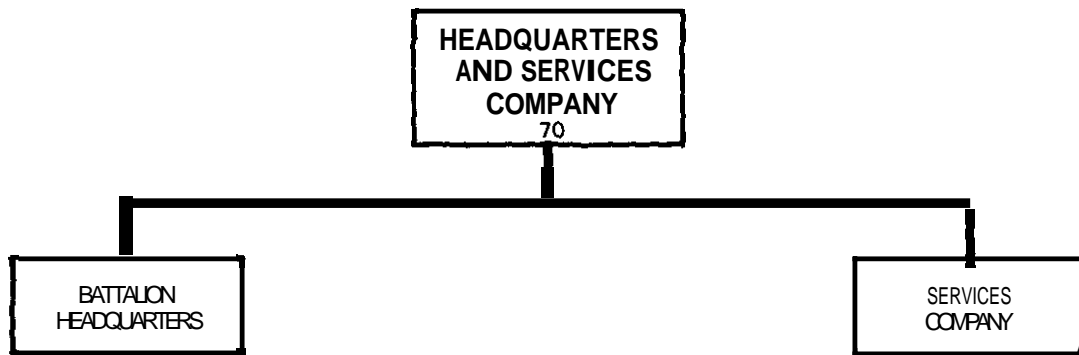


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-7V	13	Trailer. Kitchen	4
5.45-mm LMG, RPK-74	25	Trailer, POL	2
ACV. BRDM-2U	1	Chemical Reconnaissance Vehicle.	
ACV. BTR-60PA	2	BRDM-2rkh/RKhM	4
ACV, Recon, BRM-1**	3	Radar. Battlefield Surveillance, TALL MIKE	3
AICV. BMP-1/BMP-2	12	Radar Direction Finder	3
Medium Tank, T-64/72/80	6	Radio Direction Finder. HF/VHF/UHF	3
ASC, BRDM-2 or APC. BTR-60/70/80	12	Intercept Receiver, VHF/UHF	9
Truck, UAZ-69/469	5	Radios:	
Truck. GAZ-66	2	HF, Manpack, Low-Power. R-104M	6
Truck, ZIL Series	5	HF, Vehicle Mount, Medium-Power, R-130	4
Truck, Ural-375	4	HF/VHF, Vehicle Mount. Medium-Power	6
Truck, Van, GAZ (Command)	4	HF/VHF, Vehicle Mount. High-Power	2
Truck, Van. GAZ (Radio/Radar Recon)	13	VHF. Manpack, Low-Power. R-107	12
Truck. Van. ZIL (Maintenance)	2	VHF, Vehicle Mount, Medium-Power.	
Truck, Van, ZIL	6	R-123	40
Truck, POL. ZIL/Ural/KrAZ	2	Radio Relay. VHF/UHF. R-401/405	1
Truck, Ambulance, UAZ-450A/452	1	Warning Receiver, R-311	5
Trailer. Generator	2	Radio Telegraph	6
Trailer. Water	1		

FOOTNOTES. 'Also called the long-range reconnaissance company or the airborne reconnaissance company.
 ""This vehicle includes the TALL MIKE radar, which appears separately in this list.

Headquarters and Services Company,
Reconnaissance Battalion. MRD and TD

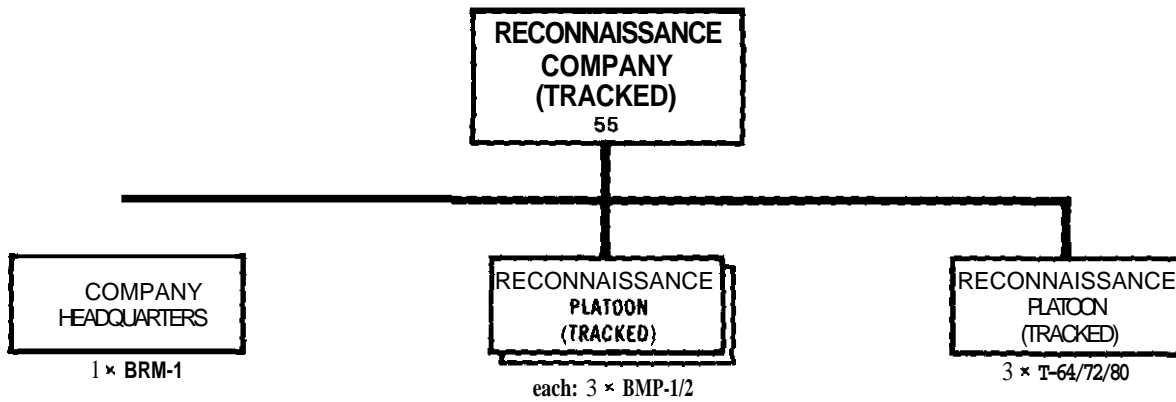


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV. Reconnaissance, BRM-1*	1	Radar, Battlefield Surveillance, TALL MIKE	1
ACV. BTR-60PA	2	Intercept Receiver. VHF/UHF	1
Truck. UAZ-69/469	4	Radios:	
Truck, ZIL Series	5	HF. Manpack, Low-Power. R-104M	2
Truck, Ural-375	4	HF, Vehicle Mount, Medium-Power. R-130	1
Truck, Van, GAZ (Command)	2	HF/VHF, Vehicle Mount. Medium-Power	2
Truck. Van, ZIL (Maintenance)	1	HF/VHF, Vehicle Mount, High-Power	1
Truck. POL. ZIL/Ural/KrAZ	2	VHF. Manpack, Low-Power, R-107	2
Truck. Ambulance, UAZ-450A/452	1	VHF. Vehicle Mount. Medium-Power. R-123	3
Trailer, POL	2	Radio Relay. VHF/UHF, R-401/405	1
Trailer. Generator	2	Warning Receiver, R-311	2
Trailer. Water	1	Radio Telegraph	6
Trailer, Kitchen	4		

FOOTNOTE. *This vehicle includes the TALL MIKE radar, which appears separately in this list.

Reconnaissance Company (Trackad),
 Reconnaissance Battalion, MRD and TD



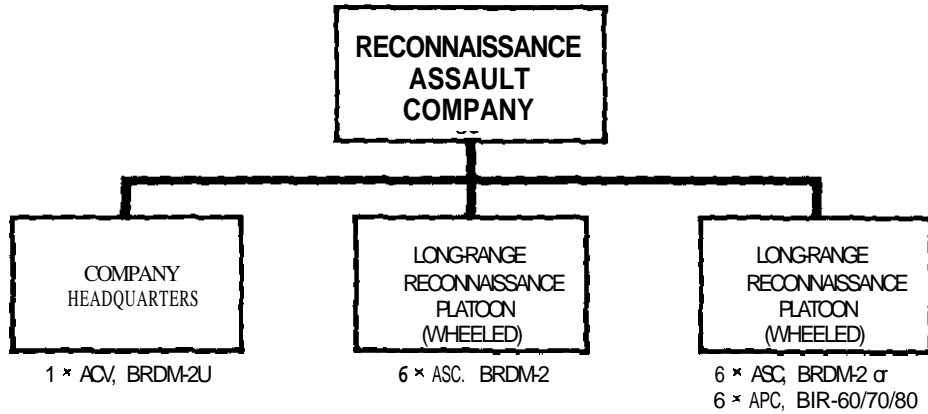
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
5.45-mm LMG, RPK-74	6	Radar, Battlefield Surveillance, TALL MIKE	1
ACV, Reconnaissance, BRM-1*	1	Radios:	
AICV, BMP-1/2	6	HF, Vehicle Mount, Medium-Power, R-130	1
Medium Tank, T-64/72/80	3	VHF, Vehicle Mount, Medium-Power.	
Truck, GAZ-66	1	R-123	12
Chemical Reconnaissance Vehicle. BRDM-2rkh or RKhM	2	Warning Receiver, R-311	1

FOOTNOTE. *This vehicle includes the TALL MIKE radar. which appears separately in this list.

FM 100-2-3

Reconnaissance Assault Company.
 Reconnaissance Battalion, MRDand TD

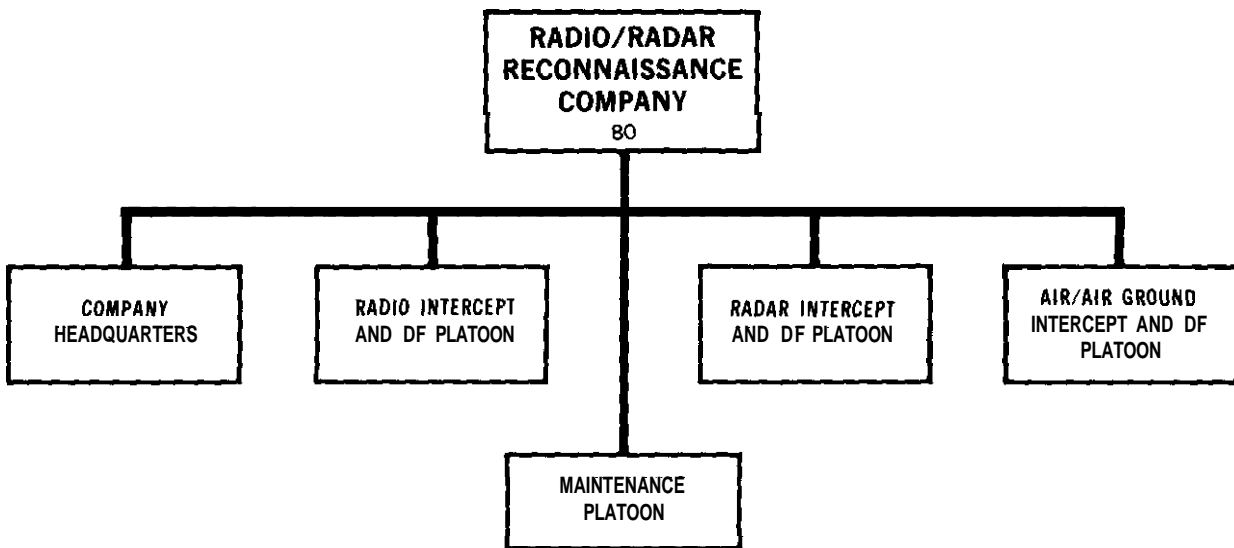


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-7V	13	VHF. Manpack, Low-Power. R-107	3
5.45-mm LMG, RPK-74	13	VHF. Vehicle Mount, Medium-Power.	
ACV, BRDM-2U	1	R-123	13
ASC, BRDM-2 or APC, BTR-60/70/80	12	Warning Receiver. R-311	1
Radios:			
HF, Vehicle Mount. Medium-Power. R-130	1		

NOTE Personnel in the reconnaissance assault company (also called the long-range reconnaissance company) have parachute training. Small teams of five to six men can enter the enemy rear area by parachute, helicopter and vehicle, or on foot. They can also land by transport helicopter (MI-6A/HOOK or MI-26/HALO A) along with their combat vehicles.

Radio/Radar Reconnaissance Company.
 Reconnaissance Battalion, MRD and TD

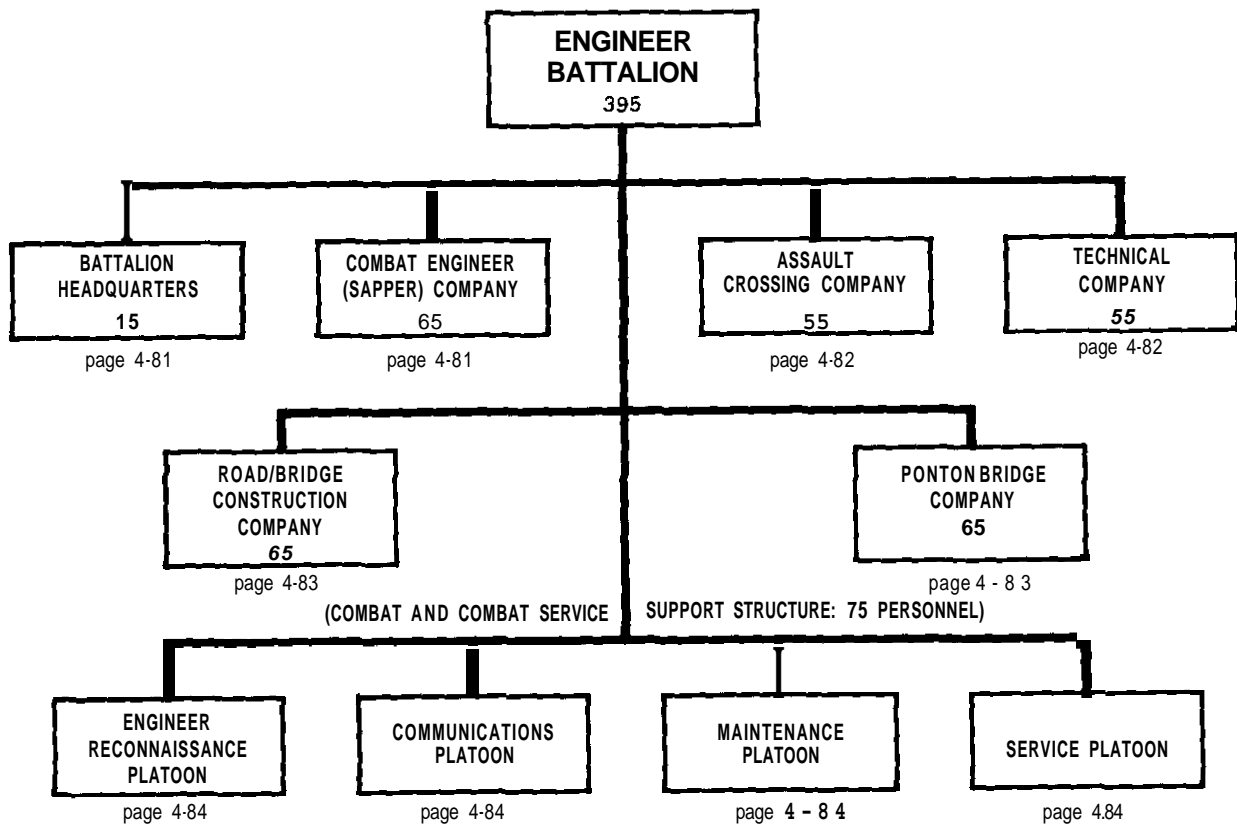


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck, UAZ-69/469	1
Truck. Van, GAZ (Command)	2
Truck. Van. GAZ (Radio/Radar Reconnaissance)	13
Truck, Van, ZIL (Maintenance)	1
Truck, Van. ZIL	6
Intercept Receiver, VHF/UHF	8
Radio Direction Finder. HF/VHF/UHF	3

Equipment	Total
Radar Direction Finder	3
Radios:	
HF, Manpack. Low-Power. R-104M	4
HF/VHF, Vehicle Mount, Medium-Power	4
HF/VHF. Vehicle Mount. High-Power	1
VHF. Manpack, Low-Power. R-107	7
Warning Receiver. R-311	1

Engineer Battalion, MRD and TD



Personnel and Equipment Recapitulation

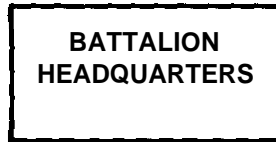
ENGINEER BATTALION, MRD AND TD											TOTAL
	BATTALION HEADQUARTERS	COMBAT ENGINEER COMPANY (SAPPER)	ASSAULT CROSSING COMPANY	TECHNICAL COMPANY	ROAD/BRIDGE CONSTRUCTION COMPANY	PONTON BRIDGE COMPANY	ENGINEER RECONNAISSANCE PLATOON	COMMUNICATIONS PLATOON	MAINTENANCE PLATOON	SERVICE PLATOON	
PERSONNEL	15	65	55	55	65	65	75			395	
WEAPONS											
ATGL, RPG-7V		2					6			8	
ACV/APC											
ACV, BRDM-2			1							1	
ACV, BTR-50/60		1								1	
APC, BTR-50/60							3			3	
GENERAL PURPOSE TRUCKS											
Truck, UAZ-69/469	2			1	1	1	2	1		8	
Truck, ZIL-130/131/151/157	1	3	2	3	2		1	1	1	22	
Truck, Ural-375		2		10						16	
Truck, KrAZ-214/255									1	1	
VAN TRUCKS											
Truck, Van, GAZ (Signal)	1							1		2	
Truck, Van, ZIL (Maintenance)									4	4	
POL TRUCKS											
Truck, POL									3	3	
SPECIAL PURPOSE TRUCKS											
Truck, Crane, K-61			1							1	
Truck, Crane, Ural-375				2						2	
Truck, Crane, Shovel, E-305V				1	1					2	
Truck, Dump, MMZ-555				1	2					3	
Truck, Saw Mill, Ural-375 (LRV Saw)					1					1	
Truck, Ambulance, UAZ-450A/452									1	1	
Truck, Water Purification				1						1	
Truck, UAZ-69 DIM Mine Detector		2					1			3	
ENGINEER EQUIPMENT											
Armored Engineer Tractor, IMR		2								2	
Bridge, TMM on KrAZ-214/255					8					8	
Tracked Ferry, GSP			6							6	
PMP Center on KrAZ-214						16				16	

(continued)

Personnel and Equipment Recapitulation (continued)

ENGINEER BATTALION, MRD AND TD											
	BATTALION HEADQUARTERS	COMBAT ENGINEER COMPANY (SAPPER)	ASSAULT CROSSING COMPANY	TECHNICAL COMPANY	ROAD/BRIDGE CONSTRUCTION COMPANY	PONTON BRIDGE COMPANY	ENGINEER RECONNAISSANCE PLATOON	COMMUNICATIONS PLATOON	MAINTENANCE PLATOON	SERVICE PLATOON	TOTAL
PMP Ramp on KrAZ-214						2					2
PMP Service on KrAZ-214						1					1
Tracked Amphibian, K-61/PTS		12									12
Ditching Machine, BTM/MDK			4								4
Dozer, BAT/BAT-M			6	2							8
Mineclearer, MTK/MTK-2		2									2
Grader, D-144				2							2
Pile Driver Set, KMS (on 3 ZIL Trucks)			1								1
Powerboat, BMK-90/150 (on ZIL)					6						6
Mine-layer, Armored SP, GMZ		3									3
Tractor, K-700			2								2
Assault Boat, NDL-10		10									10
Concrete Mixer				1							1
TRAILERS											
Trailer, Amphibious, PKP		3									3
Trailer, Lowboy									1		1
Trailer, Cargo, 1-Axle	1	2			1						4
Trailer, Cargo, 2-Axle			1	1				1	3		6
Trailer, Generator, 1-Axle					1		1				2
Trailer, Generator, 2-Axle			1					1			2
Trailer, POL									2		2
Trailer, Water									3		3
Trailer, Kitchen									5		5
Trailer, Compressor		1									1
Trailer, Saw, 2-Axle					1						1
RADIOS											
HF, Manpack, Low-Power, R-104M	1	1	1	1	1	1	3				9
HF/VHF, Vehicle-Mount, Medium- Power	1							1			2
HF/VHF, Vehicle-Mount, High-Power	1							1			2
VHF, Vehicle-Mount, Medium-Power, R-123		4	8	3	3	4	3				25
Warning Receiver, R-311								1			1

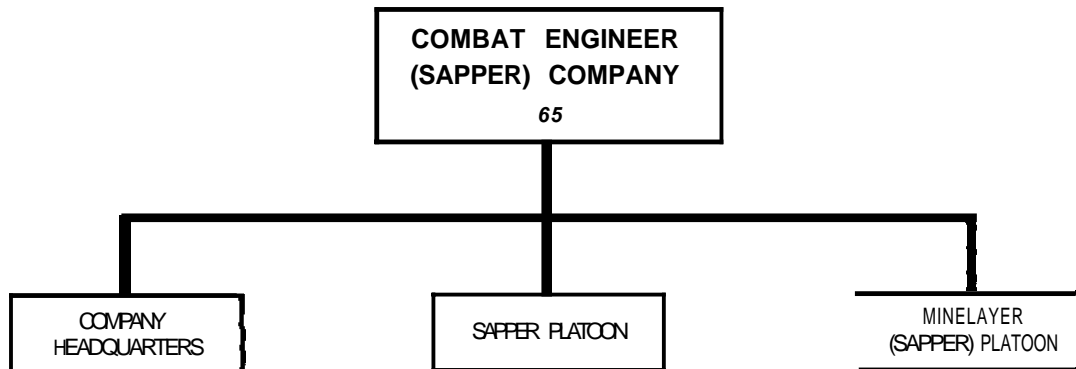
Battalion Headquarters, Engineer Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	2	Radios:	
Truck, ZIL-130/131/151/157	1	HF. Manpack, Low-Power, R-104M	1
Truck, Van, GAZ (Signal)	1	HF/VHF, Vehicle Mount. Medium-Power	1
Trailer, Cargo, 1-Axle	1	HF/VHF, Vehicle Mount, High-Power	1

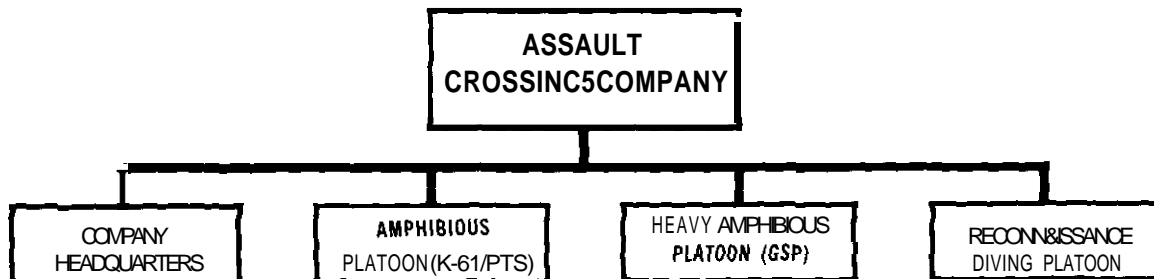
Combat Engineer (Sapper) Company. Engineer Battalion,
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-7V	2	Mineclearer. MTK/MTK-2	2
ACV, BTR-50/60	1	Minelayer. Armored, SP. GMZ	3
Truck, ZIL-130/131/151/157	3	Trailer. Cargo. 1-Axle	2
Truck, Ural-375	2	Radios:	
Truck, UAZ-69, DIM Mine Detector	2	HF, Manpack, Low-Power, R-104M	1
Armored Engineer Tractor, IMR	2	VHF. Vehicle Mount. Medium-Power, R-123 ...	4

Assault Crossing Company. Engineer Battalion,
MRD and TD

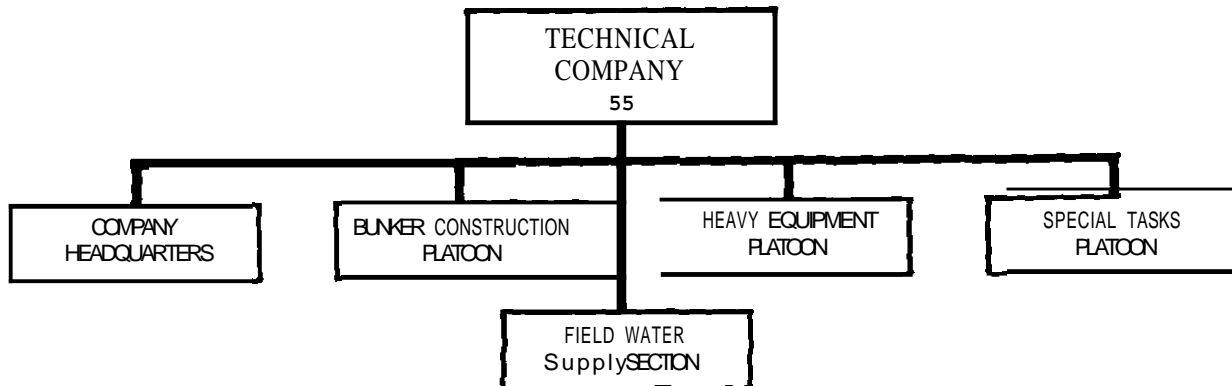


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV. BRDM-2	1	Trailer. Amphibious. PKP	3
Truck. ZIL-130/131/151/157	2	Trailer, Cargo. 2-Axle	1
Truck. Crane. K-61	1	Trailer. Compressor	1
Tracked Amphibian. K-61/PTS	12	Radios:	
Tracked Ferry, GSP	6	HF, Manpack, Low-Power. R-104M	1
Assault Boat. NDL-10	10	VHF. Vehicle Mount. Medium-Power. R-123 ...	8

NOTE. Two GSP heavy amphibious ferry vehicles make up one ferry; the twelve right-and left half-ferries in MRD and TD Engineer battalions form six ferries.

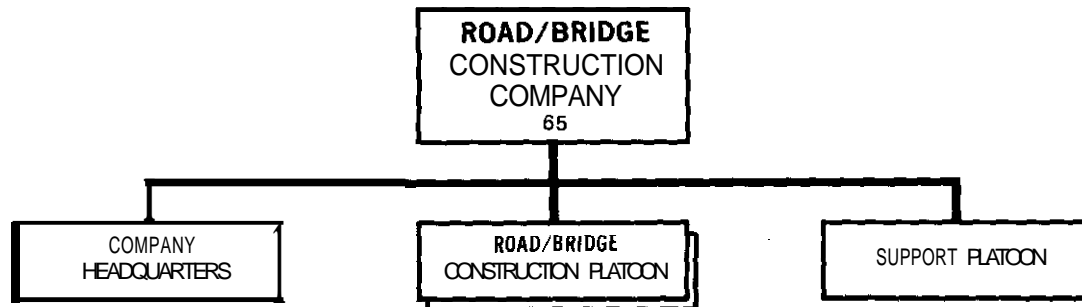
Technical Company, Engineer Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Dozer, BAT/BAT-M	6
Truck. ZIL-130/131/151/157	3	Piledriver Set. KMS (on 3 ZIL Trucks)	1
Truck. Ural-375	10	Tractor, K-700	2
Truck. Crane, Ural-375	2	Trailer. Cargo, 2-Axle	1
Truck, Crane Shovel, E-305V	1	Trailer. Generator. 2-Axle	1
Truck, Dump. MMZ-555	1	Radios:	
Truck, Water Purification	1	HF, Manpack, Low-Power, R-104M	1
Ditching Machine. BTM/MDK-2	4	VHF. Vehicle Mount, Medium-Power. R-123 ...	3

Road/Bridge Construction Company. Engineer Battalion,
MRD and TD

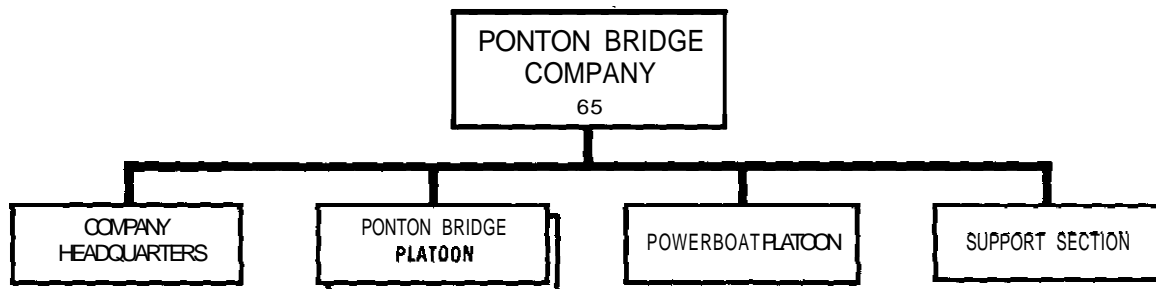


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	1	Concrete Mixer	1
Truck. ZIL-130/131/151/157	2	Trailer, Cargo, 1-Axle	1
Truck. Crane Shovel. E-305V	1	Trailer. Generator, 1-Axle	1
Truck. Dump. MMZ-555	2	Trailer. Saw. 2-Axle	1
Truck. Sawmill. Ural-375	1	Radios:	
Bridge. TMM on KrAZ-214/255	8	HF, Manpack, Low-Power, R-104M	1
Dozer, BAT/BAT-M	2	VHF, Vehicle Mount, Medium-Power, R-123 ...	3
Grader, D 114	2		

NOTE. The eight TMM spans make up two TMM bridge sets

Ponton Bridge Company. Engineer Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Powerboat. BMK-90/150	6
PMP Center on KrAZ-214	16	Radios:	
PMP Ramp on KrAZ-214	2	HF, Manpack, Low-Power, R-104M	1
PMP Service on KrAZ-214	1	VHF, Vehicle Mount, Medium-Power, R-123 ...	4

NOTE. A full bridge set consists of 32 center and 4 ramp sections. The half-set held by the engineer battalion can make up a bridge or several rafts.

Combat and Combat Service Support Structure.
Engineer Battalion, MRD and TD

**ENGINEER
RECONNAISSANCE
PLATOON**

- 6 x ATGL RPG-7V
- 3 x BTR-50/60
- 2 x UAZ Truck
- 1 x ZIL Truck
- 1 x DIM Mine Detector
- 3 x HF, Manpack, Low-Power. R-104M
- 3 x VHF, Vehicle Mount Medium Power, R-123

**COMMUNICATIONS
PLATOON**

- 1 x UAL Truck
- 1 x ZIL Truck
- 1 x GAZ Van
- 1 x Generator Trailer
- 1 x HF/VHF, Vehicle Mount, Medium Power
- 1 x HF/VHF, Vehicle Mount, High-Power
- 1 x Warning- Receiver, R-311

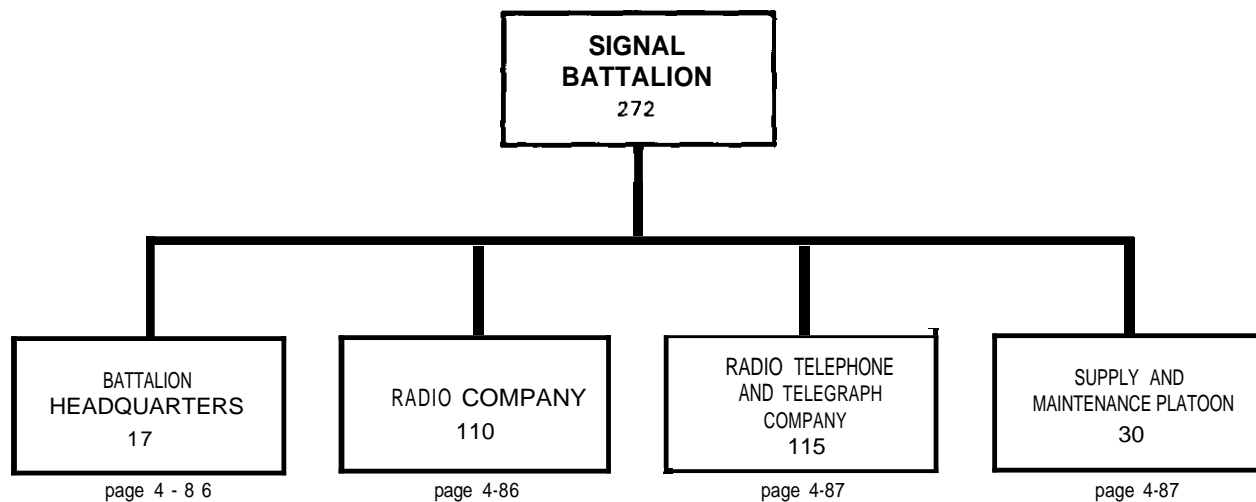
**MAINTENANCE
PLATOON**

- 1 x ZIL Truck
- 4 * ZIL Van
- 1 x Cargo Trailer
- 1 x Generator Traller

SERVICE PLATOON

- 8 x ZIL Truck
- 4 x Ural Truck
- 1 x KrAZ Truck
- 3 x POL Truck
- 1 x Ambulance
- 1 * Lowboy Trailer
- 2 * POL Trailer
- 3 x Cargo Trailer
- 3 x Water Trailer
- 5 x Kitchen Trailer

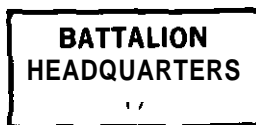
Signal Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV. BTR-50/60	8	Trailer. Generator	10
Truck, UAZ-69/469	12	Trailer, Water	1
Truck, GAZ-66	7	Trailer. Kitchen	2
Truck, ZIL/Ural	9	Radios:	
Truck. Van. ZIL (Maintenance)	4	HF, Manpack, Low-Power. R-104M	5
Truck, Van, GAZ (Signal)	21	HF. Vehicle Mount, Medium-Power. R-130	8
Truck. Van. ZIL (Signal).....	12	HF/VHF, Vehicle Mount. Medium-Power	7
Truck. POL. ZIL/Ural	1	HF/VHF, Vehicle Mount, High-Power	8
Truck. Ambulance, UAZ-450A/452	1	VHF, Manpack, Low-Power. R-107	20
Truck, Van. UAZ-452 (Bus)	1	VHF. Vehicle Mount, Medium-Power. R-123 ...	6
Motorcycle, K-750V/Ural-3	13	Warning Receiver. A-311	3
Trailer. Cargo, 1-Axle	10	Radio Relay. VHF/UHF, R-401/405/409	6
Trailer, POL, 2-Axle	1	Communications Center	2

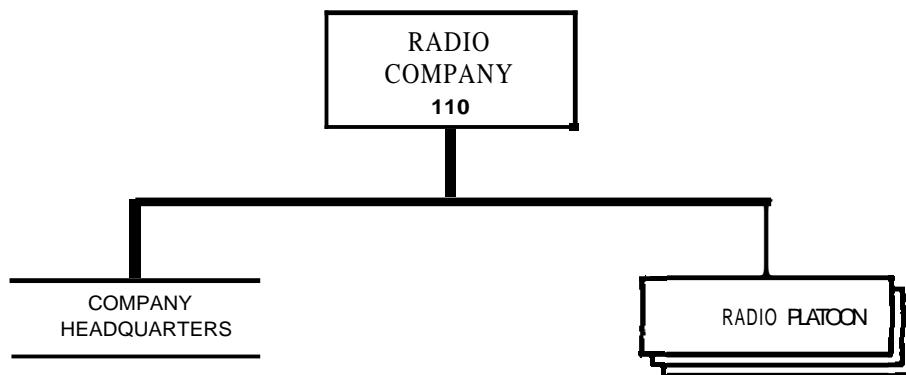
Battalion Headquarters, Signal Battalion. MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total Equipment	Total
Truck, UAZ-69/469	4	
		Radio:
		HF. Manpack, Low-Power. R-104M
		1

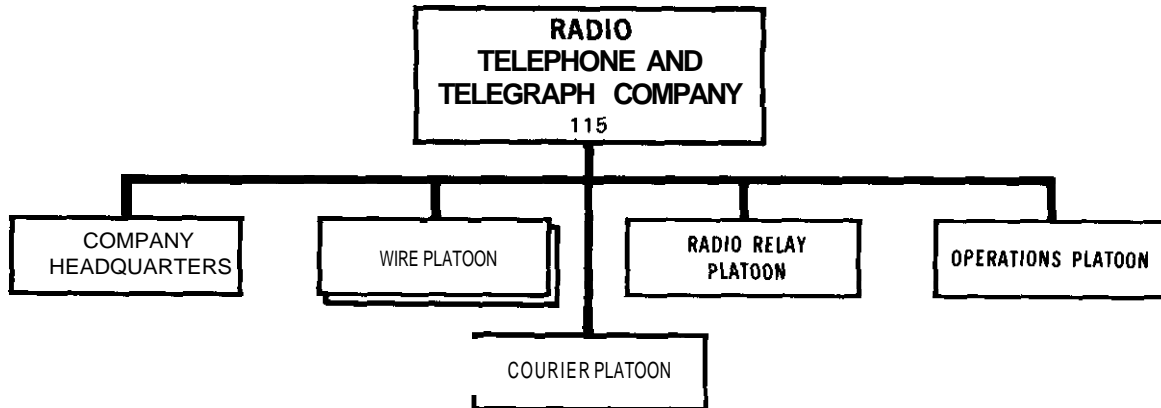
Radio Company, Signal Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV, BTR-50/60	8	HF, Vehicle Mount. Medium-Power. R-130	8
Truck, UAZ-69/469	4	HF/VHF. Vehicle Mount. Medium-Power	6
Truck, ZIL/Ural	1	HF/VHF. Vehicle Mount. High-Power	8
Truck. Van. GAZ-66 (Signal)	7	VHF, Manpack, Low-Power. R-107	7
Truck, Van, ZIL-157 (Signal)	5	VHF, Vehicle Mount. Medium-Power. R-123 ...	6
Trailer. Cargo. 1-Axle	1	Warning Receiver, R-311	1
Trailer. Generator	3		
Radios:			
HF. Manpack. Low-Power. R-104M	1		

Radio Telephone and Telegraph Company,
Signal Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

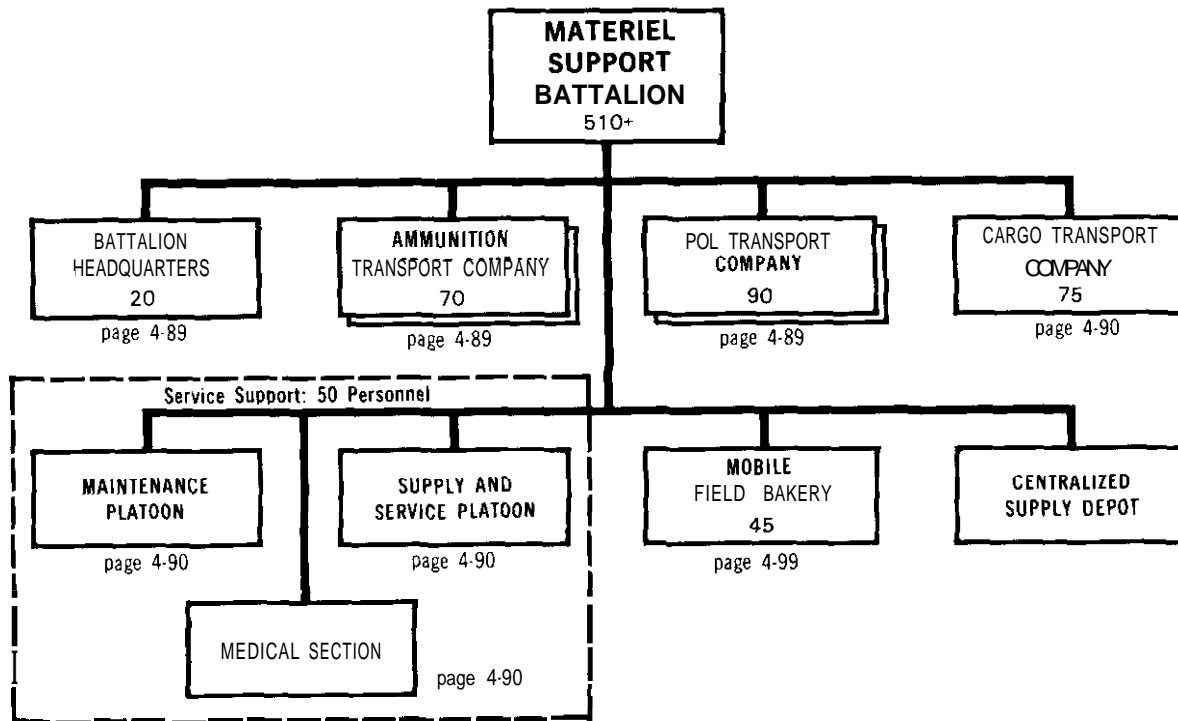
Equipment	Total	Equipment	Total
Truck, UAZ-69/469	3	Radios:	
Truck, GAZ-63/66	4	HF, Manpack, Low-Power, R-104M	2
Truck, ZIL/Ural	2	HF/VHF, Vehicle Mount, Medium Power	1
Truck, Van, GAZ-66 (Signal)	14	VHF, Manpack, Low-Power, R-107	13
Truck, Van, ZIL-157 (Signal)	7	Warning Receiver, R-311	2
Motorcycle, K-750V/Ural-3	13	Radio Relay, VHF/UHF, R-401/405/409	6
Trailer, Cargo, 1-Axle	4	Communications Center	2
Trailer, Generator	5		

Supply and Maintenance Platoon, Signal Battalion,
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	1	Trailer, Cargo, 1-Axle	5
Truck, GAZ-63/66	3	Trailer, POL, 2-Axle	1
Truck, ZIL/Ural	6	Trailer, Generator	2
Truck, Van, ZIL (Maintenance)	4	Trailer, Water	1
Truck, POL, ZIL/Ural	1	Trailer, Kitchen	2
Truck, Ambulance, UAZ-450A/452	1	Radio:	
Bus, UAZ-452	1	HF, Manpack, Low-Power, R-104M	1

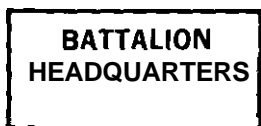


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGL. RPG-7V	19
Truck, UAZ-69/469	7
Truck, GAZ-66	33
Truck, ZIL-130/131/151/157	38
Truck, Ural-375	120
Truck, Van, GAZ	1
Truck, Van, ZIL	2
Truck, Van, ZIL (Maintenance)	9
Truck, Van, UAZ-452	1
Truck, POL. Ural-375 (5.200-Liter)	160
Truck, Crane, K-61	6
Truck, Water Tank	6
Truck, Van, Mobile Field Bakery	4

Equipment	Total
Truck, Field Kitchen, PAC-170/200	2
Truck, Ambulance, UAZ-450A/452	1
Trailer, Cargo, 2-Axle	122
Trailer, Cargo, 1-Axle	2
Trailer, POL, 2-Axle	160
Trailer, Generator	6
Trailer, Water	7
Radios:	
HF, Manpack, Low-Power, R-104M	1
HF/VHF, Vehicle Mount, Medium-Power	1
VHF, Manpack, Low-Power, R-107	5
Warning Receiver, R-311	1

Battalion Headquarters, Materiel Support Battalion,
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck, UAZ-69/469	2
Truck. Van. GAZ	1
Truck. Van. ZIL	1
Trailer. Cargo. 2-Axle	2
Radios:	
HF. Manpack, Low-Power. R-104M	1
HF/VHF. Vehicle Mount, Medium-Power	1
Warning Receiver, R-311	1

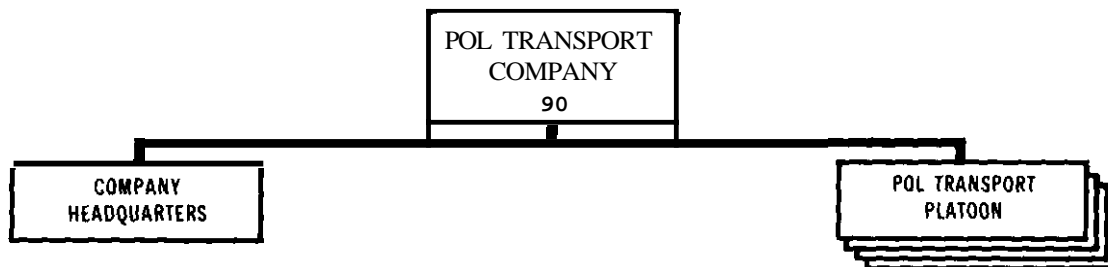
Ammunition Transport Company, Materiel Support
Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-7V	3	Trailer. Cargo, 2-Axle	60
Truck, UAZ-69/469	1	Radio:	
Truck, Ural-375	60	VHF, Manpack, Low-Power. R-107	1
Truck. Crane, K-61	1		

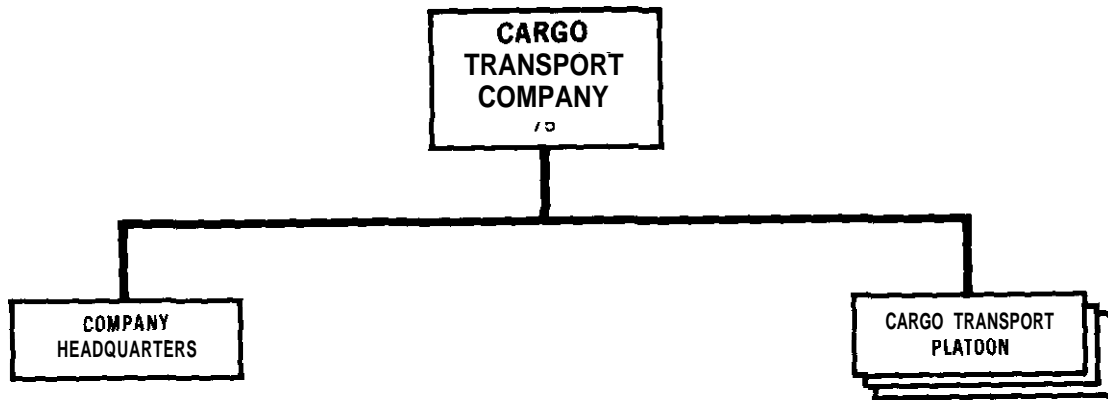
Petroleum. Oil. and Lubricants (POL) Transport Company,
Materiel Support Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-7V	4	Trailer. POL. 2-Axle	80
Truck. UAZ-69/469	1	Radio:	
Truck, POL, Ural-375 (5.200 Liter)	80	VHF. Manpack. Low-Power, R-107	1
Truck, Crane. K-61	1		

Cargo Transport Company, Materiel Support Battalion,
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-7V	3	Truck, Crane, K-61	1
Truck, UAZ-69/469	1	Radio:	
Truck, GAZ-66	30	VHF, Manpack, Low-Power, R-107	1
Truck, ZIL-151/157	30		

Service Support Structure, Materiel Support Battalion.
MRD and TD

**MAINTENANCE
PLATOON**

- 1 × ATGL, RPG-7V
- 9 × ZIL Van
- 1 × Crane Truck, K-61
- 6 × Generator Trailer

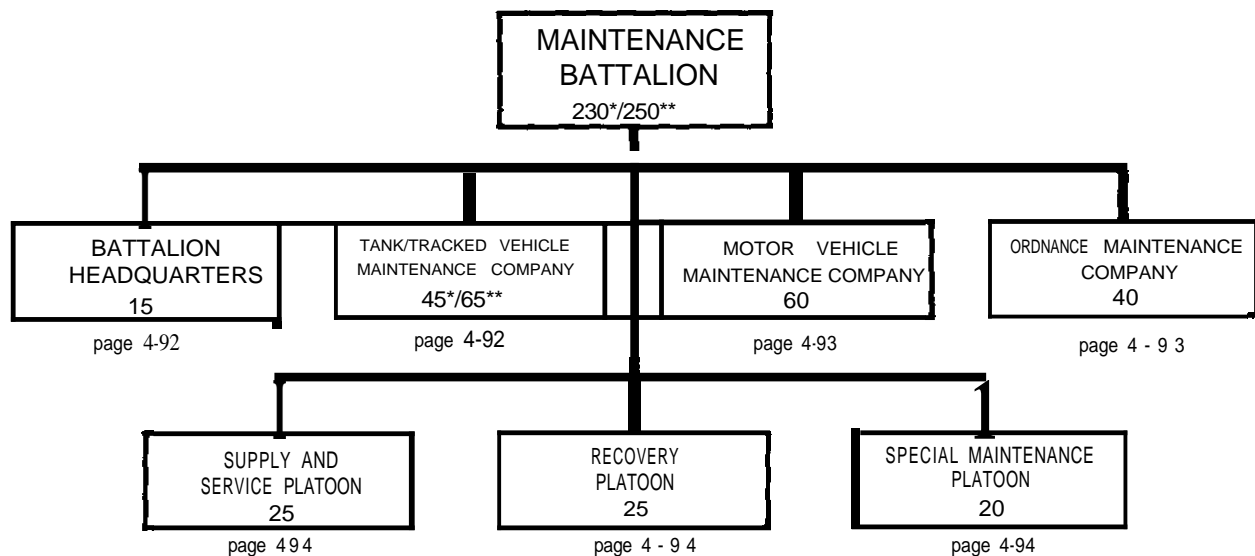
**SUPPLY
AND SERVICE
PLATOON**

- 1 × ATGL, RPG-7V
- 3 × GAZ-66
- 1 × ZIL Van
- 1 × UAZ Van
- 2 × Kitchen Truck
- 6 × Water Truck
- 2 × Cargo Trailer, 1-Axle
- 2 × Cargo Trailer, 2-Axle
- 3 × Water Trailer

**MEDICAL
SECTION**

- 1 × Ambulance

Maintenance Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	MRD*	TD**	Equipment	MRD*	TD**
ATGL, RPG-7V	11	12	Armored Recovery Vehicle	5	5
Truck, UAZ-69/469	5	5	Trailer, Cargo, 2-Axle	13	14
Truck, GAZ-66	4	4	Trailer, Generator, 2-Axle	1	1
Truck, ZIL Series	14	16	Trailer, Generator, 1-Axle	6	6
Truck, Ural-375	6	6	Trailer, POL, 2-Axle	4	4
Truck, ZIL-555	1	1	Trailer, Lowboy	2	2
Truck, Van, GAZ	3	3	Trailer, Water	1	1
Truck, Van, Ural	1	1	Trailer, Field Kitchen	3	3
Truck, Van, ZIL (Maintenance)	40	42	Radios:		
Truck, POL	4	4	HF, Vehicle Mount, Medium-Power,		
Truck, Tractor, KrAZ-214/255	2	2	R-130	1	1
Truck, Crane, Ural-375	3	3	HF/VHF, Vehicle Mount, Medium-		
Truck, Recovery, ZIL-157	2	2	Power	1	1
Truck, Water Tank	1	1	VHF, Manpack, Low-Power, R-107	5	5
Truck, Ambulance, UAZ-450A/452	1	1	VHF, Vehicle Mount, Medium-Power,		
Tracked Amphibian, K-6I/PTS	1	1	R-123	4	4
Tractor, Artillery, AT-S	1	1	Warning Receiver, R-311	1	1
Motorcycle, M-72/K-750/Ural-3	3	3			

NOTE. Page 4-92 outlines differences in personnel and equipment levels

FOOTNOTES. +Personnel and equipment levels for the maintenance battalion, MRD
 **Personnel and equipment levels for the maintenance battalion, TD.

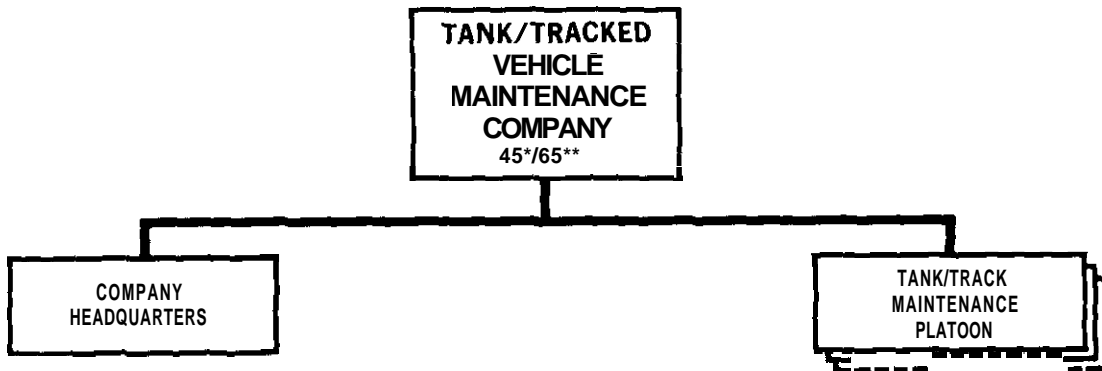
Battalion Headquarters. Maintenance Battalion.
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck, UAZ-69/469	2	VHF, Manpack, Low-Power. R-107	1
Truck, Van. Ural	1	Warning Receiver. R-311	1
Motorcycle. M-72/K-750/Ural-3	3		
Radios:			
HF/VHF, Vehicle Mount. Medium-Power	1		

Tank/Tracked Vehicle Maintenance Company.
Maintenance Battalion, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

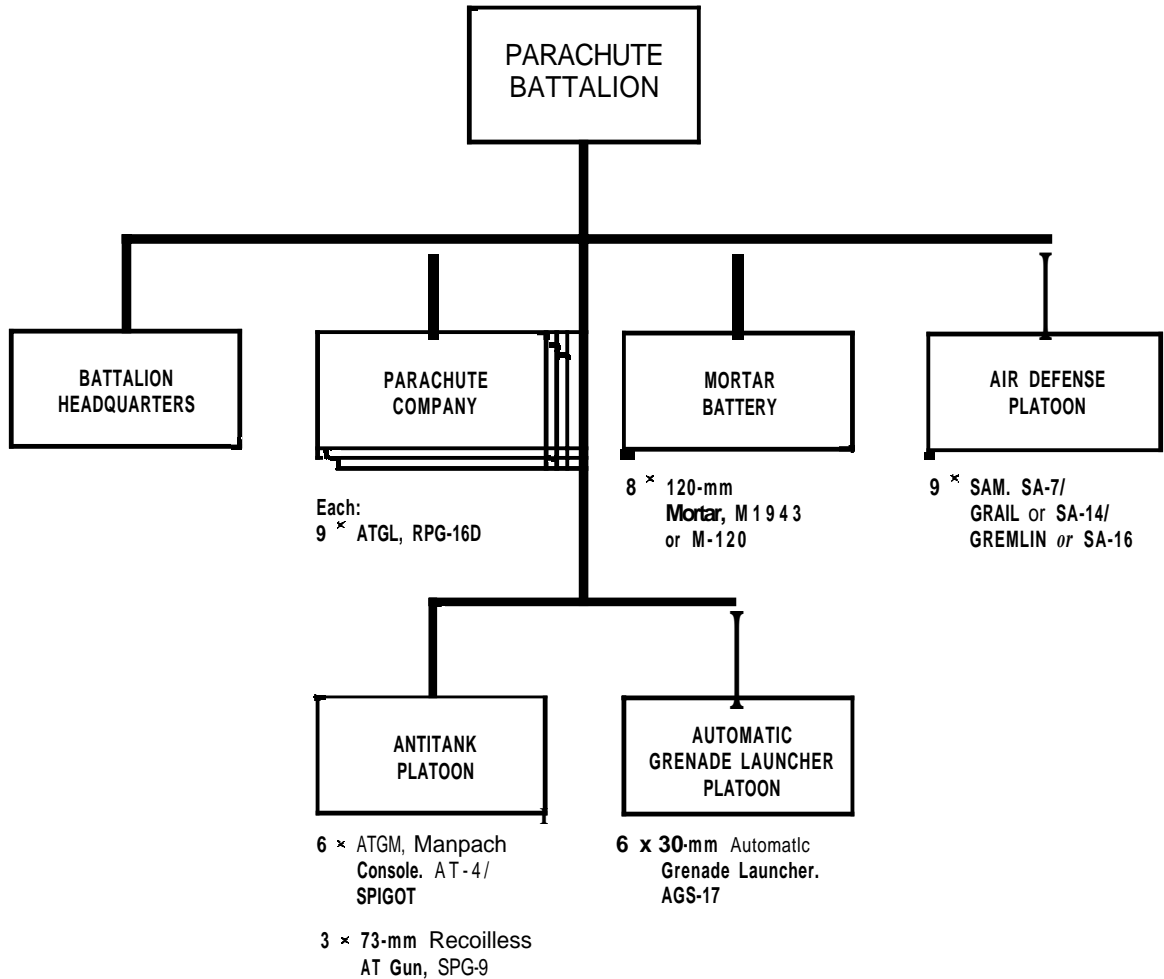
Equipment	MRD*	TD**	Equipment	MRD*	TD**
ATGL. RPG-7V	3	4	Truck, Crane, Ural-375	1	1
Truck, UAZ-69/469	1	1	Trailer. Cargo. 2-Axle	3	4
Truck, ZIL Series	4	6	Trailer, Generator, 1-Axle	2	2
Truck, Van, GAZ	1	1	Radio:		
Truck, Van. ZIL (Maintenance)	12	14	VHF. Manpack, Low-Power, R-107	1	1

NOTE. This company comprises two platoons when organic to an MRD. but three platoons when organic to a TD.

FOOTNOTES. *Personnel and equipment levels for the tank/tracked vehicle maintenance company, maintenance battalion. MRD.

**Personnel and equipment levels for the tank/tracked vehicle maintenance company, maintenance battalion, TO.

Parachute Battalion, Air Assault Brigade
and Airmobile Assault Brigade, Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-16D	27	73-mm Recoilless AT Gun. SPG-9	3
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	120-mm Mortar, M 1943 or M-120	8
ATGM, Manpack Console. AT-4/SPIGOT	6		
30-mm Automatic Grenade Launcher. AGS-17 ...	6		

NOTE. In the airmobile assault brigade, the parachute battalion may be called an airmobile assault battalion.

Supply and Service Platoon, Maintenance Battalion.
MRD and TD

**SUPPLY AND
SERVICE
PLATOON**
25

PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGL, RPG-7V	1
Truck, GAZ-66	4
Truck, ZIL Series	4
Truck, Ural-375	6
Truck, ZIL-555	1
Truck, POL	4
Truck, Water Tank	1
Truck, Ambulance, UAZ-450A/452	1
Trailer, Cargo, 2-Axle	4
Trailer, POL, 2-Axle	4
Trailer, Water	1
Trailer, Field Kitchen	3
Radio:	
VHF, Manpack, Low-Power, R-107	1

Recovery Platoon, Maintenance Battalion, MRD and TD

**RECOVERY
PLATOON**

PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck, Tractor, KrAZ-214/255	2
Truck, Recovery, ZIL-157	2
Tracked Amphibian, K-61/PTS	1
Tractor, Artillery, AT-S	1
Armored Recovery Vehicle	5
Trailer, Lowboy	2
Radios:	
HF, Vehicle Mount, Medium-Power, R-130	1
VHF, Vehicle Mount, Medium-Power, R-123 ...	4

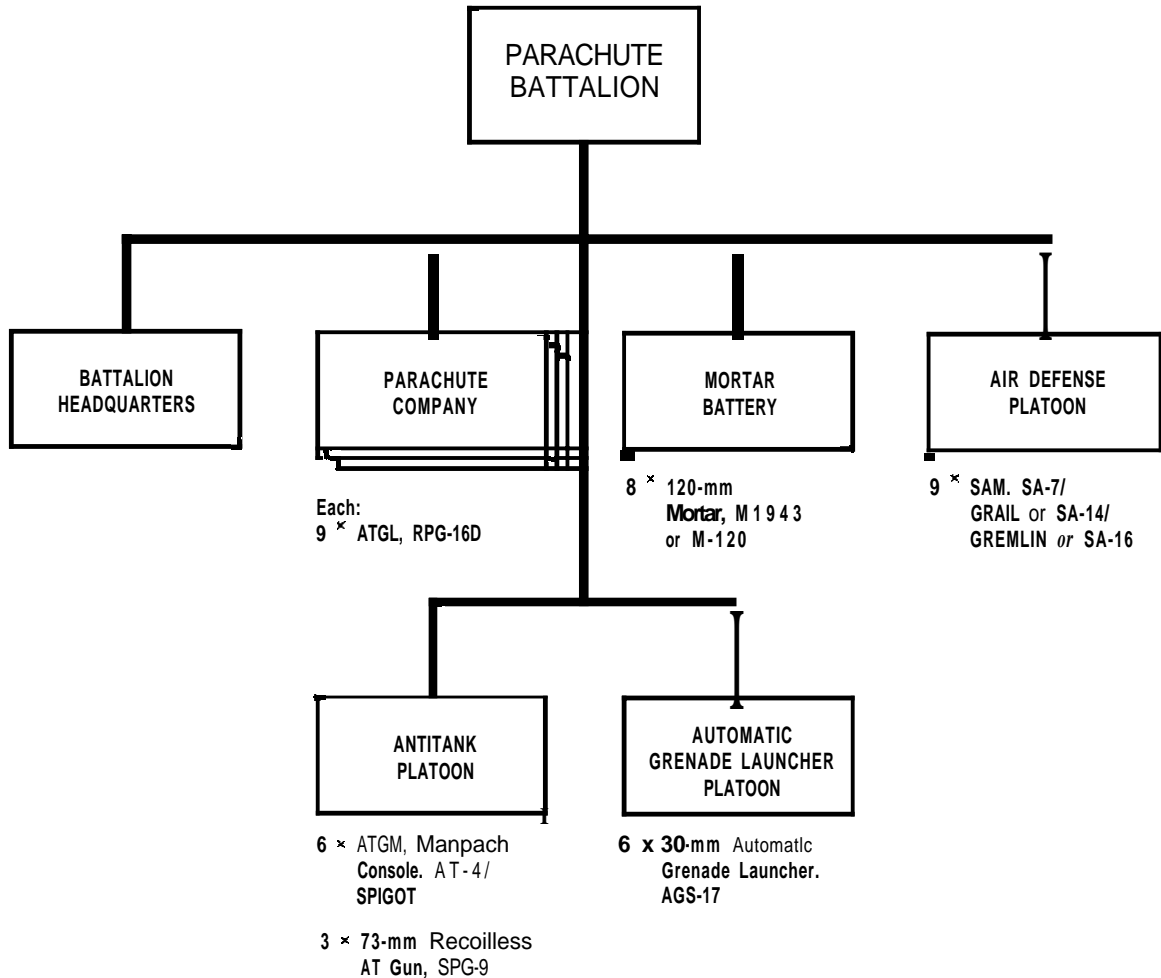
Special Maintenance Platoon, Maintenance Battalion.
MRD and TD

**SPECIAL
MAINTENANCE
PLATOON**
20

PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
Truck, Van, ZIL (Maintenance)	6
Trailer, Generator, 2-Axle	1

Parachute Battalion, Air Assault Brigade
and Airmobile Assault Brigade, Front

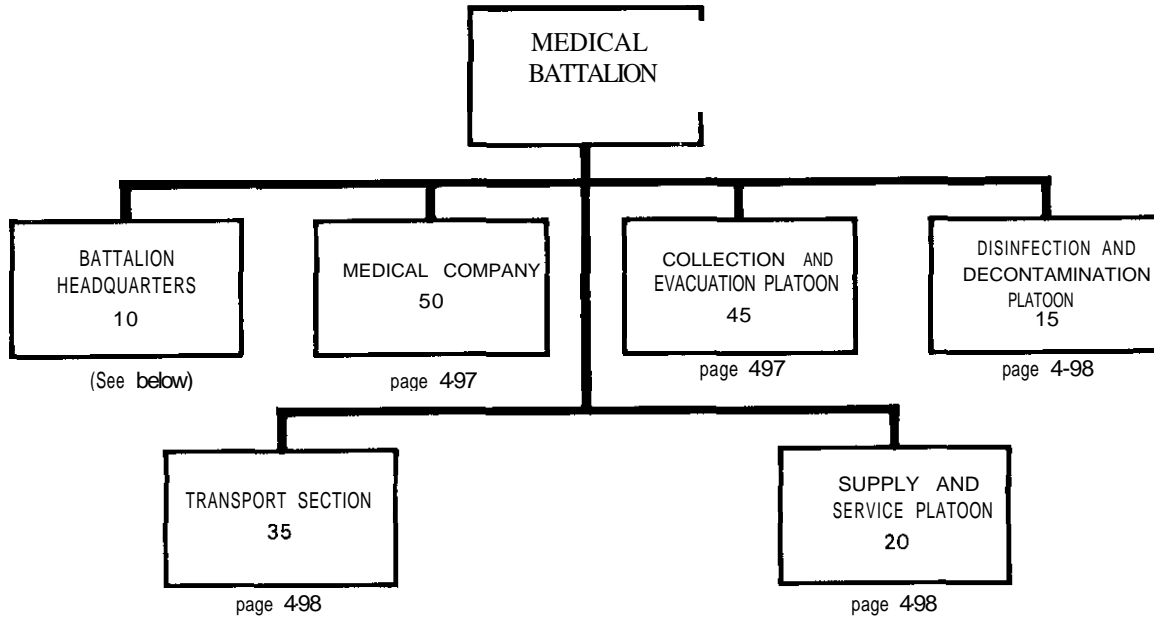


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipmenttotal	
ATGL. RPG-16D	27	73-mm Recoilless AT Gun. SPG-9	3
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	120-mm Mortar, M 1943 or M-120	8
ATGM, Manpack Console. AT-4/SPIGOT	6		
30-mm Automatic Grenade Launcher. AGS-17 ...	6		

NOTE. In the airmobile assault brigade, the parachute battalion may be called an airmobile assault battalion.

Medical Battalion, MRD and TD

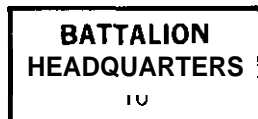


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	4	Truck. Water Tank	3
Truck, GAZ-66	1	Trailer. Cargo, 2-Axle	10
Truck. ZIL Series	21	Trailer, Generator. 2-Axle	2
Truck. Van. GAZ	1	Trailer, POL	2
Truck. Van, ZIL (Maintenance)	2	Trailer, Decontamination, DDP	3
Truck, Van, ZIL	1	Trailer. Kitchen	4
Truck, Van, Generator	1	Trailer. Water	1
Truck. Van. Hospital	9	Radios:	
Truck. POL (5.200-Liter)	2	HF, Manpack, Low-Power. R-104M	1
Truck. Decontamination, DDA-53/66..	1	HF/VHF, Vehicle Mount. Medium-Power	1
Truck. Decontamination. ARS-12U/14..	3	VHF, Manpack. Low-Power. R-107	3
Truck, Ambulance. UAZ-450A/452	20	Warning Receiver. R-311	1

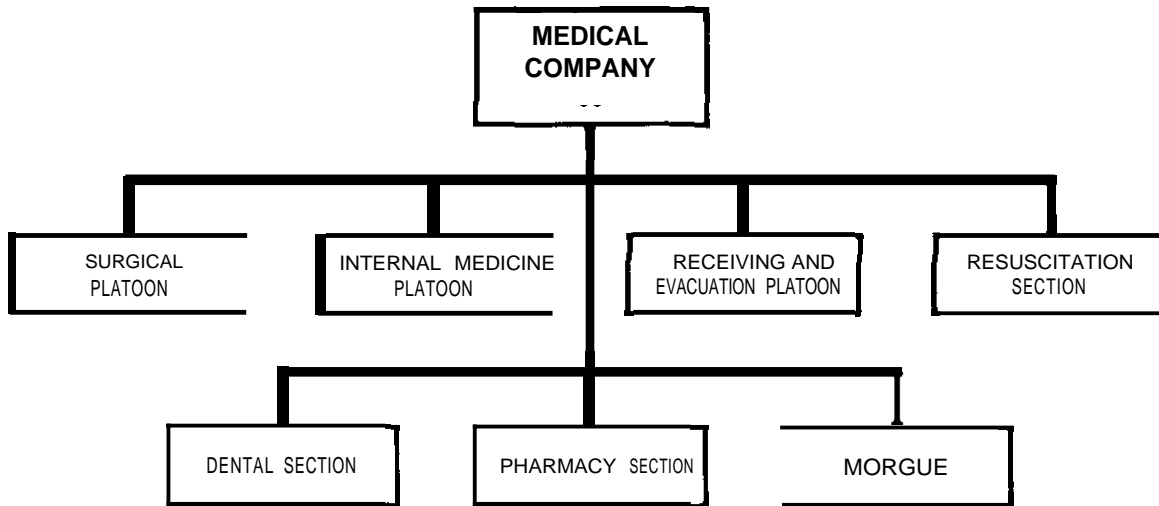
Battalion Headquarters, Medical Battalion, MRD and TD

PRINCIPAL ITEMS OF EQUIPMENT



Equipment	Total
Truck. UAZ-69/469	1
Truck, Van. GAZ	1
Radios:	
HF, Manpack. Low-Power. R-104M	1
HF/VHF, Vehicle Mount. Medium-Power	1
Warning Receiver, R-311	1

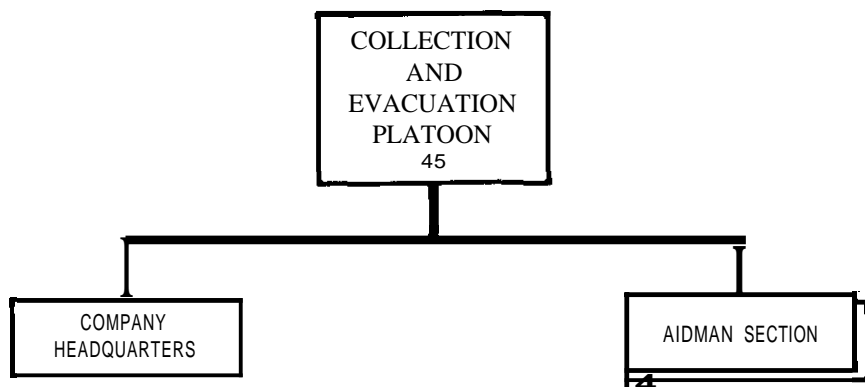
Medical Company, Medical Battalion. MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	1	Radio:	
Truck, ZIL Series	7	VHF. Manpack. Low-Power. R-107	1
Trailer. Cargo. 2-Axle	7		

Collection and Evacuation Platoon, Medical Battalion.
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Truck. UAZ-69/469	1	Truck. Van. Hospital	9
Truck. Van. ZIL	1	Radio:	
Truck. Van, Generator	1	VHF, Manpack. Low-Power. R-107	1

FM 100-2-3

Disinfection and Decontamination Platoon.
 Medical Battalion, M R Dand TD

PRINCIPAL ITEMS OF EQUIPMENT

DISINFECTION	Equipment	Total
	Truck. GAZ-66	1
	Truck, Decontamination. DDA-63/66	1
DECONTAMINATION PLATOON	Truck. Decontamination, ARS-12U/14	3
<hr style="width: 100%;"/>	Trailer, Cargo, 2-Axle	1
	Trailer. Decontamination. DDP	3
	Trailer. Water	1

Transport Section. Medical Battalion, MRD and TD

PRINCIPAL ITEMS OF EQUIPMENT

TRANSPORT SECTION
35

Equipment	Total
Truck, UAZ-69/469	1
Truck. ZIL Series	8
Truck, Van, ZIL (Maintenance)	2
Truck, POL (5,200-Liter)	2
Truck. Ambulance, UAZ-450A/452	20
Trailer, Generator	2
Trailer, POL	2
Radio:	
VHF. Manpack, Low-Power, R-107	1

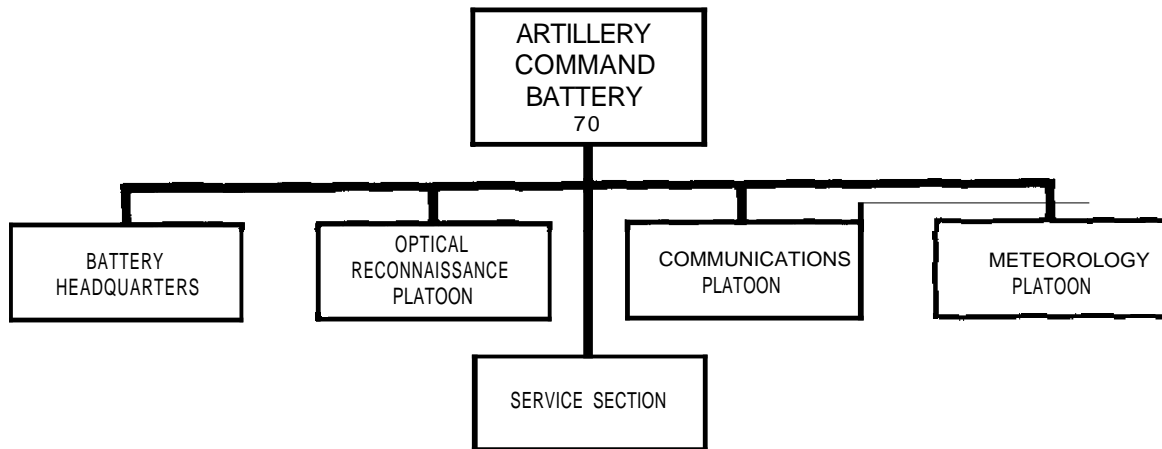
Supply and Service Platoon, Medical Battalion.
 M R Dand TD

PRINCIPAL ITEMS OF EQUIPMENT

SUPPLY AND SERVICE PLATOON

Equipment	Total
Truck. ZIL Series	6
Truck, Water Tank	3
Trailer. Cargo, 2-Axle	2
Trailer. Kitchen	4

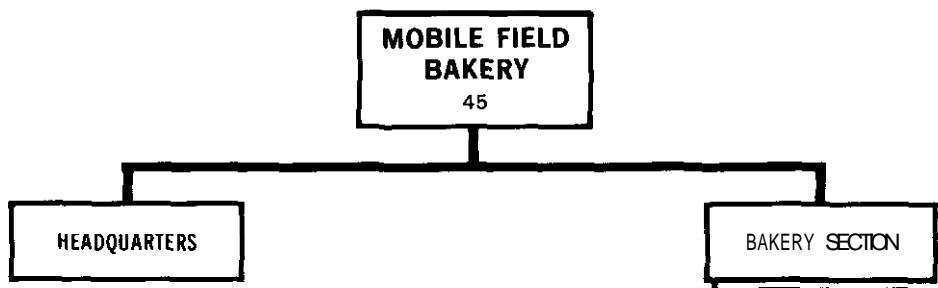
Artillery Command Battery, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-7V	4	Trailer, Cargo	2
5.45-mm LMG. RPK-74	4	Trailer, Generator	2
ACV. BTR-6OPA	2	Rangefinder	2
Truck, UAZ-69/469	2	Radar, Meteorological. END TRAY	2
Truck. GAZ-66	5	Radios:	
Truck. ZIL-157	2	HF. Manpack. Low-Power, R-104M	2
Truck, Van. GAZ	1	HF/VHF, Vehicle Mount. Medium-Power	4
Truck, Van, Ural	2	VHF, Manpack. Low-Power. R-107	6

Mobile Field Bakery, Materiel Support Battalion.
MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

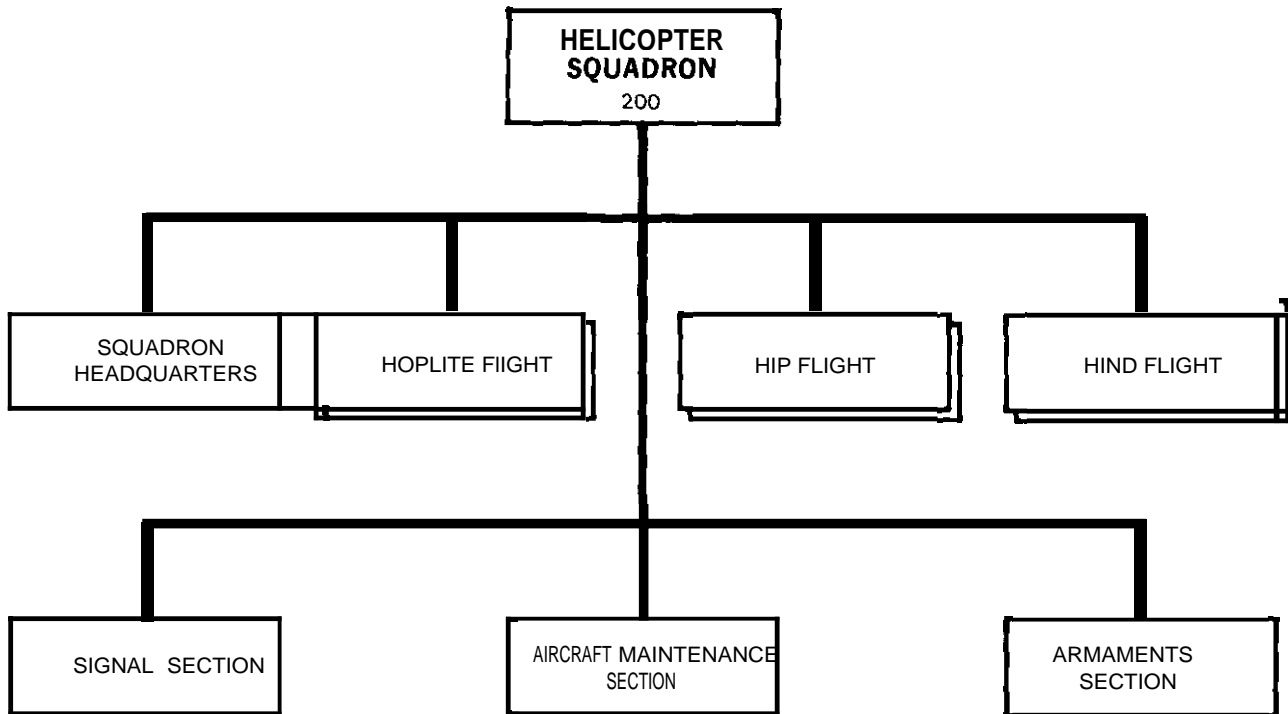
Equipment	Total	Equipment	Total
Truck, ZIL-130/131/151/157	8	Trailer, Water	4
Truck. Van, Mobile Field Bakery	4		

Helicopter Squadron. MRD and TD

Some MRDs and TDs have an organic helicopter squadron, which is also known as a fire support squadron. The squadron has 18 helicopters which may be armed with various combinations of weapons, including antitank guided missiles and air-to-surface rocket pods.

Even in the forward area, not all divisions have a helicopter squadron. Instead, they may

have a helicopter detachment that performs mostly administrative/liaison roles. The detachment has 6 HOPLITES, 2 HIP airborne command post variants, and approximately 100 personnel. The detachment does not have significant fire support or troopcarrying capabilities.

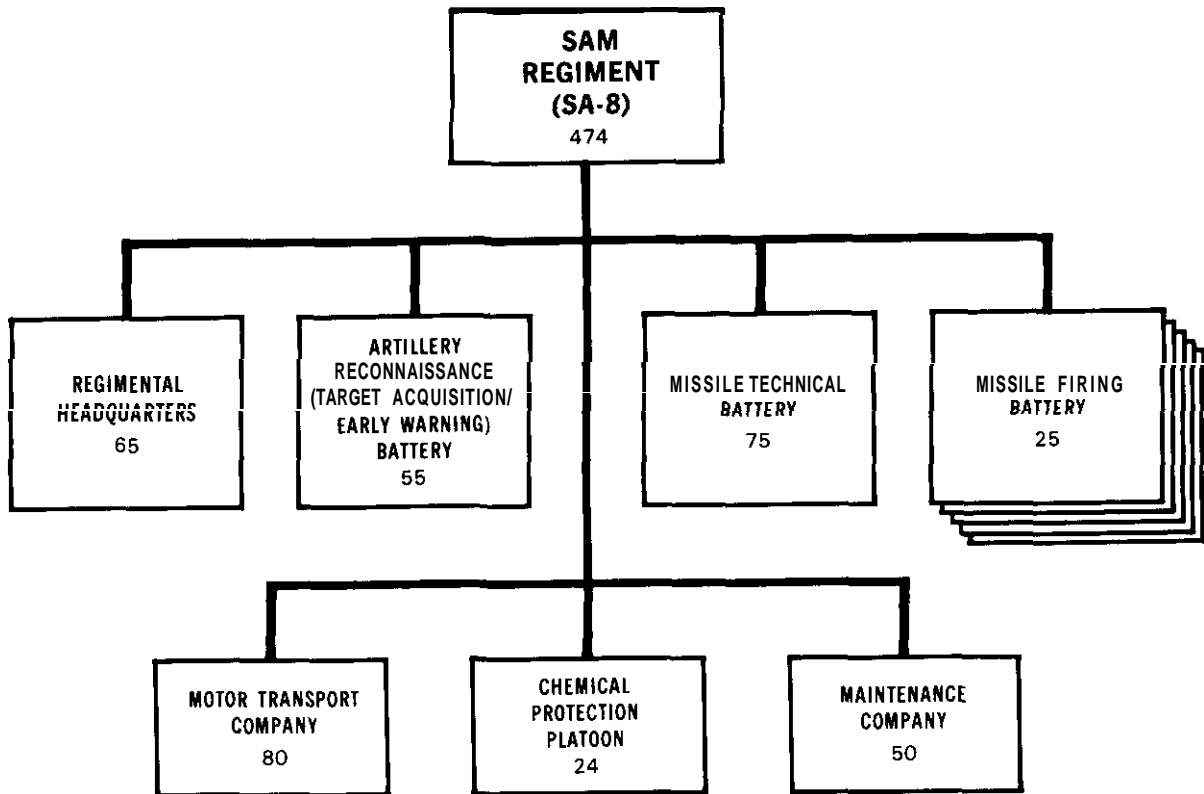


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Light Helicopter. Mi-2/HOPLITE	6	Airborne Command Post. Mi-8T/HIP D/G	2
Medium Helicopter. Mi-8T/HIP C or Mi-17/HIP H	4	Attack Helicopter, Mi-24/HIND D/E/F	6

- NOTES.** 1. Squadron structure and the totals of 18 aircraft (3 per flight) and 200 personnel are estimates only.
 2. In some squadrons, the number of HIND attack helicopters has increased.

SAM Regiment (SA-8). MRD and TD



Personnel and Equipment Recapitulation

SAM REGIMENT (SA-8), MRD AND TD								
	REGIMENTAL HEADQUARTERS	ARTILLERY RECONNAISSANCE BATTERY	MISSILE TECHNICAL BATTERY	5 * MISSILE FIRING BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	TOTAL
PERSONNEL	65	55	75	125	80	50	24	474
WEAPONS								
SAM, SA-8/GECKO TELAR*				20				20
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3		3	15				21
ACV								
ACV, BTR-60PA	2			5				7
GENERAL PURPOSE TRUCKS								
Truck, UAZ-69/469	1	3	1		1	1		7
Truck, GAZ-66	3	1	6	5	1	3		19
Truck, ZIL-131/157						3		3
Truck, KrAZ/ZIL/Ural			5		24			29
Truck, Ural-375					9			9
VAN TRUCKS								
Truck, Van, Ural	2	1	6		4			13
Truck, Van (Signal)	4							4
Truck, Van (Maintenance)					3	7		10
Truck, Van, UAZ-452 (Computer)		1						1
POL TRUCKS								
Truck, POL, ZIL/Ural					15			15
SPECIAL PURPOSE TRUCKS								
Missile Transloader (TELAR Chassis)				10				10
Radar Calibration Vehicle (TELAR Chassis)						2		2
Truck, Crane, Ural-375			2					2
Truck, Ambulance, UAZ-450A/452	2							2
Truck, Decontamination							4	4
CHEMICAL RECONNAISSANCE VEHICLES								
Chemical Reconnaissance Vehicle, BRDM-2rkh/RKhM							3	3

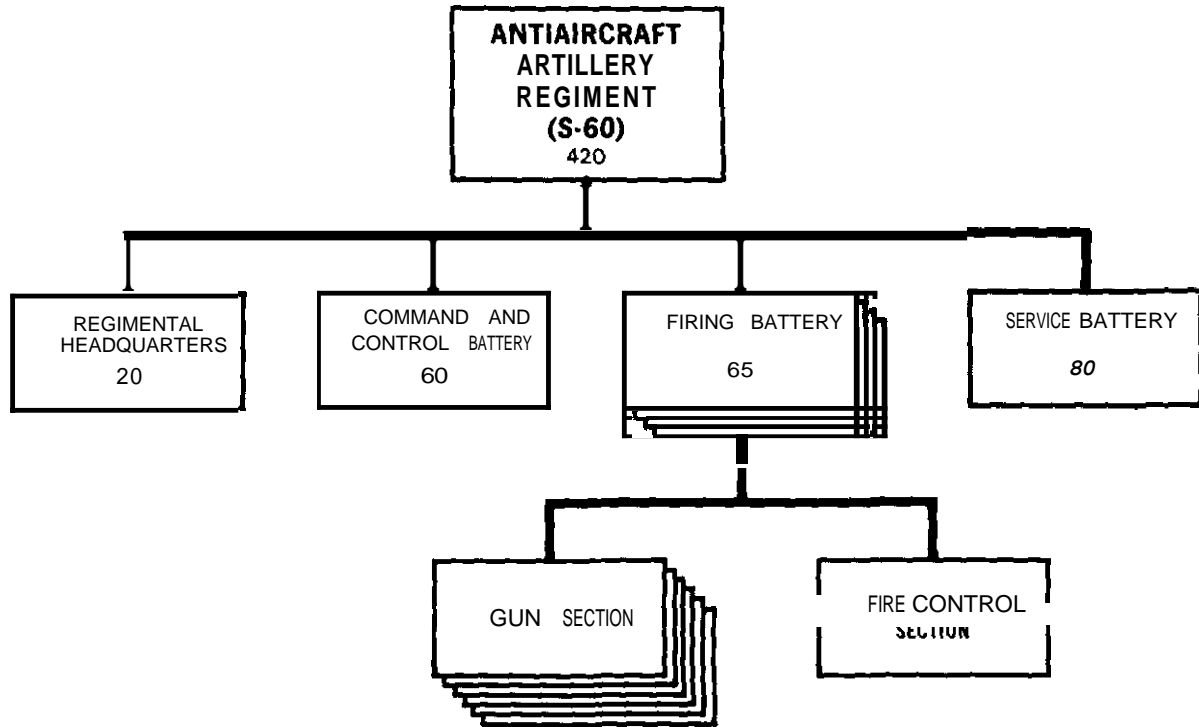
(continued)

FOOTNOTE. *The TELAR includes the LAND ROLL fire control/target acquisition radar, which appears separately in this list.

Personnel and Equipment Recapitulation (continued)

SAM REGIMENT (SA-8), MRD AND TD								TOTAL
	REGIMENTAL HEADQUARTERS	ARTILLERY RECONNAISSANCE BATTERY	MISSILE TECHNICAL BATTERY	5 - MISSILE FIRING BATTERY	MOTOR TRANSPORT COMPANY	MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	
TRAILERS								
Trailer, POL, 2-Axle					7			7
Trailer, Van, 2-Axle	4	1	1	5	2			13
Trailer, Cargo, 2-Axle		1	1	5	5	3		15
Trailer, Generator, 1-Axle	2		1		3	7		13
Trailer, Water					3	1		4
Trailer, Kitchen	1	1	2	5	1	1		11
RADARS								
Radar, Aerial Surveillance/Target Acquisition LONG TRACK/ FLAT FACE		2						2
Radar, Height-Finding, THIN SKIN		1						1
Radar, Fire Control/Target Acquisition, LAND ROLL				20				20
RADIOS								
HF, Manpack, Low-Power, R-104M		2					1	3
HF/VHF, Vehicle-Mount, Medium- Power	4							4
HF/VHF, Vehicle-Mount, High-Power	1							1
VHF, Manpack, Low-Power, R-107	1	2	1	5	1	1		11
VHF, Vehicle-Mount, Medium-Power, R-123	1	3		25			3	32
Warning Receiver, R-311	2			5				7
Radio Relay, VHF/UHF R-401/405	1							1

Antiaircraft Artillery Regiment (S-60),MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
57-mm AA Gun S-60	24
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	15
ACV, BTR-6OPA	2
Truck, UAZ-69/469	10
Truck, ZIL-131/157	12
Truck, Ural-375	65
Truck, GAZ-66	3
Truck, Van, GAZ	2
Truck, Van, Ural (Radar)	4
Truck, Van, ZIL (Radar)	2
Truck, Van, ZIL (Maintenance)	4
Truck, POL, KrAZ/Ural/ZIL	4
Truck, Crane, K-61	1
Truck, Water Tank	1
Truck, Ambulance, UAZ-450A/452	1
Truck, Chemical Reconnaissance, UAZ-69rkh	1
Trailer, POL	2

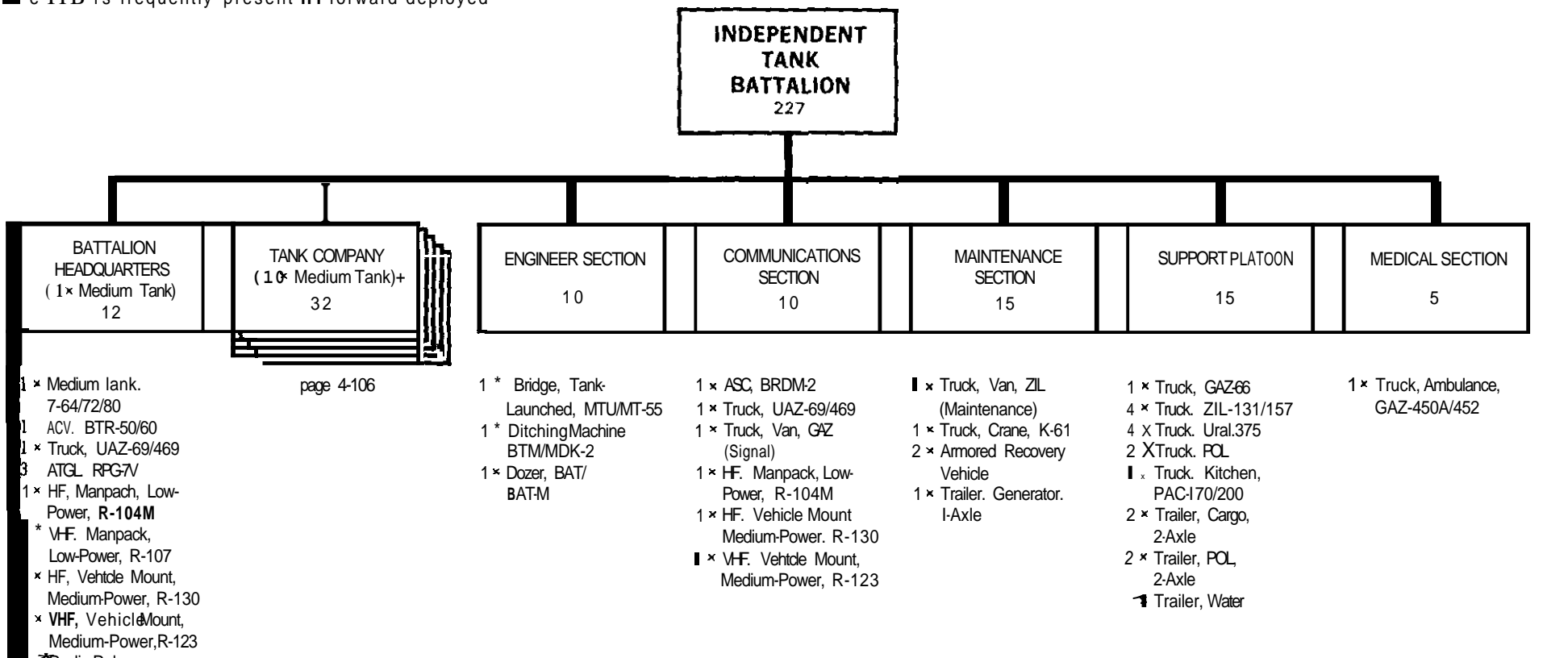
Equipment	Total
Trailer, Cargo, 2-Axle	4
Trailer, Cargo, 1-Axle	1
Trailer, Generator, 2-Axle	4
Trailer, Generator, 1-Axle	4
Trailer, Field Kitchen	8
Trailer, Water	7
Radars:	
Radar, Fire Control, FLAP WHEEL	4
Radar, Aerial Surveillance/Target Acquisition, FLAT FACE	2
Radios:	
HF, Manpack, Low-Power, R-104M	1
HF, Vehicle Mount, Medium-Power, R-130	2
HF/VHF, Vehicle Mount, High-Power	2
VHF, Portable, Very-Low-Power, R-126	15
VHF, Manpack, Low-Power, R-107	24
VHF, Vehicle Mount, Medium-Power, R-123	2
Warning Receiver, R-311	5

Independent Tank Battalion. MRD

Some MRDs have an independent tank battalion (ITB) in addition to the tank assets previously discussed. The ITB normally has 51 tanks. Since the ITB is frequently present in forward-deployed

MRDs, this chapter includes an organization chart and an equipment table of the ITB as an alternative structure. However, the ITB is not always

part of the typical MRD. For that reason, its personnel and equipment do not appear in the MRD totals.

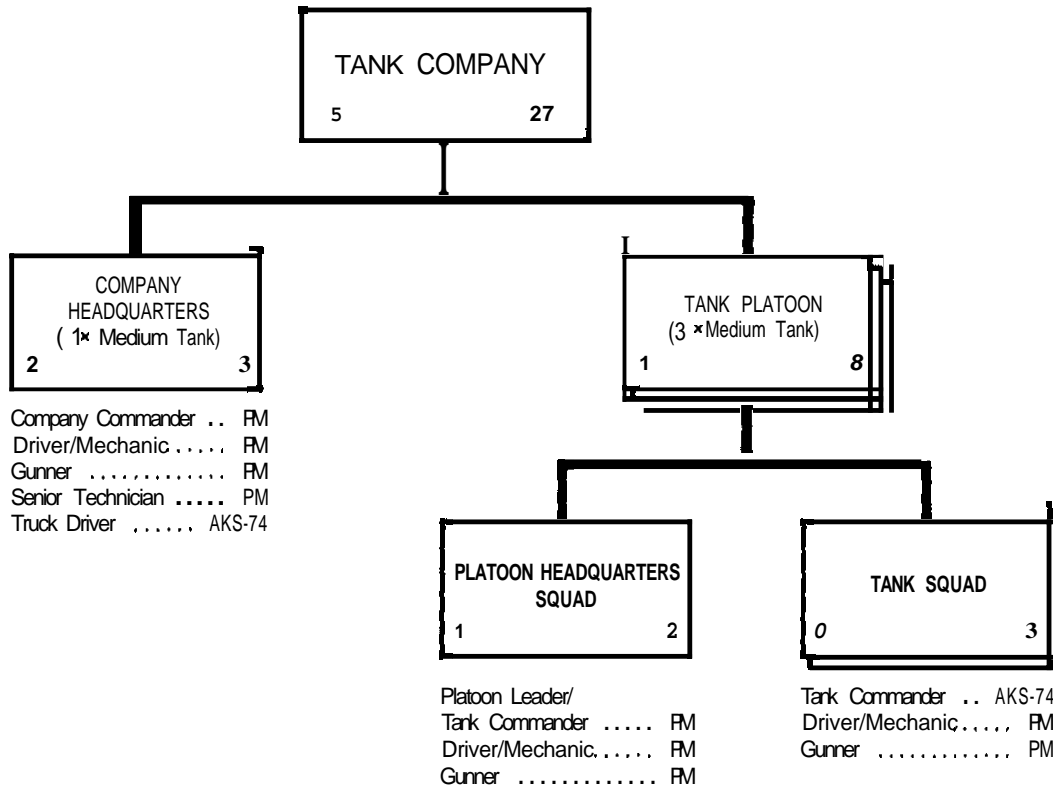


- NOTES.**
- The ITB exists only in some MRDs.
 - If the ITB has T-54/55/62 tanks, its strength will increase by 31 or 51 enlisted personnel.
 - In the late 1980s, ITBs began to adopt a 31-tank structure similar to other tank battalions. (See p. 4-108.)

PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total	Equipment	Total
Medium Tank, T-64/72/80	51	Truck, Ambulance, UAZ-450A/452	1	Trailer, POL, 2-Axle	2
ATGL RPG-7V	3	Truck Crane K-61	1	Trailer, Water	1

Tank Company, Independent Tank Battalion, MRD



PRINCIPAL ITEMS OF EQUIPMENT

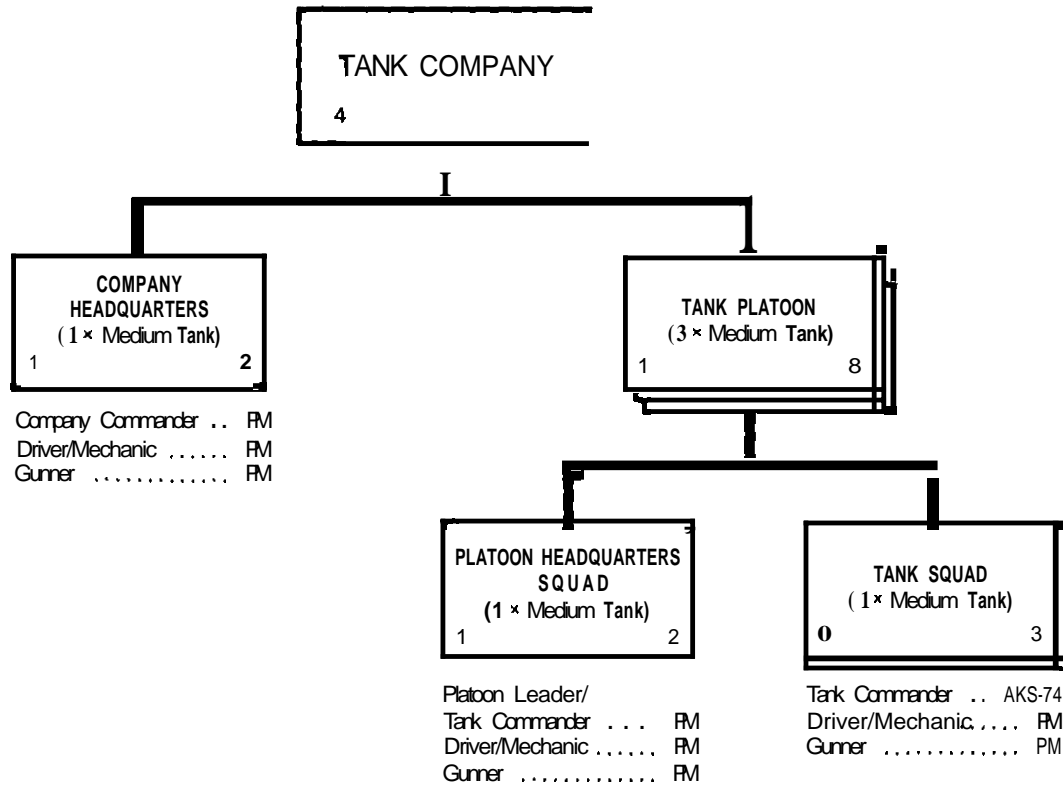
Equipment	Total
Medium Tank, T-64/72/80	10
9 - mm Pistol. PM	25
5.45-mm Assault Rifle, AKS-74	7
Mineclearing Plow/Roller, KMT-4/5M/6	3
Truck. ZIL-131/157	1

Equipment	Total
Radios:	
HF. Vehicle Mount, Medium-Power. R-130	1
VHF. Vehicle Mount. Medium-Power. R-123	10

NOTE. If the ITB has T-54/55/62 tanks. company strength will increase by ten enlisted personnel.

TANK REGIMENT STRUCTURE

Tank Company, Tank Battalion,
Tank Regiment, MRD and TD



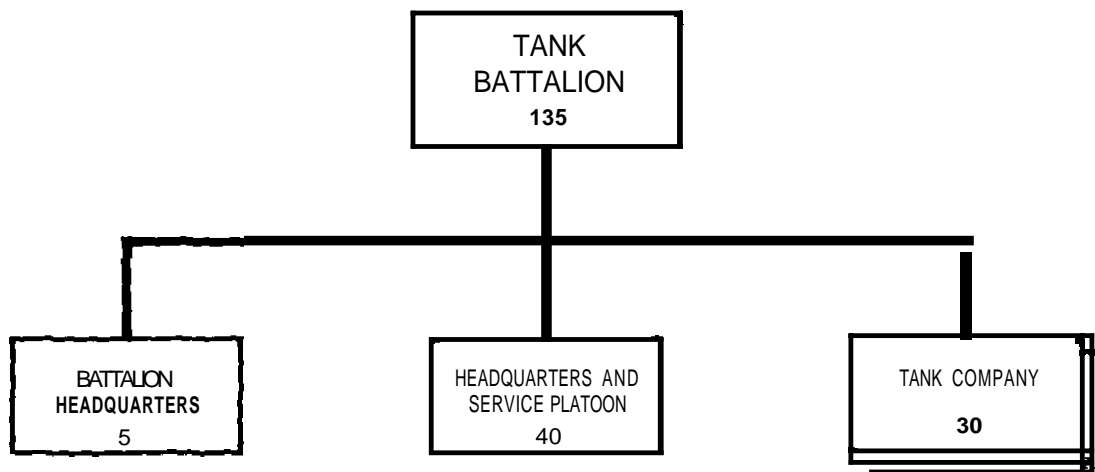
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Medium Tank, T-64/72/80	10	Radios:	
9-mm Pistol. PM	24	HF, Vehicle Mount. Medium-Power. R-130	1
5.45-mm Assault Rifle, AKS-74	6	VHF, Vehicle Mount, Medium-Power, R-123	10

NOTE. Tank companies equipped with T-54/55/62 tanks have 10 additional enlisted personnel

FM 100-2-3

Tank Battalion,
Tank Regiment, MRD and TD



PRINCIPAL ITEMS OF EQUIPMENT

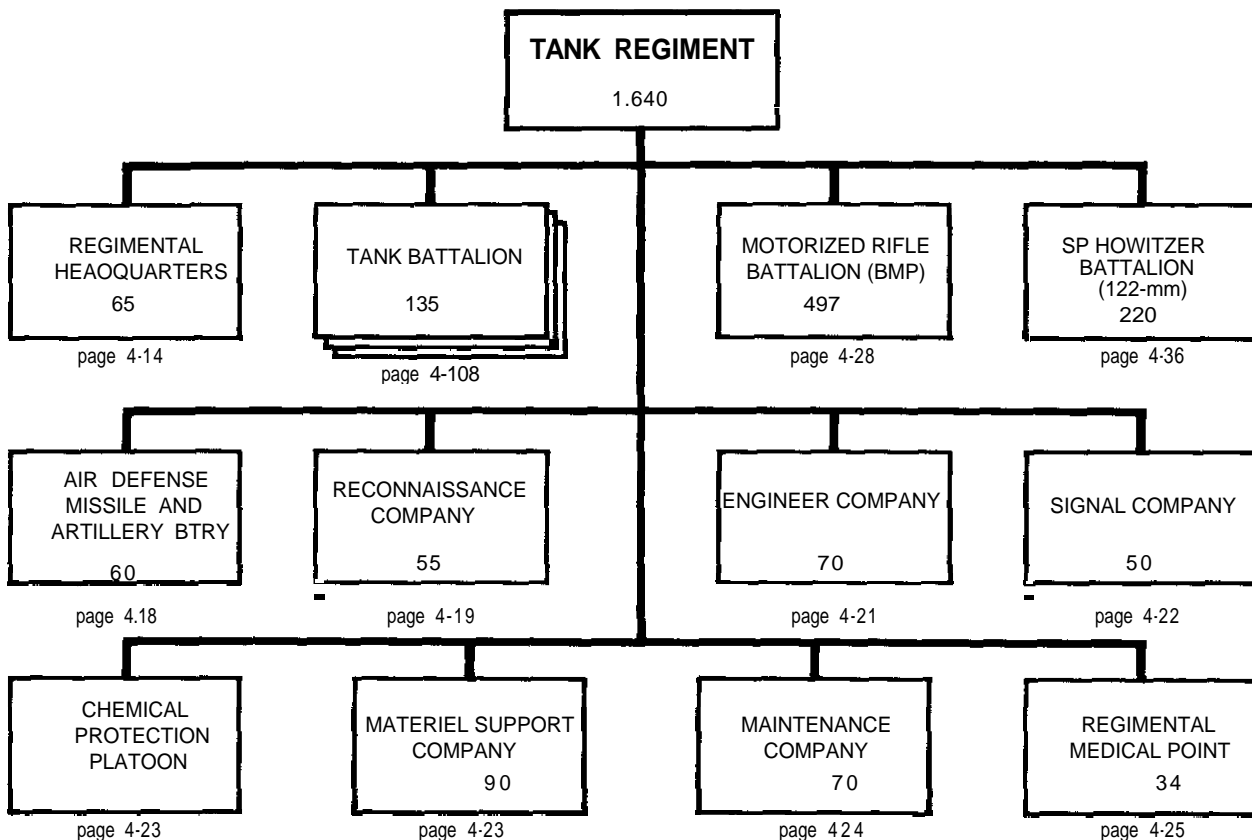
Equipment	Total	Equipment	Total
Medium Tank, T-64/72/60	31	Trailer, Generator	1
ATGL, RPG-7V	2	Trailer, Water	1
ACV, BTR-50/60/152/BRDM	2	Radios:	
Truck, ZIL-157	7	HF, Manpack, Low-Power, R-104M	2
Truck, POL	3	HF, Vehicle Mount, Medium-Power, R-130	5
Truck, Van, ZIL (Maintenance)	1	VHF, Manpack, Low-Power, R-107	1
Truck, Van, Kitchen, PAC-170/200	7	VHF, Vehicle Mount, Medium-Power.	
Trailer, Ambulance, UAZ-450A/452	1	R-123	33
Trailer, Cargo, 2-Axle	6	Warning Receiver, R-311	1
Trailer, Cargo, 1-Axle	1		

NOTE. TBs equipped with T-54/55/62 tanks will have 31 additional enlisted personnel.

Tank Regiment (T-64/72/80). TD

The TR of the TD consists of five combat and CS battalions: three TBs, each of which has 31 tanks; one MRB; and, one battalion of 18 2S1 122-mm SP howitzers. The MRB is identical to those found in BMP-equipped MRRs of both the

MRD and the TD. The TR retains all other CS and CSS subunits common to all MRRs and TRs. The one major exception is that this TR, like that of the MRD, does not have an antitank missile battery.



- NOTES.** 1. If the TR. TD. has T-54/55/62 tanks. personnel strength will increase by 94 enlisted personnel.
2. Approximately 180 personnel are officers.

FOOTNOTE. In some TRs, the howitzer battalion may still have the 122-mm towed howitzer D-30. (See p. 4-16 for the organization and equipment of a D-30 howitzer battalion.)

**TANK REGIMENT
(T-64/72/80), TO**

	REGIMENTAL HEADQUARTERS	3 rd TANK BATTALION	MOTORIZED RIFLE BATTALION (BMP)	SP HOWITZER BATTALION	AIR DEFENSE MISSILE BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIAL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL DETACHMENT	TOTAL
PERSONNEL	65	405	497	220	60	55	70	50	24	90	70	34	1,640
TANKS													
Medium Tank, T-64/72/80	1	93											94
WEAPONS													
122-mm SP Howitzer 2S1				18									18
120-mm Mortar, M1943/M-120 or 82-mm Automatic Mortar, 2B9			8										8
SAM, SA-9/GASKIN TEL or SA-13/GOPHER TELAR					4								4
SPAA Gun, ZSU-23-4 or 2S6					4								4
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3		9										12
ATGL, RPG-7V		6	35	18		4	4				4		71
Automatic Grenade Launcher, AGS-17			6										6
5.45-mm LMG, RPK-74			27	18		3							48
7.62-mm GPMG, PKM			18										18
ACV/AICV/APC/ASC/ACRV													
ACV, BRDM/BTR/BMP		6	3		3			3					15
ACV, BRM-1*						1							1
AICV, BMP-1/BMP-2			42			3							45
APC, BTR-50/60/70/80	1						3						4
ACV, BTR-60PA (FAC)	1												1
MRP, PRP-3 (BMP M1975)**				1									1
ASC, BRDM-2						4							4
ACRV, IV12 Series				8									8
GENERAL PURPOSE TRUCKS													
Truck, UAZ-69/469	3		3	1			1	5	1	2	1		17
Truck, GAZ-66			15	7	2			3	1	4		1	33
Truck, ZIL-130/131/151/157		21			4					45	1	2	73
Truck, Ural-375	1			20							1		22
Truck, KrAZ/ZIL/Ural			4				9						13
VAN TRUCKS													
Truck, Van, GAZ								3				1	4
Truck, Van, ZIL (Command)	3												3
Truck, Van, ZIL (Signal)								2					2
Truck, Van, ZIL (Maintenance)		3	1	2			1			1	12		20
Truck, Van, Kitchen, PAC-170/200		3	1										4
POL TRUCKS													
Truck, POL, ZIL/Ural/KrAZ		9	2	2						15			28
DECONTAMINATION TRUCKS													
Truck, Decontamination									4			1	5
CHEMICAL RECONNAISSANCE VEHICLES													
Chemical Reconnaissance Vehicle BRDM-2rkh/RKHM									3				3
MISCELLANEOUS SPECIAL PURPOSE VEHICLES													
Truck, Water Tank										4			4
Truck, Ambulance, UAZ-450A/452		3	1	1								4	9
Truck, Crane, K-61							1						1
Truck, Crane, Shovel, E-305V							2						2

(continued)

FOOTNOTES This vehicle includes the TALL MIKE radar which appears separately in this list
 **This vehicle includes the SMALL FAED radar which appears separately in this list

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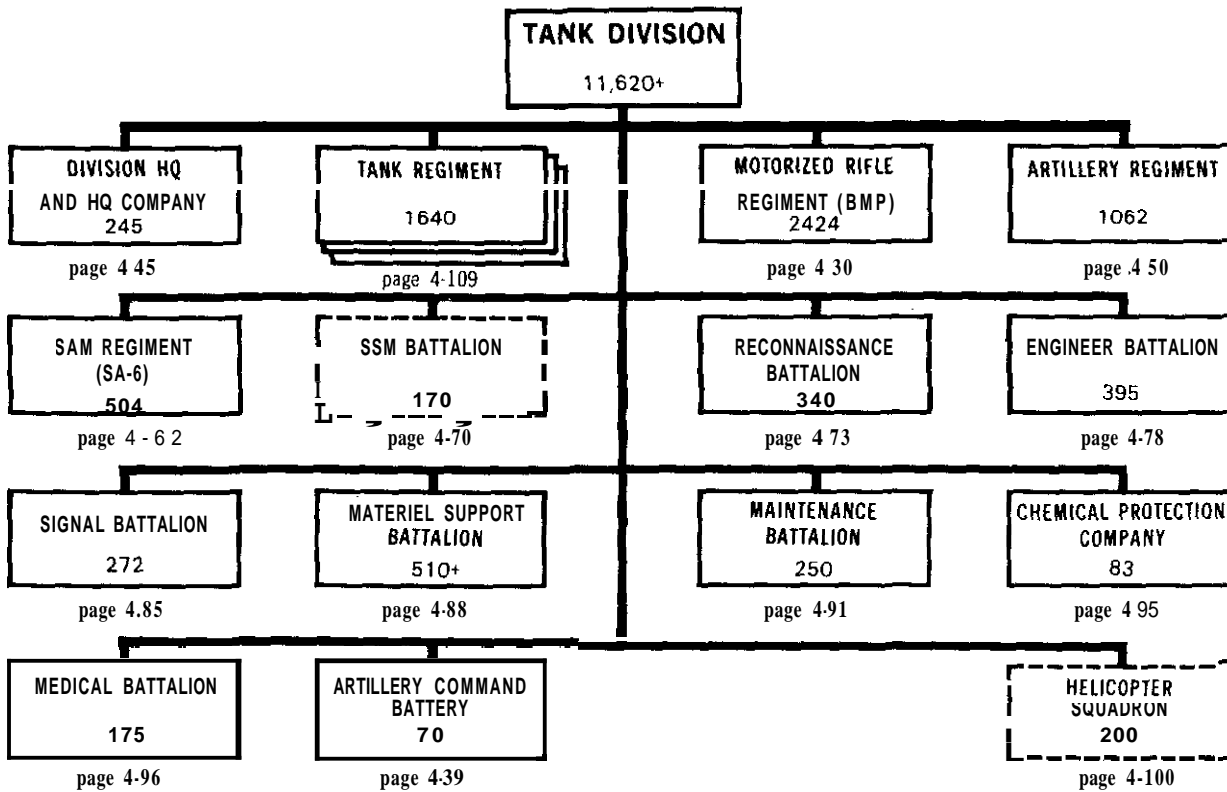
TANK DIVISION

Tank Division (T-64/72/80)

In the reorganization that began in the late 1970s, the Soviet TD gained more combat equipment and personnel than the MRD. It is now a more balanced combined arms formation. The TD, like the MRD, comprises six regiments: three TRs, one MRR, one artillery regiment, and one SAM regiment.

All other elements of the TD are virtually identical to those of the MRD, except that there is no antitank battalion in the TD. The MRR is BMP-equipped and is identical to the BMP regiment of

the MRD. Likewise, the SAM regiment, SSM battalions, and helicopter squadron have similar structures, whether they are organic to an MRD or to a TD. The same variations in equipment are possible. Some differences also exist in the configuration of the artillery regiment, the engineer battalion, and the maintenance battalion. The user of this document should consult the organization charts and the personnel and equipment tables presented under the MRD for a more complete explanation of such differences.



- NOTES.**
- 1 The TD may have a SAM regiment equipped with the SA-8 SAM (p. 4-101) or an AAA regiment equipped with the S-60 AA Gun (p. 4-104) instead of the S A - 6 SAM regiment.
 2. Armies in WGF are consolidating division-level SSM battalions into army-level SSM brigades.
 3. Starting in 1989, the Soviets are converting one of the TRs of the TD into a second MRR.
 4. Not all divisions have a helicopter squadron.

Personnel and Equipment Recapitulation (continued)

HEADQUARTERS	3 * TANK BATTALION	MOTORIZED RIFLE BATTALION (BMP)	SP HOWITZER BATTALION	AIR DEFENSE MISSILE AND ARTILLERY BATTERY	RECONNAISSANCE COMPANY	ENGINEER COMPANY	SIGNAL COMPANY	CHEMICAL PROTECTION PLATOON	MATERIEL SUPPORT COMPANY	MAINTENANCE COMPANY	REGIMENTAL MEDICAL POINT	TOTAL
					2							2
												1
				3		3						6
									5			5
					3							3
					4							4
					1							1
					1							1
					3							3
					27							27
					9							9
					3							3
					1							1
		1	2					15				18
3	2											5
18		10			2		2	30	6			68
3	1								2			6
				2		1			1			4
3	1	1								1		6
	3	3							2	1		9
	1	4										5
					1							1
		1										1
					4							4
6				1		2	1					10
15	2			1		2						21
						1						1
						2						2
						2						2
	20											20
3	14	10	2	3		7		1	1	1		44
99	45	28	11	7	7	2	4		5			210
3	1	2	3	1		3						13
						2						2
	4											4

TANK DIVISION
(T-64/72/80)

	DIVISION HQ AND HQ COMPANY	3 - TANK REGIMENTS	MOTORIZED RIFLE REGIMENT (BRM)	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIAL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY BATTERY	HELICOPTER COMMAND SQUADRON	TOTAL
PERSONNEL	245	4,920	2424	1,062	504	170	340	395	272	510+	250	83	175	70	200	11,620+
TANKS																
Medium Tank, T-64/72/80		282	40				6									328
WEAPONS																
FROG/SSM TEL, FROG-7/7B or SS-21/SCARAB						4										4
152-mm SP Howitzer, 2S3				36												36
122-mm SP Howitzer, 2S1		54	18													72
122-mm Rocket Launcher, BM-21				18												18
120-mm Mortar, M1943/M-120 or 82-mm Automatic Mortar, 2B9		24	24													48
SAM, SA-6a/GAINFUL TEL or SA-6b/GAINFUL TELAR					20											20
SAM, SA-9/GASKIN TEL or SA-13/GOPHER TELAR		12	4													16
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	6	36	30		21											93
SPAA Gun, ZSU-23-4 or 2S6		12	4													16
ATGM Launcher Vehicle (BRDM-2), AT-3/5				9												9
ATGL RPG-7V	3	213	146	44		13	8		15	12				4		458
30-mm Automatic Grenade Launcher, AGS-17		18	18													36
5.45-mm LMG, RPK-74	3	144	102	36		25								4		314
7.62-mm GPMG, PKM		54	54													108
HELICOPTERS																
Mi-2/HOPLITE															6	6
Mi-8T/HIP C or Mi-17/HIP H															4	4
Mi-8T/HIP D/G															2	2
Mi-24/HIND D/E/F															6	6
ACV/ACRV/AICV/APC/ASC																
ACV, BMP/BRDM/BTR		45	21	6	6	3	2	8					2			93
ACV, Recon. BRM-1*		3	1			3										7
AICV, BMP-1/BMP-2		135	129			12										276
APC, BTR-50/60/70/80	3	12	4			0-6	3									22-28
APC, BTR-60PA (FAC)		3	1													4
MRP, PRP-3 (BMP M1975)**		3	1	3												7
APC, M1-LB M1975***				1												1
ASC, BRDM-2		12	4			6-12										22-28
ACRV, IV12 Series		24	8	16												48
ACRV, M1979 (1/2/3)				8												8
GENERAL PURPOSE TRUCKS																
Truck, UAZ-69/469	12	51	23	21	7	1	5	8	12	6	5	2	4	2		159
Truck, GAZ-66	9	99	62	31	19	6	2		7	33	4	3	1	5		281
Truck, ZIL-130/131/151/157		219	14	8	3		5	22		38	16	5	21	2		353
Truck, Ural-375		81	67	72			4	16		120	6	1				367
Truck, KrAZ/ZIL/Ural	4	39	23	49	38	8			9		1					171
Truck, KrAZ-214/255								1								1
VAN TRUCKS																
Truck, Van, GAZ		12	4	9		6	17	2	21	1			1	1		74
Truck, Van ZIL/Ural (Command)	12	9	3	14	18	5	6			2			1	2		72
Truck, Van, ZIL (Signal)		6	2	2	4				12							26
Truck, Van, ZIL (Maintenance)	1	60	21	3	11		2	4	4	9	42		2			159
Truck, Van, UAZ-452		2		1	1	4			1	1						10
Truck, Van, Kitchen, PAC-170/200		15	5							2						22
Truck, Van, ZIL (AT-3/5 Simulator)			1													1
Truck, Van, Hospital													9			9
Truck, Van, Mobile Field Bakery									4							4
Truck, Van, Generator													1			1
POL TRUCKS																
Truck, POL, ZIL/Ural/KrAZ	1	84	26	14	15	2	2	3	1	80	4	2	2			236
DECONTAMINATION TRUCKS																
Truck, Decontamination		15	5	5	4							14	4			47

(continued)

FOOTNOTES This vehicle includes the TALL MIKE radar, which appears separately in this list
 **This vehicle includes the SMALL FRED radar, which appears separately in this list
 ***This vehicle includes the BIG FRED radar, which appears separately in this list

**TANK DIVISION
(T-64/72/80)**

	DIVISION HQ AND HQ COMPANY	3 rd TANK REGIMENT'S	MOTORIZED RIFLES REGIMENT (SMB)	ARTILLERY REGIMENT	SSM REGIMENT	SSM BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY BATTERY	HEADQUARTERS SQUADRON	TOTAL
CHEMICAL RECONNAISSANCE VEHICLES																
Chemical Reconnaissance Vehicle, BRDM-2rkh/RKhM		9	3	4	3		4					4				27
SPECIAL PURPOSE VEHICLES																
Truck, Ambulance, UAZ-450A/452	1	27	9	7	2	1	1	1	1	1				20		72
Truck, Water Tank		12	4	3						6	1			3		29
Truck, Tractor, KrAZ-214/255											2					2
Truck, Crane, K-61		3	1				1			5						10
Truck, Crane, Ural-375					2	1	2				3					8
Truck, Crane (Shovel), E-305V		6	2				2									10
Truck, Dump, MMZ-555		6	2				3									11
Truck, Recovery, ZIL-157										2						2
Truck, Sawmill, Ural-375 (LRV Saw)							1									1
Truck, Water Purification							1									1
Truck, Mine Detector, DIM							3									3
Truck-Tractor, SA-6 Canister Transporter					15											15
Semitrailer, SA-6 Canister Transporter					15											15
Truck, SA-6 Missile Transloader ZIL-131					15											15
Sedan, GAZ-24	2	3	1													6
FROG/SSM Transport Vehicle						4										4
Motorcycle, M-72/K-750V/Ural-3		18	6					13		3						40
Armored Recovery Vehicle		15	3	1						5						24
Armored Maintenance Vehicle, MTP			3													3
Tractor, Artillery, AT-5										1						1
ENGINEER EQUIPMENT																
Armored Engineer Tractor, IMR							2									2
Bridge, Tank-Launched, MTU/MT-55		9	1													10
Bridge, Truck-Launched, TMM		12	4				8									24
Tracked Ferry, GSP							6									6
PMP Center Section on KrAZ-214							16									16
PMP Ramp Section on KrAZ-214							2									2
PMP Service Truck, KrAZ-214							1									1
Tracked Amphibian, K-61-PTS							12			1						13
Ditching Machine, BTM/MDK		3	1				4									8
Dozer, BAT/BAT-M/PKT		3	1				8									12
Grader, D-144							2									2
Bucket Excavator, PZM		9	3													12
Mineclearer, MTK/MTK-2							2									2
Mineclearing Plow, KMT-4/6		81	9													90
Pile Driver Set KMS (on 3 ZIL Trucks)							1									1
Powerboat, BMK-90/150 (on ZIL Truck)							6									6
Minelayer, SP Armored, GMZ							3									3
Minelayer, Towed PMR-3		9	3													12
Tractor, K-700							2									2
Water Purification Set, MAFS		3	1													4
Assault Boat, Inflatable, NDL-10							10									10
Concrete Mixer							1									1
TRAILERS																
Trailer, Lowboy							1			2						3
Trailer, PQL	1	54	20	14	7		2	2	1	80	4			2		187
Trailer, Cargo, 1-Axle		15	7				4	10	2							38
Trailer, Cargo, 2-Axle	4	204	56	91	15	2	6		122	14			10	2		526
Trailer, Generator, 1-Axle	1	18	7	2	13		2			6						49
Trailer, Generator, 2-Axle	2	12	4	4		4	2	2	10	6	1		2	2		51
Trailer, Water	1	18	7	5	4	1	1	3	1	7	1	4	1			54
Trailer, Field Kitchen	3	27	15	11	11	1	4	5	2		3					86
Trailer, Decontamination, DKV DDP													3			3

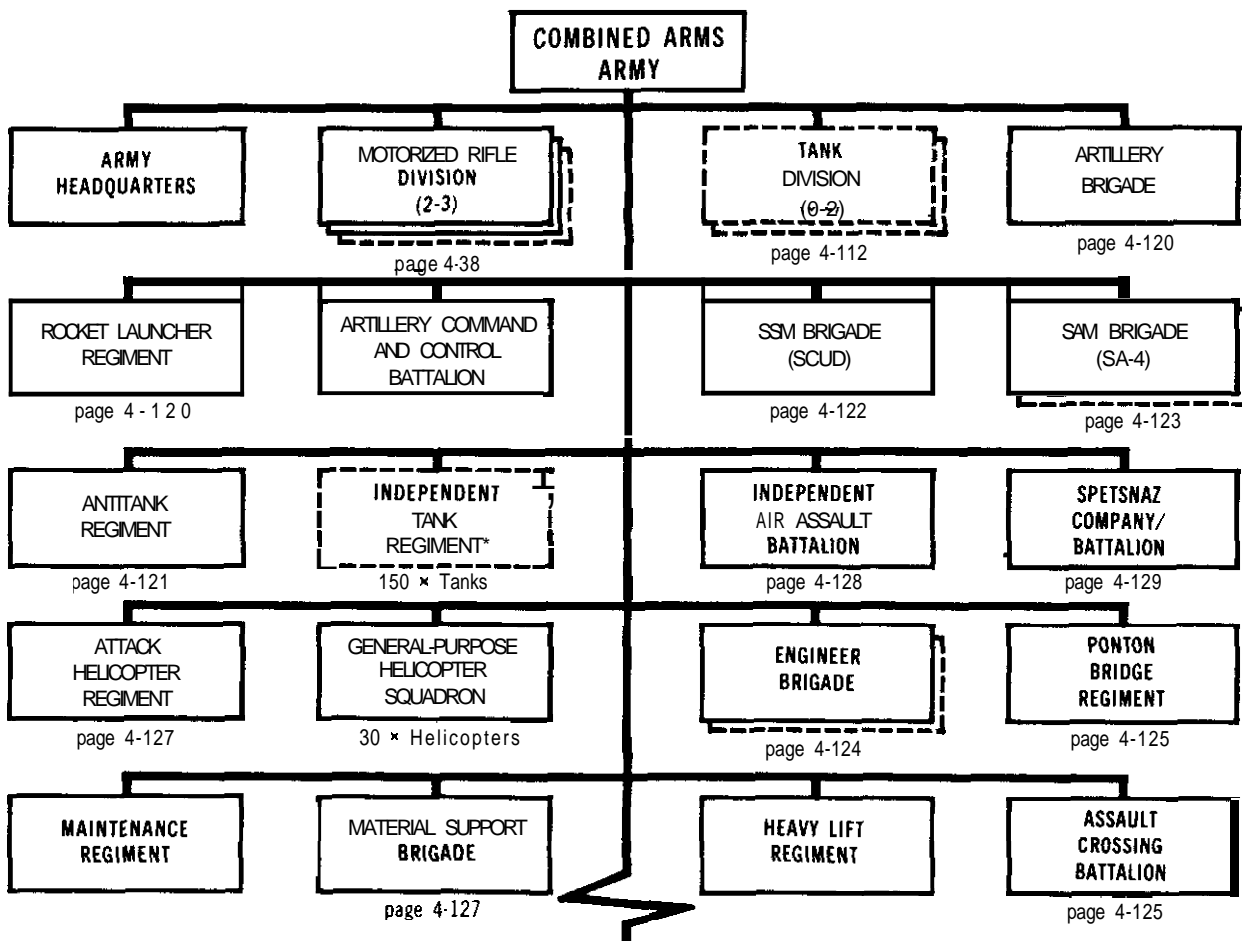
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COMBINED ARMS ARMY

Combined Arms Army

A typical CAA consists primarily of two to three MRDs and up to two TDs. Based on army structures identified in WGF in recent years, the ratio of MRDs to TDs in a CAA can vary from a pure 3:0 to a perhaps more typical 3:1 or a more

balanced 2:2. However, other combinations may be possible. Therefore, the organizational charts below depict a variable number of divisions and all the different nondivisional CS and CSS elements which could be part of any given CAA.



(continued)

FOOTNOTES. "In 1989, the Soviets began converting independent tank regiments (TRs) to independent motorized rifle regiments (IMRRs), presumably organized like other MRRs. (See p. 4-30.)

**Also known as a mobile computation and analysis station.

***Also known as a radio intercept and direction-finding battalion.

****Also known as a radio and radar intercept and direction-finding battalion.

NOTE: Armies in *WGF* are consolidating division-level SS-21 battalions into army-level SSM brigades.

Personnel and Equipment Recapitulation (continued)

	DIVISION HQ AND HQ COMPANY	3 * TANK REGIMENTS	MOTORIZED RIFLE REGIMENT (BMP)	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY COMMAND BATTERY	HELICOPTER SQUADRON	TOTAL
				13												13
							3									3
							1									1
							1									1
D																
		15	8	11									2			36
				1												1
nce				1												1
ce, SMALL		3	1	3												7
nce, TALL		3	1				3									7
nter-				1												1
Target					2											2
V SKIN					1											1
HT FLUSH					5											5
TRAY				1		2							2			5
F							9									9
							3									3
				3			3									6
Power		12	4													16
R-104M		30	6	1	2	2	6	9	5	1		2	1	2		67
Power,		63	14	5			4		8		1					95
R-118		3	1													4
adium-		6	2	5	4	4	6	2	7	1	1		1	4		43
gh-Power		6	2	1	2	1	2	2	8							24
R-148		60	60	1	3											124
R-107		132	75	60	11	17	12		20	4	5		3	6		345
m-Power	3	630	252	64	37		40	25	6		4	4				1065
		39	13	7	7	1	5	1	3	1	1		1			79
101/405/		6	2	1	1	1	1		6							18
gnal Distri-							6									6
. Very-								2								2
		12	12													24

	DIVISION HQ AND HQ COMPANY	3 * TANK REGIMENTS	MOTORIZED RIFLE REGIMENT (BMP)	ARTILLERY REGIMENT	SAM REGIMENT	SSM BATTALION	RECONNAISSANCE BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	MATERIEL SUPPORT BATTALION	MAINTENANCE BATTALION	CHEMICAL PROTECTION COMPANY	MEDICAL BATTALION	ARTILLERY COMMAND BATTERY	HELICOPTER SQUADRON	TOTAL
				13												13
							3									3
							1									1
							1									1
		15	8	11									2			36
				1												1
				1												1
SMALL		3	1	3												7
TALL		3	1			3										7
				1												1
et					2											2
KIN					1											1
FLUSH					5											5
AY				1		2							2			5
							9									9
							3									3
				3			3									6
er		12	4													16
4M		30	6	1	2	2	6	9	5	1		2	1	2		67
wer,		63	14	5			4		8		1					95
118		3	1													4
n-		6	2	5	4	4	6	2	7	1	1		1	4		43
ower		6	2	1	2	1	2	2	8							24
8		60	60	1	3											124
7		132	75	60	11	17	12		20	4	5		3	6		345
wer	3	630	252	64	37		40	25	6		4	4				1065
		39	13	7	7	1	5	1	3	1	1		1			79
05/		6	2	1	1	1	1		6							18
							6									6
Distri-									2							2
-		12	12													24

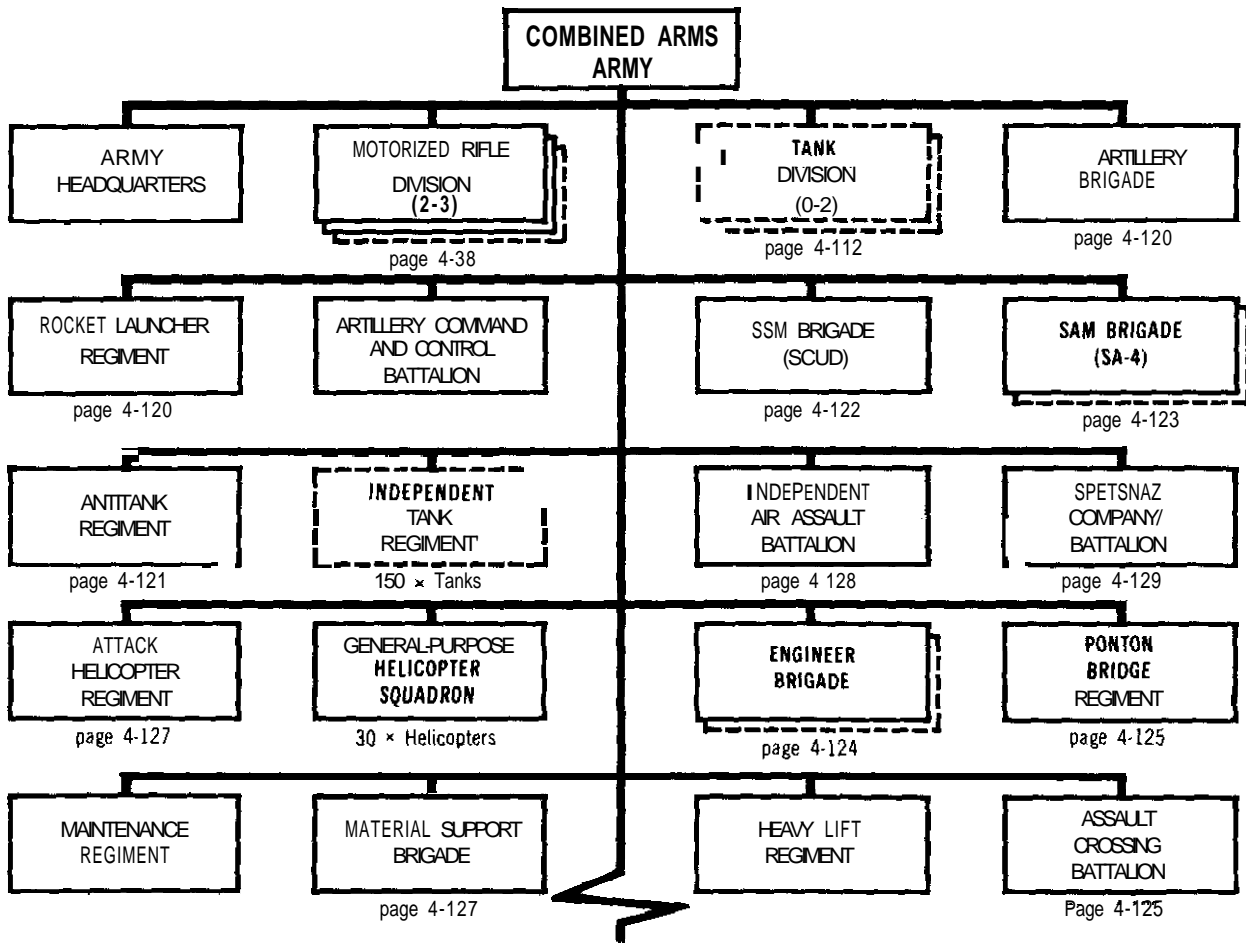
Personnel and Equipment Recapitulation (continued)

COMBINED ARMS ARMY

Combined Arms Army

A typical CAA consists primarily of two to three MRDs and up to two TDs. Based on army structures identified in WGF in recent years, the ratio of MRDs to TDs in a CAA can vary from a pure 3:0 to a perhaps more typical 3:1 or a more

balanced 2:2. However, other combinations may be possible. Therefore, the organizational charts below depict a variable number of divisions and all the different nondivisional CS and CSS elements which could be part of any given CAA.



(continued)

FOOTNOTES. In 1989, the Soviets began converting independent tank regiments (TRs) to independent motorized rifle regiments (IMRRs), presumably organized like other MRRs. (See p. 4-30.)

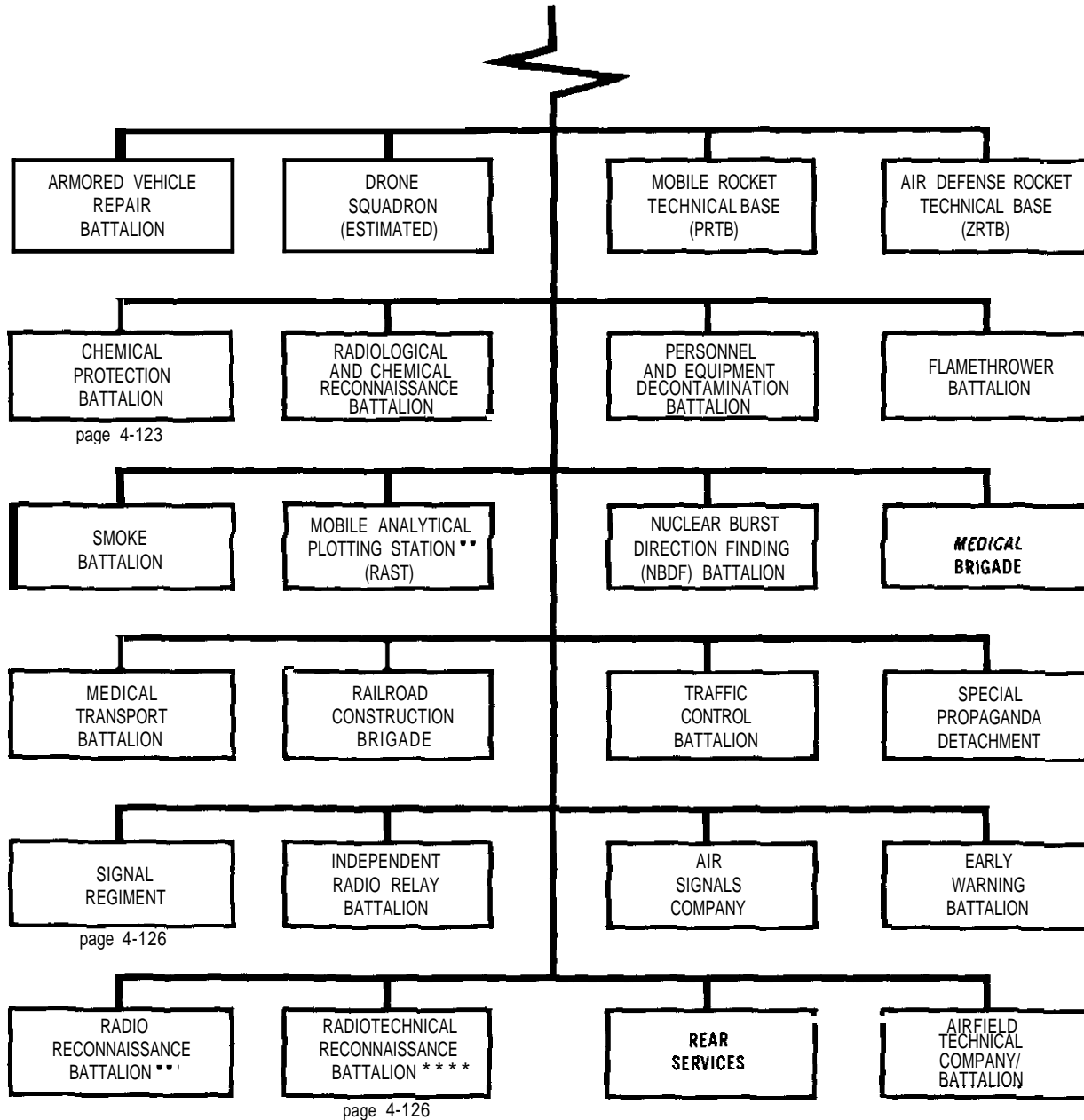
**Also known as a mobile computation and analysis station.

***Also known as a radio intercept and direction-finding battalion.

****Also known as a radio and radar intercept and direction-finding battalion.

NOTE: Armies in WGF are consolidating division-level SS-21 battalions into army-level SSM brigades.

Combined Arms Army (continued)

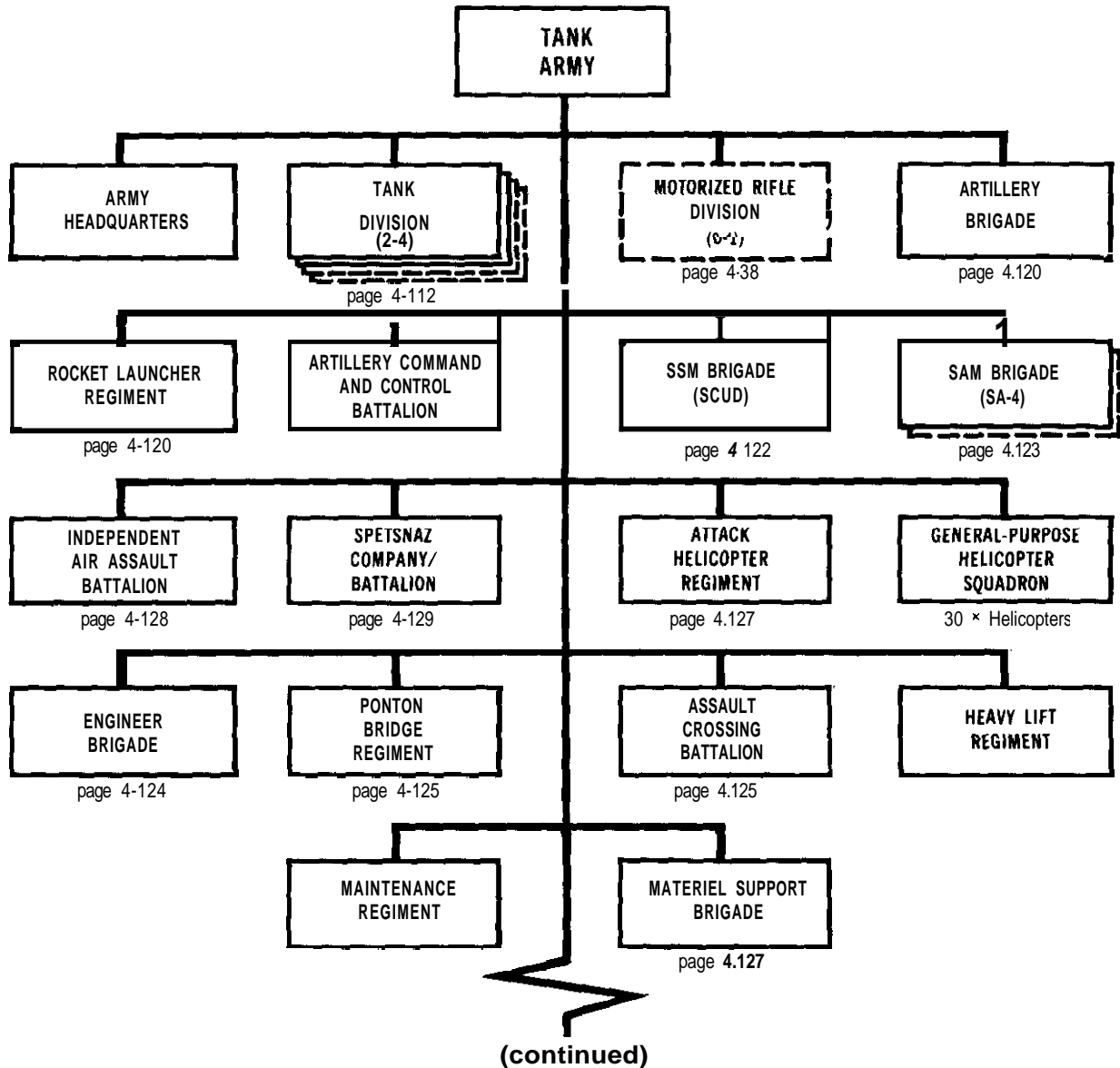


TANK ARMY

Tank Army

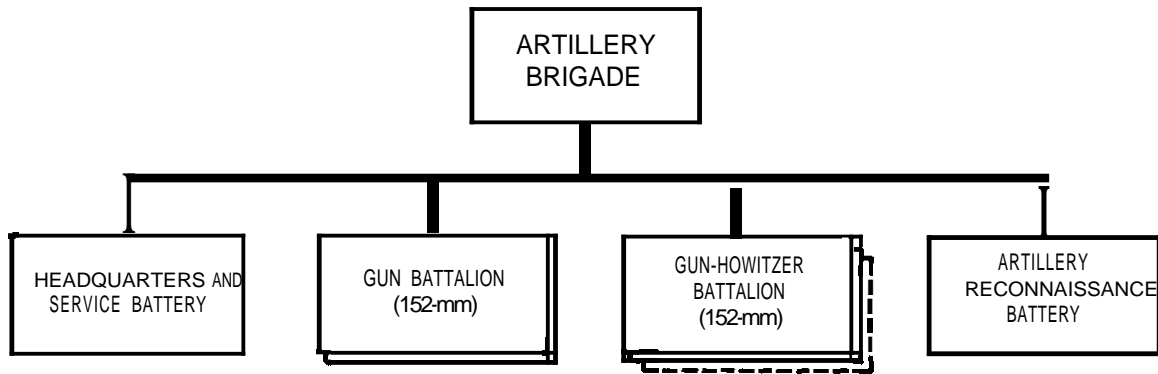
A typical TA consists primarily of three to four TDs and perhaps one MRD. Based on army structures identified in WGF in recent years, the ratio of TDs to MRDs in a TA can vary from a pure 4:0 to more balanced 4:1 3:1, or 2:1 structures.

However, other combinations may be possible. Therefore, the organizational charts below depict a variable number of divisions and all the different nondivisional CS and CSS elements which could be part of any given TA.



NOTE: Armies in WGF are consolidating division-level SS-21 battalions into army-level SSM brigades.

Artillery Brigade, Army

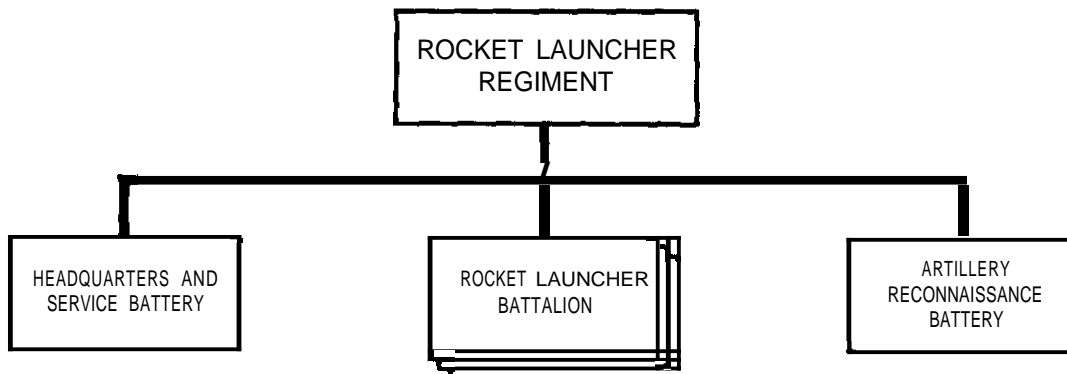


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	5 × 18-Tube Battalion	Total	4 × 24-Tube Battalion
152-mm Field Gun 2A36 or 152-mm SP Gun 2S5 or 130-mm Field Gun M-46	36	48	
152-mm Gun-Howitzer D-20 or ML-20 or MI987	54	48	

- NOTES. 1. While some armies, particularly those in the forward area, have an artillery brigade with four 24-tube battalions, most armies have an artillery brigade consisting of two gun battalions and three gun-howitzer battalions, with only 18 tubes per battalion.
2. Some battalions still have the older 130-mm field gun M-46 or 152-mm gun-howitzer ML-20.

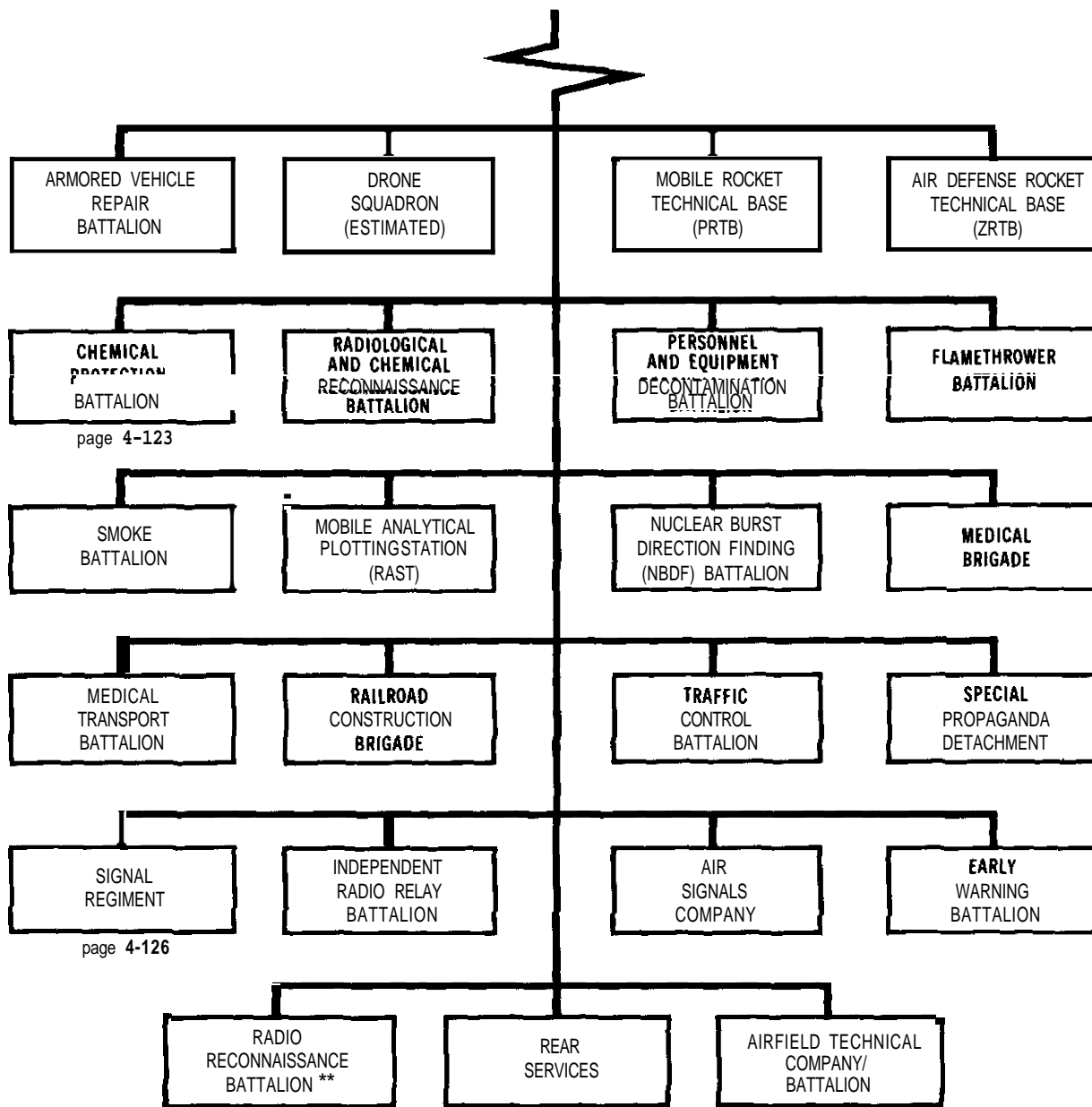
Rocket Launcher Regiment, Army



PRINCIPAL ITEMS OF EQUIPMENT

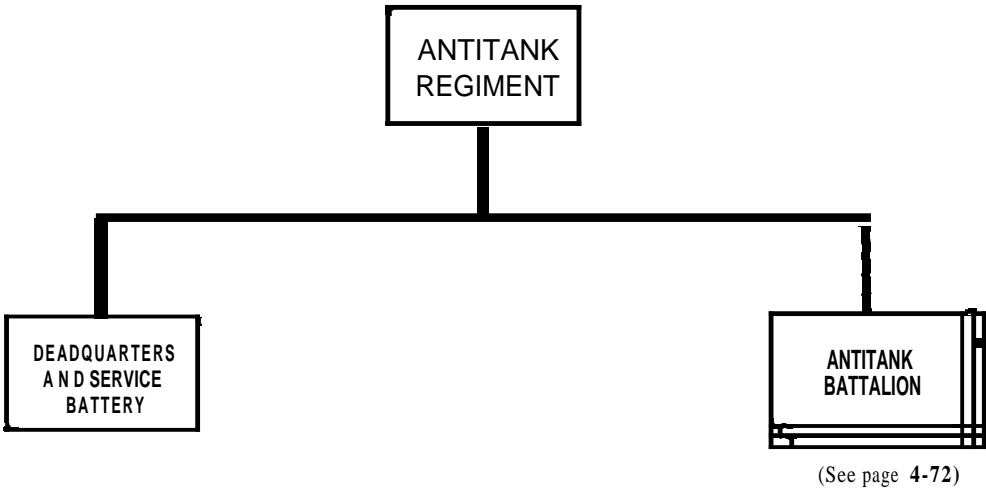
Equipment	Total
122-mm Rocket Launcher (40-Round) BM-21	54

Tank Army (continued)



FOOTNOTES. "Also known as a mobile computation and analysis station.
 **Also known as a radio intercept and direction-finding battalion.

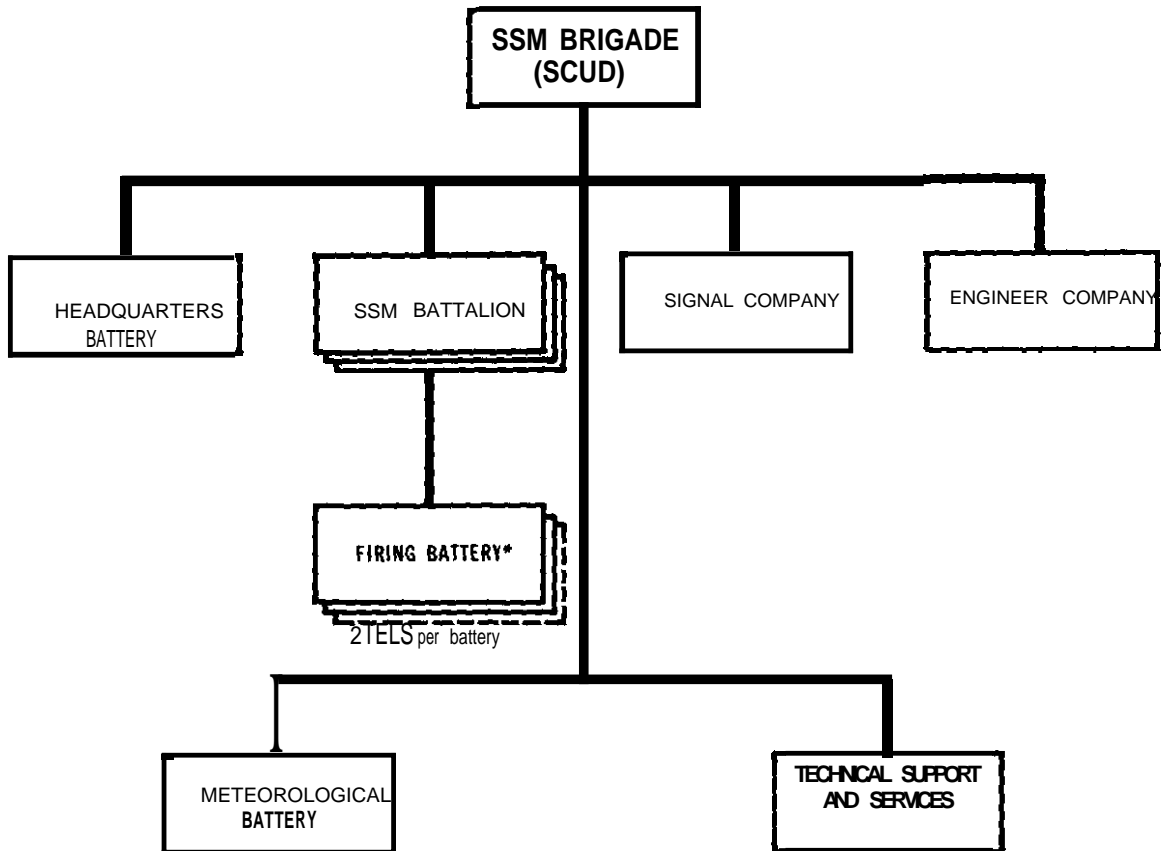
Antitank Regiment, Army _____



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
100-mm Antitank Gun T-12/MT-12	36
ATGM Launcher Vehicle (BRDM-2), AT-3/5	27

SSM Brigade (SCUD). Army or Front



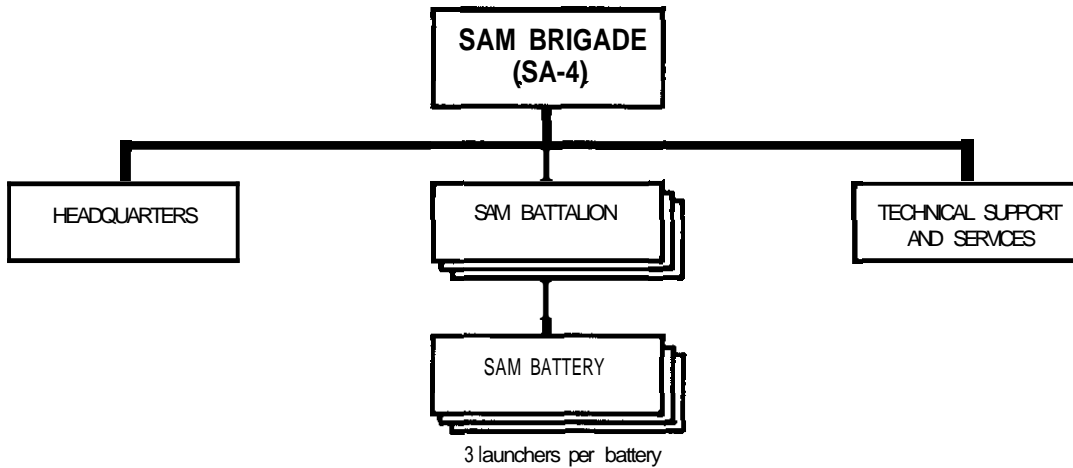
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
SSM, SS-1c/SCUD B TEL	12 or 18*	Meteorological Radar, END TRAY	3

NOTE, The 1987 INF Treaty calls for elimination of the SS-23 from the Soviet inventory

FOOTNOTE. *An SSM battalion may consist of either two or three firing batteries; therefore, a battalion may have 4 or 6 TELs, and a brigade may have 12 or 18 TELs. There is at least one reload missile per TEL.

SAM Brigade (SA-4). Army or Front



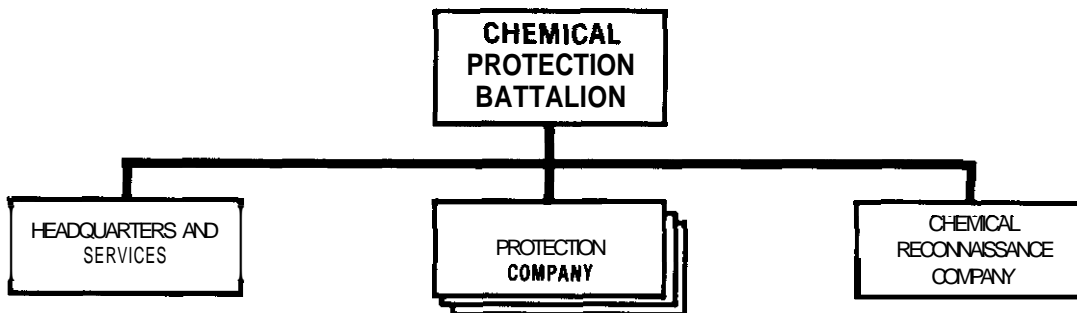
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total (estimated)	Equipment	Total (estimated)
SAM. SA-4/GANEF TEL	27	Radar. Target Acquisition, LONG TRACK	5
Radar, Fire Control, PAT HAND	9	Radar, Height Finding, THIN SKIN	1

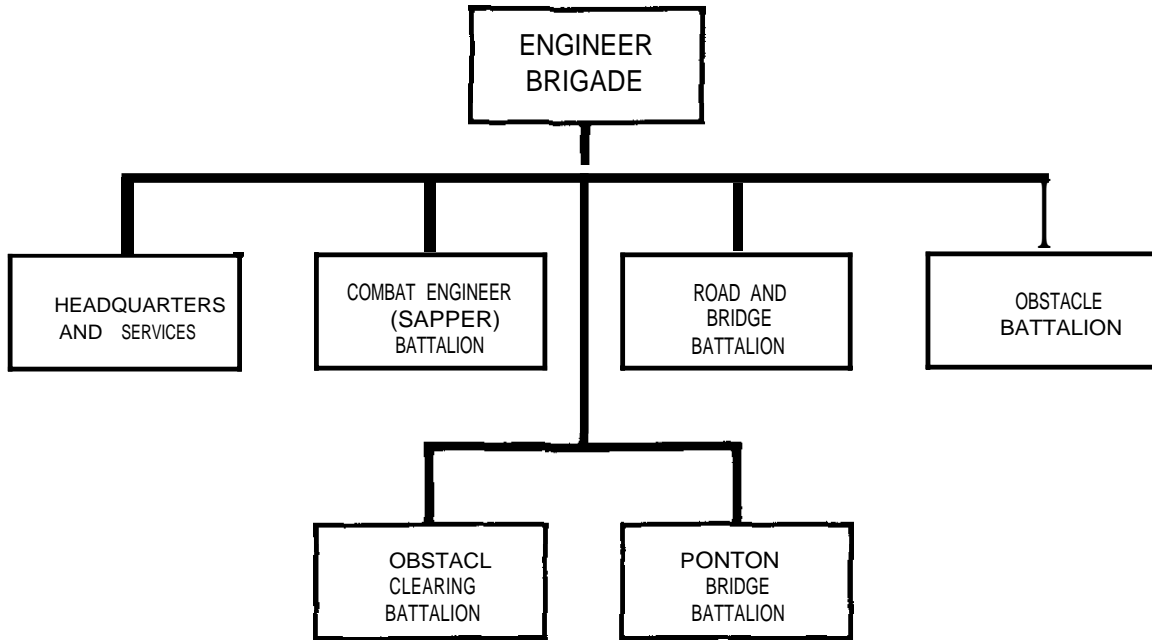
NOTES: 1. This chart depicts the key subunits of an SA-4 brigade: thus, not all of the brigade's subunits are shown.

2. The SA-11 is replacing the SA-4 in army-level SAM brigades, but under a different organization. The SA-12a/GL4DIATOR and the SA-12b/GIANT are replacing the SA-4 in nondivisional SAM units, but under an organization different from that of the SA-4 or the SA-11

Chemical Protection Battalion, Army



Engineer Brigade, Army or Front

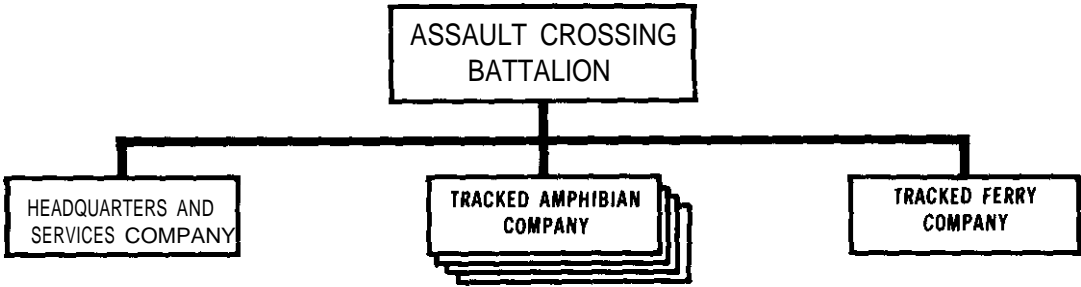


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV. BRDM-2	4	Bridge Ramp, PMP on KrAZ-255	4
APC, BTR-60	6	Tracked Ferry, GSP	24
Truck, UAZ-469	19	Tracked Amphibian, K-61/PTS	28
Truck. ZIL-131/151/157	82	Ditching Machine. BTM/MDK-2	12
Truck, KrAZ-255	25	Dozer. BAT/BAT-M/PKT	15
Armored Recovery Vehicle	6	Powerboat. BMK-150	15
Bridge. TMM on KrAZ-255	20	Minelayer, PMR-3/GMZ	13
Bridge, Tank-Launched. MTU/MT-55	12-74	Armored Engineer Tractor, IMR	6
Bridge. Section, PMP on KrAZ-255	32	Mineclearer, MTK/MTK-2	3

NOTE: Structure and number/type of equipment vary.

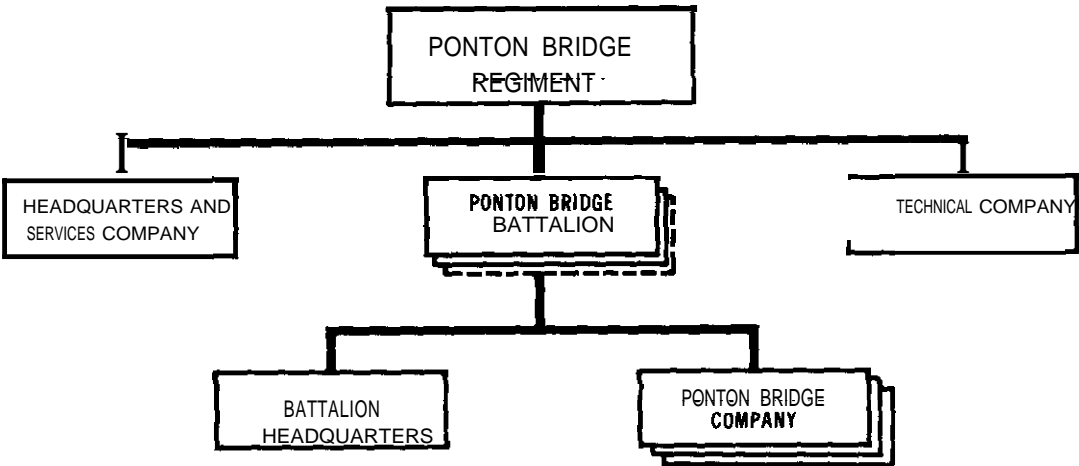
Assault Crossing Battalion, Army or Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV, BRDM-2	4	Tracked Ferry, GSP	40
Truck, UAZ-469	2	Tracked Amphibian, K-61/PTS	36
Truck, ZIL-131/151/157	10	Ditching Machine, BTM/MDK-2	3
Armored Engineer Tractor, IMR	3	Dozer, BAT/BAT-M/PKT	3
Armored Recovery Vehicle	3		

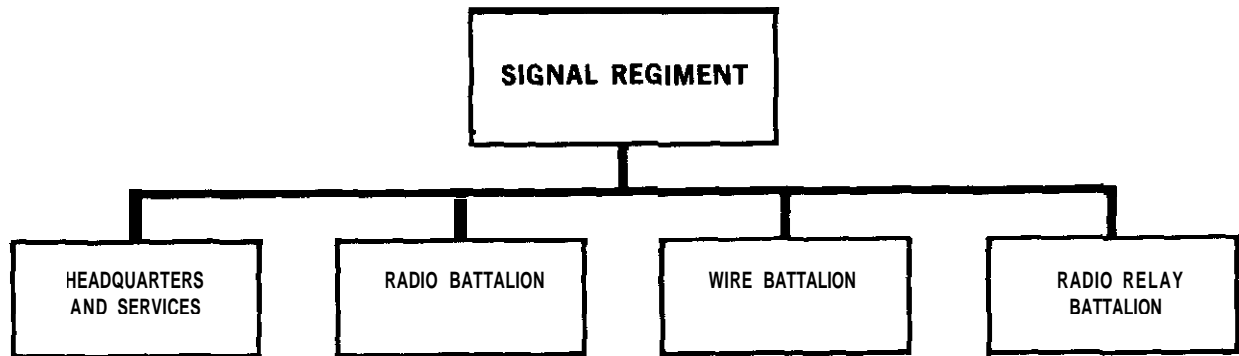
Ponton Bridge Regiment, Army or Front



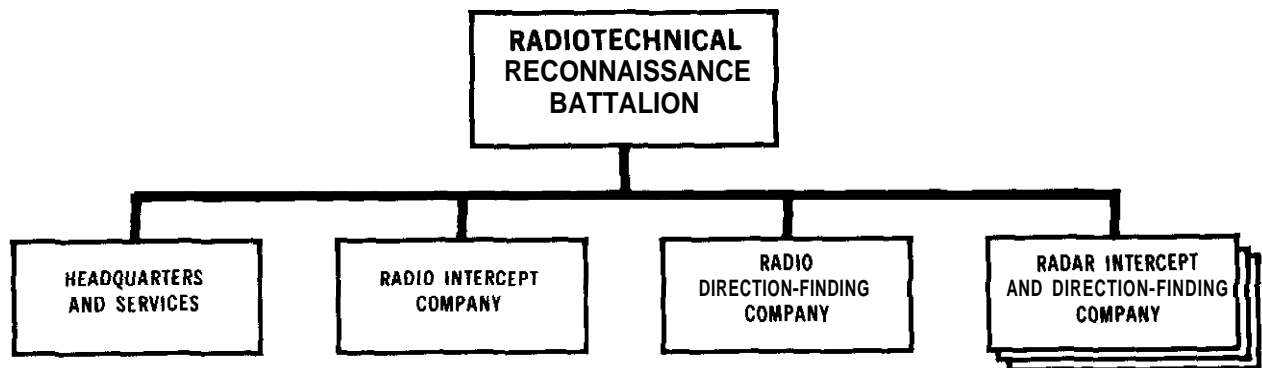
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ACV, BRDM-2	10	Bridge Section, PMP on KrAZ-255	96
Truck, UAZ-469	5	Bridge Ramp, PMP on KrAZ-255	12
Truck, ZIL-131/151/157	60	Tracked Amphibian, K-61/PTS	8
Truck, KrAZ-255	5	Ditching Machine, BTM/MDK-2	3
Armored Recovery Vehicle	3	Dozer, BAT/BAT-M/PKT	7
Bridge, TMM on KrAZ-255	4	Powerboat, BMK-150/BMK-T	36

Signal Regiment, Army

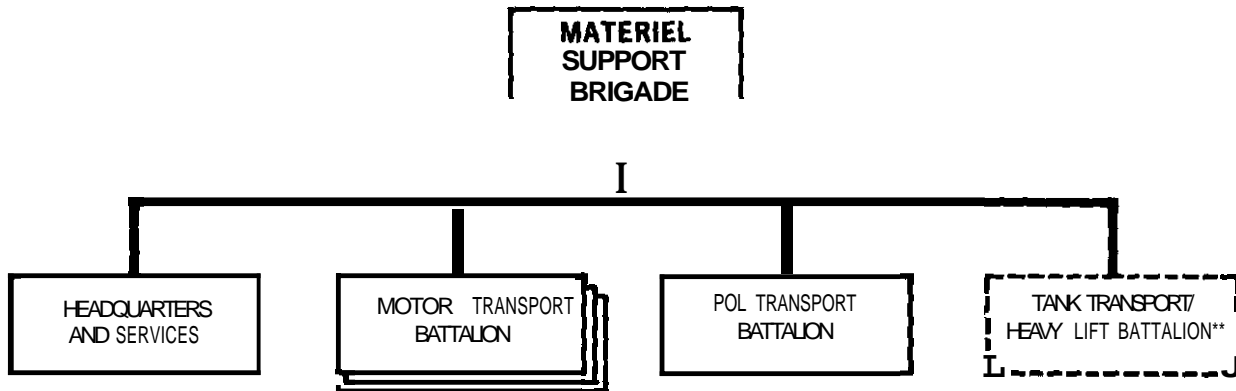


Radiotechnical Reconnaissance Battalion, Army



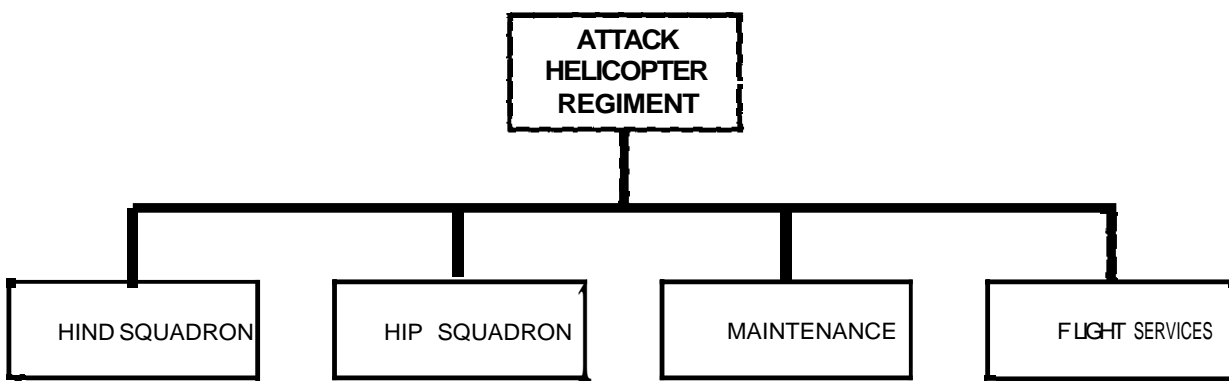
NOTE: This battalion is also known as a radio and radar intercept and direction-finding battalion.

Material Support Brigade, Army



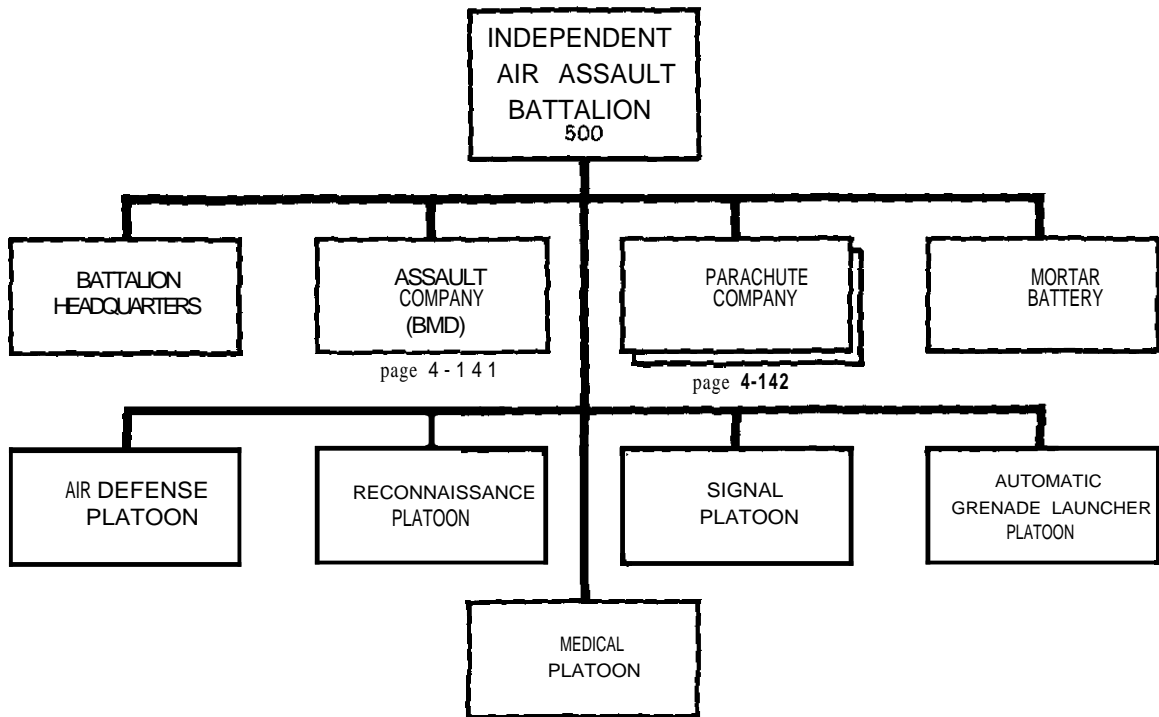
FOOTNOTE: *A tank transport/heavy lift battalion, equipped with MAZ-537 heavy tank transporters, may be attached to the brigade when the mission dictates.

Attack Helicopter Regiment, Army



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Attack Helicopter, Mi-24/HIND D/E/F	40	Medium Helicopter, Mi-8T/HIP C/E or Mi-17/HIP H	20

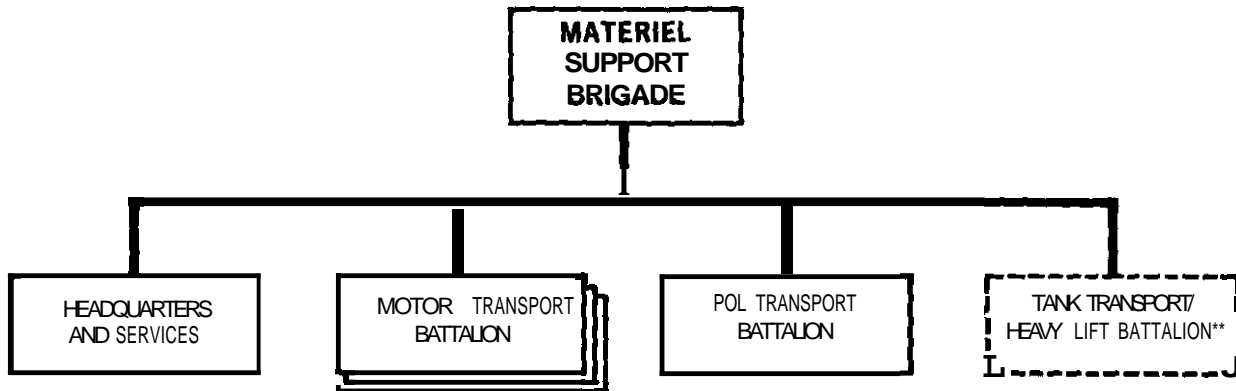


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
120-mm Mortar. M1943 or M-120	8	ATGL, RPG-16D	27
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	AAICV. BMD-1	13
30-mm Automatic Grenade Launcher. AGS-17 ...	6	APC, BMD M1979/1	3
		ACV, BMD-1KSh	1

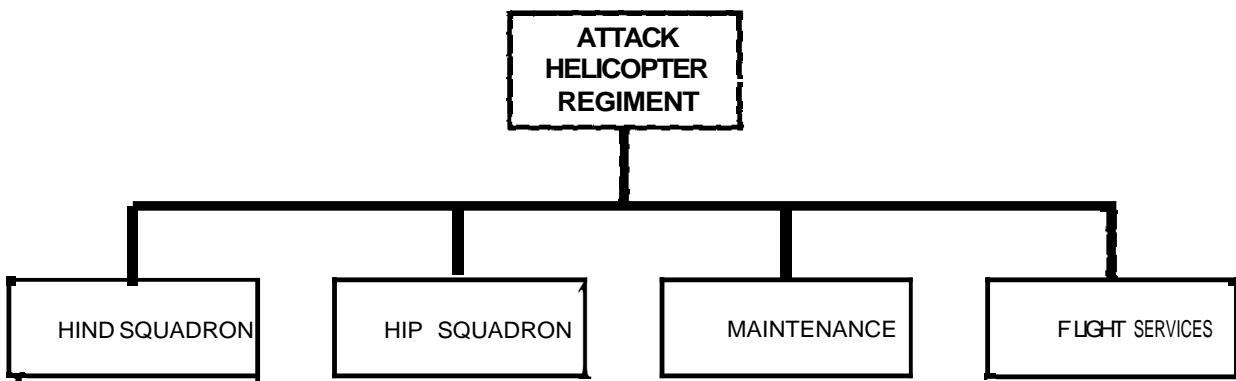
- NOTES. 1. This represents a provisional assessment of the strength, organization, and equipment of the independent air assault battalion, based on fragmentary information from several sources.
2. An army may have more than one of these battalions.
3. The battalion has no organic lift capability.

Material Support Brigade, Army



FOOTNOTE: 'A' tank transport/heavy lift battalion, equipped with MAZ-537 heavy tank transporters. may be attached to the brigade when the mission dictates.

Attack Helicopter Regiment, Army



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Attack Helicopter, Mi-24/HIND D/E/F	40	Medium Helicopter, Mi-8T/HIP C/E or Mi-17/HIP H	20

FRONT

Front

The front is the highest Soviet operational command in wartime. It is both an administrative and an operational entity, incorporating the air and ground forces required for operations in a given area. No fronts exist in peacetime, although the basic elements of a wartime front (that is, the combat and CS units and the rudimentary framework of the CSS units) are present in the peacetime structures of the military districts in the USSR and Soviet groups of forces in Eastern Europe. In wartime, Soviet force developers will activate fronts. They will organize each front for a specific strategic operation within a TVD, based on their analysis of the objectives, enemy, and terrain. Thus, there is no fixed front organization. Historically, fronts have varied greatly in size, consisting of as few as two and as many as nine armies. Today, however, a typical front may have three to five Soviet/non-Soviet CAAs or TAs.

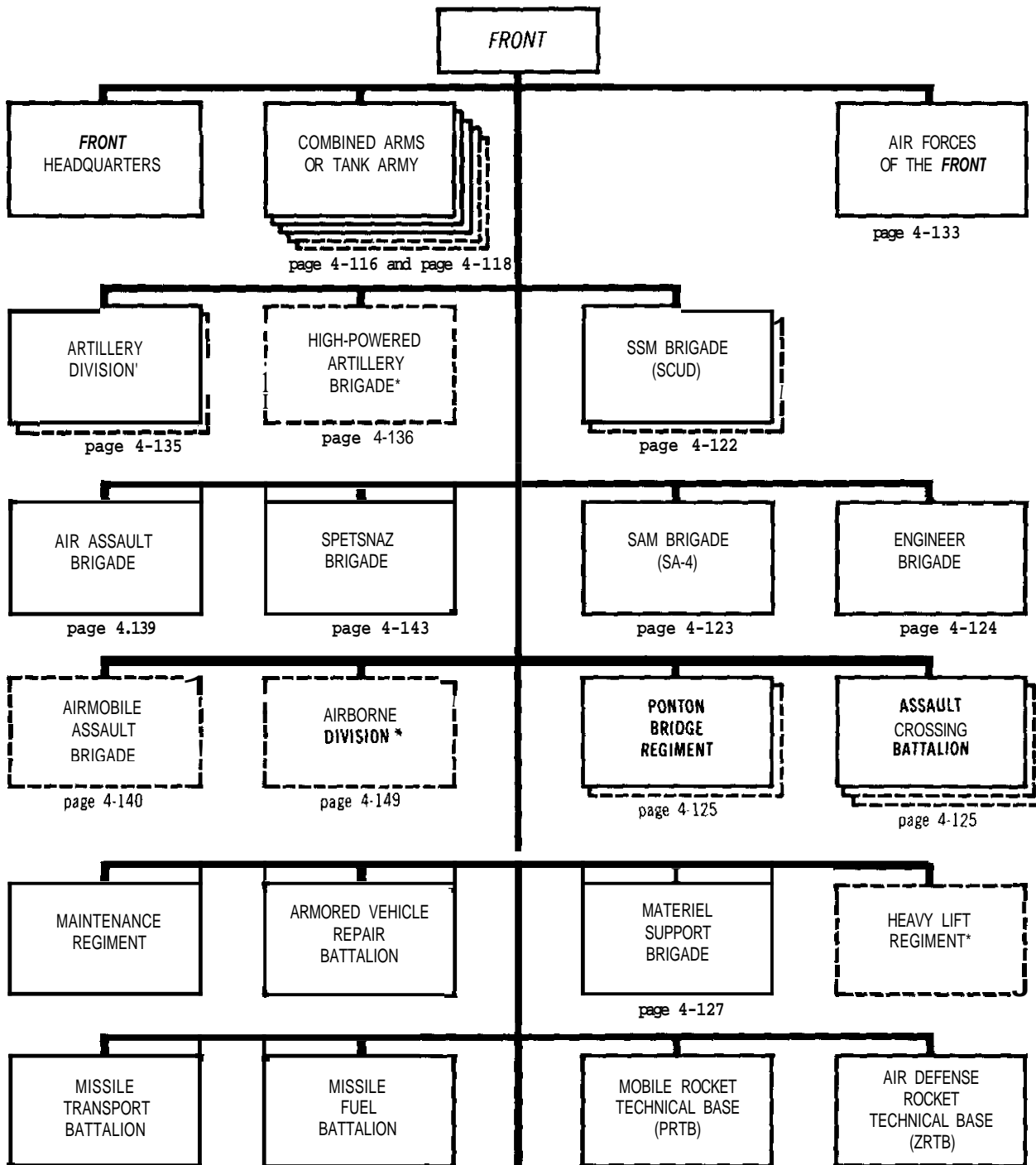
Most fronts which could be formed throughout the Soviet Army would have three to four CAAs and perhaps one TA. This may not be the case in the Western TVD, where there is a greater percentage of TDs versus MRDs and, consequently, a greater percentage of TAs versus CAAs. For example, the WGF, which could form the nucleus

of a front in wartime, currently has three TAs and only two CAAs.

In addition to these ground armies, a typical front may have air forces of the front, one or two artillery divisions, SSM brigades, a SAM brigade, an air assault brigade, and a SPETSNAZ brigade. If required, the front may receive support from airborne and amphibious forces. The TVD may receive additional assets from the Reserve of the Supreme High Command (RVGK), which it, in turn, may allocate to the front. The front may also receive support from assets of the Strategic Rocket Forces (SRF), strategic aviation, naval forces, railroad troops, and Ministry of Internal Affairs (MVD) and KGB units.

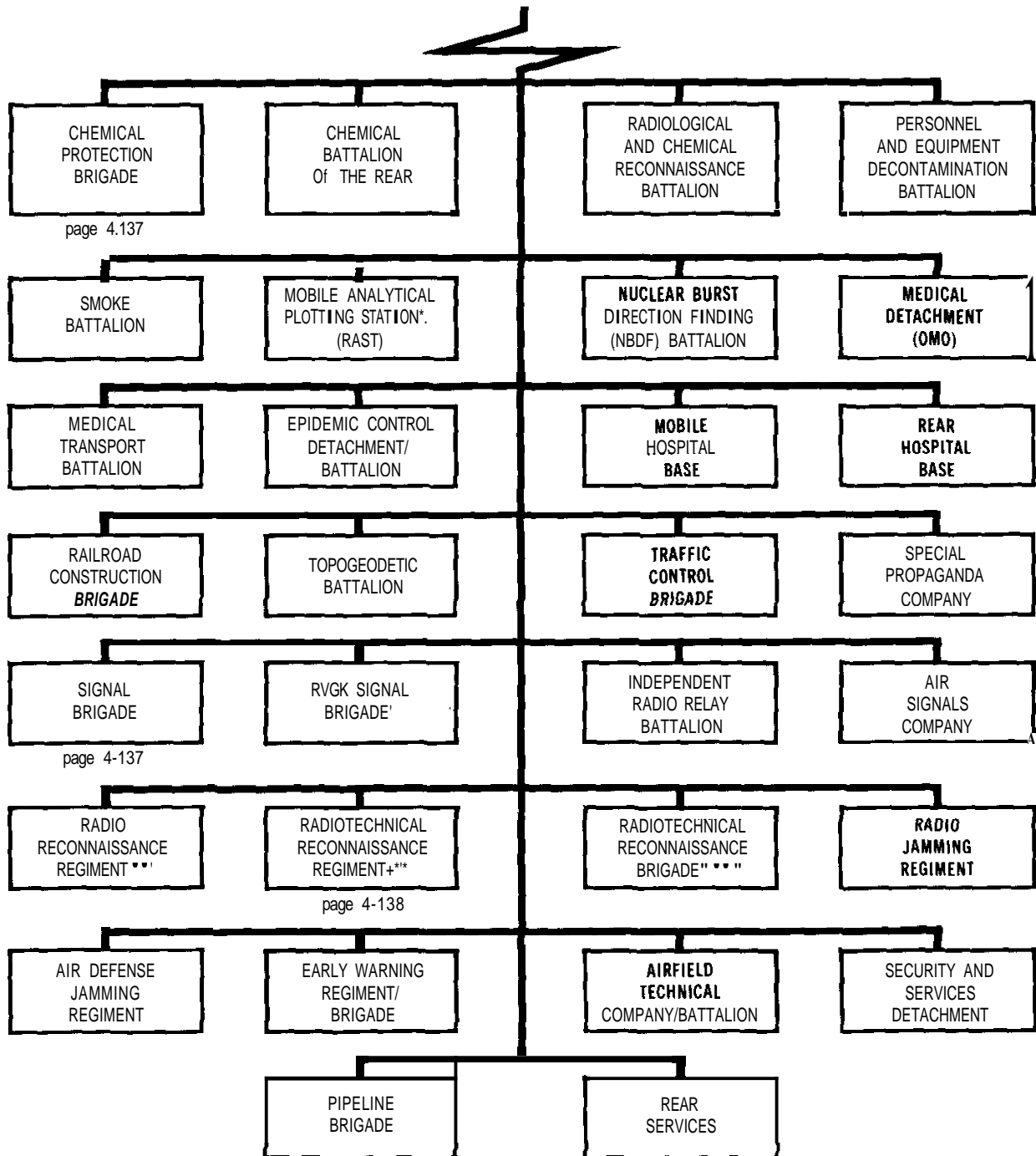
Due to the wide variety in types and numbers of units which may make up a given front, construction of a sample front structure is impossible. Instead, the following charts depict all of the different units that could be allocated to any given front, depending on its mission within the context of the overall strategic operation. Not all fronts would have all these units present. Many of the units may be modified to suit the particular needs of the front. More than one of some types of units will probably be present; for example, SSM brigades or ponton bridge regiments.

Front



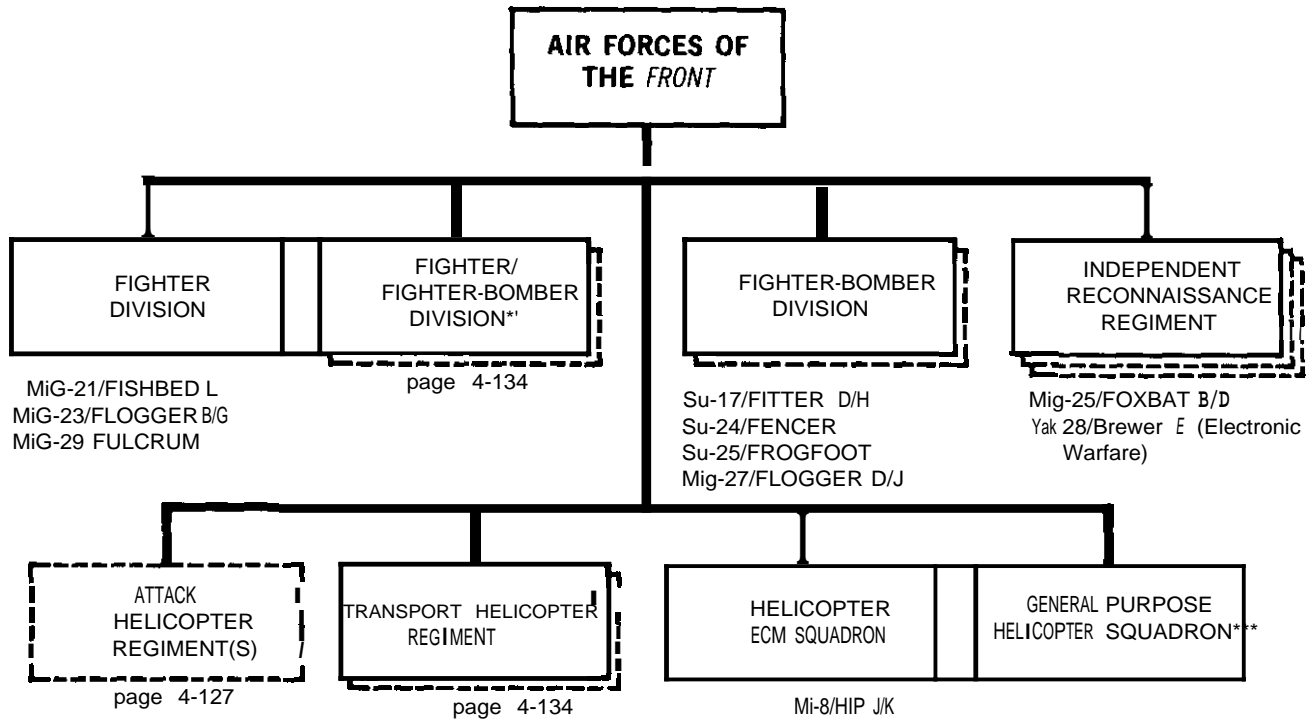
(continued)

Front (continued)



FOOTNOTES. *RVGK assets allocated through N D to front.
 **Also known as a mobile computation and analysis station.
 ***Also known as a radio intercept and direction- findingregiment.
 ****Also known as a radio and radar intercept and direction-finding regiment (brigade).

Air Forces of the Front



- NOTES.** 1. The Air Forces of the Front have no fixed organization and may tailor their structure to meet specific needs. A typical Air Forces of the Front would include two or three divisions of fighters and fighter-bombers and one or more independent regiments of reconnaissance aircraft, in addition to helicopter units of the types shown above.
2. The Air Forces of the WGF, which comprise the largest concentration of air forces in peacetime, include more than 700 combat aircraft, over 350 attack helicopters, and about 300 other aircraft and helicopters. These assets are organized into five air divisions (one fighter division, two fighter/fighter-bomber divisions, and two fighter-bomber divisions) and at least ten independent regiments (three air reconnaissance regiments, two transport helicopter regiments, and five attack helicopter regiments). While the five attack helicopter regiments belong organizationally to the Air Forces of the WGF, they *are* under the operational control of the five CAAs and TAs of the WGF.

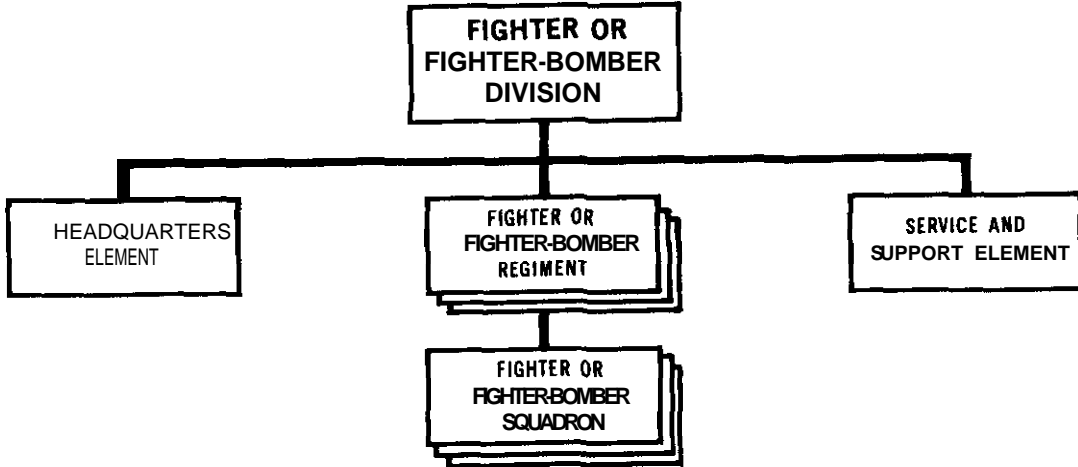
FOOTNOTES. *Fighter and fighter-bomber divisions have the same basic structure, as shown on p. 4-134.

**A fighter/fighter-bomber division has a mix of the aircraft types shown for the fighter division and the fighter-bomber division.

***The general-purpose helicopter squadron normally has 20 to 30 helicopters.

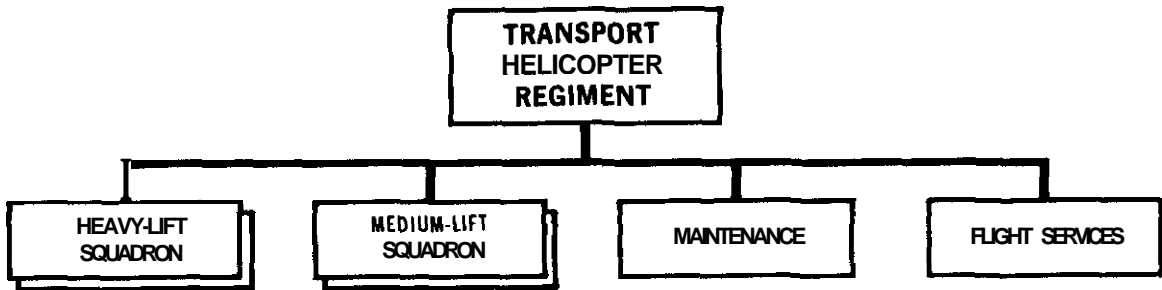
FM 100-2-3

Fighter or Fighter-Bomber Division,
Air Force of the Front



NOTE. Each fighter or fighter-bomber regiment has 45 aircraft (in three squadrons of 15 aircraft each). This total includes up to 5 trainer aircraft per regiment that can serve as combat aircraft.

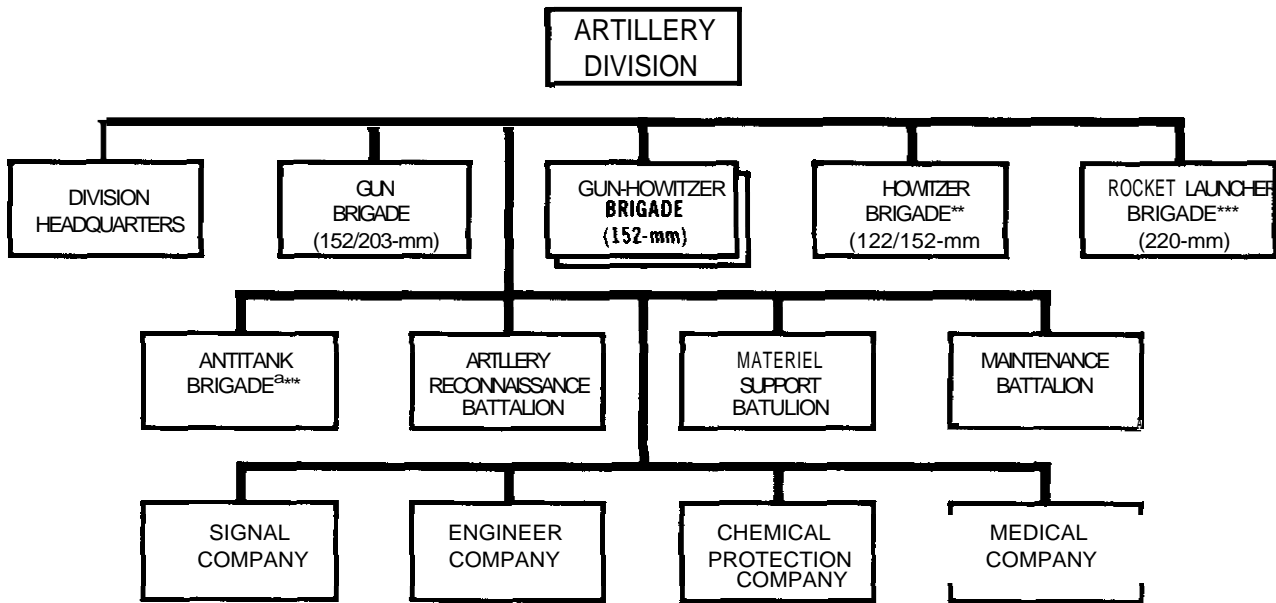
Transport Helicopter Regiment.
Air Forces of the Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
Heavy-Lift Helicopter, Mi-6A/HOOK or Mi-26/HALO A	24	Medium Helicopter, Mi-BT/HIP C or Mi-17/HIP H	32

Artillery Division, Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm Howitzer D-30 or M-30	72	220-mm Rocket Launcher (16-Round) EM-22 or 122-mm Rocket Launcher	
152-mm Gun-Howitzer D-20 or ML-20 or M 1987 or 152-mm SP Howitzer 2S3	144	(40-Round) BM-21	72
152-mm Field Gun 2A36 or 203-mm SP. Gun 2S7	72	100-mm Antitank Gun T-12/MT-12	48
		ATGM Launcher Vehicle (BRDM-2). AT-3/5	36

NOTE: In some artillery divisions, howitzer, gun-howitzer, and gun brigades consist of four 18-tube battalions, while in other artillery divisions, these brigades consist of three 24-tube battalions

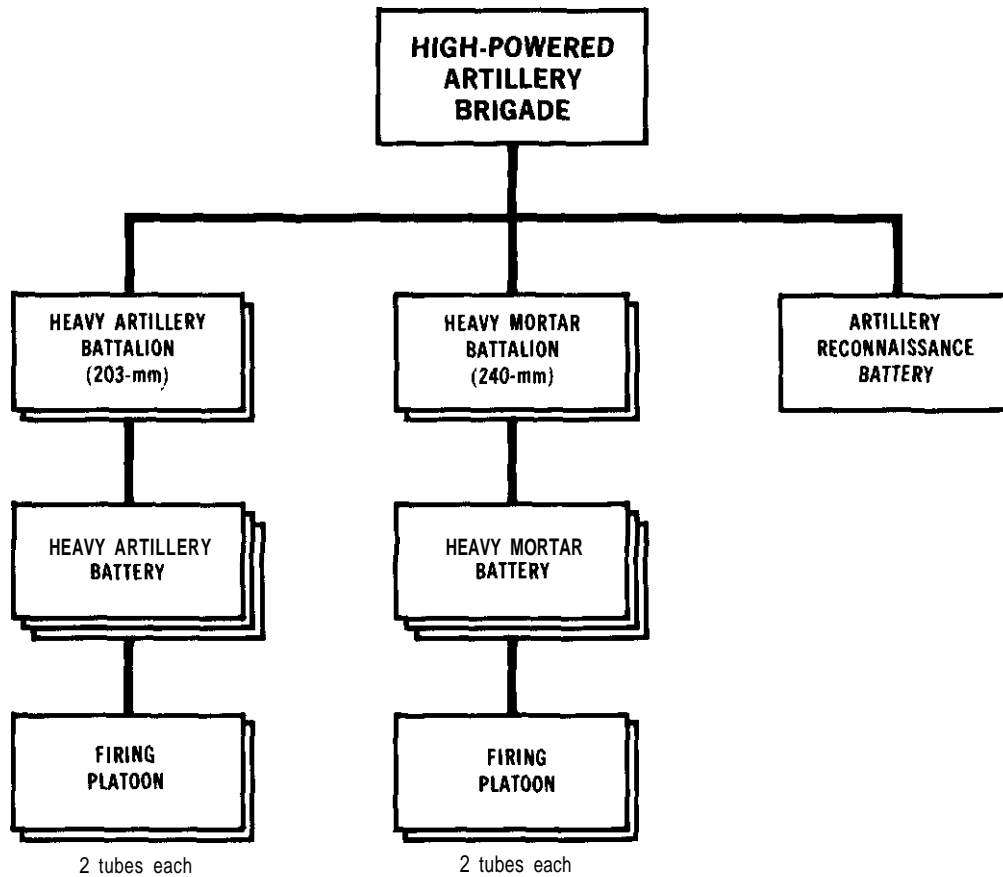
FOOTNOTES. Some gun brigades (for example, one in WGF) may have the 203-mm SP gun 2S7. In some artillery divisions, gun brigades may still have the older 130-mm field gun M-46.

**Most artillery divisions have a mixture of 122-mm howitzer and 152-mm gun-howitzer brigades: others (for example, in WGFI employ only 152-mm howitzers or gun-howitzers.

**The rocket launcher brigade normally consists of four battalions, each with 18 EM-22 rocket launchers. Some brigades may still have the 122-mm rocket launcher (40-round) EM-21, which the EM-22 is replacing in the forward area.

*** Equipment totals given are for an antitank brigade with four antitank battalions of the type shown on p. 4-72, although some artillery divisions, such as those in WGF, may have no antitank unit.

High-Powered Artillery Brigade. Front

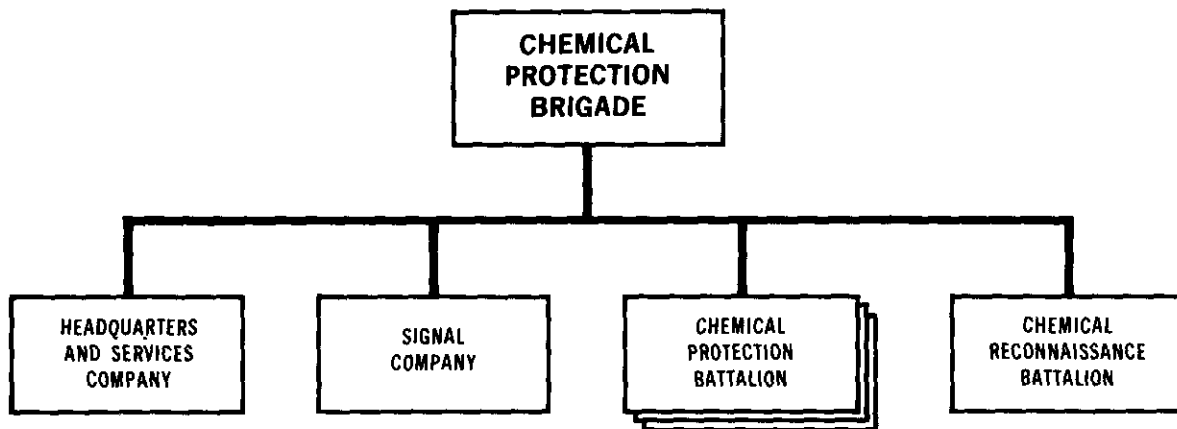


PRINCIPAL ITEMS OF EQUIPMENT

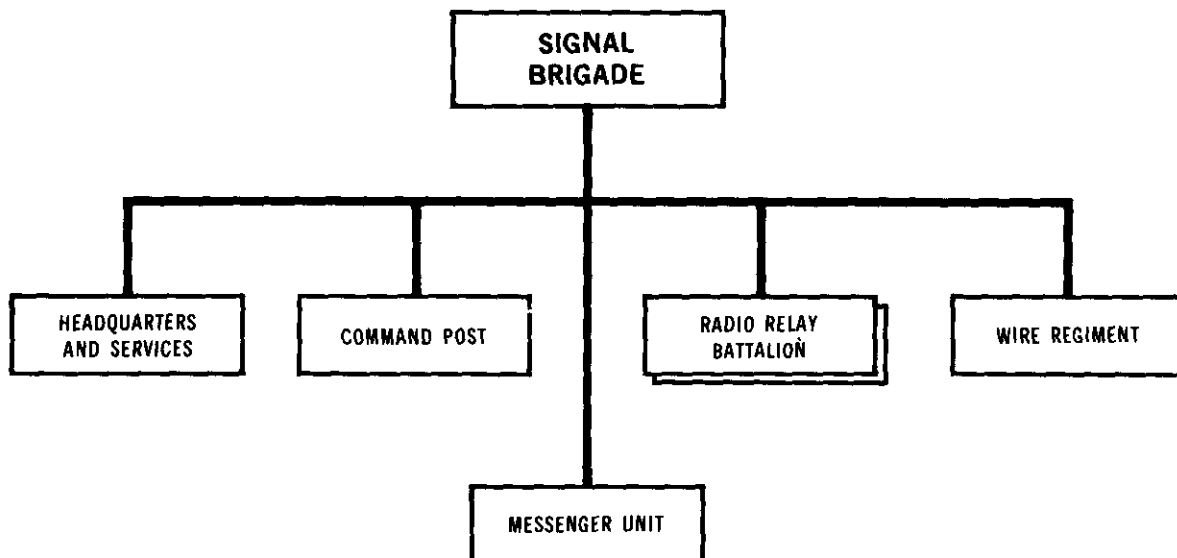
Equipment	Total	Equipment	Total
203-mm SP Gun, 2S7 or 203-mm Howitzer M 1931 (B-4M)	24	240-mm SP Mortar, 2S4 or 240-mm Mortar M-240	24

NOTE. A high-powered artillery brigade from the Reserve of the Supreme High Command (RVGK) will probably be allocated to a front. This nuclear-capable brigade is not part of the front's artillery division.

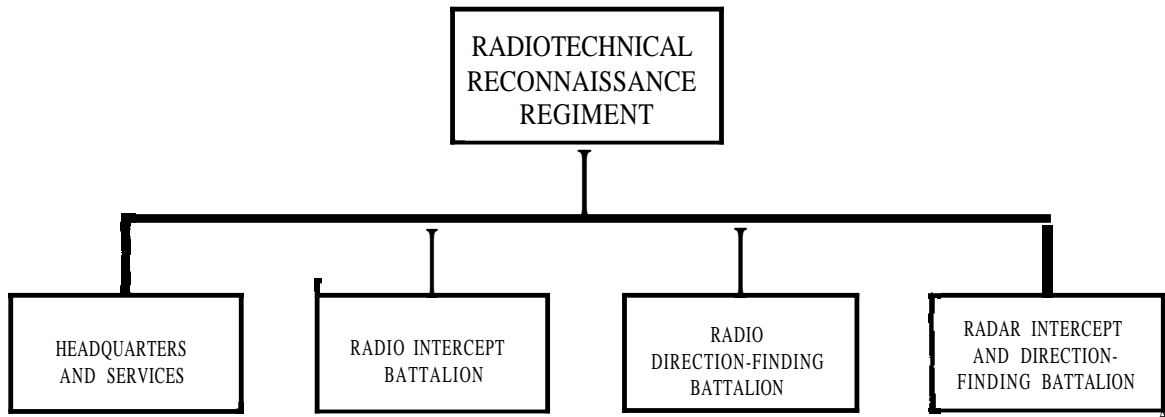
Chemical Protection Brigade, Front



Signal Brigade, Front

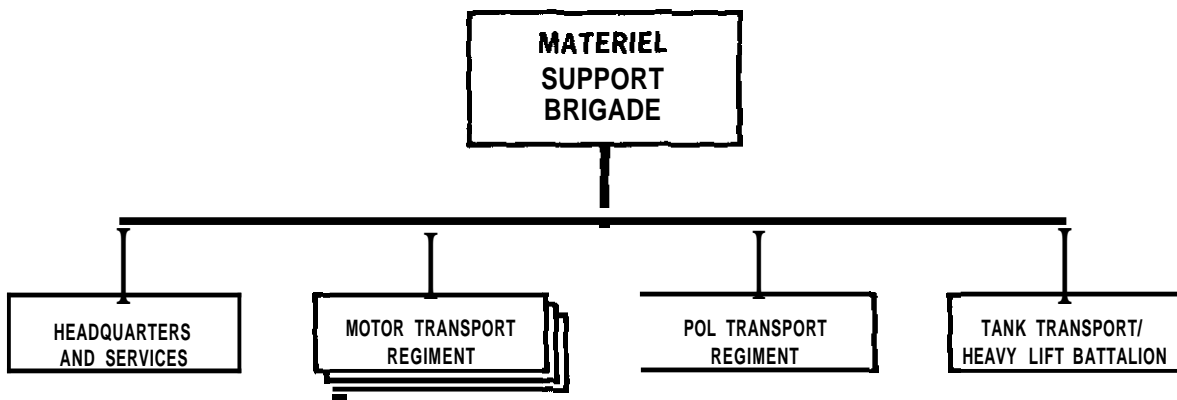


Radiotechnical Reconnaissance Regiment, Front

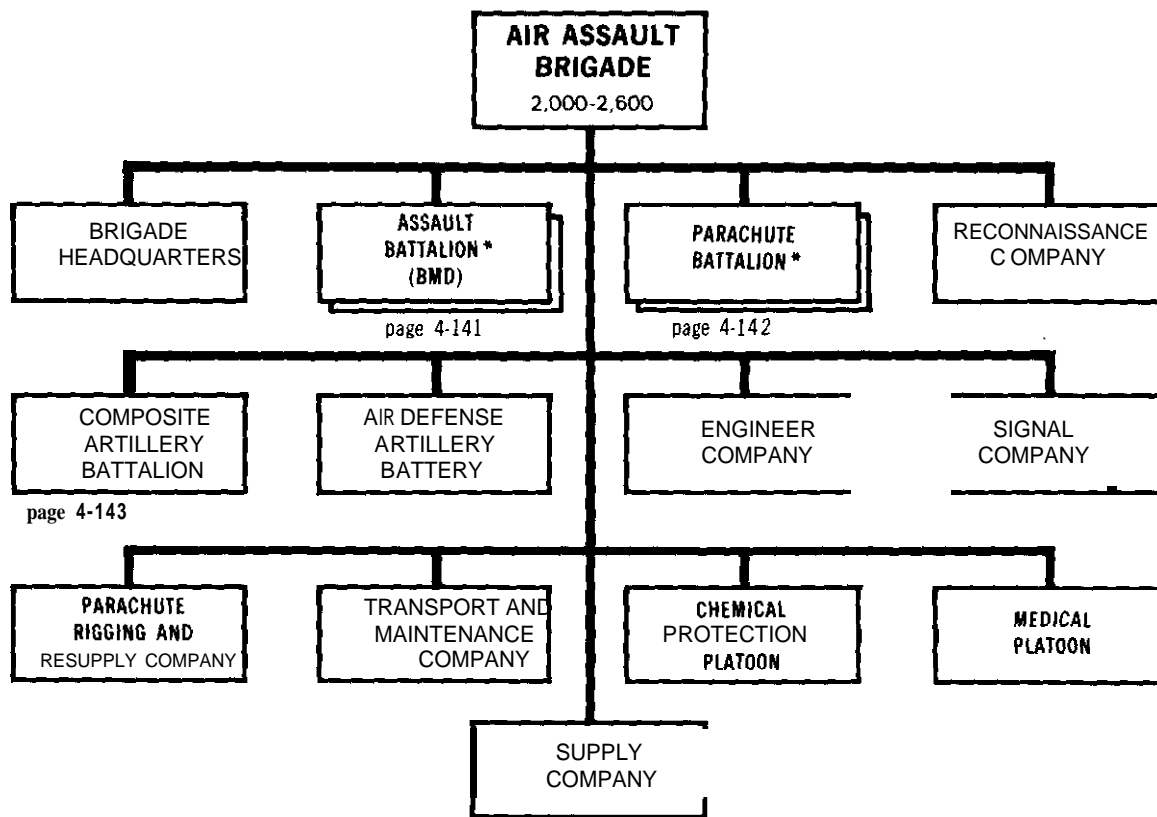


NOTE. This regiment is also known as a radio and radar intercept and direction-finding regiment.

Materiel Support Brigade, Front



Air Assault Brigade. Front



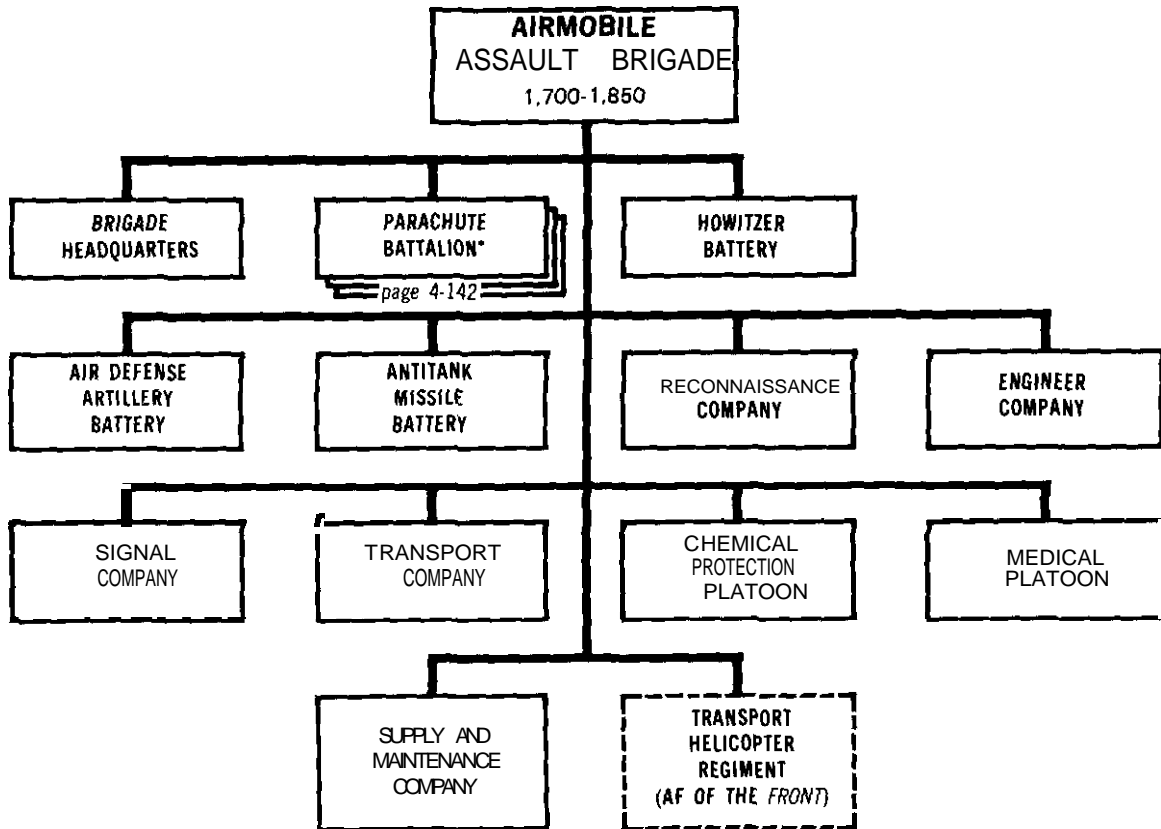
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
120-mm Mortar, M 1943 or M-120	32	ATGM Manpack Console, AT-4/SPIGOT	12
122-mm Howitzer, D-30	12-18	73-mm Recoilless AT Gun, SPG-9	6
122-mm Rocket Launcher (12-Round) 8M-21V	6	ATGL, RPG-16D	150
SAM, SA-7/GRAIL or SA-14/GREMLIN		30-mm Automatic Grenade Launcher,	
or SA-16	45	AGS-17	24
23-mm AA Gun, ZU-23	6	AAICV, BMD-1 and variants	68

- NOTES.** 1. This represents a provisional assessment of the strength, organization, and equipment of the air assault brigade, based on fragmentary information from several sources.
2. Air transport support units required for deployment may be allocated to the brigade from Military Transport Aviation (VTA) assets. Either transport aircraft or heavy-lift helicopters could air-land the BMD-equipped battalions or insert the parachute battalions by parachute. Helicopters could also air-land the parachute battalions.

FOOTNOTE. Some air assault brigades may have a different mix, consisting of one BMD-equipped assault battalion and three parachute battalions.

Airmobile Assault Brigade. Front



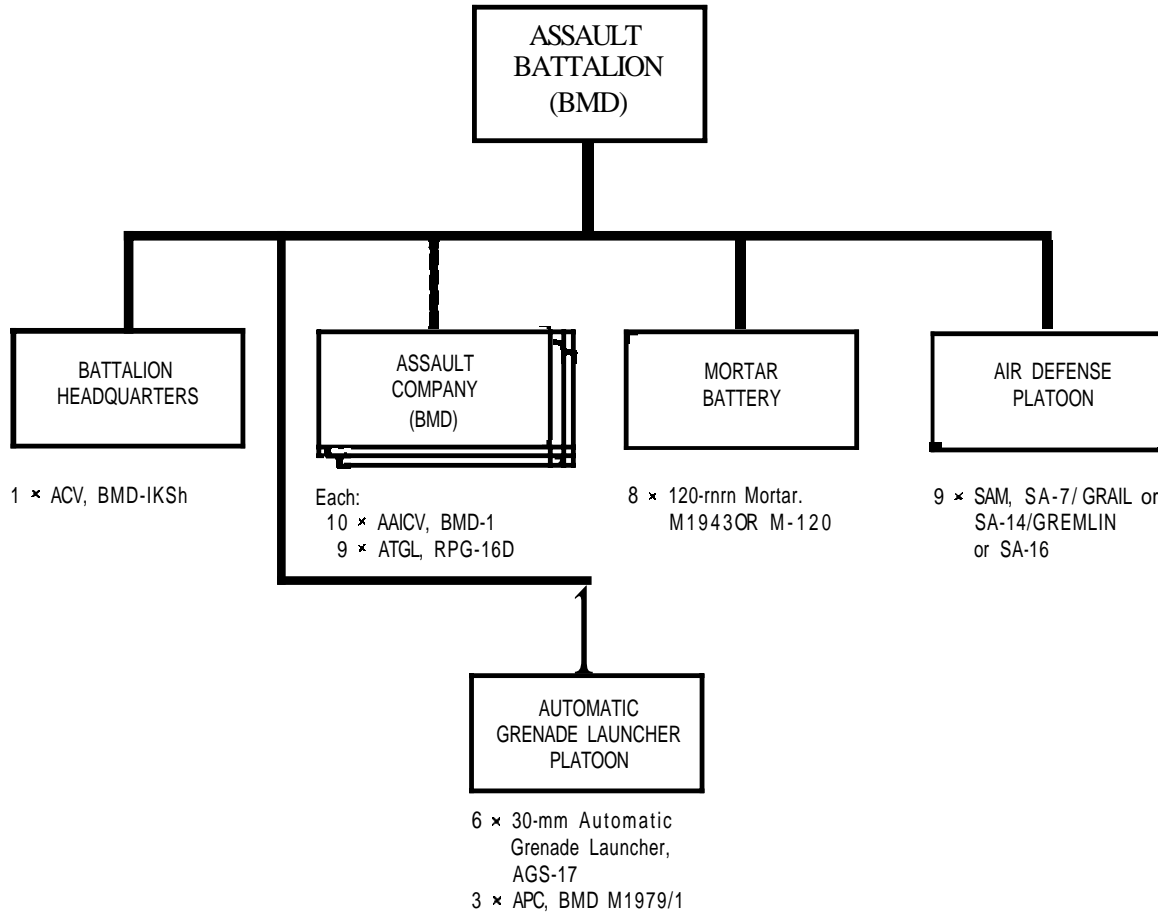
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
120-rnrn Mortar. M1943or M-120	24	ATGM ManpackConsole, AT-4/SPIGOT	18
122-mm Howitzer. D-30	6	73-mm Recoilless AT Gun. SPG-9	9
SAM, SA-7/GRAIL or SA-14/GREMLIN		ATGL, RPG-16D	114
or SA-16	36	30-mm Auto Grenade Launcher, AGS-17	18
ATGM Launcher Vehicle (BRDM-2).		ACV. BRDM-2	4
AT-3/SAGGER or AT-5/SPANDREL	9		

- NOTES.** 1. This represents a provisional assessment of the strength, organization, and equipment of the airmobile assault brigade, based on fragmentary information from several sources.
2. The helicopter is the primary mode of transportation for the airmobile assault brigade. Helicopters organic to the Air Forces of the Front may come under the operational control of the brigade headquarters. However, Military Transport Aviation (VTA) assets may also lift the brigade.

FOOTNOTE, *The parachute battalions in the airmobile assault brigade are sometimes called airmobile assault battalions.

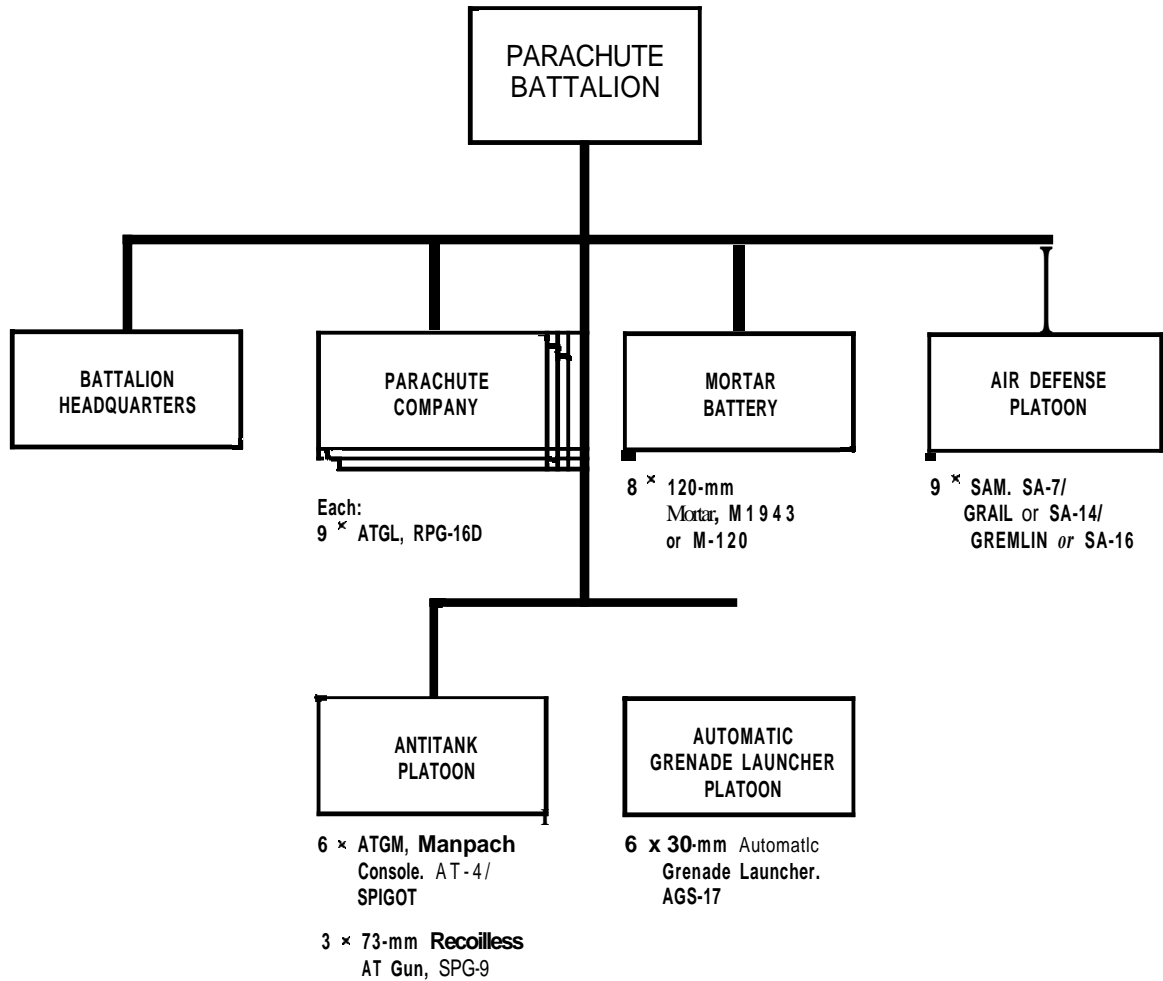
Assault Battalion (BMD), Air Assault Brigade, Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL, RPG-16D	27	120-mm Mortar, M1943or M-120	8
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	AAICV, BMD-1	30
30-mm Automatic Grenade Launcher, AGS-17 ...	6	APC, BMD M1979/1	3
		ACV, BMD-1KSh	1

Parachute Battalion, Air Assault Brigade
and Airmobile Assault Brigade, Front

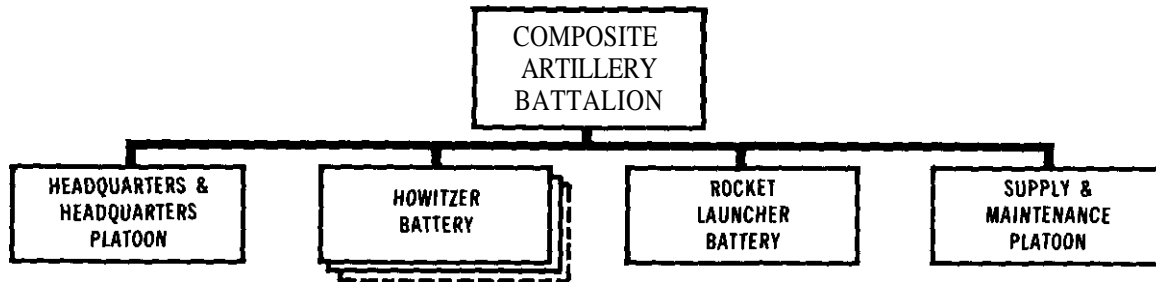


PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
ATGL. RPG-16D	27	73-mm Recoilless AT Gun. SPG-9	3
SAM. SA-7/GRAIL or SA-14/GREMLIN or SA-16	9	120-mm Mortar, M 1943 or M-120	8
ATGM, Manpack Console. AT-4/SPIGOT	6		
30-mm Automatic Grenade Launcher. AGS-17 ...	6		

NOTE. In the airmobile assault brigade, the parachute battalion may be called an airmobile assault battalion.

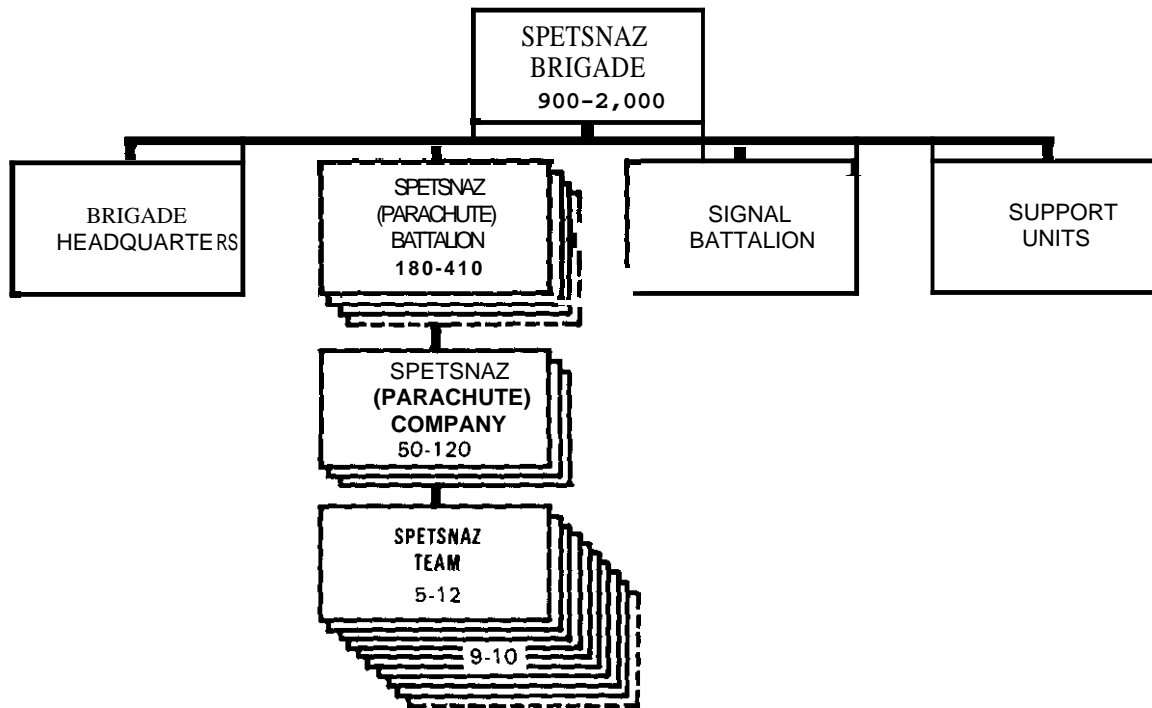
Composite Artillery Battalion, Air Assault Brigade, Front



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm Howitzer D-30	12-18	122-mm Rocket Launcher (12-Round) BM-21 V...	6

SPETSNAZ Brigade. Front



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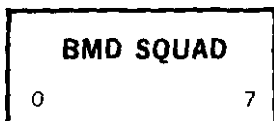
- NOTES. 1. Brigade structure is not fixed. This chart represents a provisional assessment of what may be a typical SPETSNAZ brigade's strength and organization, based on fragmentary information from several sources.
2. A brigade may deploy about 80 to 100 SPETSNAZ teams.

Airborne Forces

Soviet airborne forces are directly subordinate to the VGK or the wartime *Stavka* VGK, with operational control exercised by the Chief of the General Staff. In wartime, some airborne units would be allocated to TVDs and possibly, in turn, to fronts or armies for specific missions. Other airborne units would remain under VGK control.

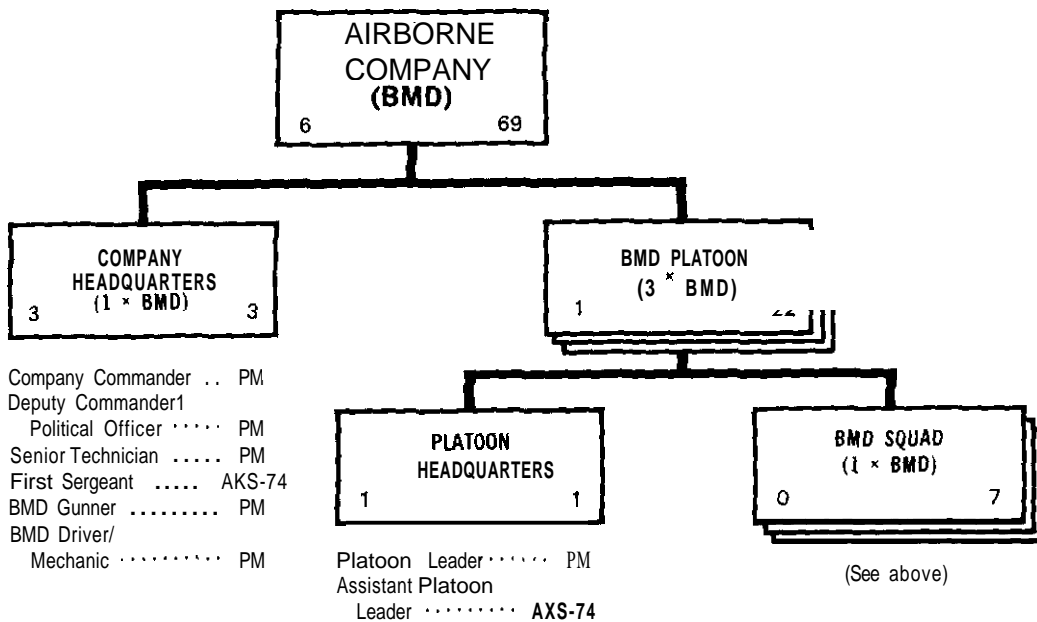
AIRBORNE REGIMENT STRUCTURE (BMD)

BMD Squad



Personnel	Equipment
Squad Leader/BMD Commander	AKS-74
BMD Driver/Mechanic	PM
BMD Gunner	PM
Machine Gunner	RPKS-74
Grenadier	RPG-16D. PM
Assistant Squad Leader/Senior Rifleman	AKS-74
Rifleman/Assistant Grenadier	AKS-74

Airborne Company, Airborne Battalion, Airborne Regiment, Airborne Division



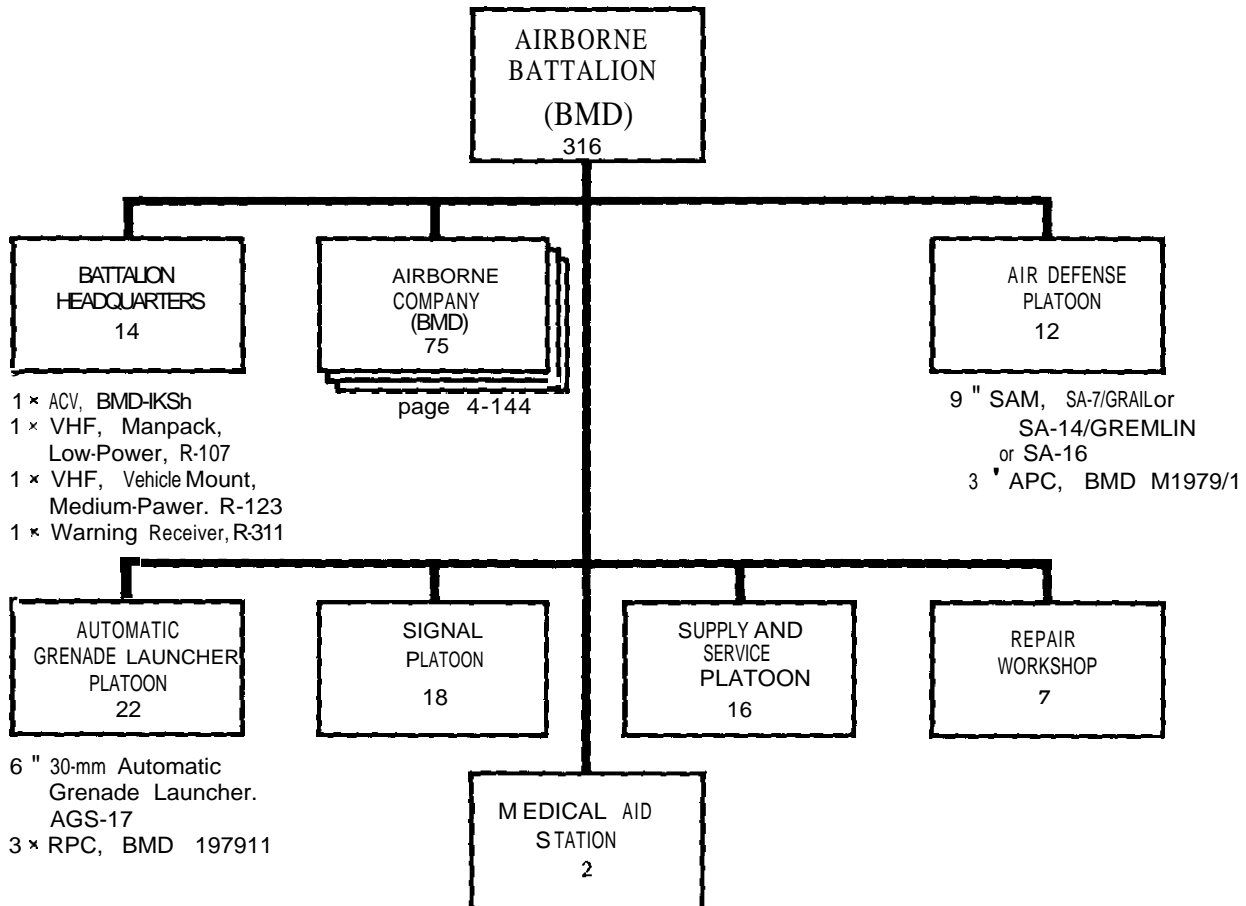
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
9-mm Pistol, PM	35
5.45-mm Assault Rifle. AKS-74	31
5.45-mm Light Machine Gun. RPKS-74	9
Antitank Grenade Launcher. RPG-16D	9
AAICV. BMD-1	10

Equipment	Total
Radios:	
VHF. Portable, Low-Power, R-148	4
VHF. Manpack. Low-Power. R-107	1
VHF, Vehicle Mount. Medium-Power. R-123	10

NOTE. The company commander's RTO **comes** from the battalion signal platoon **and is not** part of the BMD company personnel total.

Airborne Battalion, Airborne Regiment, Airborne Division



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
ATGL, RPG-16D	30
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	9
30-mm Automatic Grenade Launcher, AGS-17	6
5.45-mm LMG, RPKS-74	27
AAICV, BMD-1	30
APC, BMD M1979/1	6
ACV, BMD-1KSh	1
Truck, UAZ-69/469	1
Truck, GAZ-66A	10
Truck, Ambulance, UAZ-450A/452	1

Equipment	Total
Truck, Van, ZIL (Maintenance)	1
Trailer, Cargo, 1-Axle	3
Trailer, Field Kitchen	3
Trailer, Water	1
Radios:	
HF/VHF, Vehicle Mount, Medium Power	1
VHF, Portable, Low-Power, R-148	12
VHF, Manpack, Low-Power, R-107	7
VHF, Vehicle-Mount, Medium-Power, R-123	35
Ground-to-Air Radio Set	2
Warning Receiver, R-311	1

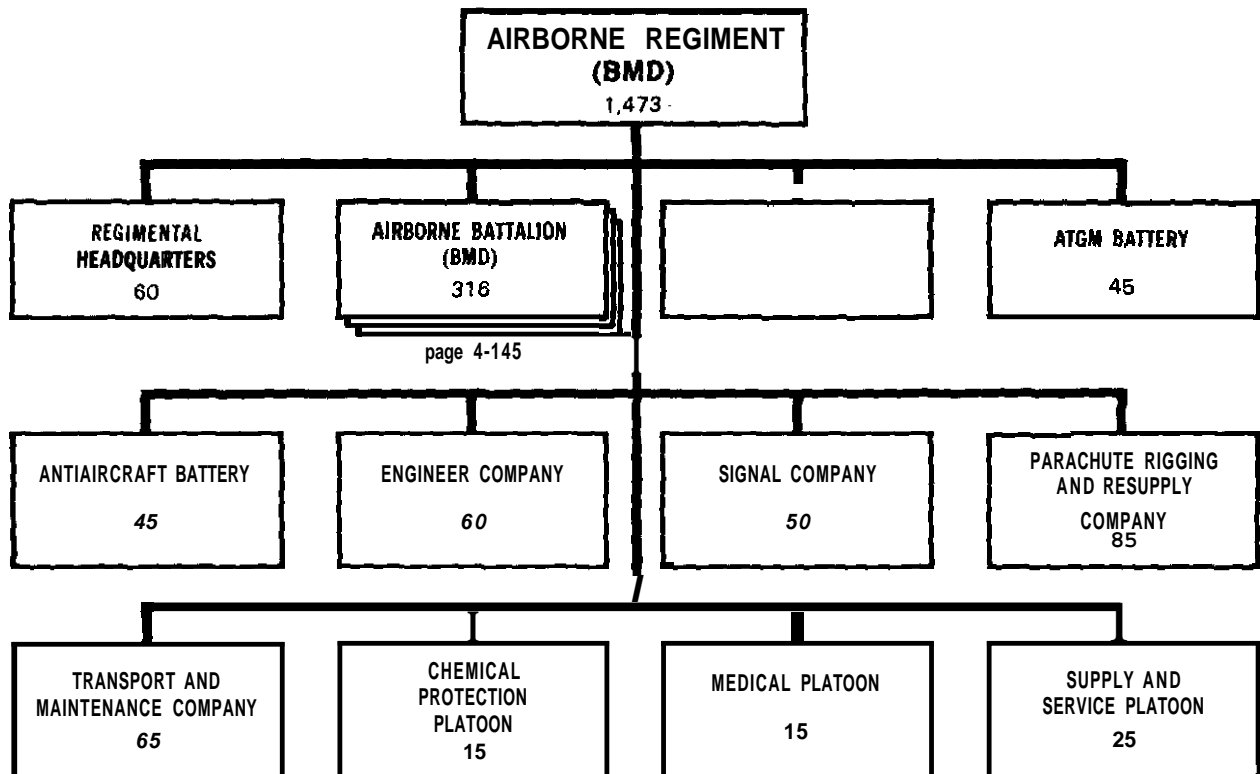
Airborne Regiment (BMD)

The airborne regiment has a nucleus of three airborne battalions and three fire support subunits. These fire support subunits include one mortar battery, one ATGM battery, and one AA battery. There are other elements that support the combat elements.

Each regiment now has over 100 BMDs in three different configurations. The basic BMD-I is the standard squad vehicle. Air defense and automatic

grenade launcher platoons within battalions use the BMD M1979/1. The BMD-1 KSh serves as a command vehicle at battalion and regimental headquarters.

By adding the BMD to such an extent, the Soviets have upgraded troop protection, mobility, and firepower while retaining air-droppability. Only a few items within airborne regiments are not air-droppable (for example, several trucks).



NOTE. Approximately 150 personnel are officers.

AIRBORNE REGIMENT (BMD).
AIRBORNE DIVISION

	REGIMENTAL HEADQUARTERS	3 x AIRBORNE BATTALION (BMD)	MORTAR BATTERY	ATGM BATTERY	ANTI-AIRCRAFT BATTERY	ENGINEER COMPANY	SIGNAL COMPANY	PARACHUTE RIGGING AND RESUPPLY COMPANY	TRANSPORT AND MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	MEDICAL PLATOON	SUPPLY AND SERVICE PLATOON	TOTAL
PERSONNEL	60	948	60	45	45	60	50	85	65	15	15	25	1,473
WEAPONS													
120-mm Mortar, M1943/M-120			6										6
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	3	27		3	3								36
23-mm AA Gun, ZU-23					6								6
ATGM Launcher Vehicle (BRDM-2), AT-3/5				9									9
ATGL, RPG-160	2	90	6	9				4					111
30-mm Automatic Grenade Launcher, AGS-17		18											18
5.45-mm LMG, RPKS-74	2	81											83
AAICV/ACV/APC/ASC													
AAICV, BMD-1		90											90
APC, BMD M1979/1		18											18
ACV, BMD-1KSh	4	3											7
ASC, BRDM-2				4									4
GENERAL PURPOSE TRUCKS													
Truck, UAZ-69/469	4	3	1		1	1	8		1				19
Truck, GAZ-66 A/B		30	6		6	4		30		2	8		86
Truck, ZIL-130/131				3				25	36				64
Truck, Ural-375D									2				2
Truck, KrAZ-255B								6					6
Truck, Ambulance, UAZ-450A/452		3								2			5
VAN TRUCKS													
Truck, Van, ZIL (AT-3/5 Simulator)				1									1

(continued)

Personnel and Equipment Recapitulation

FM 100-2-3

**AIRBORNE REGIMENT (BMD),
AIRBORNE DIVISION**

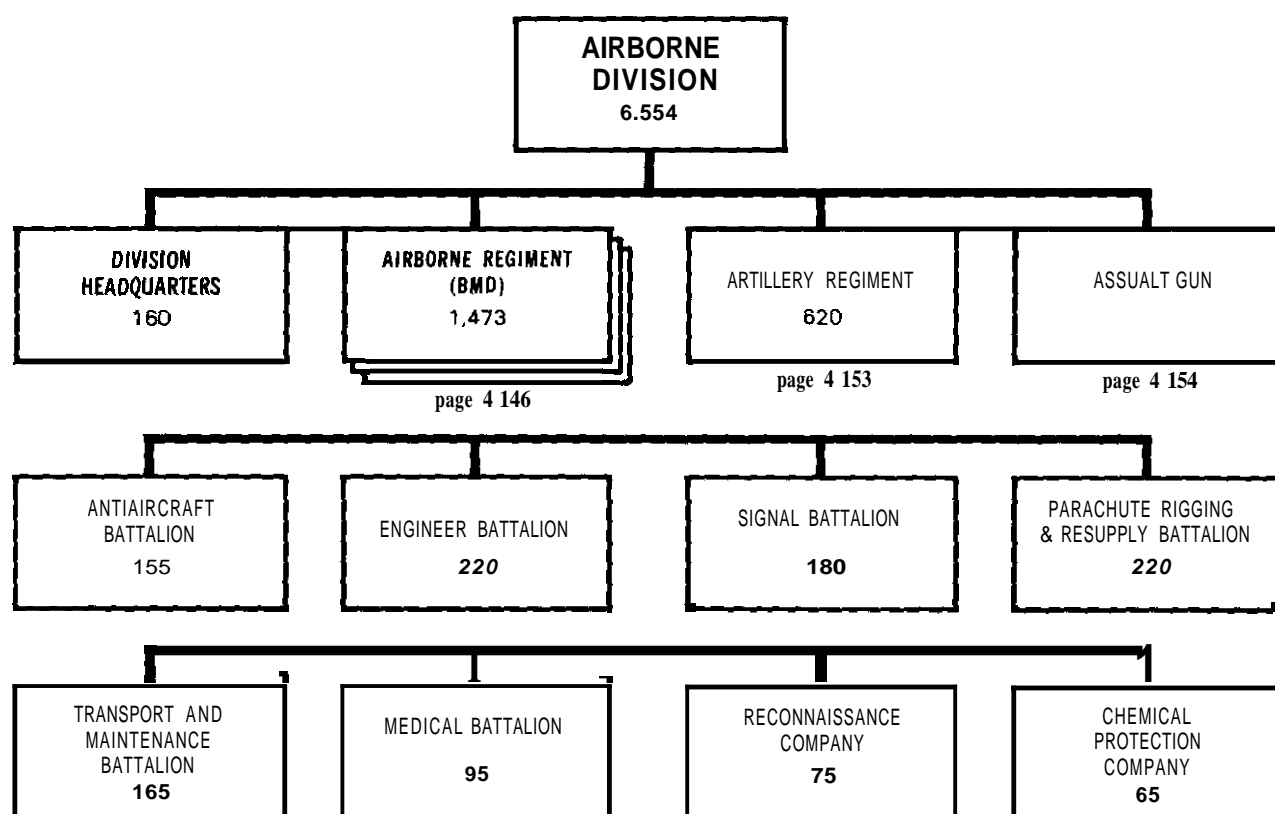
	REGIMENTAL HEADQUARTERS	3 x AIRBORNE BATTALION (BMD)	MORTAR BATTERY	ATGM BATTERY	ANTI-AIRCRAFT BATTERY	ENGINEER COMPANY	SIGNAL COMPANY	PARACHUTE RIGGING AND RESUPPLY COMPANY	TRANSPORT AND MAINTENANCE COMPANY	CHEMICAL PROTECTION PLATOON	MEDICAL PLATOON	SUPPLY AND SERVICE PLATOON	TOTAL
Truck, Van, GAZ (Signal)						3							3
Truck, Van, ZIL (Maintenance)		3						9					12
POL TRUCKS													
Truck, POL, ZIL							12						12
CHEMICAL RECONNAISSANCE VEHICLES													
Truck, Chemical Reconnaissance UAZ-69rkh									4				4
TRAILERS													
Trailer, Cargo, I-Axle	2	9						4			2		17
Trailer, Field Kitchen		9			1	1	2	1		1	4		19
Trailer, Water		3			1	1	1	1		1	1		9
RADIOS													
HF, Vehicle-Mount, Medium-Power, R-130	4					2			4				10
HF/VHF, Vehicle-Mount, Medium-Power		3				1							4
HF/VHF, Vehicle-Mount, High-Power						1							1
VHF, Portable, Low-Power, R-148		36											36
VHF, Manpack, Low-Power, R-107	2	21	4	3	4	1	6	1	1		1		44
VHF, Vehicle-Mount, Medium-Power, R-123	4	105		13									122
Ground-to-Air Radio Set	2	6				1							9
Warning Receiver, R-311	1	3				1							5

AIRBORNE DIVISION

Airborne Division

The Soviet airborne division is now almost fully equipped with motorized equipment. This significantly increases its combat power and mobility while retaining an airdrop capability for most of its equipment. The airborne division now has the BMD AAICV in all three of its airborne (infantry) regiments. An artillery regiment, an assault gun

(ASU-85) battalion, and an anti-aircraft battalion provide essential CS. The introduction of the 2S9 SP howitzer as a replacement for towed artillery will increase mobility. Also, the airborne division has other CS and CSS units that provide limited backup for combat operations.



AIRBORNE DIVISION

	DIVISION HEADQUARTERS	3 rd AIRBORNE REGIMENT (BMD)	ARTILLERY REGIMENT	ASSAULT GUN BATTALION	ANTI-AIRCRAFT BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	PARACHUTE RIGGING AND RESUPPLY BATTALION	TRANSPORT AND MAINTENANCE BATTALION	MEDICAL BATTALION	RECONNAISSANCE COMPANY	CHEMICAL PROTECTION COMPANY	TOTAL
PERSONNEL	160	4,419	620	180	155	220	180	220	165	95	75	65	6,554
WEAPONS													
122-mm Howitzer, D-30			30										30
122-mm Rocket Launcher, BM-21V			6										6
120-mm Mortar, M1943/M-120		18											18
85-mm SP Assault Gun, ASU-85				31									31
SAM, SA-7/GRAIL or SA-14/GREMLIN OR SA-16	6	108	21	12	12	6	6	6			6		183
23-mm AA Gun, ZU-23		18			18								36
ATGM Launcher Vehicle (BRDM-2), AT-3-5		27											27
ATGL RPG-16D	6	333	40	2		12	11		8		9		421
30-mm Automatic Grenade Launcher, AGS-17		54											54
5.45-mm LMG, RPKS-74	4	249	36				4				8		301
AAICV/ACV/ASC/APC													
AAICV, BMD-1		270											270
APC, BMD M1979/1		54											54
ACV, BMD-1KSh	3	21											24
ACV, BRDM/BRDM-2	2	12									1		15
ASC, BRDM/BRDM-2											8		8
GENERAL PURPOSE TRUCKS													
Truck, UAZ-69/469	16	57	30	2	1	10	7	10	6	4		6	149
Truck, GAZ-66 A/B	6	258	75		25	20	2	60				15	461
Truck, ZIL-130/131		192		6			3	50	50				301
Truck, Ural-375D		6							6				12

(continued)

AIRBORNE DIVISION

	REGIMENTAL HEADQUARTERS	3 * AIRBORNE REGIMENT	ARTILLERY REGIMENT (SMD)	ASSAULT GUN BATTALION	ANTI-AIRCRAFT BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	PARACHUTE RIGGING AND RESUPPLY BATTALION	TRANSPORT AND MAINTENANCE BATTALION	MEDICAL BATTALION	RECONNAISSANCE COMPANY	CHEMICAL PROTECTION COMPANY	TOTAL
Truck, KrAZ-255B		18						12					30
Truck, Ambulance, UAZ-450A/452	1	15	3	1					10				30
VAN TRUCKS													
Truck, Van, ZIL (AT-3/5 Simulator)		3											3
Truck, Van, GAZ	8								1				9
Truck, Van, GAZ (Signal)		9	6			9							24
Truck, Van, ZIL (Maintenance)		36	5	1				18					60
Truck, Van, Hospital									5				5
Truck, Van (SIGINT Equipment)										3			3
POL TRUCKS													
Truck, POL, ZIL		36	4	1				15					56
CHEMICAL RECONNAISSANCE VEHICLES													
Truck, Chemical Reconnaissance, UAZ-69rkh		12	1										13
DECONTAMINATION VEHICLES													
Truck, Decontamination, ARS-12U/14											1		1
Truck, Decontamination, DDA-66											?		?
SPECIAL PURPOSE TRUCKS													
Truck, Crane, K-61						2							2
Truck, Dump, MMZ						4							4
Sedan, GAZ-24	2												2
SPECIAL PURPOSE/ ENGINEER EQUIPMENT													
Armored Recovery Vehicle						3							3
Ditching Machine BTM						2							2

(continued)

Personnel and Equipment Recapitulation (continued)

AIRBORNE DIVISION

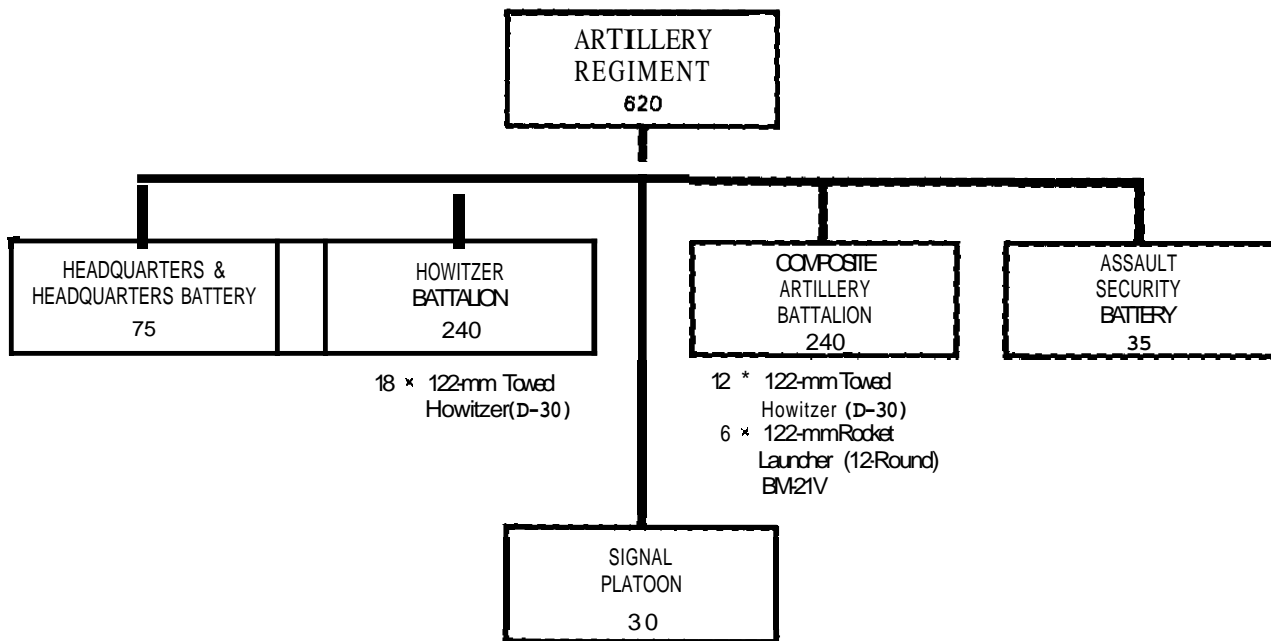
	DIVISION HEADQUARTERS	3 - AIRBORNE REGIMENT (BMD)	ARTILLERY REGIMENT	ASSAULT GUN BATTALION	ANTI-AIRCRAFT BATTALION	ENGINEER BATTALION	SIGNAL BATTALION	PARACHUTE RIGGING AND RESUPPLY BATTALION	TRANSPORT AND MAINTENANCE BATTALION	MEDICAL BATTALION	RECONNAISSANCE COMPANY	CHEMICAL PROTECTION COMPANY	TOTAL
Dozer, BAT/BAT-M						2							2
Grader						2							2
TRAILERS													
Trailer, Cargo, 1-Axle	4	51	23	3						3			84
Trailer, Generator, 1-Axle	2						3			2			7
Trailer, Water	1	27	4	1		1	2			1			37
Trailer, Field Kitchen	2	57	10	3		3	1			2			78
RADARS													
Counter-Battery/Counter-Mortar			2										2
Battlefield Surveillance, Man-Portable										2			2
SIGINT EQUIPMENT													
Radio DF, HF/VHF/UHF										3			3
Intercept Receiver, VHF/UHF							6			3			9
RADIOS													
HF, Vehicle-Mount, Medium-Power, R-130	10	30		1			4			1			46
HF, Vehicle-Mount, High-Power							1						1
HF/VHF, Vehicle-Mount, Medium-Power		12	5				1			1			19
HF/VHF, Vehicle-Mount, High-Power		3	1				1						5
VHF, Portable, Low-Power, R-148		108	5										113
VHF, Manpack, Low-Power, R-107	3	132	45	2	10	8	1	2	2	2		2	209
VHF, Vehicle-Mount, Medium-Power, R-123		366		31							9		406
Ground-to-Air Radio Set	2	27					4						33
Warning Receiver, R-311	1	15	3	1	1	1	1		1				24
Radio Relay, VHF/UHF, R-401/405/409			1				1						2

Personnel and Equipment Recapitulation (continued)

Artillery Regiment, Airborne Division

The airborne division's artillery regiment consists primarily of two firing battalions. The first is a 122-mm towed howitzer (D-30) battalion with 18 tubes. The other is a composite battalion

with twelve D-30s and six 122-mm rocket launchers (BM-21V). The artillery regiment also has limited organic support elements.



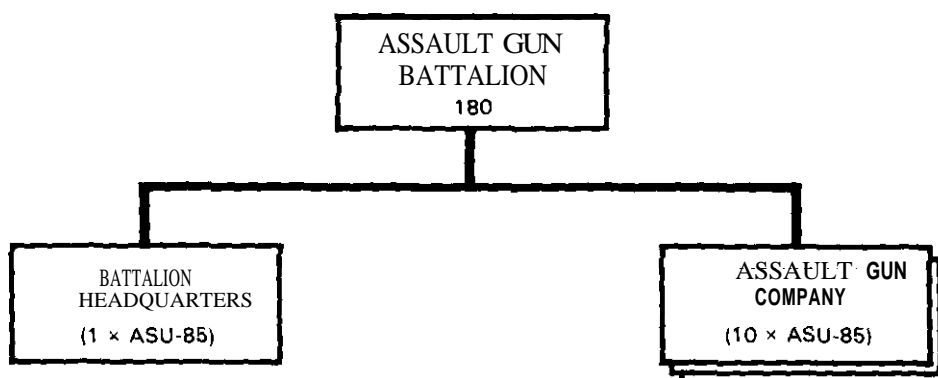
PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
122-mm Rocket Launcher (12-Round) EM-21V ...	6	Truck, Chemical Reconnaissance. UAZ-69rkh	1
122-mm Towed Howitzer. D-30	30	Trailer, Cargo, 1-Axle	23
ATGL, RPG-16D	40	Trailer, Water	4
SAM, SA-7/GRAIL or SA-14/GREMLIN		Trailer, Field Kitchen	10
or SA-16	21	Radar, Counter-Mortar/Counter-Battery	2
5.45-mm LMG, RPKS-74	36	Radios:	
Truck, UAZ-69/469	30	HF/VHF, Vehicle Mount, Medium-Power	5
Truck, GAZ-66A/B	75	HF/VHF, Vehicle Mount, High-Power	1
Truck, Ambulance, UAZ-450A/452	3	VHF, Portable, Low-Power, R-148	5
Truck, Van, GAZ (Signal)	6	VHF, Manpack, Low-Power, R-107	45
Truck, Van, ZIL (Maintenance)	5	Warning Receiver, R-311	3
Truck, POL, GAZ-66	4	Radio Relay, VHF/UHF, R-401/405	1

FM 100-2-3

Assault Gun Battalion, Airborne Division

The assault gun battalion has 31 85-mm SP assault guns (ASU-85s). The battalion has three companies with 10 ASU-85s each; there is 1 ASU-85 at battalion headquarters.



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
85-mm Assault Gun, ASU-85	31	Trailer, Cargo, 1-Axle	3
SAM, SA-7/GRAIL or SA-14/GREMLIN or SA-16	12	Trailer, Water	1
ATGL, RPG-16D	2	Trailer, Field Kitchen	3
Truck, UAZ-69/469	2	Radios:	
Truck, ZIL-130/131	6	HF, Vehicle Mount, Medium-Power, R-130	1
Truck, Ambulance, UAZ-450A/452	1	VHF, Manpack, Low-Power, R-107	2
Truck, Van, ZIL (Maintenance)	1	VHF, Vehicle Mount, Medium-Power, R-123	31
Truck, POL, GAZ-66	1	Warning Receiver, R-311	1

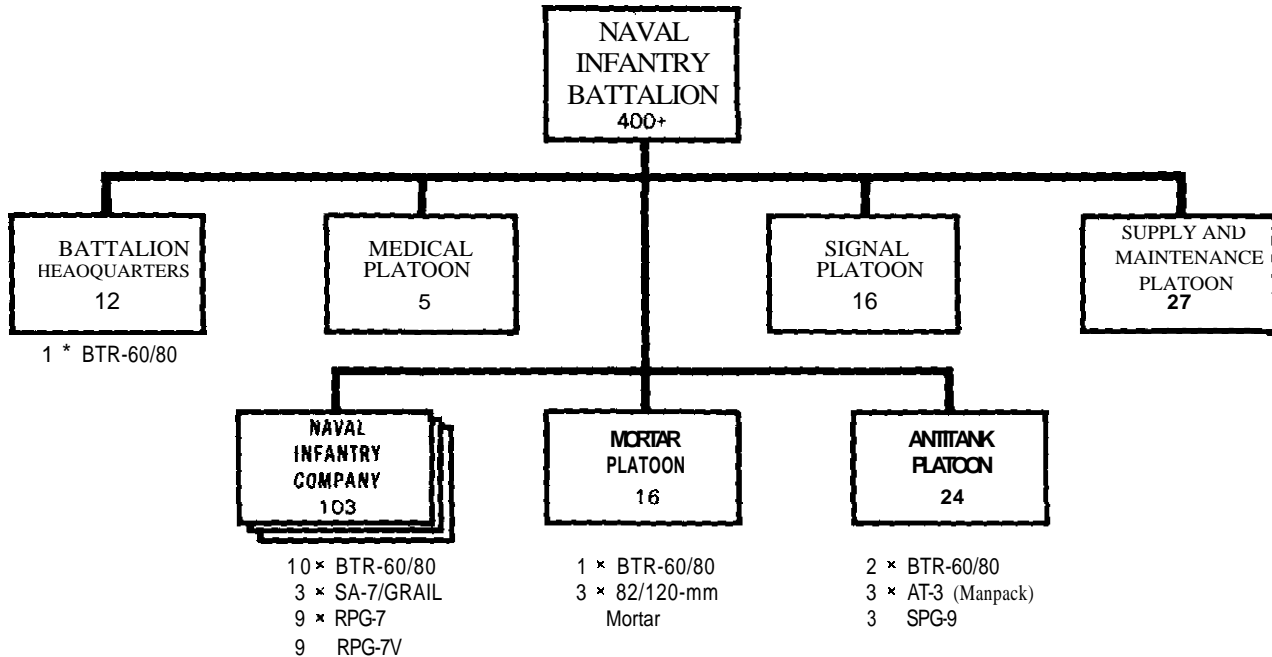
Amphibious Forces

The Soviet Naval Infantry. (SNI) is a branch of the Soviet Navy. The SNI units are operationally subordinate to fleet commanders. They may conduct landings in support of a front or TVD as part of the combined arms operations. The organization of a naval infantry battalion is

similar to that of an MRB in the ground forces. These SNI battalions, along with a TB and other units, form either regiments or brigades. While brigades operate separately, regiments are part of a naval infantry division.

NAVAL INFANTRY REGIMENT/BRIGADE STRUCTURE

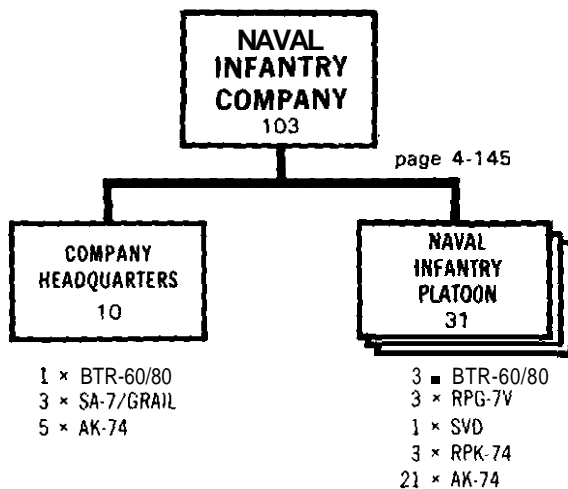
Naval Infantry Battalion, Naval Infantry Regiment or Brigade



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total	Equipment	Total
APC. BTR-60/80 (including command variants)	34	ATGM Manpack Console. AT-3	3
82/120-mm Mortar	3	73-mm Recoilless Gun, SPG-9	3
SAM, SA-7/GRAIL	9	7.62-mm Sniper Rifle, SVD	9
ATGL, RPG-7V	27	5.45-mm LMG. RPK-74	27
		5.45-mm Assault Rifle, AK-74	282

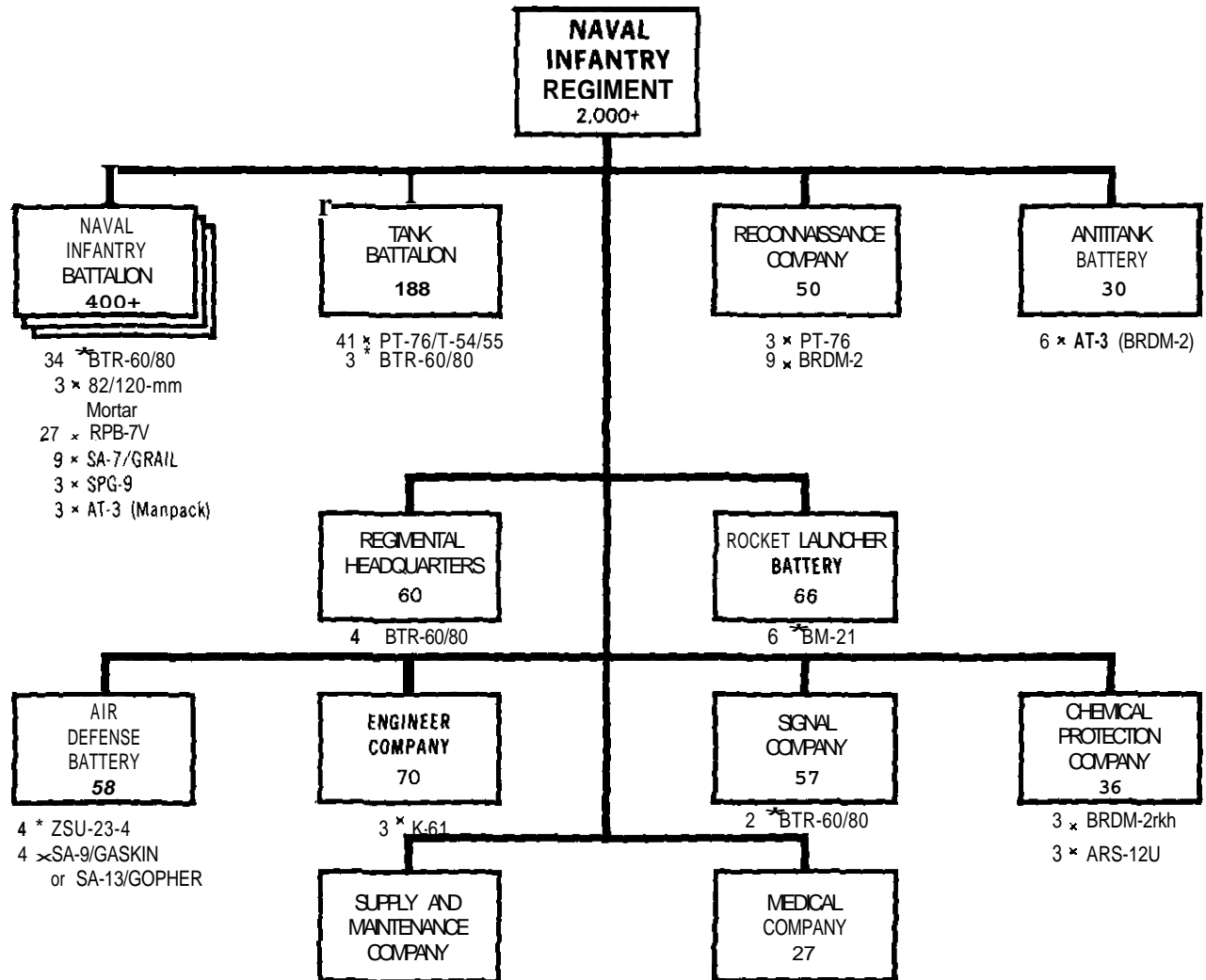
Naval Infantry Company



PRINCIPAL ITEMS OF EQUIPMENT

Equipment	Total
APC, BTR-60/80	10
SAM, SA-7/GRAIL	3
ATGL, RPG-7	9
7.62-mm Sniper Rifle, SVD	3
5.45-mm LMG, RPK-74	9
5.45-mm Assault Rifle, AK-74	68

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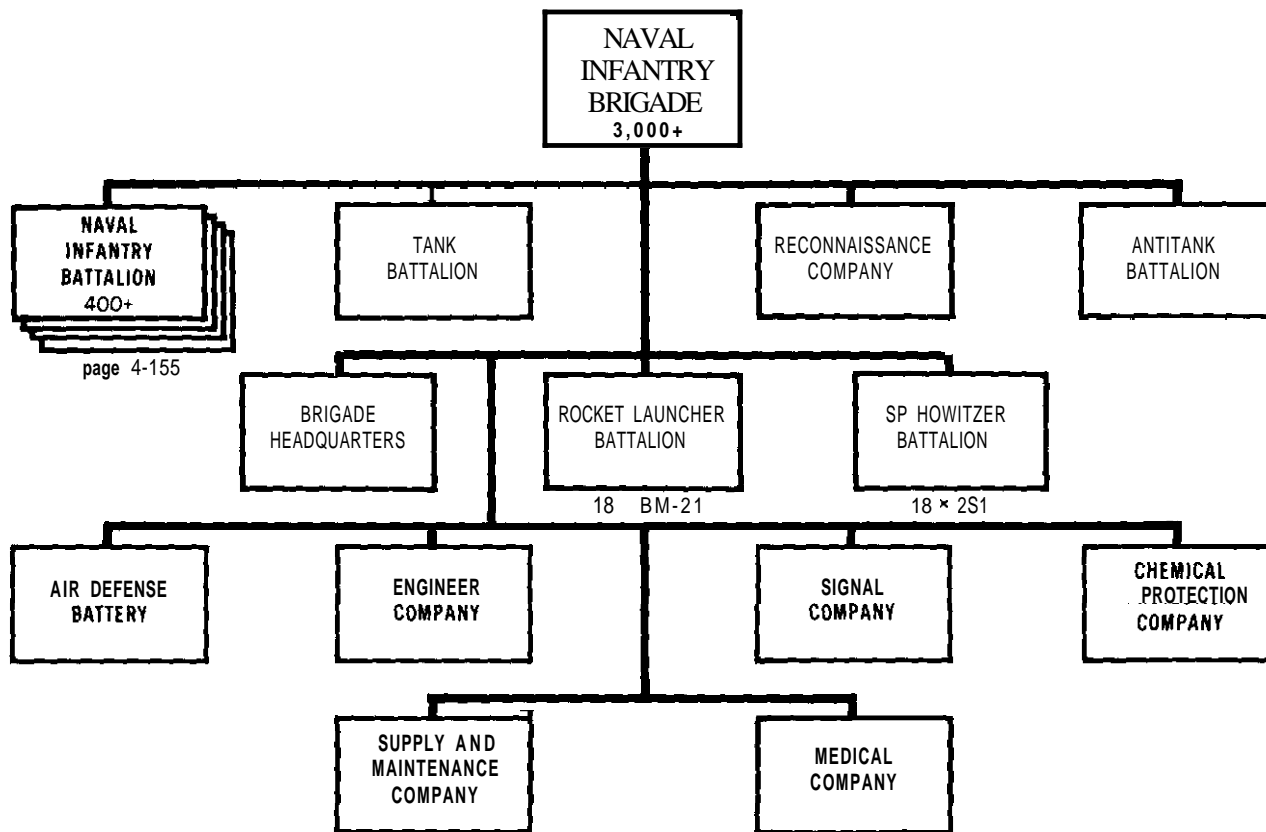
Equipment	Total
Medium Tank. T-54/55 or Light Amphibious Tank. PT-76	44
APC. BTR-60/80 (including command variants)	111
ASC, BRDM-2	9
ATGM Launcher Vehicle (BRDM-2), AT-3	6
Chemical Reconnaissance Vehicle, BRDM-2rkh	3
122-mm Rocket Launcher. BM-21	6
SPAA Gun, ZSU-23-4	4
SAM, SA-9/GASKIN TEL or SA-13/GOPHER TELAR	4

Equipment	Total
Tracked Amphibian, K-61	3
Truck. Decontamination. ARS-12U	3
83/120-mm Mortar	9
ATGL, RPG-7V	90
SAM, SA-7/GRAIL	27
73-mm Recoilless Gun. SPG-9	9
ATGM Manpack Console. AT-3	9
5.45-mm LMG. RPK-74	90
5.45-mm Assault Rifle. AK-74	1,521
7.62-mm Sniper Rifle. SVD	27

NAVAL INFANTRY DIVISION

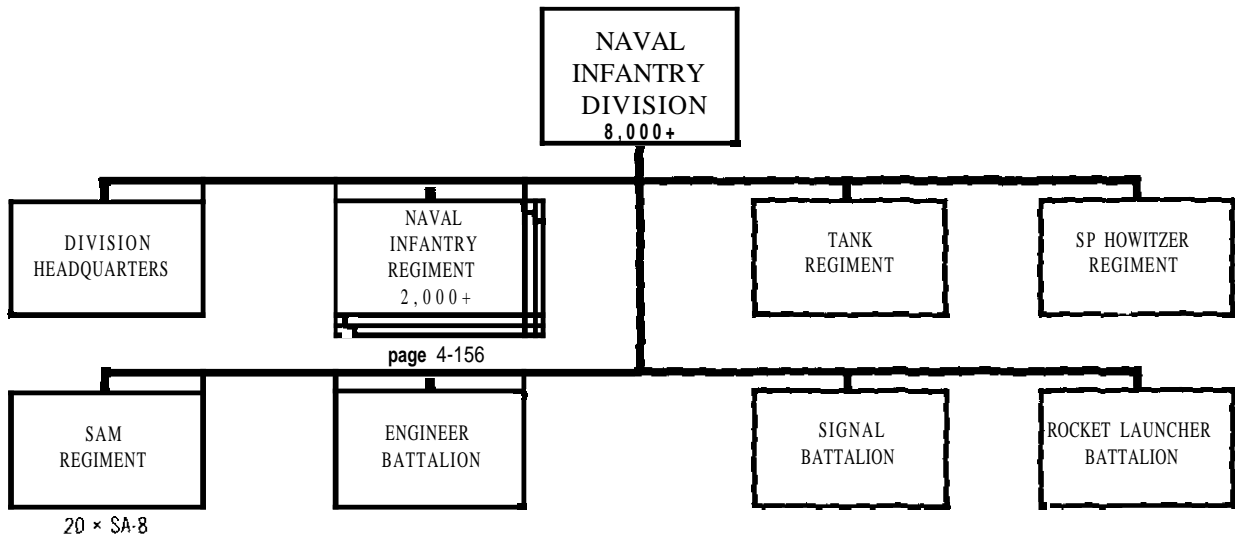
Naval Infantry Brigade

There are three SNI brigades. The Northern, Baltic, and Black Sea Fleets each have one.



Naval Infantry Division

There is only one SNI division. It is in the Pacific Fleet.



CHAPTER 5 Equipment

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This chapter provides descriptions and performance characteristics of the principal items of equipment listed in the organization charts of Chapter 4. The chapter divides current Soviet weapons, vehicles, and other equipment into

general categories. Most categories contain subsections dealing with specific types of equipment. Subsections begin with tables of characteristics, followed in most cases by descriptions and illustrations of individual items of equipment.

SMALL ARMS

Pistols, Rifles, and Submachine Guns

Pistol, rifle, and submachine gun characteristics

CHARACTERISTICS	PISTOL PM	ASSAULT RIFLES		SUBMACHINE GUN AKSU-74	SNIPER RIFLE SVD
		AKM/AKMS	AK-74		
CALIBER (mm)	9	7.62	5.45	5.45	7.62
LENGTH, overall (m)	0.16	0.88/0.87	0.94/0.88*	0.73/0.49****	1.23
WEIGHT, loaded (kg)	0.735	4.02/3.80	3.95	3.11	4.49
WEIGHT, empty (kg)	0.658	2.93/3.13	3.40	2.55	4.31
FIRE MODE	semiautomatic	Selective	selective	selective	semiautomatic
FEED	8-rd box magazine	30-rd Uetachable box magazine	30-rd detachable box magazine	30-rd detachable box magazine	10-rd detachable box magazine
AMMUNITION (type)	9 × 18-mm	7.62 × 39-mm M1943 rimless	5.45 × 39-mm	5.45 × 39.5-mm	7.62 × 54-mm rimmed
PERFORMANCE					
Muzzle velocity (rn/sec)	315	710	900	850	830
Range					
Maximum (m)	INA	2,500	3,150	1,500	3,800 (est)
Effective (m)	50	200/300***	500	250-300	800/1,300**
Rate of Fire (rd/min)					
Cyclic	NA	640	600	600	NA
Practical	30	100/40***	100/40***	100-150	30
UNIT OF FIRE (rd)	16	300	INA	INA	100
DOI	1951	1951/1961	1974	1984?	1967
STATUS	standard	Obsolete	standard	standard	standard

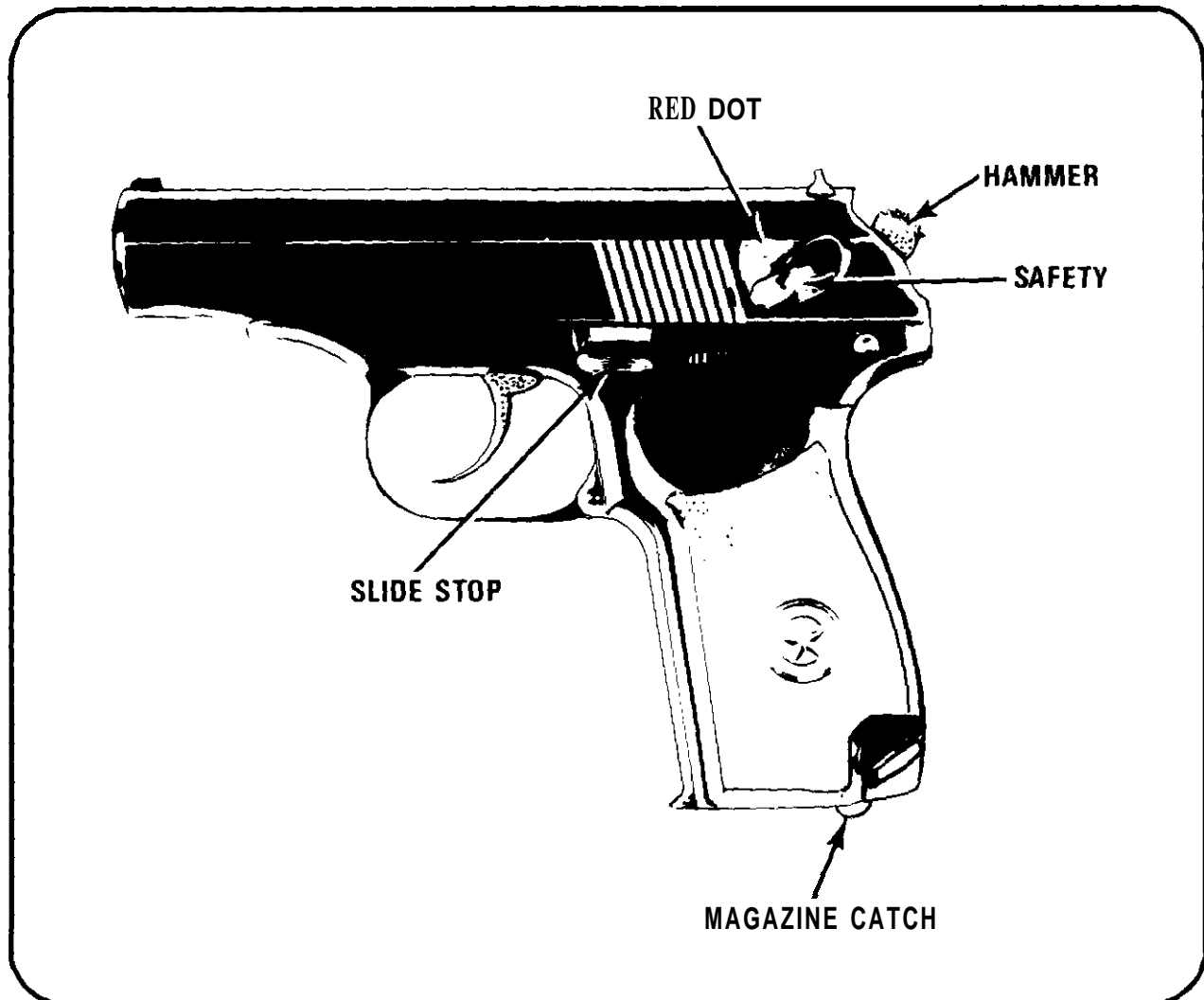
FOOTNOTES *With/without muzzlebrake.

**Without/with scope.

***Fully automatic/semiautomatic

****Stock extended/folded

9-mm Pistol PM

PM***DESCRIPTION:***

The PM is a semiautomatic, blowback-operated, magazine-fed weapon fitted with a double-action trigger mechanism. It fires a 9 x 18-mm cartridge and uses an 8-round magazine. The Soviets issue it with a leather holster, an extra magazine, and a cleaning rod.

CAPABILITIES:

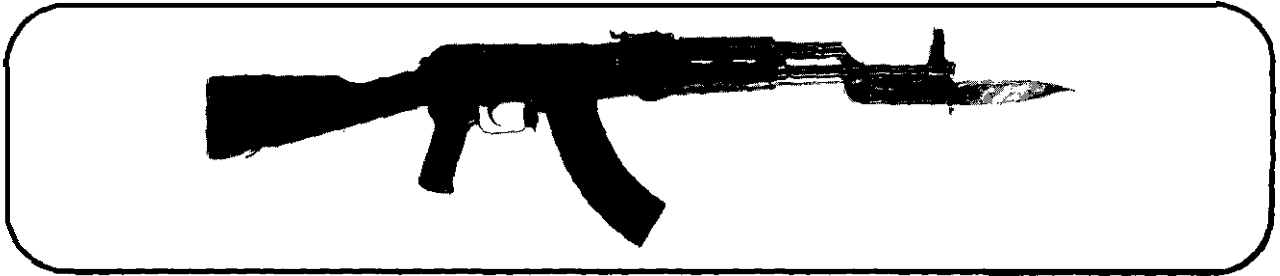
The effective range of the PM is 50 meters. Its muzzle velocity is 315 meters per second. Its practical rate of fire is 30 rounds per minute.

LIMITATIONS:

The use of a low-powered round limits the range of the PM, as it does with other pistols. There is no option for automatic fire.

REMARKS:

Following World War II, the Soviets introduced two new blowback-operated 9-mm weapons to replace the 7.62-mm Tokarev pistol (TT-33). The larger weapon, the 9-mm machine pistol Stechkin (APS), appeared only in small numbers. The 9-mm pistol Makarov (PM), however, has become the Soviet's most widely issued pistol.

AKM**DESCRIPTION:**

The original AK was also known as AK-47. It was a gas-operated, selective-fire weapon. Like all 7.62-mm Kalashnikov assault rifles, it fired the Soviet 7.62 x 39-mm M1943 round and used a standard 30-round curved box magazine. The AK came in two versions: one with a fixed wooden stock, and another, the AKS, with a folding metal stock issued primarily to parachutists and armor troops. Except for the differences in the stock and the lack of a tool kit with the AKS, the two versions were identical. The early AKs had no bayonet, but the version with the fixed wooden stock later mounted a detachable knife bayonet.

The improved model, known as the AKM, is easier to produce and operate. It weighs about one kilogram less than the AK. The reduced weight results from using thinner, stamped sheetmetal parts rather than machined, forged steel; laminated wood rather than solid wood in the handguard, forearm, pistol grip, and buttstock; and new lightweight aluminum and plastic magazines. Other improvements include a straighter stock for better control; an improved gas cylinder; a rate-of-fire control alongside the trigger; a rear sight graduated to 1,000 meters rather than 800 meters; and a greatly improved, detachable bayonet.

The AKM also has a folding-stock version, designated AKMS, intended for use by riflemen in armored infantry combat vehicles such as the BMP. Except for its T-shaped, stamped-metal, folding buttstock, the AKMS is identical to the AKM. The folding-stock model can reduce its length from 868 to 699 millimeters.

CAPABILITIES:

All 7.62-mm Kalashnikov assault rifles fire in either a semiautomatic or automatic mode and have an effective range of about 300 meters. At

full cyclic rate, they can fire about 600 rounds per minute (up to 640 rounds per minute for the AKM), with a practical rate of 100 rounds per minute fully automatic or 40 rounds per minute semi-automatic. Both the AK and AKM can mount a grenade launcher. Both can have passive image intensifier night sights. Both can function normally after total immersion in mud and water. The fully chromed barrel ensures effective operation even at very low temperatures. The muzzle of either weapon fits into the swiveling firing ports of the BMP. Thus, the infantryman can fire the weapon while the vehicle is moving.

LIMITATIONS:

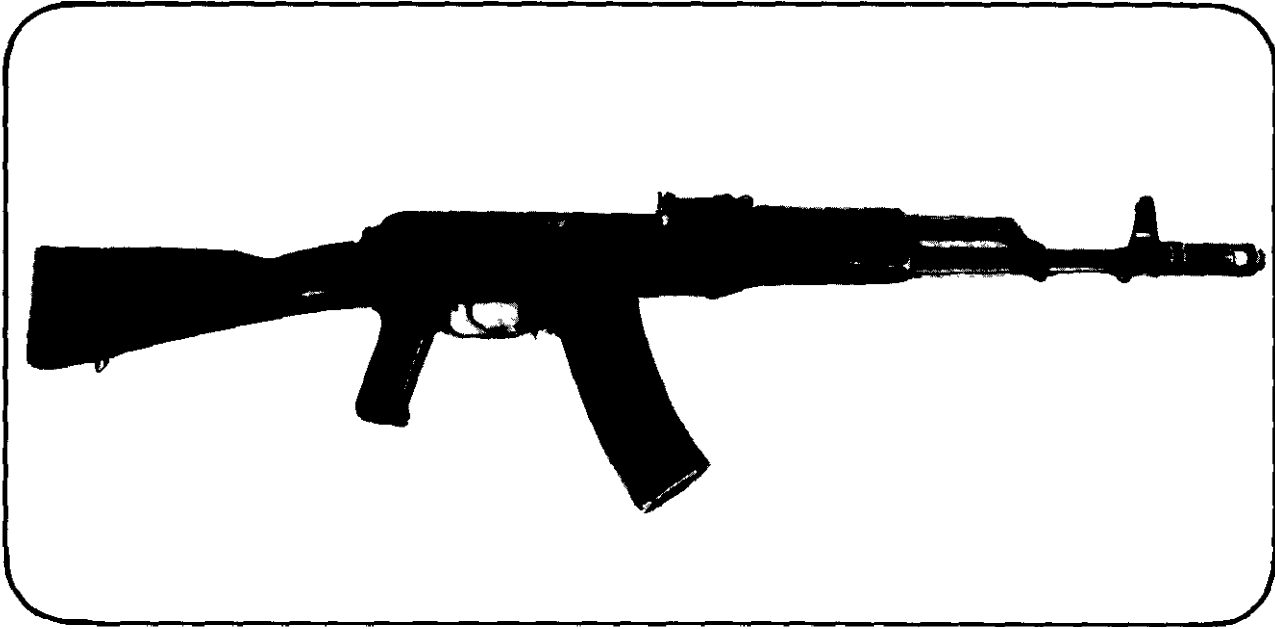
The most serious drawback to the AK and AKM is the low muzzle velocity (710 meters per second) of the relatively heavy 7.62-mm round. This results in a looping trajectory that requires a clumsy sight adjustment for accuracy at ranges beyond 300 meters. The barrel overheats quickly when the weapon fires for extended periods, making the weapon hard to handle and occasionally causing a round to explode prematurely in the chamber. The exposed gas cylinder is easily dented, sometimes causing the weapon to malfunction.

REMARKS:

Although they designed it in 1947 and thus referred to it as the AK-47, the Soviets actually adopted the AK in 1949. The AK entered service in 1951. It was the basic individual infantry weapon of the Soviet Army until the introduction of the AKM. The Soviets developed the AKM in 1959. It entered service in 1961. All 7.62-mm Kalashnikov assault rifles are very dependable weapons. They produce a high volume of fire and are simple to maintain. However, the new 5.45-mm assault rifle AK-74 is replacing the 7.62-mm weapons.

5.45-mm Assault Rifle AK-74

AK-74

**DESCRIPTION:**

The AK-74 is basically an AKM rechambered and rebored to fire a 5.45-mm cartridge. Externally, it has the same general appearance as the AKM, with two notable differences. It has a distinctive, two-port muzzle brake, giving it a slightly greater overall length than the AKM. It also has a smooth plastic magazine which is slightly shorter and is curved to a lesser extent than the grooved metal AKM magazine. It uses the same type of bayonet as the AK-series weapons.

There is also a folding-stock version, designated AKS-74, which has a Y-shaped, tubular stock. The stock has an extremely narrow buttplate, as opposed to the T-shaped, stamped-metal buttstock of the AKMS.

CAPABILITIES:

The AK-74 fires 5.45 x 39-mm ball, ball-tracer, and incendiary-tracer rounds. The 5.45-mm round of the AK-74 has a considerably higher muzzle velocity than the 7.62-mm round of the AKM; this eliminates the range-limiting drawback of its predecessor. Like the AKM, the AK-74 has a maximum sight setting of 1,000 meters, but the effective range is 500 meters (versus 300 meters for the AKM).

The muzzle brake on the AK-74 uses a fluidic device to minimize recoil and muzzle climb. Although the AK-74 is somewhat heavier than the AKM when empty, its loaded weight is slightly less than that of the AKM this is due primarily to the plastic magazine and its smaller-caliber ammunition. Like the AK and AKM, the AK-74 can mount a grenade launcher and a passive image intensifier night sight.

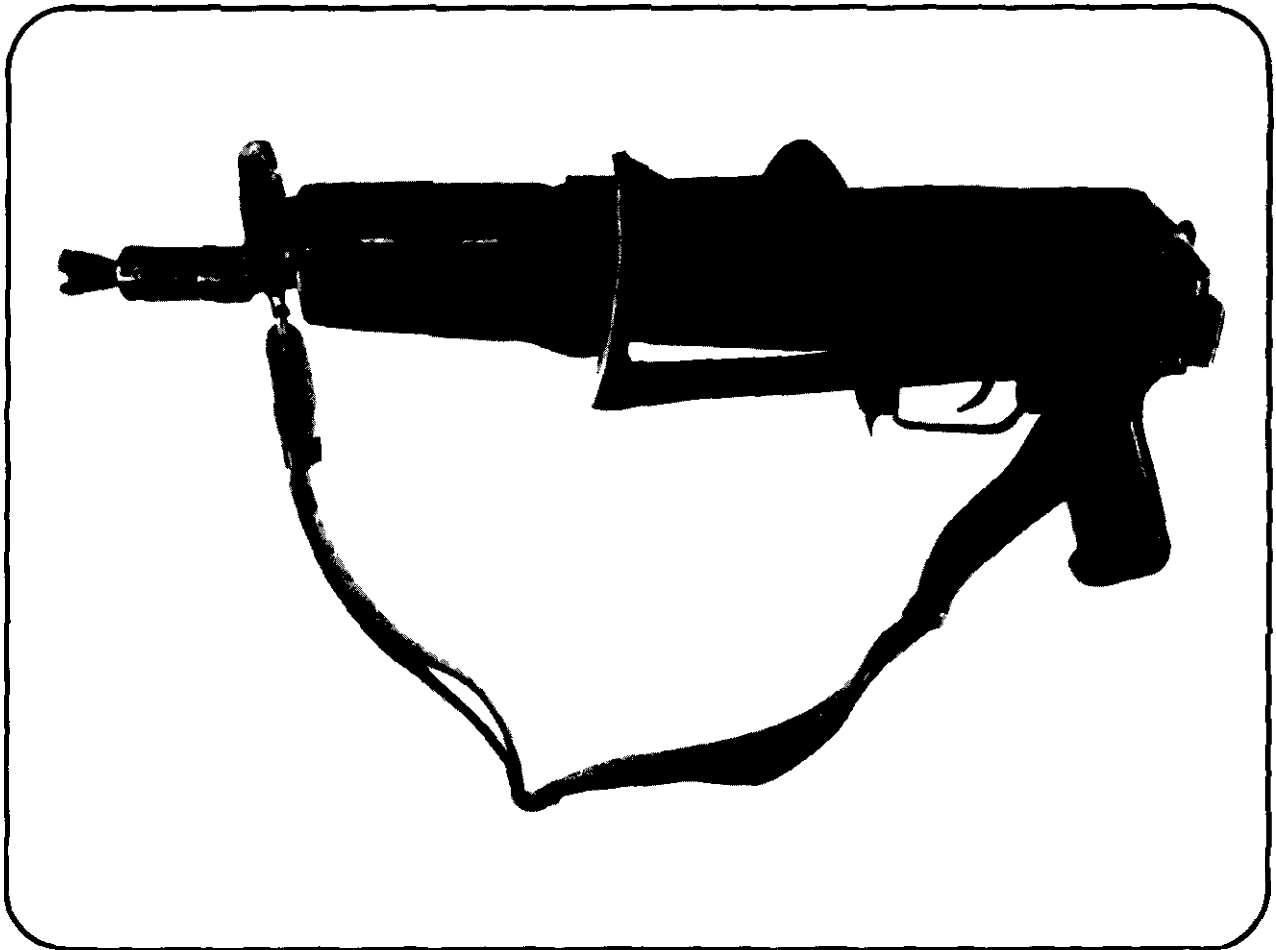
LIMITATIONS:

The gas cylinder, like the cylinders on the AK and AKM, is in a vulnerable position; if dented, it may cause weapon malfunction. The reddish-brown or orange color of the plastic magazine does not lend itself to camouflage.

REMARKS:

The Soviets fielded the AK-74 in 1974, as indicated by the weapon's designation. The folding-stock AKS-74 was first seen with Soviet airborne troops in November 1977. The AK-74 is also the basis for other 5.45-mm small arms, including the AKSU-74 submachine gun and the RPK-74 light machine gun.

AKSU-74



DESCRIPTION:

The AKSU-74 is a modified version of the AK-74 assault rifle with a much shorter barrel (207 millimeters versus 413 millimeters) and a conical flash suppressor instead of a muzzle brake. Like the AKS-74, it has a folding metal stock. The overall length of the submachinegun is only 492 millimeters with stock folded or 728 millimeters with extended stock. The rear sight is a flip-type U-notch. The front sight is a cylindrical post.

CAPABILITIES:

The Soviets designed the AKSU-74 as a weapon short enough to be handled easily when the crew enters and exits vehicles. The device at the end of the barrel functions as an expansion chamber

to bleed off gases which would otherwise cause a violent recoil. With a loaded weight of 3.106 kilograms, the submachine gun is considerably lighter than the assault rifle AK-74 and has a somewhat higher rate of fire.

LIMITATIONS:

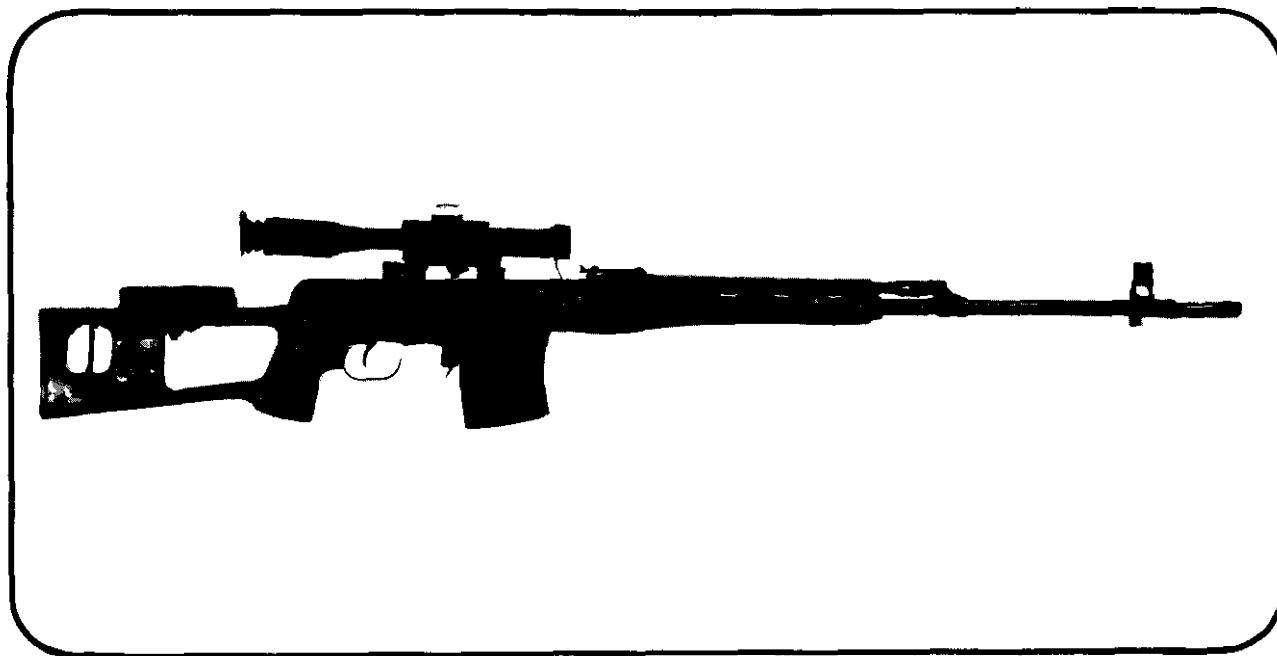
The AKSU-74 has a greatly reduced range due to its shortened barrel. However, it still has more power and longer range than conventional submachine guns that fire pistol cartridges.

REMARKS:

The AKSU-74 was first seen with Soviet airborne troops in early 1984.

7.62-mm Sniper Rifle SVD

SVD

**DESCRIPTION:**

The Sniper Rifle Dragunov (SVD) is a gas-operated, semiautomatic weapon. It fires the Soviet 7.62 x 54R cartridge and uses a detachable 10-round box magazine. Its overall length is 1,225 millimeters, and its empty weight is 4.3 kilograms. (Its loaded weight with bayonet is 4.78 kilograms.) Its bolt mechanism and gas recovery system are similar to those of the AK and AKM: but, because of the difference in cartridges used, parts are not interchangeable with the assault rifles. The most distinguishing features of the SVD are the open buttstock, which has a cheek pad for ease in sighting, and the telescopic sight mounted over the receiver. It has a combination flash suppressor/compensator. It may mount the standard AKM bayonet. The Soviets issue it with four magazines, a cleaning kit, and an extra battery and lamp for the telescopic sight.

CAPABILITIES:

The SVD fires approximately 30 rounds per minute in the semiautomatic mode. It has a maximum effective range of 1,300 meters with the 4-power telescope or 800 meters without it. The PSO-1 optical sight has a 6-degree field of view. It contains an integral, infrared detection aid and

an illuminated rangefinder reticle. Thus, the SVD is effective in daylight against point targets or at night against active infrared emitters, such as night driving aids and weapon sights. It can fire light ball, heavy ball, steel core, tracer, and anti-tank incendiary ammunition.

LIMITATIONS:

The SVD can fire only light and heavy ball-type ammunition with accuracy. Even though it is equipped with a bayonet, the SVD is not an ideal weapon for close combat because it can fire only in the semiautomatic mode. Its weight and length also limit its maneuverability. The 7.62 x 54-mm rimmed cartridge of the SVD is not interchangeable with the 7.62 x 39-mm rimless round of the AKM.

REMARKS:

The Soviets developed the SVD in 1965. It entered service in 1967 and is the standard Soviet sniper weapon. One squad in each motorized rifle platoon has an SVD; selected riflemen receive regular, centralized sniper training on it. Largely due to its open buttstock, the SVD is lighter than older sniper rifles.

Grenade Launchers
Grenade launcher characteristics

CHARACTERISTICS	AGS-17	BG-15
CALIBER (mm)	30	40
LENGTH, overall (m)	1.28	0.325
WEIGHT, loaded (kg)	45.05 (with full magazine)	1.79
WEIGHT, empty (kg)	30.71 (without magazine)	1.54
FIRE MODE	selective	single shot
FEED	29-rd drum magazine	muzzle loaded
AMMUNITION (type)	30-mm Frag-HE	40 × 101.6 mm (7P17) 40 × 118.5 mm (VOG-25)
PERFORMANCE		
Muzzle velocity (M/sec)	approximately 190	approximately 71
Range		
Maximum (m)	1,730	400
Effective (m)	700/1,200*	INA
Rate of fire (rd/min)		
Cyclic	100/400**	NA
Practical	60+	INA
UNIT OF FIRE (rd)	89	INA
ELEVATION (c)	+7 to +87	NA
TRAVERSE (ø)	30 total	NA
CREW	3	NA
DOI	1974	1984?
STATUS	standard	standard

FOOTNOTES. *Direct/indirect fire.
**Minimum/maximum setting

30-mm Automatic Grenade Launcher AGS-17

AGS-17

***DESCRIPTION:***

The AGS-17 is a blowback-operated 30-mm automatic grenade launcher which can be mounted on a tripod or vehicle. A prominent drum magazine mounted on the right side holds 29 belted grenade rounds. The nondisintegrating metallic link belt exits from the left side. The short barrel with disc-shaped cooling fins protrudes from a large rectangular receiver. A range table is riveted to the top of the receiver cover; it provides sight settings in Soviet mils for direct fire at ranges from 50 to 1,730 meters and for indirect fire at ranges from 1,000 to 1,730 meters. The 2.6-power illuminated telescopic sight PAG-17 is mounted on the left rear of the launcher. All exposed nonmoving parts are subdued black.

For ground transport, the system breaks down into four parts. The launcher itself weighs 17.86

kilograms and may be enclosed in a canvas carrying case. The sight weighs 0.99 kilograms; the folding tripod weighs 11.86 kilograms; and the magazine weighs 14.34 kilograms fully loaded, or 2.87 kilograms empty.

CAPABILITIES:

MRBs have an automatic grenade launcher platoon with six AGS-17 launchers, carried in pairs in three armored vehicles (BTR or BMP). Each of the battalion's three MRCs could receive one vehicle. A platoon of six AGS-17s is also organic to airborne battalions and to assault and parachute battalions in air assault and airmobile assault brigades.

30-mm Automatic Grenade Launcher AGS-17 (continued) _____

The AGS-17 crew consists of a gunner and two riflemen-assistant gunners. For training, there may be only one assistant. When they dismount, the gunner carries the sight and launcher, the first assistant carries the tripod and a magazine, and the second assistant carries two additional magazines. Dismounted AGS-17s can provide effective fire support for Soviet infantry operating in areas where BTRs, BMPs, and tanks cannot go or where minimum safety distances preclude artillery or air support.

The Soviets designed the AGS-17 to provide their infantry with an area-type suppressive-fire capability. They intend to use it primarily against personnel targets. It probably has some capability to engage soft-skinned and lightly armored vehicles. It is very accurate in the semiautomatic mode; it is also quite effective in area coverage in the automatic mode. The 50-m increments in the range table atop the receiver give some indication of the accuracy against point targets. The gunner can select a "maximum" cyclic rate of fire of 400 rounds per minute or a "minimum" cyclic rate of 100 rounds per minute.

One of the most important characteristics of the AGS-17 is its ability to provide indirect fire from protected positions against enemy troops in trenches, on reverse slopes of hills, or behind

wooded areas. The gunner can engage targets by high-angle indirect fire at ranges from 1,000 to 1,730 meters; he can also use direct fire or high-angle direct fire at ranges from 50 to 1,730 meters. The sight reticle can serve as a direct-fire sight for point targets at ranges of up to 700 meters. The range table allows the gunner to adjust his fire rapidly for various ranges without computing elevations for the sight.

LIMITATIONS:

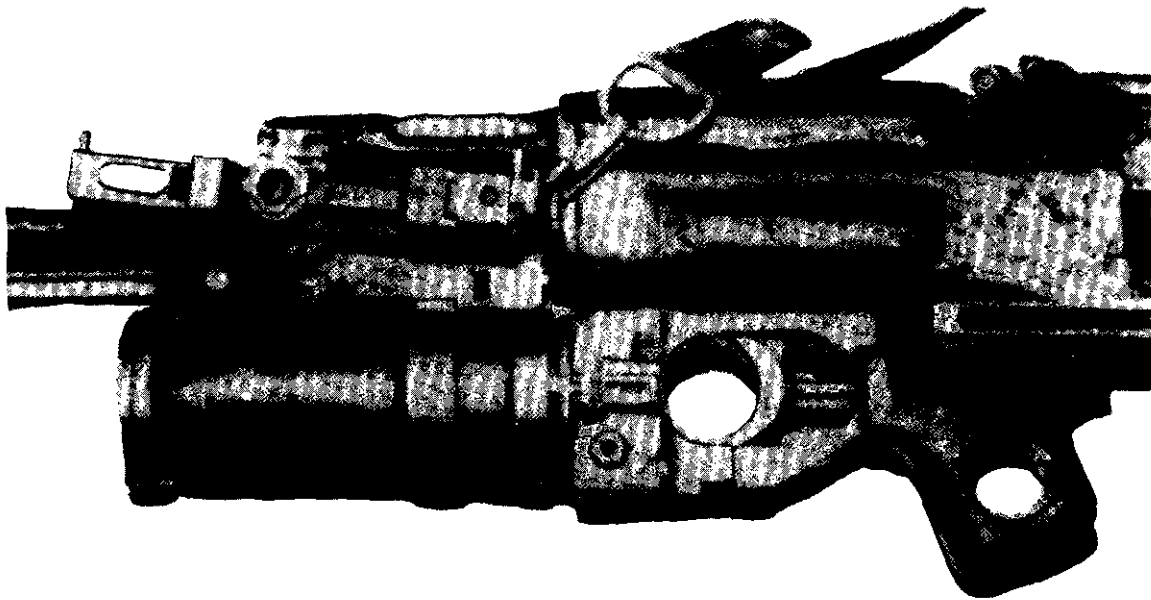
To effectively employ the AGS-17, the gunner must make accurate determinations of distances to all targets. Low muzzle velocity makes grenades susceptible to crosswinds, especially when the weapon fires at high angles. The grenade fuze is armed shortly after leaving the bore. Fuze sensitivity probably preempts firing under conditions of heavy rainfall, high ground cover (grass or brush) within 50 meters of the muzzle, or low-hanging tree limbs.

REMARKS:

Introduction of AGS-17 into Soviet units began in 1974. The acronym, AGS, stands for *avtomaticheskii granatomet stankouy* (automatic grenade launcher on mount). The Soviet nickname for the weapon is *Plamya* (flame).

-mm Under-Barrel Grenade Launcher BG-15

BG-15



Description:

The BG-15 grenade launcher consists of two parts: the barrel and the trigger mechanism. The barrel segment includes the barrel itself, the sight, and the mounting bracket. The barrel is 120 millimeters long. The sight attaches to the left side of the mounting bracket. It consists of a front post and a rear open U-notched sight graduated for ranges out to 400 meters. An additional sight setting is available for high-angle fire at ranges of 200 and 300 meters. The trigger mechanism attaches to the barrel by means of an interrupted thread coupler. The rifleman can activate it only when the complete weapon is attached to the assault rifle.

CAPABILITIES:

The BG-15 can attach under the barrel of the AK-74 and AKS-74 assault rifles. It uses an integral

button-released notch which connects to the bayonet lug. The grenade launcher is muzzle-loaded. A pre-engraved band on the projectile body positions the grenade. Two types of 40-mm grenades are known to be used: the 7P17 and the rebounding VOG-25. The launcher is percussion-primed.

LIMITATIONS:

The extremely low muzzle velocity would make the grenades susceptible to crosswinds, especially when the grenades are employed in high-angle fire.

REMARKS:

The BG-15 was first observed in 1984. It is standard in units equipped with the AK-74 or AKS-74 assault rifles.

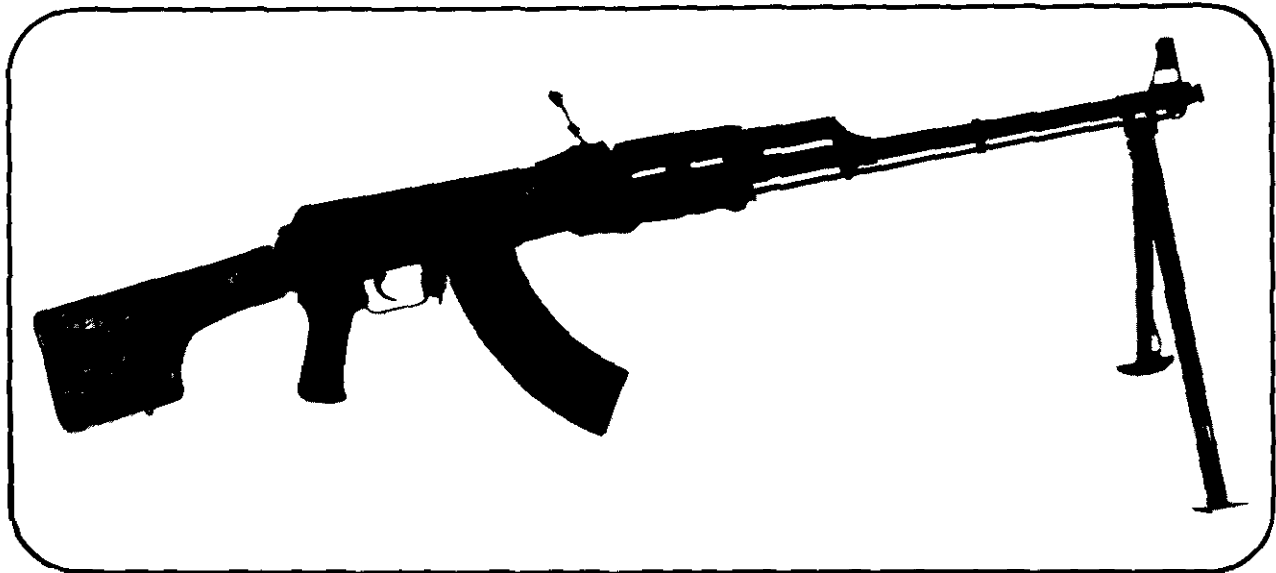
Machine Guns
Machine gun characteristics

CHARACTERISTICS	SQUAD MACHINE GUNS		VEHICLE-MOUNTED MACHINE GUNS			
	RPK/RPKS	RPK-74	PK SERIES***	DShK	KPVT	NSV
CALIBER (mm)	7.62	5.45	7.62	12.7	14.5	12.7
LENGTH, overall (m)	1.035/0.82	1.07	1.16/1.08***	1.56 (gun only)	2.00	1.58
WEIGHT, loaded (kg)	5.67*	5.00	varies with magazine	157.5 (with mount)	varies with mount	INA
WEIGHT, empty (kg)	4.90	4.60	8.40/10.66***	35.60 (gun only)	49.10	25.0
FIRE MODE	selective	selective	automatic	automatic	automatic	automatic
FEED	(1) 40-rd detachable box magazine (2) 75-rd spring-loaded drum magazine (3) 30-rd AKM magazine	(1) 40-rd detachable box magazine (2) 30-rd AK-74 magazine when necessary	joinable 25-rd non-disintegrating belts: 100/200/250	nondisintegrating metallic belt (50-rd sections in box magazine)	varies (10-rd metallic belt sections in 50-rd boxes can be used)	belts in 60-rd boxes
AMMUNITION (type)	7.62×39-mm rimless	5.45×39-mm rimless	7.62×54-mm rimmed	12.7×108-mm API, API-T	14.5×114-mm API, API-T, AP-T, I-T, HEI	12.7×108-mm API, API-T, HEI
PERFORMANCE						
Muzzle velocity (m/sec)	745	960	825/855***	840	1,000-1,050	845
Range Maximum (m)	2,500	2,500	3,800/4000***	7,000 ground	7,000 ground	7,850 ground
Effective (m)	800	800	1,000	1,000 AA 2,000 ground (800 against armor)	1,400 AA 2,000 ground	1,000 AA 2,000 ground (800 against armor)
Armor penetration (mm @ 0° obliquity @ 500/1,000 m)	8(500 m)	INA	8(500 m)	20/13.2	30/20	20/13.2
Rate of fire (rd/min)						
Cyclic	650	600	650	540-600	550-600	680-800
Practical	150/50**	150/50**	250	80-100	150	100
UNIT OF FIRE (rd)	1,000	INA	2,500	INA	INA	300
DOI	1964	late 1970s	1971/1968***	1946	1953	early 1970s
STATUS	standard	standard	standard	standard	standard	standard

FOOTNOTES. *40-rd magazine.

**Fully automatic/semiautomatic.

***PKM (squad)/PKT (vehicle-mounted)

7.62-mm Light Machine Gun RPK*RPK***DESCRIPTION:**

The RPK is a variant of the AKM assault rifle. It has a longer, heavier barrel (591 millimeters versus 414 millimeters); a stamped metal bipod; and a heavier type of fixed, wooden buttstock. The modified receiver of the RPK can accommodate its larger-diameter barrel. The RPK normally feeds ammunition from either a 40-round curved box magazine or a 75-round spring-loaded drum magazine: However, it can also use the 30-round curved box magazine of the AKM, if necessary. It has a chrome-plated barrel, chamber, and gas piston. It also has a cyclic rate reducer built into the trigger mechanism. The Soviets usually install luminous night sights on the front and rear sights. Some RPKs can mount an infrared night-sighting device.

The Soviets issue a folding-stock version, the RPKS, to airborne troops. With stock folded, it is only 820 millimeters long (versus the RPK, which is 1,035 millimeters long).

CAPABILITIES:

The RPK has a maximum effective range of 800 meters in either automatic or semiautomatic mode. It also has a practical rate of fire of 150 rounds per minute automatic or 50 rounds per minute semiautomatic. In offensive operations, the

machine gunner normally attaches the 75-round drum magazine beneath the weapon at the beginning of an attack. He subsequently replaces it with a 40- or 30-round magazine during the assault or in the early stages of defense. Almost all of the moving parts of the RPK are interchangeable with those of the AK or AKM assault rifles.

LIMITATIONS:

Because the RPK fires from a closed bolt, it tends to "cook off" its cartridges after prolonged firing. Since the barrel cannot be changed, the sustained rate of fire must not exceed about 80 rounds per minute. The lack of a gas regulator causes rough action and vigorous ejection to the right rear when the gun is clean. It also causes the rate of fire to slow down gradually as residue and dirt accumulate in the gas port.

REMARKS:

The Soviets first produced the RPK in 1961. It entered service around 1964. It was first displayed in the 1966 May Day parade in Red Square. It has become the standard squad automatic weapon in most Warsaw Pact armies. However, the 5.45-mm RPK-74 is now replacing it in Soviet units.

5.45-mm Light Machine Gun RPK-74

RPK-74



DESCRIPTION:

Just as the RPK is the squad machine gun version of the AKM, the RPK-74 is a machine gun version of the AK-74, firing the same ammunition. The RPKS-74 is a folding-stock version of the weapon. Instead of the prominent muzzle brake used on the AK-74, the machine gun has a short flash suppressor. The magazine is longer than that normally used with the AK-74, but the magazines are interchangeable. The RPK-74 has a bipod.

CAPABILITIES:

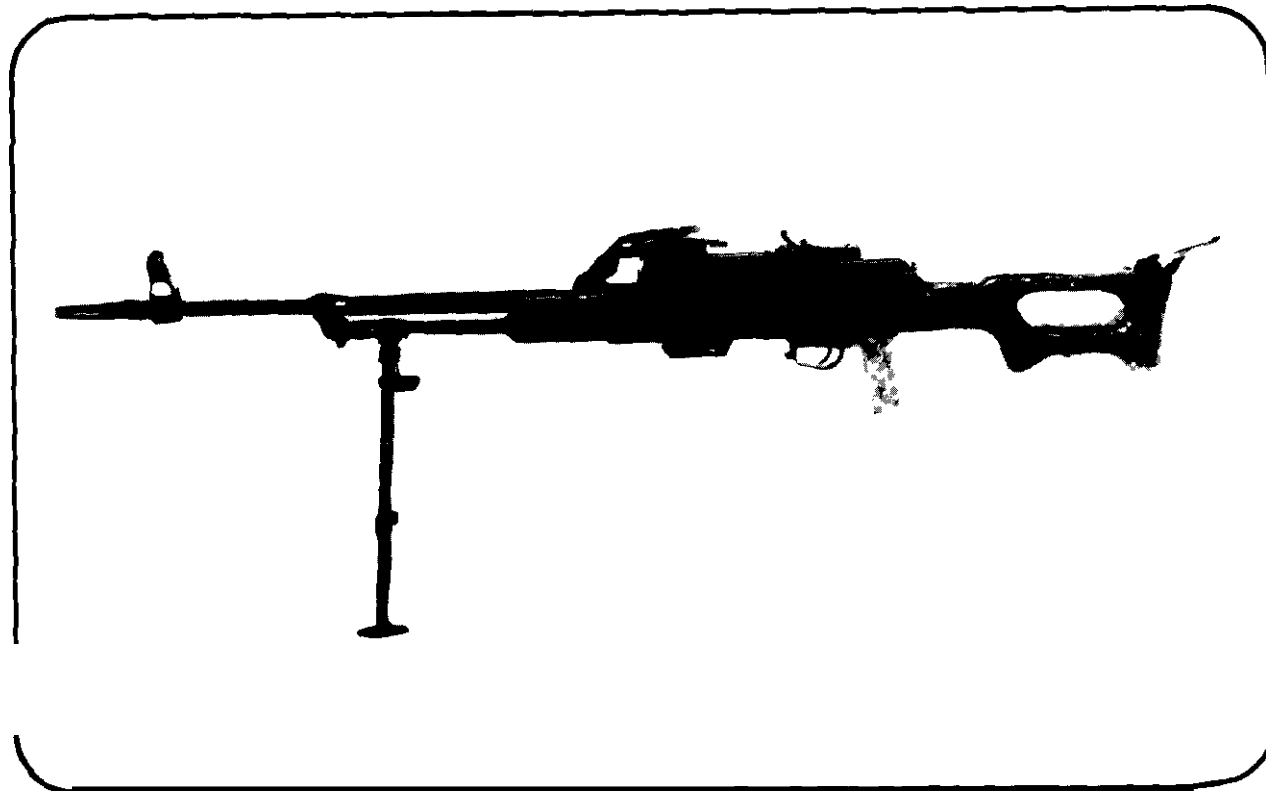
The 5.45-mm round of the RPK-74 has a considerably higher muzzle velocity than the 7.62-mm

round of the RPK. However, both weapons probably have the same maximum range (2,500 meters) and effective range (800 meters). Unlike the RPK, the RPK-74 is compatible with the front firing ports of the BMP.

REMARKS:

Since its introduction in the late 1970s, the RPK-74 has become the standard squad machine gun in Soviet motorized rifle units. It is replacing both the RPK and PKM 7.62-mm weapons. Airborne squads also employ the RPKS-74.

7.62-mm General-Purpose Machine Guns, PK Series

PKM**DESCRIPTION:**

The 7.62-mm general-purpose machine gun Pulemyot Kalashnikov (PK) is a gas-operated, belt-fed, sustained-fire weapon. The Soviets based its design on the Kalashnikov assault rifle. Notable differences from the assault rifle are the gas cylinder below the barrel and the hollow-frame stock resembling that of the SVD sniper rifle. The PKM fires 7.62 x 54R rimmed cartridges using a metal nondisintegrating belt.

The basic PK model is bipod-mounted. It is fed by a 100-round belt carried in a box fastened to the right side of the receiver. It weighs 9 kilograms and is 1,161 millimeters long. It is constructed partly of stamped metal and partly of forged steel.

The PKS is a PK mounted on a lightweight (4.75-kg) tripod. It uses either a 200- or 250-round

belt. The belt feeds from a box placed to the right of the weapon.

The PKT is the tank-mounted version of the PK. Late-model Soviet tanks, turreted APCs and ICVs, and amphibious scout cars mount it as a coaxial machine gun. It has a longer and heavier barrel than the PK. It also lacks the PK's stock, sights, bipod, and trigger mechanism. The PKT has a solenoid at the rear for remote-controlled firing, although it also has an emergency manual trigger.

The PKB is a variant of the PKT. It is intended for use as a pintle-mounted gun on APCs and SP guns. It differs from the PKT by having a butterfly trigger rather than a solenoid trigger and by having double space grips and front and rear sights. There may also be a PKMB, derived from the PKM rather than from the PK.

7.62-mm General-Purpose Machine Guns, PK Series (continued) _____

The PKM is an improved, lighter version (8.4 kilograms) of the PK, using stamped metal components instead of machined metal. Joinable 25-round sections of nondisintegrating metallic belts feed the bipod-mounted PKM. An assault magazine attached to the rails under the receiver can carry 100 cartridges belted in this way. Either 200- or 250-round belt boxes can also feed the PKM.

The tripod-mounted PKMS is a lightweight version of the PKS. It has the same characteristics as the PKM. from which it is derived.

CAPABILITIES:

The effective range of the PK-series machine guns is 1,000 meters. They have a cyclic rate of fire of 650 rounds per minute and a practical rate of fire of 250 rounds per minute. Ammunition types include the following: ball, ball-tracer, armor-piercing incendiary, armor-piercing incendiary-tracer, and incendiary-ranging.

The PKM is currently organic to the machine gun platoon of a BMP-equipped MRC and to the machine gun/antitank platoon of a BTR-equipped MRC. It normally fires from its bipod mount but can also fit in vehicle firing ports.

The PKS and PKMS are also infantry weapons. Used as heavy machine guns, they provide long-range urea fire. Their tripod provides a stable mount for long-range ground fire. The tripod opens quickly to elevate the gun for antiaircraft fire. The

machine gun has an effective range of 600 meters against slow-moving aircraft.

The PKT serves as a coaxial machine gun on most modern Soviet tanks, ICVs, and APCs. The PKB (PKBM) serves as a pintle-mounted gun on older armored vehicles such as the BRDM, BTR-50, and BTR-60.

LIMITATIONS:

The nondisintegrating belt can get in the way if the gunner must move the weapon during firing. Barrel changing is not as fast and effective as in the more recent Western machine guns. Although designed by Kalashnikov, the weapon's moving parts are not interchangeable with those of AK-series weapons.

REMARKS:

The Soviets introduced the basic PK machine gun in 1964. They followed it with the PKS, PKT, PKB (1968), PKM (1971), and PKMS. Compared to the US M-60, the PK-series machine guns are easier to handle during firing, easier to care for, and lighter. They use a more powerful cartridge and have a slightly shorter effective range (1,000 meters versus 1,100 meters for the M-60). The PK and PKM once served as squad machine guns in BMP-equipped motorized rifle squads, but now the 5.45-mm light machine gun RPK-74 has that function. The vehicle-mounted PKT continues to be standard equipment on many armored fighting vehicles.

12.7-mm Heavy Machine Gun DShK 38/46

DShK 38/46**DESCRIPTION:**

The DShK is one of the standard heavy machine guns of the Soviet Army. It is a gas-operated, belt-fed, air-cooled weapon which fires from the open-bolt position. The model 38/46 has a shuttle feed housed in a flat, rectangular cover. It has reversible feed; that is, the ammunition belt can feed from either the left or the right side with minor adjustment. It also has a quick-change barrel.

CAPABILITIES:

The Soviets use the DShK extensively as an antipersonnel and antiaircraft armament on

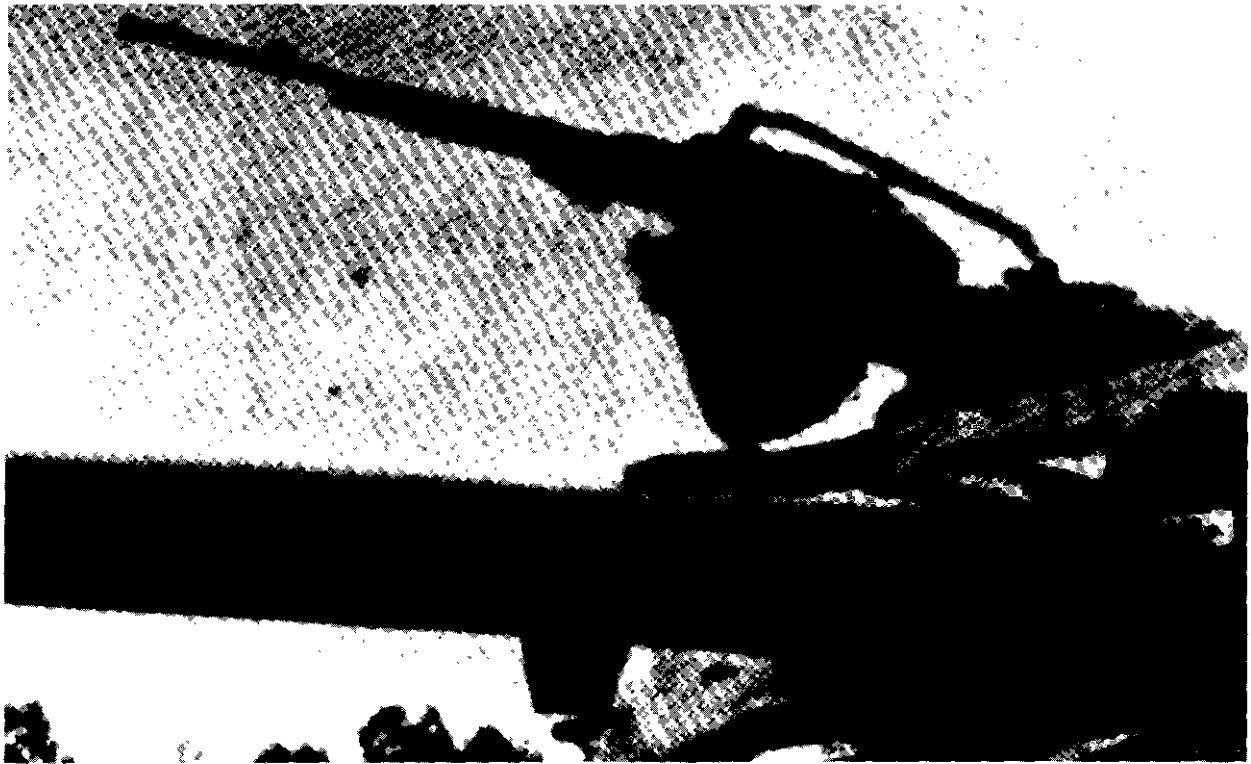
medium tanks and armored personnel carriers. It is capable of full automatic fire only.

REMARKS:

The Soviets adopted the original DShK (model 38 or M1938) in 1938 as a ground-mounted, dual-purpose antiaircraft and antitank gun. Largely superseded by the 14.5-mm ZPU-series weapons in the antiaircraft role, the ground-mounted version has become obsolete. In 1946, the Soviets adopted the improved version (model 38/46 or M1938/46, also known as DShKM) with a modified feed mechanism and a quick-change barrel. It is still in use as a vehicle-mounted armament. When used as a tank machine gun, it is known as the DShKT.

12.7-mm Heavy Machine Gun NSV

NSVT on T-64B



Krasnaya Zvezda

DESCRIPTION:

The NSV is a gas-operated, belt-fed, air-cooled automatic weapon with a horizontal sliding wedge breechblock and a quick-change barrel. It has a long, smooth, unfinned barrel with a conical flash suppressor. It features a rectangular stamped-and-ribbed receiver. Ammunition loaded in nondisintegrating belts feeds into the weapon from a 50-round-capacity metal container.

A tripod-mounted version of the NSV is available for infantry use in a ground role. However, the NSV appears more commonly mounted on the turrets of T-64, T-72, and T-80 tanks as an anti-aircraft machine gun. On the T-72 and apparently also on the T-80, it has a rotating mount; there is no provision for firing it from within the tank. The tank commander employs the K10-T reflex sight to engage aircraft. On the T-72/T-80 mount, he engages ground targets with the metallic sights (tangent leaf rear and folding front post) on the gun itself.

The T-64 tank mounts a modified version with a fixed mount on the commander's cupola. It fires

by means of an electrical solenoid when the tank is buttoned up. An optic serves this purpose. Instead of the normal 50-round ammunition belt container, the NSV on the T-64 may use a larger belt container, which probably holds 200 rounds.

CAPABILITIES:

On a vehicular mount, the NSV can engage both aerial and ground targets. The weapon fires from an open-bolt position. It fires the same 12.7 x 108-mm cartridges as the older DShK model 38/46. Although the NSV is approximately 11 kilograms lighter than the DShK, the ruggedness of the gas regulator and cylinder suggest that barrel vibrations would be dampened, resulting in accuracy comparable to that of the DShK. The firing mechanism does not provide for semi-automatic fire. The weapon has a 360-degree traverse and an elevation capability of -5 to +75 degrees. It has an estimated barrel life of 5,000 rounds, and its barrel change time is approximately 5 seconds.

12.7-mm Heavy Machine Gun NSV (continued)

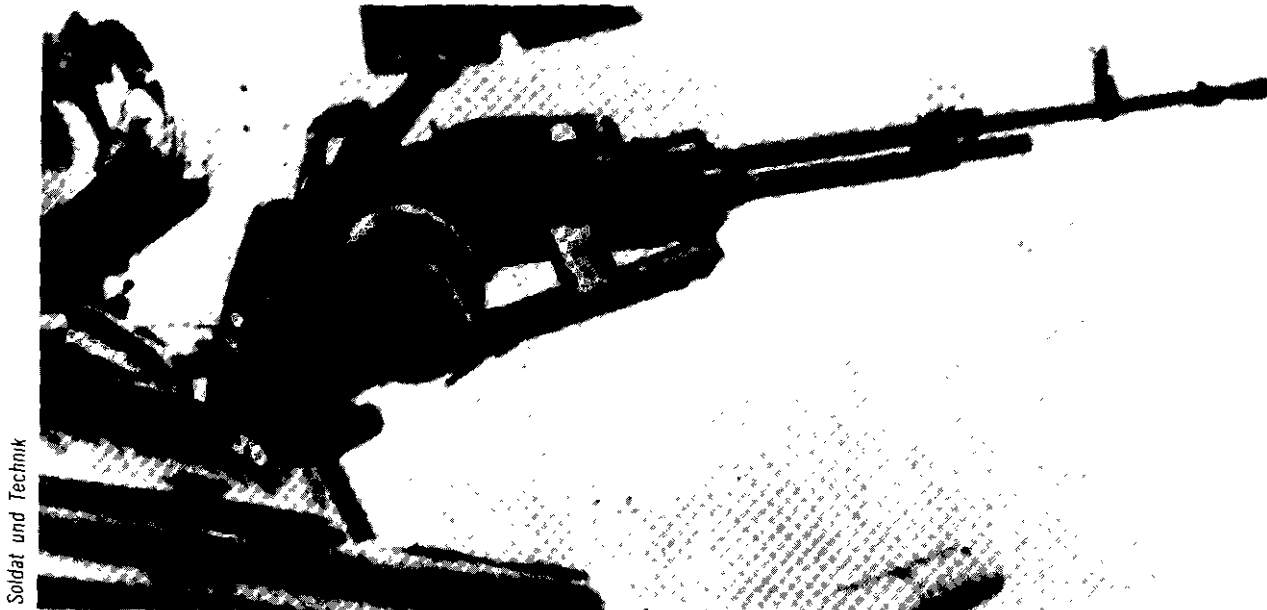
LIMITATIONS:

Although ammunition can feed from either side, the manufacturer determines direction of feed; soldiers cannot easily change it in the field. Evidence indicates that NSV mounts on the T-72 and T-80 permit only left-hand feed, and that the NSV mount on the T-64 provides for right-hand feed only. The left-hand-operated trigger mechanism on the vehicular mounts is awkward, but training can overcome this awkwardness. Due to

the configuration of the tripod, the ground-mounted NSV has only a limited anti-aircraft capability.

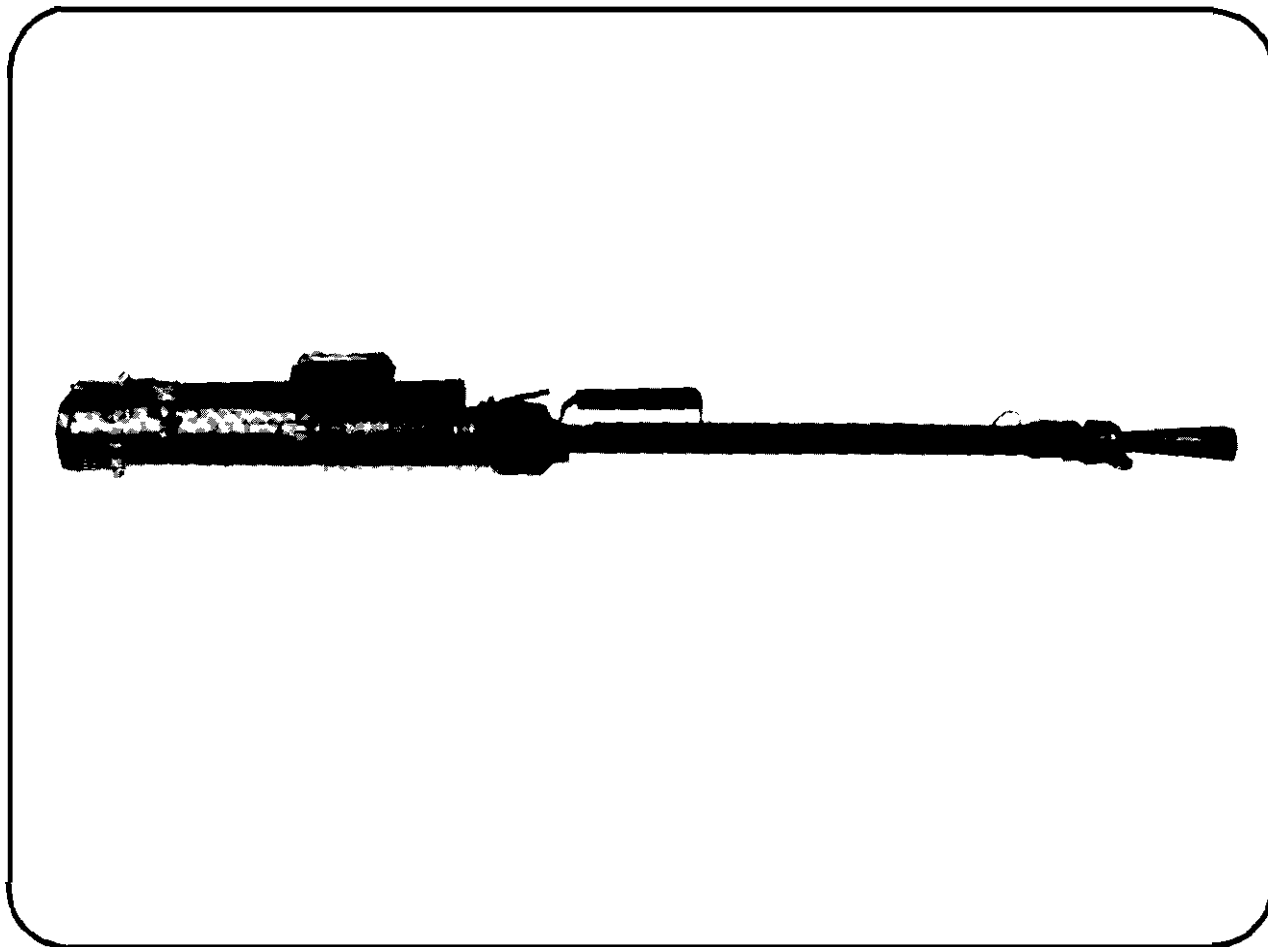
REMARKS:

The NSV was first observed in 1976 but was probably introduced in the early 1970s. The designation incorporates the initials of its designers (Nikitin, Sokolov, and Volkov).

NSV on T-72

Soldat und Technik

KPV



DESCRIPTION:

The Soviets use the 14.5-mm heavy machine gun Vlainirou (KPV) in both ground and antiaircraft roles. In its antiaircraft role, the KPV is the basic machine gun mounted on the ZPU series of antiaircraft gun mounts. It also serves as the main turret armament of the BRDMS amphibious scout car and the BTR-60PB, BTR-70, and BTR-80 APCs. In this armored vehicle role, the weapon is known as KPVT.

CAPABILITIES:

The KPV is a recoil-operated, fully automatic weapon which fires from the open-bolt position.

Metallic nondisintegrating link belts, coupled together in 10-round sections, can feed it either from the left or the right of the receiver. The quick-change barrel is removable with the barrel jacket as a unit. The bore is chromium-plated to increase barrel life. The weapon fires the Soviet 14.5 x 114-mm cartridge.

The gun is simple in design and rugged in construction. It is considered to be reliable.

REMARKS:

The Soviets first produced the KPV in 1953.

ARMORED FIGHTING VEHICLES

Light Armored Vehicles (Wheeled)

Light Armored Vehicles (Wheeled) Characteristics

VEHICLE CHARACTERISTICS	BRDM-2	BTR-60PB	BTR-70	BTR-80
CREW	2 to 4 or 5 (varies w/mission)+ up to 4 (varies w/mission)	3 (cdr, driver, gunner) + 8 passengers	3 (cdr, driver, gunner) × 8 passengers	3 (cdr, driver gunner) + 8 passengers
WEIGHT (mt)	7.0	10.2	11.5	11.0
LENGTH				
Gun forward (m)	5.70	7.22	7.535	7.535
Without gun (m)	5.70	7.22	7.535	7.535
WIDTH, overall (m)	2.35	2.82	2.800	2.800
HEIGHT, overall (m)	2.31	2.31	2.235	2.235
ENGINE	V-8 140-hp, gasoline	2x6-cyl 90-hp, gasoline	2x8-cyl 120-hp, gasoline	V-8, 260-hp diesel (turbocharged)
SPEED				
Road (km/hr)	100	80	80	80-85
Water (km/hr)	10	10	10	10
FUEL CAPACITY (liters)	290	290	290	290
ROAD RANGE (km)	750	500	500	500
TRENCH CROSSING (m)	1.25~1.60	2.00	2.00	2.00
VERTICAL STEP (m)	0.40	0.40	0.40	0.40
GRADABILITY (C)	30	30	30	30
FORDING (m)	amphibious	amphibious	amphibious	amphibious
ARMOR (maximum)				
Hull (mm)	14	9	10	25
Turret (mm)	7	7	7	7
INFRARED				
Driver	yes	yes	yes	yes
Gunner	no	no	no	no
Commander	yes	yes	yes	yes
NBC PROTECTION	filtration and over- pressure system	filtration and over- pressure system	filtration and over- pressure system	filtration and over- pressure system
DO1	1966	1961 (BTR-60P)	mid-1970s	1984
STATUS	standard	standard	standard	standard

Light armored vehicle (wheeled) armament characteristics

MAIN ARMAMENT CHARACTERISTICS	BRDM-2	BTR-60PB	BTR-70	BTR-80
CALIBER (mm)	145	145	145	145
NUMBER	1	1	1	1
TYPE	turret mounted machine gun	turret mounted machine gun	turret mounted machine gun	turret mounted machine gun
MODEL	KPVT"	KPVT*	KPVT*	KPVT*
TRANSVERSE (c)	360	360	360	360
ELEVATION (c)	-5 to +30	-5 to +30	-5 to +30**	-5 to +60
STABILIZATION	no	no	no	no
FIRE CONTROL	telescopic sight	telescopic sight	telescopic sight	telescopic sight
BASIC LOAD (rd)	500	500	500	500
SECONDARY ARMAMENT CHARACTERISTICS	BRDM-2	BTR-60PB	BTR-70	BTR-80
CALIBER (mm)	7.62	7.62	7.62	7.62
NUMBER	1	1	1	1
TYPE	coaxial machine gun	coaxial machine gun	coaxial machine gun	coaxial machine gun
MODEL	PKT	PKT*	PKT*	PKT*
BASIC LOAD (rd)	2,000	2,000	2,000	2,000

FOOTNOTES. * See Characteristics of DShK 38/46, KPVT, and PKT on page 5-12

** Elevation is -5 to +60 on variants with high-angle-of-fire turret.

Amphibious Scout Car BRDM-2

BRDM-2**DESCRIPTION:**

Like the earlier BRDM, the BRDM-2 is a fully armored, four-wheel-drive, amphibious reconnaissance vehicle. It has two pairs of belly wheels and a centralized tire pressure regulation system for increased cross-country capability. It also has a single waterjet for propulsion through water. Externally, it differs from the BRDM due to its larger, box-like hull. It retains the boat-like bow of the BRDM. However, the crew compartment is now farther forward and the engine is in the rear. In the basic model, a small conical turret is mounted on the hull in a central position above the belly wheels. There are two front cupolas. Both sides have centrally placed vision blocks. The engine is larger than the BRDM's (it is a 140-hp V-8 instead of a 90-hp 6-cylinder). The BRDM-2 has an IR spotlight and IR driving lights, as well as an NBC filter system.

CAPABILITIES:

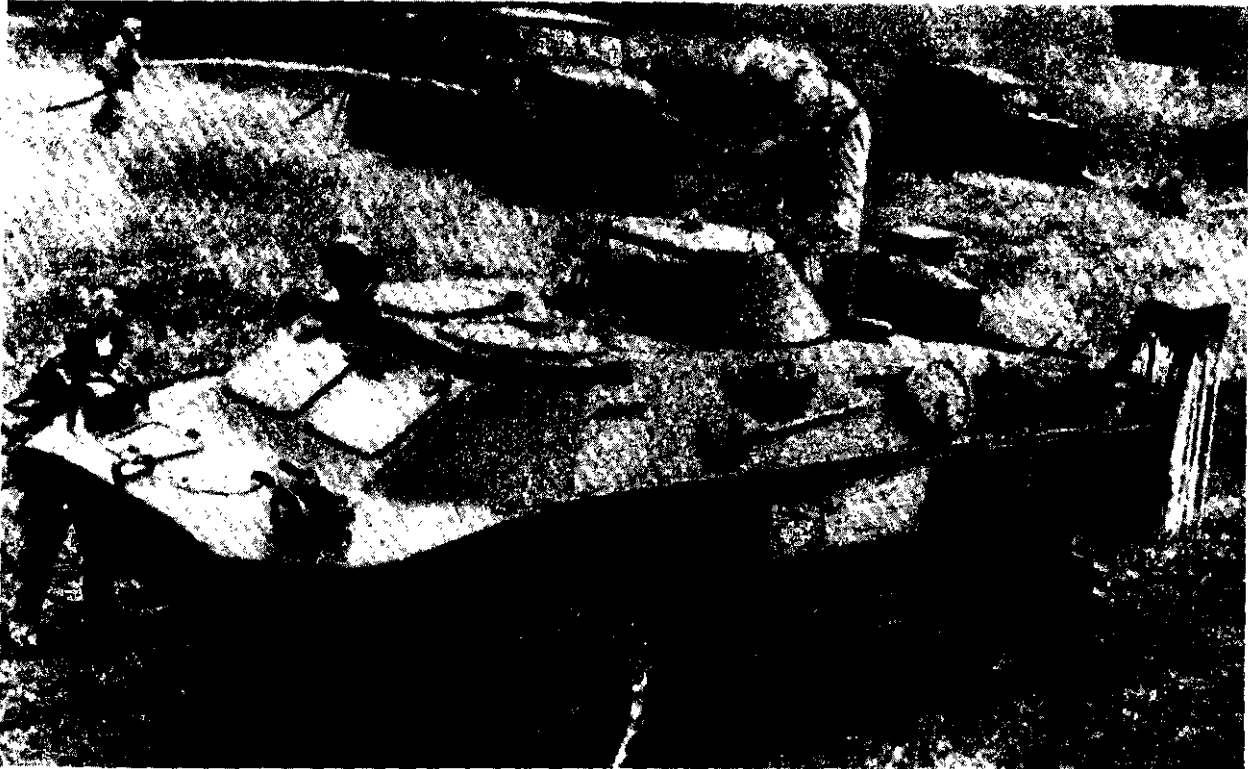
Like the BRDM, the BRDM-2 exists in several versions. The first four of these have the same roles as their BRDM counterparts.

The basic BRDM-2 reconnaissance vehicle is distinguished by its turret, which is the same as that mounted on the BTR-60PB. The conical turret, which mounts two machine guns (14.5-mm and 7.62-mm), is unusual in that it has no top hatch opening. This model carries a crew of four: the commander, the gunner, the driver, and the co-driver. It also has a land navigation system that gives coordinate readings.

The BRDM-2rkh radiological-chemical reconnaissance vehicle has dispensers for emplacing warning flags around contaminated areas. Its primary armament is the 7.62-mm PKT instead of the 14.5-mm KPVT. The regimental chemical defense platoon and the division-level chemical defense company use it, as does the divisional reconnaissance battalion. The Soviet open press has designated it the BRDM-2rkhb; this stands for radiological-chemical-biological reconnaissance.

The BRDM-2U command vehicle has no turret; however, it carries a generator and extra radios.

BRDM-2rkh



The increased number of antennas marks this version as a c2 vehicle. Battalion and regimental headquarters of maneuver and reconnaissance units employ it; artillery units also use it extensively.

The ATGM launcher vehicle (BRDM-2) can mount the AT-2/SWATTER, AT-3/SAGGER, or AT-5/SPANDREL. The AT-5 launcher can also fire the AT-4/SPIGOT missile. The ATGM launcher replaces the turret. This model is found in regimental and divisional antitank units of MRDs, the antitank regiments of combined arms armies (CAA), and in the antitank regiment or brigade in the artillery division of a front.

The SA-9/GASKIN TEL uses a variant of the BRDM-2 chassis. The SAM launching system with quadruple canisters replaces the machine gun turret on top of the vehicle; it is capable of 360 degrees traverse and limited elevation. This version probably has four crewmen.

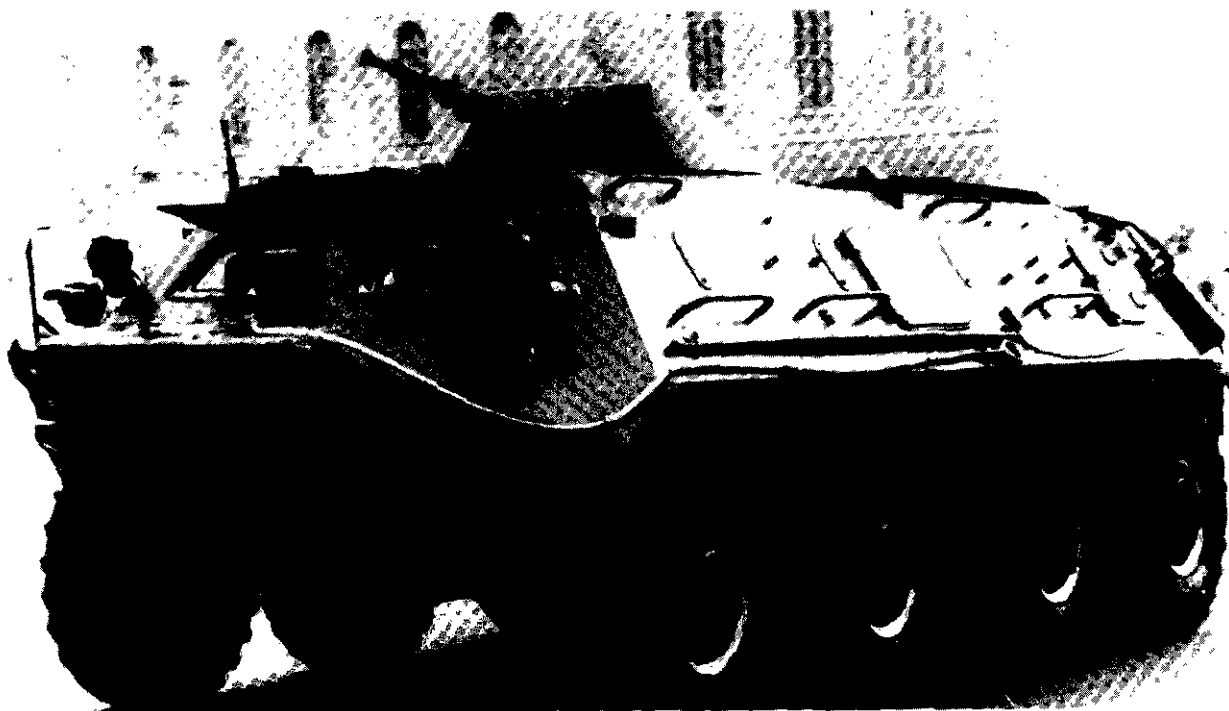
LIMITATIONS:

Artillery fragments and a .M-caliber machine gun fire can penetrate BRDM-2 series vehicles with maximum armor of 14 millimeters. The BRDM-2-series tires are not protected by armor. They are particularly vulnerable to puncture from fire of all kinds.

REMARKS:

The original BRDM (also known as the BTR-40P) first appeared in 1959. The BRDM-2 (also known as the BTR-40PB) was first seen in 1966. It has generally replaced the BRDM in the Soviet and Warsaw Pact armies. The BRDM-2 is sometimes confused with the Hunearian FUG (OT-65) amphibious scout car and the FUG-70 APC, which have rear engines but also have twin waterjets. The BTR-60PB is replacing the BRDM-2 in divisional reconnaissance battalions.

Amphibious Armored Personnel Carrier BTR-60PB

BTR-60PB***DESCRIPTION:***

The BTR-60PB is an eight-wheel-drive vehicle with evenly spaced wheels, except for a slightly larger space between the second and third wheels. It has a long, boat-like hull with well-sloped armor on the sides and overhead armor cover. Its small conical turret is identical to that of the BRDM-2. The turret sits over the second set of wheels and mounts coaxial 14.5-mm and 7.62-mm machine guns. The BTR-60PB has a three-man crew: the commander, the driver, and the gunner. There are two semicircular hatches for the crew in front of the turret. The vehicle also has two rectangular hatches behind the turret for mount and dismount of up to eight passengers. There are three firing ports in each side of the troop compartment. The rear-mounted power plant employs two 6-cylinder, 90-hp engines. A single waterjet propels the vehicle through water. The tires are partially filled with a foam-rubber-like substance. They have the centralized pressure regulation system common to Soviet wheeled APCs.

The BTR-60PU armored command vehicle has no turret; however, it does have additional communication equipment. It is easily recognizable by the bent, dipole antenna that runs nearly all around the top of the vehicle. The BTR-60PU normally does not have integral armament. There are numerous other command variants, with and without turrets. They differ according to role and command level.

CAPABILITIES:

The BTR-60PB is the standard APC in some motorized rifle units. It is widely used by Soviet naval infantry. It has begun to replace BRDM-2s in some divisional reconnaissance battalions. The vehicle performs well cross-country in conditions that favor wheels. In the water, the vehicle is steered by a rudder in the waterjet port and by the two front sets of wheels, which also have power steering. The boat-shaped hull with sloped

sides provides good swimming capability and helps deflect hostile fire. The BTR-60PB has a searchlight and IR equipment. These give it a night fighting capability; however, the gunner's periscope is a day sight only.

LIMITATIONS:

The BTR-60PB's armor is thicker than that of older model APCs. However, it is still vulnerable to Frag-HEs as well as to small arms fire. Its tires are extremely vulnerable to puncture. Soft ancillary equipment (antennas and integral fuel tanks) are vulnerable to destruction by field artillery weapons. Troops must mount and dismount through the top hatches; this exposes them to fire.

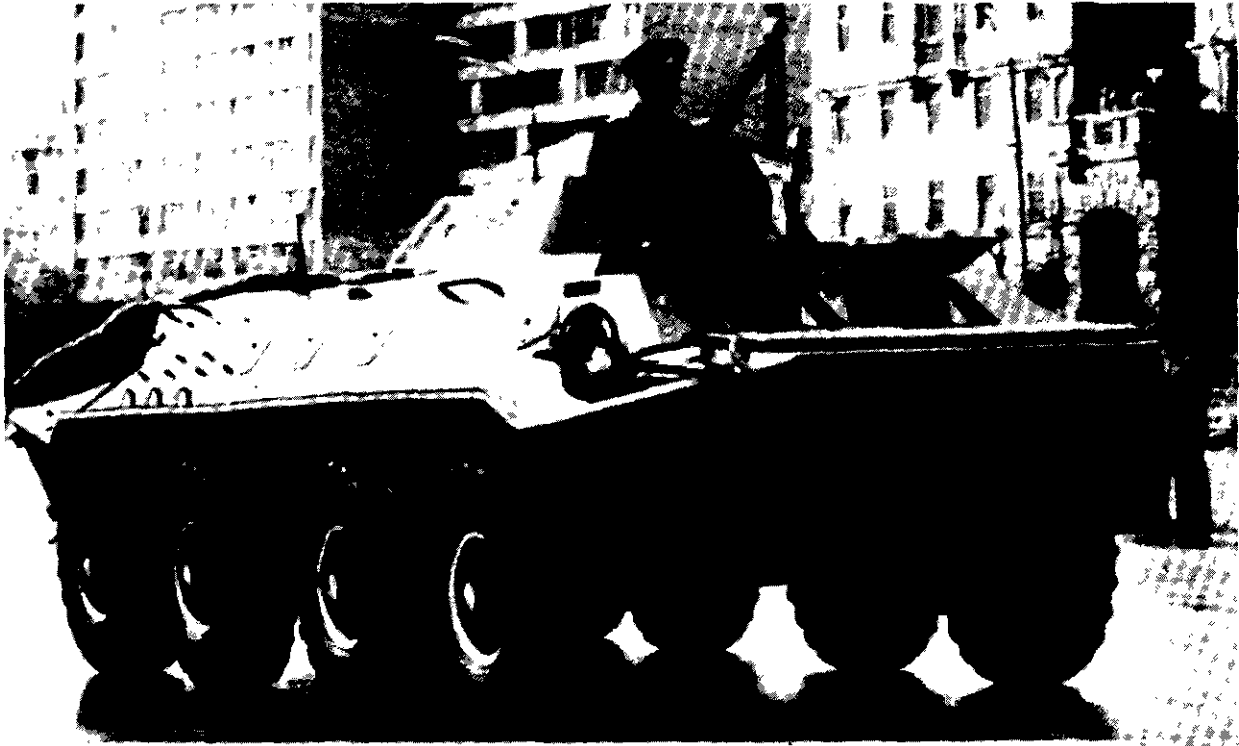
REMARKS:

The BTR-60PB first appeared in 1965 as the third modification in the BTR-60P series of APCs. It was preceded in 1961 by the open-topped BTR-60P and in 1964 by the BTR-60PA (also known as BTR-60PK). The latter added overhead armor cover but lacked the turret of the

BTR-60PB. The BTR-60PU command vehicle, with additional radios, is a later modification. The Forward Air Control Vehicle, another modified BTR-60PB, has a large window replacing the coaxial machine guns in the turret and a large portable generator mounted on the rear deck. All versions in the series are still in service, although the BTR-60P and -60PK models seldom appear today in first-line units. The Soviets have exported the vehicle to many countries, including North Korea and most of the Warsaw Pact. There are also Polish, Romanian, and Czech versions of this vehicle. Since 1978, the BTR-70 has begun to replace the BTR-60PB.

The artillery command and reconnaissance vehicle (ACRV) M1979(2) is another BTR-60 variant. It serves as a command observation post (COP) vehicle in towed artillery batteries and battalions. The same organizations have two other types of ACRV: the M1979(1), mounted on a GAZ-66 box-body van (BBV), serves as a battery fire direction center (FDC); the M1979(3), mounted on a ZIL-131 BBV, serves as a battalion FDC.

Amphibious Armored Personnel Carrier BTR-70

BTR-70**DESCRIPTION:**

The BTR-70 is a successor vehicle to the BTR-60PB. Both vehicles have the same turret armament. The BTR-70 is slightly longer in the hull. It also has a recognizable gap between its front set of road wheels and the rear set. Triangular-shaped access doors are in this lower hull space on both sides of the vehicle. They provide side entrance and exit for troops. (The BTR-GOPB has only top hatches.) Also, the wave deflector attaches differently on the BTR-70 than on the BTR-60PB. The BTR-70 has two upgraded, 6-cylinder, 120-hp gasoline engines.

CAPABILITIES/LIMITATIONS:

Like the BTR-60PB, the BTR-70 has good cross-country capability, high road speed, and large troop-carrying capacity. The redesigned seating arrangement allows the troops to sit back-to-back, facing outward. The vehicle's versatility and amphibious capability are also advantages. Its primary disadvantage is its relatively light armor protection, although the bow section reportedly may incorporate special layered armor.

Modified BTR-70 M1986/1

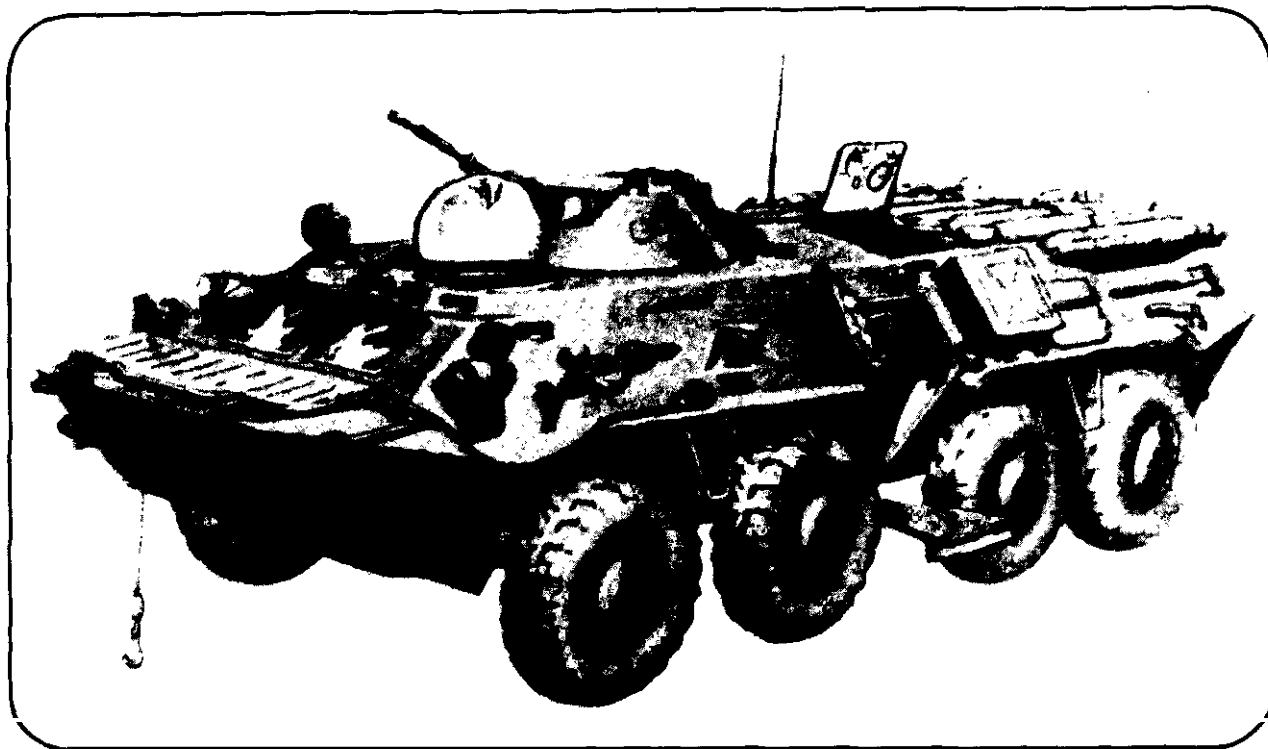


REMARKS:

The BTR-70 was first seen in 1978; thus, it received the preliminary designation BTR M1987. A BTR-70 variant (M1986/1) appeared in the October 1986 Moscow parade. This vehicle mounted the following equipment: the modified high-angle-of-fire turret used on the BTR-80; a

modified wave deflector, rear bumpers, and headlight brush guards; rooftop firing ports (this included two on each side, mounted in chamfered edges of the hull roof); and brackets which the Soviets may possibly use to attach additional armor to the sides of the vehicle.

Amphibious Armored Personnel Carrier BTR-80

BTR-80**DESCRIPTION:**

The Soviets based the BTR-80 on the BTR-70 APC. It has a 260-hp, V-8, turbocharged, water-cooled, diesel engine. The reconfigured rear portion of the hull accommodates a new, single engine. The Soviets removed the roof chamfers of the modified BTR-70, raised the rear, and squared off the rearward-sloping engine compartment.

CAPABILITIES:

The Soviets modified the truncated cone turret used on the BTR-70 for the BTR-80 by redesigning the mantlet. This allows the 14.5-mm and coaxial 7.62-mm machine guns to be elevated to a maximum of 60 degrees. This high angle of fire is useful in engaging targets on steep mountainsides, such as those in Afghanistan. It may also give the BTR-80 increased air defense capability. The Soviets have also modified the design and positioning of the firing ports; the ports are now round, rather than tear-shaped, and have ball mounts similar to those used on the BMP. The forward firing ports now sit in angled recesses which allow the individual weapons to fire to the front of the vehicle.

The redesigned side doors are split horizontally. The upper portion opens forward; this gives dismounting troops some protection against small arms fire from the front of the vehicle. The lower portion opens down, forming a step. Six smoke grenade projectors are mounted on the rear of the turret. Armor protection, particularly in the frontal 60-degree arc, has probably increased.

LIMITATIONS:

The side firing ports are angled forward. This design prevents mounted infantrymen from engaging targets directly to the sides and rear of the vehicle with small arms fire.

REMARKS:

In 1984, the Soviets began production of a diesel variant of the BTR-70, which they called the BTR-80. The Soviets have retrofitted some BTR-70s with several of the improvements incorporated into the BTR-80, including the high-angle-of-fire turret.

Light Armored Vehicles (Tracked)

Light armored vehicle (tracked) characteristics

CHARACTERISTICS	BTR-50	BMP-1	BMP-2	BMD-1	MT-LB	ACRV 1V12
CREW	2 (cdr, driver)	3 (cdr, driver, gunner)	3 (cdr, driver, gunner)	3 (cdr, driver, gunner)	2 (driver, gunner)	5
CAPACITY	20	8	7	4	up to 10 (warps with mission)	INA
WEIGHT	14.2	13.5	14.3	7.5	9.7	11
GROUND CLEARANCE	0.51	0.57	0.64	0.57	0.46/0.28*	INA
HEIGHT (m)	NA	6.74	6.86	5.41	6.45	NA
WIDTH (m)	7.32	6.74	6.86	5.41	6.45	7.06
DEPTH (m)	3.14	2.94	3.13	2.55	2.85	2.81
WHEEL GROUND CLEARANCE (m)	1.85	2.15	2.08 (to top of turret)	1.77	1.87	2.43
WEIGHT (mm)	330	400	460	100-450	395-415	395-415
ENGINE (num)	6-cyl, 240-hp, diesel	V-6, 290-hp, diesel	V-6, 290-hp, diesel, UDT-20	V-6, 240-hp, diesel	V-8, 290-hp, diesel	V-8, 290-hp, diesel
MAX SPEED (km/h)	45	65	65	80	60	60
RANGE (km)	10	6	7	10	6	6
FUEL CAPACITY (liters)	480	460	460	300	450	450
MAX RANGE (km)	240	500	600	320	500	500
CRUISE SPEED (km/h)	2.80	2.00	2.50	1.60	2.70	2.70
MAX SPEED (km/h)	1.10	0.80	0.77	0.80	0.70	0.70
WATER CROSSING (m)	38	30	30	32	35	35
WATER CROSSING (m)	amphibious	amphibious	amphibious	amphibious	amphibious	amphibious
WATER CROSSING (m)	10	19	19	15	7	15
WATER CROSSING (m)	NA	23	23	23	7	20
WATER CROSSING (m)	yes	yes	yes, passive IR	yes	yes	yes
WATER CROSSING (m)	NA	yes	yes, BPK-1-42, day/night II	no	no	no
WATER CROSSING (m)	yes	yes	yes, IP3-3 day only	yes	no	no
PROTECTION	PK and PU models have limited radiological protection	filtration and overpressure system	filtration and overpressure system	filtration and overpressure system	filtration and overpressure system	filtration and overpressure system
PROTECTION	1954	1967	1980	About 1970	1970	1974
PROTECTION	obsolescent	standard	standard	standard	standard	standard

Light armored vehicle (tracked) armament characteristics

		BTR-50	BMP-1	BMP-2	BMD-1	MT-LB	ACRV 1V12
MAIN ARMAMENT CHARACTERISTICS	CALIBER (mm)	127 (145)	73	30	13	762	127 (1V13A 1V16)
	NUMBER	1	1	1	1	1	1
	TYPE	open-mounted heavy MG DShK (KPV)	smoothbore 2A28	automatic gun 2A42	smoothbore 2A28	corret-mounted MG PKT	current-mounted AAMG DShk
	TRAVERSE (c)	90	360	360	360	360	INA
	ELEVATION (c)	-10 to +80	-4 to +33	-5 to +74	-4 to +33	up to +30	INA
	RATE OF FIRE (rd/min) Maximum/Sustained	540-600/80-100 (600/150)	8/23	550/200-300 (high/low cyclic)	8/23	650/250	540/600/1801
	STABILIZATION	no	no	dual plane	no	no	no
	FIRE CONTROL	reflex sight (optical sight)	image intensifying, 1PN22M1	image intensifying, BPK-1-42	image intensifying, 1PN22M1	optical sight PP-61	API, API-T
	AMMUNITION (Type)	API, API-T (AP), API-T, III	HEAT FS, Frag-HE(FS)	AP-T, Frag HEI	HEAT FS, Frag-HE(FS)	Ball, ball tracer, API	API, API-T
	MUZZLE VELOCITY (m/sec)	840 (1,000)	NA	900	NA	855	840
	HEAT FS	NA	700	NA	700	NA	NA
	FRAG HEI FS	NA	700	900	700	NA	NA
	MAXIMUM RANGE (m)	7,000 (7,000)	2,200	INA	2,200	4,000	7,000
EFFECTIVE RANGE 50% Ph (m)	1,000 (1,400) AA/ 1,500 (2,000) ground	800-1,000	3,000 AA/ 2,000-4,000 ground*	800-1,000	1,000	1,000 AA/ 1,500 ground	
ARMOR PENETRATION (mm @ 0° obliquity @ 500/1,000 m)	20/13 2 (30/20)	300 (HEAT-FS, any range)	55/50	300 (HEAT-FS any range)	8 (500 m)	201132	
BASIC LOAD (rd)	750 (500)	40	500	40	2,000	INA	
SECONDARY ARMAMENT CHARACTERISTICS	MODEL	NA	PKT***	PKT***	PKT***	NA	NA
	CALIBER (mm)	NA	7.62	7.62	162	NA	NA
	NUMBER/TYPE	NA	1/coaxial	1/coaxial	1/coaxial MG, 2/bow MG	NA	NA
BASIC LOAD (rd)	NA	2,000	2,000	2,000/3,000 (total)	NA	NA	
AUXILIARY ARMAMENT CHARACTERISTICS	TYPE	NA	AT3/SAGGER or AT-4/SPIGOT or AT-5/SPANDREL***	ATGM	ATGM	NA	NA
	YOYEL	NA	AT3/SAGGER or AT-4/SPIGOT or AT-5/SPANDREL***	AT-4/SPIGOT or AT-5/SPANDREL****	AT-3/SAGGER or AT-4/SPIGOT or AT-5/SPANDREL****	NA	NA
	LAUNCH RAILS/TUBES	NA	1	1	1	NA	NA
	BASIC LOAD (rd)	1	4	4	3	NA	NA

FOOTNOTES *Gun at 5
 **1,000 meters direct fire at 2-m high target.
 ***See MT-LB main armament and page 5 - 1 2

Amphibious Armored Personnel Carrier BTR-SOP

BTR-50PK*BTR-50PU* command vehicle**DESCRIPTION:**

The Soviets developed their first amphibious APC, the BTR-SOP, using the basic PT-76 light tank chassis and hull and then adding an armored superstructure in place of a turret. Since its introduction, the BTR-SOP has spawned a series of variants. The BTR-50PA added a 14.5-mm KPV heavy machine gun mounted on the roof of the commander's cupola. The BTR-50PK added overhead armor and limited radiological protection.

The BTR-50PU command variant has the following features: an armored roof; two projecting bays normally on the front of the vehicle; a generator mounted on the rear deck (not on all models); and extra antennas. It normally does not have

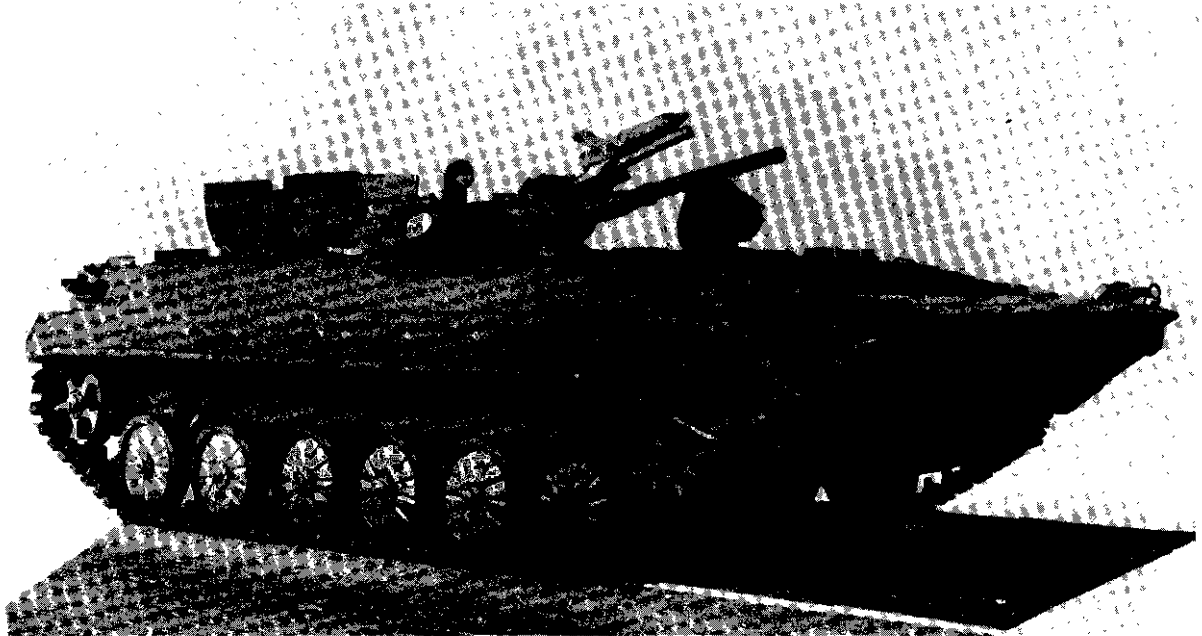
integral armament. The vehicle characteristics are essentially the same as those of the BTR-50P.

The MTK mineclearing vehicle is a modified BTR-50PK with the UR-67 explosive line charge. Another variant, designated MTP, serves as an amphibious armored maintenance support vehicle. (see p. 5-208.)

REMARKS:

The BTR-50P was introduced in 1954. It is no longer in production. Newer BTRs and BMPs have largely replaced it in the Soviet Army.

BMP-1



DESCRIPTION:

The BMP is a fully armored AICV. Its low-silhouetted hull has a sharp, sloping front with a conspicuously ridged surface. A centrally located, extremely flat, truncated cone turret mounts a 73-mm smoothbore gun and a 7.62-mm coaxial machine gun. A launching rail for SAGGER missiles attaches above the gun. The 290-hp, water-cooled, 6-cylinder diesel engine is in the right front of the hull. The driver's hatch is at the left front, directly in front of the commander's hatch, which mounts an IR searchlight. The gunner's hatch is on the left side of the low turret roof. To the rear of the turret are four large hatches in the roof of the troop compartment; two large exit doors are also in the rear. There are four firing ports in each side of the troop compartment and one in the left rear door. The suspension has six unevenly spaced road wheels of the PT-76 type, with three track support rollers and a front drive sprocket.

CAPABILITIES:

A combination of effective antitank firepower, high mobility, and adequate protection makes the BMP a formidable addition to the inventory of Soviet motorized rifle units. Its 73-mm main gun fires a rocket-assisted, fin-stabilized HEAT projectile with an effective range of 800 to 1,000 meters. It also has an automatic loader. For longer range antitank capability, the BMP can carry any of three ATGMs: the AT-3/SAGGER, effective to 3,000 meters; the AT-4/SPIGOT, effective to 2,000 meters; or the AT-5/SPANDREL, effective to 4,000 meters.

The BMP is amphibious, propelled through water by its tracks rather than by the waterjet propulsion of the PT-76. It has the range and speed necessary to keep up with the fast-moving tanks it normally follows in offensive formations.

Amphibious Infantry Combat Vehicle BMP (continued)

The BMP has a three-man crew. This includes the vehicle commander, who becomes the squad leader when the infantry passengers dismount through the rear exit doors. Vision blocks and firing ports in the sides and rear of the troop compartment allow the infantrymen to fire assault rifles (AKM or AK-74) and light machine guns (PKM or RPK-74) from inside the vehicle on the move. The troops also carry the RPG-7V antitank grenade launcher, which can be fired by a passenger standing in a rear hatch. BMP ICVs carry the SA-7/14/16 and AGS-17 weapon systems in the BMP-equipped MRB's air defense and automatic grenade launcher platoons. When buttoned up, crew and passengers have NBC protection in the pressurized and filtered hull. This allows them to operate regardless of the outside environment.

The BMP has an infrared searchlight, periscopes, and sights for night operations. It also has a capability to make its own smoke screen by injecting diesel fuel into the exhaust manifold.

LIMITATIONS:

The BMP has relatively thin armor, with a maximum thickness of 19 millimeters in the hull and 23 millimeters in the turret. This provides protection against .50-caliber armor-piercing rounds only over the 60-degree frontal arc. The vehicle is extremely vulnerable to ATGM and tank fire. Its compactness dictates the location of critical areas in such a manner that penetration anywhere on the vehicle will normally result in a mobility, firepower, or personnel kill. These critical areas include the engine compartment and ammunition storage area, on the right side; fuel cells in the rear doors; and the troop compartment.

Because of its limited capability to depress the main gun, the BMP cannot engage tanks and APCs from good hull-down positions. It is thus very vulnerable to enemy fire when it exposes itself to engage targets. Although the turret can traverse 360 degrees, the main gun and coaxial machine gun must be elevated to clear the IR searchlight on the commander's cupola. This creates a dead space for both weapons between 10:00 and 11:00 o'clock.

The BMP can maintain its top speed of 65 kilometers per hour for only short periods of time. This results from the high amount of vibration and the possibility of transmission failure. Due to the complicated loading mechanism and the lack

of stabilization, the 73-mm gun or the coaxial machine gun cannot fire accurately on the move over rough terrain. The BMP must be stationary when firing and tracking an ATGM. The SAGGER is difficult to reload; it cannot be reloaded at all under NBC conditions without breaking the integrity of the vehicle's protective overpressure system. To reload the SPIGOT and SPANDREL, the gunner must open his hatch; this, again, negates the overpressure system and exposes him to fire. The land navigation system must be zeroed every 30 minutes.

REMARKS:

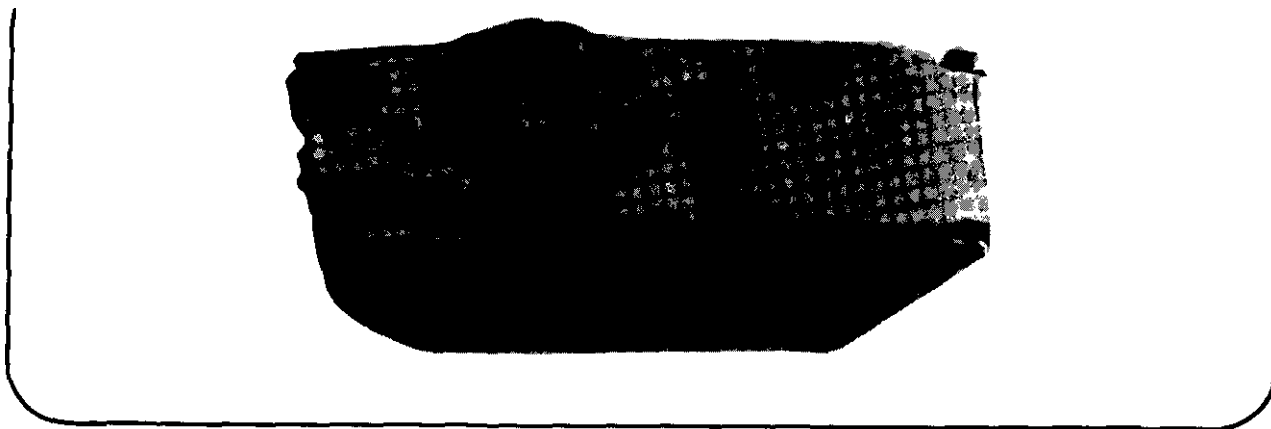
The BMP, introduced in 1967, represents a transition from the "armored personnel carrier" to the "infantry combat vehicle" in the Soviet and most Warsaw Pact armies. It replaces the BTR-50P and complements the wheeled BTRs in first-line motorized rifle units. Because of the extreme vulnerability demonstrated by the BMP in the 1973 Middle East War, there has been extensive debate in the Soviet Army as to how this vehicle should be used in battle. The BMP is significantly smaller than Western APCs and has considerably greater firepower.

The most common variant of the infantry combat vehicle is the BMP-1, which appeared in 1970. It is also called the BMP-A. Its most noticeable modifications are the lengthening of the bow and the extension of the deflector shroud to the rear. These improved the vehicle's swimming capability, which was inhibited by the forward placement of the engine. Other changes include the following: an enlarged, squared firing port for the PKM machine gun below the turret; repositioned vision blocks above the crew compartment; redesigned rear roof hatch positions; and the addition of an air intake on the rear roof. Many BMPs now mount either the improved, semiautomatic AT-3c/SAGGER C or the new AT-4/SPIGOT or AT-5/SPANDREL ATGM.

Some BMP-1s have appeared in Afghanistan with additional armor. This armor consists of full side skirts, which extend to the tops of the road wheels; it also includes armor plating bolted to the upper hull sides, above the side skirts. Apparently, the design of the armor still allows the side firing ports to open. The Soviets have retrofitted some BMP-1s with six smoke grenade projectors, mounted together on the rear of the turret as they are on the BTR-80.

Amphibious Infantry Combat Vehicle BMP (continued)

Mobile reconnaissance post PRP-3



Soldat und Technik

BMP VARIANTS:

The BMP infantry combat vehicle has also become the basis for a family of variants performing other roles. Until the actual Soviet designation is known, each variant bears a designation corresponding to the year in which it was first observed.

The BMP-1K command vehicle (previously known as BMP M1974) differs from the BMP-1 mainly by having additional radio equipment and antennas and having the machine gun ports welded shut. It is used as a battalion-level command vehicle.

The artillery mobile reconnaissance post PRP-3 was previously known as BMP M1975. It has an enlarged two-man turret that has been moved toward the rear. The turret armament consists of only a 7.62-mm machine gun, rather than the 73-mm gun and SAGGER rail of the BMP-1. A rectangular folding antenna for the SMALL FRED battlefield surveillance radar is mounted on the rear of the turret. The effective range of the radar is 20 kilometers. The PRP-3 carries a five-man crew and extensive radio and optical equipment. The Soviets assign one of these vehicles to each howitzer battalion (towed or SP); another is organic to the target acquisition battery of each artillery regiment.

The BRM reconnaissance vehicle, previously known as the BMP M1976(1), has the same enlarged two-man turret as the PRP-3 but mounts the standard 73-mm main gun (without the SAGGER launcher). The BRM-1, or BMP M1979(2),

model has a small parabolic antenna on the roof for the TALL MIKE radar. One of these vehicles is assigned, along with three BMP-1s, to the reconnaissance company of a MRR or TR. Three of them are assigned to the reconnaissance battalion of an MRD or TD.

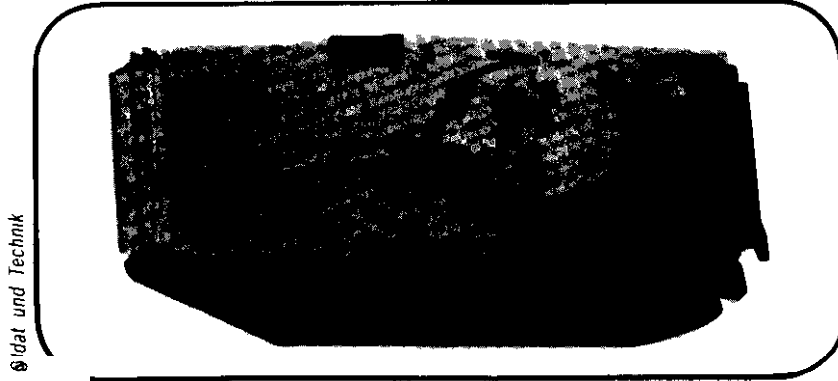
The BMP-1KSh command and communications vehicle mounts a large telescopic antenna and more radio equipment than the BMP-1K. The turret has no armament. Regimental and division staffs reportedly use this variant. It was previously called BMP M1978.

The VPV, previously known as the BMP M1983/1, is a Czechoslovak maintenance and support variant of the BMP. It has the standard BMP-1 chassis, but with the turret removed and a rotatable crane added. This crane reportedly assists in removing light vehicle turrets and engines.

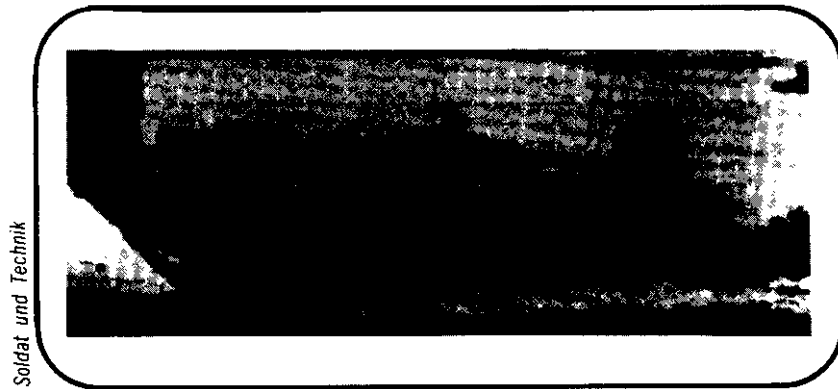
The PPO mobile training post uses the BMP chassis. The Soviets have removed the turret and have used the space normally occupied by the fighting and passenger compartments to provide eight student training stations. Positions are also available for an instructor and a driver. Each of the student stations has a hatch, observation devices, and communications equipment which duplicate those of a normal BMP commander's position.

Amphibious Infantry Combat Vehicle BMP (continued)

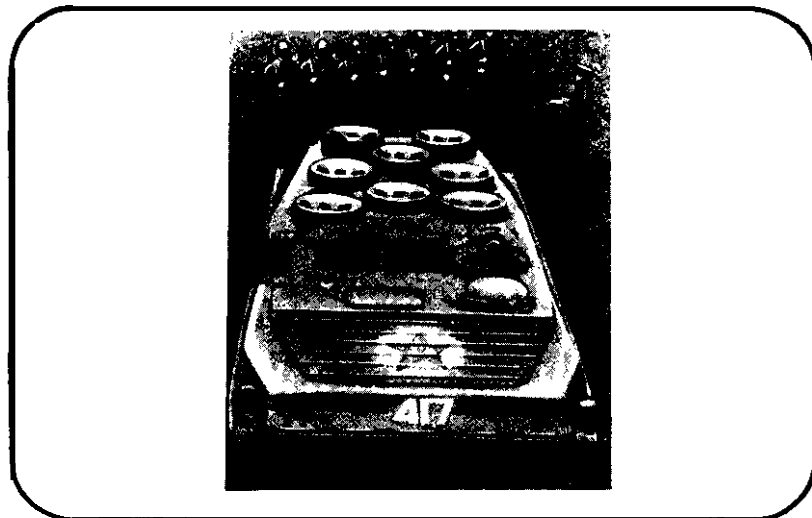
BRM reconnaissance vehicle



BMP-1KShcommand and communications vehicle



PPO mobile training post



Amphibious Infantry Combat Vehicle BMP-2

BMP-2**DESCRIPTION:**

The BMP-2 is an infantry combat vehicle variant of the BMP-1 that incorporates a major armament change. It has an enlarged two-man turret which mounts a 30-mm automatic gun, model 2A42, with a long, thin tube and a double-baffle muzzle brake, along with a 7.62-mm coaxial machine gun on its front. On top of the turret is an ATGM launcher. This launcher can employ both AT-4/SPIGOT or AT-5/SPANDREL missiles. The AT-5/SPANDREL canister is normally seen mounted. The engine is an upgraded 300-hp, V-6 diesel. The vehicle commander now sits in the two-man turret, along with the gunner. Because of the enlarged turret, there is room for only two roof hatches in the rear fighting compartment, rather than the four of the BMP-1. The BMP-2 can accommodate one less passenger than the BMP-1; there also is one less firing port for an assault rifle on each side. However, a new machine-gun-type firing port on the left side of the hull, forward of the turret, indicates that an infantryman now occupies the BMP-1 vehicle commander's position.

CAPABILITIES:

The 30-mm dual-purpose automatic gun can fire at either air or ground targets. With a maximum elevation of 74 degrees and an effective antiaircraft range of 3,000 meters, the 30-mm gun can engage low-flying, subsonic aircraft and helicopters.

Against ground targets, particularly ATGMs, the gun is capable of long-range suppressive fire with an effective range of 2,000 or 4,000 meters, depending on the type of ammunition selected. The crew can remove the ATGM launcher and employ it in a dismounted mode. The BMP-2 can generate screening smoke by using the engine exhaust or the six 81-mm smoke grenade projectors mounted on the turret. It also has the overpressure and filtration systems used on the BMP-1, and an automatic protection system which shuts down the engine and activates the overpressure and filtration systems in the event of a nuclear explosion.

REMARKS:

The BMP-2 was first seen in April 1981 with Soviet forces in Afghanistan. It also appeared in the Zapad-81 exercise in the Soviet Union in September 1981. Initially identified with the STANAG designator BMP M1981, the vehicle has the actual Soviet designator of BMP-2.

BMP-2s seen in the May of 1985 Moscow parade had attachment points on the lower glacis for mounting mineclearing devices similar to the KMT-4 and KMT-6. These vehicles also displayed a layer of applique armor; the armor was on the vehicles' turret fronts and sides, and on the two forward hull hatch tops.

Airborne Amphibious Infantry Combat Vehicle BMD

BMD-1**DESCRIPTION:**

The BMD AAICV superficially resembles the BMP-I, although it is considerably smaller. This full-tracked amphibious vehicle has a BMP-type turret. Like the BMP-1, its main armament is a 73-mm smoothbore gun with a 7.62-mm coaxial machine gun mounted on the right side of the main gun and either a SAGGER ATGM launcher mounted over the gun or a SPIGOT/SPANDREL launcher mounted on top of the turret. The BMD, however, also has two additional 7.62-mm machine guns, one mounted in each of the front bow corners. The bow is much shorter than that of the BMP, and the upper part of the hull is shaped differently. It also differs from the BMP in having

only five evenly spaced road wheels with four support rollers, and in having no rear exit doors. The driver's hatch and vision blocks are centered below the main gun. There is an additional hatch on either side of the driver. The troop compartment has overhead armor cover; however, it has only one firing port on each side and one in the rear from which the mounted infantrymen can fire their weapons. The BMD has a hydropneumatic suspension with a variable height capability. A rear-mounted, 240-hp, 6-cylinder, water-cooled, diesel engine powers the vehicle; two waterjets at the rear propel it in water.

Airborne Amphibious Infantry Combat Vehicle BMD (Continued)

CAPABILITIES:

The air-droppable BMD is considerably smaller and lighter than the BMP but has roughly the same capabilities. Soviet airborne divisions use it as an infantry combat vehicle. Its turret armor is the same (maximum 23 millimeters) as that of the BMP, but its hull is thinner (maximum 15 millimeters). An internal NBC filtration system provides protection for the three-man crew and four combat troops. Two squad members, including the squad leader, ride in the two hatch positions on each side of the driver; the remaining three occupy the compartment between the turret and engine. The BMD has an estimated maximum speed of 60 to 80 kilometers per hour on land and 10 kilometers per hour in water, with a land cruising range of 320 kilometers. It has an onboard directional gyrocompass.

LIMITATIONS:

Since the BMD has the same turret as the BMP-1, the turret armaments probably have the same limitations, except that the BMD does not have a dead space in its traverse. The passenger space is somewhat cramped. The airborne soldiers

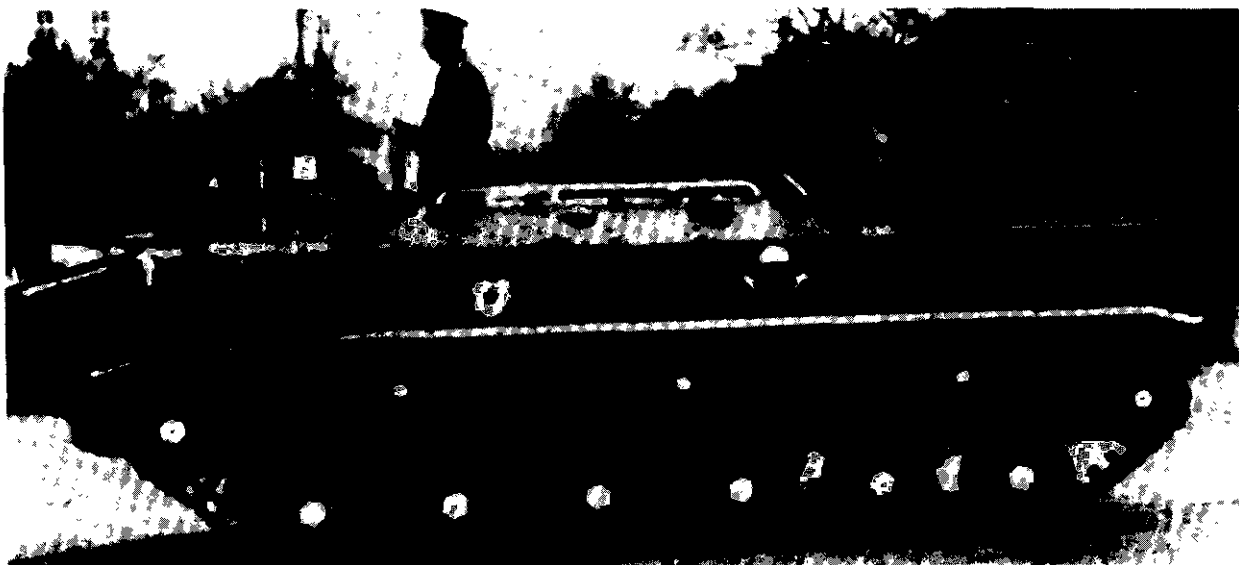
must dismount over the sides of the vehicles, since there is no rear door.

REMARKS:

The BMD was first seen in the Dvina exercises in the USSR in 1970. It was not seen again until the November 1973 Moscow Red Square parade. Since then, the Soviets have used the BMD to completely mechanize the three airborne regiments in each Soviet airborne division. This substantially increases the division's firepower and maneuverability. It also equips the assault companies of army-level independent air assault battalions and the assault battalions of air assault brigades. Some naval infantry units may also have it.

Although originally thought to be a light tank, the BMD may more properly be considered the airborne equivalent of the BMP-1 infantry combat vehicle. However, except for the turret and main armament, it is an entirely new design and not a modified BMP. Excluding the obsolescent ASU.57, the BMD (at approximately 7.5 metric tons) is the lightest tracked combat vehicle in the Soviet Army.

BMD M1979/1



Amphibious Infantry Combat Vehicle BMD (continued)

BMD-1KSh***BMD VARIANTS:***

The basic BMD was initially introduced around 1970. Between then and about 1973, it underwent a variety of minor product-improvement modifications. The final design, designated BMD-1, has a recognizable dome-shaped NBC filter intake on the right-center hull roof. The BMD-1 has retained the protection, mobility, and firepower characteristics of the BMD.

The BMD M1979/1 variant is an airborne APC which first appeared during the 1979 Soviet Afghanistan incursion. The chassis of the M1979/1 is approximately 600 millimeters longer, with the addition of one road wheel and one support roller

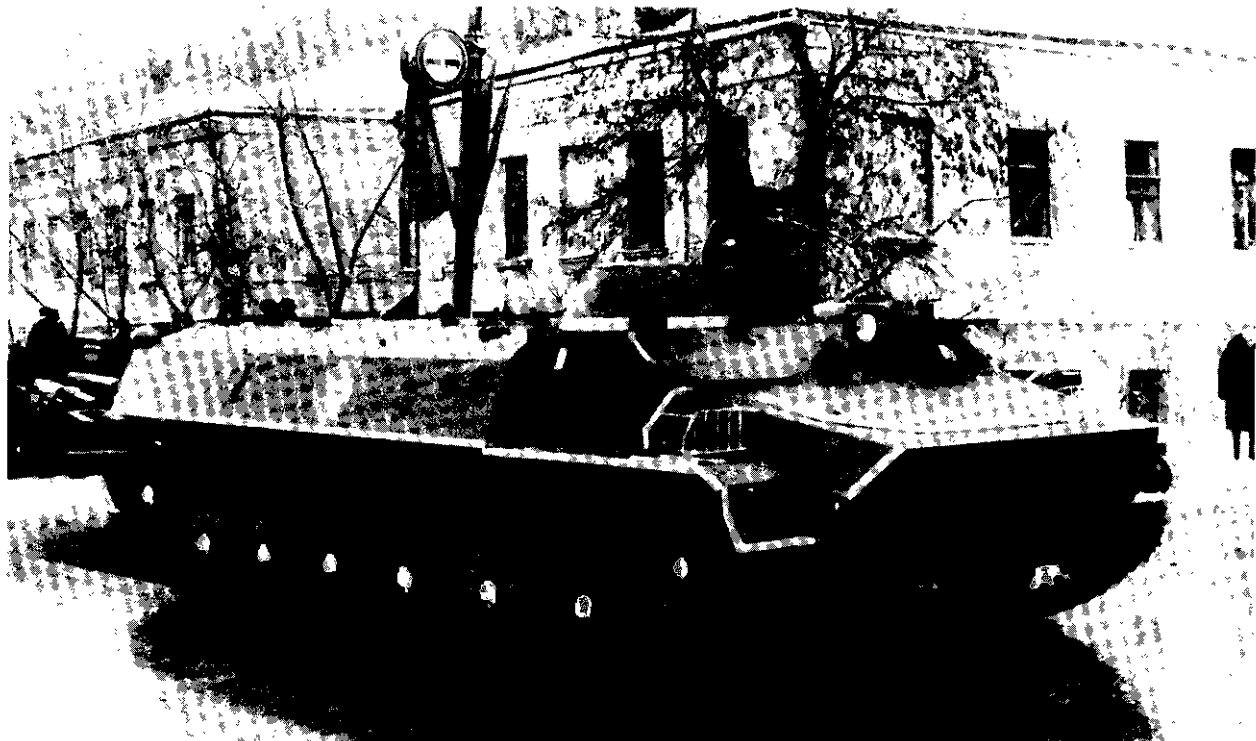
per side. The BMD turret and its integral armaments are absent, replaced by a low, flat superstructure. The vehicle has at least two firing ports per side. It retains the bow machine guns. The collective NBC protection system is also present. Some vehicles mount a self-entrenching blade on the lower glacis.

The BMD-1KSh, previously known as the BMD M1979/3, is a C2 vehicle which differs from the M1979/1 in its addition of several folding antenna masts. It also has a generator on the rear deck.

The 120-mm SP howitzer (airborne) 2S9 is also based on the lengthened BMD chassis. (See page 5-62.)

Multipurpose Armored Vehicle MT-LB

MT-LB



DESCRIPTION:

The MT-LB is an amphibious armored tracked vehicle. It has a low-silhouette, box-like hull made of welded steel plates, and a small turret on the right front that mounts a single 7.62-mm machine gun. There are four firing ports: one on each side of the vehicle and one in each of the two rear exit doors. The flat hull roof has two forward-opening, troop exit hatches. The flat-track suspension consists of six road wheels with no return rollers.

The MT-LB can employ an extra-wide track with an "aggressive" grouser to make over-snow and swamp operations easier. The wide-tracked version, designated MT-LBV, has a track which is 565 millimeters wide, compared to the normal 350-mm-wide track. The wider track reduces ground pressure from 0.46 to only 0.28 kilograms per square centimeter.

CAPABILITIES:

The MT-LB is a multipurpose vehicle. When used as an APC or command vehicle, it can carry

ten personnel besides its two-man crew (driver and commander-gunner). It also serves as a prime mover for various types of artillery. In this case, it can also carry the artillery crew of six to ten personnel. It frequently serves as prime mover for the 100-mm antitank gun T-12. As a cargo and general transport vehicle, it has a cargo capacity of 2.0 metric tons. (Its towed load is 6.5 metric tons.) The Soviets use the wide-tracked MT-LBV as a soft-terrain vehicle.

LIMITATIONS:

The MT-LB is lightly armed and lightly armored.

REMARKS:

Since the West initially identified it in 1970, the MT-LB was first designated M1970. The MT-L light transport vehicle and prime mover is the basis for its design. The Soviets first developed the MT-L, which is unarmored and turretless, for geological research in the far north.

Multipurpose Armored Vehicle MT-LB (continued)

MT-LB M1975 with BIG FRED battlefield surveillance radar



MT-LB VARIANTS:

The MT-LB chassis is also the basis for many other vehicles. Its versatility suggests that the Soviets could use the MT-LB chassis for even more military purposes in the future. The following paragraphs describe currently known variants.

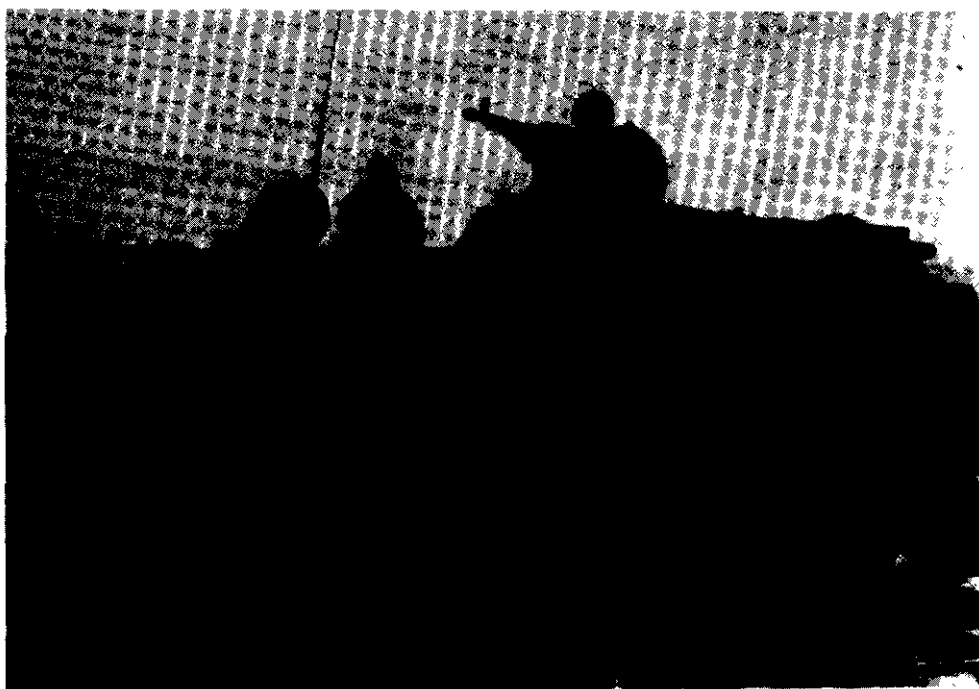
The 122-mm SP howitzer 2S1 was introduced in 1974. It is based on a chassis derived from the MT-LB, known as the MT-LBu. The 2S1 is somewhat longer than the MT-LB (7.40 meters versus 6.45 meters.) It has seven road wheels; the MT-LB has six.

The ACRV IV12 also uses the MT-LBu chassis. The small turret at the front of the MT-LB is absent. The IV12 has a larger turret mounted on the rear half of the vehicle.

The MT-LB M1975 has the BIG FRED battlefield surveillance radar mounted on the rear half of the MT-LB chassis. Unlike the 2S1 and the ACRV IV12, the chassis of the radar variant does not appear to be lengthened. It still has the original six-road-wheel suspension, and it retains the MT-LB's small front turret with its 7.62-mm machine gun. It also has the MT-LB's two rear exit doors.

The SA-13 TELAR uses the MT-LB chassis. So do the RKhM chemical reconnaissance vehicle, the MTK-2 mineclearer, and the R-330P communications jammer.

ACRV IV13



DESCRIPTION:

ACRV IV12 is the overall designation for a series of vehicles known to consist of four versions: 1V13, 1V14, 1V15, and 1V16. All four use the MT-LBu chassis. The suspension consists of seven road wheels with no support rollers. The high, box-like hull has a steep glacis at the front. It also has a flat, round turret on the rear half. The straight vertical rear of the hull contains a single exit door. A total of three or four antennas may attach on top of the hull.

The ACRV IV13 normally has a 12.7-mm DShK AA machine gun on a swivel mount atop the turret. The ACRV IV14/IV15 turret mounts the following items: a laser rangefinder, optical observation devices, and associated fire-control equipment. The ACRV IV16 may mount a 12.7-mm machine gun. It probably contains a digital fire-direction computer. The ACRV IV13 and IV14/IV15 also vary from the ACRV IV16 by having a rectangular box projecting from the right side of the hull, just below the turret.

CAPABILITIES:

The four versions of the ACRV are deployed in SP howitzer battalions. The following paragraphs describe these versions.

The ACRV IV13 remains in the battery firing position as the battery fire direction center (FDC). The battery senior officer (the platoon leader of the first firing platoon), assisted by (manual) fire direction computation and communications personnel, mans it. It has direct radio communications with the battery COP, the battalion COP, and the battalion FDC. The battery senior officer relays firing data to the SP howitzers.

The ACRV IV14 and IV15 serve as battery and battalion commanders' COPs, respectively. They do not remain in the firing position; in most cases, they collocate with the COPs of the supported maneuver unit commanders. The artillery commander decides how to attack targets of opportunity and targets relayed to him by the supported maneuver unit. Target acquisition,

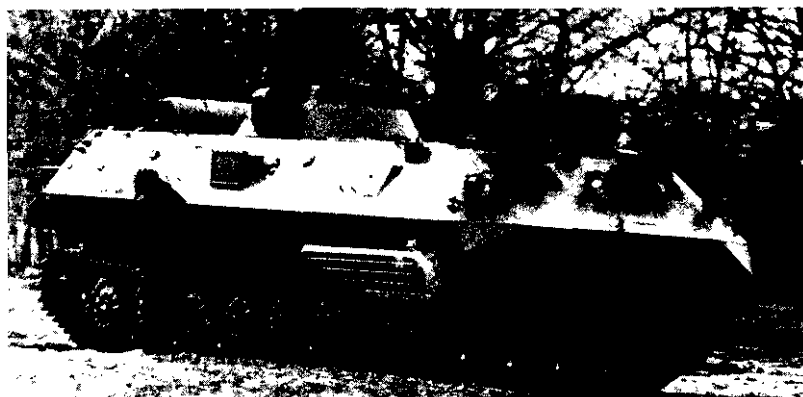
Artillery Command and Reconnaissance Vehicle (ACRV) 1V12 (continued)

(manual) fire direction computation, and communications personnel in the COP assist him. The battery COP has radio links to battery firing positions and to the battalion COP. The battalion COP also has direct radio communications with battery firing positions.

The ACRV 1V16 functions as the battalion FDC. The battalion chief of staff and the fire direction computation and communications personnel man it. It most likely carries the one electronic field artillery computer available to each battalion. Battery fire direction personnel will probably receive, from the battalion FDC, fully computed firing data ready to be passed to the SP howitzers.

REMARKS:

ACRVs were first observed in 1974, and were introduced along with the 122-mm and 152-mm SP howitzers. Their high degree of mobility allows SP howitzers to operate closer to the FLOT and to the supported maneuver units. This increases their responsiveness. The automation of gunnery computations helps reduce mission times. It also gives greater flexibility in the deployment of firing batteries. The centralization of fire mission computation and fire control at battalion level is consistent with the recent establishment of the battalion, rather than the battery, as the basic firing unit in Soviet artillery.

ACRV 1V14*ACRV 1V16*

Medium Tanks

Medium tank vehicle characteristics

Medium tank armament characteristics

T-54/55	T-62	T-64	T-72	T-80
4 (cdr, driver, gunner, loader)	4 (cdr, driver, gunner, loader)	3 (cdr, driver, gunner)	3 (cdr, driver, gunner)	3 (cdr, driver, gunner)
36.0	37.5	39.0	41.0	42.0
9.00	9.33	9.10	9.50	9.70
6.20	6.63	6.40	6.90	7.20
3.14	3.30	3.40	3.46	3.46
2.20	2.40	2.30	2.30	2.30
V-12, 520-hp (T-54), 580-hp (T-55), diesel	V-12, 580-hp, diesel	5-cylinder, 710-hp, opposed-piston diesel	V-12, 780-hp, diesel	1,000-hp gas-turbine
50	50	85	60	85
NA	NA	NA	NA	NA
800 (T-54), 960 (T-55)	960	1,000	1,200	1,700 (estimated)
400 (T-54), 500 (T-55) (600 w/aux fuel tanks, T-54)	300 (430 w/aux fuel tanks)	300 (400 w/aux fuel tanks)	400 (510 w/aux fuel tanks)	385 (500 w/aux fuel tanks)
(715 w/aux fuel tanks, T-55)				
2.70	2.80	2.70	2.70	2.70
0.80	0.80	0.80	0.80	0.80
30	30	30	30	30
1.4; 5.5 (w/snorkel)	1.4, 5.5 (w/snorkel)	1.4; 5.5 (w/snorkel)	1.4, 5.5 (w/snorkel)	1.4; 5.5 (w/snorkel)
99	102	greater than T-62 ³	greater than T-62 ³	greater than T-72 ³
203	242	greater than T-62 ³	greater than T-62 ³	greater than T-72 ³
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
PAZ radiation detection system ⁴	PAZ radiation detection system ⁴	filtration and overpressure system and PAZ radiation detection system ⁵	filtration and overpressure system and PAZ radiation detection system ⁵	filtration and overpressure system and PAZ radiation detection system ⁵
1949 (T-54); 1958 (T-55)	1961	late 1960s	early 1970s	early 1980s
standard	standard	standard	standard	standard

		T-54/55	T-62	T-64	T-72	T-80
MAIN ARMAMENT CHARACTERISTICS	CALIBER (mm)	100	115	125	125	125
	TYPE	rifled tank gun	smoothbore tank gun	smoothbore tank gun	smoothbore tank gun	smoothbore tank gun
	ELEVATION (°)	-4 to +17 (T-54), -5 to +18 (T-55)	-5 to +18	-5 to +15	-6 to +14	-5 to +15
	RATE OF FIRE (rd/min)	5-7	3-5	6-8	6-8	6-8
	AMMUNITION (types)	Frag-HE, HEAT, HVAP-T, AP-T, APDS, APC-T (T-55 only)	Frag-HE (FS), HEAT-FS, HVAPFSDS	Frag-HE (FS), HEAT-FS, HVAPFSDS ²	Frag-HE (FS), HEAT-FS, HVAPFSDS	Frag-HE (FS), HVAPFSDS ²
	MAXIMUM RANGE (HVAPFSDS) of armed fire (m)	3,000 (APDS)	3,000	4,000+	4,000	4,500
	EFFECTIVE RANGE, 50% P_h (m)	1,500	1,600	2,100	2,100	2,400
SECONDARY ARMAMENT CHARACTERISTICS	ARMOR PENETRATION (mm @ 0° obliquity @ 1,000 m)	200 (HVAP-T), 180 (AP-T and APC-T), 390 (HEAT, any range)	230 (HVAPFSDS), 450 (HEAT-FS, any range)	400+ (HVAPFSDS), 500+ (HEAT-FS, any range)	400+ (HVAPFSDS), 500+ (HEAT-FS, any range)	400+ (HVAPFSDS), 500+ (HEAT-FS, any range)
	BASIC LOAD (rd)	34 (T-54), 43 (T-55)	40	40	40	40
	NUMBER/TYPE	1/coaxial machine gun, 1/bow machine gun (not on later T-55s)	1/coaxial machine gun	1/coaxial machine gun	1/coaxial machine gun	1/coaxial machine gun
	MODEL	SGMT	PKT	PKT	PKT	PKT
	CALIBER (mm)	7.62	7.62	7.62	7.62	7.62
	MAXIMUM RANGE (m)¹	3,500	4,000	4,000	4,000	4,000
	EFFECTIVE RANGE (m)	1,000	1,000	1,000	1,000	1,000
SECONDARY ARMAMENT CHARACTERISTICS	ARMOR PENETRATION (mm @ 0° obliquity @ 500 m)	8	8	8	8	8
	PRACTICAL RATE OF FIRE (rd/min)	200-250	250	250	250	250
	BASIC LOAD (rd)	3,500	2,000	2,000	2,000	2,000
	NUMBER/TYPE	1/turret-mounted AA machine gun	1/turret-mounted AA machine gun	1/turret-mounted AA machine gun	1/turret-mounted AA machine gun	1/turret-mounted AA machine gun
	MODEL	DShK 38/46	DShK 38/46	NSV	NSV	NSV
	CALIBER (mm)	12.7	12.7	12.7	12.7	12.7
	MAXIMUM RANGE (m)¹	7,000	7,000	7,850	7,850	7,850
SECONDARY ARMAMENT CHARACTERISTICS	EFFECTIVE RANGE (m)	1,000 (AA), 2,000 (ground)	1,000 (AA), 2,000 (ground)	1,000 (AA), 2,000 (ground)	1,000 (AA), 2,000 (ground)	1,000 (AA), 2,100 (ground)
	ARMOR PENETRATION (mm @ 0° @ 500 m)	20	20	20	20	20
	PRACTICAL OBLIQUITY	80-100	80-100	100	100	100
	RATE OF FIRE (rd/min)					
	BASIC LOAD (rd)	250 (T-54), 500 (T-55)	250	300	300	300

¹ tons for tanks mounting reactive armor.
² external fuel drums
³ used for attachment of reactive armor.
⁴ and T-62s may also have been retrofitted with NBC air filtration and overpressure systems, and with antiradiation liners and with antiradiation liners.

FOOTNOTE ¹T-64B and T-80 can also fire the AT-E/SONGSTER

Medium Tank T-55

T-55**DESCRIPTION:**

The T-55 medium tank has a fully tracked, five-road-wheeled chassis. This chassis has a space between the first and second road wheels and no return rollers. The T-55 has a low-silhouetted hull with a dome-shaped turret mounted over the third road wheel. The 100-mm rifle-bore main gun has a bore evacuator at the muzzle. The T-55 also mounts a 7.62-mm coaxial machine gun; the later T-55A version lacks the bow machine gun.

The T-55 differs from the older T-54 models because it lacks the right-hand cupola and the turret dome ventilator, which is located in front of that cupola on the T-54. Most T-55s also lack the turret-mounted 12.7-mm AA machine gun of the T-54. All T-55s mount an infrared gunner's searchlight above and to the right of the main gun. This searchlight, however, is not a distinguishing feature since it has been retrofitted to many T-54 and T-54A tanks.

CAPABILITIES:

The T-55 combines a high-velocity gun with a highly mobile chassis, a low silhouette, and exceptional long-range endurance. Improvements over the T-54 include a larger V-12 water-cooled diesel engine with 580 rather than 520 horsepower, and an increased cruising range of 500 rather than 400 kilometers (600 kilometers with auxiliary tanks). The increased cruising range can go up to 715 kilometers with two 200-liter auxiliary fuel tanks which can be carried on the rear. The T-55 has two-plane stabilization of the main gun rather than verticle stabilization only. It also has a basic load for the main gun of 43 rather than 34 rounds.

The T-55 can ford depths of 1.4 meters without preparation. It has snorkel equipment which enables it to cross depths of up to 5.5 meters at a speed of 2 kilometers per hour. This equipment takes about 30 minutes of preparation, but can be jettisoned immediately on leaving the water. All

Medium Tank T-55 (continued)

T-55s have the PAZ radiation detection system; the T-55A also has an antiradiation liner. The Soviets may have retrofitted some T-55s with a full NBC collective protection system (air filtration and overpressure). Injecting vaporized diesel fuel into the exhaust system can generate a dense smoke screen.

LIMITATIONS:

The half-egg-shaped turret of the T-55 has good ballistic qualities; however, it creates cramped working conditions for the crew. This results in a slow rate of fire. Its silhouette is one meter lower than the M60's. This advantage is counterbalanced by its poor armor protection, which is thin by Western standards. Its gun control equipment is also crude. It shares the disadvantage that most Soviet tanks have: a limited ability to depress the main gun. This hinders its ability to fire effectively from defilade, forcing it to expose itself to engage targets. Ammunition and fuel storage positions are vulnerable. The lack of a turret basket presents loading difficulties, and there is limited ready ammunition. The driver, commander, and gunner all sit in a line.

The T-55 is not airtight. The filtration system protects the crew from radioactive dust. However, they must wear individual protective masks and clothing to guard against chemical and biological agents. The tank must thus pass through contaminated areas rapidly and the crew must decontaminate before it is fully operational.

The tank can be made watertight for fording water obstacles up to 1.4 meters deep (or 5.5 meters with snorkel). However, it takes one-half hour to

prepare a medium tank unit for a snorkeling operation. Entrance and exit points may also need preparation.

REMARKS:

The T-54-series tanks first appeared in 1949. They replaced the T-34 tank of World War II. The Soviets continuously improved and modified the T-54; when sufficient changes had been made, they redesignated it the T-55. They introduced the T-55 in 1958. It incorporates all the improvements of the fully developed T-54 series without being radically different in design or appearance. The T-55A appeared in the early 1960s.

More T-54/55 tanks have been produced than any other tank in the world. The Warsaw Pact countries and many others use the seven main production models extensively. Czechoslovakia and Poland manufacture the T-54/55. Communist China's version is known as Type 62. Many T-54/55 tanks are still in service; however, the T-62, T-64, T-72, and T-80 are replacing them as the primary main battle tanks in first-line Soviet tank and motorized rifle units.

The Soviets are modernizing some T-55s. Improvements include new APFSDS ammunition. This ammunition has a muzzle velocity of 1,500 meters per second and armor penetration of 300 millimeters. Other improvements include the following: laser rangefinders; add-on armor, as on the T-62; smoke grenade launchers; track skirts; and up-graded mobility components (track and engine). Czech T-55 improvements include a crosswind sensor and a warning device that alerts the crew when the vehicle is being lased.

Medium Tank T-62

T-62**DESCRIPTION:**

The T-62 medium tank has a fully tracked, five-road-wheeled chassis. The chassis has close spaces between the three front road wheels and large gaps separating the third, fourth, and fifth road wheels. The drive sprocket is at the rear and the idler at the front; there are no track return rollers. The rounded turret, mounted over the third road wheel, is more smoothly cast and more nearly egg-shaped than that of the T-54/55 series. The commander's cupola on the left is cast with the turret. It is not bolted on as in the case of the T-54/55. The loader's hatch on the right is also farther forward.

The 115-mm smoothbore main gun has a longer and thinner tube than the 100-mm gun of the T-54/55. Its bore evacuator is about two-thirds of

the way up the gun tube from the turret. There is also a 7.62-mm coaxial machine gun. The T-62A model also mounts a 12.7-mm AA machine gun at the loader's hatch position.

A gunner's IR searchlight is mounted on the right, above the main gun. A smaller IR searchlight is mounted on the commander's cupola. The driver's hatch is in front of the turret on the left side of the flat, low-silhouetted hull.

CAPABILITIES:

Like the T-55, the T-62 has a 580-hp, V-12, water-cooled diesel engine. This engine gives the T-62 a cruising range of 280 kilometers cross-country; 450 kilometers on paved roads, with

Medium Tank T-62 (continued)

integral fuel cells; and 400 kilometers cross-country, or 650 kilometers on paved roads, with two 200-liter auxiliary fuel tanks. The tank also shares the snorkeling and smokescreen-generating capabilities of the T-54/55 series. It has the same PAZ radiation detection system as the T-55. The Soviets may have retrofitted some T-62s with full NBC collective protection systems (air filtration and overpressure). Most models have the same IR night sight and driving equipment and the same fire control equipment as the T-54/55. Some T-62s, however, have received a passive night sight. This replaces the gunner's active IR sight. A laser rangefinder may now replace the stadiametric reticle rangefinder.

The most significant improvement over the T-54/55 tanks, however, is the 115mm smooth bore main gun. It fires a hypervelocity, armor-piercing, fin-stabilized, discarding sabot (HVAPFSDS) round with a muzzle velocity of 1,615 meters per second. The penetrator flies in a very flat trajectory; therefore, it is extremely accurate out to a maximum effective range of 1,600 meters. The specific number of each type of round varies with the expected tactical situation; however, the 40-round basic load typically includes 12 HVAPFSDS, 6 HEAT, and 22 HE rounds.

The T-62 also has an automatic shell ejector system. The recoil of the main gun activates this system. It also ejects spent casings through a port in the rear of the turret.

The T-62 has the standard 7.62-mm PKT coaxial machine gun with a range of 1,000 meters. It also features a 12.7-mm DShK AA machine gun. The gun has a range of 1,500 meters against ground targets and a slant range of 1,000 meters against aircraft. The T-62A also has a stabilized main gun; it enables the gunner to track and fire on the move with improved accuracy.

A command tank model, designated the T-62K, also has a land navigation system. This system has a gyroscopic compass and a calculator giving continuous enroute readout of two factors: the tank's location, in relation to its point of origin; and its distance from, and azimuth to, a predetermined objective.

LIMITATIONS:

The T-62 has all the limitations listed before for the T-55: a cramped crew compartment; thin

armor; crude gun control equipment (on most models); limited depression of the main gun; and vulnerable fuel and ammunition storage areas. The automatic spent-cartridge ejection system can cause dangerous accumulations of carbon monoxide. It can cause possible physical injury to the crew from cartridge cases projected against the edge of a poorly aligned ejection port and rebounding into the crew compartment. Opening the ejection port under NBC conditions would also expose the crew to contamination.

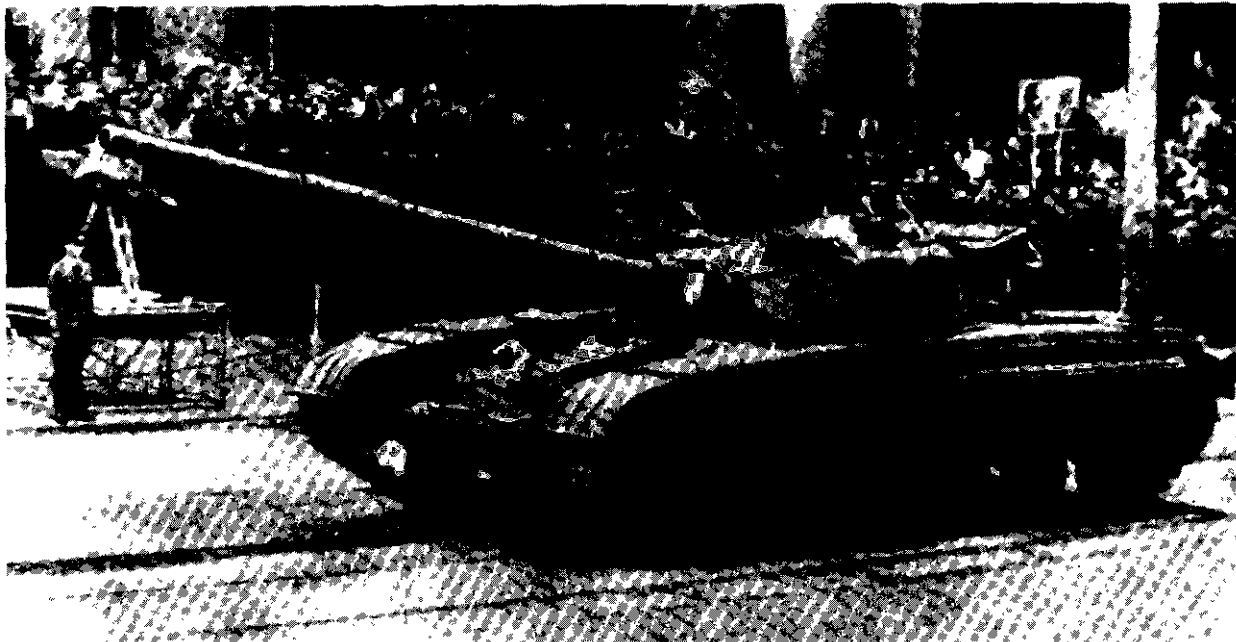
Each time the gun fires, the tube must go into detent for cartridge ejection. The power traverse of the turret is inoperable during ejection and reloading operations. Manual elevation and traverse are slow and not effective for tracking a moving target; therefore, rapid fire and second-hit capabilities are limited. The turret also cannot be traversed with the driver's hatch open. Although the tank commander may override the gunner and traverse the turret, he cannot fire the main gun from his position. He is unable to override the gunner in elevation of the main gun, causing target acquisition problems.

To fire the 12.7-mm AA machine gun, the loader must be partially exposed. This makes him vulnerable to suppressive fires; he must also neglect his main gun loading duties.

REMARKS:

The T-62 is a further step in the line of development begun with the T-54/55 series. It first appeared in 1961. It became the standard main battle tank in Soviet tank and motorized rifle units, gradually replacing the T-54 and T-55. The T-62A variant first appeared in 1970. Currently, however, it is being replaced by the new generation T-64/T-72/T-80 tanks as the first-line Soviet main battle tank.

T-62 tanks of the TR involved in the six-regiment "troop withdrawal" from Afghanistan in 1986 showed a number of modifications: full-length track skirts; curved, add-on armor sections mounted on the front and sides of the turret; and additional armor on the upper glacis. The add-on turret armor provides additional protection against shaped-charge antitank weapons. These tanks carried a probable laser rangefinder mounted atop the main gun. They also had smoke grenade projectors on the sides of the turret.

T-64A**DESCRIPTION:**

The T-64 and T-72 medium tanks are similar in appearance. Both retain the low silhouette of earlier T-54/55/62 tanks; both have a live track with six evenly spaced road wheels; and both have a drive sprocket at the rear and an idler wheel at the front. The driver's hatch is centered at the top of a sharply sloped upper glacis. The glacis has four steel ribs and a V-shaped water and debris deflector. The low, rounded turret is centered on the hull. The commander's cupola is on the right side of the turret; the gunner's hatch is on the left side. The 125-mm main gun has a four-section removable thermal shield. It has two sections in front of, and two sections to the rear of, the mid-tube bore evacuator. A 7.62-mm coaxial machine gun is mounted to the right of the mantlet. Integrated fuel cells and stowage containers give a streamlined appearance to the fenders. The tank has a toothed shovel/dozer blade on the front of the hull, beneath the glacis. There are attachment points beneath the blade for the KMT-6 mine-clearing plow. Early models sometimes mounted four detachable track protection plates on the front half of each side. Later versions have shown detachable full-length standoff skirting.

There are several design differences between the two tanks. Those features peculiar to the T-64

include six small, stamped road wheels; four track return rollers; a 12-tooth drive sprocket; double-pin, rubber-bushed track; and linear-type shock absorbers. Other features are as follows:

- A gunner's IR searchlight mounted to the left of the main gun.
- A newly designed 12.7-mm NSV AA machine gun on the commander's cupola with a fixed mount.
- The AA machine gun, which can fire buttoned up.
- Several large external ammunition stowage boxes, normally attached to the sides of the turret.
- A long snorkel stowed on the rear edge of the turret. (A second snorkel with an elbow for attachment to the engine exhaust is stowed inside the first.)
- A smaller engine compartment than the T-72. Its radiator grill is near the turret.
- A command variant with an additional whip antenna and a 10-m antenna mast. The mast can be erected in the center of the turret using guy wires, with an antenna connector located in front of the commander's cupola. It employs the same TNA-3 land navigation system found

Medium Tank T-64 (continued)

in the T-62K command tank and mounts no AA machine gun. It serves as a battalion and regimental command vehicle.

CAPABILITIES:

The T-64 has greater mobility than the T-62. The 5-cylinder, opposed-piston, diesel engine has an estimated output of 710 horsepower. Two 200-liter auxiliary fuel drums can fit on the rear of the hull.

The T-64 has better armor protection than the T-62. Its greatly increased frontal armor protection is due to the use of improved layered armor. It can also mount track protection plates or full-length skirts. Low-flash fuel storage also offers protection to the sides. The front-mounted shovel enables the tank to dig itself in within 20 to 30 minutes. It also increases the armor protection of the lower hull front when it is folded upwards.

Besides its PAZ radiation detection system and an antiradiation liner, the T-64 has a collective NBC filtration and overpressure system. It also has the same integral smoke-generating capability as earlier T-54/55/62 tanks. Variants have the same type of turret-mounted smoke grenade projectors seen on the T-72 and T-80.

The 125-mm smoothbore main gun fires a hyper-velocity, armor-piercing, fin-stabilized, discarding-sabot (HVAPFSDS) round. The round may have a muzzle velocity of over 1,750 meters per second and an effective range of 2,100 meters. The 40-round basic load would typically include 12 HVAPFSDS, 6 HEAT, and 22 HE rounds. The cartridges are semicombustible with stub-cases. An automatic loader allows the number of crew members to decrease to three: the commander, the gunner, and the driver. The gun has an automatic spent-cartridge ejection system similar to that of the T-62.

The T-64B has an onboard computer. Some variants may have a laser rangefinder.

LIMITATIONS:

An automatic loader has allowed the Soviets to reduce not only the number of crewmen, but also the size of the turret. Therefore, the space available in the turret has not significantly increased. The ability to depress the main gun (-5 degrees) is still limited. When using the mast antenna, the command variant is immobile, since the mast must be anchored in the ground. Even

with the IR searchlight, visibility decreases to 800 meters when the night sight is used.

REMARKS:

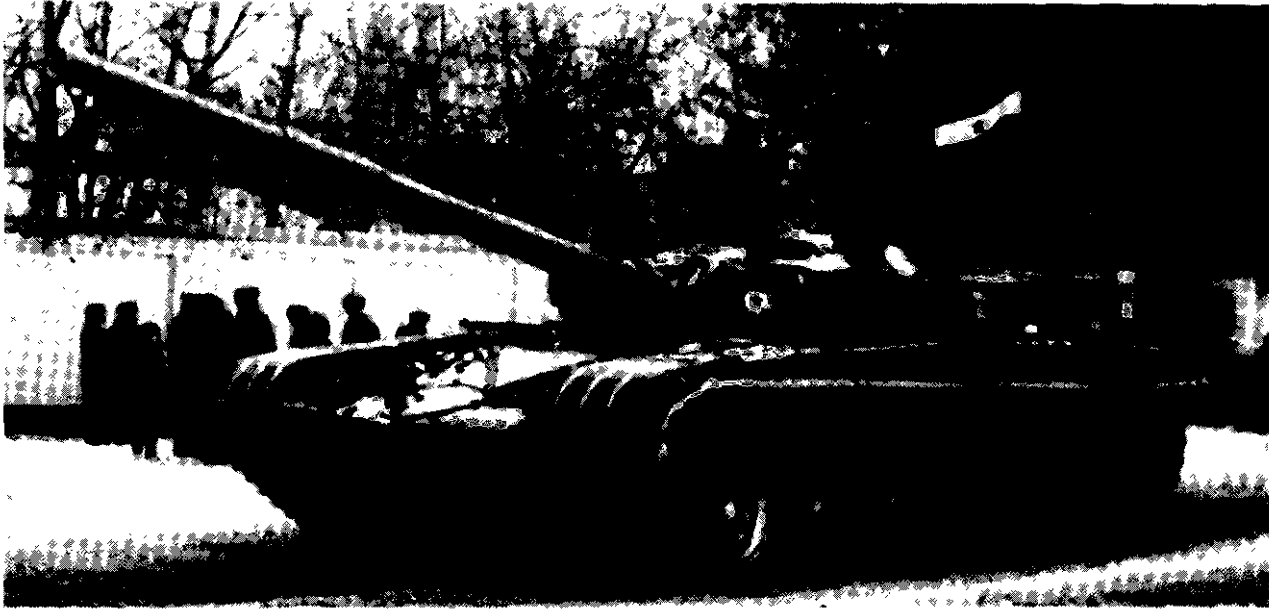
The T-64 entered production in 1967. It is the first of a new family of Soviet main battle tanks developed as successors to the T-54/55/62 family. The first T-64s had the 115-mm gun of the T-62; the T-64A version subsequently received the 125-mm gun.

The T-64A has an optical rangefinder. It fires normal 125-mm tank gun ammunition. It originally had four-part fold-out track skirts. It has since received full-length track skirts, but retains brackets for the four-part skirts. Originally produced without smoke grenade projectors, many T-64As have been retrofitted with twelve of them; these are on both sides of the turret. The hull glacis armor consists of layers of steel enclosing fiberglass layers. The cast armor of the turret is reinforced with non-metallic materials. The T-64A was deployed in WGF in 1976. It replaced most T-55s in three armies: 2d Guards Army, 3d Shock Army, and 20th Guards Army. In 1980, it was introduced in the SGF. Since late 1984, the T-64B has partially replaced it in both Groups of Forces.

The T-64B, previously known as the SMT M1981/1, has a laser rangefinder. It can fire the AT-8/SONGSTER ATGM from its main gun; this is in addition to firing standard 125-mm ammunition. It has full-length track skirts, and it has four transverse ribs in front of the driver's hatch. A radio frequency antenna in an armored housing replaces the rangefinder optic on the right side of the turret. The optic on the left side of the turret is larger, approximately twice as large as that on the T-64A and T-72 variants. The T-64B has only eight smoke grenade projectors, mounted in groups of four on both front sides of the turret.

Modified T-64Bs with reactive armor were first observed in October 1984. To accommodate this armor, the eight smoke grenade projectors are combined into two groups of four at the rear of the left side of the turret. Only two transverse ribs appear in front of the driver's hatch. Also, stowage boxes have been relocated. These modifications allow reactive armor boxes to fit on the upper glacis, the front of the turret, and the turret roof. Applique armor has been added to the turret roof and sides, and to the left and right of the driver on the hull roof. An antiradiation liner now protects the interior of the turret.

Medium Tank T-72

T-72**DESCRIPTION:**

The T-72 medium tank is similar in general appearance to the T-64. The T-64's description includes recognition features common to both. Only those features peculiar to the T-72 appear here.

The T-72 has six large, die-cast, rubber-coated road wheels and three track return rollers. It has a 14-tooth drive sprocket, RMSH single-pin track with rubber-bushed pins, and rotary shuck absorbers. The tank has a larger engine compartment than the T-64. Its radiator grill is near the rear of the hull.

The gunner's IR searchlight sits on the right of the main gun. The 12.7-mm NSV AA machine gun has a rotating mount. It cannot be fired from within the tank. The commander employs a K10-T sight for the machine gun. There are normally only a few small stowage boxes on the outside of the turret; a single short snorkel stows on the left rear of the turret.

CAPABILITIES:

The T-72 has greater mobility than the T-62. The V-12 diesel engine (model V-46) has an output of 780 horsepower. This engine appears to be remarkably smoke-free and smooth-running. The excessive vibration which reportedly caused high crew fatigue in the T-62 is gone. Two 200-liter auxiliary fuel drums can fit on the rear of the hull.

The T-72 has better armor protection than the T-62. This is due to the use of layered armor and other features discussed under T-64 capabilities. Besides the PAZ radiation detection system, the T-72 has an antiradiation liner and a collective NBC filtration and overpressure system. It has the same integral smokegenerating capability as earlier T-54/55/62 tanks. Variants have had smoke grenade projectors mounted on the front of the turret. The T-72 employs the same armament, ammunition, and fire control as the T-64A. Later variants may have a laser rangefinder.

Medium Tank T-72 (continued)

LIMITATIONS:

Same as for T-64

REMARKS:

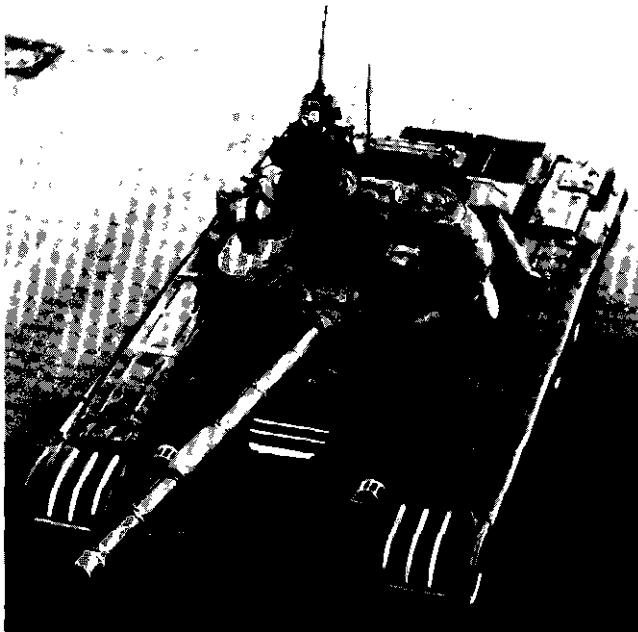
The Soviets introduced the T-72 in the early 1970s. It is not a further development of the T-64; instead, it is a parallel design, a high-production tank that complements the T-64. The Soviets have used the T-64 only in forward-deployed Soviet units. However, they use the T-72 within the USSR and export it to non-Soviet Warsaw Pact armies and several other countries.

The basic T-72 had an optical rangefinder. It also had four-part track skirt plates like the basic T-65's A variant, the T-72M, shows modification: full track skirts; smoke grenade projectors (seven on the left and five on the right of the turret front); and no right-hand optic, indicating the presence of a laser rangefinder. This variant is for export; it first appeared with the East German Army in October 1981. The variant SMT M1981/2 displayed a raised rear deck cover.

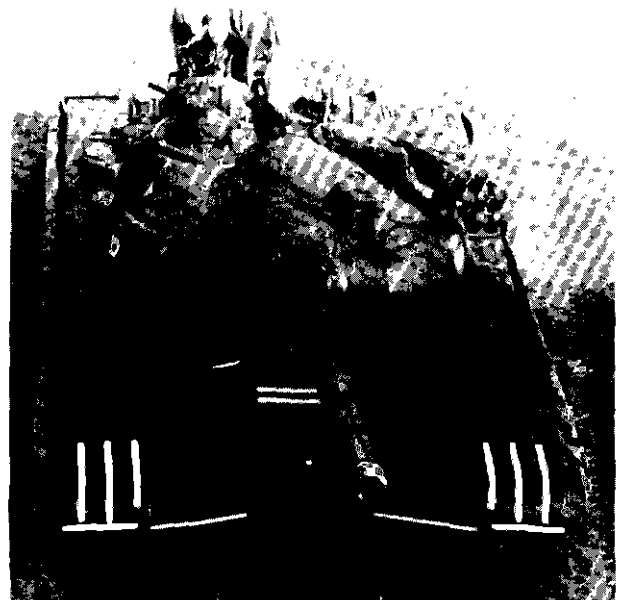
The West incorrectly called the variant SMT M1981/3 the T-80. This variant and the similar T-72M1 show some improvements: a thicker upper glacis with three, rather than four, transverse ribs in front of the driver's hatch; increased frontal turret armor; and applique armor on the turret roof. It has smoke grenade projectors, an antiradiation liner, and a laser rangefinder. It possesses infrared night sights for the gunner (TPN-1-49-23) and commander (TKN-3). The variant is now the standard model for Soviet units with the T-72.

A further modified variant appeared in the November 1986 Moscow parade. It displayed more frontal turret protection than the SMT M1981/3. Like the modified T-64B, it had several components moved to make room for reactive armor. Eight smoke grenade projectors are mounted on the left rear side of the turret; the stowage box positions have been shifted; and there are only two transverse ribs on the upper glacis.

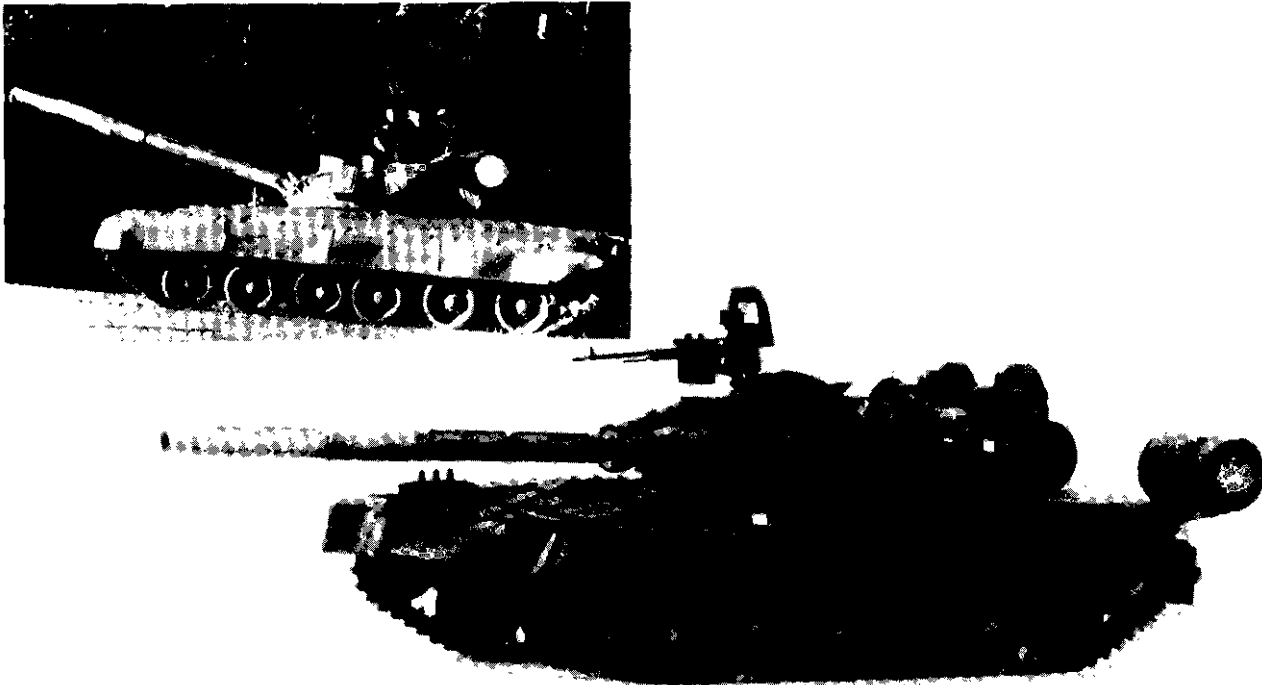
SMT M1981/3



T-72 Variant M1986



Medium Tank T-80

T-80**DESCRIPTION:**

The T-80 uses features of both the T-64 and T-72. It also has some unique features. For example, it has a new type of rubber-tired road wheels. These are larger than the T-64's, but slightly smaller than the T-72's. The road wheels are mounted in noticeable pairs, with the middle pair particularly close together. The rubber-bushed, double pin track has rubber track pads and U-shaped track guides. A self-entrenching blade is mounted on the lower glacis. The rear hull has a large exhaust.

The T-80 displays a large left-hand optic, indicating a laser rangefinder. The smoke grenade launchers are moved to the rear of the turret sides to make room for reactive armor boxes. (Reactive armor appears on many T-80s.) The tank also has an enlarged snorkel on the turret rear.

CAPABILITIES:

The T-80 is the most recent Soviet tank to enter series production and it incorporates the latest in Soviet technology. It is capable of firing the AT-8/SONGSTER ATGM through its main gun; it can also fire conventional 125-mm ammunition.

It has an autoloader for the main gun. Its armament and optics are like those of the T-64B. Its infrared sight indicates that it lacks a thermal imager.

The T-80 may have enhanced frontal armor; that is, it may have an upper glacis of steel layers enclosing fiberglass layers, and a cast steel turret incorporating nonmetallic materials. It has the same collective NBC protection system and anti-radiation liner as the T-64 and the T-72 tanks.

The T-80 has improved mobility due to an estimated 1,000-hp gas-turbine engine. However, its weight has increased to 42 metric tons.

REMARKS:

A T-80 prototype existed in 1976, but it did not enter production until the early 1980s. It has been deployed since 1984 in Soviet units in the WGF; that is, in the two armies which did not receive the T-64: the 1st Guards Tank Army and 8th Guards Army. It is likely that the Soviets will initially reserve the T-80 for their own forces, as they did with the T-64.

Assault Guns and Light Tanks
 Assault guns and light tank vehicle characteristics

VEHICLE CHARACTERISTICS	ASU-57	ASU-85	PT-76
CREW	3	4 (cdr, gunner, driver, loader)	3 (cdr/gunner driver, loader)
WEIGHT (mt)	3.3	14.0	14.0
LENGTH			
Gun forward (m)	5.00	8.50	7.63
Without gun (m)	3.60	6.00	6.90
WIDTH, overall (m)	2.00	2.70	3.14
HEIGHT , overall (m)	1.40	2.00	2.20
ENGINE	4-cylinder, 55-hp, in-line gasoline	6-cylinder, 240-hp, in-line diesel	6-cylinder, 240-hp, diesel
SPEED (maximum)			
Road (km/hr)	40	40	44
Water (km/hr)	NA	NA	10
FUEL CAPACITY (liters)	140	250	250
ROAD RANGE (km)	250	260	260 (450 w/auxiliary fuel tanks)
TRENCH CROSSING (m)	1.4	2.8	2.8
VERTICAL STEP (m)	0.5	1.1	1.1
GRADABILITY (c)	30	38	38
FORDING (m)	0.7	1.2	amphibious
ARMOR (maximum)			
Hull (mm)	6	40	14
Turret (mm)	NA	NA	16
INFRARED			
Driver	no	yes	yes (some vehicles)
Gunner	no	yes	no
Commander	no	yes	yes (some vehicles)
NBC PROTECTION	no	yes	no
DO1	1955	1962	1952
STATUS	obsolescent	standard	limited standard

Assault guns and light tank armament characteristics

MAIN ARMAMENT CHARACTERISTICS	ASU-57	ASU-85	PT-76
CALIBER (mm)	57	85	76
SIGHTING DEVICE	direct fire telescope	direct fire telescope	telescopic sight
AMMUNITION (types)	Frag-HE, HVAP, AP-T, API-T	Frag, HE, HVAP-T, APC-TAP-T, HEAT, smoke	Frag-HE, HEAT, HVAP-T, AP-T
ELEVATION (c)	-5 to +12	-4 to +15	-4 to +30
TRAVERSE (c)	22 total	12 total	360
MAXIMUM RANGE (m)*	12,000+	15,000+	12,000
EFFECTIVE RANGE 50% Ph (m)	750	900	650
RATE OF FIRE			
Maximum (rd/min)	8-12 (antitank role)	7-8	6-8
Sustained 1st hr (rd)	100.150	70	INA
ARMOR PENETRATION (mm @ 0° obliquity @ 1,000 m)	145 (HVAP)** 100 (AP-T)**	180 (HVAP-T), 125, (APC-T), 400 (HEAT, any range)	50 (HVAP-T), 60 (AP-T) 120 (HEAT, any range)
BASIC LOAD ON-BOARD (rd)	30	40	40

SECONDARY ARMAMENT CHARACTERISTICS	ASU-57	ASU-85	PT-76
NUMBER/TYPE	NA	1/ coaxial machine gun***	1/ coaxial machine gun
MODEL	NA	PKT	SGMT
CALIBER (mm)	NA	7.62	7.62
MAXIMUM RANGE (m)*	NA	4,000	3,500
EFFECTIVE RANGE (m)	NA	1,000	1,000
ARMOR PENETRATION (mm @ 0° obliquity @ 500 m)	NA	8	8
PRACTICAL RATE OF FIRE (rd/min)	NA	250	200-250
BASIC LOAD (rd)	NA	1,000	1,000

FOOTNOTES. *Gun at 4.5

**@ 500 meters for ASU-57.

***Some ASU-85s also mount a 12.7-mm AA machine gun DShK.

ASU-85



DESCRIPTION:

The ASU-85 has a PT-76 type chassis with six road wheels (with a wider space between the first and second). Its box-shaped, low-silhouetted hull has a sharply sloping glacis plate in front. The main armament is an 85-mm gun. The gun has a double-baffle muzzle brake and a bore evacuator on its long, thin barrel. A large IR searchlight for the gunner is mounted above the mantlet. The gun also has a smaller IR searchlight for the commander at the right. The armor-covered crew area is NBC-sealed. The secondary armament is a 7.62-mm coaxial machine gun. Some ASU-85s also mount a 12.7-mm AA machine gun DShK.

CAPABILITIES:

The ASU-85 provides mobile armored striking power in the assault gun battalion of airborne divisions. Fixed-wing aircraft (including the An-12/CUB) can transport it. Helicopters (including the Mi-6, Mi-10, and Mi-26) can also transport it. It is normally air-landed; it can also be air-dropped using a high capacity multichute system.

The ASU-85 is a versatile weapon designed to serve principally in an antitank role. It is also

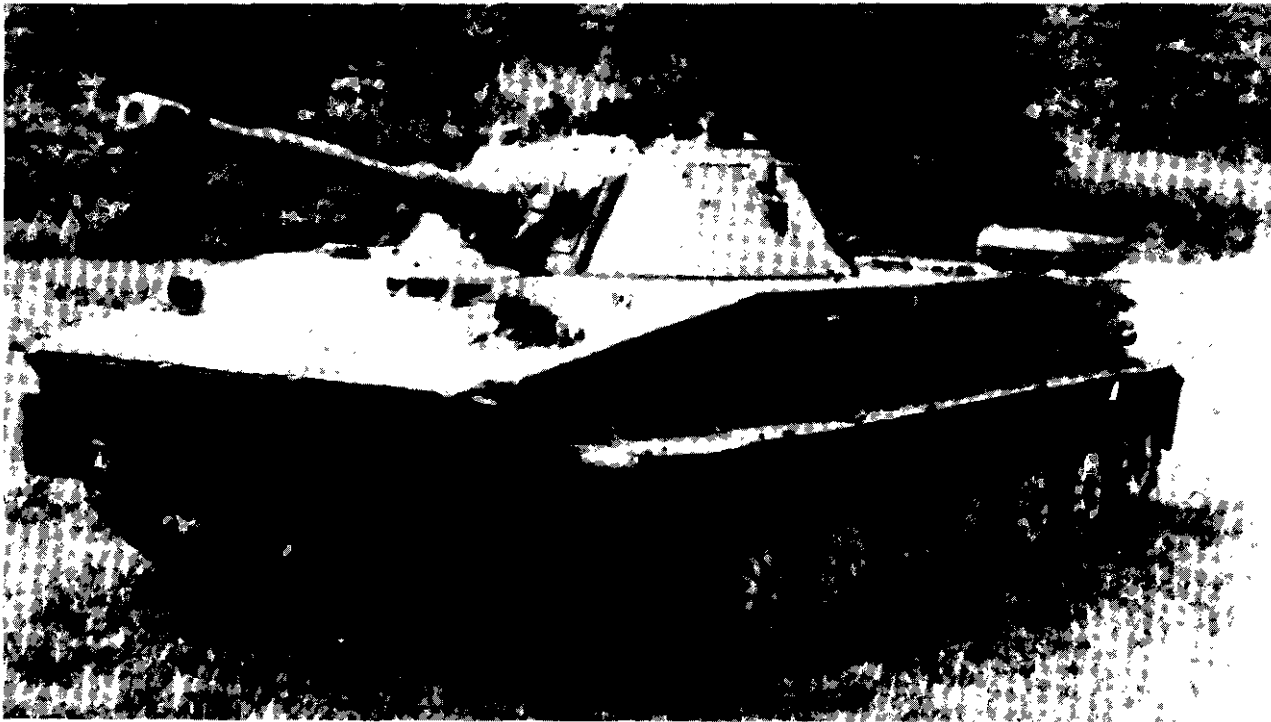
capable of providing general fire support. It fires a HVAP round which will penetrate 180-mm armor at 1,000 meters. IR equipment gives the ASU-85 good nightfighting capability. It has a 240-hp, V-6, water-cooled diesel engine. It carries a crew of four: the commander, the gunner, the loader, and the driver.

LIMITATIONS:

The ASU-85's suspension uses components of the PT-76 light tank. However, it has no waterjets and is not amphibious. It has relatively thin armor: the glacis plate is only 40 millimeters thick, and the upper hull side only 15 millimeters thick.

REMARKS:

Introduced in 1962, the ASU-85 was a follow-on to the 57-mm airborne assault gun ASU-57, which had been in use in airborne units since 1957. The ASU-57 had very light armor (6 millimeters). Since 1962, it has become less common. The ASU-85 is widely used by the Soviet and Polish airborne divisions; however, the airborne howitzer 2S9 may replace it.

PT-76**DESCRIPTION:**

The PT-76 is a lightly armored amphibious tank. It has a flat, boat-like hull. Its suspension has six road wheels and no return rollers. A dish-type turret mounts over the second, third, and fourth road wheels. The turret has a double hatch for commander and loader. The driver's hatch is beneath the main gun, at the top of the sloping glacis plate.

Four variants are distinguished by the differences in the 76-mm main armament. Early models mounted a D-56T gun with no bore evacuator and a long, multislot muzzle brake. Later models mount a D-56TM gun with a bore evacuator and a double-baffle muzzle brake. Further variants have a stabilized D-56TM gun (PT-76B) and an unidentified clean-barrel gun. A coaxial 7.62-mm machine gun also is mounted at the right of the main gun.

CAPABILITIES:

The PT-76 was formerly the standard reconnaissance tank of the Soviet and Warsaw Pact armies. It has been replaced in first-line units by

BMP-1, BMP-2, BRM, and BRM-1 vehicles. It may still equip the reconnaissance companies and battalions of some MRRs, MRDs, TRs, and TDs. The TBs of naval infantry units still have it as well. Aside from its reconnaissance role, it can cross water obstacles in the first wave of an attack and can provide fire support during the establishment of a beachhead. Its V-6, 240-hp water-cooled engine gives it a road speed of 44 kilometers per hour, with a cruising range of 260 kilometers. Its twin waterjet propulsion system moves it through water at 10 kilometers per hour with a range of 100 kilometers. The 76-mm main gun is light for a modern tank; it fires HVAP and HEAT rounds capable of penetrating APCs and other light armored vehicles. The PT-76 is a reliable, highly mobile reconnaissance vehicle. It has an ideal design for amphibious capability, but it has many limitations as a fighting vehicle.

LIMITATIONS:

Like most Soviet tanks, the PT-76 has limited ability to depress its main gun; therefore, it cannot fire effectively from defilade. Its amphibious design

Light Amphibious Tank PT-76 (continued)

makes it unnecessarily large for its weight class and allows less armor protection than that on other light tanks. Its relatively thin armor has a maximum thickness of 13 millimeters in the hull and 17 millimeters in the turret. It is vulnerable to artillery fragments and .50-caliber machine gun fire. The fact that the commander is also the gunner and radio operator reduces his effectiveness as an observer. The PT-76 also lags behind other Soviet armored fighting vehicles in having no night vision equipment and no NBC protection system for the three-man crew.

REMARKS:

The PT-76 is lightly armored and undergunned for a modern tank. Its inherent amphibious capability outweighs these limitations. It has had widespread use in the Warsaw Pact and many other countries. Communist China manufactures a very similar amphibious tank known as T-60. The popular PT-76 chassis was the basis for many subsequently developed vehicles: the BTR-50P and OT-62 series of APCs; the ZSU-23-4 SP AA gun; the ASU-85 airborne assault gun; the transport-launching vehicles for the FROG-2 through FROG-5 and SA-6/GAINFUL missiles; and even the BMP, which replaced the PT-76 in Soviet reconnaissance units.

Gun and howitzer characteristics (armament and vehicle) (continued)

VEHICLES CHARACTERISTICS	120-MM SP HOWITZER (ABN)2S9	122-MM SP HOWITZER 2S1	152-MM SP HOWITZER 2S3	152-MM SP GUN 2S5	203-MM SP GUN 2S7
CREW	4	4	4	4	4 (estimated)
WEIGHT (mt)	8	16	25-30	30	40 (estimated)
LENGTH					
Gun forward (m)	6.02	7.40	8.40	9.50	12.80
Without gun (m)	6.02	7.40	7.80	7.30	10.50
WIDTH overall (m)	2.13	3.00	3.20	3.20	3.20
HEIGHT, overall (m)	230/1.90*	2.40	2.80	2.80	2.80
GROUND CLEARANCE (m)	100-450	395	450	400 (estimated)	400 (estimated)
ENGINE	V-6 240 hp, diesel	V-8, 300 hp, diesel	V-12, 520-580 hp, diesel	V-12, 520-580 hp, diesel	INA
SPEED (maximum)					
Road (km/hr)	60	70	50	50	50 (estimated)
Water (km/hr)	9	5	NA	NA	NA
FUEL CAPACITY (liters)	INA	550	850	850	INA
ROAD RANGE (km)	500	500	500	500	500
TRENCH CROSSING (m)	1.60	2.50	2.50	2.50	INA
VERTICAL STEP (m)	0.80	1.00	1.00	1.00	INA
GRADABILITY (r)	32	35	30	30	INA
FORDING (m)	amphibious	amphibious	1.5	1.5	INA
ARMOR (maximum)					
Hull (mm)	15	15	15	15	INP
Turret (mm)	INA	20	20	NA	NR
INFRARED					
Driver	yes	yes	yes	INA	INA
Gunner	no	no	no	INA	INA
Commander	yes	yes	yes	INA	INA
NBC PROTECTION	filtration and overpressure system	filtration and overpressure system	filtration and overpressure system	possible filtration and overpressure system	filtration and overpressure system

FOOTNOTES: * of turret in travel position (at maximum ground clearance)/in firing position.

ARMAMENT CHARACTERISTICS	76-MM FIELD GUN ZIS-3 (M1942)	122-MM HOWITZER M30 (M1938)	122-MM FIELD GUN D-74	152-MM HOWITZER D-1 (M1943)	1 GUN. ML-2
CREW	7	8	9	9	9
WEIGHT					
Firing position (kg)	1116	Z 360	5570	1600	7261
Travel position (kg)	1116	2,500 (w/limber)	5570	3640	8,013
LENGTH, travel position (m)	6.10	5.93	100	5.93	B 10
WIDTH, travel position (m)	1.44	1.97	2.50	1.86	2.31
HEIGHT, travel position (m)	1.37	1.80	2.70	1.86	2.26
FIRE CONTROL	panoramic telescope	panoramic telescope	panoramic telescope	panoramic telescope	panoramic telescope
AMMUNITION (types)	Frag-AP, HVAP, HEAT	Frag HE, HEAT smoke (WP), illuminating, leallet chemical	Frag HE, APC	Frag HE, CP HEAT-SS illuminating chemical	Frag-1 CP, illuminating
PERFORMANCE					
Elevation (C)	-5 to +31	-3 to +635	-5 to +45	-3 to +655	2 to
Traversal (C)	54 total	49 total	58 total	35 total	58 to
Maximum range (m)	13,300	11,800	23,900	12,400	17,23
Rate of fire					
Maximum (rd/min)	15-20	6	6.1	4	3.4
Sustained, 1st hr (rd)	150-200	75	75	65	65
Arm penetration (mm @ 0° obliquity @ 1000 m)	60 (AP TL), 50 (HVAP), 300 (HEAT any range)	460 (HEAT, any range)	L85 (APC T)	INA	INA
UNIT OF FIRE (rd)	140	80	80	60	60
EMPLACEMENT/ DISPLACEMENT TIME (min)	varies	1-15/1-15	3.5/3-5	2	8-10/
DOI	1942	1938	1955	1943	1937
STATUS	obsolescent	limited standard	obsolescent	obsolescent	obsole

ARTILLERY

Guns and Howitzers

Gun and howitzer characteristics (armament and vehicle)

76-MM MOUNTAIN GUN M1966	120-MM SP HOWITZER (ABN) 2 S 9	122-MM HOWITZER D-30	122-MM SP HOWITZER 2 S 1
7	4	8	4 onboard 4 inammo carrier)
180 780 4 80 150 140	See vehicle characteristics	3,150 3,210 5 40 1.95 1.66	See vehicle characteristics
direct fire sight and panoramic telescope Frag-HE, HEAT	direct fire sight and panoramic telescope Frag-HE, HEAT-FS, smoke (WP), illuminating, incendiary	direct fire sight and panoramic telescope Frag-HE, HEAT-FS, smoke (WP), illuminating, chemical flechette, leaflet incendiary, SLP	direct fire sight and panoramic telescope Frag-HE, HEAT-FS, smoke (WP), illuminating, chemical flechette, leaflet incendiary, SLP
-5 to +65 50 total 10,500/11,500 600 (Frag-HE)	-4 to *80 70 total 8,800 INA	-7 to +70 360 15,300 690 (Frag-HE) 740 (HEAT)	-3 to *70 360 15,300 890 (Frag-HE) 740 (HEAT)
1 5 100 300 (HEAT, any range) 140 NA	6-8 INA INA 80 (estimated) 60	7-8 75 460 (HEAT-FS, any range) 80 NA	5 8 70 460 (HEAT-FS, any range) 80 40
varies 1966 standard	05/05 1985 standard	15-25/15-25 1963 standard	indirect missions) 1974 standard

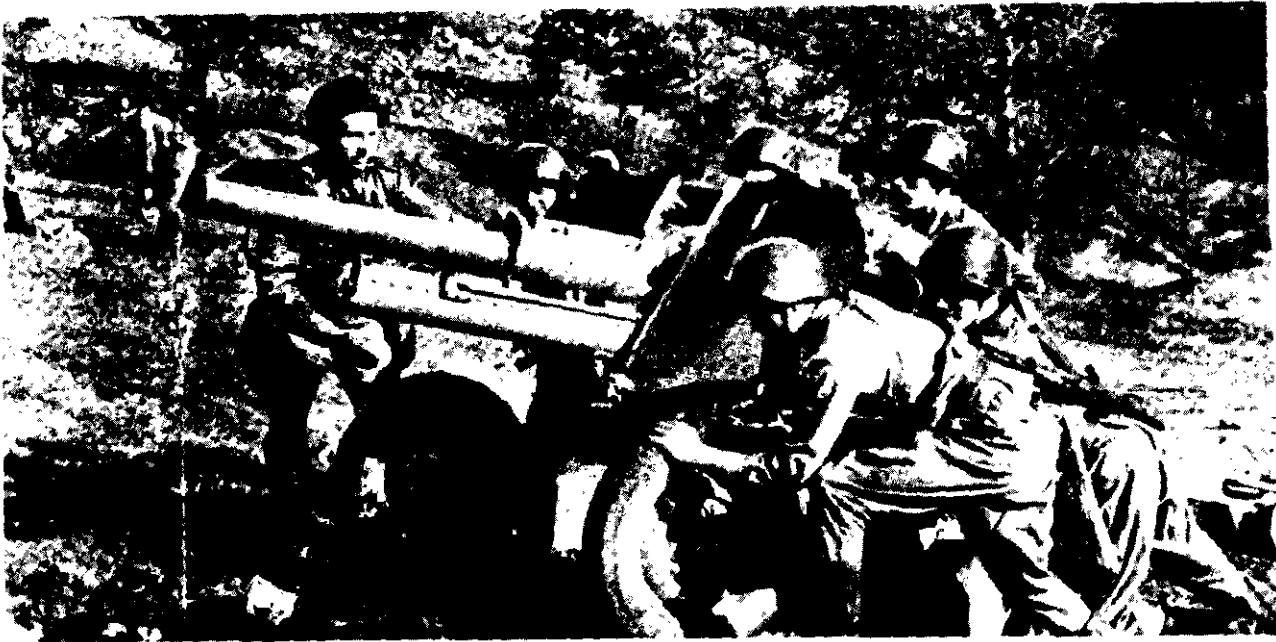
ARMAMENT CHARACTERISTICS	130-MM FIELD GUN M-46	152-MM GUN-HOWITZER D-20	152-MM SP HOWITZER 2S3	152-MM FIELD GUN 2A36	152-MM SP GUN 2S5
CREW	8	10	4 onboard (+2 in ammo carrier)	INA	4 onboard (+4 in ammo carrier)
WEIGHT					
Firing position (kg)	7,700	5,700			
Travel position (kg)	8,450	5,900	See vehicle characteristics	12,300 12,920	See vehicle characteristics
LENGTH, travel position (m)	11.73	8.14		13 (estimated)	
WIDTH, travel position (m)	2.45	2.35		2.79	
HEIGHT, travel position (m)	2.55	2.46		2.76	
FIRE CONTROL	direct fire sight and panoramic telescope	direct fire sight and panoramic telescope	direct fire sight and panoramic telescope	INA	INA
AMMUNITION (types)	Frag-HE, APC-T, smoke (target marker), illuminating, chemical	Frag-HE, HEAT-SS, CP, smoke, chemical, incendiary, illuminating, flechette, nuclear, scatterable mines (AT and AP), SLP, probable RAP.	Frag-HE, HEAT-SS, CP, smoke, chemical, incendiary, illuminating, flechette, nuclear, scatterable mines (AT and AP), SLP, probable RAP.	Frag-HE, nuclear, chemical, AP-T	Frag-HE, nuclear, chemical, AP-T
PERFORMANCE					
Elevation (°)	-2.5 to +45	-5 to +63	-4 to +60	-2.5 to +57	-3 to +65
Traverse (°)	50 total	58 total	360	50 total	INA
Maximum range (m)	27,490	17,230*	17,230*	28,000**	28,000**
Muzzle velocity (m/sec)	930 (Frag-HE, APC-T, smoke), 687 (illuminating)	700 (Frag-HE)	700 (Frag-HE)	800 (Frag-HE)	800 (Frag-HE)
Rate of Fire					
Maximum (rd/min)	5-6	5	4	5-6	4-5
Sustained, 1st hr (rd)	70	65	60	INA	INA
Armor penetration (mm @ 0° obliquity @ 1,000 m)	240 (APC-T)	INA	INA	INA	INA
UNIT OF FIRE (rd)	80	60	60	INA	INA
BASIC LOAD ONBOARD (rd)	NA	NA	about 46	NA	25
EMPLACEMENT/DISPLACEMENT TIME (min)	4/4	5/5	1/1 (indirect fire missions)	5/10	2/2
DOI	1954	1955	1973	since 1978	1981
STATUS	limited standard	standard	standard	standard	standard

FOOTNOTES: *Also known to have extended-range capability of 20,500 meters
**Also known to have extended-range capability of 33,000 meters.

ARMAMENT CHARACTERISTICS	203-MM HOWITZER B-4 (M1931) and B-4M (M1931)	20 SP
CREW	14+	4 (estimated)
WEIGHT		
Firing position (kg)	17,700/15,500*	See vehicle
Travel position (kg)	24,000/21,800*	
LENGTH, travel position (m)	1120	
WIDTH, travel position (m)	2 70	
HEIGHT, travel position (m)	280	
FIRE CONTROL	panoramic telescope	INA
AMMUNITION (types)	HE CP, nuclear	Frag-HE, CP
PERFORMANCE		
Elevation (°)	0 to *60	0 to + 5 5
Traverse (DI)	20 total	30 total
Maximum range (m)	18,025 (B-4M)	37,500**
Muzzle velocity (m/sec)	601 (HE)	INA
Rate of fire		
Maximum (rd/min)	0 5	1
Sustained, 1st hr (rd)	20	INA
Armor penetration (mm @ 0° obliquity @ 1,000 m)	NA	NA
UNIT OF FIRE (rd)	40	INA
BASIC LOAD ON-BOARD (rd)	NA	INA
EMPLACEMENT/DISPLACEMENT TIME (min)	60+/60+	INA
DOI	B-4 1931 B-4M; post-WWII	1975
STATUS	8 4 obsolete B-4M limited standard	standard

FOOTNOTES: *B-4/B-4M
**Also known to have extended-range capability of 50,000 meters.

76-mm Mountain Gun M1966

M1966**DESCRIPTION:**

The M1966 has split box-section trails and a relatively small, two-piece, flat-sloped shield with winged sides and a scalloped top. The shield has large wheel cutouts for the swing-axle-mounted wheels. There is a direct fire sight aperture in the left shield section. The shield lacks a sliding central section.

CAPABILITIES:

The weapon may break down into two animal loads for transport. A light truck can tow it when it is fully assembled. This gun can probably fire the same projectiles as the 76-mm field gun

ZIS-3 (M1942). Its maximum range is between 10,500 and 11,500 meters.

REMARKS:

The M1966 first appeared publicly during a 1966 Soviet May Day parade in Baku. It probably replaces the 76-mm mountain gun M1938 since it has improved performance over the older weapon. This gun is rarely seen in the USSR and is not known to be deployed outside the USSR. Some MRDs may use it in mountainous terrain. The GAZ-66 truck can tow it. Helicopters can air-lift both the gun and prime mover.

2S9



DESCRIPTION:

The 2S9 is an amphibious, 120-mm SP howitzer mounted on a stretched version of the BMD chassis. The chassis of the BMD is light enough for air insertion of the weapon, but is also strong enough for the recoil of the 120-mm howitzer. The large turret is in the middle of the chassis, which has six road wheels. The smooth barrel has no bore evacuator or muzzle brake.

CAPABILITIES:

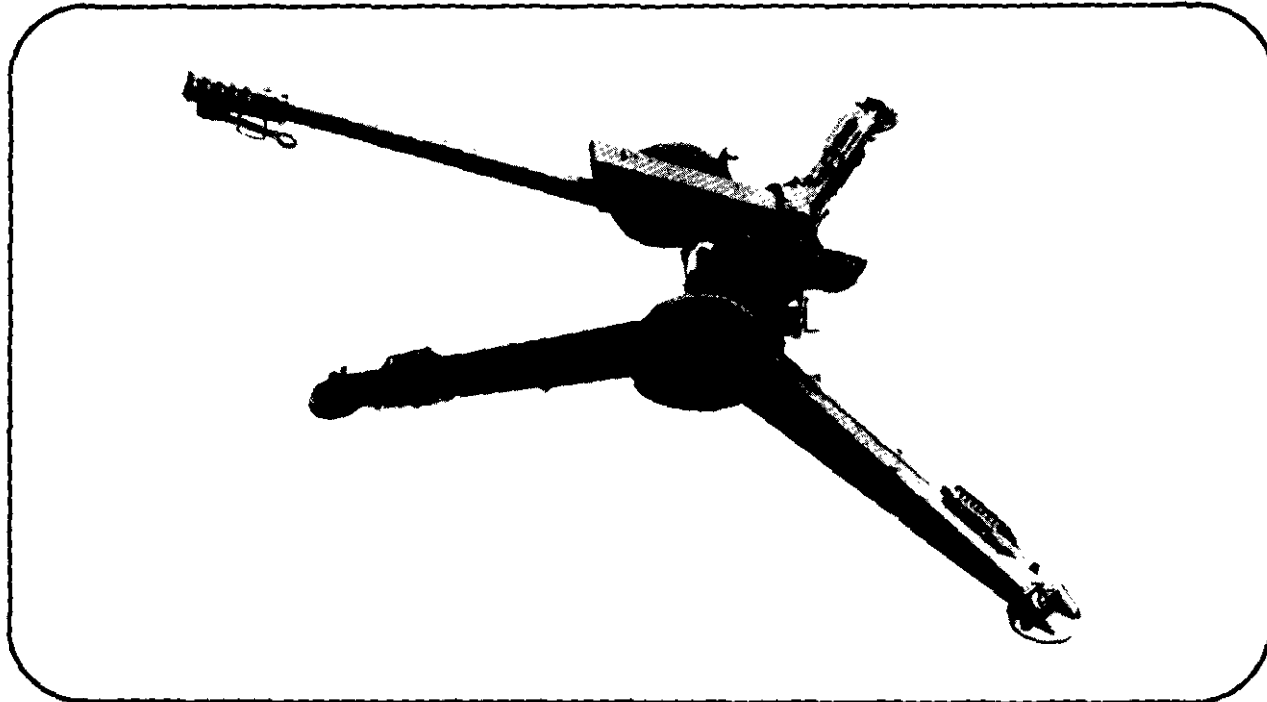
Airborne and air assault units employ this SP howitzer. It significantly increases their organic fire support capabilities. The 2S9 can move rapidly cross-country with the BMD-equipped forces. In addition to the normal trajectory of the howitzer, the 2S9 can fire upon reverse slopes with a mortar

capability. This is especially useful in mountainous terrain. Besides conventional Frag-HE, the 2S9 can probably fire HEAT rounds in a limited antitank/antiarmor role.

REMARKS:

The 2S9 was previously known as the M1981 in the West. Its Soviet nickname is Anona (custard apple). It first appeared publicly during the May 1985 parade in Moscow. It may replace the 120-mm mortar in airborne regiments and towed artillery in airborne divisions. Various Western sources have erroneously termed this versatile weapon a "gun/mortar" or "gun/howitzer." It actually combines the functions of a mortar and a howitzer.

122-mm Howitzer D-30

D-30**DESCRIPTION:**

The D-30 has a unique three-trail carriage, a conspicuous box-like shield for the recoil-recuperator mechanism mounted above the tube, and a small protective shield which is fitted between the wheels. The gun has a semiautomatic, vertically sliding, wedge-type breechblock. A truck (Ural-375 or ZIL-131) or armored tractor can tow it at speeds up to 80 kilometers per hour. It is towed muzzle-first by a large lunette just under the muzzle brake, with its trails folded under the barrel. Early models of the D-30 had a multibaffle muzzle brake; more recent models have a double-baffle muzzle brake similar to that used on the SP version 2S1.

CAPABILITIES:

The D-30 may be organic to the howitzer battalion of BTR-equipped MRRs and to the artillery regiment of MRDs, TDs, and airborne divisions. Its maximum effective range is 15,300 meters.

In firing position, the crew of eight unhitches the gun; it lowers the central emplacement jack, raising the wheels high enough to clear the trail legs; and it spreads the two outer trails 120 degrees on each side. The revolving mount permits 360

degrees traverse and is equipped for high and low angles of fire. This makes the D-30 fully suitable for antitank defense.

The D-30 fires a variable-charge, case-type, separate-loading ammunition. It has a special non-rotating, fin-stabilized HEAT projectile which allows it to effectively engage armored vehicles with direct fire. The D-30 can also fire a flechette round.

LIMITATIONS:

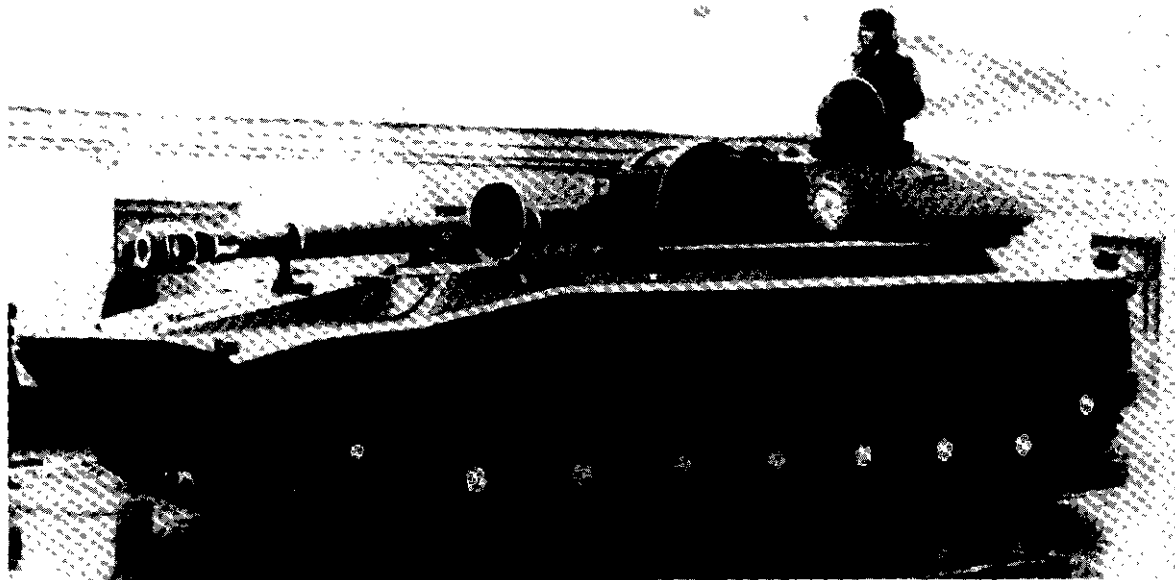
It is doubtful that full elevation is possible when the breech is directly over a trail leg.

REMARKS:

The D-30 was formerly known as the M1963. It replaces the older 122-mm howitzer M-30 (M1938). Introduced in 1963, the D-30 is now in service throughout the USSR and Warsaw Pact forces. The USSR has also exported it to other countries. The D-30 is probably still in production; however, the 2S1 may eventually replace it in some BTR-equipped MRRs.

122-mm Self-Propelled Howitzer 2S1

2S1

**DESCRIPTION:**

The chassis of the 2S1 somewhat resembles that of the PT-76. However, the 2S1 is mounted on a chassis derived from the MT-LB, known as the MT-LBu. The 2S1 has seven road wheels (versus six for either PT-76 or MT-LB) and no return rollers. Its drive sprocket is at the front, and the idler is at the rear. Like the MT-LB, the 2S1 can use two different widths of track. The wider tracks lower the ground pressure and facilitate travel over soft terrain. The amphibious 2S1 is propelled through the water by its tracks.

The boat-like hull contains the engine compartment at the right front. The driver's compartment is at the left front, with the driver's hatch to the left of the gun tube. A low-silhouette, rotating turret tops the fighting compartment in the rear of the hull. Atop the all-welded turret are the commander's cupola (with its single hatch cover) on the left and the loader's hatch on the right. The gunner, also located in the left side of the turret, has no hatch. The commander and driver have IR night sighting equipment; however, there is no IR gunnery equipment. An interesting feature on the turret is the teardrop-shaped port cover on the left front near the gunner's position. The 2S1 has a direct fire sight besides its panoramic telescope. The vehicle has a collective NBC overpressure and filtration protective system.

The long 122-mm howitzer on the rounded front of the turret derives from the towed 122-mm howitzer D-30. The double-baffle muzzle brake is flush with the forward edge of the hull; the bore evacuator is midway along the tube.

The 2S1 is distinguished from the 152-mm SP howitzer 2S3 by its smaller turret and less massive gun. The 2S1 also has a single unit shield for the recoil-recuperator mechanism above the tube. The 2S3 has two separate cylinders above the tube. Also, the tube of the 2S1 does not extend beyond the front of the vehicle, while the 2S3 tube does.

CAPABILITIES:

The 2S1 is organic to the howitzer battalions of BMP-equipped (and some BTR-equipped) MRRs and TRs. Since it is tracked and amphibious, it has the cross-country capability necessary to keep pace with supported BMPs and tanks. It has a maximum range of 15,300 meters. The Soviets use it extensively in a direct fire role against armored vehicles or in breaching minefields and other obstacles.

The vehicle has a relatively light weight of less than 16 metric tons. It also has a ground pressure of approximately 0.5 kilograms per square centimeter. This allows it to operate in swamps and

122-mm Self-Propelled Howitzer 2S1 (continued)

deep snow and also contributes to its amphibious capability. Track drive propels it in water as well as on land. The light weight and low profile also make air-lifting easier. The tightly sealed hull with its filtration system enables the 2S1 to operate in irradiated or contaminated zones as well as under heavy dust conditions. The turret has a ball-bearing race and an electric drive for rapid traverse, although precise aiming is performed with a manual drive. A ramming mechanism speeds up the loading process, and the gun ejects fired cases automatically.

LIMITATIONS:

Because of its light weight, the 2S1 offers only slight armor protection for its four-man crew.

REMARKS:

The 2S1 appeared in public for the first time in 1974. It had the provisional designation M1974. Although the 2S1 has been variously termed a gun, a gun-howitzer, or a howitzer, the Soviet press calls it a howitzer. Its introduction coincided with the expansion of the Soviet MRR's artillery battery to a battalion and with the introduction of the ACRV 1V12 series, which is associated with SP artillery units. The SP howitzer 2S1 provides the Soviet Army with highly mobile firepower that fits neatly into its doctrine of the offensive. Some non-Soviet Warsaw Pact armies also use it. Newer 122-mm howitzers may have a nuclear capability.

130-mm Field Gun M-46

M-46**DESCRIPTION:**

The 130-mm field gun M-46 has a recognizable long, thin tube with a cylindrical, perforated (pepperpot-type) muzzle brake. It has a hydro-pneumatic recuperator and a recoil cylinder located above and below the tube, respectively. For travel, the crew withdraws the tube from battery to reduce the overall length of the weapon. The rearward-angled, winged shield may then hide the recuperator above the tube from sight. The gun has a manually operated horizontal sliding wedge breech-block. It fires case-type, variable-charge, separate-loading ammunition. It has night direct fire sights (IR and/or passive in nature).

The gun is mounted on a two-wheeled split trail carriage with large sponge-filled rubber tires on each of the single wheels. For travel, it has a two-wheeled limber. A truck or armored tractor can tow it at speeds up to 50 kilometers per hour. The trails consist of steel plates welded into box-section construction.

CAPABILITIES:

Gun battalions of artillery brigades organic at front and army levels use the M-46. These battalions may be assigned to maneuver divisions as part of a divisional artillery group (DAG).

The M-46 is an excellent indirect fire weapon with high muzzle velocity and exceptional range (27,490 meters). It is also a formidable antitank weapon with impressive armor penetration capability. Its tactical role usually is counterbattery.

REMARKS:

The M-46 first appeared in public in May 1954. The West originally knew it as the M1954. The armies of many countries, both communist and noncommunist, still use it. Since 1978, however, two new nuclear-capable guns, the 152-mm field gun 2A36 and the 152-mm SP gun 2S5, have begun to replace the M-46 in Soviet forces.

152-mm Gun-Howitzer D-20

D - 2 0**DESCRIPTION:**

The D-20 uses the same carriage as the obsolescent 122-mm field gun D-74. This short, split-trail carriage has distinguishable features: caster wheels, folded upward for travel, at the end of each trail; a prominent central emplacement jack connected to the bottom forward cradle; and a scalloped, winged shield with traveling central portion. The tube, however, differs from that of the D-74 in that it is much shorter (29 versus 47 calibers) and larger in diameter, and has a larger double-baffle muzzle brake. Both guns have a two-cylinder recoil mechanism above the tube; both tubes are prominently stepped, with a semi-automatic, vertically sliding, wedge breechblock. Both guns also fire similar case-type, variable-charge, separateloading ammunition.

CAPABILITIES:

The D-20 is organic to the artillery division of a Soviet front and to the artillery brigade of a TA or CAA. The circular emplacement jack and caster wheels make it possible to rotate the whole gun swiftly up to 360 degrees. The gun also has direct fire sights for both day and night. It can

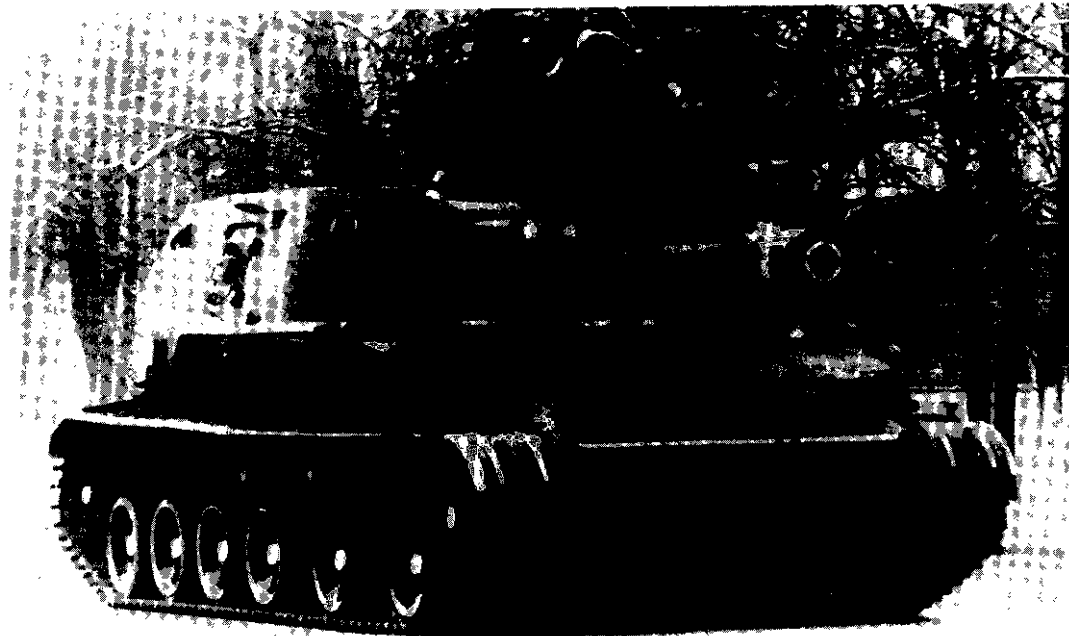
engage armored targets with direct fire. A truck or armored tractor (AT-L) can tow it.

LIMITATIONS:

The D-20 is a very large gun-howitzer, equating to 6-inch caliber. It is heavy for a simple towed carriage. Its restricted mobility, however, is somewhat compensated for by its range.

REMARKS:

The D-20 was formerly known as the M1955 or M-55. First introduced in 1955, it replaced the heavier, less powerful, 152-mm gun-howitzer ML-20 (M1937) in the Soviet and Warsaw Pact inventory. It is now organic to army/front-level artillery while the SP version 2S3 is in the artillery regiment organic to MRDs and TDs. All Warsaw Pact armies except Bulgaria now import the D-20. The Soviet Army is now introducing a new 152-mm gun-howitzer 2A65. The 2A65 has an extended range of 30,000 meters and a conventional maximum 24,000-m range. It fires the same rounds as the D-20, including a semiactive laser-guided projectile (SLP).

**DESCRIPTION:**

The 2S3 comprises a modified version of the 152-mm towed gun-howitzer D-20 and a chassis similar to the SA-4/GANEF launch vehicle. The thick tube extends beyond the front of the hull by the length of the double-baffle muzzle brake. It differs from the D-20 in its addition of a bore evacuator just behind the muzzle brake; a brace attached just behind the bore evacuation supports the tube in travel position. The running gear differs from that of the SA-4 in that it has only six road wheels (with larger spaces between the three front wheels only) and different spacing between the four support rollers.

The driver sits in the left front of the vehicle, with the engine located on the right side. The commander sits at the left center of the turret, with the gunner in front of him. The loader is at the right side of the turret. The crew uses a hatch in the rear of the hull for loading ammunition. There is also a large hatch on the right side of the turret for loading ammunition and discarding expended brass. The commander's cupola mounts a 7.62-mm machine gun.

CAPABILITIES:

The 2S3 provides highly mobile, all-terrain fire

support for MRDs and TDs. Its maximum range of 17,230 meters with a Frag-HE round is the same as that of the 152-mm towed gun-howitzer D-20. It also fires a RAP round to an extended range of 20,500 meters. Unlike the 122-mm SP howitzer 2S1, it is not amphibious.

LIMITATIONS:

The twin recuperators above the tube restrict the elevation to +63 degrees. Armor is thin-skinned, providing only minimum protection for the four-man crew.

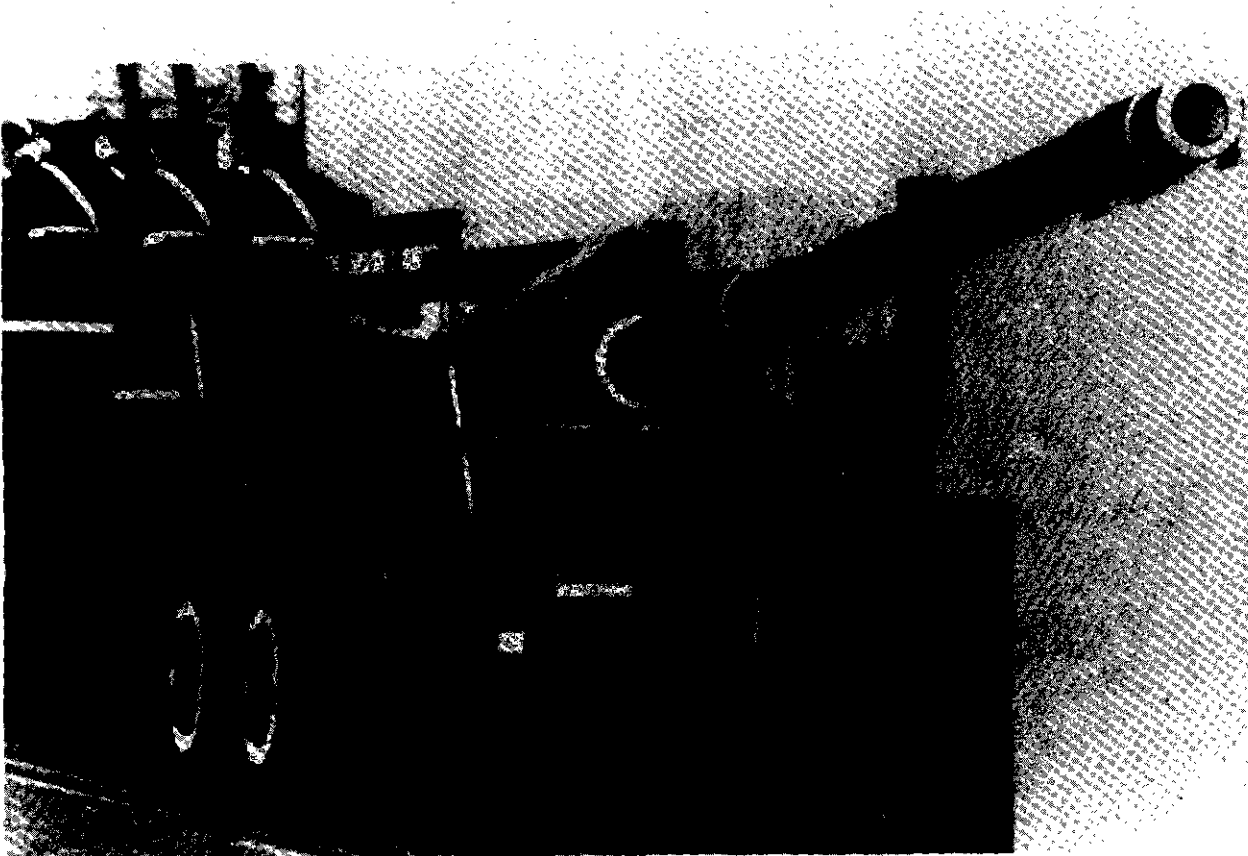
REMARKS:

The 2S3 first appeared in the Soviet inventory in 1973. It somewhat resembles the US 155-mm SP howitzer M-109.

Since its introduction, the 2S3 has gradually been replacing two other systems: the towed 152-mm howitzer D-1 (M1943) in the artillery regiment of MRDs, and the towed 122-mm howitzer D-30 in the artillery regiment of both MRDs and TDs. Also, the 2S3 is currently replacing some towed 152-mm artillery in the front-level artillery division. The Soviet Army is now introducing a new 152-mm SP gun-howitzer 2S19. It probably has the same range as the towed 2A65.

152-mm Field Gun 2A36

2A36

**DESCRIPTION/CAPABILITIES:**

The towed, nuclear-capable 152-mm field gun 2A36, along with its SP counterpart 2S5, is replacing the 130-mm field gun M-46 in the gun battalions organic to artillery brigades at front and army levels. This gun has a distinctive four-wheeled carriage. The Soviets have fielded it since 1978 and now deploy it in their forces in Eastern Europe. This deployment suggests the importance that Soviet doctrine places on the capability to deliver low-yield nuclear strikes relatively close to

Soviet forces. It also shows the importance the Soviets continue to place upon towed artillery for supporting fires. The 2A36 has a maximum range of 28,000 meters and an extended range of 33,000 meters.

REMARKS:

The provisional designation for the 2A36 was M1976.

2S5

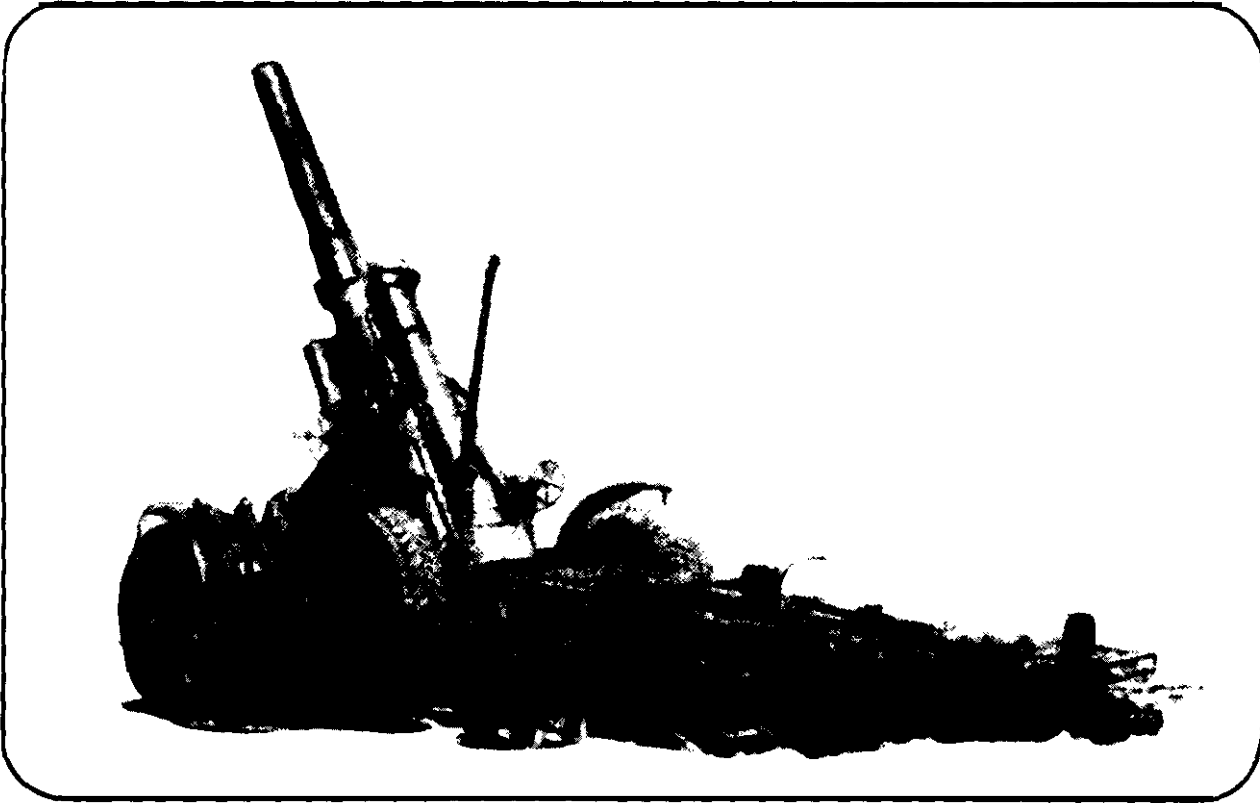


DESCRIPTION/CAPABILITIES:

The 152-mm SP gun 2S5 was previously known as the M1981. It is an unturreted gun mounted on a six-road-wheeled tracked chassis similar to that of the 152-mm SP howitzer 2S3. The nuclear-capable 2S5, along with its towed counterpart 2A36, is replacing the 130-mm field gun M-46 in gun battalions organic to artillery brigades at army level. The Soviets fielded it in 1981 and deployed it with their forces in Eastern Europe

during 1982. This deployment is part of an upgrade of Soviet nuclear and conventional theater forces. It indicates the importance Soviet doctrine places on the capability to deliver low-yield nuclear strikes relatively close to Soviet forces. Both the 2S5 and the 2A36 have a maximum range of 28,000 meters and an extended range of 33,000 meters.

203-mm Howitzer M1931(B-4M)

M1931 (B-4M)**DESCRIPTION:**

The 203-mm howitzer M1931 (B-4) has a relatively short tube, only 25 calibers long. It has a hydraulic recoil buffer, a hydropneumatic recuperator, and a screw-type breechblock. It fires bag-type, variable-charge, separate-loading ammunition. Early models used a full-track, but not SP, carriage in firing position and for short moves. For longer moves, the tube was removable for transport on a separate four-wheeled tube transporter. On later models (B-4M), a large four-wheeled carriage replaced the tracked one to permit long moves without removing the tube. In firing position, the wheels of the B-4M are raised, and the weapon rests on a firing platform. Both models use the same box trail and are towed by the AT-T tracked artillery tractor.

CAPABILITIES:

The M1931 fires a 98.8-kg HE round to a maximum range of 18,025 meters. The Soviets

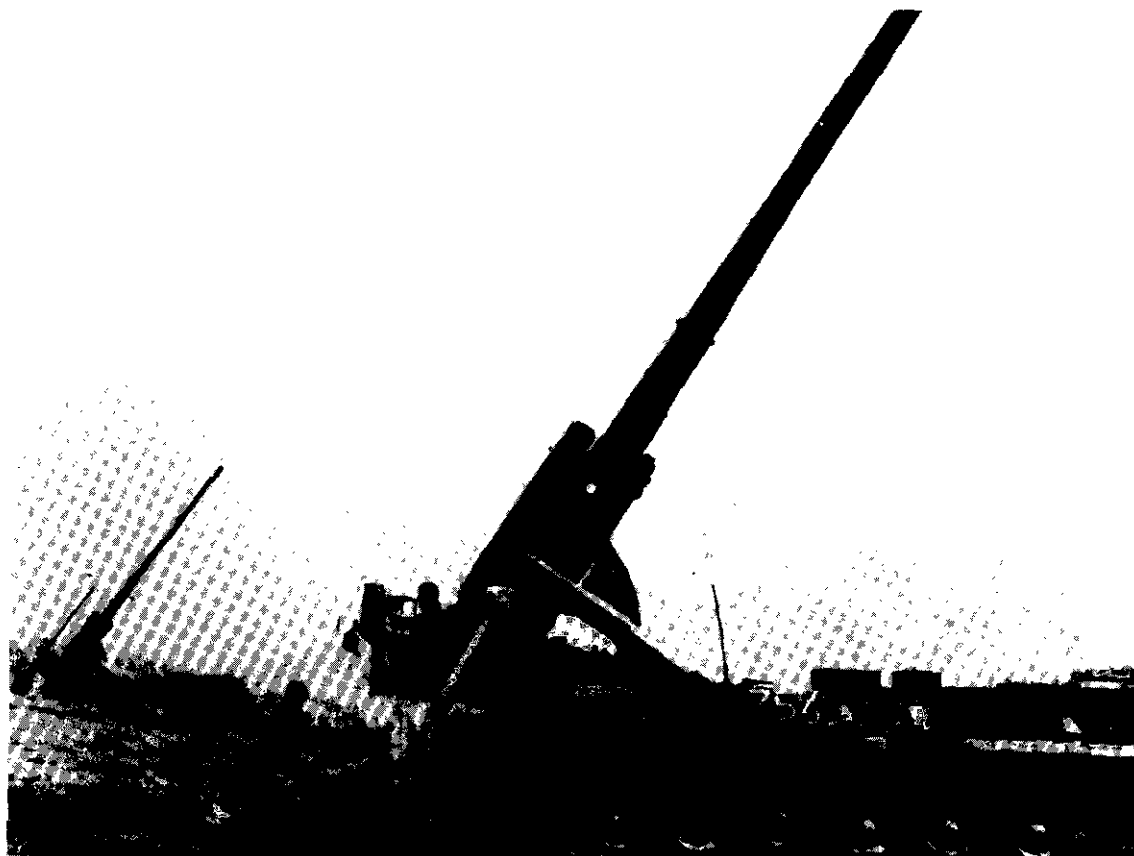
have adapted it to fire a nuclear round.

LIMITATIONS:

The M1931 has a very limited traverse of 10 degrees in either direction and a slow rate of fire of 0.5 rounds per minute. (Some reports indicate that the rate of fire is one round per minute.) When towed, it must employ a two-wheeled limber (front running gear).

REMARKS:

The M1931 (B-4) is a rather old weapon. The Soviets developed it in 1931 and adopted it for service in 1934. The modified version (B-4M) with four-wheeled carriage appeared only after World War II. It may be found in the high-powered artillery brigade at front level. The 203-mm SP gun 2S7 is now replacing the B-4M. The 2S7 mounts on a tracked chassis.



DESCRIPTION:

The 2S7 is an unturreted gun mounted on a long, tracked chassis. It has seven evenly spaced, T-80-type road wheels and six support rollers. The drive sprocket is at the front of the suspension. The idler wheel at the rear can be lowered hydraulically all the way to the ground, along with the large, dozer blade-like spade on the rear of the vehicle; this gives the SP gun increased stability during firing.

The boat-like bow projects far beyond the front of the suspension. Extending across the entire width of the bow is an armored cab for the driver and crew. The cab has two windows, which can be covered with steel shutters; it also has an NBC collective protection system. Located directly behind the cab is the engine compartment, with rectangular exhaust vents on both sides of the hull.

The massive gun tube is mounted well to the rear, extending far beyond the front of the vehicle. In travel position, it is secured by a tie-down ring attached to the center of the cab roof. The tube has no muzzle brake but has a slight thickening at the muzzle. Above and below the rear of the gun tube are the recoil cylinder and recuperator. The power-assisted loading mechanism is on the right side of the breech; the gunner sits on the left side of the breech; and the cannonier services the gun from a platform on the left rear of the vehicle. A radio antenna is mounted atop the left side of the hull, roughly above the fifth road wheel.

CAPABILITIES:

The 2S7 is organic to the high-powered artillery brigade, which may be allocated to a front.

3-mm Self-Propelled Gun 2S7(continued)

gun has a maximum range of 37,500 meters and an extended range of 50,000 meters. It can fire nuclear projectiles, as well as other ammunition types.

LIMITATIONS:

The open gun mount provides no protection for the four-man crew in firing position.

REMARKS:

The West first observed the 2S7 in 1975. It had the provisional designation M1975. It replaced the older 203-mm howitzer M1931 (B-4M) in high-powered artillery brigades. In some cases, the 2S7 may also be organic to the artillery division at front level; for example, in WGF. The 2S7 chassis may derive from the same type chassis as the heavy tracked artillery tractor MT-T. It is also similar to the SA-12 SAM system vehicle.

Mortars

Mortar characteristics

CHARACTERISTICS	82-MM MORTAR M1937 (1942-43 VERSION)	82-MM AUTOMATIC MORTAR 2 B 9	120-MM MORTAR M1943	120-MM MORTAR 2B11 (M-120)	120-MM SP MORTAR 2S12 (M-120)	160-MM MORTAR M-160	240-MM MORTAR M-240	240-MM SP MORTAR 2S4
DOI STATUS	1943 obsolescent	1983 standard	1943 standard	early 1980s standard	early 1980s standard	1953 standard	1952 limited standard	1975 standard
CREW	5	3	6	INA	INA	6-7	8-9	INA
CALIBER (mm)	82	82	120	120	120	160	240	240
WEIGHT								
Total (kg)	55.8	800	521.5	INA	INA	1,314	4,240	INA
Firing Position (kg)	55.8	INA	283.5	INA	INA	1,291	3,610	INA
MOUNT (type)	baseplate and bipod	split-trail carriage, with emplacement jack	baseplate and bipod	baseplate and bipod	GAZ-66 truck	baseplate and wheels	baseplate and wheels	SP, tracked chassis
BASEPLATE WEIGHT (kg)	35*	NA	94**	INA	INA	240 (baseplate normally not detached)	685 (baseplate normally not detached)	INA
SIGHTING DEVICE	collimator sight, MP-42	INA	collimator sight, MP-42	INA	INA	panoramic tele- scope, MP-46M (on-carriage); collimator (off- carriage)	panoramic tele- scope, MP-46M (on-carriage); collimator (off- carriage)	INA
AMMUNITION (types)	Frag-HE, smoke, illuminating, incendiary	Frag-HE, smoke, illuminating, incendiary, possible chemical	Frag-HE. HE. smoke, illumi- nating, incen- diary, possible chemical	Frag-HE, smoke, illumi- nating, incen- diary, possible chemical	Frag-HE. smoke, illumi- nating, incen- diary, possible chemical	HE	HE, nuclear, chemical	HE, nuclear, chemical
PERFORMANCE								
Elevation (c)	+45 to +85	0 to +85	+45 to +80	INA	INA	+50 to +80	+45 to +70	INA
Traverse (c)	10 total	20 total	6 total	INA	INA	25 total	17 total	INA
Maximum range (m)	3,040	5,000	5,700	7,200	7,200	8,040	9,700***	9,700***
Minimum range (m)	90	100	500	460	460	750	800	800
Rate of Fire								
Maximum (rd/min)	25	40-60	9	10	10	3	1	INA
Sustained, 1st hr (rd)	210(10-finrd) 140(6-finrd)	INA	70	INA	INA	48	38 (25 with heaviest charge)	INA
Muzzle velocity (m/sec)	210.5 (Frag-HE)	INA	272 (Frag-HE. HE)	INA	INA	343 (HE)	362 (HE)	INA
UNIT OF FIRE (rd)	120	INA	80	INA	INA	80	40	INA
EMPLACEMENT/DIS- PLACEMENT TIME (min)	varies	varies	varies	varies	varies	varies	varies	INA

FOOTNOTES *23.5 kilograms for bipod.

**68 kilograms for bipod.

***Also known to have emended-range capability of 20,000 meters.

82-mm Automatic Mortar 2B9

2B9

Soldat und Technik

DESCRIPTION:

The 82-mm automatic mortar 2B9 differs vastly from earlier mortars in its appearance. It uses a conventional artillery carriage with split trails and an emplacement jack located at the front. In the firing position, the jack is lowered and the wheels pivot forward, lifting off the ground. This permits the three-man crew to rapidly traverse and shift the fires of the weapon. The GAZ-66 truck may tow or carry the mortar.

CAPABILITIES:

The 2B9 is breech-loaded with ammunition fed automatically from 4-round ammunition clips. It can also be hand-loaded. In the photo above, the loader in the foreground is holding one clip; another clip is already on the loading tray on the right of the mortar.

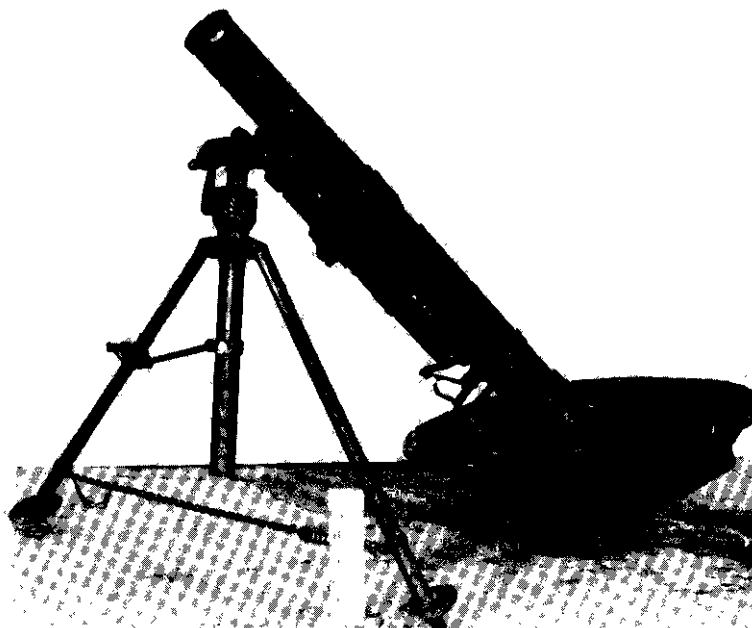
The 2B9 has a maximum range of 5,000 meters, a minimum range of 100 meters, and a 10-degree traverse in either direction. It fires Frag-HE, illuminating, incendiary smoke, and possibly

chemical rounds. The Soviet press has reported a (cyclic) rate of fire of up to 120 rounds per minute. However, the practical rate of fire is approximately 40 to 60 rounds per minute; a 4-round burst leaves the tube in as little as 2 seconds. This quick volume of fire considerably increases the shock effect of the first burst of fire on targets such as infantry and crew-served weapons. The mortar has a shorter minimum range than the M1943: 100 versus 500 meters. This and an increased rate of fire significantly improve the firepower of an MRB. The 2B9 serves as an alternative to 120-mm mortars in some MRBs.

REMARKS:

The Soviet nickname for the 2B9 is Vasilek. (This is pronounced va-sil-YOK and means "cornflower.") The Soviets used an SP version mounted on the rear deck of the MT-LB tracked armored vehicle in Afghanistan. It had the mortar elevated on steel boxes and its carriage wheels removed.

M1943



DESCRIPTION:

The M1943 is a conventional, muzzle-loading, smoothbore mortar with a large circular baseplate. For movement over short distances, it can quickly break down into three parts: barrel, bipod, and baseplate. For normal travel, the whole weapon folds together, and a GAZ-66 truck tows it on a two-wheeled tubular carriage. It also can travel in the truck's bed. If necessary, animals can pack the mortar in its three parts.

CAPABILITIES:

The M1943 is standard equipment in the mortar battery of an MRB (in MRRs and in the TR of the TD), in the mortar battery of an assault or parachute battalion (in air assault or airmobile assault brigades), and in the mortar battery of an airborne regiment. Each battery has six or eight tubes.

This mortar can be drop-or lanyard-fired. The Soviets have retrofitted it with a special muzzle device to prevent double loading. The outer casing of the HE ammunition can consist of either wrought or cast iron. The latter is more effective against personnel, but slightly reduced in maximum range. The baseplate mounting of the M1943

permits all-azimuth firing. The M1943 has a maximum range of 5,700 meters and a minimum range of 500 meters.

LIMITATIONS:

As with most Soviet mortars, the M1943 is difficult to turn rapidly over a wide traverse. However, it can accommodate small-angle shifts (of up to 6 degrees) without shifting the bipod.

REMARKS:

The M1943 is also known simply as M43. The Soviets first introduced it in 1943 as a modified version of the older 120-mm mortar M1938. It differs from the M1938 in having longer shock absorber cylinders and more sophisticated elevating and traversing gear. Although the M1943 has virtually replaced the M1938 as the mortar of the Soviet infantry battalions, the armies of other Warsaw Pact nations have both models. However, the new 120-mm mortar M-120 and 82-mm automatic mortar 2B9 (the Vasilek) are now replacing the M1943 in the Soviet Army.

120-mm Mortar 2B11 (M-120)

2B11

Soviet Military Review

DESCRIPTION:

The 120-mm mortar 2B11 resembles the older M1943 version, with several improvements. Like the M1943, the 2B11 has a special safety device to prevent double loading when the mortar round is not fired or not removed from the tube. When a round is loaded, it trips a tab on the tube, preventing another round from being loaded. This tab shifts to the "ready" position when the round fires, allowing the 2B11 to be reloaded. The 2B11 is mounted on a lightweight carriage for towing by either the GAZ-66 or UAZ-469 light trucks.

CAPABILITIES:

The rate of fire is 10 rounds per minute with 6 seconds required to reload the tube for the next firing. The 2B11 mortar can fire a projectile weighing almost 16 kilograms to a maximum range

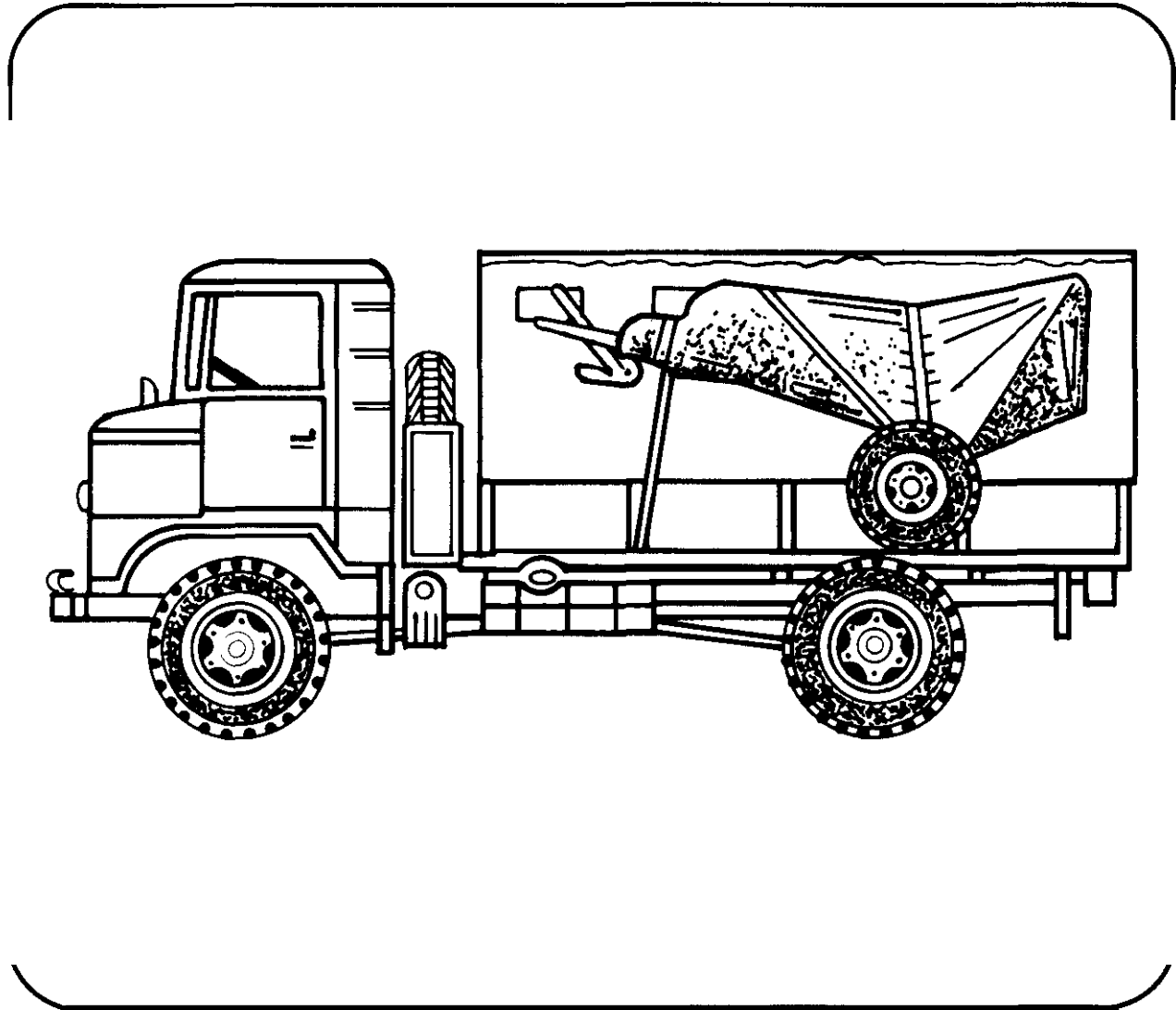
of 7,200 meters. It has a minimum range of 460 meters and is nine times lighter than a 122-mm howitzer.

The 2B11 is organic to the mortar batteries of MRRs and airborne regiments. Each battery has six or eight tubes.

REMARKS:

The 120-mm mortar originally identified as M-120 has at least two versions. The Soviets call the towed version 2B11 and the self-propelled version 2S12. Some mortar batteries have replaced the older 120-mm mortar M1943 with the 2B11, others with the 2S12. Still other batteries employ the 82-mm automatic mortar 2B9 (Vasilek).

2S12 on GAZ-66



DESCRIPTION:

The 2S12 is a self-propelled version of the 120-mm mortar 2B11 (M-120) carried on the bed of a GAZ-66 truck.

CAPABILITIES:

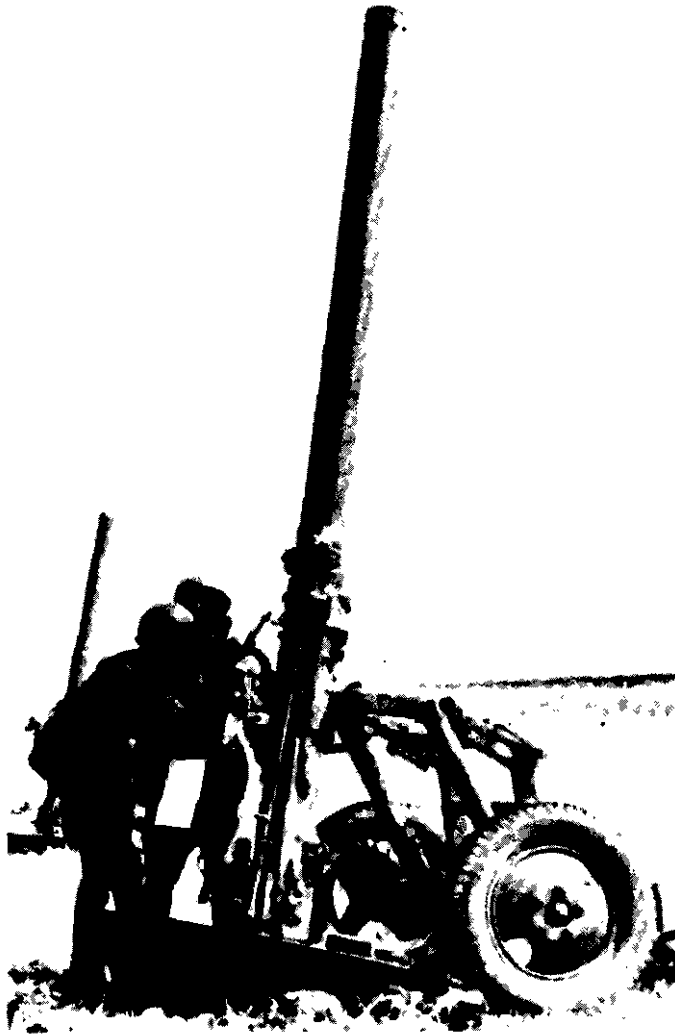
Same as for 2B11. The SP model provides even more mobility for this versatile mortar.

REMARKS:

The Soviet nickname for the 2S12 is Sani (sled). There are also reports of the 2S12 mounted on a modified MT-LB chassis.

160-mm Mortar M-160

M-160

***DESCRIPTION:***

The 160-mm mortar M-160 is a breech-loaded, trigger-fired weapon. It has a relatively long tube, a large circular baseplate with four lifting handles, and permanently attached wheels. The GAZ-66 general purpose cargo truck normally tows it.

CAPABILITIES:

The crew releases the entire tube from the base and rotates it to a horizontal position for loading. A tray-served round then is hand-rammed into the breech end of the tube. The crew returns the tube

to the firing position and fires the round with lanyard attached to the trigger. The M-160 has a maximum range of 8,040 meters and a minimum range of 750 meters.

REMARKS:

The Soviets introduced the M-160 in 1953 as a replacement for the older 160-mm mortar M1943. Compared to its predecessor, the M-160 has a longer tube and greater range. Some divisions have the M-160 instead of 152-mm howitzers.

M-240



DESCRIPTION:

The 240-mm mortar M-240 is the largest Soviet towed mortar. It is also the largest mortar used by any army in the world. It has a very large baseplate with star-shaped ribbing on the underside, a very long tube (5,340 millimeters), small vertical cylinders on either side of the tube just above the axle, and a collar around the tube in which the trunnions are located. A truck or tracked artillery tractor tows the M-240 muzzle-first. It also carries the ammunition and the eight-or nine-man crew.

CAPABILITIES:

The M-240 is a trigger-fired and breech-loaded mortar. It is similar in operation to the M-160. Its wheels remain attached during firing.

The M-240 has a maximum range of 9,700 meters and a minimum range of 800 meters. It fires HE, chemical, and nuclear rounds. Its maximum rate of fire is only one round per minute.

LIMITATIONS:

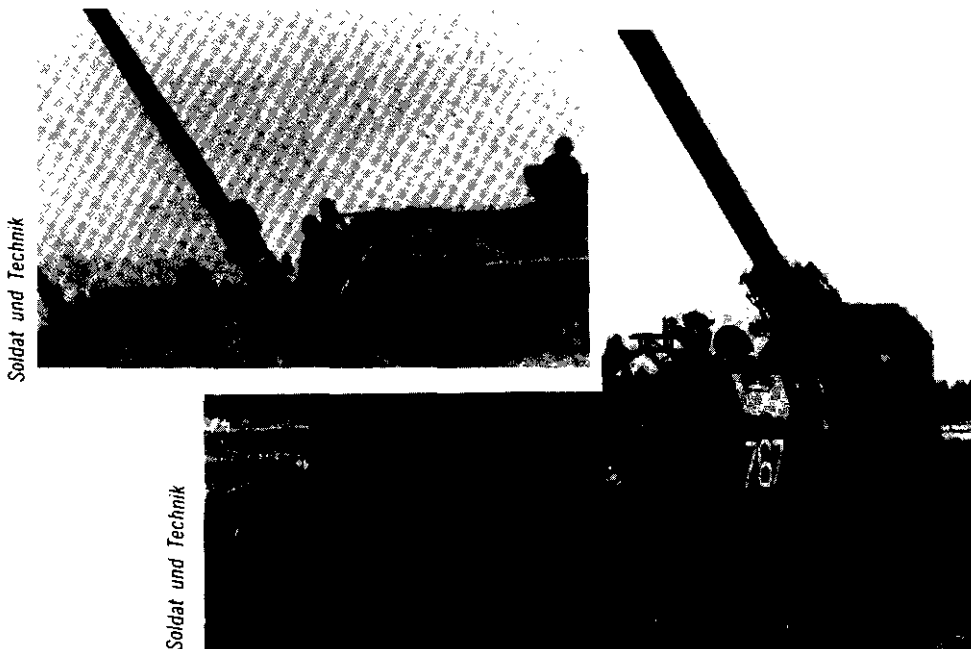
The M-240 has reasonable elevation but only limited traverse. For loading, the crew rotates the tube on its trunnions to the horizontal position. Lifting the round to the breech, which is more than five feet off the ground, is a four-or five-man task. The short range of the mortar must present a problem for deployment in a nuclear role.

REMARKS:

The Soviets first produced the M-240, also known as the M1953 or M-53, in 1952. The West first saw it in 1953. It is no longer in production. Soviet forces originally employed it in roles where US forces would use medium artillery. In recent years, they have adapted it to fire nuclear rounds and relegated it to service in some independent high-powered artillery brigades at front level. They have some in reserve stocks. The 240-mm SP mortar 2S4, believed to be a modification of the M-240 system, is now in service.

40-mm Self-Propelled Mortar 2S4

2S4

**DESCRIPTION:**

The 2S4 system comprises a heavy mortar carried in an open mount atop the same type of cracked chassis used for the SA-4 SAM system, one 2S3 SP howitzer, and the 2S5 SP gun. The suspension features six road wheels and four support rollers. It has more space between the first, second, and third road wheels. The mortar travels with its muzzle forward; the muzzle does not extend to the front of the vehicle, only even with the first road wheel. The large baseplate has flat sides, rounded corners, and a star pattern on its bottom. It is folded at a forward angle above the breech in travel position. The crew uses a remote console to hydraulically lower the mortar over the back of the vehicle into firing position. The barrel points rearward when the baseplate rests on the ground.

CAPABILITIES:

The 2S4 is organic to the high-powered artillery brigade which may be allocated to a front. The mortar is essentially identical to the towed 240-mm mortar M-240, which it is replacing. Like the M-240, it is capable of firing a standard 30-kg HE round to a maximum range of 9,700

meters. This SP version can fire to an extended range of 20,000 meters. The 2S4 can also fire chemical and nuclear rounds.

The use of the SP mount overcomes the towed M-240's significant shortcomings in mobility, greatly decreasing the emplacement/displacement time. It also circumvents serious handling and loading problems for the massive 240-mm rounds. A power-assisted rammer pushes rounds stowed in the vehicle hull into the breech of the mortar; the mortar pivots on its trunnions to bring the breech near the rear of the hull for loading.

LIMITATIONS

Like the M-240, the 2S4 has only limited traverse capability. The open mount provides no protection for the crew in firing position. The mortar's short range must present a problem when the 2S4 has a nuclear role.

REMARKS:

The 2S4 was first observed in 1975; therefore, it originally received the provisional designation M1975. It is a replacement for the towed M-240 in high-powered artillery brigades.

Rocket Launchers

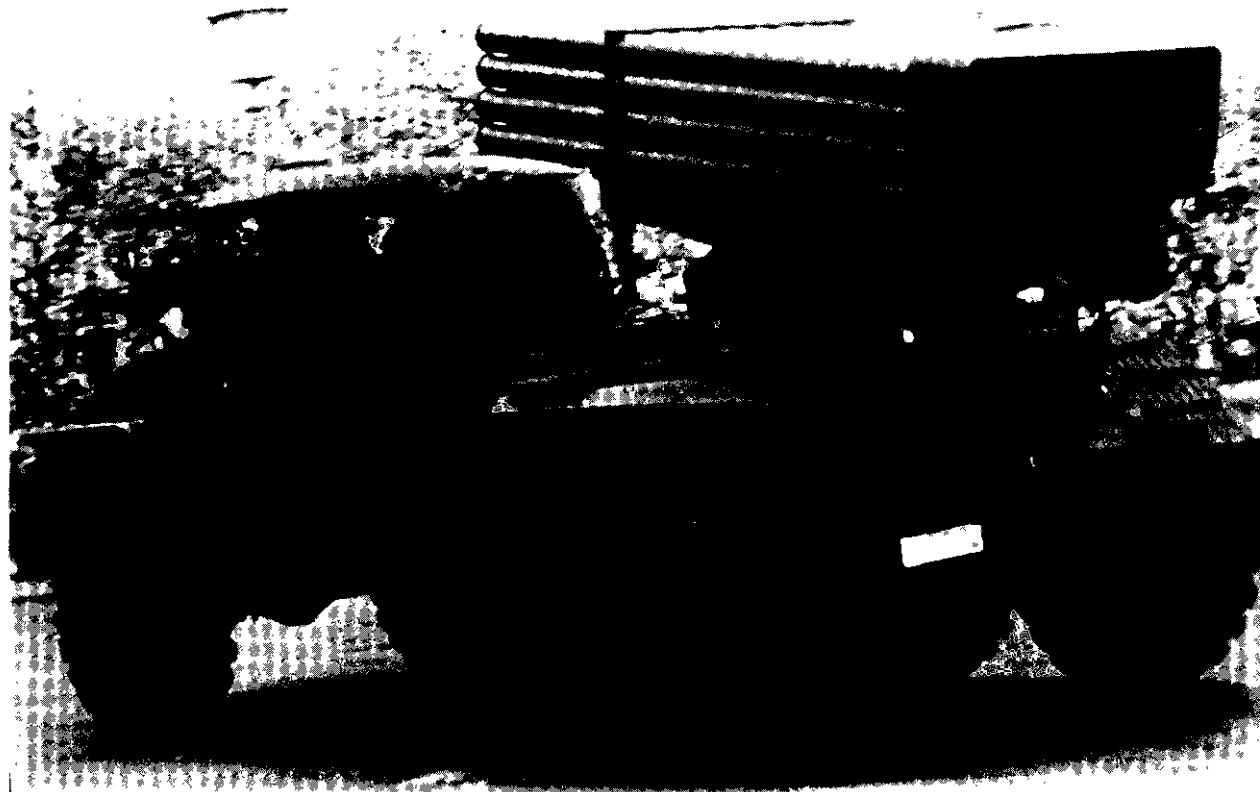
Rocket launcher armament characteristics

ARMAMENT CHARACTERISTICS	122-MM ROCKET LAUNCHER (40-RD) BM-21	122-MM ROCKET LAUNCHER (36-RD) BM-21-1	122-MM ROCKET LAUNCHER (12-RD) BM-21V	220-MM ROCKET LAUNCHER (16-RD) BM-22
DOI	1964	1976	1975	1977
STATUS	standard	standard	standard	standard
LAUNCHER				
Elevation (c)	0 to +56.5	0 to +55	0 to +50	approximately 0 to +55
Traverse (c)	168 (100 left, 68 right)	270	360	240 (estimated)
ROUND				
Caliber (mm)	122	122	122	220
Total weight (kg)	66.0	66.0	66.0	approximately 300
Length, overall (m)	2.87	2.87	2.87	4.80
Type of stabilization	fin and spin	fin and spin	fin and spin	fin and spin
RANGE				
Maximum (m)	20,380	20,380	20,380	40,000
Minimum				
Direct fire (m)	500	500	500	INA
Indirect fire (m)	1,500	1,500	1,500	approximately 5,000
WARHEAD (types)	Frag-HE, chemical, incendiary	Frag-HE, chemical, incendiary	Frag-HE, chemical, incendiary	Frag-HE, chemical (CM (scatterable AP and AT mines; frag and incendiary bomblets)
UNIT OF FIRE (rd)	120	120	120	48
EMPLACEMENT TIME, launcher preloaded (min)	2-4	2-4	3-4	INA
DISPLACEMENT TIME (min)	1-2	1-2	2-3	INA

Rocket launcher vehicle characteristics

VEHICLE CHARACTERISTICS	122-MM ROCKET LAUNCHER (40-RD) BM-21	122-MM ROCKET LAUNCHER (36-RD) BM-21-1	122-MM ROCKET LAUNCHER (12-RD) BM-21V	220-MM ROCKET LAUNCHER (16-RD) BM-22
CREW	5	5	2	INA
MODEL	Ural-375D (6 × 6)	ZIL-131 (6 × 6)	GAZ-66B (4 × 4)	ZIL-135 (8 × 8)
WEIGHT, with launcher and rockets (kg)	14,850	10,200	6,000	approximately 23,000
LENGTH, travel position (m)	7.42	7.00	5.655	approximately 9.30
WIDTH, travel position (m)	2.50	2.50	2.400	approximately 2.80
HEIGHT, travel position (m)	3.05	2.50	2.44	approximately 3.20
ROAD SPEED, maximum (km/hr)	75	75	87	approximately 65
FUEL CAPACITY (liters)	360	340	210	approximately 770
ROAD RANGE (km)	750	525	875	approximately 520

122-mm Rocket Launcher (40-Round) BM-21

EM-21**DESCRIPTION:**

The BM-21 is distinguishable from other MRLs by its square-cornered, 40-tube launching apparatus with 4 banks of 10 tubes. A protective canvas often covers the apparatus. The BM-21 is mounted on the Ural-375D 6 x 6 truck chassis, which has a distinctive fender design and a spare tire on the rear side of the cab. The BM-21 has no blast shields on the driver's cab. However, the material used in the cab windows and windscreen is strong enough to withstand the overpressures and other effects associated with the firing of 122-mm rockets.

CAPABILITIES:

The BM-21's crew can fire it either from the cab or remotely from a distance of up to 60 meters when using a cable set. They can fire some or all rockets at a fixed 0.5-sec interval. They can fire single rockets manually at any desired interval. This five-man crew can reload the launcher in 8 to 10 minutes.

The BM-21 fires a rocket with a range of 20,380 meters. Each launch tube is grooved to impart a slow rotary motion to the rocket. However, the rocket is primarily fin-stabilized. This combination of spin- and fin-stabilization ensures closely grouped fire at ranges of up to 16 kilometers.

On explosion, the warhead produces a great fragmentation effect and shock wave. The warhead fill may be Frag-HE, chemical, or incendiary.

Because of its high volume of fire and large area coverage, the BM-21 is well suited for use against troops in the open, for use in artillery preparations, and for delivery of chemical concentrations. One volley from a BM-21 battalion is 720 rounds. Because these weapons have a large circular error probable (CEP), they are not suited for attacks against point targets.

The Ural-375D vehicle has a maximum road speed of 75 kilometers per hour, a cruising range

122-mm Rocket Launcher (40-Round) BM-21(continued) _____

of 750 kilometers, and an exceptional cross-country capability.

LIMITATIONS:

When firing rockets, the vehicle must park obliquely to the target. This protects the unshielded cab from blast damage.

REMARKS:

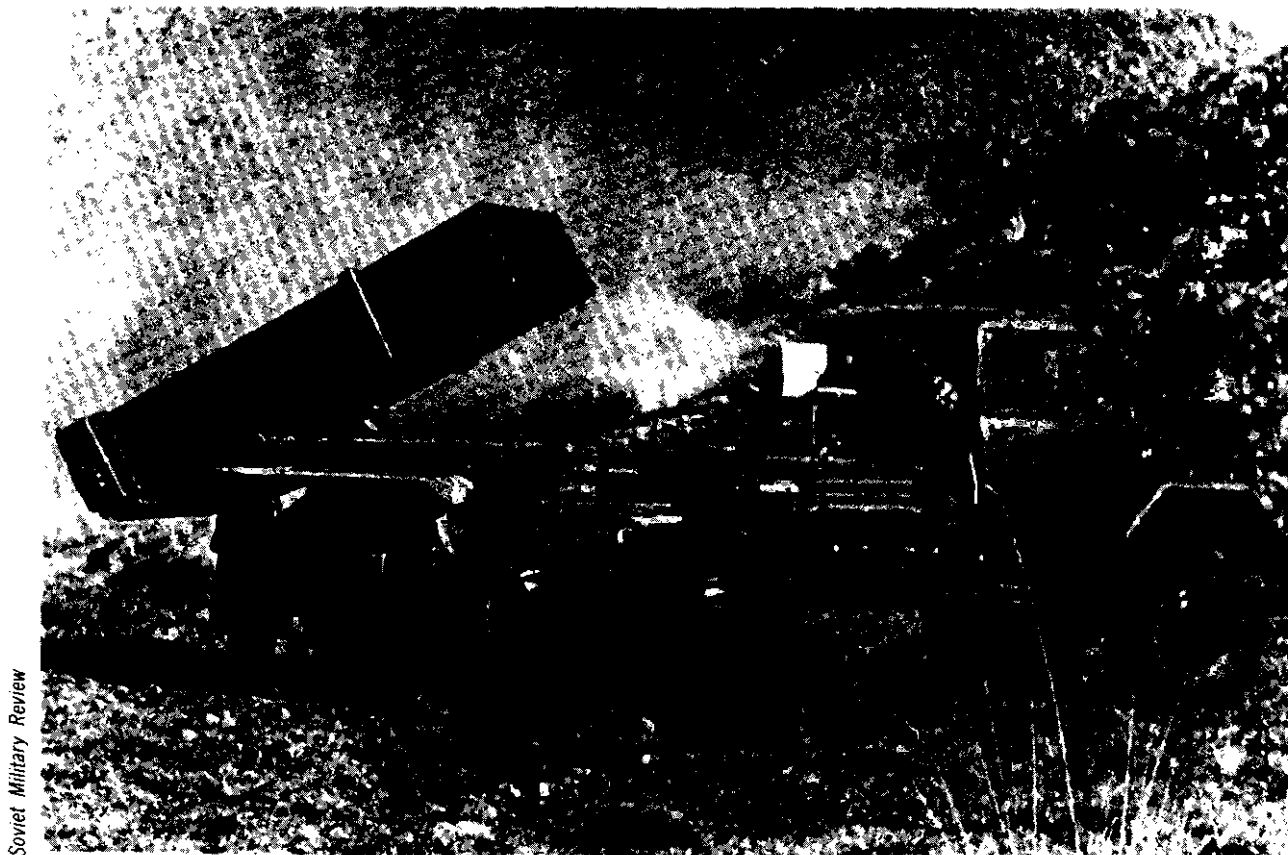
The BM-21 entered service in 1964 as a replacement for the 140-mm (16-and 17-round) BM-14 rocket launchers. It is now the most widely used truck-mounted rocket launcher in the Warsaw Pact forces. Older, heavier rocket launchers are seldom seen in front-line units. These would include the 200-mm (4-round) BMD-20, the 240-mm (12-round) BM-24, and the 250-mm (6-round) BMD-25. Although the BM-21 rockets are smaller in caliber than previous models, the warhead is equal to that of the 140-mm rocket, and the range exceeds that of the older 140-mm and 240-mm models. Due to

the smaller caliber of its rockets, the BM-21 also can fire a greater quantity of rockets than the earlier models. This makes it especially useful for area fire and for delivering massive surprise fires.

The rocket launcher battalion organic to each MRD and TD uses the BM-21. Forces at front and army levels also employ it. The 220-mm rocket launcher (16-round) BM-22 is replacing it at front.

In 1972, the Czechoslovak Army introduced a new version with the BM-21 launching apparatus mounted on a modified 10-ton TATRA 813 (8 x 8) truck. A reload pack of 40 additional rockets sits between the launcher and the armored cab, allowing a decreased reload time of 1.5 to 3.0 minutes. Although this combination is larger and heavier than the Soviet BM-21 on the Ural-375D truck, it has the same road speed and a similar cruising range (600 kilometers). Its additional rocket supply also permits greater tactical flexibility. This variant, known as the RM-70, is now in service in at least Czechoslovakia and East Germany.

122-mm Rocket Launcher (36-Round) BM-21-1

BM-21-1

Soviet Military Review

DESCRIPTION:

The 122-mm MRL BM-21-1 closely resembles the BM-21. However, the BM-21-1 variant uses a ZIL-131 chassis instead of a Ural-375D; therefore, it has a slightly lower profile than the BM-21. The rear fenders of the ZIL-131 rotate with the launcher when the BM-21-1 is aimed for firing. A more important difference is that the BM-21-1 has only 36 tubes, unlike the BM-21 which has 40. A launching apparatus has had the two center tubes in each of the lower two banks removed.

CAPABILITIES:

The BM-21-1 fires the same fin-stabilized rocket as the BM-21 to a maximum range of 20,380 meters, with Frag-HE, chemical, or incendiary warheads. The crew can fire 36 rounds remotely or from the cab in less than 20 seconds, quickly producing a large volume of fire. This firing is especially

effective against uncovered troops, during artillery preparations, and for delivery of chemical agents.

LIMITATIONS:

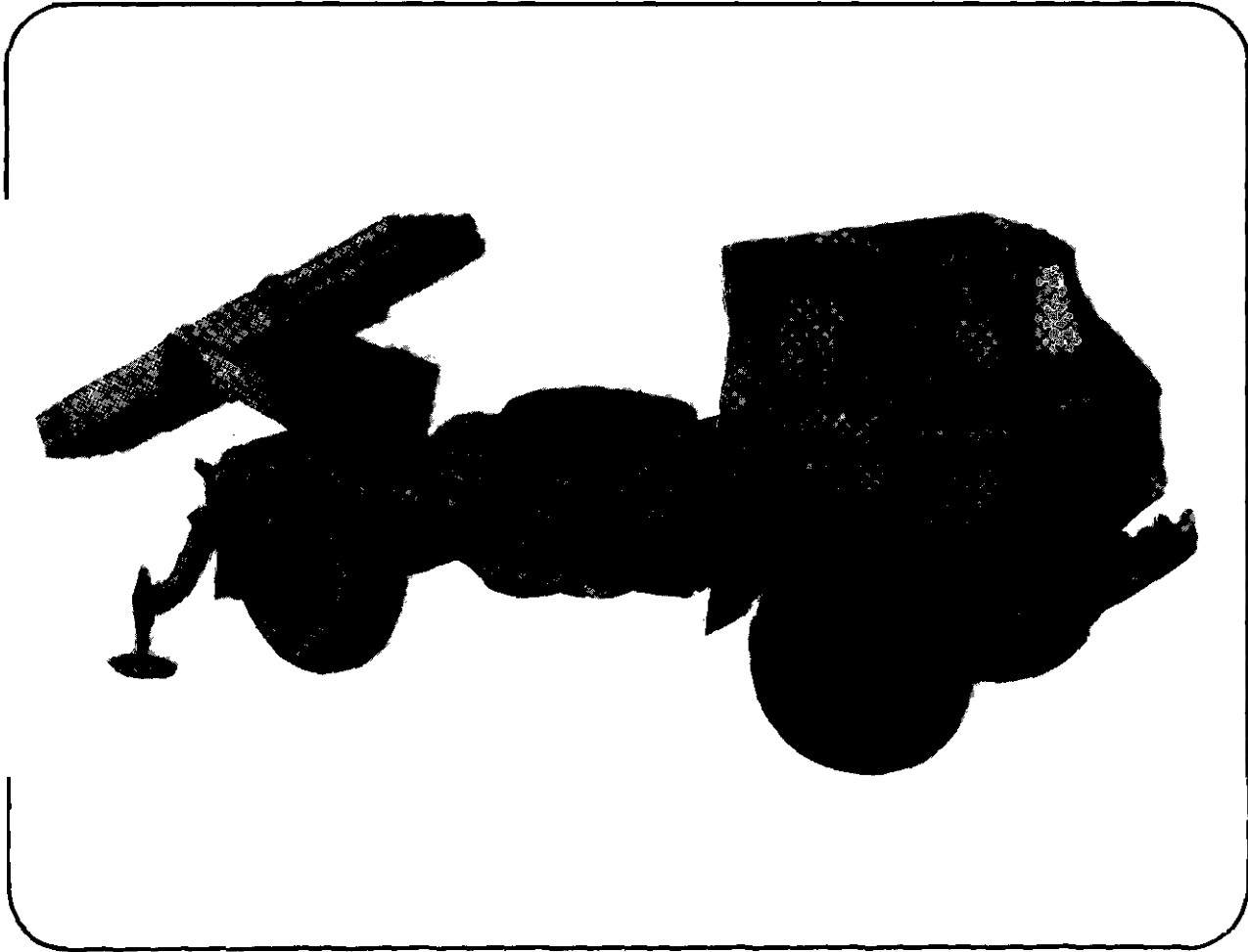
Like most MRLs, the BM-21-1 produces a distinct blast area. The vehicle must park obliquely to the target to avoid damage to the vehicle's cab when the launcher fires the rockets.

REMARKS:

The BM-21-1 was originally designated M1976. It was also called BM-21 Modified because of similarities to this standard system. Contrary to earlier assessments, the BM-21-1 fires the same rocket as the BM-21. There are no indications that the BM-21-1 is replacing the BM-21 at division-level. However, its employment and subordination are set unknown.

122-mm Rocket Launcher (12-Round) BM-21V

BM-21V



Soldat und Technik

DESCRIPTION:

The 12-tube launcher, with its two tiers of 6 tubes, is mounted on the lower chassis of the GAZ-66B truck. The BM-21V launcher is traversed forward towards the cab while traveling. It uses two stabilizing jacks when the lower chassis is traversed toward the rear for firing.

CAPABILITIES:

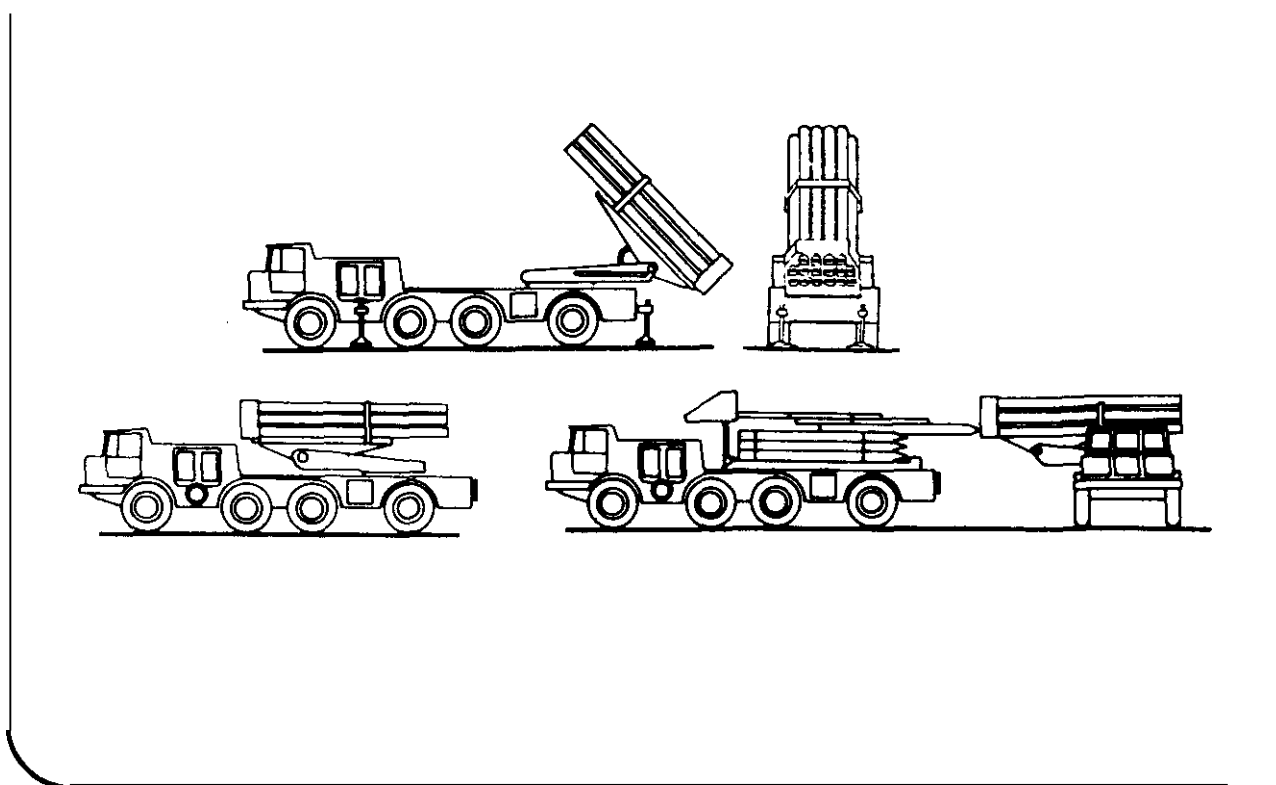
The BM-21V fires the same 122-mm fin-stabilized rocket as the BM-21 and BM-21-1. The rockets can deliver Frag-HE, chemical, or incendiary warheads to a range of 20,380 meters. This airborne MRL can fire all 12 rockets in 6 seconds or fire each singly. It can reload in 5 minutes. The B version of the GAZ-66 has reduced weight and mass due

to a canvas-covered cab and a windshield that can be folded down to simplify air-landing or air-dropping. The BM-21V has a maximum highway speed of 87 kilometers per hour.

REMARKS:

The BM-21V received a provisional designation of M1975 because that was the year in which it was first observed. The addition of V to the equipment designator probably means *vozdushnodesantnyy* or airborne. The BM-21V mounts on the air-droppable GAZ-66B. This MRL can provide organic supporting fires to airborne or air assault units.

220-mm Rocket Launcher (16-Round) BM-22

BM-22**DESCRIPTION:**

The 16-round 220-mm rocket launcher BM-22 uses a ZIL-135 8 x 8 truck chassis similar to that used for the FROG-7 system. Its launch tubes are arranged in three banks, with the lower two banks having six tubes each and the upper bank having four tubes.

A reload vehicle, also based on the ZIL-135 chassis, complements the BM-22. It is a flatbed vehicle carrying 16 rockets arranged in two stacks positioned on either side of the vehicle bed. A loading device which transfers the rockets from the reload vehicle to the launcher is mounted between the two stacks.

CAPABILITIES:

The BM-22 fires rockets with Frag-HE, chemical, and ICM warheads. Submunitions for the ICM warheads include AP and AT mines, fragmentation bomblets, and incendiary bomblets. The fin-and

spin-stabilized rockets have a range of 40,000 meters, greatly exceeding the range of earlier Soviet heavy rocket launchers. The maximum rate of fire for the BM-22 is approximately one round every .5 seconds. Reloading the launcher with a second set of 16 rockets takes 15 to 20 minutes.

The BM-22 is currently replacing the 40-round 122-mm rocket launcher BM-21 in the rocket launcher brigade of front-level artillery divisions. However, it has not yet replaced the BM-21 in the rocket launcher regiment at army level. It is not expected to replace the BM-21 at division level.

REMARKS:

The West first saw the BM-22 in 1977, hence its preliminary designation MRL M1977. The Soviet designation is BM-22 rather than BM-27, as previously assumed.

Free Rocket and Surface-To-Surface Missiles

Free rocket and surface-to-surface missile characteristics

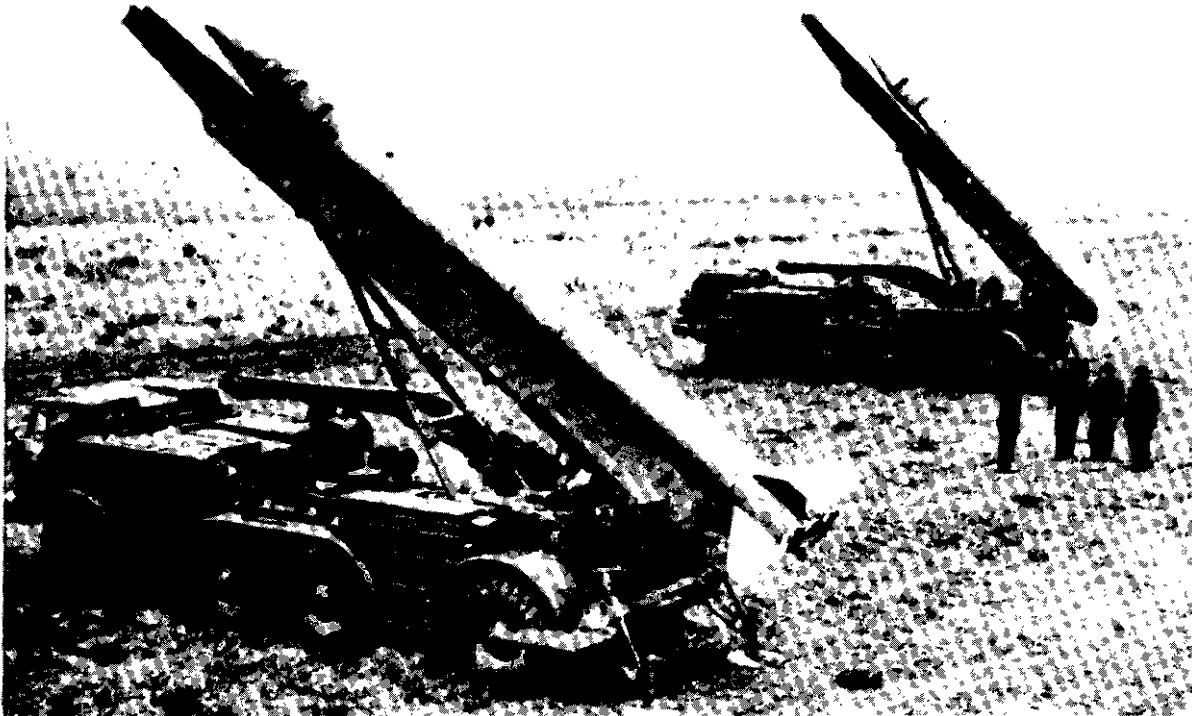
ROCKET/MISSILE CHARACTERISTICS	FROG-7	SS-1c/SCUD B	SS-12 Mod 2 / SCALEBOARD B	SS-21/SCARAB	SS-23/SPIDER
LENGTH, overall (m)	900 (7A) 950 (7B)	1125	1200	900	152
DIAMETER (m)	0.55	0.85	1.01	INA	0.91
WEIGHT, overall (kg)	2,300-2,500 (estimated, varies)	6,300 (estimated)	9,700 (estimated)	9,000 (estimated)	INA
MAXIMUM RANGE (km)	10	300	900	70	500
WARHEAD (types)	Hi, chemical nuclear, ICM	HE, chemical, nuclear	nuclear	HE, chemical, nuclear, ICM	HE, chemical, nuclear, ICM
REACTION TIME (min)	15-30 (after arrival at pre-surveyed site)	Up to 60 (after arrival at pre-surveyed site)	Up to 60 (after arrival at pre-surveyed site)	INA	INA
RATE OF FIRE	1 rocket on TEL vehicle; 3 rockets on reload vehicle	1 missile on TEL vehicle; at least 1 reload missile per TEL	1 missile on TEL vehicle; at least 1 reload missile per TEL	1 missile on TEL vehicle; unknown number on reload vehicle	1 missile on TEL vehicle; 1 missile on missile transport vehicle
RELOAD TIME (min)	varies	varies	varies	INA	INA
MOI	1965 (7A) 1968 (7B)	1961	1979	1976	early 1980s
STATUS	standard	standard	standard	standard	standard*

Free rocket and surface-to-surface missile vehicle characteristics

VEHICLE CHARACTERISTICS	FROG-7	SS-1c/SCUD B	SS-12 Mod 2 / SCALEBOARD B	SS-21/SCARAB	SS-23/SPIDER
CHASSIS	ZIL-13518 x 81	MAZ543 (8 x 8)	MAI 543 (8 x 8)	BAZ5921 (6 x 6)	UL wheeled vehicle (8 x 8)
CREW	4	INA	INA	INA	INA
WEIGHT, w/missile (mt)	230	290	320	3080	2407
LENGTH					
W/rocket/missile (m)	1080	12.00	1326	950	INA
Without missile (m)	930	1200	1200	950	1176
WIDTH, overall (m)	2.80	3.00	3.10	2.78	3.13
HEIGHT, overall (m)	3.50	2.60	3.45	2.50	3.00
ENGINE	2 x 90 hp, V-8, gasoline	580 hp, V 12, diesel	580 hp, V 12, diesel	295 hp V 6, diesel	INA
SPEED					
Road (km/hr)	7075	70	70	60	INA
Water (km/hr)	NA	NA	NA	5	INA
FUEL CAPACITY (liters)	700+	800	800	350	INA
ROAD RANGE (km)	400	550	550	500	INA
TRENCH CROSSING (m)	2.6	3.4	3.4	1.2	INA
VERTICAL STEP (m)	0.7	0.8	0.8	0.5	INA
GRADABILITY (°)	30	30	30	30	30
FORDING (m)	0.6	1.0	1.0	amphibious	INA
ARMOR, maximum (mm)	none	none	none	none	none
INFRARED					
Driver	no	yes	yes	INA	INA
Commander	no	no	no	INA	INA
NBC PROTECTION	no	no	no	yes	INA

*NOTE: *Scheduled for elimination under the terms of the 1987 Intermediate-Range Nuclear Forces (INF) Treaty

Free Rocket Over Ground FROG-7

FROG-7**DESCRIPTION:**

The FROG-7 is the latest addition to the free rocket over ground (FROG) family of unguided, spin-stabilized, short-range, battlefield support artillery rockets. It employs a ZIL-135TEL vehicle, which carries one rocket and an on-board crane on an eight-wheeled chassis. A similar vehicle can transport three reload rockets for each TEL. The rocket is of conventional, single-stage design. It has a cylindrical warhead of the same diameter as the rocket body, giving it a cleaner and more modern appearance than its predecessors.

CAPABILITIES:

The range of the rocket is 70 kilometers; the cruising range of the TEL vehicle is 400 kilometers. The FROG-7 can deliver HE, nuclear, or chemical warheads. The FROG-7B variant also has an improved conventional munitions (ICM) warhead, with submunitions rather than a unitary warhead. The FROG battalion of Soviet divisions may have the FROG-7A or -7B.

LIMITATIONS:

The FROG-7 TEL vehicle provides no NBC protection for the crew. The single-rail launcher has limited traverse.

REMARKS:

The Soviets introduced the FROG-7A in 1965 as a replacement for earlier FROG variants. Some variants had been in service since the mid-1950s. The FROG-1 and -2 are obsolete. Some non-Soviet Warsaw Pact armies still have the FROG-3, -4, and -5 variants, mounted on a nonamphibious version of the PT-76 light tank chassis. The Soviet Army still has a few of these rockets. The FROG-5 still serves as a training rocket, and the FROG-6 is a dummy rocket used for training purposes only. The FROG-7B, introduced in 1968, is essentially the same rocket as the FROG-7A, but with a longer warhead section. The Soviets export non-nuclear versions of the FROG-7 to both Warsaw Pact and some non-Warsaw Pact nations. The SS-21 tactical ballistic missile is rapidly replacing the FROG-7.

Surface-To-Surface Missile SS-21/SCARAB

SS-21/SCARAB

Krasnaya Zvezda

DESCRIPTION:

The tactical ballistic missile SS-21/SCARAB uses a six-wheeled amphibious TEL similar to the SA-8/GECKO SAM. Like the SA-8, it has good cross-country capability. It probably has an air filtration and overpressure system for collective chemical, radiological, and biological protection. The missile lies on the centerline of the TEL. There is space on both sides to transport equipment. Protective doors on the top of the TEL cover the missile during travel. These doors open to the sides when the missile is erected to the vertical position for firing. A modified version of the same 6 x 6 vehicle serves as a missile resupply vehicle for the SS-21.

CAPABILITIES:

Both the SS-21 TEL and the resupply vehicle can travel an average of 60 kilometers per hour

on-road or 29 kilometers per hour off-road in support of operations. The SS-21 tactical ballistic missile has a range of 70 kilometers. It also has improvements over the FROG-7 in reaction time, reliability, accuracy, and handling. The SS-21 has three variants which can deliver HE, nuclear, chemical, and improved conventional munitions. It can deliver these warheads with a very high degree of accuracy and reliability.

REMARKS:

The Soviets have nicknamed the SS-21 Tochka, which means "point." It first appeared in 1976 in the USSR. The West first reported it in WGF in 1981. The SS-21 is now rapidly replacing the FROG7 in divisions opposite NATO. Soviet armies in WGF are consolidating division-level SS-21 battalions into army-level brigades.

Surface-to-Surface Missile SS-1c/SCUDB

SS-1c/SCUDB**DESCRIPTION:**

The SCUD-series guided missiles are single-stage, short-range ballistic missiles using storable liquid propellants. Although originally transported on a Joseph Stalin heavy tank chassis, the SCUD B is now primarily mounted on a TEL vehicle based on the MAZ-543 (8 x 8) wheeled chassis. Unlike the FROG series of unguided missiles, the SCUDs have movable fins.

CAPABILITIES:

The MAZ-543 TEL gives the SCUD missile system greater road mobility. It reduces the number of support vehicles required, and still preserves a great choice in selecting off-road firing positions. SCUD missiles are organic to SSM (SCUD) brigades at front/army level. Warheads can be HE, chemical, or nuclear. The missile, launched vertically from a small platform at the rear of the TEL, has a range of 300 kilometers. The SCUD-series missiles have the Soviet front

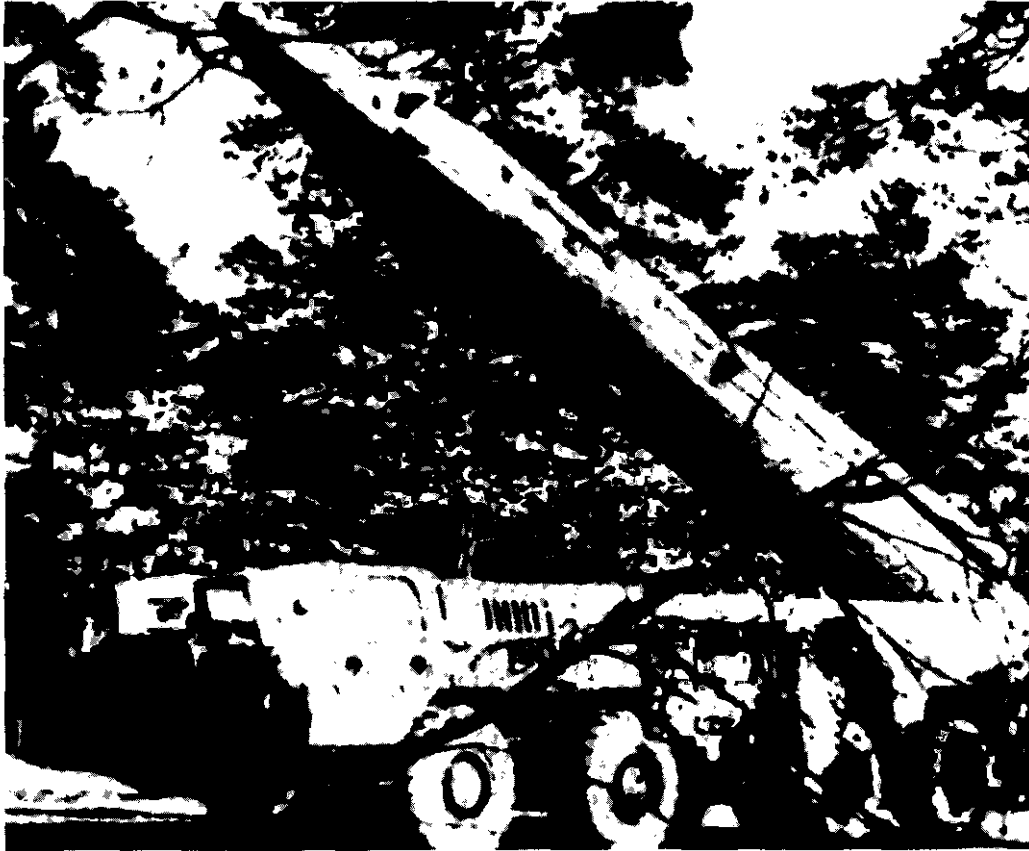
and army commanders an integral nuclear weapons capability.

REMARKS:

The Soviets introduced the SCUD B on the JS-3 tracked chassis in 1961. It appeared on the MAZ-543 wheeled chassis in 1965. It replaced the JS-3-mounted SCUD A, which had been in service since the mid-1950s. Both Warsaw Pact and non-Warsaw Pact nations have imported non-nuclear variants of the SCUD missiles. The SCUD A is also known as SS-1b, and the SCUD B as SS-1c.

The SS-23 has greatly improved range (500 kilometers). It also has increased accuracy and reduced reaction and refire times. The SS-23 had begun to replace the SCUD B in forward areas. However, the 1987 INF Treaty calls for removal of the SS-23 from the Soviet inventory.

SS-12/SCALEBOARD



DESCRIPTION:

The SS-12/SCALEBOARD uses the same MAZ-543 (8 x 8) chassis as the SCUD B. It differs, however, in the environmental protective container that completely encloses its SCALEBOARD missile; this is the primary recognition difference. The latest version, SS-12 Mod 2/SCALEBOARD B, is a two-stage, solid-fuel system with improved range (900 kilometers), accuracy, and warhead, compared to the SCUD.

CAPABILITIES:

Like the SCUD, the SCALEBOARD fires from a preselected position; then it moves to another prearranged position. The MAZ-543 has centralized tire pressure control and wide-profile tires. Its good ground clearance results in excellent mobility for a vehicle of its size.

The SCALEBOARD is a front- and theater-level weapon system that gives the Soviet commander a nuclear capability. To date, the SCALEBOARD has appeared only with Soviet forces. The mid-range missile can be stationed in the western part of the USSR and still hit important targets in Central Europe.

REMARKS:

The Soviets first deployed the SS-12 Mod 1/SCALEBOARD A in the mid-1960s. The new SS-12 Mod 2, introduced in 1979, has largely replaced it. The new Mod 2 missile has the same range (900 kilometers), but offers improved accuracy. However, the 1987 INF treaty calls for removal of all SS-12 systems from the Soviet inventory.

Artillery-Associated Radars
Artillery-associated radar characteristics

RADAR	FUNCTION	VEHICLE	FREQUENCY BAND
END TRAY (RMS-1)*	meteorological	trailer	D
PORK TROUGH-1 (SNAR-2)	battlefield surveillance	AT L	I
PORK TROUGH-2 (SNAR-6)	battlefield surveillance	INA	J
BUZZ STAND (PSNR-1)	battlefield surveillance	manpack	I
SMALL FRED	battlefield surveillance	PUP-3 (BMP-M1975)	INA
BIG FRED (SNAR-LO)	battlefield surveillance	MT-LBM1975	INR
SMALL YAWN (ARSOM-2P)	countermortar/counter-battery	AT-L	I
ARK-I	countermortar/counter-battery	INA	INA

FOOTNOTE. *Also employed by missile units

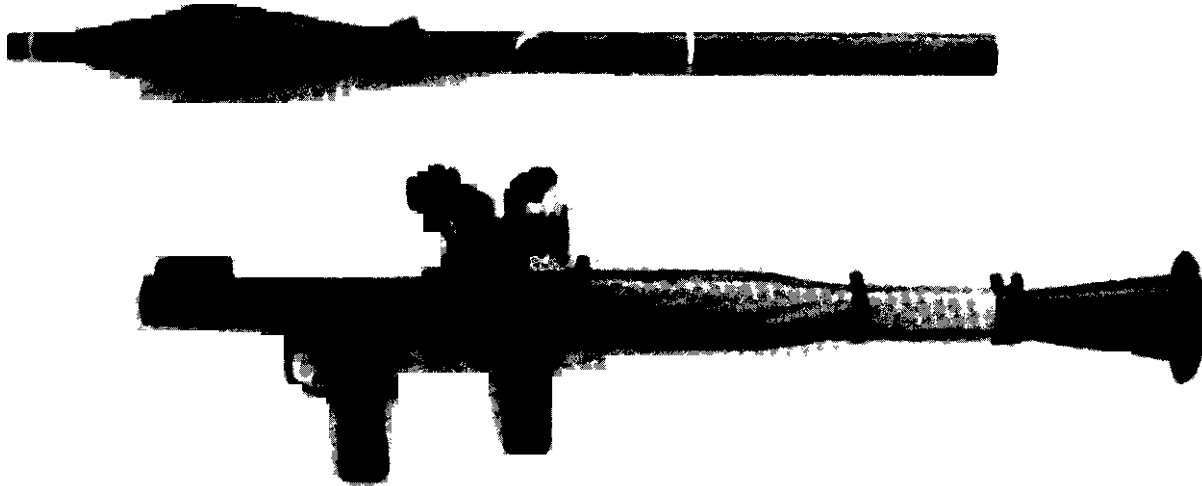
ANTITANK WEAPONS
Antitank Grenade Launchers and Rocket Launchers

Antitank grenade launcher and rocket launcher characteristics

CHARACTERISTICS	ANTITANK GRENADE LAUNCHER RPG-7V	ANTITANK GRENADE LAUNCHER RPG-16D	ANTITANK ROCKET LAUNCHER RPG-18	ANTITANK ROCKET LAUNCHER RPG-22
LAUNCHER				
Tube caliber (mm)	40	58.3	64	73
Length (m)	0.953	1.100	1.050 (extended) 0.705 (closed)	0.850 (extended) 0.750 (closed)
Weight (kg)	7.9 (empty)	10.3	2.70 (grenade and launcher)	3.00 (approximately. grenade and launcher)
PROJECTILE				
Projectile type	rocket-assisted grenade	rocket-assisted grenade	rocket	racket
Warhead type	HEAT	HEAT	HEAT	HEAT
Warhead caliber (mm)	85/70*	58.3	64	73
Length (m)	0.905/INA*	0.600	0.670	INA
Weight, complete round (kg)	2.25/INA*	3.0	1.4	1.8 (approximately)
PERFORMANCE				
Muzzle velocity (m/s)	120	130	115	INA
Maximum velocity (m/s)	300	350	115	INA
Effective range (m)	300/500**	500/800**	200	250
Maximum range (m)	920 (limited by self-destruct element)	varies (self-destruct element)	varies (self-destruct element)	INA
Armor penetration (mm @ 0° obliquity @ any range)	330	up to 375	up to 375	390 (approximately)
Rate of fire (rd/min)	4-6	4-6	NA (disposable weapon)	NA (disposable weapon)
CREW	2	1 and ammunition bearer	1	1
UNIT OF FIRE (rd)	20	varies	varies	INA
DOI	1962	mid-1970s	mid-1970s	1985
STATUS	standard	standard	standard	standard

FOOTNOTES. ***PG-7/PG-7M** projectile.
 ** Against moving/stationary targets.

Antitank Grenade Launcher RPG-7V

RPG-7V**DESCRIPTION:**

The RPG-7V is a recoilless, shoulder-fired, muzzle-loaded, reloadable, antitank grenade launcher. It fires an 85-mm (PG-7) or 70-mm (PG-7M) rocket-assisted HEAT grenade from a 40-mm smoothbore launcher tube. The launcher has two hand grips; a large optical sight; a thick, wooden heat guard around the middle; and a large, flared blast shield at the rear of the tube. The launcher is 953 millimeters long without grenade, and 1,340 millimeters with PG-7 grenade. The launcher weighs 7.9 kilograms and the PG-7 grenade weighs 2.25 kilograms.

CAPABILITIES:

The RPG-7V is light enough to be carried and fired by one person. However, an assistant grenadier normally deploys to the left of the gunner to protect him with small arms fire. The grenadier normally carries two rounds of ammunition, and the assistant grenadier carries three rounds.

The RPG-7V is an improved version of the earlier RPGs. The RPG-2 had only one hand grip; a smaller, simpler sight; a smaller blast shield; and no heat guards. It fired a smaller, 80-mm, nonrocket-assisted grenade.

The internal rocket motor of the PG-7/7M grenade ignites after traveling approximately 11 meters; this gives the projectile higher velocity (sustained out to 500 meters), flatter trajectory, and better accuracy. Further enhancing accuracy

are four large, knife-like fins at the rear of the projectile which unfold when the round leaves the tube, and smaller, offset fins at the very rear which produce a slow rotation. The maximum effective range is 500 meters for stationary targets and 300 meters for moving targets. Maximum range is 920 meters, at which point the projectile self-destructs approximately 4.5 seconds after launching. The PG-7/-7M grenade, with a shaped-charge warhead, has armor penetration of 330 millimeters.

The current RPG-7V model can mount a telescope and both infrared and passive night sights. All RPG-7 models have optical sights which can be illuminated for night sighting. They have open sights for emergency use.

The RPG-7V is the standard squad antitank weapon in motorized rifle units. (Each squad has one weapon.) The weapon is also found in reconnaissance units. Airborne units use the RPG-7D, which can separate into two sections.

LIMITATIONS:

The RPG-7V requires a well-trained gunner to estimate ranges and lead distances for moving targets. Crosswinds as low as 7 miles per hour can complicate the gunner's estimate and reduce first-round hit probability to 50 percent at ranges beyond 180 meters. An RPG projectile screen of

Antitank Grenade Launcher RPG-7V (continued)

chain link fence will completely neutralize 50 percent of the rounds and degrade the penetrating capability of the remaining rounds.

Reloading and reaiming the RPG-7V requires a minimum of 14 seconds. Firing leaves noticeable signatures in the form of flash, smoke, and noise. The unprotected gunner is extremely vulnerable to suppressive fires.

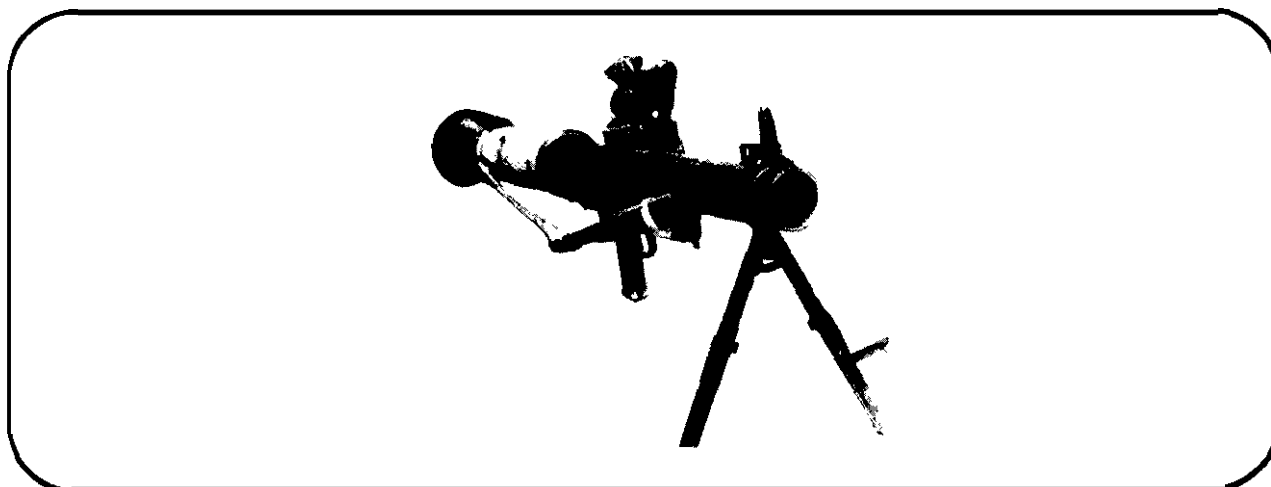
REMARKS:

The first Soviet recoilless antitank grenade launcher, the RPG-2, derived from the World War

II German Panzerfaust. The Soviets fielded it in the early 1950s. The RPG-7, introduced in 1962, is a second-generation weapon employing a rocket-assisted projectile. The current version, designated RPG-7V, is in service throughout the Warsaw Pact (except Czechoslovakia). The folding version for airborne troops, introduced in 1968, was initially known as RPG-8, but then redesignated RPG-7D. A third generation weapon, the RPG-16D, incorporates further refinements resulting from battle testing the RPG-7V in Southeast Asia and the Middle East. It has replaced the RPG-7D as the standard squad antitank weapon in Soviet airborne forces.

Antitank Grenade Launcher RPG-16D

RPG-16D



DESCRIPTION/CAPABILITIES:

The RPG-16D is a reloadable antitank weapon. It is shoulder-fired, either with or without the support of a bipod mounted at the muzzle end. It has an optical sight above the tube, a single hand grip below the tube, and a conical blast shield at the rear. The 58.3-mm rocket-assisted HEAT projectile PG-16 has an increased range of 500 to 800 meters and a greater armor penetration capability of up to 375 millimeters, compared to the PG-7/-7M projectile of the RPG-7. As with the RPG-7, the RPG-16D grenadier probably carries two rounds of ammunition. The assistant grenadier carries three rounds and protects the grenadier with his assault rifle.

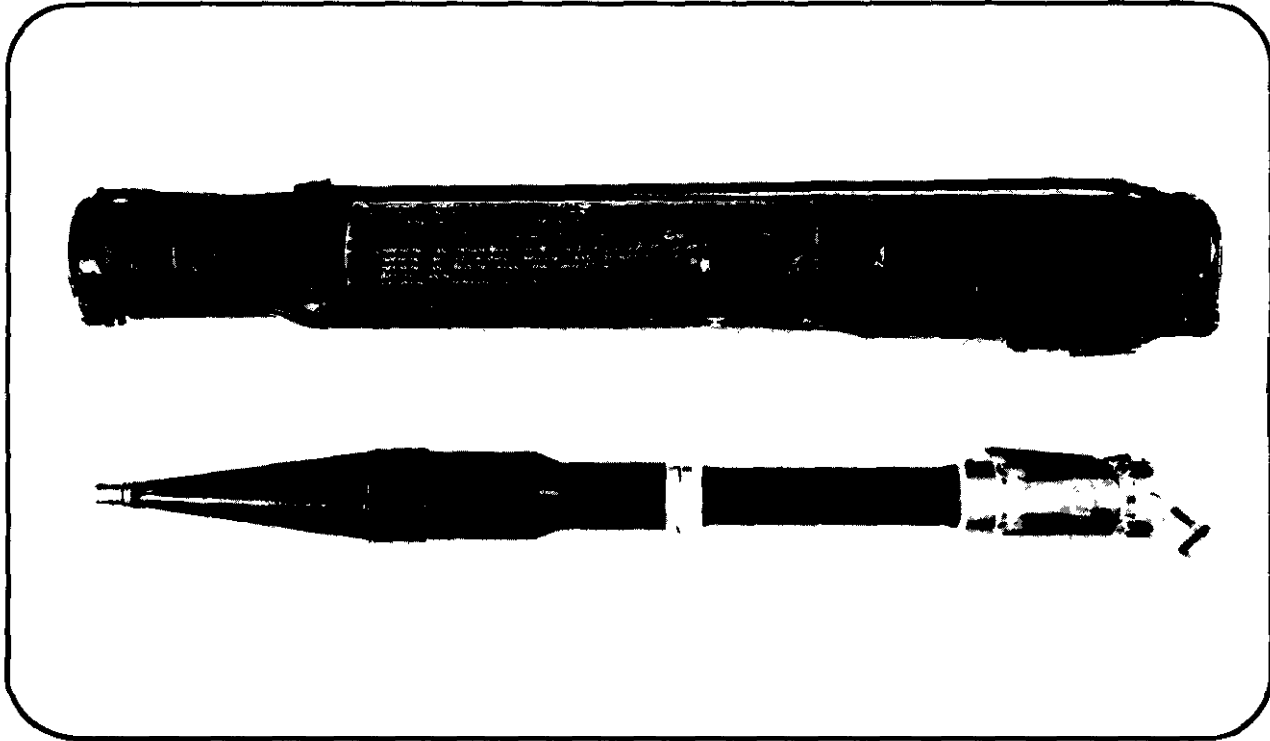
LIMITATIONS:

The RPG-16D is heavier than the RPG-7V-7D, but one person can still carry and fire it.

REMARKS:

The Soviets introduced the RPG-16D in the mid-1970s as a replacement for the RPG-7D. Western observers also expected a one-piece version (RPG-16?) to replace the RPG-7V in motorized rifle units; however, the Soviets have not yet deployed such a weapon. To date, only the airborne forces have employed the two-piece airborne version designated RPG-16D.

Antitank Rocket Launcher RPG-18

RPG-18**DESCRIPTION/CAPABILITIES:**

The RPG-18 is a short-range, tube-launched, disposable infantry antitank rocket launcher. It is somewhat similar to the US LAW system. The lightweight tube presumably consists of fiberglass-reinforced plastic. The operator carries the launcher in a collapsed position and extends the inner tube to make the weapon ready to fire. It fires a 64-mm rocket (PG-18) with an effective range of 200 meters and a HEAT warhead capable of penetrating up to 375 millimeters of armor. The fuze of the HEAT grenade activates 2 to 15 meters after leaving the tube and self-destructs after a flight time of 4 to 6 seconds. The trigger, safety catch, and rear peep sight are roughly in the middle of the extended tube, or at the rear end of the collapsed tube. The folding sight at the forward end of the tube is calibrated for ranges of 50, 100, 150, and 200 meters.

The RPG-18 is probably a squad-level weapon. Unlike the RPG-7V/7D and RPG-16D, the RPG-18 is not linked to a specific person; that is, to the

antitank grenadier provided for in the TOE. All soldiers in the squad train on it. This increases the squad's capabilities to destroy tanks at short range.

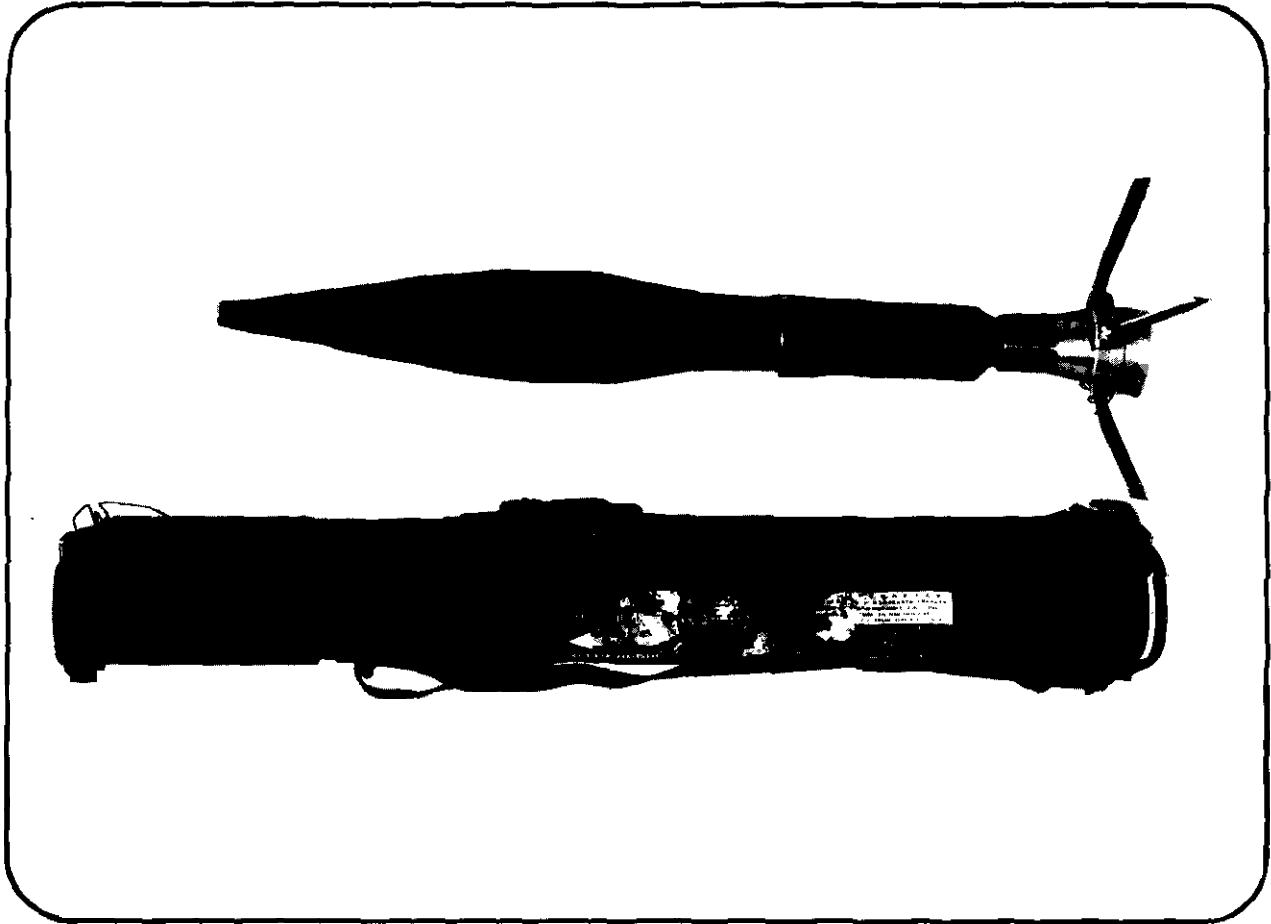
LIMITATIONS:

The RPG-18 should not be fired if friendly personnel are in a 90-degree sector within 30 meters behind it. It also should not be fired if there are obstacles nearer than 2 meters in front of it, or if the height of the line of fire is less than 20 centimeters. Once the tube is extended for firing, it cannot be shoved back together again.

REMARKS:

The Soviets introduced the RPG-18 in the mid-1970s. It is widely distributed throughout the Soviet Army, including the airborne forces. For employment in airborne units, the RPG-18 comes with a cover which protects it during parachute jumps.

RPG-22



DESCRIPTION/CAPABILITIES:

The RPG-22 is a short-range, tube-launched, disposable, infantry antitank rocket launcher, similar to the US LAW system. The lightweight, collapsible launch tube consists of two parts: the outer tube made of fiberglass and a sliding inner tube made of aluminum. The inner tube extends 10 centimeters to the front of the outer tube in firing position. It fires a 73-mm fin-stabilized rocket with an effective range of 250 meters and a HEAT warhead capable of penetrating approximately 390 millimeters of armor.

The trigger and the pop-up rear peep sight are in the middle of the extended tube. The pop-up front sight is at the forward end of the outer tube. The front sight is calibrated for ranges of 50, 150, and 250 meters.

LIMITATIONS:

Instructions printed on the side of the RPG-22 launch tube indicate that back-blast covers a 90-degree sector out to 30 meters behind the weapon; that it should not be fired if a wall is closer than 2 meters behind it; and that the line of fire should be at least 20 centimeters from the ground.

REMARKS:

The Soviets introduced the RPG-22 in 1985. In time, it will probably replace the RPG-18. As with the RPG-18, it has no dedicated grenadier; however, all soldiers train to use the squad-level, throw away weapon.

Antitank Guns

Antitank gun characteristics

CHARACTERISTICS	72-MM RECOILLESS GUN SPG-9	100-MM ANTITANK GUN T-12/MT-12
CREW	3	6-7
WEIGHT		
Firing position (kg)	47.5 (tripod2.0)	3,100
Travel position (kg)	47.5 (tripod2.0)	3,100
LENGTH, travel position (m)	2.110	9.16
WIDTH, travel position (m)	0.990	1.78
HEIGHT, travel position (m)	0.800	1.44
FIRE CONTROL	iron and optical; IR and passive night sights	direct fire telescope; IR system for gunner mounted on gun
AMMUNITION (types)	rocket-assisted HE. HEAT	HVAPFSDS, HEAT-FS, Frag-HE
PERFORMANCE		
Elevation (c)	-3 to +7	-6 to +20
Traverse (c)	30 total	54 total
Maximum range (m)	1,300 (limited by self-destruct element)	8,200 (18,000-21,000 with gun at 45")
Effective direct fire range (m)	1,000	1,000 (HEAT) 2,000 (HVAPFSDS)
Muzzle velocity (m/sec)	435	900 (HEAT) 1,500 (HVAPFSDS)
RATE OF FIRE		
Maximum (rd/min)	6 (practical)	10 (practical)
Sustained. 1st hr (rd)	INA	75
ARMOR PENETRATION (mm @ 0° obliquity @ 1,000 m)	400 (HEAT, any range)	400 (HEAT, any range) 225 (HVAPFSDS)
UNIT OF FIRE (rd)	80	60
Emplacement/displacement time (min)	INA	2-3/2-3
DOI	1970	1965
Status	standard	standard

SPG-9



DESCRIPTION:

The SPG-9 is a tripod-mounted, recoilless anti-tank gun that fires a 73-mm fin-stabilized, rocket-assisted HEAT projectile. The launcher is 2,110 millimeters long and weighs 47.5 kilograms (59.5 kilograms with tripod). The projectile weighs 3.5 kilograms. Its great length is due to the propellant charge case attached behind the fins. The SPG-9 can also fire a 4-kg rocket-assisted HE round.

CAPABILITIES:

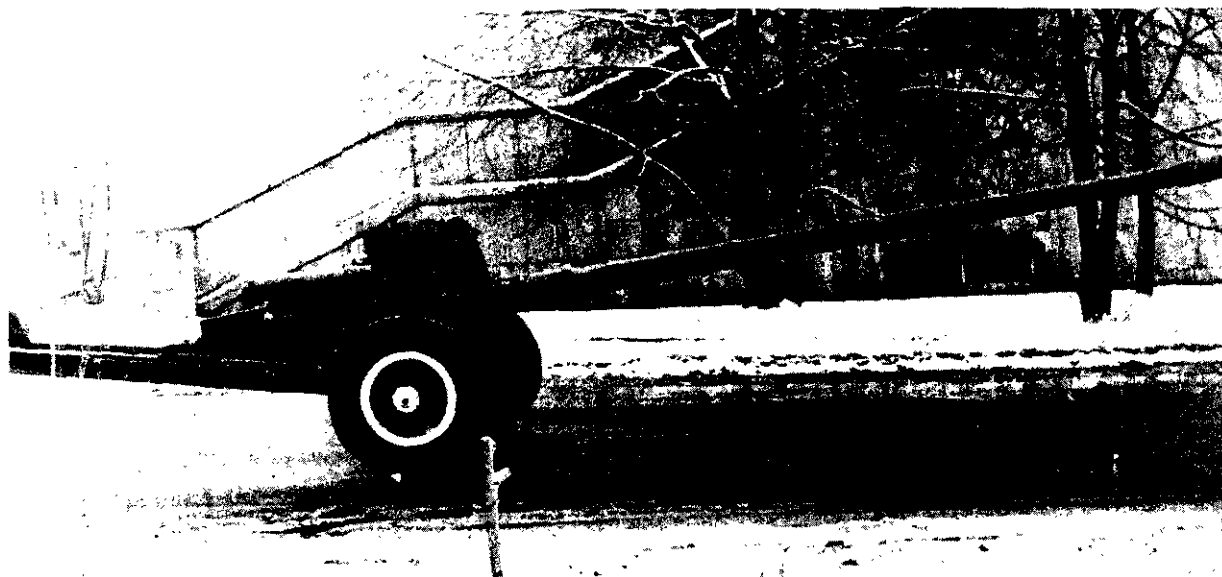
The SPG-9 is manportable, but a truck or APC normally carries it. It must be dismounted and placed on its tripod for firing. It normally has a crew of three. Both IR and passive night sights are available. The rocket-assisted HEAT projectile

has an effective range of 1,000 meters and can penetrate 400 millimeters of armor. It has a high muzzle velocity (435 meters per second) which is increased to 700 meters per second by rocket assist. The SPG-9 is organic to the antitank platoon of a BTR-equipped MRB. The Soviets usually employ it with mutually supporting ATGMs.

REMARKS:

The SPG-9 began replacing the previous recoilless antitank guns (82-mm B-10 and 107-mm B-11) around 1970. It is now in service not only in Soviet MRBs, but also in the Polish, Bulgarian, East German, and Hungarian armies.

100-mm Antitank Gun T-12/MT-12

MT-12**DESCRIPTION:**

The T-12 is a 100-mm smoothbore antitank gun mounted on a two-wheeled, split-trail carriage, with a single caster wheel near the trail ends. The long (8,484-mm) gun tube has a cylindrical, multiperforated muzzle brake which is only fractionally larger in diameter than the thin barrel. The MT-12 variant has a winged shield angled to the rear on both sides and an additional recoil cylinder above the breech on the right. Both versions frequently mount infrared night sighting equipment.

CAPABILITIES:

The T-12 and MT-12 are organic to antitank battalions at division, army, and front levels. They fire fin-stabilized, nonrotating rounds similar to those of the 115-mm gun of the T-62 tank. Muzzle velocity is 900 meters per second for HE and HEAT rounds or 1,500 meters per second for HVAPFSDS rounds. Maximum indirect fire range is 8,200 meters (Frag-HE). The effective direct fire range is approximately 1,000 meters (HEAT) or 2,000 meters (HVAPFSDS). Grazing range against a 2-m-high target is 1,880 meters (HVAPFSDS). The HEAT round can penetrate about 400 millimeters of armor at any range. The HVAPFSDS

round can penetrate about 225 millimeters at 1,000 meters. The theoretical rate of fire is reportedly 14 rounds per minute; however, rate for aimed fire is only 6 rounds per minute, and the maximum practical rate is 10 rounds per minute.

LIMITATIONS:

The T-12 or MT-12 can function as a field gun only under limited circumstances; this is due to its limited maximum elevation (+20 degrees). With trails dug in to provide 45-degree elevation, maximum range is 18,000 to 21,000 meters.

REMARKS:

Since its introduction in about 1965, the T-12 has replaced the older 100-mm field gun M1944 and the 85-mm antitank gun D-48 in most Soviet frontline units. The MT-12 variant was formerly called the T-12A. Like their predecessors, both can be towed by a truck or armored tracked artillery tractor. The MT-LB multipurpose armored tracked artillery tractor/APC usually tows them. They are in service in at least the Soviet and East German armies. In 1989, the Soviets began to introduce the MT-12 into motorized rifle regiments.

Antitank Guided Missiles

ATGM characteristics

CHARACTERISTICS	AT-2/SWATTER	AT-3/SAGGER	AT-4/SPIGOT	AT-5/SPANDREL
WEIGHT, preflight (kg)	270 (A), 290 (B, C)	11.3	7.4	12-18
LENGTH, overall (m)	1.16	0.864	0.863	1.30 (tube)
DIAMETER, (mm)	148	120	119	150
FIN SPAN, (m)	0.70	0.37	0.354	INA
RANGE				
Maximum (m)	2,500 (A), 3,500 (B), 4,000 (C)	3,000	2,000	4,000
Minimum (m)	500 (A, B), INA (C)	500 (A), INA (C)	70	100
APPROXIMATE TIME OF FLIGHT TO MAXIMUM RANGE (sec)	17 (A), 23 (B), 26-27 (C)	25	11	16
WARHEAD				
Type	HEAT	HEAT	HEAT	HEAT
Weight (kg)	5.4	2.5	2.5	3.0
ARMOR PENETRATION (mm @ 0° obliquity @ any range)	500+	400+	500-600	500-600
GUIDANCE	MCLOS (A, B), SACLOS (C)	MCLOS (A), SACLOS (C)	SACLOS	SACLOS
COMMAND LINK	radio	wire	wire	wire
LAUNCHING PLATFORM	BRDM/BRDM-2 (A, B) Mi-8T/HIP E (B, C) Mi-24/HIND A/D (B, C)	manpack (A) BRDM/BRDM-2 BMP-1, BMD-1 Mi-2/HOPLITE, Mi-8TB/HIP F	manpack BMP-1, BMP-2, BMD-1	BRDM-2, BMP-2
DOI	1960 (A), 1965 (B) 1968-1970 (C)	1961	1974	1974/75
STATUS	standard	standard	standard	standard

CHARACTERISTICS	AT-6/SPIRAL	AT-7/SAXHORN	AT-8/SONGSTER
WEIGHT, preflight (kg)	INA	INA	INA
LENGTH, overall (m)	INA	INA	INA
DIAMETER, (mm)	INA	INA	125
FIN SPAN, (m)	INA	INA	INA
RANGE			
Maximum (m)	5,000	1,000	4,000
Minimum (m)	500	INA	INA
APPROXIMATE TIME OF FLIGHT TO MAXIMUM RANGE (sec)	11 (to 5,000 m)	INA	supersonic
WARHEAD			
Type	HEAT	HEAT	HEAT
Weight (kg)	INA	INA	INA
ARMOR PENETRATION (mm @ 0° obliquity @ any range)	600-700	INA	700-800
GUIDANCE	SACLOS	SACLOS	SACLOS
COMMAND LINK	radio	wire	radio
LAUNCHING PLATFORM	Mi-24/HIND E/F	manpack	T-64B, T-80
DOI	1973	1979	around 1981
STATUS	standard	standard	standard

Antitank Guns

Antitank gun characteristics

CHARACTERISTICS	72-MM RECOILLESS GUN SPG-9	100-MM ANTITANK GUN T-12/MT-12
CREW	3	6-7
WEIGHT	47.5 (tripod)	3,100
Firing position (kg)	47.5 (tripod)	3,100
Travel position (kg)	2.110	9.16
LENGTH, travel position (m)	0.990	1.78
WIDTH, travel position (m)	0.800	1.44
HEIGHT, travel position (m)	iron and optical; IR and passive night sights	direct fire telescope; IR system for gunner mounted on gun
FIRE CONTROL	rocket-assisted HE. HEAT	HVAPFSDS, HEAT-FS, Frag-HE
AMMUNITION (types)		
PERFORMANCE	-3 to +7	-6 to +20
Elevation (c)	30 total	54 total
Traverse (c)	1,300 (limited by self-destruct element)	8,200 (18,000-21,000 with gun at 45")
Maximum range (m)		
Effective direct fire range (m)	1,000	1,000 (HEAT) 2,000 (HVAPFSDS)
Muzzle velocity (m/sec)	435	900 (HEAT) 1,500 (HVAPFSDS)
RATE OF FIRE		
Maximum (rd/min)	6 (practical)	10 (practical)
Sustained. 1st hr (rd)	INA	75
ARMOR PENETRATION (mm @ 0° obliquity @ 1,000 m)	400 (HEAT, any range)	400 (HEAT, any range) 225 (HVAPFSDS)
UNIT OF FIRE (rd)	80	60
Emplacement/displacement time (min)	INA	2-3/2-3
DOI	1970	1965
Status	standard	standard

Antitank Guided Missile AT-2/SWATTER (continued)

The Mi-8T/HIPE can mount two SWATTERs above each of its two external weapons racks. The

Mi-24/HIND A and D mount two SWATTERs on wingtip launch rails on each of their two stub wings.

AT-2/SWATTER launch rails on HIND D



CAPABILITIES:

The SWATTER A can engage targets at ranges between 500 and 2,500 meters. SWATTER B and C have maximum ranges of 3,500 and 4,000 meters, respectively. All versions have a flight speed of 150 meters per second, resulting in the following flight times to maximum ranges: 17 seconds to 2,500 meters (SWATTER A); 23 seconds to 3,500 meters (SWATTER B); and 26 to 27 seconds to 4,000 meters (SWATTER C). Armor penetration capability is over 500 millimeters, and the probability of first-round hit is 67 percent for SWATTER A and B and over 90 percent for the SWATTER C.

The antitank batteries of MRRs sometimes use the BRDM/BRDM-2 SWATTERs, although this role is more likely filled by the AT-3 or AT-5. However, SWATTERs, especially the AT-2cuprated version, are still in wide use as helicopter-mounted missiles.

LIMITATIONS:

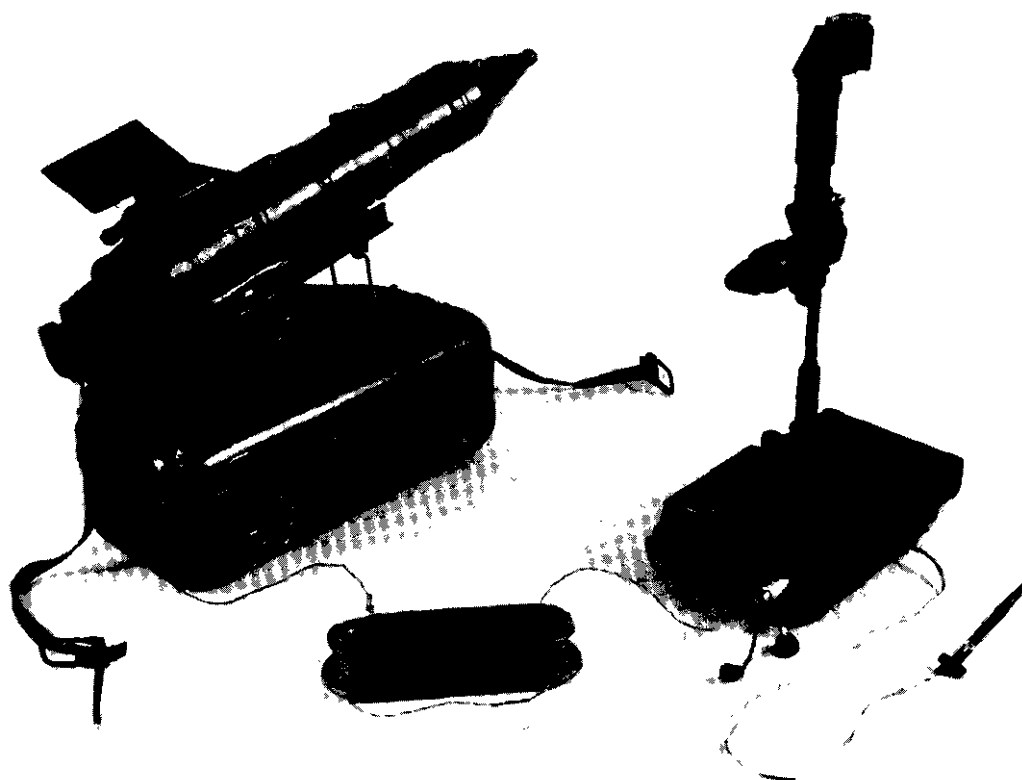
The SWATTERs with MCLOS guidance have a major disadvantage: the operator must track target and missile simultaneously and manually guide the missile to the target. The slow flight speed makes evasive action an effective countermeasure, especially at long ranges.

REMARKS:

The Soviets introduced the SWATTER A in 1960, the SWATTER B in 1965, and the SWATTER C in 1968-1970. The AT-5/SPANDREL is currently replacing the MCLOS-guided BRDM-mounted SWATTERs. The helicopter-mounted SWATTER C, retrofitted with a semiautomatic IR/radio guidance system, was apparently an interim measure pending the full deployment of the longer-range, second-generation missile AT-6/SPIRAL.

Antitank Guided Missile AT-3/SAGGER

AT-3/SAGGER on BRDM-2

AT-3/SAGGER *manpack***DESCRIPTION:**

The SAGGER is a wire-guided ATGM with a HEAT warhead. The missile is 864 millimeters in length, 120 millimeters in diameter, and 11.3 kilograms in weight. It has several launch configurations: manpack, armored vehicle, and even helicopter.

With the manpack version, the operator carries the SAGGER missile in a fiberglass "suitcase." He attaches it by a hinged support to the lid of the case. From that position, he launches the

missile by means of a firing button on the control box. He then uses the control box's periscope sight and control stick to guide the missile to the target.

On BRDM/BRDM-2 scout vehicles, six launch rails are mounted on the underside of a retractable armored cover, with eight additional missiles carried inside the vehicle. The BMP-1 and BMD-1 combat vehicles have single launch rails mounted above the 73-mm main gun and carry a total of four and three missiles, respectively.

AT-3/SAGGER launch rails on HIP F



The Mi-2/HOPLITE helicopter can carry two SAGGERs on each side of its cabin. The Mi-8TB/HIP F carries six SAGGERs.

CAPABILITIES:

The SAGGER can engage targets at ranges of 500 to 3,000 meters and penetrate over 400 millimeters of armor. It employs an MCLOS guidance system in which the operator must observe both missile and target and guide the one towards the other. The wire-guided missile is invulnerable to electronic countermeasures and has a very small percentage of malfunctions.

The retractable launcher on the BRDM-2 vehicle has the ability to traverse 70 degrees to the left or right with elevation varying from 3.5 to 17 degrees.

The AT-3c/SAGGER C variant employs SACLOS guidance. It is mounted primarily on the BRDM-2, but it may also be mounted on the HIP F and HOPLITE helicopters. These heliborne systems provide greater flexibility to the ground command but at a greater vulnerability cost to the launch platform.

The antitank platoon of a BTR-equipped MRB has two ATGM squads, each with two manpack SAGGER firing teams. Each three-man team has a control box, four SAGGER missiles, and an RPG-7V antitank grenade launcher. The gunner

carries two missiles and the control box in suitcases. The assistant gunner carries two more missiles in suitcases. The backup gunner carries the PRG-7V. The team can set up, check out, and fire one missile in 5 minutes or all four missiles in 12 to 15 minutes. Using a four-position selector switch on the control box, the gunner can fire up to four missiles consecutively. He can remotely fire missiles from positions up to 15 meters from the launchers. For targets at ranges of less than 1,000 meters, the gunner can guide the missile by eye; for longer ranges, he must use the 8-power magnifying periscopic sight. The RPG-7V gunner usually is deployed 150 to 200 meters in front of the SAGGER position to cover targets inside the minimum SAGGER range of 500 meters. The antitank platoon also has two SPG-9s which may deploy with the manpack SAGGERs.

BRDM/BRDM-2 SAGGERs are organic to the antitank missile battery of MRRs and airborne regiments, to the antitank battalion of MRDs, to the antitank regiment of CAAs, and to the antitank brigade of artillery divisions. The BRDM/BRDM-2 vehicles have a reaction time of one minute to fire from a completely buttoned-up mode. The crew can fire six missiles without reloading, and the vehicle can carry eight additional missiles inside. Successive missiles can be fired and tracked within five seconds of the previous missile's impact. The gunner can operate either from within the vehicle

Antitank Guided Missile AT-3/SAGGER (continued)

or from a remote position up to 80 meters away. The vehicle has a two-man crew that includes the commander/gunner and the driver. They also have assault rifles and an RPG-7V antitank grenade launcher.

LIMITATIONS:

The SAGGER A gunner must visually track target and missile simultaneously; this requires extensive training and constant practice. Although the missile leaves the launcher armed and can detonate and kill at very short range, it can be captured by the gunner only at ranges of 500 to 800 meters. Under combat conditions, however, most gunners probably can successfully engage targets only between 1,000 and 3,000 meters. The missile has a very long flight time to the target: 12.5 seconds to 1,500 meters, and 25 seconds to 3,000 meters. Evasive action is effective against it, especially at long range. Although a SAGGER

launching gives off a gray smoke cloud and a loud roar, its signature is difficult to detect on the battlefield.

REMARKS:

The SAGGER, also known by the designation AT-3, was first seen in 1961. It is more compact than the earlier AT-1/SNAPPER and AT-2/SWATTER ATGMs, but carries an equally powerful warhead. In recent years, the Soviets have retrofitted some SAGGER systems, designated AT-3c, with semiautomatic IR/wire guidance systems. Only the vehicle- and helicopter-mounted missiles have been so retrofitted. This is obviously an interim measure pending the full deployment of longer-range, second-generation AT-5/SPANDREL and AT-6/SPIRAL missiles. The AT-4/SPIGOT is replacing manpack SAGGERS as well as those mounted on the BMP-1 and BMD-1.

AT-4/SPIGOT**DESCRIPTION:**

The AT-4/SPIGOT is a tube-launched, wire-guided, SACLOS, ATGM system, similar in many respects to the US TOW system. The AT-4 system consists of three major components: the SPIGOT missile, the launch tube, and the missile launcher. The missile is 863 millimeters long and 119 millimeters in diameter; it weighs 7.4 kilograms and has a HEAT warhead. The launch tube is 1,100 millimeters long, 130 millimeters in diameter, and 5.2 kilograms in weight. It serves to store and carry the missile. The tripod-mounted launcher for ground-launched employment has a periscope sight attached to its left side. The sight and the missile tracker comprise a single unit, which is mechanically attached to the launch-tube connecting rail so both move together in elevation. A locking lever allows the complete periscope sight and missile tracker unit to be released and rotated into a folded position for transport. The monocular optical sight has 4-power magnification and a 4.5-degree field of view. The crew loads the SPIGOT missile by sliding the tube onto the launch supports from the rear until the electrical contacts and a mechanical catch engage; then the system is ready for launch.

The Soviets originally designed the AT-4 as a ground-launched weapon system. However, turrets of the BMP-1 and BMD-1 combat vehicles can mount the AT-4 launcher. The BRDM-2 launcher vehicle of the AT-5 system and the launcher on the BMP-2 can fire the SPIGOT missile.

CAPABILITIES:

The SPIGOT has a minimum range of only 70 meters and a maximum range of 2,000 meters. Missile speed is estimated at 185 meters per second, with a maximum flight time of 11 seconds. The warhead, which is probably smaller than that of the SAGGER, has an armor penetration capability of 500 to 600 millimeters. Probability of first-round hit should be at least the same as for the semi-automatic AT-3c/SAGGERC; that is, 90 percent.

The SACLOS guidance system increases accuracy and reduces operator training requirements since it is no longer necessary for the operator to track target and missile simultaneously. The operator keeps his sight trained on the target while the

Antitank Guided Missile AT-4/SPIGOT (continued)

missile is tracked automatically. The deviation between the missile's path and the operator's line-of-sight is measured by an IR tracking apparatus. (The IR source is in the tail of the missile.) An apparatus at the control site then generates guidance commands which are transmitted to the missile by wire, causing the missile to eliminate the deviation.

The AT-4 tracker is adequate, simple, and inexpensive. Its extremely narrow field of view makes it more difficult to decoy, since the decoy source must be inside the field of view.

The antitank platoon of a BTR-equipped MRB has four or (in high-readiness units) six AT-4/SPIGOT firing teams. In each three-man team, the gunner carries the folded launcher and tripod as a backpack, and each of the two bearers carries two launch tubes as backpacks. All three men carry an assault rifle but no RPG-7V, since the SPIGOT does not have the 500-m deadspace of the SAGGER.

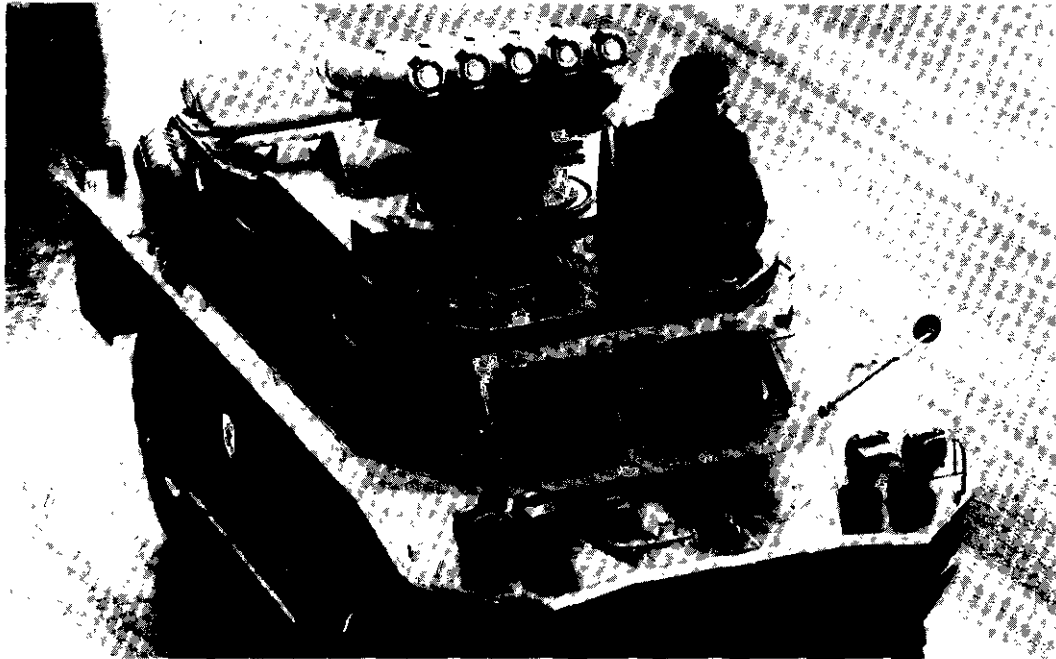
LIMITATIONS:

The requirement that the missile launcher of a SACLOS system be collocated with the aiming and tracking assembly (that is, with the operator) eliminates the possibility of moving the operator to a remote position for safety. Since the operator must establish and maintain visual contact with the target, any means of interfering with his visual contact or disrupting his concentration will be an effective countermeasure. Such means include flash blinding, counterfire, and smoke screening. Besides being an effective and inexpensive means of obscuring visual contact, smoke can also attenuate the IR guidance link of the missile tracker.

REMARKS:

The AT-4/SPIGOT system, nicknamed Fagot (bassoon) by the Soviets, was introduced in 1974. It is operational in all Warsaw Pact countries. The interoperability of the SPIGOT missile on the AT-5 launch vehicle and BMP-2 provides a significant logistical and tactical advantage; however, the use of the SPANDREL missile on the AT-4 portable launcher has not been confirmed.

AT-5/SPANDREL



DESCRIPTION:

The AT-5/SPANDREL is a wire-guided, SACLOS, ATGM system mounted on the BRDM-2 amphibious scout car chassis. The dimensions and shape of the launch tube are similar to those of the AT-4/SPIGOT, but the SPANDREL missile is considerably heavier. The SPANDREL launch tube has a blow-out cap at the front, and it is flared at the rear. Five SPANDREL missiles, or any combination of SPIGOT and SPANDREL missiles, are carried on a traversable mount just behind the two front cupolas of the BRDM-2. A bowed hatch in the vehicle roof immediately behind the launcher allows the mount to be folded backwards into the hull for reloading under armor protection. The vehicle carries an additional 10 reload missiles inside. A rotatable optical sighting/tracking periscope, similar in appearance to the periscope on the AT-4/SPIGOT launch apparatus, is mounted atop the gunner's hatch on the 'right front of the vehicle roof.

A single-tube AT-5 launch platform with an integrated optics/tracker housing is mounted atop the turret of the BMP-2 amphibious infantry combat vehicle. As with the BRDM-2 launch pedestal configuration, this variant of the AT-5 system

can launch either the SPIGOT or SPANDREL missile. The basic onboard load for the BMP-2 is four missiles.

CAPABILITIES:

The SPANDREL has a maximum range of 4,000 meters and a minimum range of 100 meters. Other capabilities are essentially the same as those listed above for the AT-4/SPIGOT, except for the time of flight.

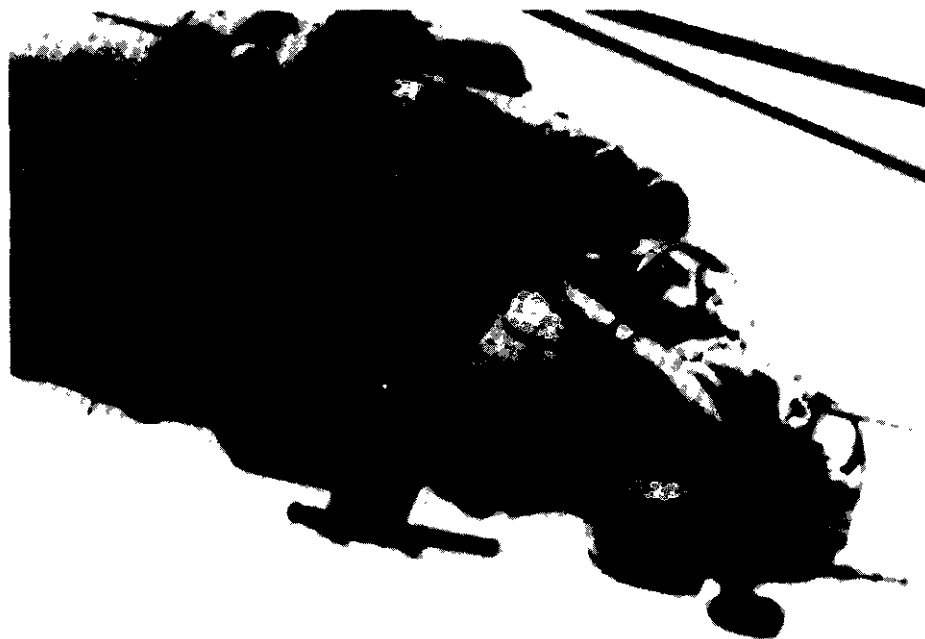
LIMITATIONS:

Same as for the AT-4/SPIGOT.

REMARKS:

The Soviets nicknamed the AT-5/SPANDREL system Konkurs (contest). They introduced it around 1974 or 1975, although they did not display it publicly until the Red Square parade on November 1977. The BRDM-2-mounted AT-5 system will eventually replace all vehicle-mounted AT-2 and AT-3 systems in the Soviet Army. It is already operational in Warsaw Pact countries.

Antitank Guided Missile AT-6/SPIRAL

AT-6/SPIRAL on HIND E**DESCRIPTION:**

The AT-6/SPIRAL is a tube-launched, SACLOS, ATGM mounted on the Mi-24/HIND E and F helicopters. It replaces the heliborne AT-2/SWATTER variants found on previous HIND models. Normally, there are I-shaped launch fixtures for two SPIRAL launch tubes on each wingtip of the HIND E and F. However, the HIND E and F may carry a second AT-6 launch platform on the outboard universal pylon on each wing. This allows them to mount a total of 8 SPIRAL missiles. Some HIND E and F models have "stacked" AT-6 launch platforms on the wingtip pylons and the outboard universal pylons, for a possible total of 16 SPIRALs. Unlike the AT-4/SPIGOT and AT-5/SPANDREL, this missile is not wire-guided. The SPIRAL uses a SACLOS system with IR missile tracking and radio guidance (similar to the uprated AT-2c/SWATTER C). It is much larger than previous Soviet ATGMs.

CAPABILITIES:

The SPIRAL has a maximum range estimated at 5,000 meters. Its minimum range may be similar to the earlier AT-2/SWATTER ATGMs; that is,

500 meters. Missile speed is probably about 450 meters per second. The warhead could weigh up to 10 kilograms with an armor penetration capability of 600 to 700 millimeters. Probability of first-round hit should be at least the same as for the AT-2c; that is, 90 percent. The SACLOS guidance system probably operates the same as the AT-4/SPIGOT and AT-5/SPANDREL, except that the SPIRAL is not wire-guided.

LIMITATIONS:

During the flight time of the SPIRAL to the target (estimated at approximately 11 seconds to 5,000 meters), the target can take evasive action, but the helicopter launch platform has limited ability to take evasive action itself since the AT-6 operator must keep the target in his sight.

REMARKS:

Although introduced in 1973, the AT-6/SPIRAL was first observed on the HIND E in 1978. Some sources credit the SPIRAL with a range of up to 7,000 meters.

AT-7/SAXHORN



Soldat und Technik

DESCRIPTION:

The AT-7/SAXHORN is a tube-launched, SACLOS, ATGM system with a wire command link. One man can carry and operate it, but its crew normally consists of two men. The second man probably carries additional missile canisters.

CAPABILITIES:

The AT-7 system is organic to the machine gun/antitank platoon of the BTR-equipped MRC. This platoon has three manpack launchers.

The SAXHORN missile, with a HEAT warhead, has a maximum range of 1,000 meters. The opera-

tor tracks the target visually using a monocular scope. The missile is guided automatically to the target on which the operator keeps the crosshairs of his sight.

LIMITATIONS:

Same as for the AT-4/SPIGOT.

REMARKS:

The AT-7/SAXHORN system was introduced in 1979 and is the Soviet equivalent of the US Dragon system.

AT-8/SONGSTER



DESCRIPTION:

AT-8/SONGSTER is a tank-gun-launched system with SACLOS guidance and a frequency guidance link. It is known to be used on the T-64B and T-80 medium tanks.

ABILITIES:

SONGSTER missile has a maximum range of 1000 meters. Its HEAT warhead has an armor penetration capability of 700 to 800 millimeters. The missile is fired through the main gun tube of a normal tank round; after launch, however, it has a sustain or boost/sustain motor to propel it to the target. The tank gunner tracks the target

visually using a monocular periscope; the missile is guided automatically to the target on which he keeps the crosshairs of his sight. The missile has a primary antitank role, but it also has a secondary antihelicopter role.

LIMITATIONS:

Same as for other SACLOS ATGMs.

REMARKS:

The AT-8/SONGSTER may have entered service around 1981.

AIR DEFENSE
Antiaircraft Guns
Antiaircraft gun armament characteristics

WEIGHT, TRAVELING position (kg)	930 (estimated)/950		4 34,000	4,763/4,763
LENGTH, TRAVELING position (mm)	4.60/4.60	see vehicle characteristics	INA	8.84/8.84
WIDTH, travel/firing position (mm)	1.86/2.41		INA	2.08/6.93
HEIGHT, travel/firing position (mm)	2.07/1.28		INA	2.37/6.02
GUN				
Caliber (mm)	2 x 23	4 x 23	4 x 30****	1 x 57
Ammunition loading (type)	2 box magazines 2/50-rd metallic link belt	metallic link belts (about 500 rounds per belt)	INA	4-rd clip
AMMUNITION (types).	HEI. HEI-T. API-T	HEI, HEI-T. API-T	INA	Frag-HE-T, APC-T
PERFORMANCE				
Elevation (c)	-10 to +90	-4 to +85	INA	-4 to +87
Traverse (c)	360	360	INA	360
Maximum horizontal range (m)	7,000	7,000	INA	12,000
Ground target range (m)	2,000	2,000	INA	INA
Maximum vertical range (m)	5,100 (about 3,500 w/self-destruct fuzing)	5,100 (about 3,500 w/self-destruct fuzing)	INA INA	8,800 (about 7,400 w/self-destruct fuzing)
Tactical AA range (m)	2,500*	2,500*	4,000	6,000 (off-carriage fire control) 4,000 (on-carriage fire control)
Cyclic rate of fire (rd/min)	800-1,000 per barrel	800-1,000 per barrel	INA	105-120
Muzzle velocity (m/sec)	930-1,000**	930-1,000**	INA	960-1,000***
Armor Penetration (m @ 0° obliquity @ 500/1,000 m)	24.1/19.3 (API-T)	24.1/19.3 (API-T)	INA	101.1/96.5 (APC-T)
UNIT OF FIRE (rd)	1,200	2,000	INA	200
BASIC LOAD ON VEHICLE (rd)	INA	2,000	INA	INA
EMPLACEMENT/DISPLACEMENT TIME	15-20sec/35-40sec	varies, dependent on potential or actual fire mission	INA	1 min/3 min
FIRE CONTROL	optical-mechanical computing sight (AA); straight-tube telescope (ground)	on-board GUN DISH fire-control radar, electronic computer, and optical sights	on-board HOT SHOT fire control radar	on-carriage: optical-mechanical computing sight (AA), straight-tube telescope (ground); off-carriage: PUAZO-5 director and SON-4 (WHIFF) radar (old), PUAZO-6/60 director and SON-9 or -9A (FIRECAN) radar (newer), or FLAP WHEEL fire control radar (newest)
PRIME MOVER	UAZ-69, GAZ-63, or GAZ-66	NA	NA	Ural-375 or AT-T
DOI	1962	1965	1986	1950
STATUS	standard	standard	standard	standard

FOOTNOTES. * 1.500-m height.
 ** 1970 meters per second when new; 930 meters per second is standard

Antiaircraft gun characteristics (vehicle)

VEHICLE CHARACTERISTICS	23-MM ZU-23	23-MM zsu-23-4	57-MM S-60
VEHICLE (Prime mover)	UAZ-69 jeep	self-propelled	Ural-375 truck
WEIGHT (mt)	1.6	20.5	8.4
LENGTH (m)	3.9	6.5	7.4
WIDTH, overall (m)	1.9	3.1	2.7
HEIGHT, overall (m)	2.0	2.60/3.75*	3.0
ENGINE	4-cylinder, 55-hp, gasoline	6-cylinder, 240-hp, diesel	8-cylinder, 175-hp, gasoline
SUSPENSION	wheels, 4 × 4	tracked, six road wheels, no track support rollers	wheels, 6 × 6
MAXIMUM ROAD SPEED (km/hr)	90/40**	50	75/60***
FUEL CAPACITY (liters)	48	520	360
ROAD RANGE (km)	530	450	750
TRENCH CROSSING (m)	0.46	2.5	0.875
VERTICAL STEP (m)	0.30	1.0	0.800
GRADABILITY (c)	30	30	32
FORDING (m)	0.61/.080***	1 0	1.5
ARMOR (maximum)	no armor		no armor
Hull (mm)	NA	9.4	NA
Turret (mm)	NA	8.9	NA
INFRARED			
Driver	yes	yes	yes
Gunner	NA	no	NA
Commander	NA	yes	NA
NBC PROTECTION	none	radiation detection warning system; air filtration and over-pressure system	none
CREW	1 (driver)	NA (See Armament)	1 (driver)
PASSENGERS	gun crew	NA	gun crew

FOOTNOTES. *Radar in travel position/radar up.

**UAZ-69/ZU-23 when towed by UAZ-69(70 kilometers per hour when towed by GAZ-63)

***Prime mover/gun.

ZU-23



DESCRIPTION:

The ZU-23 comprises twin 23-mm cannons on a towed two-wheel carriage. The cannons mount side-by-side between large ring-type trunnions. In appearance, the ZU-23 resembles the 14.5-mm ZPU-2; however, the shape and placement of the ZU-23 ammunition boxes (at right angles to the gun carriage) and prominent muzzle flash suppressors are distinguishing features.

CAPABILITIES:

The ZU-23 is a highly mobile, air-droppable weapon. A battery of 6 ZU-23s is organic to Soviet air assault brigades, as well as to airborne regiments. A battalion of 18 ZU-23s is organic to the Soviet airborne division. It is that division's principal anti-aircraft artillery (AAA) weapon. It has an effective AA range of 2,500 meters. It can also be effective against lightly armored ground vehicles.

In firing position, the ZU-23 is leveled by jacks and stabilized on a three-point base. It uses an optical-mechanical computing sight for AA fire and a straight-tube telescope for ground targets. The crew can fire the gun from the traveling position in emergencies.

The ZU-23 fires the same ammunition as the 23-mm SP AA gun ZSU-23-4. On the towed system, ammunition feeds from box magazines mounted on the outside of each trunnion. Reloading is fast and uncomplicated. The magazines are easily accessible. The beginning link of the new belt attaches to the link of the last old cartridge. This last cartridge automatically interrupts the firing cycle when it reaches the feedway and signals the bolt to remain open.

LIMITATIONS:

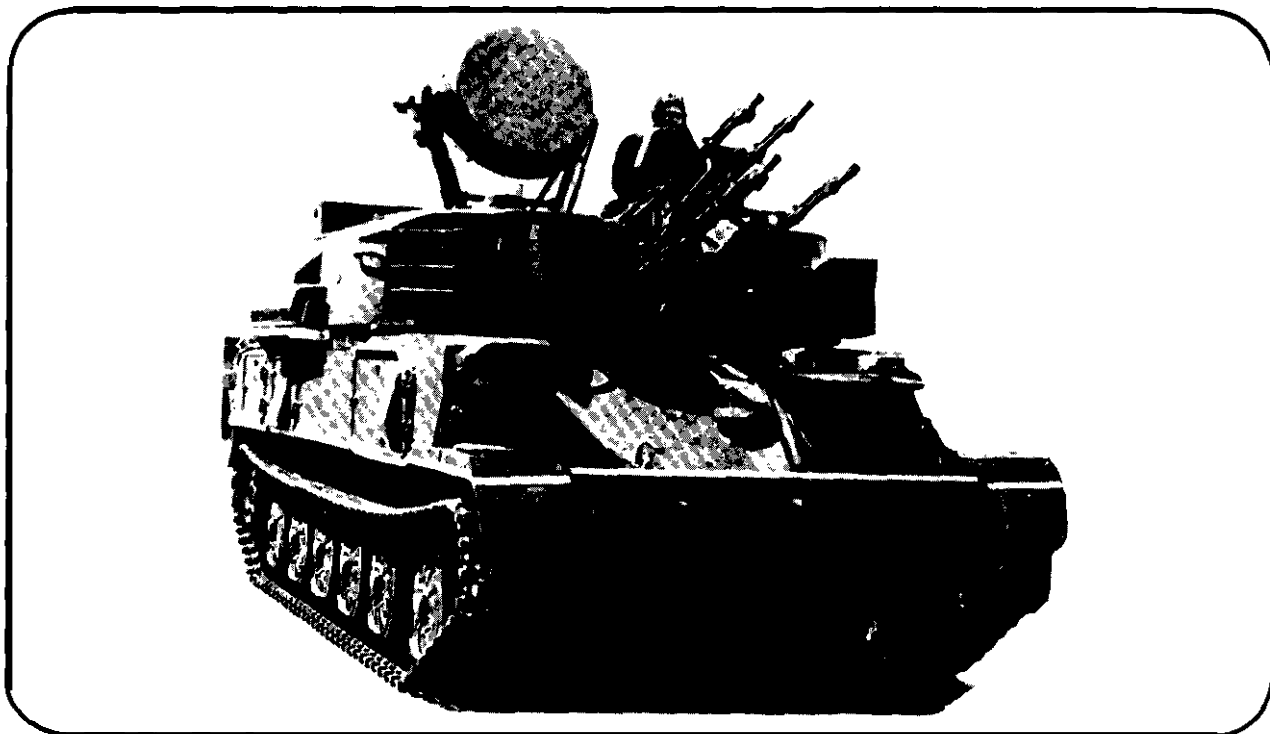
One drawback of the ZU-23 is its inability to fire anything but automatic fire.

REMARKS:

Introduced in 1962, the ZU-23 is the Soviets' newest lightweight, automatic, towed AA gun. It is used extensively by airborne units and possibly by some MRRs that have not yet converted to the ZSU-23-4/SA-9 air defense battery. ZU-23s also provide close-in air defenses for an SA-4 brigade.

The Soviets have exported the ZU-23 to many countries. Some of these countries have added a degree of mobility to the system by mounting it on various trucks and armored vehicles.

23-mm Self-Propelled Antiaircraft Gun ZSU-23-4

ZSU-23-4**DESCRIPTION:**

The ZSU-23-4 is a fully integrated, SP AA system with four liquid-cooled 23-mm automatic cannons mounted on the front of a large, flat, armored turret. The chassis has many components borrowed from other Soviet armored vehicles. The suspension system resembles that of the PT-76 and ASU-85; that is, it has six road wheels and no track support rollers. The driver sits in the left front of the hull; the rest of the crew (the commander, gunner, and radar operator) sit in the turret. The GUN DISH fire control radar mounted on the rear of the turret can fold down during travel.

The Soviets have produced a number of different ZSU-23-4 models. These are distinguishable externally by the types of stowage boxes on the turret and minor modifications in the mounting of the guns.

CAPABILITIES:

A platoon of four ZSU-23-4s, along with four SA-9-GASKINSAM systems, is organic to the air defense missile and artillery battery of MRRs and

TRs. Two ZSU-23-4s will usually support each of the two first-echelon battalions. These two weapons are normally separated by 200 meters, and they typically travel 400 meters behind the battalion's leading elements.

The ZSU-23-4 is not amphibious, but has a fording capability of just over one meter. During river assault operations, the ZSU-23-4s would be ferried to the far bank immediately after the leading companies.

The ZSU-23-4 has the capability to both acquire and track low-flying aircraft targets, with an effective AA range of 2,500 meters. It also is capable of firing on the move because of its integrated radar/gun stabilization system. The high-frequency operation of the GUN DISH radar emits a very narrow beam that provides excellent aircraft tracking while being difficult to detect or evade. However, such a frequency also dictates a limited range; linking the system to other long-range acquisition radars in the area can compensate for this. The ZSU-23-4 can also engage lightly armored ground vehicles.

23-mm Self-Propelled Antiaircraft Gun ZSU-23-4 (continued)

The four guns are water-cooled and have a cyclic rate of fire of 800 to 1,000 rounds per minute each. However, the gunner normally fires them in bursts (2 to 3 rounds per barrel) to reduce ammunition expenditure and prolong barrel life. Each ZSU-23-4 carries about 2,000 rounds onboard. Supply trucks, which follow the ZSUs at a distance of 1.5 to 2.5 kilometers, carry an estimated additional 3,000 rounds for each of the four ZSUs. Electronic target acquisition, tracking, and ranging are automated; an onboard computer determines superelevation and azimuth lead. Conventional optical sights also are available.

The onboard load normally mixes two types of ammunition at a ratio of three HEI-T rounds per one API-T round. An HEI round is also available. The HEI-T and HEI rounds are intended for defeating aircraft by blast, fragmentation, or incendiary effect. However, they may also be used against personnel in a ground role. The API-T round can penetrate lightly armored ground targets and aircraft and defeat them by an incendiary effect. Tracers facilitate correction of fire.

The An-22/COCK or IL-76/CANDID transport aircraft or the Mi-26/HALO A heavy-lift helicopter can airlift the ZSU-23-4. The crew of the

ZSU-23-4 receives a degree of protection from the thin armor (maximum thickness 9.4 millimeters in the hull, 8.9 millimeters in the turret). A radiation detection and warning system and an air filtration and overpressure system provide collective NBC protection.

LIMITATIONS:

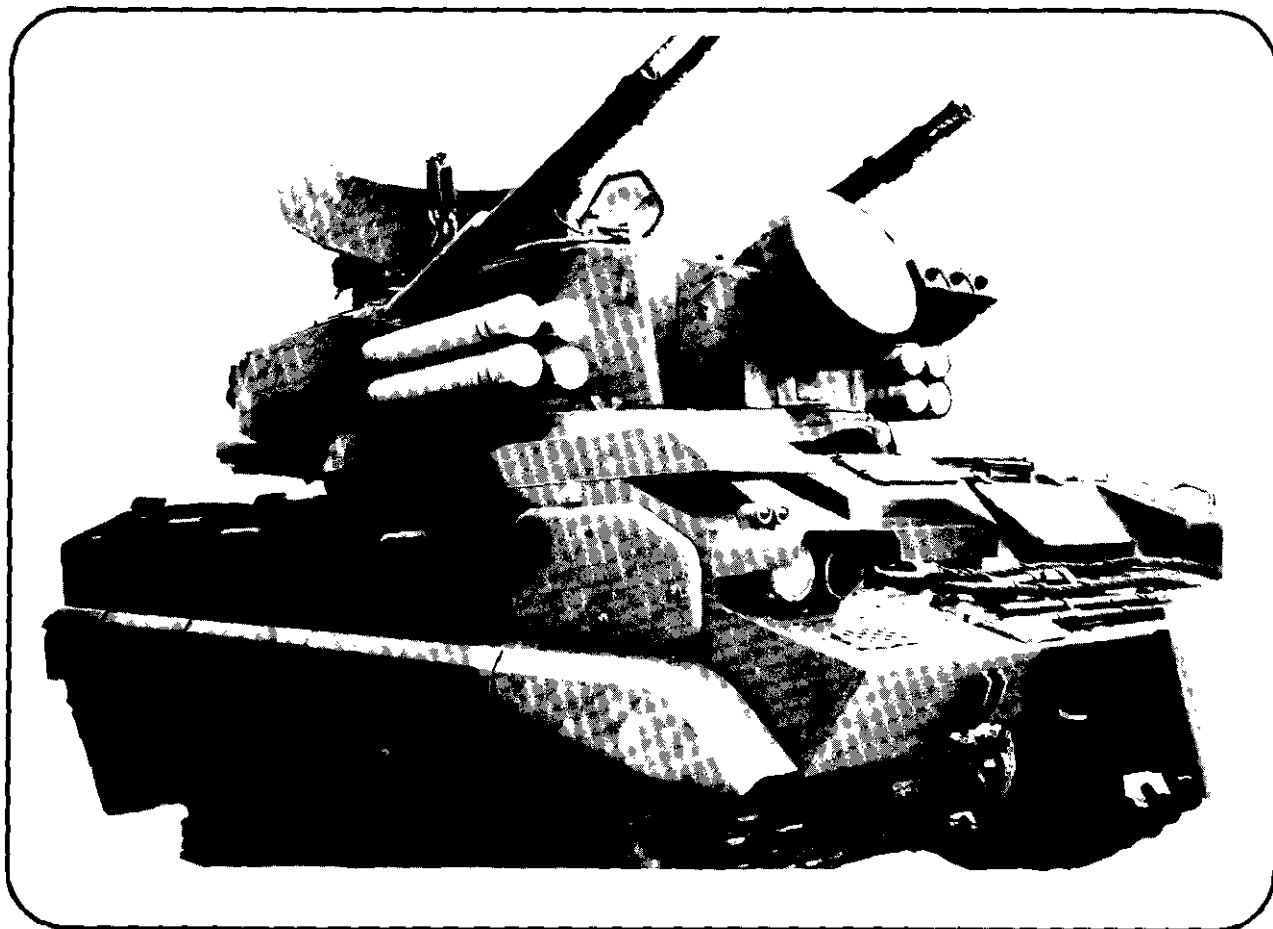
Heavy machine gun fire can penetrate the hull and turret. Tread and road wheels are vulnerable to artillery fire. Frag-HE rounds can penetrate the armor, destroy the radar dish, or rupture the liquid coolant sleeves of the 23-mm cannons. The system is also vulnerable to ECM.

REMARKS:

The ZSU-23-4, introduced around 1965, is called Shilka by the Soviets. The rest of the Warsaw Pact has deployed it widely since 1970. Despite the ZSU-23-4's good record, the 30-mm SP AA system 2S6 is replacing it. The 2S6 system, previously known as SP AA gun M1986, has improved AA range, rate of fire (per barrel), and fire-control equipment. The newer system is mounted on a more heavily armored chassis derived from the SA-4/GANEFSAM launcher vehicle.

30-mm Self-Propelled Antiaircraft System ZS6

2S6

**DESCRIPTION:**

The 2S6 system integrates four 30-mm automatic cannons with launchers for eight SA-19 SAMs on the same chassis. In addition to two guns and four SAM launchers on each side, the turret mounts a fire control radar on its front and a target acquisition radar on its rear. The suspension system resembles that of the SA-4/GANEF SAM system, but it has only six road wheels.

CAPABILITIES:

A battery of six 2S6 systems is organic to the air defense battalion which replaces the air defense missile and artillery battery in some MRRs and TRs. The mixed armament of guns

and missiles allows the 2S6 to replace both the ZSU-23-4SP AA guns and the SA-13 SAM systems at this level. The separate radars for target acquisition and fire control enable the 2S6 to search for and engage targets simultaneously. Compared to the ZSU-23-4 the 2S6 guns have improved AA range and rate of fire (per barrel). The onboard SAMs can engage even longer-range targets.

REMARKS:

The 2S6, previously known as the SP AA gun M1986, has been deployed in WGF since the spring of 1987.

-mm Antiaircraft Gun S-60

S-60



DESCRIPTION:

The S-60 is a towed, road-transportable, short-to medium-range, single-barrel 57-mm AA gun system. The recognition features include a four-wheeled carriage; a long, thin tube with multi-perforated muzzle brake; and a distinctive gun shield. The prime mover for the S-60 is usually the Ural-375 cargo truck. Besides on-carriage optical fire control, the S-60 also employs an off-carriage SON-9 or FLAP WHEEL fire control radar, mounted on a separate van.

CAPABILITIES:

The S-60 is present in the AA regiment of some MRDs and TDs. However, the SA-6/GAINFUL or SA-8/GECKOSAM systems have replaced it in most divisions in the forward area. It also may be organic to territorial defense units, especially around airfields. An S-60-equipped regiment has 24 guns: four firing batteries, each consisting of six guns and a fire control center.

The S-60's tactical AA range is 4,000 meters with optical sights and 6,000 meters with radar

guidance. This weapon, designed to provide defense against aircraft and helicopters, can also be effective against lightly armored ground vehicles. The four-wheel carriage can be leveled and stabilized on jacks to form a point firing base. The four round clips feed ammunition horizontally into the weapon. The gun can fire from the traveling position in emergencies.

LIMITATIONS:

The towed S-60 system lacks the mobility of the newer SAM systems which are replacing it.

REMARKS:

The S-60, introduced around 1950, is no longer organic to first-line Soviet divisions. The Soviets introduced an SP version, the ZSU-57-2, in 1957. It had twin 57-mm guns mounted on a modified T-54 tank chassis. The ZSU-57-2 has the same characteristics as the S-60 except that it is not radar-controlled. It is now considered obsolete

SAM vehicle characteristics (SA-4/GANEF through SA-13 GOPHER)

VEHICLE CHARACTERISTICS	SA-4/ GANEF	SA-6a/ GAINFUL	SA-8/ GECKO	SA-9/ GASKIN	SA-11/ GADFLY*	SA12a/ GLADIATOR	SA13/ GOPHER
CREW	3-4	3	3	3	INA	INA	3
WEIGHT, with missiles (mt)	300	140	90	70	INA	INA	125
LENGTH							
With missile (m)	9.46	6.80	9.14	5.80	INA	INA	6.60
w/o missile (m)	7.30	6.80	9.14	5.80	7.80 (estimated)	8.63 (estimated)	6.45
WIDTH, overall (m)	3.20	3.20	2.75	2.40	3.34 (estimated)	3.42 (estimated)	2.85
HEIGHT, overall (m)	4.47	3.45	4.20**	2.30/3.80***	INA	INA	2.30/3.80***
ENGINE	520-580-hp, V-12, diesel	240-hp, 6-cyl, diesel	290-hp, V-6, diesel	140-hp, V-8, gasoline	INA	710-hp, 5-cyl diesel (estimated)	290-hp, V-8 diesel
SPEED							
Road (km/hr)	50	45	60	100	INA	INA	60
Water (km/hr)	NA	NA	5	10	INA	INA	6
FUEL CAPACITY (liters)							
	850	250	350	290	INA	INA	450
ROAD RANGE (km)							
	450	250	500	750	INA	INA	500
TRENCH CROSSING (m)							
	2.5	2.5	1.2	1.2	INA	INA	2.7
VERTICAL STEP (m)							
	1.0	1.0	0.5	0.4	INA	INA	0.7
GRADABILITY (°)							
	30	35	30	30	INA	INA	35
FORDING (m)							
	1.5	1.0	amphibious	amphibious	INA	INA	amphibious
ARMOR, maximum (mm)							
	15	9.4	none	14	INA	INA	7
INFRARED							
Driver	no	yes	no	yes	INA	INA	yes
Commander	no	yes	no	yes	INA	INA	no
NBC PROTECTION							
	yes	yes	yes	yes	INA	INA	yes

FOOTNOTES *Same vehicle used for SA-6b GAINFUL system
 **With radar folded down
 ***With launcher down, erected

Air Defense Artillery-Associated Radars

Air defense artillery-associated radar characteristics

	PRIMARY WEAPON	FUNCTION	FREQ BAND	RANGE (km)
h-mounted)	S-60 (57 mm)	fire control	I	about 35
	S-60 (57-mm)	target acquisition	C (UHF)	250
ard)	ZSU-23-4 (quad 23-mm)	fire control	J	20
ard)	2S6 (quad 30-mm)	fire control and target acquisition	INA	20 (estimated)

Surface-To-Air-Missiles

SAM missile characteristics (SA-2/GUIDELINE through SA-7/GRAIL)

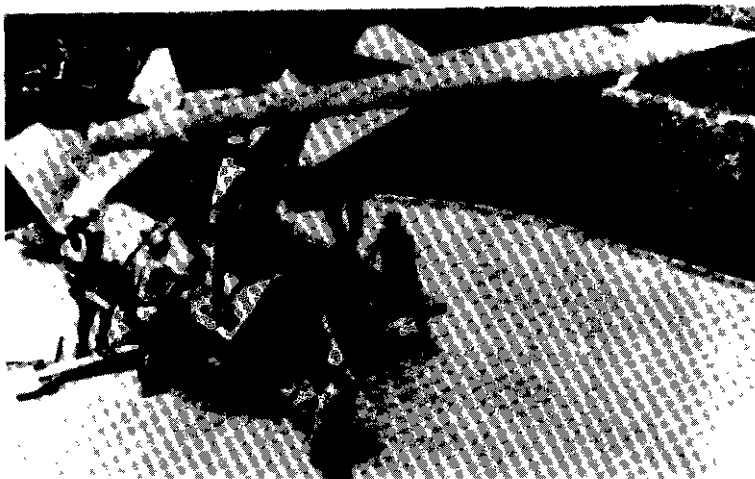
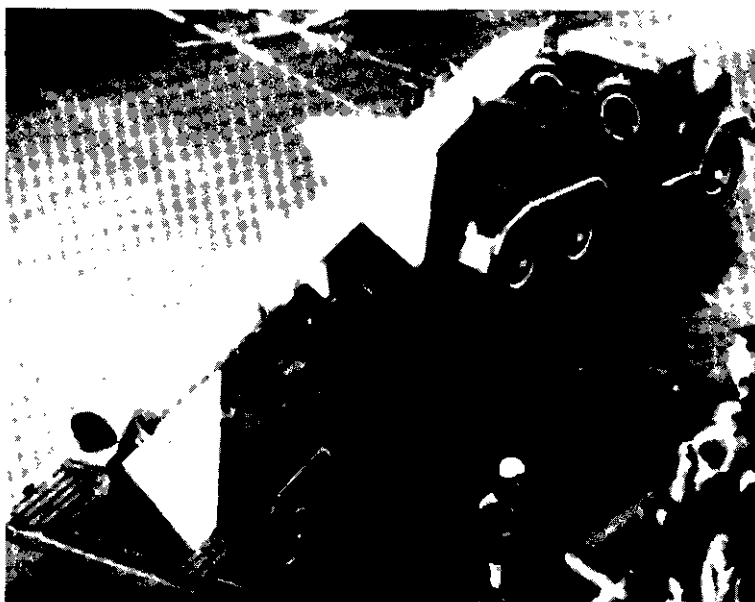
CHARACTERISTICS	SA-2/GUIDELINE	SA-3/GOA	SA-4/GANEF	SA-6/GAINFUL	SA-7/GRAIL
	1959	1961	1967/1974*	1970/1979**	1969/1972***
	standard	standard	standard	standard	standard
	10-60	6-70	8-50/7-90*	5-80	1-45
	0.70	0.60	0.80	0.33	0.07
h (kg)	2,300	600	2,500	580	10
STEM	solid	solid	4 solid (strap-on)	integral solid	solid ejector
	liquid	solid	liquid ramjet	solid ramjet	solid boost-sustain
TUBES	single rail, ground mounted (not mobile)	2 or 4 rails ground mounted (not mobile)	2 rails	3 rails	1 tube
	command	command (possibly IR terminal homing)	command (possibly terminal homing)	semiactive radar homing	passive IR homing
	HE, possibly nuclear	HE	HE	HE	HE
y (Mach)	4.5	3+	4.0	2.5	1.4/1.75***
e (m)	28,000	25,000	25,000	12,000	3,500/4,500***
e (m)	100	100	100	50	15
(km)	35-50	25	80-100	24	3.6/5.5***
m)	7-9	6	9	4	0.5
0	10	50	10-15	10	10 seconds
ARS	FAN SONG, SPOON REST	FLAT FACE, LOW BLOW, SQUAT EYE	PAT HAND, LONG TRACK, THIN SKIN	STRAIGHT FLUSH, LONG TRACK, THIN SKIN	none

A-4a/4b
A-6a/6b
A-7a/7b.

SAM missile characteristics (SA-8/GECKO through SA-19)

MISSILE CHARACTERISTICS	SA-8/GECKO	SA-9/GASKIN	SA-11/GADFLY	SA-12a/GLADIATOR	SA-13/GOPHER	SA-14/GREMLIN	SA-16	SA-19
DOI	1974/1980*	1968	1983	1986	1977	1978	1986	1986
STATUS	standard	standard	standard	standard	standard	standard	standard	standard
LENGTH (m)	3.10	1.80	5.6	7.2 (estimated)	2.20	1.4 (estimated)	1.55 (estimated)	INA
DIAMETER (m)	0.20	0.12	0.4	0.5 (estimated)	0.12	0.07 (estimated)	0.08 (estimated)	INA
WEIGHT, at launch (kg)	170	30	650	2,000 (estimated)	INA	15 (estimated)	INA	INA
PROPULSION SYSTEM								
Booster	solid	solid	solid	INA	INA	solid ejector	INA	INA
Sustainer	solid	solid	solid	INA	INA	solid boost-sustain	INA	INA
LAUNCH RAILS/TUBES	4 rails/6 canister tubes*	4 canister tubes	4 rails	4 canister tubes	4 canister tubes	1 tube	1 tube	8 tube- on 2S6
GUIDANCE	command	passive IR homing	semiactive monopulse radar homing	INA	passive IR homing	passive IR homing	INA	INA
WARHEAD (type)	HE	HE	HE	HE	HE	HE	HE	HE
PERFORMANCE:								
Maximum velocity (Mach)	2+	1.5	3 (estimated)	3 (estimated)	1.8	INA	INA	INA
Maximum altitude (m)	12,000	5,000	20,000 (estimated)	30,000 (estimated)	5,500	5,500 (estimated)	INA	3,500
Minimum altitude (m)	10	10 (estimated)	25-30 (estimated)	30-90 (estimated)	9-10	0 (estimated)	INA	15
Operational range (km)	12	6	30 (estimated)	90 (estimated)	6-7 (estimated)	6 (estimated)	INA	8-10
Minimum range (km)	1.6-3	0.6	3 (estimated)	INA	0.7	0.6	INA	2
Reload time (min)	5	5	INA	INA	INA	INA	INA	INA
ASSOCIATED RADARS	LAND ROLL, LONG TRACK, THIN SKIN, (possible FLAT FACE)	none	U/I acquisition radar, U/I tracking radar	U/I phased-array radar	U/I range-only radar	none	none	HOT S

FOOTNOTE *SA-8a/8b

SA-2/GUIDELINE**SA-2/GUIDELINE***SA-2/GUIDELINE in travel mode***DESCRIPTION:**

The SA-2/GUIDELINE is a two-stage, radar-guided SAM. It travels on a semitrailer towed by a truck or tractor to the launch site. The SA-2 has appeared in several versions. Most of these have HE warheads; however, one version, first seen in 1967, reportedly has a nuclear warhead.

CAPABILITIES:

The SA-2, with a slant range of 35 to 50 kilometers, can defend high-altitude approaches up to 28,000 meters. The weapon is a national-level asset

usually found in the rear area with the mission of defending static assets such as supply and command installations. SA-2 units are not subordinate to the ground forces but to the air defense forces at the strategic level. However, the Soviets may incorporate them into the front air defense system to provide high-altitude air defense of front critical rear area assets.

An SA-2 regiment consists of three battalions, each having a single firing battery. Each battery has six launchers arranged in a star formation, a

SA-2/GUIDELINE (continued)

centrally located FAN SONG fire control radar, and a loading vehicle. Although the launchers are transportable, they normally deploy in fixed sites. The two forward batteries usually locate 40 to 50 kilometers behind front lines; the third battery locates 80 kilometers behind. The system normally is integrated with other rear area air defense systems to permit redundant coverage.

LIMITATIONS:

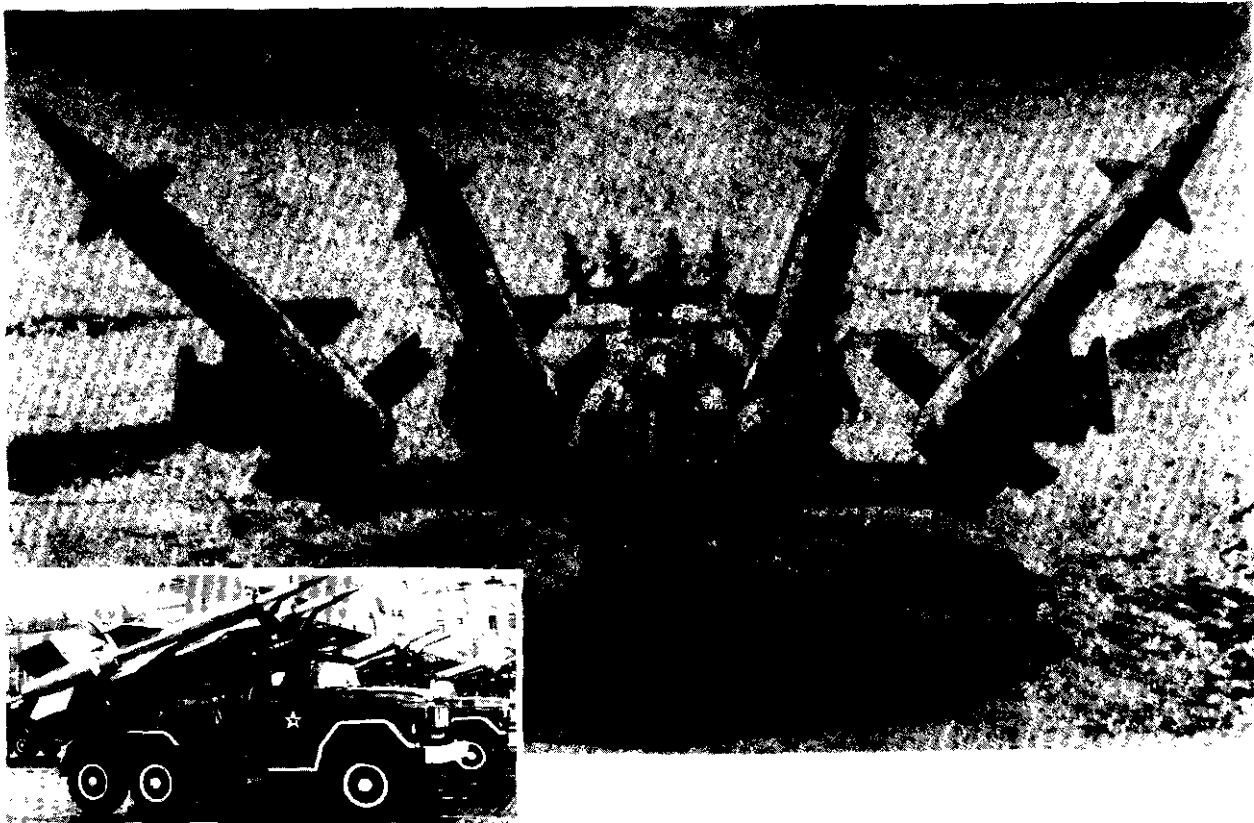
Although the SA-2 is reportedly effective within its kill zone, it is unlikely to be very effective

against an enemy employing sophisticated ECM equipment. Other drawbacks are the system's restricted mobility and its limited capability against low-altitude air targets.

REMARKS:

The SA-2 system, operational since 1959, is technologically obsolescent. The Soviets are gradually phasing it out of their inventory. The Soviet designation for the GUIDELINE missile is V7750VK; the complete SA-2 system is known as V75SM.

SA-3/GOA

SA-3/GOA**DESCRIPTION:**

The SA-3/GOA is a two-stage, solid-fuel, low-to medium-altitude SAM. Two ready missiles travel in tandem on a modified truck or tracked vehicle from which the crew loads the missiles onto a ground-mounted, trainable launcher for firing. Both twin and quadruple launchers are in use. The truck-mounted FLAT FACE radar acquires the targets, while the LOW BLOW radar carries out the fire control function.

CAPABILITIES:

The SA-3 has automatic radio-command guidance. The weapon can engage air targets at altitudes between 100 and 25,000 meters at slant ranges of 6 to 25 kilometers. It is principally a point/small-area defense weapon. Along with the S-60 and other AA guns, it may provide low-to medium-altitude air defense of front critical rear area assets as a complement to the high-altitude

capabilities of the SA-2. As with SA-2 units, SA-3 units are not normally subordinate to the ground forces, although they may be integrated into the front air defense system.

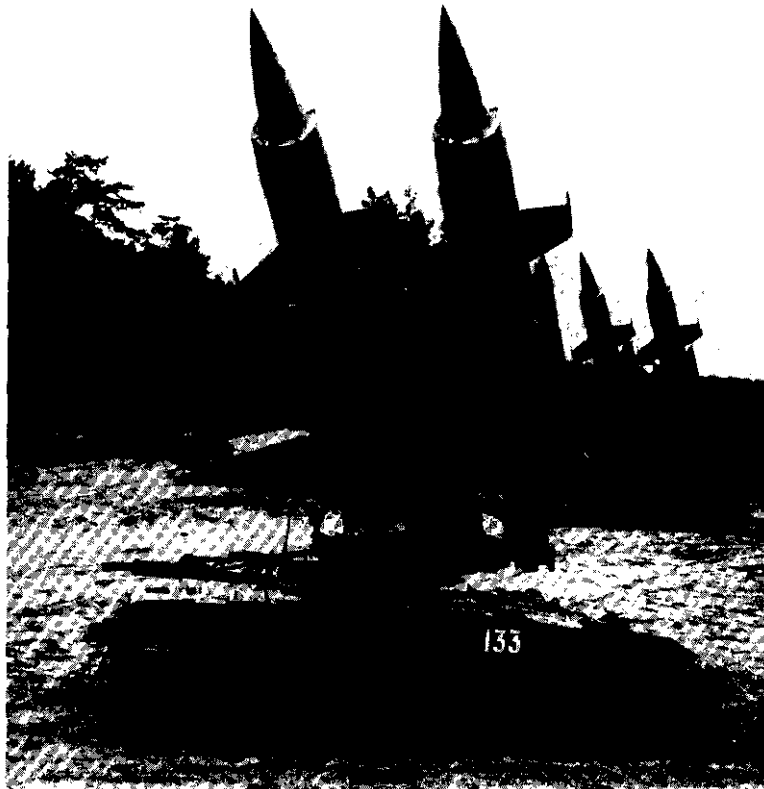
LIMITATIONS:

The SA-3 system is not mobile. It is movable, but its displacement time is considerable.

REMARKS:

The Soviets introduced the SA-3 into service in 1961. Newer, more mobile systems with improved capabilities (for example, the SA-6 and SA-8) have replaced it in its original role as a low-altitude air defense weapon in support of maneuver elements. However, it has continued in its role as a rear area air defense weapon. The Soviets introduced a quadruple launcher in 1973 for this purpose.

SA-4b/GANEF Mod 1



DESCRIPTION:

The SA-4/GANEF is a two stage, medium- to high-altitude SAM. It employs four wrap-around, solid-fuel boosters and a cruise-type liquid-fuel ramjet sustainer to attain long range. Guidance is radio-command with semiautomatic homing. The GANEF missiles travel in pairs on a tracked TEL with 360-degree traverse. The system includes the PAT HAND fire control radar and the necessary C2 and logistic support vehicles and equipment. The SA-4 brigade also has THIN SKIN height-finding and LONG TRACK target acquisition radars. ZU-23 guns provide close-in air defense of the launchers.

When it appeared, the SA-4 TEL vehicle was a completely new design; that is, it was not a modification of any previous chassis or vehicle. A reload vehicle based on the SA-4 chassis carries two additional missiles and follows the TEL vehicle.

CAPABILITIES:

The SA-4 has a slant range of 80 to 100 kilometers and a kill zone at altitudes between 100 and 25,000 meters. The LONG TRACK radar, which also supports other missiles, provides long-range surveillance while the PAT HAND radar provides target acquisition and fire control.

A total of 27 SA-4 TELs are organic to a front/army SAM brigade. The brigade comprises three battalions with three batteries each. Each battery has three twin launchers, one PAT HAND radar, and one loader vehicle. All are tracked. Besides providing high-altitude air defense for an advancing army, the system's excellent mobility allows some batteries to support the army's forward maneuver elements, filling gaps between low-altitude SA-6 or SA-8 batteries. Thus, three SA-4 batteries might typically follow about 10 kilometers behind the army's forward forces, with the other batteries moving in a belt 25 kilometers

SA-4/GANEF (continued)

behind the front lines. The SA-4 TEL is air-transportable in the An-22 transport aircraft.

LIMITATIONS:

The SA-4 system is vulnerable to suppressive fires and ECM. Its capabilities are significantly reduced when the system is on the move. The TEL has no on-board radar.

REMARKS:

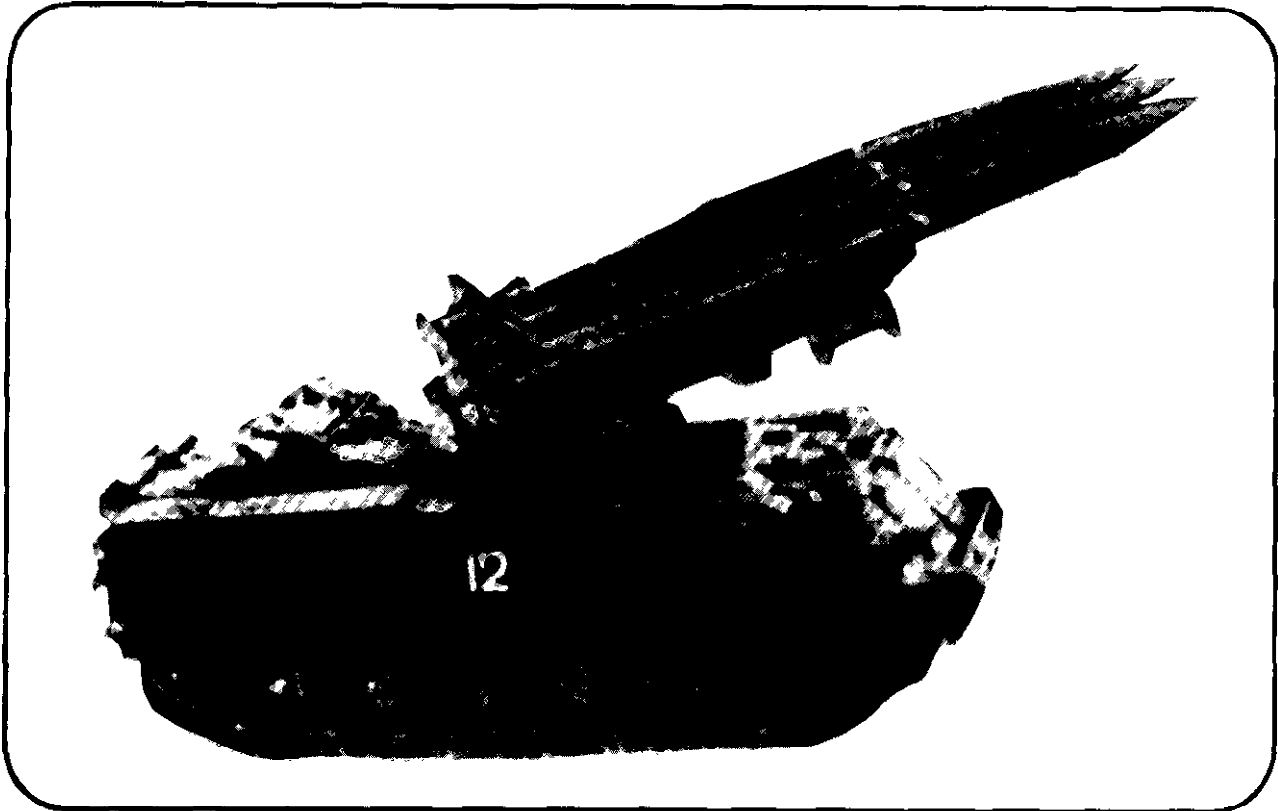
The SA-4 was the Soviets' first mobile SAM system. The original SA-4a/GANEF was first seen

in 1964. It entered service in the Soviet Army around 1967. An improved version, designated SA-4b/GANEF Mod 1, was first seen in 1974. The SA-4b features a shorter nose, with approximately two feet of the missile forebody removed, as well as a modified TEL.

The SA-11 and SA-12 systems are replacing the SA-4 in nondivisional air defense units. The Soviets have deployed the SA-11 in army-level SAM brigades; they have initially deployed the SA-12 in front-level SAM brigades.

SA-6/GAINFUL

SA-6a/GAINFUL



DESCRIPTION:

The GAINFUL is a two-stage, solid-fuel, low-altitude SAM. It has radio-command guidance with semiactive radar terminal homing. Three missiles are carried and launched from a three-rail mount with 360-degree traverse. The SA-6a launcher is mounted on a modified PT-76 tank chassis similar to the ZSU-23-4. Like the ZSU-23-4, the SA-6a TEL is not amphibious. In travel position, the three-missile launcher normally is lowered with the missiles facing toward the rear. The SA-6b system mounts three GAINFUL missiles on a different type of tracked chassis with an on-board radar. For either variant of the SA-6 system, a truck-based reload vehicle carries three additional missiles.

The associated STRAIGHT FLUSH radar vehicle uses the same chassis as the SA-6a TEL. The LONG TRACK target acquisition radar is also associated with the SA-6 system.

CAPABILITIES:

The SA-6 can deliver extremely responsive fires with a slant range of 24 kilometers and a kill zone from 50 to 12,000 meters in altitude. After the SA-6 regiment's LONG TRACK surveillance radar acquires target data, the STRAIGHT FLUSH missile site radars take over target acquisition and fire control. Target tracking is on a single beam; final intercept is by semiactive radar homing, using continuous-wave radar. In ECM conditions, the crew can perform tracking optically.

The SA-6 regiments organic to MRDs and TDs consist of 20 TELs in five batteries. Each battery has four triple launchers, one STRAIGHT FLUSH vehicle, and two reload vehicles. Normally, three of these batteries are deployed 5 kilometers behind the front line; the remaining two are deployed about 10 kilometers farther back, filling the gaps between the three forward batteries.

SA-6/GAINFUL (continued)

Division-level SA-6s may be used to supplement the air defense assets of maneuver regiments. This is due to their excellent mobility.

LIMITATIONS:

Besides being vulnerable to suppressive fires and ECM, the system is slaved to the STRAIGHT FLUSH target acquisition and tracking radar. Without it, the SA-6 battery depends heavily on target acquisition data provided by the LONG TRACK regimental radar.

REMARKS:

The Soviets first displayed the SA-6 in Moscow in November 1967. The Soviet Army placed it in

service around 1970. Either the SA-6 or SA-8 has replaced S-60 AA guns in most divisional air defense regiments.

Around 1979, the SA-6b began to appear alongside the SA-6a in batteries of divisional SAM regiments. In such configurations, a separate STRAIGHT FLUSH radar can perform target acquisition; or, the SA-6b system, with its integrated transporter-erector-launcher and radar (TELAR), can operate independently for surveillance, as does the SA-8. This gives a higher degree of autonomy and mobility to the very limited number of SA-6b-equipped units.

SA-7/GRAIL

SA-7/GRAIL



DESCRIPTION:

The SA-7/GRAIL is a man-portable, shoulder-fired, low-altitude SAM system similar to the US Army's Redeye. The missile has an HE warhead and passive infrared homing guidance. The system comprises the missile, a reloadable gripstock, and a thermal battery. There are two versions: the SA-7a and SA-7b.

CAPABILITIES:

Every MRB and airborne battalion has an organic air defense platoon in which nine SA-7 operators with gripstocks are transported by the platoon's three BTRs, BMPs, or BMDs. A SAM section consisting of one vehicle and three SA-7 gripstocks normally attaches to each of the battalion's three MRCs. Similar air defense platoons are organic at battalion level in air assault and airmobile assault units.

The SA-7a has a slant range of 3.6 kilometers and a kill zone between 15 and 3,500 meters in altitude. Its speed is about 470 meters per second (Mach 1.4).

The updated version SA-7b differs from the SA-7a primarily by using a boosted propellant

charge to increase range and speed. This gives the SA-7b a slant range of about 5.5 kilometers, a ceiling of about 4,500 meters, and a speed of about 580 meters per second (Mach 1.75). However, the burn time has not increased.

Both the SA-7a and the SA-7b are tail chase missile systems. An identification, friend or foe (IFF) system can be fitted to the operator's helmet. The operator uses a permanent gripstock with attachable canister-tube stored missiles. Each operator carries a gripstock with one missile; up to four additional missiles are carried in each vehicle.

The effectiveness of the SA-7 depends on its ability to lock onto the heat source of targets, usually low-flying fixed- and rotary-wing aircraft. Although the SA-7 is limited in range, speed, and altitude, it forces enemy pilots to fly above Soviet minimum radar limitations. This results in detection and vulnerability to regimental and divisional air defense systems.

The operator engages a target by pointing the tube at the target, partially depressing the trigger,

SA-7/GRAIL (continued)

SA-16

Soldat und Technik

and waiting for the red indicator light to turn green. When the green light indicates that the IR seeker has locked onto the target, the operator depresses the trigger completely to fire the missile.

If an SA-7 misses its target, it will self-destruct 15 seconds after launch, or about 6.4 kilometers downrange. If this occurs close to an aircraft, severe damage can result despite the miss.

LIMITATIONS:

The SA-7 is susceptible to suppressive fires and battlefield obscurations. Its gunner also must have line-of-sight to his target. This may cause him to be exposed in relatively open terrain. High-intensity flares ejected from aircraft under attack were once successful countermeasures against the SA-7; however, the infrared guidance system of later models has a filter to screen out decoy flares.

REMARKS:

The SA-7a, introduced in 1969, is called *Strela-2* (arrow) by the Soviets. The SA-7b was introduced in 1972. Over the years, both the Soviets and their allies have tried to develop additional launch configurations for the SA-7. In 1979, the East German Army developed its own truck-mounted quadruple SA-7 launcher, which it uses to defend airfields.

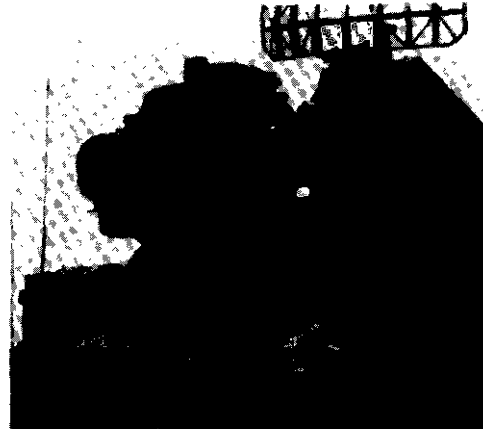
The SA-14/GREMLIN man-portable SAM is replacing the SA-7. The SA-14 entered service in 1978 and is similar to the SA-7b. Unlike the SA-7a and SA-7b, however, it can engage targets head-on at ranges of up to 4,000 meters. In 1986, the Soviets introduced yet another hand-held SAM, the highly accurate SA-16, which is also replacing the SA-7 in tactical units. The Soviet nickname for the SA-16 is *Igla* (needle).

SA-8/GECKO

SA-8a/GECKO



SA-8b/GECKO



Soldat und Technik

DESCRIPTION:

The SA-8/GECKO is a two-stage, solid-fuel, short-range, low-altitude, all-weather SAM system. The unique six-wheeled SA-8 TELAR is amphibious and has a large boatlike bow. On the SA-8 system, four missiles mount on launch rails on an integrated rotatable turret; the SA-8b system carries six canister-launched missiles. On either variant, the on-board LAND ROLL target acquisition and fire control radar system also is mounted on the front of the turret. The LAND ROLL system consists of a folding surveillance radar antenna located atop the launcher, between the two pairs of launch rails, and a large tracking radar dish flanked by two smaller command radar dishes forward of the launch rails.

CAPABILITIES:

The SA-8 has a slant range of 12 kilometers and a kill zone of approximately 10 to 12,000 meters in altitude. Compared to other Soviet air defense systems, the SA-8 has several advantages: it is fully self-contained, highly mobile, amphibious, and air-transportable.

The SA-8 system is organic to the SAM regiment of some MRDs and TDs. An SA-8 regiment has a total of 20 TELARs organized into five batteries of 4 TELARs each. The regiment also has 10 resupply vehicles, based on the same chassis as the TELAR, which carry additional missiles and a crane for transloading.

The surveillance radar of the LAND ROLL system probably operates in the H band and has an effective range of around 30 kilometers against

a typical target. Its antenna folds down behind the launcher, enabling Soviet transport aircraft to airlift the system. The tracking radar is of the pulsed type; it probably operates in the J band with a range of 20 to 25 kilometers. The two I-band guidance radars make it possible to launch two missiles at the same target, each one responding to a different frequency to frustrate ECM. A low-light-level television camera mounted on top of the fire-control assembly is used for optical target tracking.

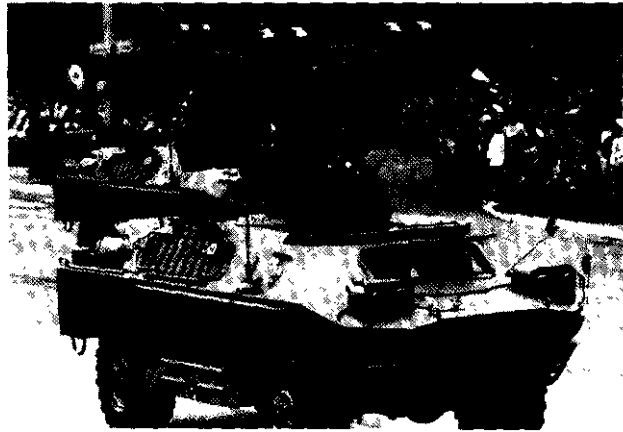
The incorporation of the radars and the number of ready missiles on the TELAR give the amphibious SA-8 system some mobility and tactical employment advantages over the SA-6 system. The SA-6, on the other hand, provides greater depth of coverage, especially against aircraft employing standoff weapons. The use of canisters on the SA-8b system has three advantages: it further increases the number of ready missiles, it improves missile survivability, and it facilitates resupply and reloading.

LIMITATIONS

Besides being susceptible to suppressive fires and ECM, the SA-8's exposed radars and wheels are especially vulnerable to artillery fires.

REMARKS:

The Soviets introduced the SA-8a in 1974 and first publicly displayed it in 1975. The SA-8b variant was first seen in 1980. Along with the SA-6, the SA-8 systems have replaced the S-60 AA gun in most division-level air defense regiments.

SA-9/GASKIN**SA-9/GASKIN****DESCRIPTION:**

The SA-9/GASKIN is a short-range, low-altitude SAM. Four missiles in detachable, box-like launch canisters are mounted on a modified BRDM-2 amphibious armored scout car. The launcher is 360-degree traversable and rests flat on the rear of the vehicle when not in the launch-ready position. The vehicle carries an additional four missiles inside.

The GASKIN missile has a passive infrared seeker. It carries an HE warhead.

CAPABILITIES:

The SA-9 has a slant range of approximately 6 kilometers and a kill zone of 10 to 5,000 meters in altitude. A surveillance data link alerts an operator seated in the vehicle cabin to an approaching target. The operator then tracks the target optically through a large window at the base of the launcher pedestal.

Once targets are sighted visually, the SA-9 probably uses a red/green light indicator system similar to that of the SA-7/GRAIL; that is, when the red light turns green, the missile has locked onto the target and is ready to fire. However, the GASKIN missile is not a derivative of the GRAIL. The SA-9 is the least complex of Soviet vehicle-mounted SAM systems.

A platoon of four SA-9 vehicles is organic to the air defense battery of MRRs and TRs. The SA-9s are teamed with a platoon of four ZSU-23-4s. The SA-9 also is organic to Soviet naval infantry regiments and brigades.

The four SA-9/GASKIN fire units normally operate as a group. They would most likely deploy between the first and second echelons of the regiment. From that location, the SA-9s can protect both first- and second-echelon units without becoming exposed to enemy direct fire weapons. The SA-9s probably have the task of covering the regimental command post, the regiment's organic artillery battalion, and other organic or attached elements in the regiment's sector.

The SA-9 is amphibious with hydrojet propulsion. An air filtration and overpressure system provides NBC protection. These capabilities enable the SA-9 to cross rivers and zones of radiation along with forward columns of tanks and APCs.

LIMITATIONS:

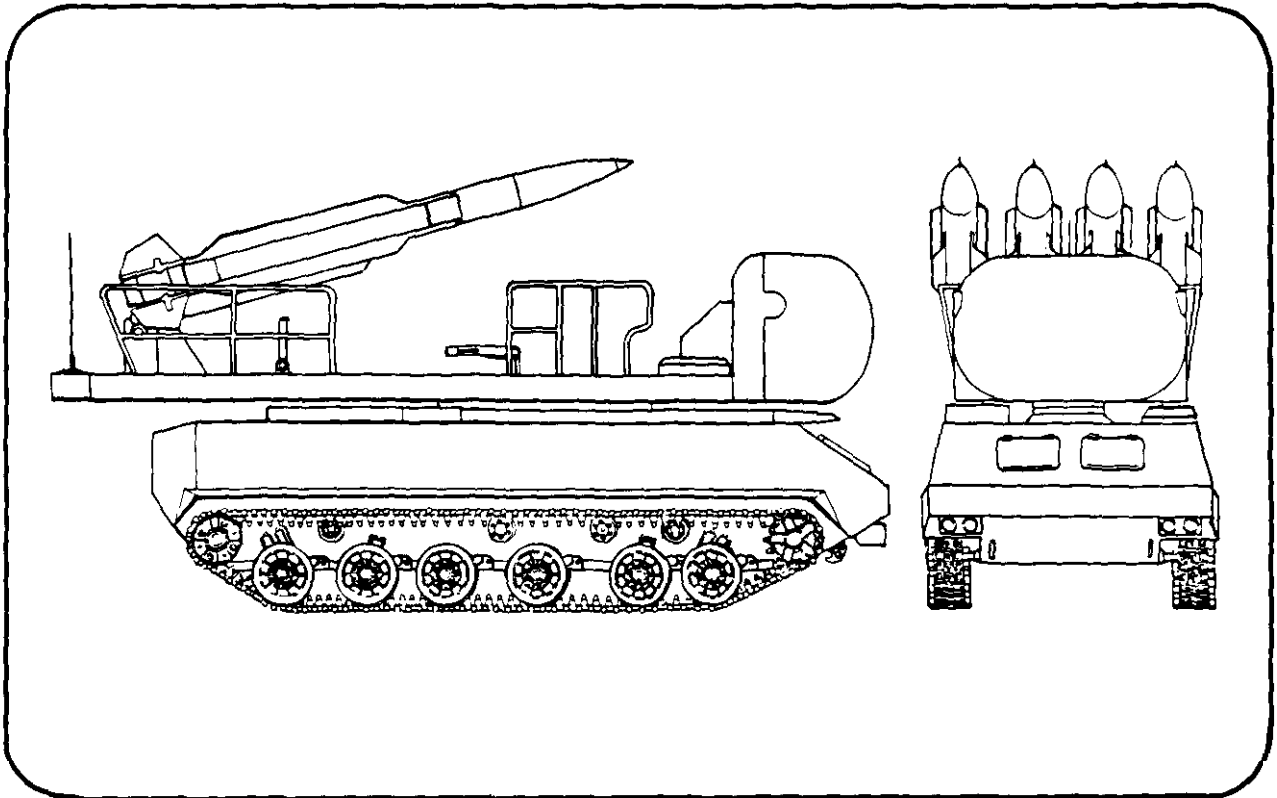
The SA-9 has significantly reduced range against high-speed aircraft approaching the launcher. The system has no on-board radar. Therefore, the crew must depend on preliminary target data broadcast over the division early warning radio net until they visually acquire the target. The system is susceptible to suppressive fires and battlefield obscuration. Maximum armor protection is only 14 millimeters.

REMARKS:

The Soviets introduced the SA-9 in 1968. Its Soviet nickname is Strela-1 (arrow). Around 1977, the SA-12/GOPHERSAM system began to replace the SA-9.

SA-11/GADFLY

SA-11/GADFLY



DESCRIPTION:

The SA-11/GADFLY is a low-to-medium altitude SAM. The SA-11 TELAR is based on a tracked chassis also used for the radar vehicles associated with the SA-11. The TELAR features a 360-degree traversable platform with a dome-shaped radar antenna at the front and a four-rail launcher near the rear. At the extreme rear of the platform is a communications antenna.

CAPABILITIES:

The GADFLY missile has a slant range of 30 kilometers. It provides air defense against high-performance aircraft operating at low-to-medium altitudes, as well as against cruise missiles. The tracked TELAR provides excellent mobility.

Although SA-11 batteries (if deployed at division level) or battalions (if deployed at army level) have

longer-range surveillance and target acquisition radars, each TELAR, with its on-board guidance and tracking radar, can operate independently for surveillance and target engagement.

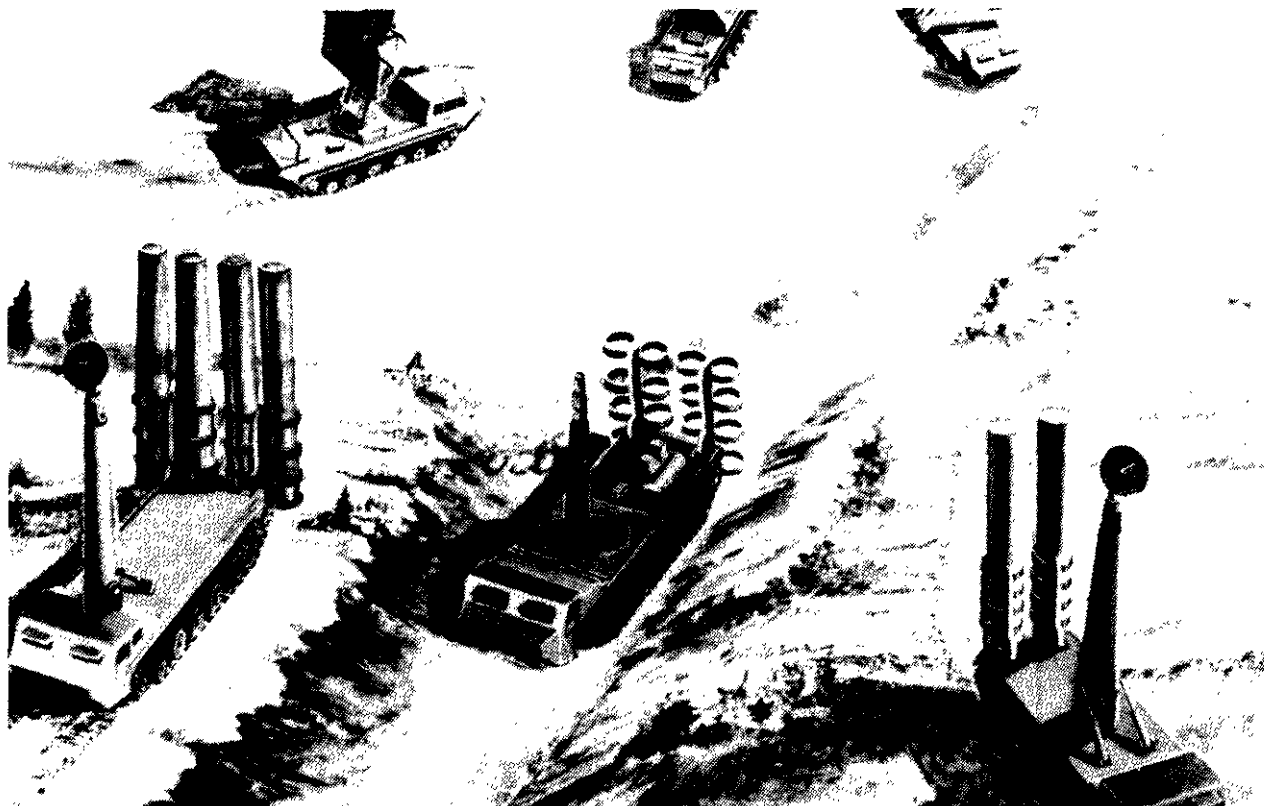
LIMITATIONS:

The TELAR apparently does not carry reload missiles onboard.

REMARKS:

The SA-11 TELAR vehicle first appeared with the SA-6b/GAINFUL system around 1979. The entire SA-11 system with the GADFLY missile was not introduced until 1983. Initially deployed as a replacement for the SA-4 system in army-level SAM brigades, the SA-11 may eventually replace the SA-6 as a division-level SAM.

SA-12/GLADIATOR and SA-12b/GIANT

SA-12a/GLADIATOR and SA-12b/GIANT**DESCRIPTION:**

The SA-12a/GLADIATOR is a long-range, low-to-high altitude, tactical SAM system. The SA-12a TELAR is based on a modified MT-T heavy tracked transporter. Cylindrical containers in circular launch racks carry four GLADIATOR missiles. The canisters are erected to the vertical at the rear of the TELAR in firing position. A tall antenna mast with a radar dish is erected at the rear of the driver's cab. A separate transloader vehicle on the same type of chassis carries four reload missiles and a crane. Separate phased-array radars and C3 vehicles associated with this SAM system use similar vehicles.

CAPABILITIES:

The GLADIATOR missile has a range of 90 kilometers and a kill zone at altitudes between 30 and 30,000 meters. The SA-12a mobile system provides air defense against all types of aerodynamic vehicles, including cruise missiles and some tactical ballistic missiles. The phased-array radars provide

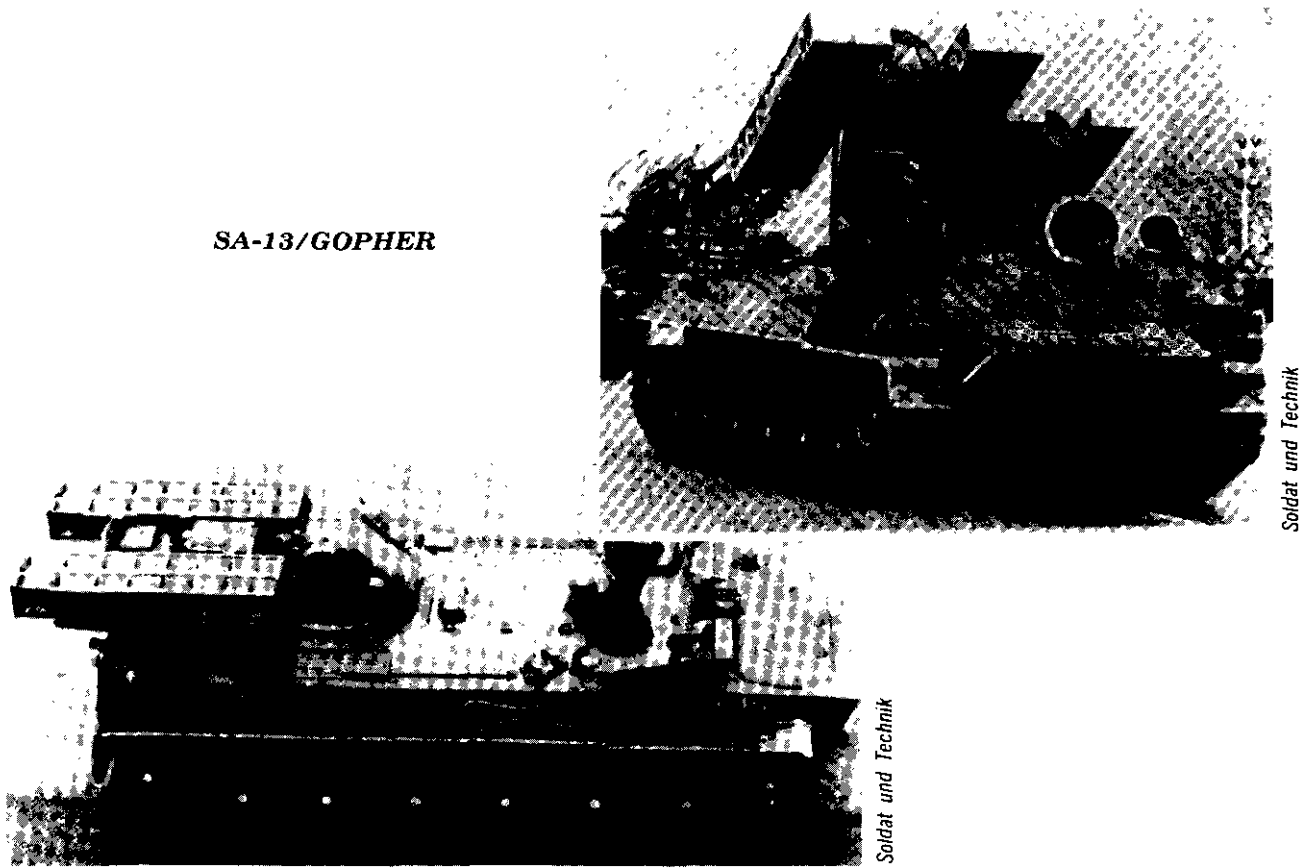
long-range surveillance and a capability for handling multiple targets.

The SA-12a/GLADIATOR system is a replacement for the SA-4/GANEFin nondivisional SAM units. Initial deployment has been to front-level SAM brigades.

REMARKS:

The Soviets first deployed the SA-12a/GLADIATOR system in 1986. Still under development is an even more capable, longer-range, higher-altitude missile to complement it. The second missile, designated SA-12b/GIANT, is a tactical SAM with a range of 100 kilometers. The GIANT can intercept aircraft at all altitudes, cruise missiles, tactical ballistic missiles, and possibly some types of strategic ballistic missiles. The SA-12b system uses the same TELAR as the SA-12a, except that it carries only two of the larger GIANT missiles.

SA-13/GOPHER



SA-13/GOPHER

DESCRIPTION:

The SA-13/GOPHER is a short-range, low altitude SAM system. The SA-13 TELAR is a modified MT-LB amphibious armored tracked vehicle with the machine gun turret removed. The launcher pedestal mounted to the rear of center of the vehicle is 360-degree traversable. It incorporates the operator's position behind a large, rectangular window at its base. Atop the pedestal are mounting brackets for four missile canisters. The SA-13 launcher can accommodate the GASKIN missile canisters normally associated with the SA-9 system; it can also accommodate the slightly larger canisters for the GOPHER missiles associated exclusively with the SA-13 system. Like the GASKIN canisters, the GOPHER canisters are box-shaped, with hinged covers at both front and rear. However, the GOPHER canisters are slightly longer and reinforced by transverse ribs in their rear portion, while the GASKIN canisters have smooth sides.

Located between the two pairs of missile canisters is the circular parabolic antenna of a ranging radar. There is an unidentified plank-shaped structure above the position for the inside right canister. On both sides of the pedestal are running boards for crew members emplacing new missile canisters. In travel position, the canisters and radar are lowered to the rear of the pedestal and rest on the rear deck, facing to the rear; approximately one-third of the canister length extends behind the vehicle. The MT-LB cargo compartment may carry up to eight reload missiles. It has two large doors at the rear.

The platoon leader of the SA-12-equipped SAM platoon uses a second version of the SA-13 TELAR. This version features four box-shaped receiver devices mounted on the front, rear, and both sides of the hull.

SA-12/GOPHER (continued)

CAPABILITIES:

The GOPHER missile has a slant range of 6 to 7 kilometers and a kill zone between a minimum of 9 to 10 meters and a maximum of 5.500 meters in altitude. It has a cooled IR seeker and operates in dual frequency bands to better discriminate against countermeasures (in comparison to the GASKIN). As with the SA-9 system, the operator tracks the target optically; but, in this case, the on-board ranging radar allows him to determine when the target aircraft is within range of the missile. This reduces the needless expenditure of missiles on out-of-range targets.

A platoon of four SA-13 TELARs is organic to the air defense battery of MRRs and TRs, where they are complemented by a platoon of four SP AA guns. The SA-13 is also organic to Soviet naval infantry brigades.

The four box-shaped structures on the hull of the platoon leader's TELAR house a passive radar warning system. The receivers' arrangement provides 360-degree coverage around the vehicle.

The tracked, amphibious TELAR with collective NBC protection allows the SA-13 system to cross

rough terrain, water obstacles, and contaminated areas along with the tank and BMP-equipped units it supports.

LIMITATIONS:

The SA-13 has significantly reduced range against high-speed aircraft approaching the launcher. Despite a limited surveillance capability of the range-only radar, the SA-13 still depends primarily on visual acquisition by the crew. It also depends on target data passed to the crew by data link when targets are acquired by the radars of the battery's SP AA guns or by division-level radars. Suppressive fires and battlefield obscuration may degrade the operator's ability to track targets visually. The MT-LB hull offers a maximum armor protection of only 7 millimeters (half that of the BRDM-2 hull of the SA-9).

REMARKS:

The Soviets introduced the SA-13 system around 1977 as a replacement for the SA-9 system. Their nickname for the SA-13 is Strela 10.

Surface-to-Air Missile Associated Radar

SAM-associated radar characteristics

RADAR	WEAPON	FUNCTION	FREQ BAND	RANGE (km)
FAN SONG A/B	SA-2/GUIDELINE	fire control	E/F	60-120
FAN SONG C/D/E			G	70.145
FAN SONG F (all trailer-mounted)			INA	INA
FLAT FACE (P-15) (van-mounted)	SA-3/GOA, possibly SA-8/GECKO	target acquisition	C (UHF)	250
LAND ROLL (on-board)	SA-8/GECKO	fire control and short-range target acquisition	H (acquisition), J (tracking)	INA
LONG TRACK (tracked)	SA-4/GANEF, SA-6/GAINFUL, SA-8/GECKO	target acquisition	E	excess of 150 km, 30,000 m altitude
LOW BLOW	SA-3/GOA	fire control	I	40-85
PAT HAND (tracked)	SA-4/GANEF	fire control	H	INA
SPOON REST A (P-12) (truck-mounted)	SA-2/GUIDELINE	target acquisition	A (VHF)	INA
SPOON REST B (P-12) (mast-mounted)			VHF (below A band)	INA
SQUAT EYE (P-15M) (mast-mounted)	SA-3/GOA	target acquisition (low altitude, instead of FLAT FACE)	C	INA
STRAIGHT FLUSH (tracked)	SA-6/GAINFUL	fire control and short-range target acquisition	G/H (acquisition), I (tracking)	60.90 km. 10,000 m altitude
THIN SKIN A/B (van-or trailer-mounted)	SA-4/GANEF, SA-6/GAINFUL, SA-8/GECKO	height finder (low-altitude capability, used with LONG TRACK)	H	240
U/I	SA-11/GADFLY	target acquisition	INA	INA
U/I	SA-11/GADFLY	target engagement	INA	INA
U/I	SA-12a/GLADIATOR	target acquisition	INA	INA
U/I	SA-12a/GLADIATOR	target engagement	INA	INA
U/I	SA-12a/GLADIATOR	special-purpose acquisition	INA	INA
U/I	SA-13/GOPHER	ranging	INA	INA

ENGINEER EQUIPMENT

Bridges and Rafts

Bridge and raft characteristics

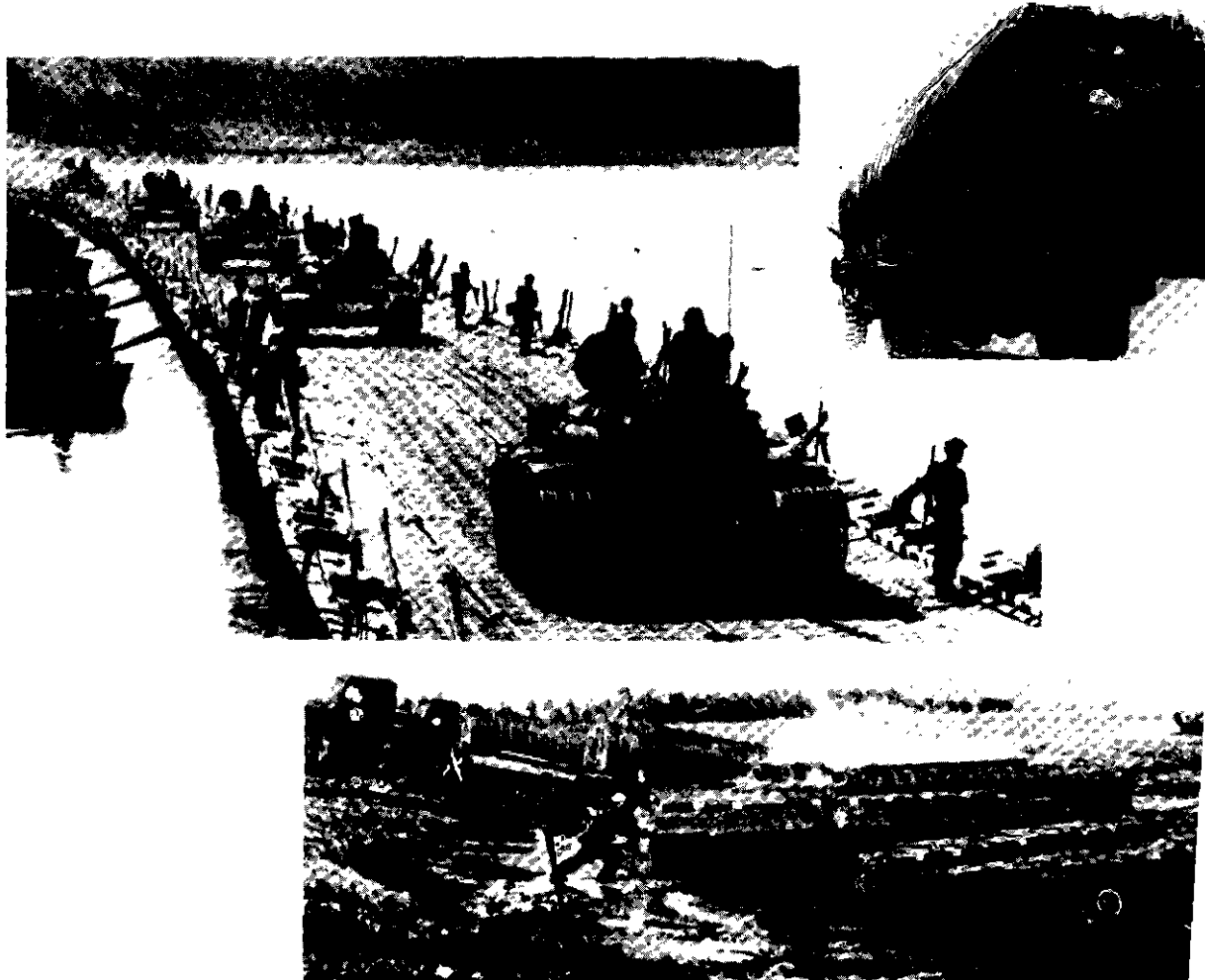
BRIDGE CHARACTERISTICS	HEAVY FOLDING PONTON BRIDGE PMP (See chart below)				TRUCK-MOUNTED BRIDGE TMM	TANK-LAUNCHED BRIDGE MTU-20	TANK-LAUNCHED BRIDGE MT-55
BRIDGE AND LAUNCHER IN TRAVEL POSITION:							
Length (m)					9.3	11.6	9.9
Width (m)					3.2	3.3	3.3
Height (m)					3.15	3.4	3.35
Weight (mt)					19	37	36
Transporter-launcher BRIDGE ONLY	KrAZ-255B				KrAZ-214/255B	T-55 chassis	T-55 chassis
Treadway length (m)							
Unfolded	6.75/5.6 ¹				10.5	20.0	18.0
Folded	6.75/5.6 ¹				5.2	11.6	9.9
Width (m)							
Unfolded	8.0/7.0 shore end				3.8	3.3	3.3
Folded	3.0/3.1 ¹				3.2	NA	NA
Weight (mt)	6.79/7.25 ¹				4.24	7	6
ASSEMBLY DATA	Half-set		Full-set				
Spans in set	16/2 ¹		32/4 ¹		4	1	1
Length of span (m)	6.75/5.6 ¹		6.75/5.6 ¹		10.5	18	18
Total length of bridge (m)	191	119	382	227	42	18	18
Roadway width (m)	3.27	6.5	3.27	6.5	3.2/3.8 ²	3.3	3.3
Capacity (mt)	20	60	20	60	60	50	50
Assembly Time (min)	35-40 ³	15-17 ³	50 ³	30 ³	20-40	5/5-7 ⁴	5/5 ⁴
Working party	65	65	130	130	3/12 ⁵	2	2
Year introduced	1961				1964	1967	1964

PMP RAFT CHARACTERISTICS	40-TON	60-TON	80-TON	110-TON	170-TON
ASSEMBLY DATA					
Spans in raft	2/01	3/01	4/01	5/1	8/1 ¹
Total length (m)	13.5	20.3	27.0	39.3	59.6
Roadway width (m)	6.5	6.5	6.5	6.5	6.5
Capacity (mt)	40	60	80	110	170
Assembly time (min)	8	10	12	15	18
Working party	6	9	12	18	18

FOOTNOTES Center/rafter section.
 Closed/extended.
 Average assembly time 7 meters per minute. (Trained engineers can assemble 200 meters in 11 minutes or 500 meters in 30 minutes.)
 Launch/retrieval time.
 Per span/total.

Heavy Folding Ponton Bridge PMP

PMP



DESCRIPTION:

Although the complete PMP ribbon bridge set consists of 32 center pontons and 4 ramp pontons, the ponton bridge company of an engineer battalion normally has half a set (one complete bridge) made up of 16 center and 2 ramp pontons. Each 4-section ponton is launched from a KrAZ-255B truck. It automatically unfolds upon entering the water. The sections then lock in place to form a bridge unit 6.75 meters long and 8 meters wide. Normally, all the units are launched simultaneously. They join together parallel to the near shore to form a continuous roadway. The roadway then swings across the water obstacle; powerboats (6 per half-set) hold it in place on the designated centerline.

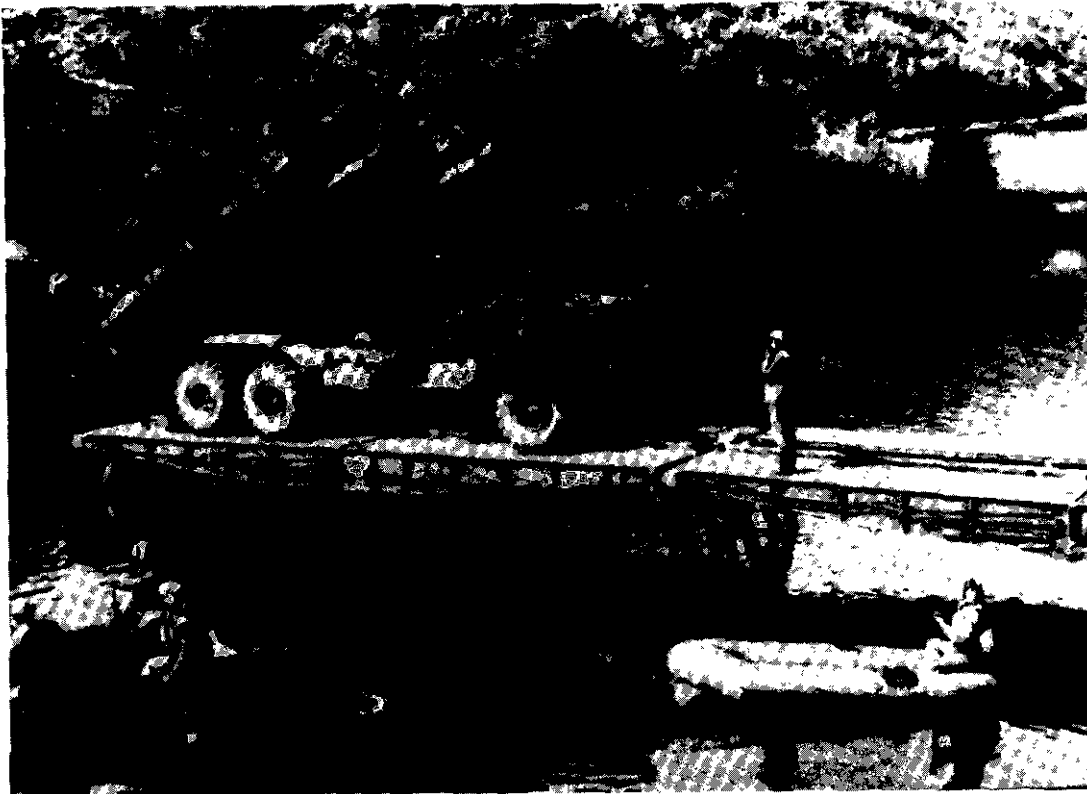
CAPABILITIES:

Engineers can use the full 36-ponton construct 227 meters of 60-ton bridge. They also configure it as 40- to 170-ton rafts. A 1 gives each division the capability to construct meters of 60-ton bridge, 191 meters of 20-ton or rafts. Under ideal conditions, assembly of 7 meters of bridge per minute can result

REMARKS:

The PMP was introduced in 1961. It is vulnerable to air attack and artillery.

Truck-Mounted Scissors Bridge TMM

TMM***DESCRIPTION:***

The TMM is a multiplespan, trestle-supported, scissors-type, treadway bridge. One bridge set comprises four 10.5-m spans carried on, and launched from, modified KrAZ-214 or KrAZ-255B (6 x 6) trucks. Spans fold in half for transport. Three of the spans have integral-mounted, adjustable (1.7 to 3.2 meters) trestle legs, while the fourth (far-shore) span has none. During travel, the trestles can fold beneath the scissors span.

CAPABILITIES:

A launching girder mounted on the truck bed launches the TMM hydraulically over the tailgate. Assisted by winch cables and pulleys, the girder

raises, unfolds, and emplaces the span with the folding trestle legs.

Engineers can launch the complete 42-m bridge in 40 to 60 minutes during the day or 60 to 80 minutes at night; however, a well-trained working party can cut this time in half. If necessary, it can lay the TMM underwater; this adds about 50 percent to the launching time. Adding more spans can lengthen the bridge.

REMARKS:

The TMM was introduced in 1964. It is vulnerable to direct and indirect fire weapons.

MTU-20



DESCRIPTION:

The MTU-20 is the major Soviet-produced, tank-launched, single-span, assault bridge currently employed as standard equipment in the Soviet Army. It consists of a twin-treadway superstructure mounted on a modified T-55 tank chassis. Each treadway is made up of a box-type aluminum girder with a folding ramp attached to both ends to save space in the travel position. Thus, the vehicle with bridge on board is only 11.6 meters long, but the overall span length is 20 meters.

CAPABILITIES:

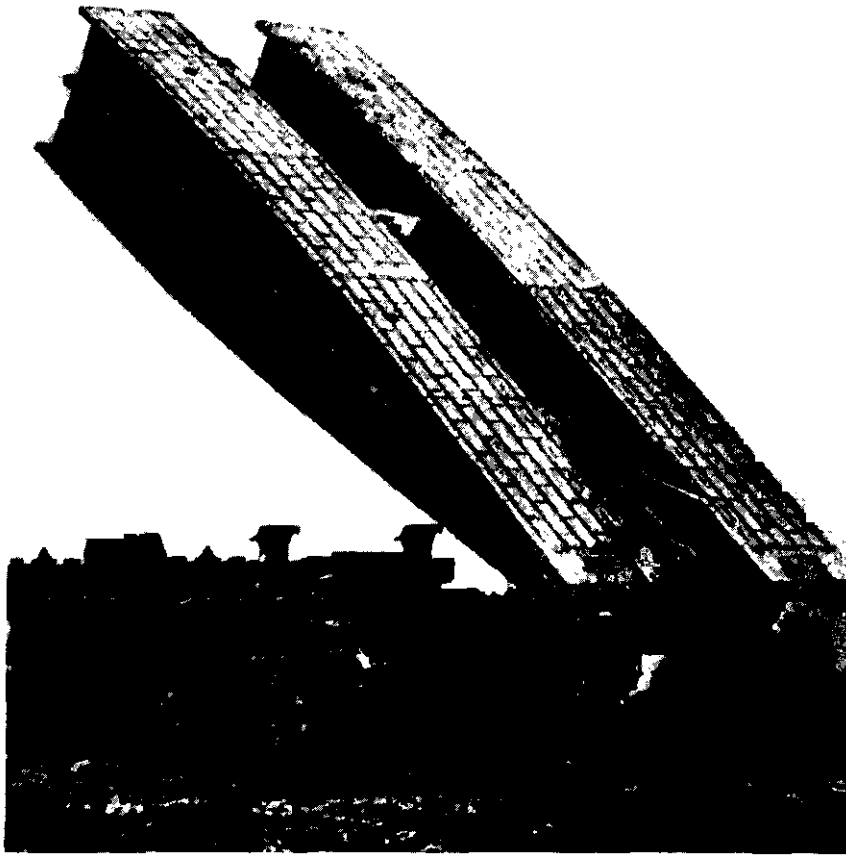
The MTU-20 is launched by the cantilever method: the ramps are lowered and fully extended before the treadways are cantilevered out with the full load of the bridge resting on the forward support plate during launch. The span moves forward over the cantilever launching girder until

the far end reaches the far bank. Then the crew lowers the near end onto the near bank. This method of launching gives the bridgelayer a low silhouette, and makes it less vulnerable to detection or destruction.

Launch time is 5 minutes for the MTU-20. The launcher vehicle can retrieve the emplaced bridge from either end. Retrieval time is 5 to 7 minutes.

REMARKS:

In 1957, the Soviets introduced a tank-launched bridge mounted on a modified T-34 tank chassis. They produced this bridge only on a limited basis and soon replaced it with the T-54 MTU, which was introduced in 1958. Since 1967, the improved MTU-20 and the Czech M-55 have supplemented and largely replaced the T-54 MTU.

MT-55***DESCRIPTION:***

The MT-55, produced in Czechoslovakia, is a scissors-type bridge with solid sides. It folds in the idle. It is similar in design and appearance to the East German BLG-60 tank-launched scissors bridge. The MT-55 mounts on and launches from a modified T-55 tank chassis.

CAPABILITIES:

The crew can launch this bridge in five minutes to span an 18-m gap. The bridge can carry a 50-mt load.

REMARKS:

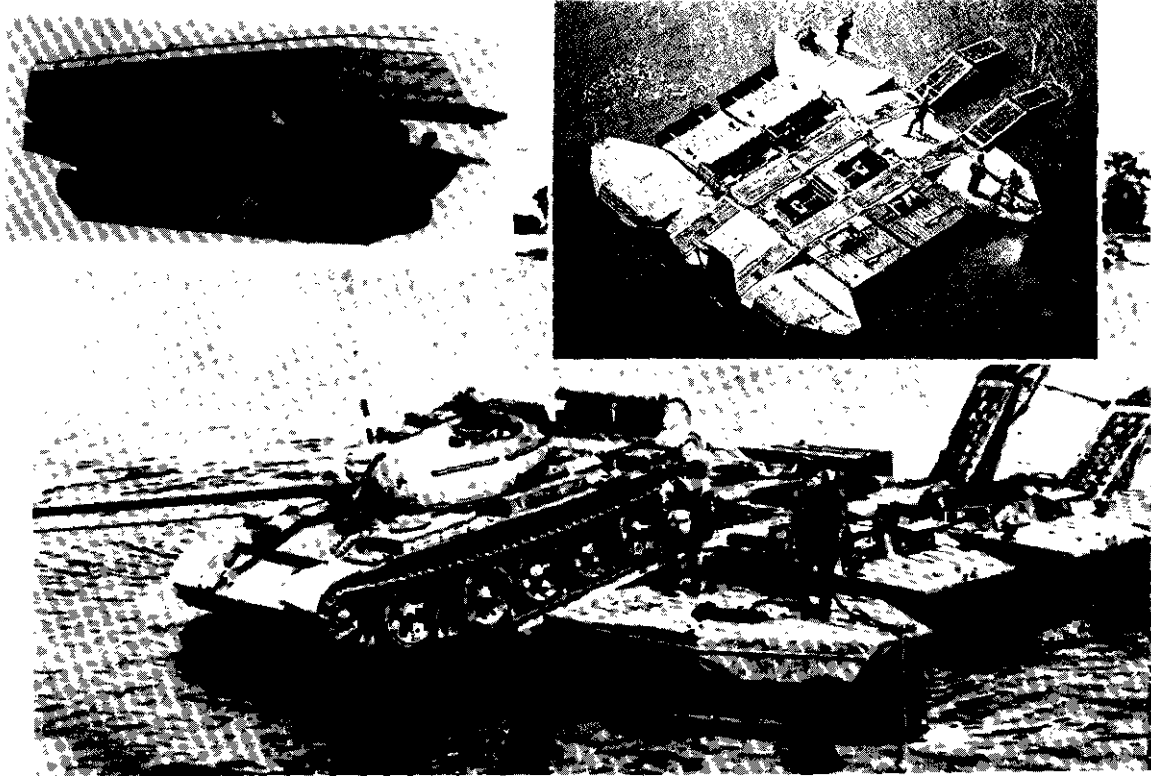
Some Soviet MRRs and TRs use the MT-55 instead of the MTU-20, even though it is made in Czechoslovakia.

Amphibians and Ferries

Amphibian and ferry characteristics

CHARACTERISTICS	TRACKED AMPHIBIAN K-61	TRACKED AMPHIBIAN PTS-M	AMPHIBIOUS TRAILER PKP	TRACKED AMPHIBIAN PTS-2	HEAVY AMPHIBIOUS FERRY GSP1	AMPHIBIOUS BRIDGING SYSTEM—TRACKED PMM-2	AMPHIBION BRIDGING SYSTEM—WHEELED
WEIGHT (kg)							
Empty	9,550	15,000	3,600	INA	17,000/34,000 ²	INA	INA
Loaded, land	12,550	22,500	8,600	INA	NA	NA	NA
Loaded, water	14,500	30,000	8,600	INA	84,000	INA	INA
PAYLOAD (kg)							
Land	3,000	7,500	5,000	INA	NA	NA	NA
Water	5,000	15,000	5,000	INA	50,000	52,000	INA
CREW	2	2	NA	2	working party 6	INA	INA
PERSONNEL LOAD	50	50'	NA	INA	NA	NA	NA
LENGTH (mm)	9,150	11,500	10,300	11,500	12,000	13,500	8,400
WIDTH (mm)	3,150	3,500	2,820/4,050 ⁵	3,300	3,240/12,630/ 21,500"	3,500/10,500/ INA"	INA/7,000 INA ⁴
HEIGHT (mm)	2,165	3,400	2,200	INA	3,200	INA	INA
GROUND CLEARANCE (mm)	366	500	INA	INA	350	INA	INA
GROUND PRESSURE (kg/cm ²): Empty	0.35	0.32	INA	INA	0.52	INA	INA
Loaded	0.46	0.41	INA	INA	NA	NA	NA
MAXIMUM SPEED (km/hr)							
Land	36	40	towed	INA	40	INA	INA
Water (w/load)	10	15	towed	INA	7.7	INA	INA
CRUISING RANGE							
Land (km)	170	425	towed	INA	INA	INA	INA
Water (hrs)	8	10	towed	INA	INA	INA	INA
SLOPE (c)							
Empty	42	30	INA	INA	25	INA	INA
Loaded	15/106	10	INA	INA	NA	NA	NA
STEP (mm)	640	650	INA	INA	INA	INA	INA
TRENCH (mm)	3,000	2,500	INA	INA	INA	INA	INA
ENTRY ANGLE (c)							
Empty	15	INA	INA	INA	INA	INA	INA
Loaded	10/56	15	INA	INA	INA	INA	INA
EXIT ANGLE (c)	20	25	INA	INA	INA	INA	INA
YEAR INTRODUCED	1954	1966	mid 1950s	1981	1955	1983	1981

FOOTNOTES. Assembly time 3 to 5 minutes.
 Half/full ferry.
¹May also carry 12 litters.
²Travel position/in water without ramps/in water with ramps
 Side pontoons folded.
³Loaded with cargo/soldiers/vehicle

Heavy Amphibious Ferry GSP**GSP****DESCRIPTION:**

The GSP ferry set consists of two self-contained, mirror-image half-ferries which resemble each other but are not interchangeable. In travel position, one ponton folds atop each amphibian. After launching, the crew lowers the pontoons on hinges to the outer sides of the amphibians and locks them in place. The two half-ferries join together. Treadways attach to the top of the decked pontoons and transversely across the gunwales of the amphibians. For loading and unloading, the ferry has a scissors-type ramp extending from the outer gunwales of both pontoons. The pontoons are filled with foam plastic to make them unsinkable.

CAPABILITIES:

The GSP is organic to the engineer battalion of MRDs and TDs (12 half-ferries). Engineer brigades, ponton bridge regiments, and assault crossing battalions at front and army levels also use it. It primarily supports tank, heavy artillery, and missile units in river crossings. The SP ferry can carry up to 50 metric tons of equipment

(including medium and heavy tanks, SP artillery, and other tank-based equipment) at a water speed of up to 7.7 kilometers per hour. Assembly time is 3 to 5 minutes.

LIMITATIONS:

The bank can be no higher than 0.5 meters and the water depth no less than 1.2 meters at the point where the GSP places its ramps to load or unload. Otherwise, the ferry can be damaged. The GSP is vulnerable to air attack and artillery.

REMARKS:

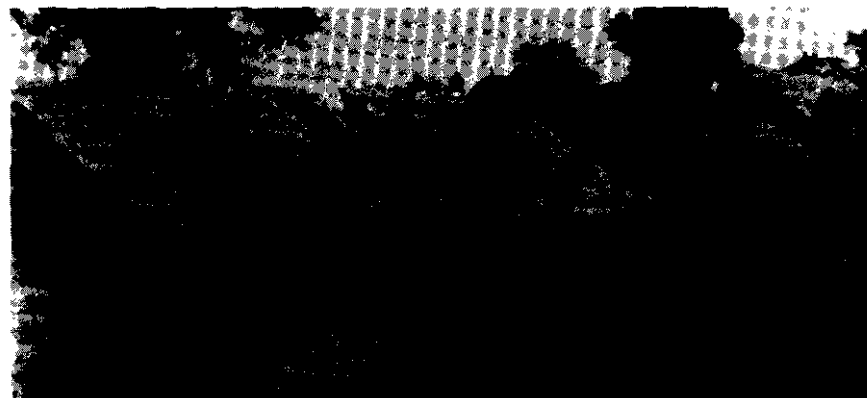
GSP is the Soviet abbreviation for "tracked self-propelled ferry." The GSP was first sighted in 1955. Since then, the Soviet Army and other Warsaw Pact armies have used it in increasing numbers. However, its deployment ended in 1969, and new Amphibious Bridging system-racked (PMM-2) sets are replacing it.

Amphibious Bridging System—Tracked (PMM-2)

PMM-2



Soldat und Technik



Soldat und Technik

DESCRIPTION:

This amphibious tracked vehicle bears great similarity to the PTS-2 tracked amphibian, with its cab and boat-like bow. The chassis is similar to that of the MT-T artillery prime mover, with seven road wheels and four return rollers. This same chassis is the basis of the MDK-3 excavator, BAT-2 dozer, and PTS-2 tracked amphibian. The pontoons of the PMM-2 sit on top of each other and open hydraulically to both sides. They resemble those of the Amphibious Bridging System—Wheeled. The unfolded pontoons have wave deflectors, as well as ramps to expedite the loading and unloading of vehicles. Analysts estimate that the vehicle is 13.5 meters long and 3.5 meters wide with folded pontoons. With the pontoons

unfolded and deployed, the PMM-2 can be 10.5 meters wide.

CAPABILITIES:

The PMM-2 can serve as a ferry. Joined together with other PMM-2s, it can serve as a ribbon bridge. It has one main advantage as a ferry over the GSP: whereas two GSP half-ferries must be joined together to produce one ferry with a capacity of 50 metric tons, one PMM-2 can handle the same capacity. Until the Soviet designation PMM-2 became known, this system was called ABS-Tin the West.

Amphibious Bridging System—Wheeled

ABS-W

Soldat und Technik



Soldat und Technik

DESCRIPTION:

This new system appears to be similar to the PMM-2, but it uses a modified ZIL-1.35 8 x 8 truck as a chassis. As with the PMM-2, the crew deploys two pontoons hydraulically. Using the dimensions of the ZIL-135 as a guide, the ABS-W can form a ferry 8.4 meters long and 7 meters wide.

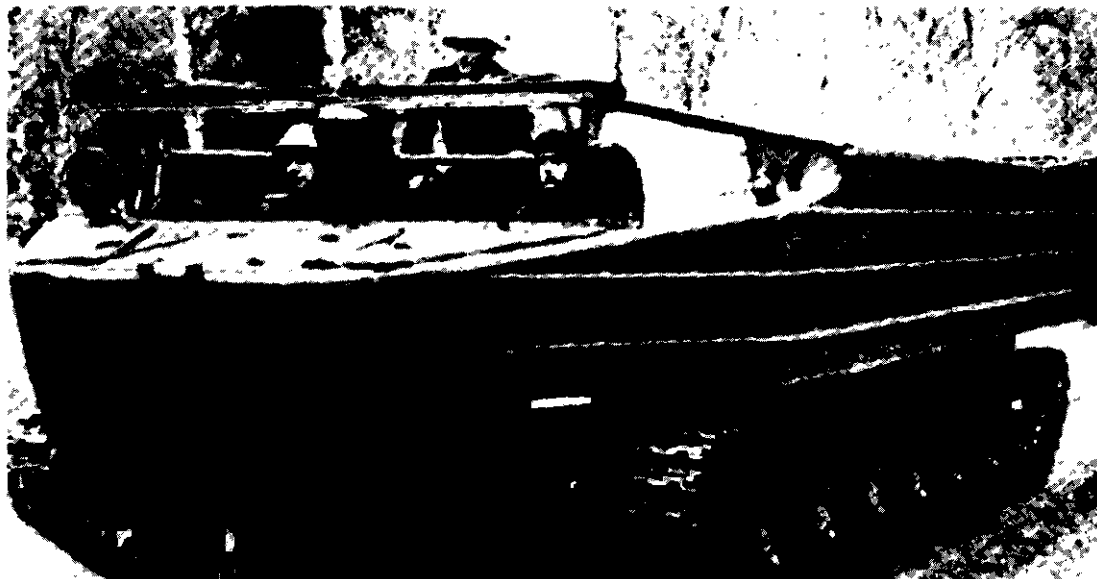
CAPABILITIES:

The ABS-W combines the capabilities of the GSP ferry and the PMP ponton system in one

vehicle. It can serve either as a single ferry or, combined with other vehicles, as part of a ribbon bridge. However, in contrast to the GSP, it can form a ferry with a single vehicle. Unlike the PMP, it is self-contained, and does not require transport vehicles or power boats to place it into operation. Also, less manpower is required to deploy the system.

Tracked Amphibian K-61

K-61



DESCRIPTION:

The K-61 is an unarmored, full-tracked transport vehicle with a watertight all-steel hull. The crew compartment at the front accommodates the commander and driver. It has a hinged windshield which can be opened horizontally. The cargo compartment at the rear has a large tailgate, which also acts as a loading ramp, and a power-driven winch. Bows and a tarpaulin can cover the crew and cargo compartments.

The suspension consists of seven small road wheels with the drive sprocket at the front and the idler at the rear. The K-61 is unique among Soviet tracked vehicles in that it has no track support rollers but uses seven support slides. The vehicle is propelled in water by two large, three-bladed propellers in the rear of the hull. When the screws are engaged, the tracks remain idle.

CAPABILITIES:

The K-61 (or the newer PTS-M) is organic to the engineer battalion of MRDs and TDs (with 12 amphibians in the amphibious platoon of the assault crossing company). It is also organic to the divisional maintenance battalion (which has one amphibian). It is primarily a tactical support vehicle for transporting cargo, equipment, and personnel in river crossing operations.

The K-61 can carry 50 troops or cargo loads of 3,000 kilograms on land, or 5,000 kilograms in water. Typical equipment loads include artillery pieces (120-mm mortar, 122-mm howitzer, or 152-mm howitzer) and trucks (GAZ-63, ZIL-130, or ZIL-157). Twelve K-61s can transport a battery of artillery with prime movers.

LIMITATIONS:

The K-61 has a limited road cruising range of 170 kilometers. (Some sources optimistically report 260 kilometers.) Faulty support slides can cause the tracks to bind when a turn is made in either direction. The vehicle may shed its tracks when steering clutch levers are used in landing and in climbing the bank after water operation. The K-61 is vulnerable to direct and indirect fire weapons.

REMARKS:

The Soviets introduced the K-61 in 1954. It is sometimes referred to as the GPT. Since 1966, the heavy tracked amphibian PTS-M has largely replaced it. The PTS-M has over twice the carrying capacity of the K-61. The K-61 is now obsolete, found only in low readiness units in the Soviet Army; however, it is still common in many Warsaw Pact and Third World armies.

Heavy Tracked Amphibian PTS-M

PTS-M***DESCRIPTION:***

The PTS-M is an unarmored, full-tracked transport vehicle. It strongly resembles the K-61, which it has replaced, but it is substantially larger. Unlike the K-61, it has a fully enclosed cab which is farther forward than the open crew compartment of the K-61. It also has two circular hatches in its roof. The large cargo bed has a removable canvas cover and seven supporting bows. A winch is mounted at the front of the cargo compartment. The large, triangular tailgate has two integral, hinged loading ramps.

The torsion-bar suspension consists of six larger road wheels, with the drive sprocket at the front and the idler at the rear. It has neither support slides nor support rollers. The engine sits

under the center of the cargo compartment with exhaust ports just above each side of the cargo compartment. The vehicle is propelled in water by two 3-blade propellers; two rudders at the rear of the hull steer it. Standard equipment includes infrared night vision devices, an intercom, radios, and a high-capacity bilge pump.

The PKP wheeled amphibious trailer is often used with the PTS-M. The PKP is a boat-shaped, two-wheeled trailer with two small folding side pontoons for improving trim and increasing buoyancy. It has a foam-plastic-filled, watertight hull and treadways on its deck with recesses for the wheels of transported artillery pieces.

Heavy Tracked Amphibian PTS-M (continued)

CAPABILITIES:

The PTS-M is organic to the engineer battalion of MRDs and TDs (with 12 amphibians in the amphibious platoon of the assault crossing company). It is also organic to the divisional maintenance battalion (which has one amphibian). The amphibious platoon also has three PKP trailers. Together, they normally transport artillery, air defense, or logistical elements across water barriers.

The PTS-M can transport 50 troops; some sources say this figure is nearer to 70. It can also transport cargo loads of 7,500 kilograms on land or 15,000 kilograms in water. ~~T h u s~~ it can transport larger trucks such as the Ural-375D. Typical equipment loads are similar to those for the K-61, except that the PTS-M normally carries trucks and other prime movers, while the PKP trailer carries artillery pieces. The PKP has a load capacity of 5,000 kilograms.

The PTS-M with PKP trailer can transport an artillery piece, its prime mover, and its crew in a

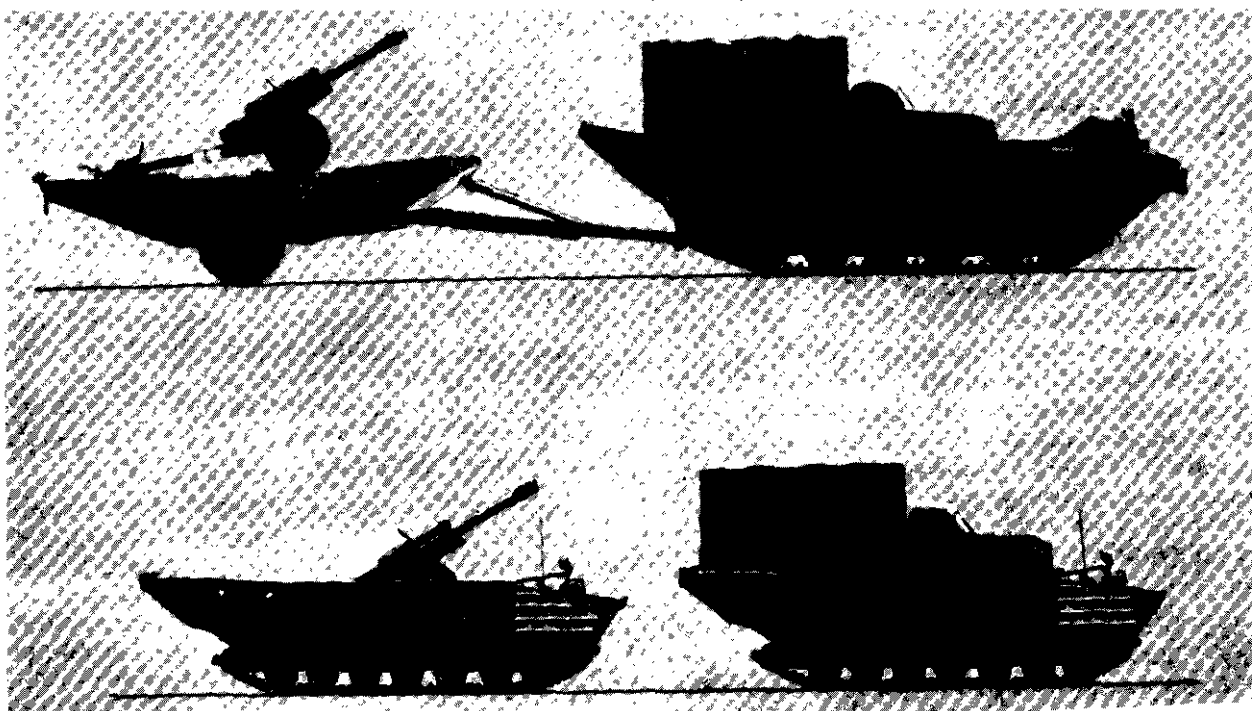
single lift. The same task would require the use of two K-61s.

For travel, the PKP can fit in the cargo compartment of the PTS-M. The PTS-M can also serve as an ambulance, transporting 12 litters on special rack mounts. With a fully sealable cab, the PTS-M can operate under conditions of chemical or nuclear contamination.

REMARKS:

In 1969, the Soviets began to replace the K-61 with the larger PTS and PTS-M amphibians. Both new vehicles have the same dimensions; but the PTS-M, which is the more widely deployed, has a more powerful engine (350 versus 250 horsepower). It thus has a slightly greater speed in water (15 versus 10 kilometers per hour). The PTS-M is now being phased out with the introduction of the PTSS.

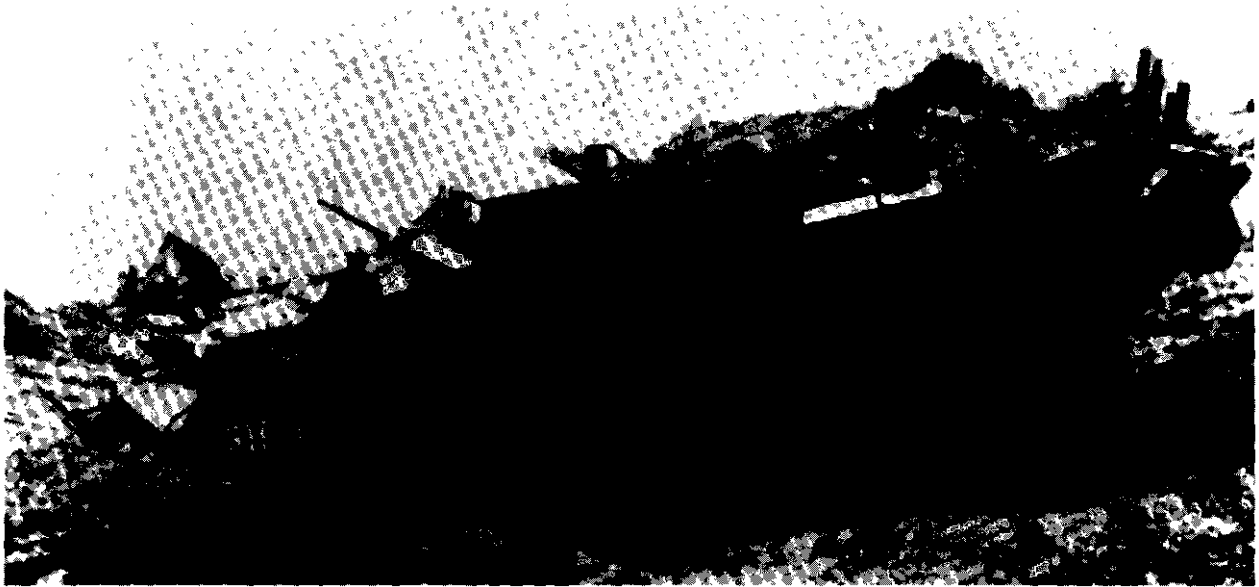
Lift capacity of PTS-M with PKP trailer (top) compared to two K-61s (bottom)



Heavy Tracked Amphibian PTS-2

PTS-2

Soldat und Technik

**DESCRIPTION:**

This amphibious transport vehicle employs the chassis of the MT-T heavy tracked prime mover. The MDK-3 tracked ditching machine, the BAT-2 dozer, and the PMM-2 bridging system also use this chassis. The most discernable differences between the chassis of the PTS-2 and that of the PTS-M are the PTS-2's seven T-64 tank-type road wheels and four support rollers. The PTS-2 is larger than the PTS-M; it is 11.5 meters long and 3.3 meters wide. The crew cab extends farther forward, and the larger wave deflector is positioned on the bow when in the travel mode. Also new is the hydraulically-operated self-entrenching system located on the rear deck of the PTS-2.

CAPABILITIES:

The PTS-2 is moved through the water by twin propellers mounted on the rear. It has a

winch, bilge pumps, and an automatic fire extinguishing system. The blades of the self-entrenching system can be widened with additional, detachable blades. The system can create and improve the entrance and exit slopes of water crossing sites.

REMARKS:

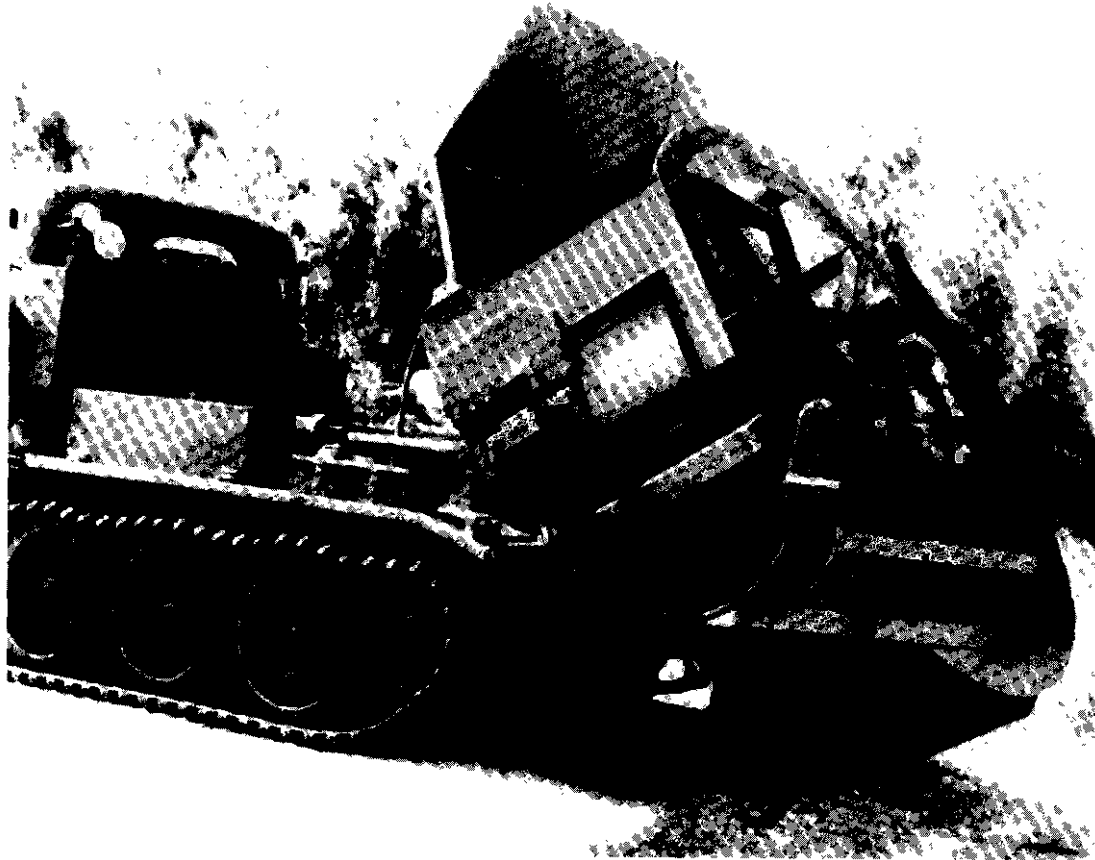
The PTS-2 first appeared in 1981. It is replacing K-61s and PTS-Ms in the assault crossing company of the engineer battalion of high-priority MRDs and TDs, and in the assault crossing battalion and ponton bridge regiment of the engineer brigade at army or front.

Ditching Machines
Ditching machine characteristics

CHARACTERISTICS	MDK-2M	MDK-3	BTM-3	PZM-2	TMK-2
MAXIMUM DIGGING DEPTH (m)	3.5	3.0	1.5	1.5	1.5
DIGGING WIDTH (m)	3.5	3.5	0.6	0.8-3.5	1.1
DIGGING CAPACITY (m ³ /hr)	120-300	400-500	220-600	80-250	200-600
WORKING SPEED (m/hr)	200-800	400-500	600	180	450
MAXIMUM ROAD SPEED (km/hr)	36	70	36	45	60
RANGE (km)	500	500	500	500	500
CREW	2	2	2	2	2
WEIGHT (mt)	28	INA	26.7	12.8	26.3

NOTE. Excavation capabilities depend on soil type, depth of cut, and other factors.

Ditching Machine MDK-2M

MDK-2M**DESCRIPTION:**

The MDK-2M high-speed ditching machine is based on the tracked AT-T artillery tractor chassis. The system mounts a rotary excavator on the rear and a bulldozer blade on the front.

CAPABILITIES:

The MDK-2M can dig field positions, antitank ditches, and firing positions. Depending on soil conditions, it can excavate 120 to 300 cubic meters of soil per hour. The system can dig a 3.5-m-deep and 3.5-m-wide ditch with multiple passes. The MDK-2M has a filtration system for operation in a contaminated environment.

LIMITATIONS:

The MDK-2M has relatively slow speed and limited cross-country mobility. More than one pass

may be necessary to dig the trench to the desired depth. The MDK-2M cannot excavate in rocky terrain or in frozen soil. It cannot be airlifted by helicopter or be airdropped. It is vulnerable to small arms fire.

REMARKS:

Introduced in 1965, the MDK-2M is now standard equipment in Soviet and Warsaw Pact engineer units. It is organic to the technical company of the engineer battalion in an MRD or TD, and is also organic to the technical platoon of the engineer company in an MRR or TR. The MDK-2M's production ended in 1979. The newer MDK-3 is replacing it.

MDK-3



Soldat und Technik

DESCRIPTION:

Since 1982, the MDK-3 has begun to replace the MDK-2M. The MDK-3 has the chassis of the MT-T tracked artillery tractor, with a rotary excavator on the rear and a bulldozer blade on the front.

CAPABILITIES:

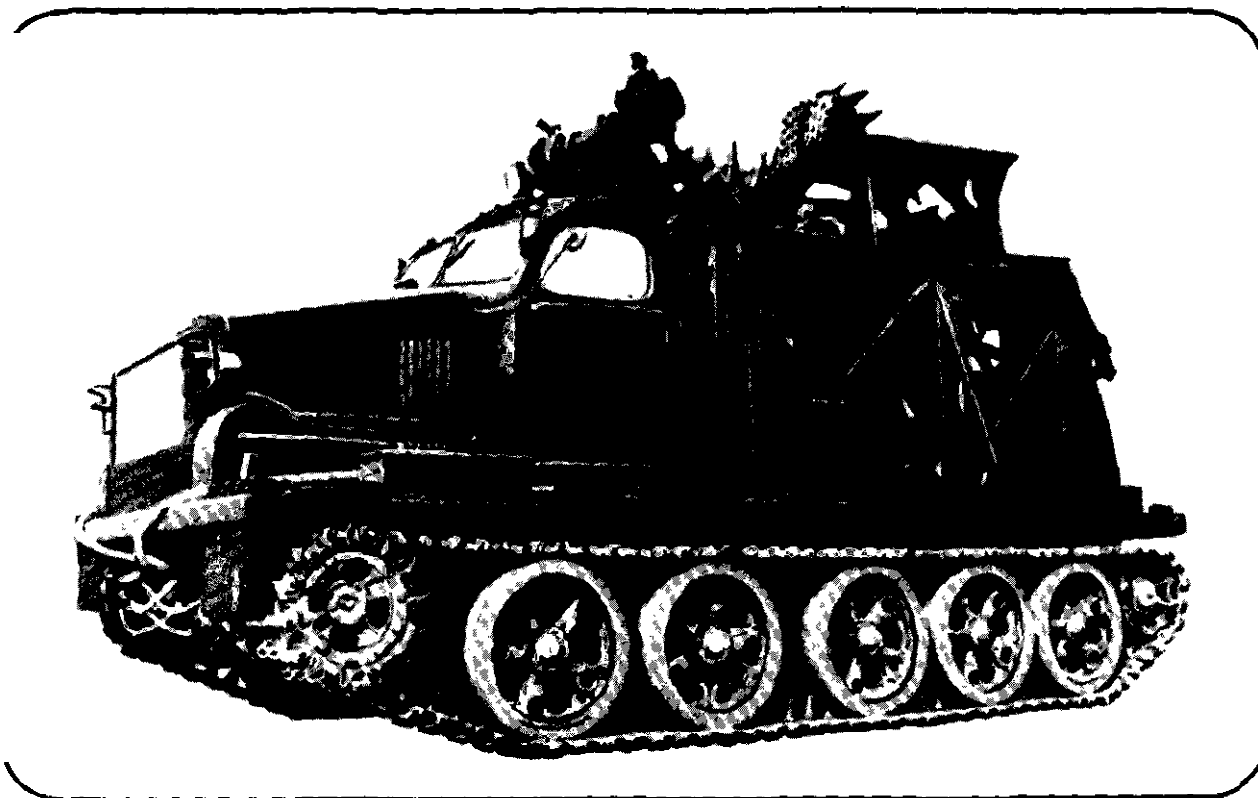
The MDK-3 can dig antitank ditches, vehicle

positions, and fighting positions. Its hourly excavation rate is 400 to **500** cubic meters per hour. The system can dig ditches **3.5** meters wide by 1.7 meters deep in a single pass.

REMARKS:

The MDK-3 cannot be airlifted by helicopter or airdropped.

BTM-3



DESCRIPTION:

The BTM-3 is the latest in a series of BTM vehicles based on the chassis of the AT-T tracked artillery tractor. The system mounts a circular excavator on the rear.

CAPABILITIES:

The BTM-3 can dig personnel trenches, anti-tank ditches, and vehicle positions. Its hourly excavation rate is 220 to 600 cubic meters per hour. The system can dig ditches 0.6 meters wide by 1.5 meters deep.

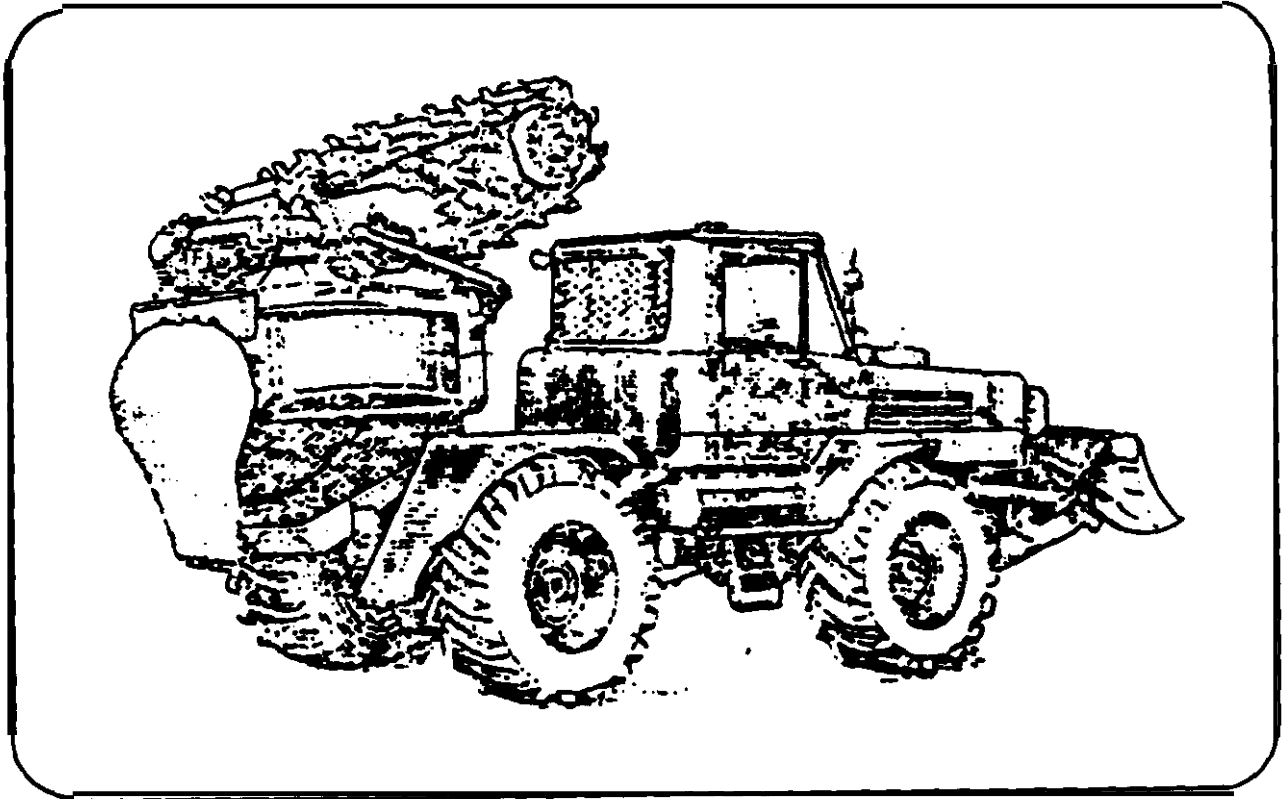
LIMITATIONS:

The system cannot be airlifted by helicopter or airdropped. It has neither armor nor NBC protection for the crew. The lack of a bulldozer blade limits the system's utility.

REMARKS:

The BTM-3's earlier versions are now obsolete. Along with the MDK-2M or MDK-3 ditching machines, any versions may be present in the technical company of the engineer battalion in a MRD or TD. They may also serve in the technical platoon of the engineer company in a MRR or TR.

PZM-2



DESCRIPTION:

The PZM-2 ditching machine is based on the wheeled T-150K tractor chassis. It has a bulldozer blade mounted on the front and a ladder-type excavator mounted on the rear.

CAPABILITIES:

The PZM-2 can dig antitank ditches, personnel and communications trenches, and vehicle positions. It can dig 80 to 250 cubic meters per hour. The system can dig ditches 0.8 meters wide by 1.5 meters deep on a single pass. With multiple

passes, it can create ditches up to 3.5 meters wide. The PZM-2 can be carried by either helicopter or transport aircraft, and it can be airdropped. It has an on board filtration system. It can operate in a contaminated environment for short periods of time.

LIMITATIONS:

The PZM is without significant armor, being essentially a modification of an agricultural tractor. It is vulnerable to small arms fire.

Trenching Machine TMK-2

TMK-2***DESCRIPTION:***

The TMK-2 trenching machine is a wheeled system based on the KZKT-538D tractor. The system mounts a circular excavator on the rear and a light bulldozer blade on the front.

CAPABILITIES:

The TMK-2 can dig in personnel, communications means, and vehicles. Its secondary missions include road maintenance, snow plowing,

river bank preparation, and NBC decontamination. The hourly capacity of the TMK-2 is 200 to 600 cubic meters per hour, depending on the type of soil. The trench created by the TMK-2 is 1.5 meters deep and 1.1 meters wide. The TMK-2 has NBC detection devices and protection systems.

LIMITATIONS:

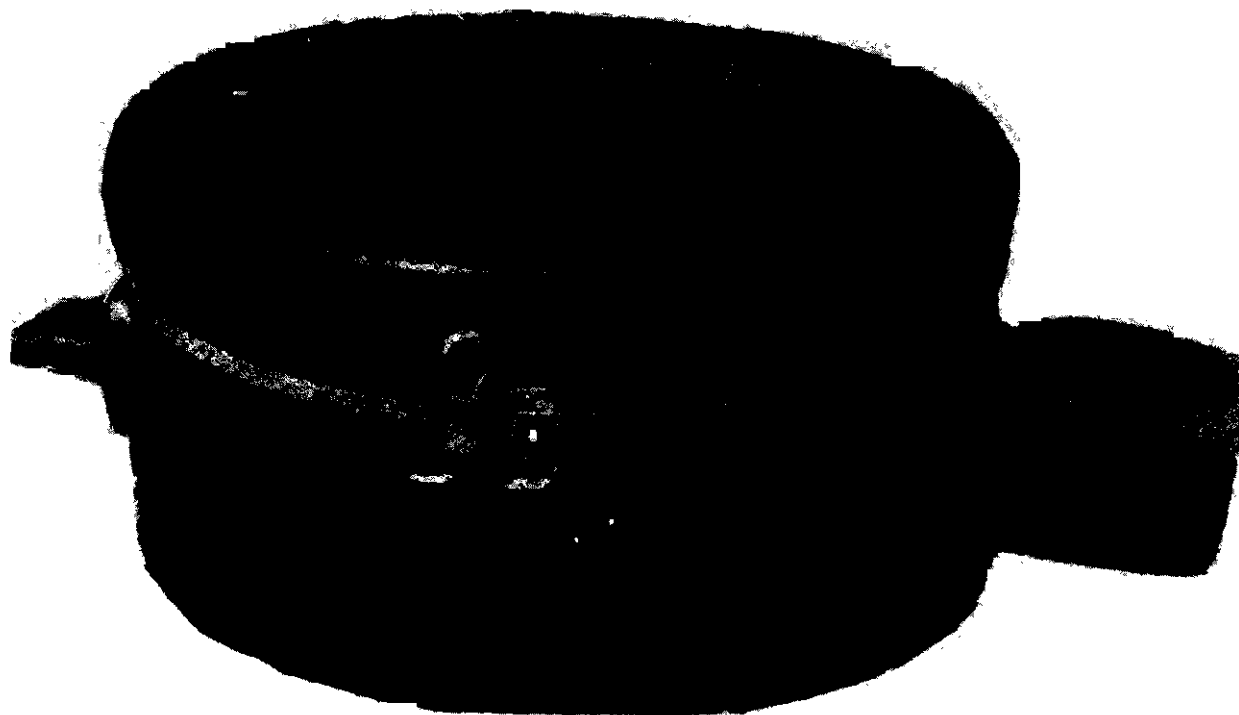
The TMK-2 is vulnerable to small arms fire.

Antipersonnel Mines
Antipersonnel mine characteristics

CHARACTERISTICS	PMN	PMD-6M	POMZ-2M	OZM-3	KhF-1/KhF-2
TYPE	antipersonnel blast	antipersonnel blast	antipersonnel fragmentation stake mine	bounding antipersonnel bounding fragmentation	chemical bounding chemical (mustard)
MAXIMUM DIAMETER (mm)	110	length-191 width-89	60	75	150/190
HEIGHT (mm)	56	64	107 (not including stake)	120	245/280
WEIGHT (kg)	0.55	0.4	2.0	3.0	15
ACTUATING FORCE (kg)	8-25	10	1.0	varies	varies
FUZING SYSTEM	pressure plate	pull	trip wire pull	trip wire or electronic	electronic, pressure delay
DOI STATUS	1960 standard	1939 limited standard	1951 limited standard	1950 standard	1941-1942 obsolete

CHARACTERISTICS	PFM-1	MON-50	MON-100	MON-200
TYPE	antipersonnel scatterable blast	antipersonnel directional fragmentation	antipersonnel directional fragmentation	antipersonnel directional fragmentation
MAXIMUM DIAMETER (mm)	120 4	220 × 105	220	520
HEIGHT (mm)	60 96	INA	80	INA
WEIGHT (kg)	0 074	INA	5	25
ACTUATING FORCE (kg)	5	10	10	10
FUZING SYSTEM	delay, pressure	trip wire or electronic	trip wire or electronic	trip wire or electronic
DOI STATUS	1978 standard	1970 standard	1970 standard	1970 standard

Antipersonnel Mine PMN

PMN**DESCRIPTION:**

The PMN is a small, round, flat, box-shaped antipersonnel mine. Its duroplastic casing has a side hole for the firing mechanism and primer charge. The top half of the mine case is covered by a rubber sheet secured by a metal clasp. The mine contains 237 grams of cast TNT.

CAPABILITIES:

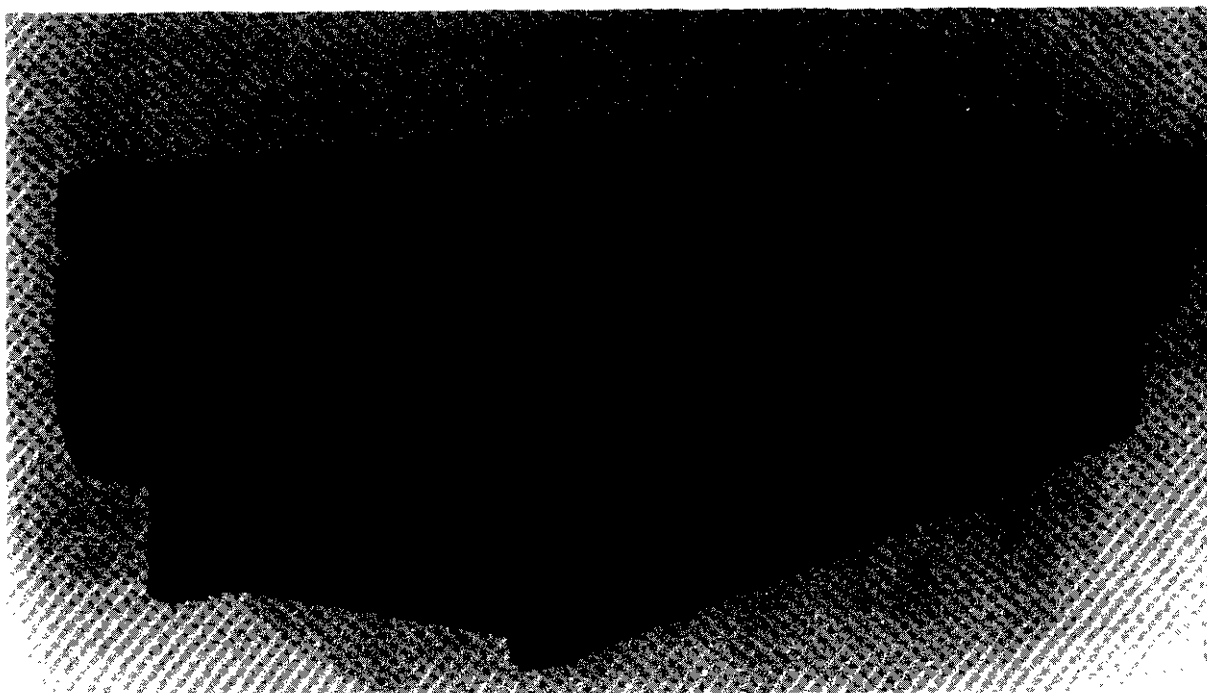
Pressure on the top of the case activates the PMN. This pressure releases a spring-loaded striker which hits the percussion cap capsule, setting off the main charge. Though rather small, the PMN can cause serious injury to foot or leg when stepped on.

When the PMN is emplaced, a 20-minute delay-action spring mechanism arms the pressure-plate fuzing system. The method of arming makes the mine extremely sensitive when emplaced. The mine cannot be disarmed.

REMARKS:

The Soviets introduced the PMN around 1960. It has been employed on the East German border as well as in Vietnam. The PMN can be used singly or in groups, used in mixed or homogeneous minefields, and surface-laid or buried. It can be manually emplaced or surface-laid with the aid of chutes from trucks, APCs, or helicopters.

PMD-6M



DESCRIPTION:

The PMD-6M is a wooden box with a hinged lid, a block of TNT, and a pull fuze. The hinged lid serves as a pressure plate. The box is large enough to contain a 200-gram charge of TNT.

CAPABILITIES:

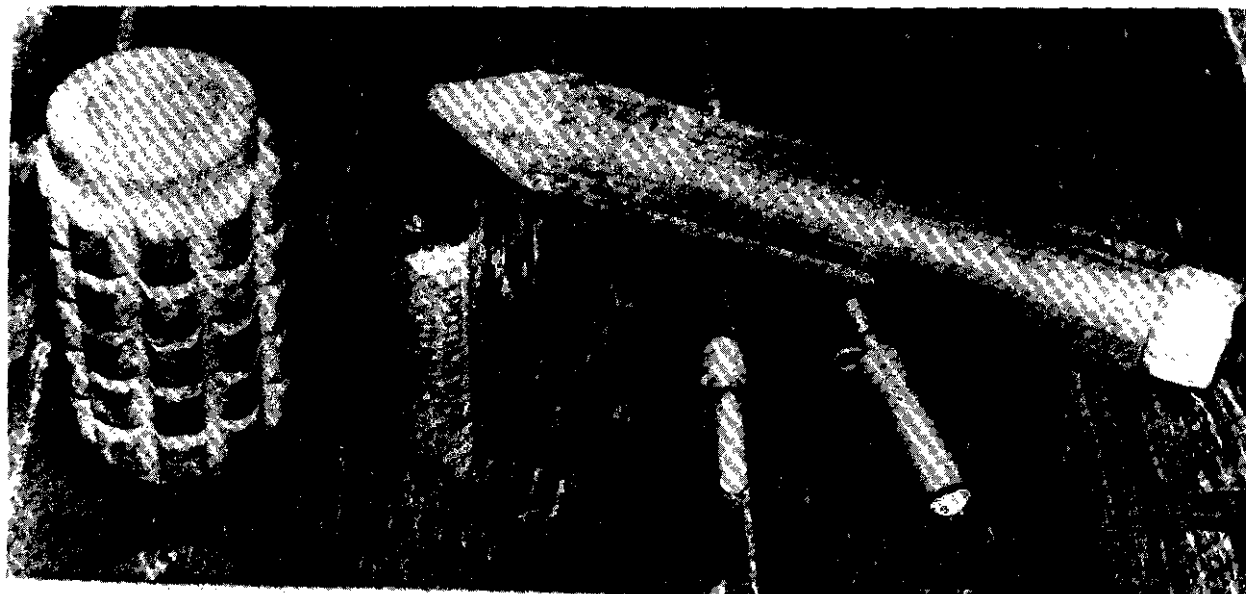
When pressure forces the lid down, the safety pin is withdrawn from the fuze, and the TNT ex-

plodes. The PMD-6M is a direct-contact mine. It produces casualties by blast *overpressure*.

REMARKS:

The PMD mines were first introduced around 1939. PMN mines have replaced them for normal usage. However, they frequently appear in Third World countries, since they are easily fabricated by unskilled personnel.

Antipersonnel Mine POMZ-2M

POMZ-2M**DESCRIPTION:**

The POMZ-ZM antipersonnel stake mine consists of a cylindrical, segmented cast iron body (similar to that of a hand grenade) filled with TNT and mounted on a stake. The original POMZ-2 had six rows of fragments; the modified POMZ-2M, introduced after World War II, has only five rows.

CAPABILITIES:

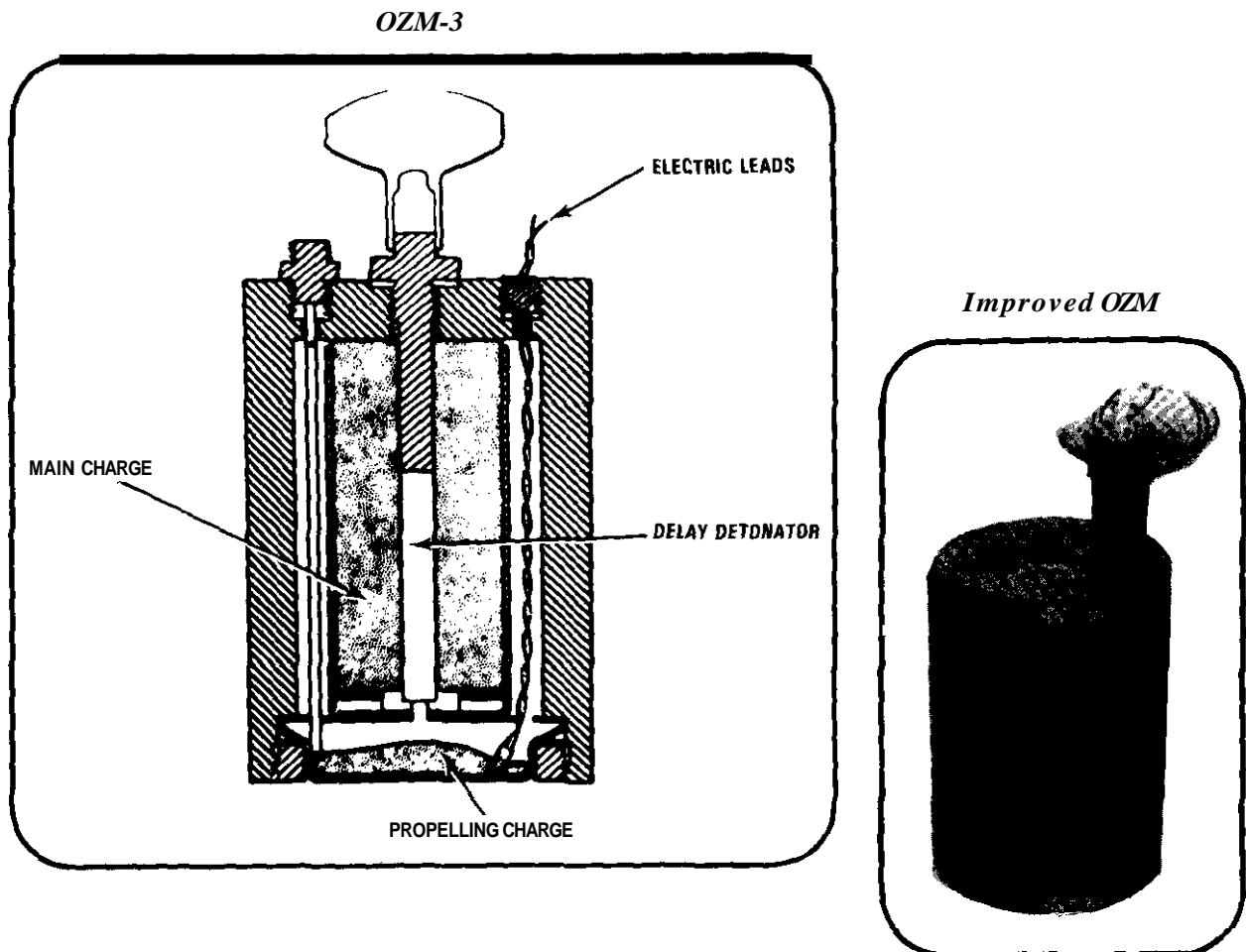
The stake is placed in the ground so that the

mine sits not more than 30 millimeters above the ground. The mines normally are laid in clusters of at least four mines. A trip wire runs from the firing-pin retaining pin. When this wire is pulled and the remaining pin withdrawn, the mine explodes.

REMARKS:

The POMZ-2 proved very effective in World War II. The modified POMZ-2M is still in the active inventory.

Bounding Antipersonnel Mine OZM



DESCRIPTION:

The OZM series of mines rely on their bounding fragmentation effect. Earlier versions include the OZM, OZM-3, OZM-4, and the OZM-160. Each mine consists of a main charge and a propelling charge. Each has an electrical fuze as well as provision for a mechanical fuze.

CAPABILITIES:

The OZM mines can be command-detonated or trip-wire-initiated. On activation, the propelling charge causes the inner case containing the main charge and fragmentation sleeve to bound into the air. A tethering wire which remains attached to the base of the outer case determines the

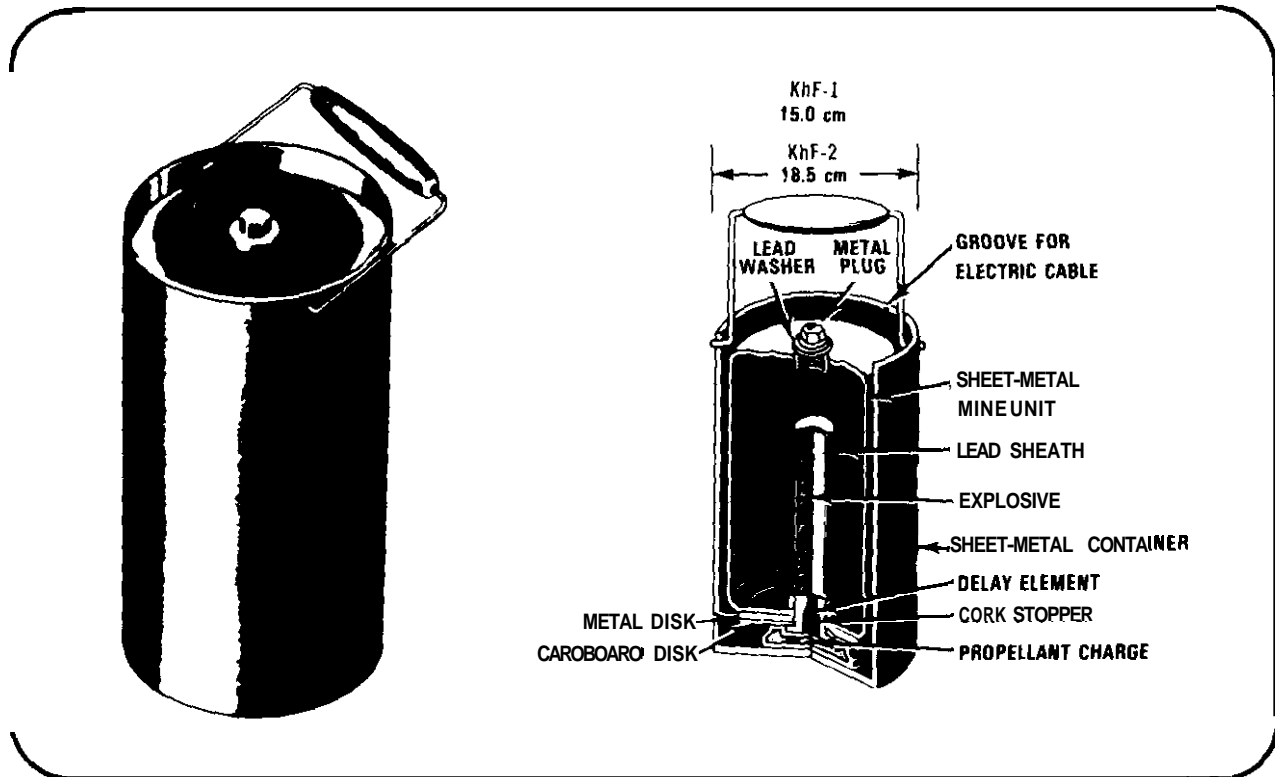
height of the main charge explosion. The OZM-3 and OZM-4 have lethal radii of 9 and 13 meters, respectively.

REMARKS:

The OZM-3 was introduced around 1950 as a replacement for the improvised OZM (fragmentation obstacle mines) used during World War II. Each improved OZM mine has featured greater explosive content and more fragmentation. The newest version appears to follow this trend, perhaps indicating a lethal radius 25 to 50 percent greater than the OZM-4.

Chemical Bounding Antipersonnel Mines KhF-1 and KhF-2

KM-I and KM-2

**DESCRIPTION:**

The KhF-1 and KhF-2 chemical bounding antipersonnel mines differ only in dimensions. Both mines are cylindrical with a handle on one end. The outer shell acts as a miniature mortar tube. The inner shell holds 4.5 liters of liquid contaminant (mustard).

CAPABILITIES:

Both mines fire electronically from a remote position. The firing of the electronic detonator ignites the propellant charge. This hurls the mine upward out of the container, simultaneously igniting the delay fuze. After a delay of 1 to 1.5 seconds, the delay fuze sets off the explosive charge, shattering the mine and spreading the liquid contaminant.

The mines are normally employed in groups of 10 to 12, connected by cable to a single power source located a minimum of 300 meters from the grouping of mines. If the mine explodes between 4 to 8 meters off the ground, the contaminant filling will cover approximately 250 to 300 square meters.

REMARKS:

During World War II, the Soviet Union produced, but did not employ, the KhF-1 and the KhF-2. The Soviets designed the shorter KhF-2 because of difficulty in burying the taller KhF-1 in hard and frozen ground.

PFM-1



DESCRIPTION:

The PFM-1 is an aerially delivered, hydraulically activated, pressure-fired antipersonnel landmine. It functions principally as an area-denial munition. The mine appears to be a copy of the US BLU-43B mine, commonly referred to as "Dragon Teeth." Cased in plastic, this mine is characterized by a viscous explosive charge, a metal fuze, and a stabilizing fin. The high-density polyethylene mine casing weighs approximately 12 grams.

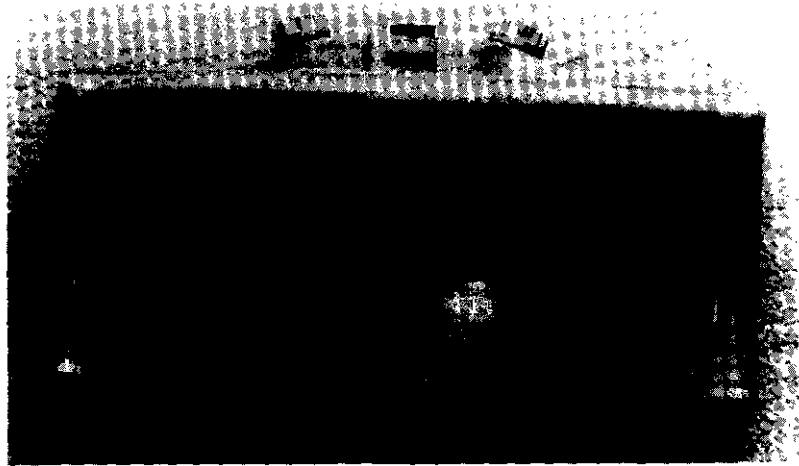
CAPABILITIES:

The four-component liquid explosive that hydrau-

lically transmits the pressure to the fuze has a density of 1.57 grams per milliliter and contains 2, 2, 2-trinitroethyl acetate, methyl, 4, 4, 4-trinitrobutylate, 2 chloro-2, 2-dinitroethyl formal and 2, 2, 2-trinitroethyl formal. This explosive represents a new formulation and application previously unknown to the West.

The fin acts to stabilize and disperse the mine and extends outward from the lower portion of the fuze well. The PFM-1 comes in green and tan versions. A white version may also exist.

Antipersonnel Mine MON Series



*MON-50 antipersonnel mine with
scissor legs folded*

*Soldiers emplacing MON-50 (background)
and MON-100 (foreground)
antipersonnel mines*

**DESCRIPTION:**

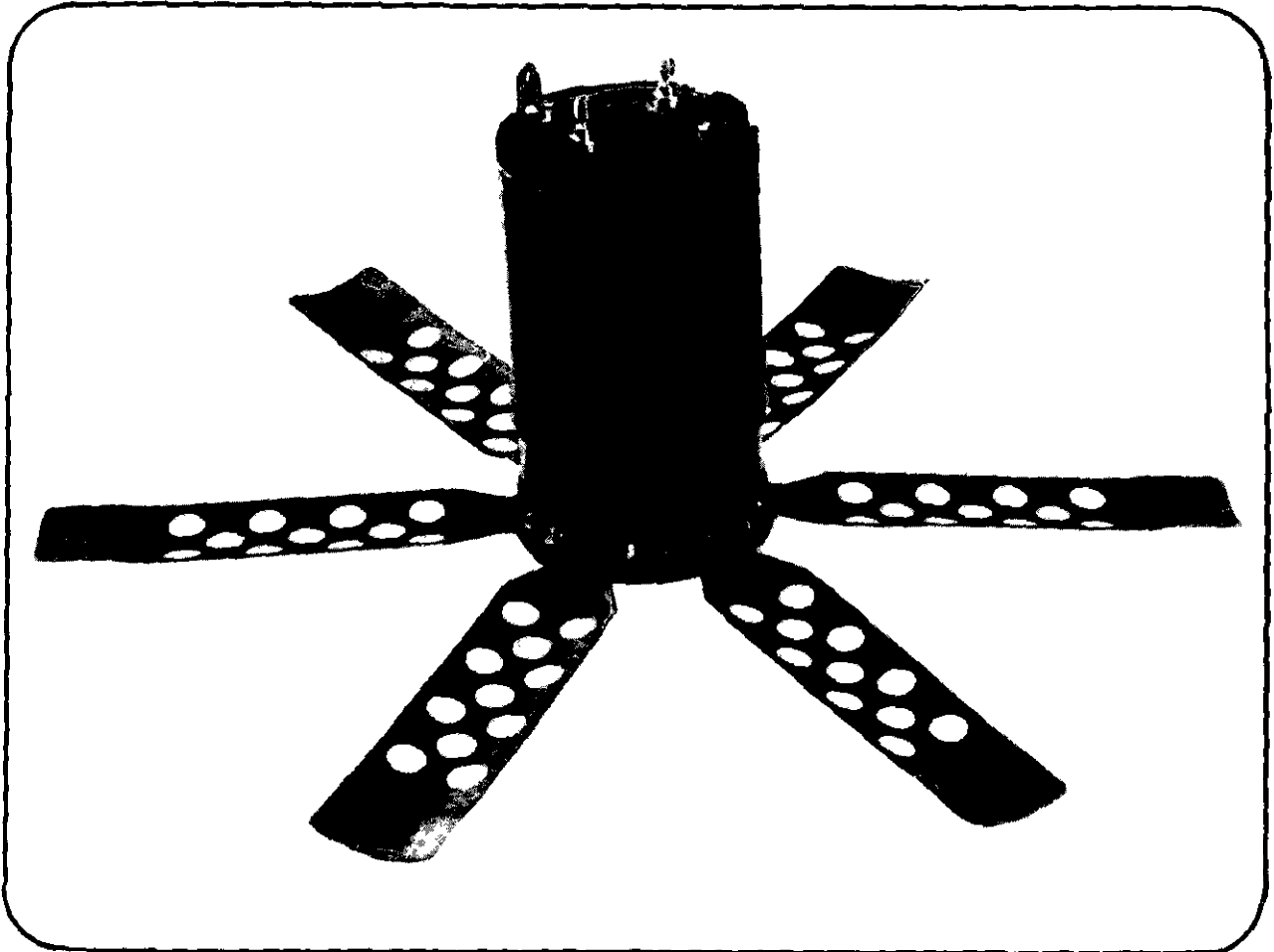
The plastic-cased Soviet MON-50 is an almost identical copy of the US M18A1 Claymore. Its lethal range is approximately 50 meters with fragmentation coverage similar to that of the Claymore. The MON-100 and the MON-200 are metallic-cased, circular mines with a much more focused fragmentation effect. Their lethal ranges are expected to be 100 and 200 meters. For mounting the mines, the integral carrying handle and stand of the MON-100 and MON-200 can be driven into the ground or trees.

CAPABILITIES:

The fuze normally employed is command-detonated; it electrically initiates a percussion detonator, firing a nonelectric cap. These mines can also accommodate a trip wire fuze. The MON-series mines provide devastating fragmentation in ambushes as well as around defensive perimeters. The larger MON-series mines will also have a significant effect against unprotected and lightly armored vehicles (with 2.0 and 12.0 kilograms of TNT, respectively).

Scatterable Antipersonnel Mine, Unidentified

U/I scatterable antipersonnel mine



DESCRIPTION:

Little is known about this newest scatterable antipersonnel mine: it is aurally delivered; it has

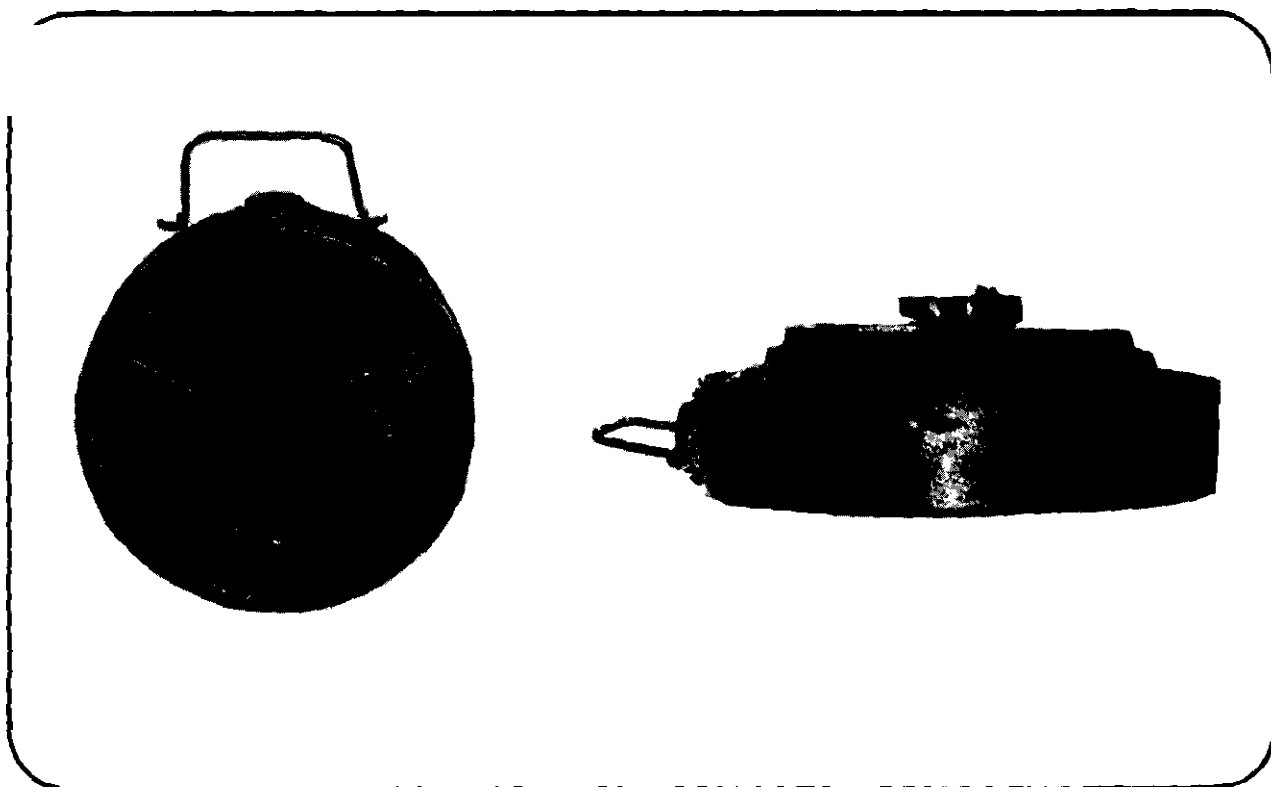
self-erecting leas: and it extends its own trio wires. The metal-cased mine has a fragmentation kill mechanism.

Antitank Mines
Antitank mine characteristic 8

CHARACTERISTICS	TMN-46	TM-57	TM-62B	TM-62D
TYPE	antitank blast	antitank blast	antitank blast	antitank blast
MINE CASE MATERIAL	sheet steel	sheet steel	caseless	wooden
MAXIMUM DIAMETER (mm)	305	316	INA	340 × 295
HEIGHT (mm)	74	100	INA	178
WEIGHT (kg)	8.7	8.5	7.0	11-13
ACTUATING FORCE (kg)	180 (MVM fuze) 132 (MVSh tilt rod fuze)	200 (MVZ fuze) INA (MVSh tilt rod fuze)	200 (VM-62) seismic VM-62Z)	200 (VM-62) seismic (VM-62Z)
FUZING SYSTEM	pressure, tilt rod, and antift device	pressure, tilt rod, and antift device	pressure, seismic, tilt rod	pressure, seismic, tilt rod
DOI	1946	1957	1960	1960
STATUS	limited standard	limited standard	standard	standard

CHARACTERISTICS	TM-62M	TM-62P	TMK-2
TYPE	antitank blast	antitank blast	antitank shaped-charge
MINE CASE MATERIAL	sheet steel	plastic	sheet steel
MAXIMUM DIAMETER (mm)	316	INA	80 (minimum) 300 (maximum)
HEIGHT (mm)	100	115	350
WEIGHT (kg)	8.5	8.2	12.5
ACTUATING FORCE (kg)	200 (VM-62) seismic (VM-62Z)	200 (VM-62) seismic (VM-62Z)	8-12
FUZING SYSTEM	pressure, seismic, tilt rod	pressure, seismic, tilt rod	tilt rod
DOI	1960	1960	1955
STATUS	standard	standard	standard

TMN-46



DESCRIPTION:

The TMN-46 blast-type antitank mine has a cylindrical metal case with a slightly domed, ridged top. The main TNT charge weighs 5.3 kilograms.

CAPABILITIES:

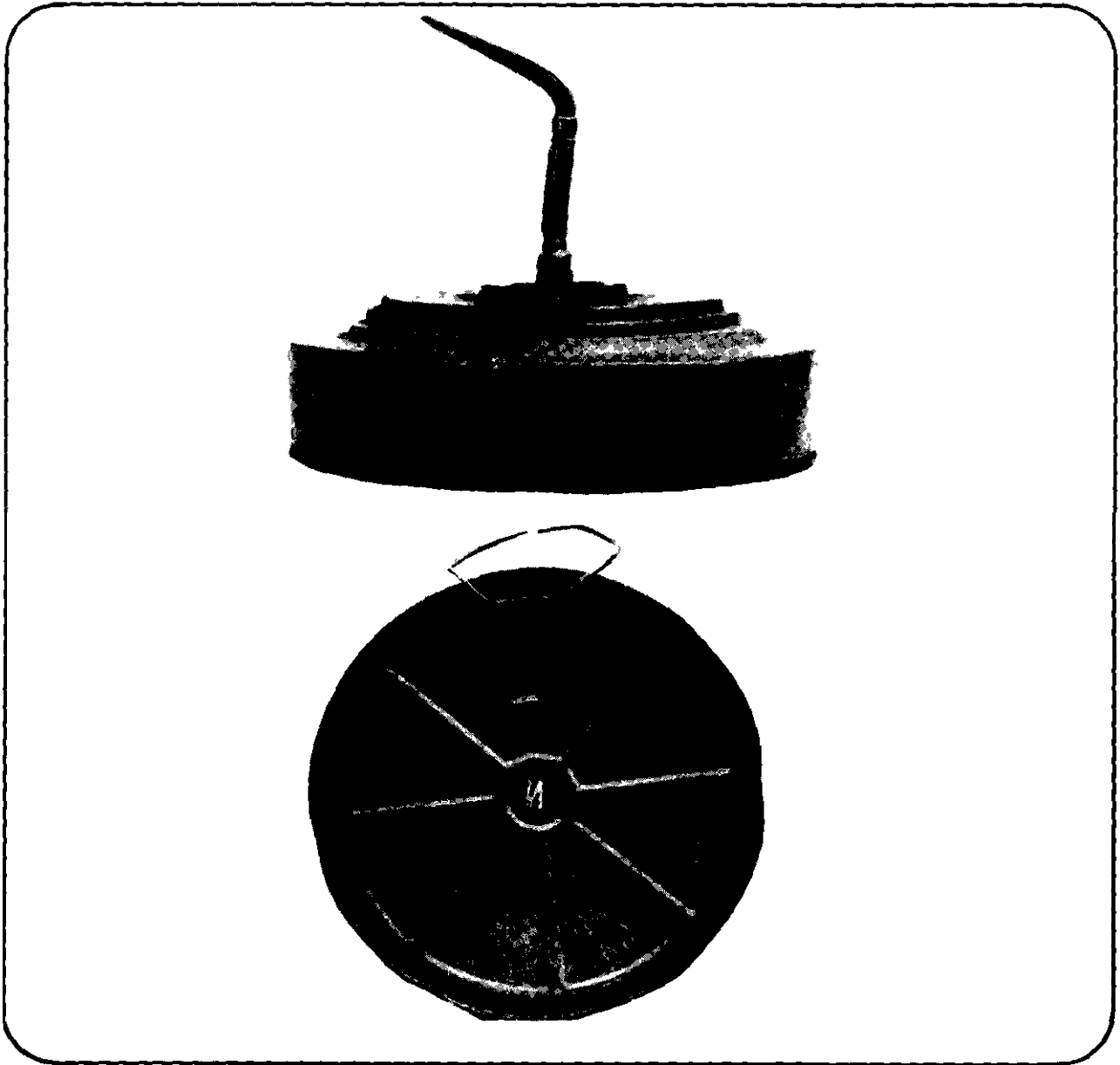
The TMN-46 has a fuze well on the bottom for booby trapping. It has a pressure fuze for mechani-

cal laying. A more recently developed angled tilt-rod fuze is used only when the mine is laid by hand.

REMARKS:

The Soviets introduced TMN-46 around 1946. It differs from the earlier TM-46 only in having a fuze well on the bottom. Both models can be laid mechanically. They are limited standard items.

Antitank Mine TM-57

TM-67**DESCRIPTION:**

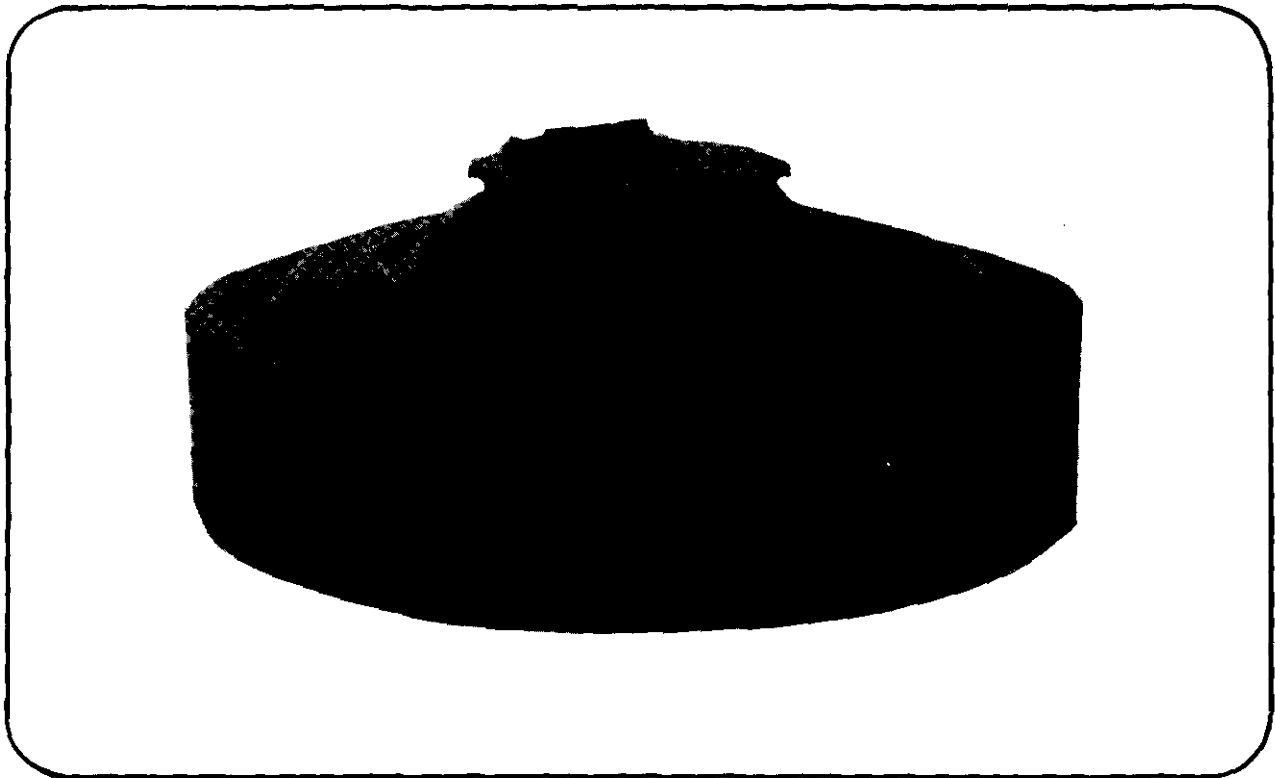
The TM-57 blast-type antitank is almost identical to the older TM-46 and TMN-46; however, it has a larger charge (6.3 kilograms) and improved fuzing. It has no booby trap well, since it is designed for mechanical laying. The steel mine is

olive green in color.

CAPABILITIES:

A delay-armed fuze is standard, but a tilt-rod fuze can be used when the TM-57 is laid by hand.

TM-62M antitank mine with unarmed pressure fuze MVCh-62



DESCRIPTION:

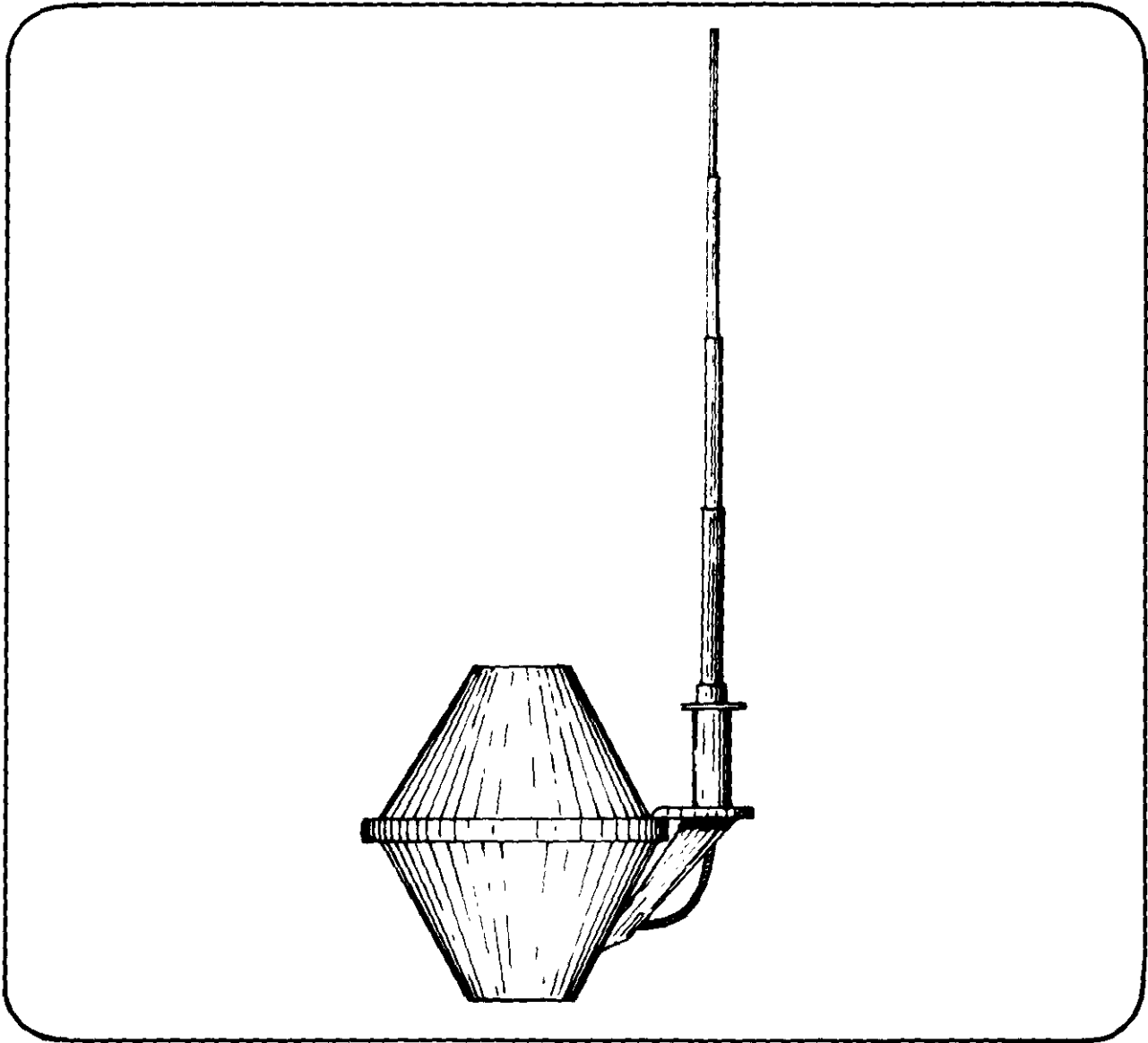
The TM-62 series of conventional antitank blast mines are the current mainstay of the Soviet antitank mine inventory. They exist in four distinct versions: the TM-62M, metallic case; TM-62P, plastic case; TM-62B, caseless; and TM-62D, wooden case. All are circular except for the TM-62D, which is rectangular. The TM-62M has a bracket on the base plate to accommodate a springy metal handle.

CAPABILITIES:

It is logical to assume that the TM-62 series

stemmed from a need for improved countermeasures and variety. The TM-62 mines represent the first physically similar series of mines that allows mechanical emplacement; varying degrees of detectability; and the use of a manufactured anti-disturbance fuze, the VM-62Z. The TM-62 mines can be emplaced manually or mechanically, in mixed or homogeneous minefields. The TM-62M and TM-62P probably have limited duration capabilities when used underwater.

Antitank Mine TMK-2

TMK-2**DESCRIPTION:**

The TMK-2 shaped-charge antitank mine consists of a double-truncated, conical-shaped mine body with a shaped charge in the lower half. It has an adjustable-length, tilt-rod fuze attached to a holder on the side of the mine. The metal mine is olive green in color.

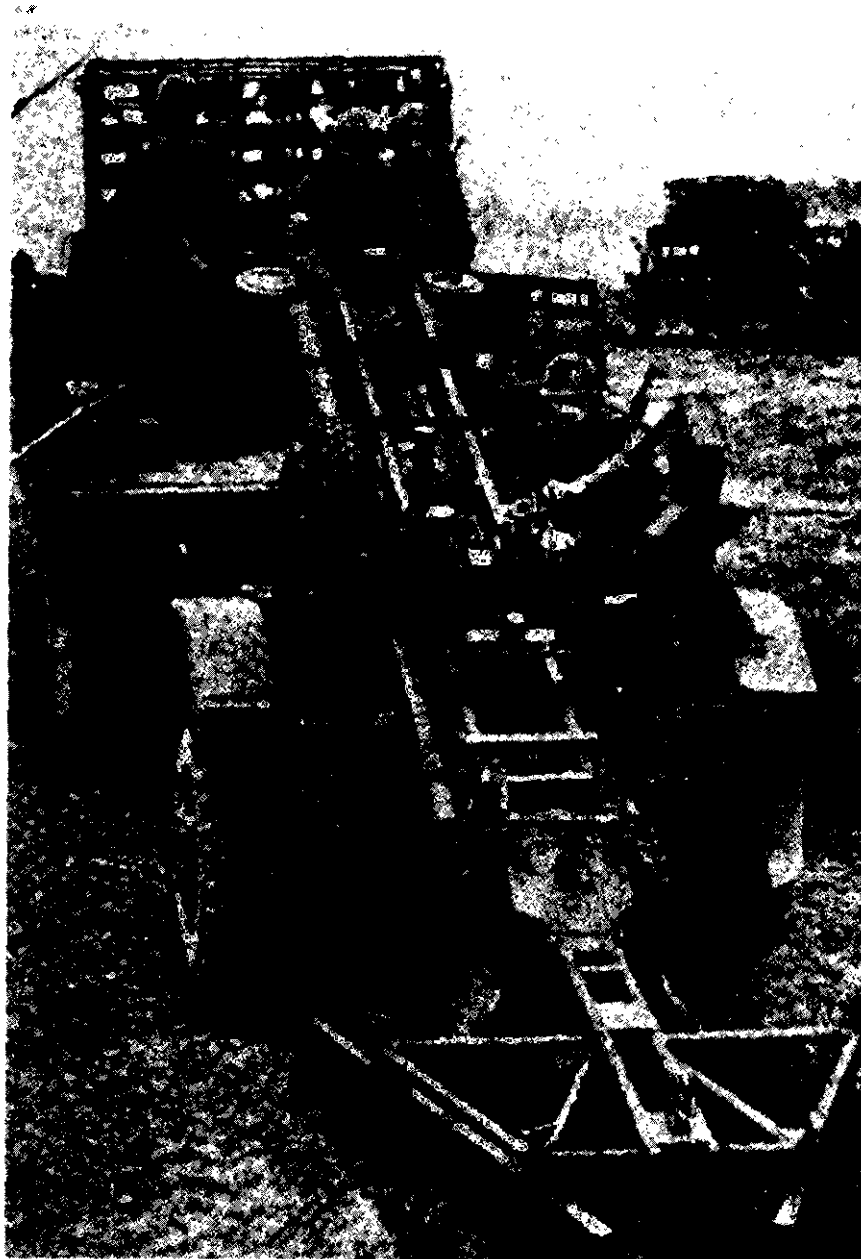
CAPABILITIES:

The TMK attacks the bellies of tanks and other armored vehicles. Normally, it is buried in the ground leaving only the tilt rod exposed. Its effectiveness results from the shaped charge (HEAT) which produces a penetrating jet in the same manner as shaped demolition charges and HEAT projectiles.

Minelaying Equipment

Mechanical Minelaying Trailer PMR-3

PMR-3



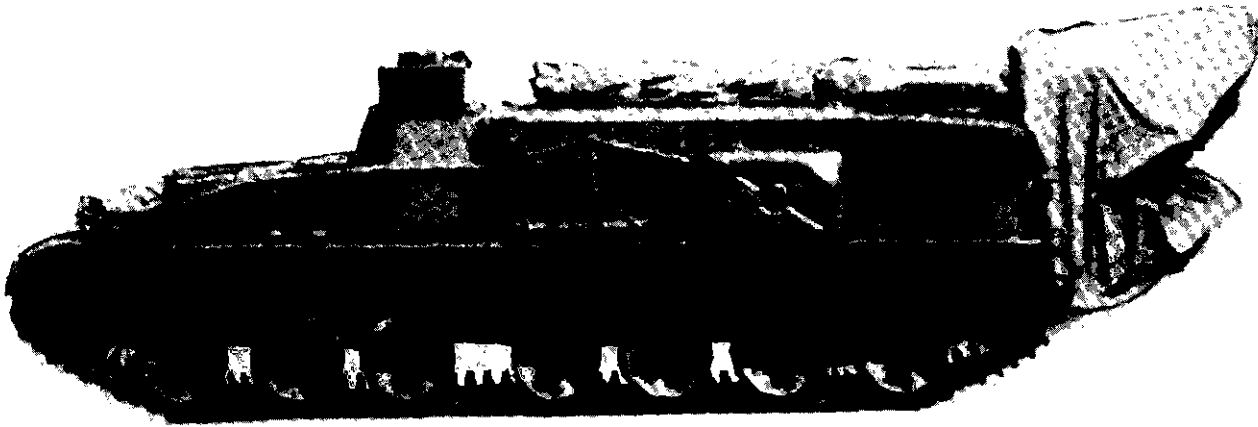
DESCRIPTION:

The PMR-3 (and the similar PMZ-4) consists of a single chute and a plow attachment. The attachment provides the option of burying the mines or depositing them on the surface of the ground. The mines can be spaced 4 to 5.5 meters apart, depending on the control setting. If buried, the

mines are emplaced at a depth of 6 to 12 centimeters at a speed of 5 kilometers per hour. The trailer weighs 1.8 metric tons. The towing vehicle may carry 200 to 300 mines, depending on the type of vehicle; these may be TM-44-, TM-46-, TM-57-, or TM-62-series antitank mines.

Armored Tracked Mechanical Minelayer GMZ _____

GMZ



DESCRIPTION:

This vehicle derives from the chassis of the SA-4/GANEFSAM. Mine storage is in the rear.

The minelaying device operates in a manner similar to that of the PMR-3.

Minelaying Chutes _____

Minelayingchutes with BTR-162

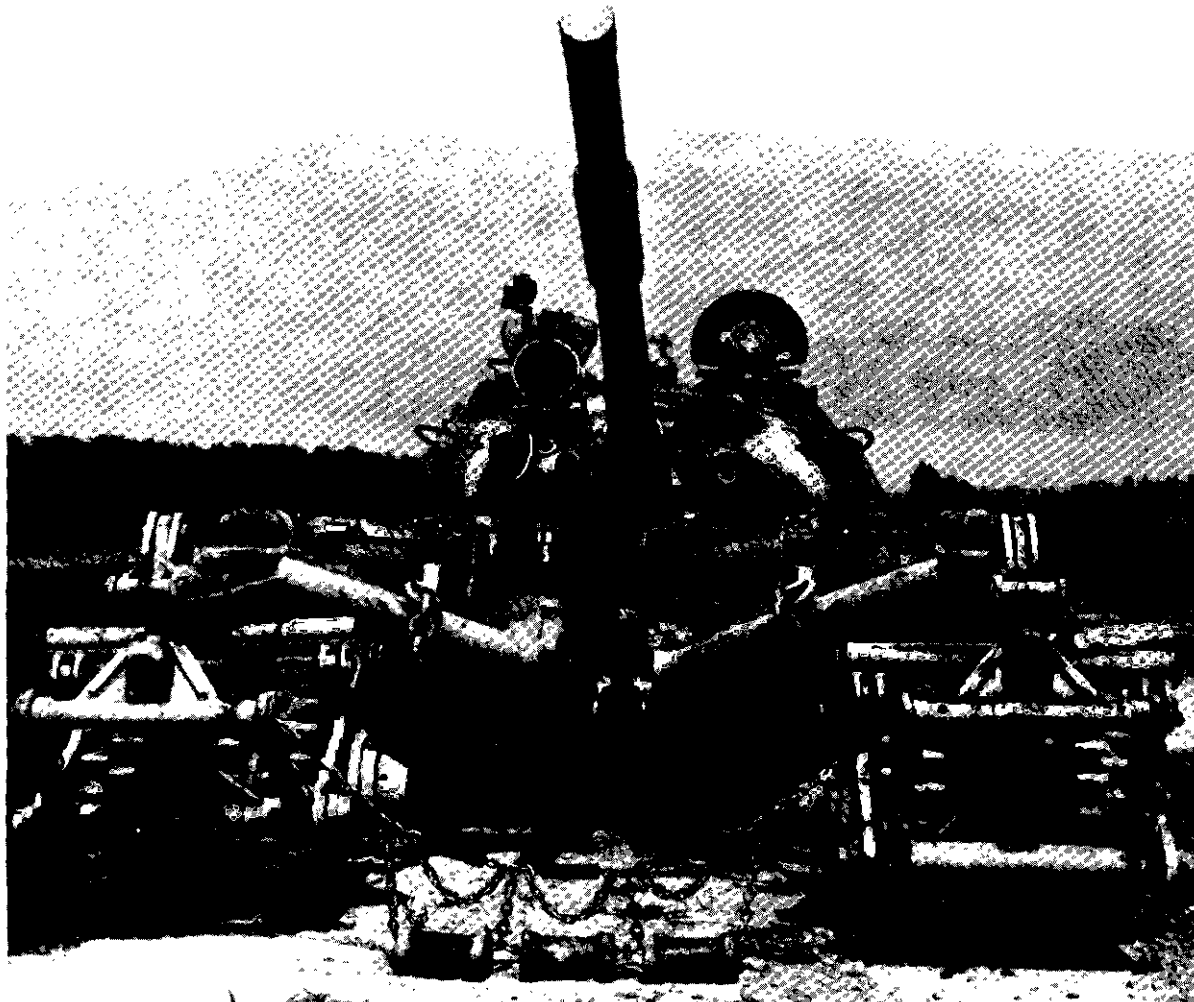


DESCRIPTION:

The Soviets have attached minelaying chutes to trucks, APCs (especially the BTR-152), and helicopters. They can quickly lay a minefield

on the surface. Minelaying chutes are still available, but they are seldom used.

KMT-5M

***DESCRIPTION/CAPABILITIES:***

The KMT-5M mine roller-plow combination consists of two plows and two sets of three rollers attached to the front of the tank hull. It is very flexible, since it allows for either the plows or the rollers to be used, depending upon terrain features, type of soil, and fuzing encountered. The rollers function satisfactorily against mines equipped with simple pressure fuzes, but other mines will defeat this equipment. However, the roller-plow combination also allows the tank to counter more sophisticated fuzes with plows designed to uncover or push mines aside. The plows and rollers cannot work simultaneously. The speed of clearing varies from 6 to 12 kilometers per hour.

The KMT-5M also includes a luminous lane-marking device for night operations. Because plows and rollers do not clear the area between them, a "dogbone" or light chain with rollers is stretched between the roller sections to defeat tilt-rod mines. The crew can install the system in 30 to 45 minutes. Quick disconnects allow the operator to drop either plows or rollers or both; otherwise, the crew can remove the system in 8 to 13 minutes. All current medium tanks have fittings for attaching mineclearing equipment. One roller-plow combination is issued per tank company. However, the engineer company of a TR or MRR normally holds these assets. One KrAZ-255B truck or two ZIL-131 trucks can carry one KMT-5M.

KMT-6 Mineclearing Plow

KMT-6M**DESCRIPTION/CAPABILITIES:**

The Soviets introduced KMT-6 and KMT-6M track width mineclearing plows along with the T-64 and T-72 tanks in the early 1970s. When its plow is lowered, the KMT-6's teeth dig into the ground and remove mines from the path of the tank rather than simply detonating the mines (as rollers do). The plow system is also lighter than rollers. It permits the tanks to retain their cross-country mobility. Its estimated clearing speed is 6 to 12 kilometers per hour; its depth of clearance is 10 centimeters. Installation requires 15 to 20 minutes. Removal requires 5 to 10. Three plows are issued per tank company (one per platoon of three tanks). These assets are organic to the engineer company of a TR or MRR. One ZIL-131 truck can carry three plows. However, the plows are normally

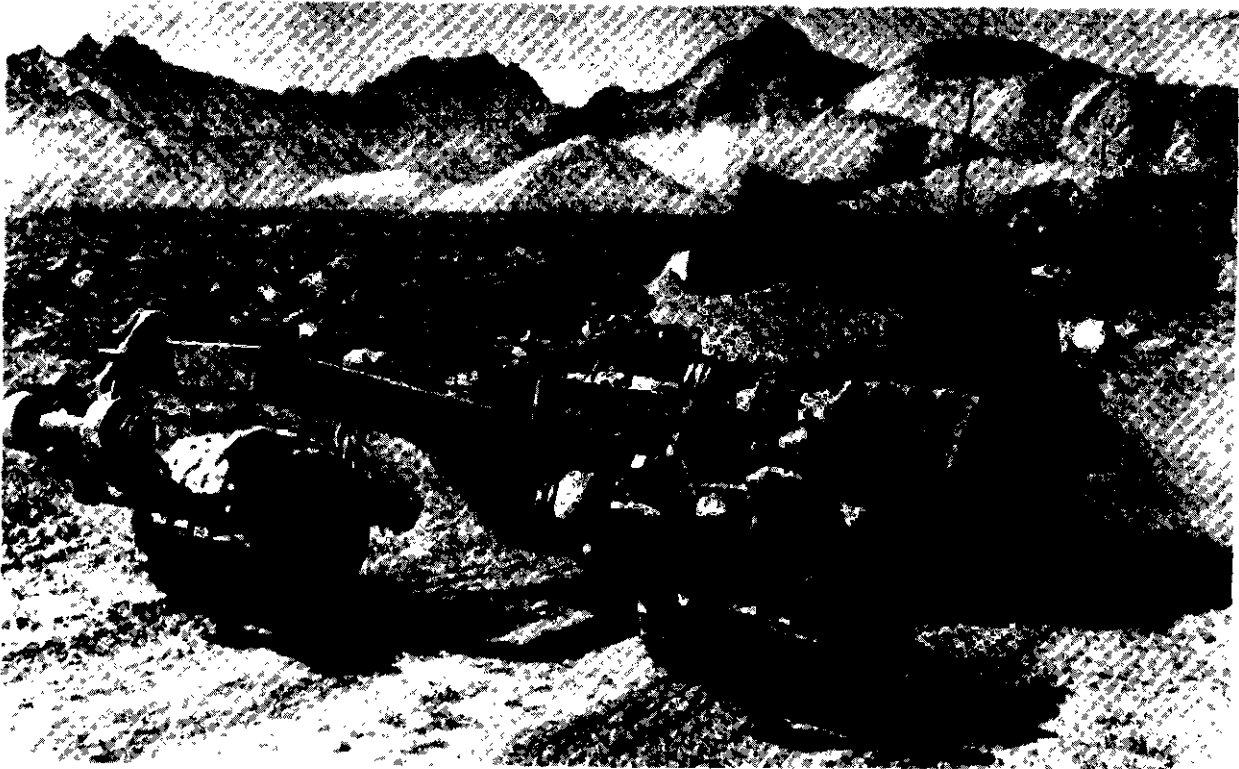
already mounted on tanks when they deploy onto the battlefield.

The KMT-6M is a modernized version of the KMT-6. The only noticeable difference between the two plows is that the KMT-6M has three tines on its hinged extendable moldboard rather than the two on the KMT-6.

REMARKS:

The Soviets developed the KMT-4 mineclearing plow in the 1960s. It is the predecessor of the KMT-6, and is used on the T-54, T-55, and T-62 tanks. Plows without moldboards have been observed on BMPs, and fixtures for mounting mineclearing equipment have been seen on BMP-2s.

T-55 roller



Krasnaya Zvezda

DESCRIPTION:

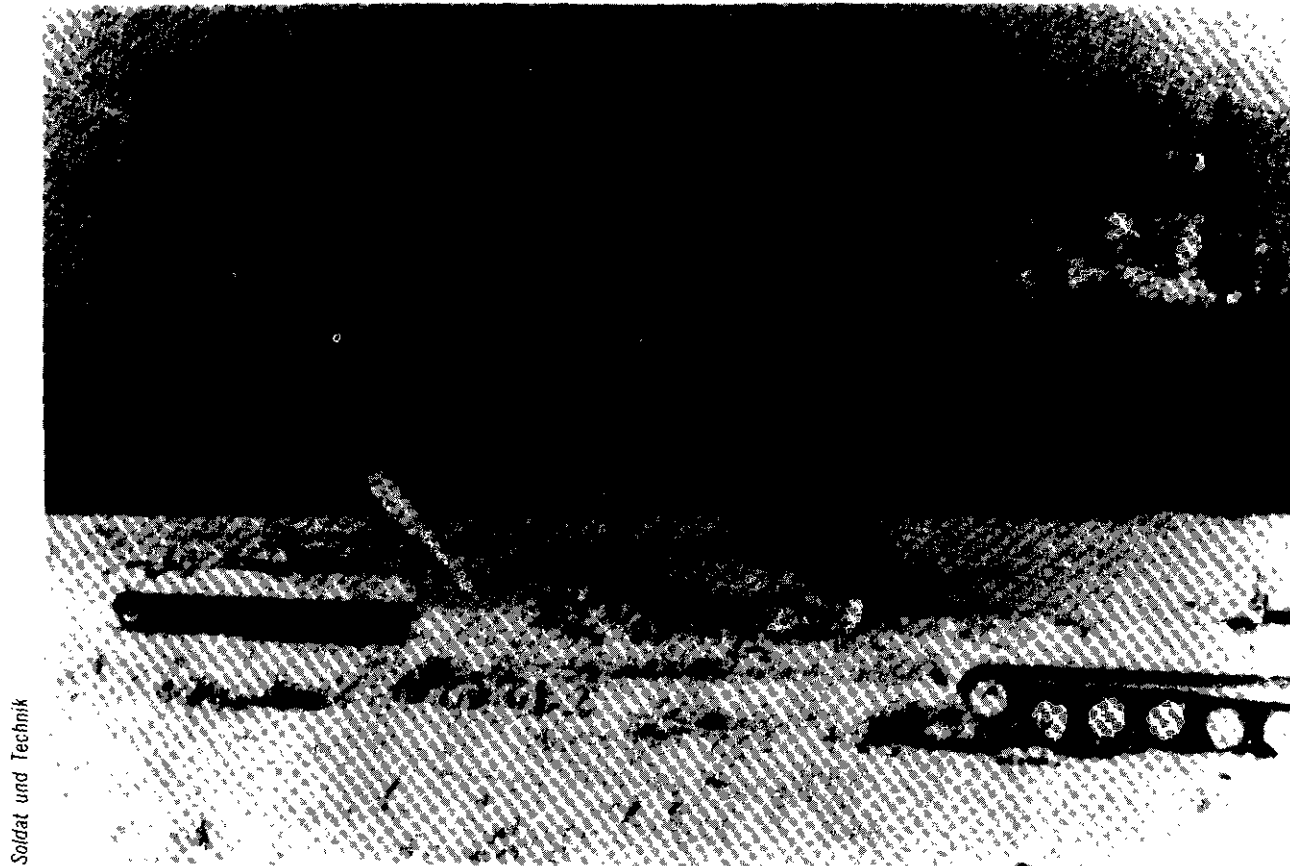
A modified T-55, with the M1986 mineclearing roller, serves as the basis for this mineclearing vehicle. Its turret is absent. In its place, on the right side of the chassis, is an angular attachment housing a 12.7-mm AA machine gun; on the left side is an elevated driver's position. In front of these additions are four smoke grenade projectors on each side. Steel-reinforced rubber protective skirts fit on the track covers to protect the fuel tanks. Two mine roller sets with three rollers each, similar to those of the KMT-5M plow/roller system, are mounted in front. However, in place of the tube-like frame of the KMT-5M, the new system

has a beam-like frame. Two extra mine roller sets ride on the rear of the vehicle.

REMARKS:

This vehicle was observed in 1986 in Afghanistan. Also pictured in the column is an IMR armored engineer tractor whose crane may facilitate the replacement of rollers. While the ordinary employment of the KMT-5M in conventional combat is only for short periods of time to create passages in minefields, the new system appears to have been created for the special combat situation in Afghanistan.

Mineclearer MTK-2

MTK-2**DESCRIPTION:**

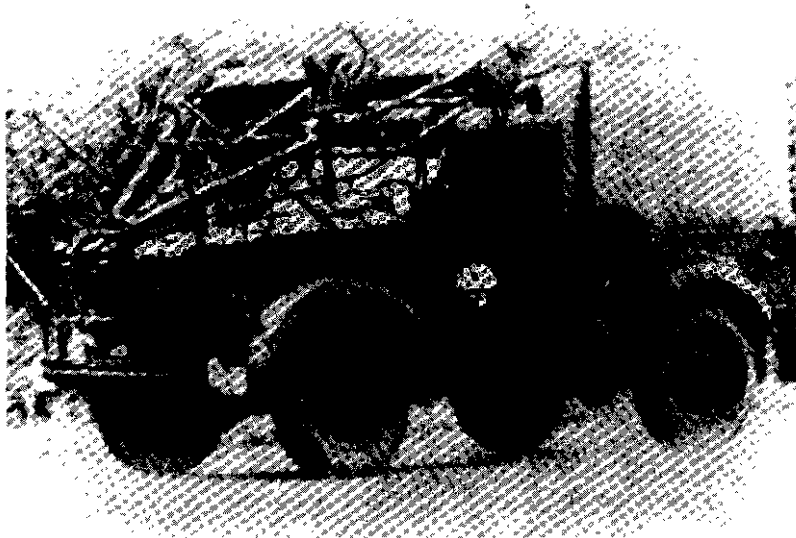
The MTK-2 mineclearer's chassis and roadwheels are similar to those of the 122-mm SP howitzer 2S1. The MTK-2 is amphibious. It has a small, flat, box-like turret mounted on a chassis. This holds the rocket-firing mechanism; when closed, it covers the storage area for the explosive line charges. Before firing, a hydraulic mechanism raises the rocket-firing portion.

CAPABILITIES:

The MTK-2 can clear a 180-m-long path, 3 meters wide, through a minefield which has pressure fuzes; it can clear a path 8 meters wide through a field with tilt-rod fuzes. It carries a crew of three: the commander, the gunner, and the driver. It has a maximum speed of 60 kilometers per hour on hard surface roads, and 4.5 kilometers per hour in the water.

Vehicle-Mounted Mine Detector DIM

DIM



Soldat und Technik



Soldat und Technik

DESCRIPTION:

The DIM is mounted on a UAZ-469/69 truck. The detection element fastens on a frame on the front of the vehicle. When the vehicle approaches a metallic mine, a signal light appears on the dash and, simultaneously, the system applies compressed air into the brake cylinders, halting the detector.

CAPABILITIES:

This system can detect metallic mines in roadways, airfields, and other terrain. It can detect mines buried 25 centimeters deep. It can travel at a speed of up to 10 kilometers per hour while scanning. Placing the system in or out of operation takes up to seven minutes. The DIM has a two-man crew.

Other Equipment

Obstacle Clearing Vehicle IMR

IMR



DESCRIPTION:

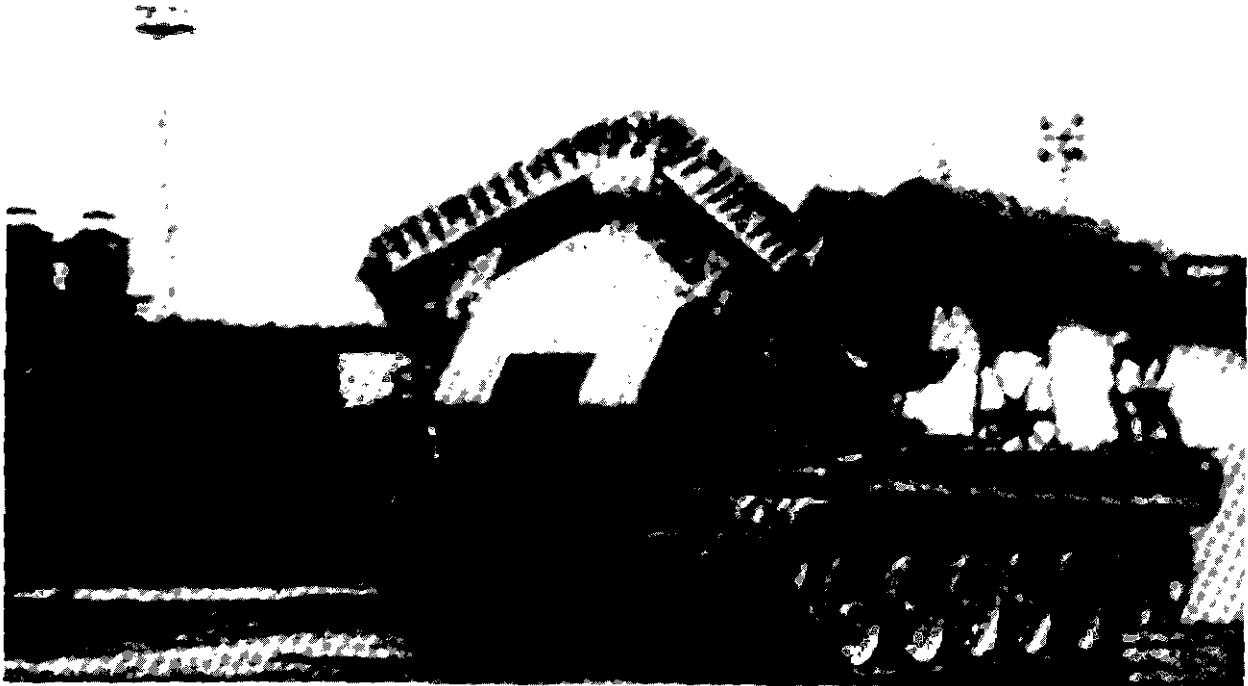
This vehicle is based on a T-54/55 tank chassis. The turret is absent, replaced by a hydraulic crane which can be fitted with a number of attachments. An articulating, hydraulically-operated dozer blade mounts on the front. The crane operator sits in an armored cupola. The IMR has filtration and overpressure systems and an antiradiation liner, which would allow it to operate in a contaminated area.

REMARKS:

The primary mission of the IMR is obstacle clearing. Secondary uses include road clearing, firefighting, and reducing the effects of NBC attacks. The combat engineer (sapper) company of the engineer battalion of MRDs and TDs uses the IMR. It cannot keep up with current models of main battle tanks and other combat vehicles.

CHARACTERISTICS	IMR
Crew	23
Weight (mt)	34.0
Length, travel position (m)	10.60
Width	
vehicle (m)	3.27
dozer blade (m)	3.80 (straight) 3.40 (angled)
Height, travel position(m)	3.37
Crane capacity (kg)	4,000-7,000
Bucket capacity (m)	0.15
DOI	1975
Status	Standard

IMR M1986



DESCRIPTION:

The IMR M1986 is based on a T-72 tank chassis. It mounts an articulating bulldozer blade on the front and a telescoping crane arm which can employ a number of attachments. It has NBC protection for the crew.

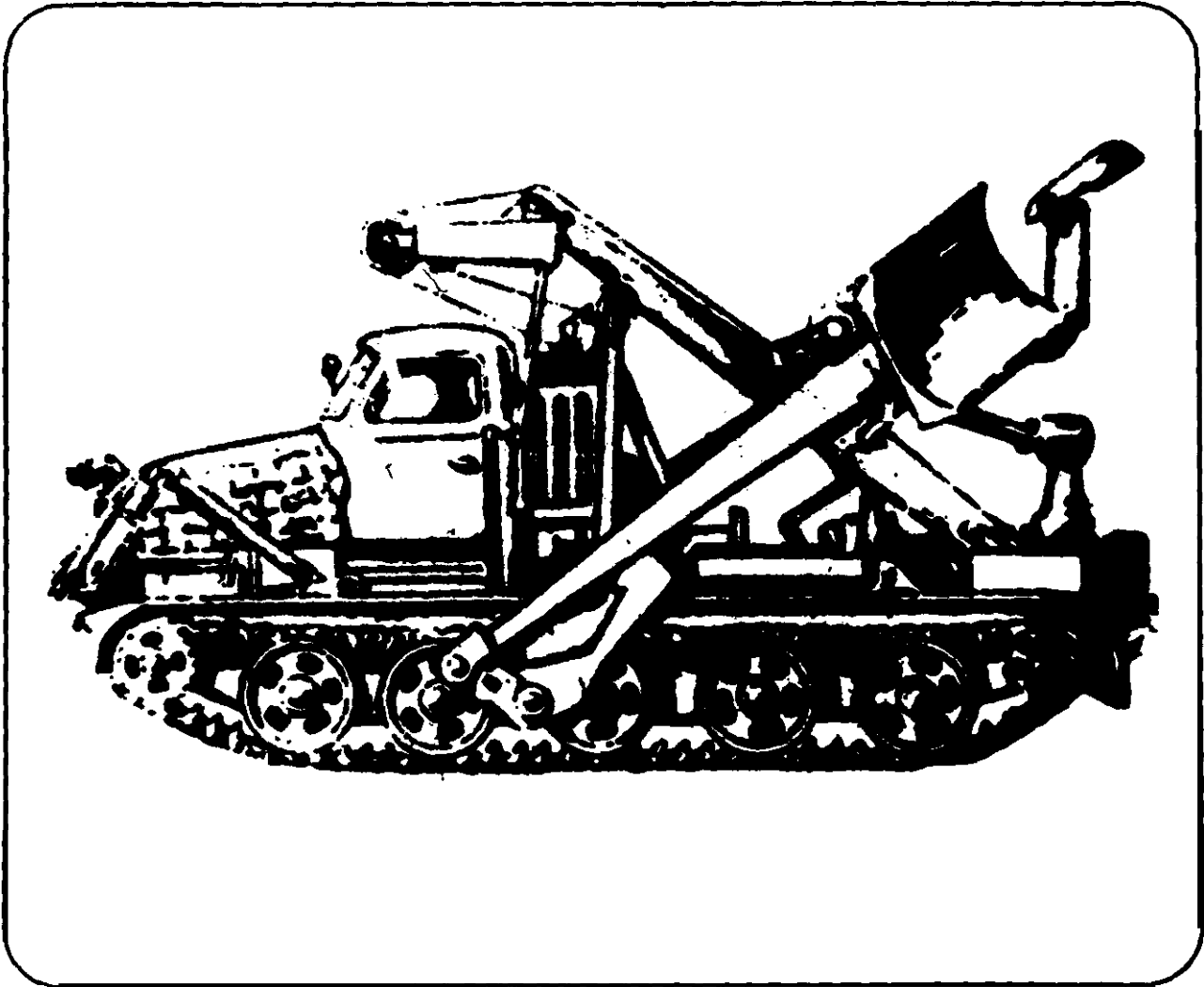
CAPABILITIES:

The primary purpose of the IMR M1986 is identical to that of the older IMR. The crane can lift between 5 and 11 metric tons.

REMARKS:

Although the IMR M1986 is presently in service with the Soviet armed forces, its fielding scheme is unknown at this time. Low ground pressure reduces the tractive force of the system.

Route Clearing Vehicle BAT

BAT-M***DESCRIPTION:***

The BAT has a cable-operated, two-section adjustable dozer blade mounted on an AT-T heavy artillery tractor. The BAT-M adds a hydraulic operating mechanism for the blade, and a rotary crane mounted on the bed of the vehicle. The BAT-M can move material with its blade at a rate of 200 to 250 cubic meters per hour. Its crane capacity is 2 metric tons. Its maximum road speed is 35 kilometers per hour, and its range is 500

kilometers. The BAT-M weighs 27.5 metric tons. Its two-man crew can place it into an operation in five to seven minutes. It has a filtration system and can operate in contaminated areas for short periods of time. Although it is an aging piece of equipment, the BAT-M is still found in engineer units at all echelons. However, the BAT-2 is currently replacing it.

Route Clearing Vehicle BAT-2

BAT-2



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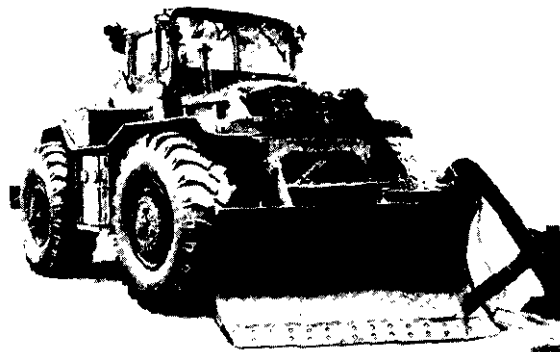
DESCRIPTION:

The BAT-2, previously known as the BAT M1983, is based on the tracked chassis of the MT-T artillery tractor. It is the latest in the BAT series of vehicles. It mounts an articulating bulldozer blade, a telescoping boom crane, and a ripper. The vehicle provides NBC and armor protection for the

crew and passenger compartment. The BAT-2 is found at regiment and division level. Its primary mission is route clearing; secondary missions include obstacle clearing and transportation of sapper personnel.

Route Clearing Vehicle PKT

PKT



DESCRIPTION:

The PKT and the improved PKT-2 are based on the MAZ-538 four-wheeled, all-wheel-drive tractor. The PKT has a hinged blade on the rear. The blade has a float shoe to control the depth of the cut. The PKT-2 has increased power over the PKT.

CAPABILITIES:

The Soviets specifically developed the PKT to be used as a route clearer; it can operate in temperatures as low as -40 degrees centigrade. Both the PKT and PKT-2 have a maximum road speed of 45 kilometers per hour. The PKT-2 can clear debris at a rate of 3 to 6 kilometers per hour, and

can fill ditches at a rate of 100 to 120 cubic meters per hour. The PKT-2 weighs 19.4 metric tons; it has a range of 500 kilometers. It has a crew of two, who can put it into operation in one minute. It also has a hermetically sealed cab with a collective protection filtration system.

REMARKS:

The Soviets first produced the PKT in 1970. Its primary mission is route clearing; its secondary missions include snow plowing and the reduction of the effects of NBC munitions. It is vulnerable to small arms fire.

Combat Vehicle-mounted Blades

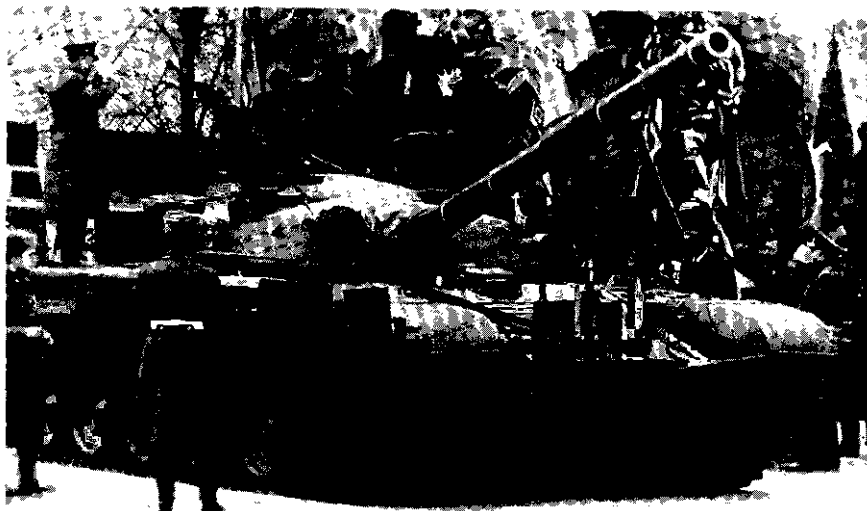
BTU blade on T-54 tank**DESCRIPTION/CAPABILITIES:**

BTU dozer blades may be mounted on T-54/55-series and T-62-series tanks. The blades are effective in excavating vehicle positions and in light dozing work. A BTU blade can move approximately 250 cubic meters of earth per hour when clearing or filling and approximately 150 cubic meters of earth per hour when digging in. The maximum speed of the tank when operating the blade is 6 kilometers per hour. BTU blades restrict

cross-country mobility and are time-consuming to mount or take off.

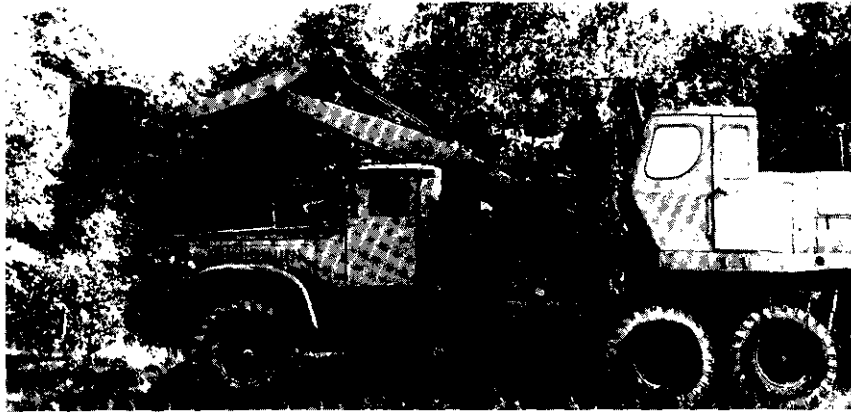
Newer tracked armored combat vehicles often have self-entrenching blades or spades on the rear of the vehicle or stowed on the lower front glacis. The systems can create a tank hull-down position in 20 to 60 minutes depending on soil conditions. The blades require crew members to dismount to place the system into or out of operation.

Self-entrenching blade on T-72 tank



Crane-Shovel E-305V

E-305V



EOV-4421



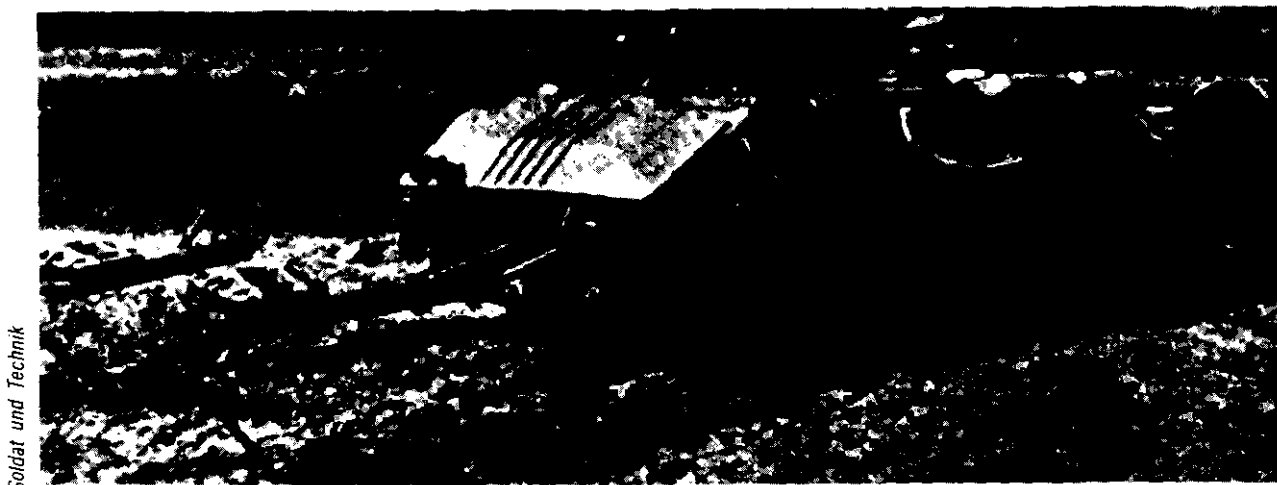
DESCRIPTION:

The E-305V mounts on the KrAZ-2146 x 6 truck chassis. A separate diesel engine, instead of the truck engine, powers the crane-shovel. A newer model, the E-305BV, is mounted on the KrAZ-255B chassis, as is the similar EOV-4421, a replacement for the E-305V in the Soviet and East German armies.

CAPABILITIES:

The E-305BV can move 65 cubic meters of material per hour as a shovel, and 30 cubic meters per hour as a backhoe. In comparison, the EOV-4421 can dig 110 cubic meters per hour as a backhoe. The crane capacity for the E-305BV is 4 metric tons, while that of the EOV-4421 is 3.5 metric tons. The E-305BV weighs 17.3 metric tons, and the EOV-4421 weighs 20 metric tons. The range of both is 650 kilometers, and their maximum road speed is 70 kilometers per hour. Both have a crew of two.

Engineer Reconnaissance Vehicle IRM

IRM

Soldat und Technik

DESCRIPTION:

This engineer reconnaissance vehicle's chassis employs components of the BMP infantry combat vehicle. It has two propellers in housings mounted on the rear of the armored hull for propulsion in the water. A wave deflector covers the front of the hull. Also mounted on the front of the hull are two arms for a metallic mine detector. A periscope is mounted on the right front of the vehicle, at the commander's station. The IRM weighs 17 metric tons and is powered by a 300-hp engine. With the detector arms in the travel mode, the vehicle is 8.22 meters long, 3.15 meters wide, and 2.40 meters high. It is armed with a single 7.62-mm machine gun.

CAPABILITIES:

The IRM can travel at a road speed of 52 kilometers per hour, with a range of 500 kilometers. It is amphibious and can swim at up to 10 kilo-

meters per hour. Onboard reconnaissance and navigation equipment includes the mine detector; a mechanical penetrometer, to analyze soil for trafficability; sonar, for water bottom profiles and mine and obstacle detection; a gyrocompass and gyro-stabilized artificial horizon; land navigation and night observation equipment; and the periscope. The mine detector arms are hydraulically articulated to their operating position (as depicted) in three minutes. The detector will bring the vehicle to a halt upon encountering an obstacle or detecting a metallic object. The periscope can extend to 1.5 meters and can move vertically up to 750 millimeters. The IRM has an engine exhaust smoke system, water pumping equipment, and a collective protection system. It also carries portable sapper equipment such as portable mine detectors, a DSP-30 rangefinder, a PIR periscope, an ice drill, and a hand penetrometer. These allow dismounted sappers to conduct further reconnaissance.

NBC EQUIPMENT

Collective Protection Systems

The Soviets have continuously upgraded NBC equipment and capabilities. They have introduced many new items and have upgraded older items. The DIA publication DST-1640S-048-86 provides a complete description of individual and collective protection equipment; protection and treatment kits; chemical, biological, and radiation detection instruments; flame, smoke and chemical munitions and equipment; and reconnaissance vehicles, area marking devices, and warning devices. (See the Reference section of this manual for a complete

citation.) The following section discusses only selected items of NBC equipment listed under principal items of equipment in Chapter 4, as well as flame and smoke equipment used by Soviet units.

The NBC collective protection systems provide an NBC-free environment in the crew and passenger compartments of vehicles. They eliminate the hindrances and discomfort of wearing protective masks and clothing. They also prevent the contamination of vital equipment inside the vehicles.

Collective Protection in Combat Vehicles

DESCRIPTION:

The Soviets employ two types of collective protection on combat vehicles: the PAZ (protivoatomnaya zashchita) nuclear protection system and the comprehensive NBC collective protection system (air filtration and overpressure). Some vehicles have both types. The PAZ system consists of a radiation detector, explosive squibs, and a blower/dust separator (sometimes referred to as a centrifugal particulate air filter). The comprehensive NBC collective protection system consists of a blower/dust separator and NBC filter.

CAPABILITIES:

When the PAZ system senses the initial pulse of radiation which precedes a blast wave during a nuclear attack, the radiation detector activates firing mechanisms for explosive squibs; these squibs automatically close the louvers and apertures of engine ports and gun sights. If the vehicle is not already buttoned up, the sound of the exploding squibs warns the crew to shut all hatches. The blower/dust separator filters out radioactive particles, but not toxic gases, from the air supply.

The comprehensive NBC collective protection system protects vehicles against chemical, biological, and radiological contaminants. The system includes the PRKhR radiation and chemical detector-alarm, which can automatically alert the crew to a nuclear or chemical attack and activate the automatic closing system. The blower/dust separator forces contaminated air through the filter and directs purified air into the crew and

passenger compartments. The resultant increase in air pressure (overpressure) within the vehicle prevents NBC agents from entering through nonair-tight areas, such as gun ports.

LIMITATIONS:

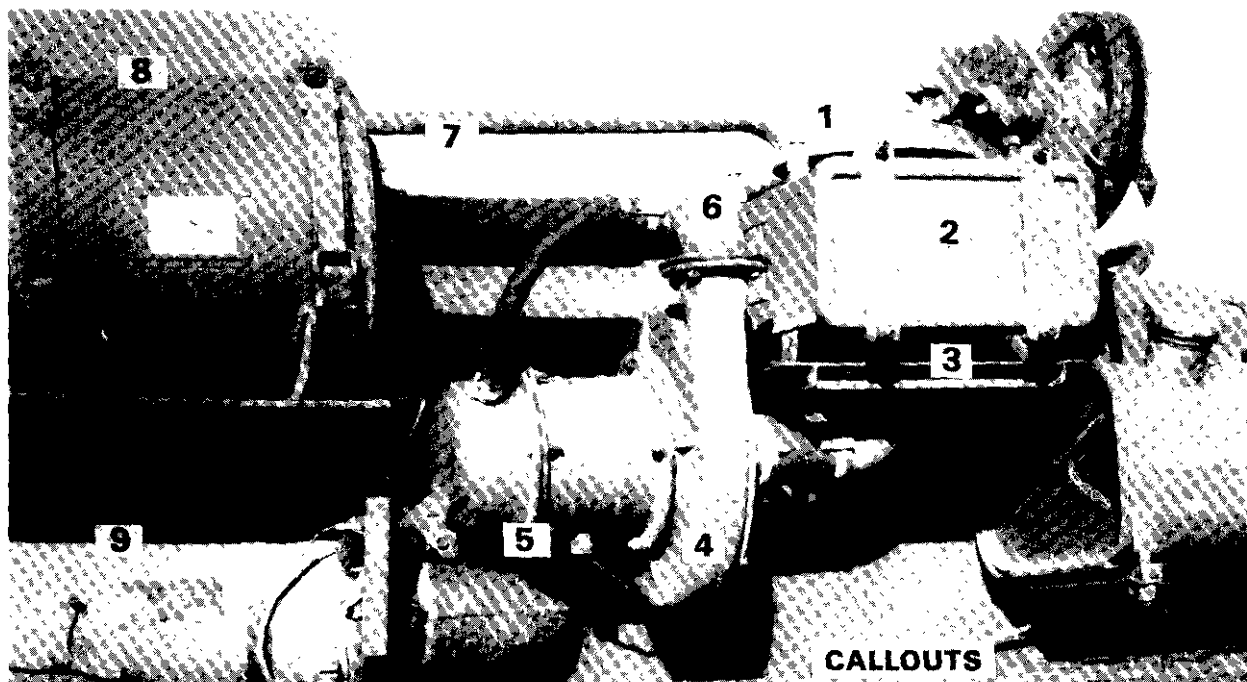
All collective protection systems found on Soviet combat vehicles are reliable only as long as the crew and passengers remain buttoned up inside. When personnel open vehicle hatches or dismount, they must assume that the inside compartments are contaminated. During subsequent use of the vehicle, crew and passengers must wear masks and protective suits until the vehicle is decontaminated.

REMARKS:

The T-55 and T-62 tanks were the first Soviet vehicles with PAZ systems installed as original equipment. The Soviets may have also retrofitted some T-55s and T-62s with NBC collective protection systems. All T-64 and T-72 tanks, as well as the T-80, have both PAZ and NBC collective protection systems. The BMP, BMD, and ZSU-23-4 also have both types of protection. Other vehicles with NBC collective protection (air filtration and overpressure) systems include the following: later models of the BTR-60PB, while earlier BTR-60PBs had only a Blower/dust separator; the BTR-70 and BTR-80; the BRDM-2; the MT-LB; the ACRV 1V12 series; the S Phowitzers 2S1 and 2S3; the SP guns 2S5 and 2S7; the SS-21; the SA-4; the SA-6; the SA-8; the SA-9; and the SA-13.

Collective Protection in Other Vehicles

NBC collective protection system



- CALLOUTS**
1. AIR INTAKE WEATHER SHIELD
 2. PARTICULATE FILTER, MODEL PFA-75M
 3. AIR DUCT FROM PARTICULATE FILTER TO BLOWER
 4. BLOWER
 5. BLOWER MOTOR
 6. AIR DUCT FROM BLOWER TO NBC FILTER
 7. POSSIBLE AIR COOLING DUCT FOR MOTOR
 8. NBC FILTER, MODEL FPT-ZOOM
 9. POSSIBLE OIL BURNING SPACE HEATER

DESCRIPTION/CAPABILITIES:

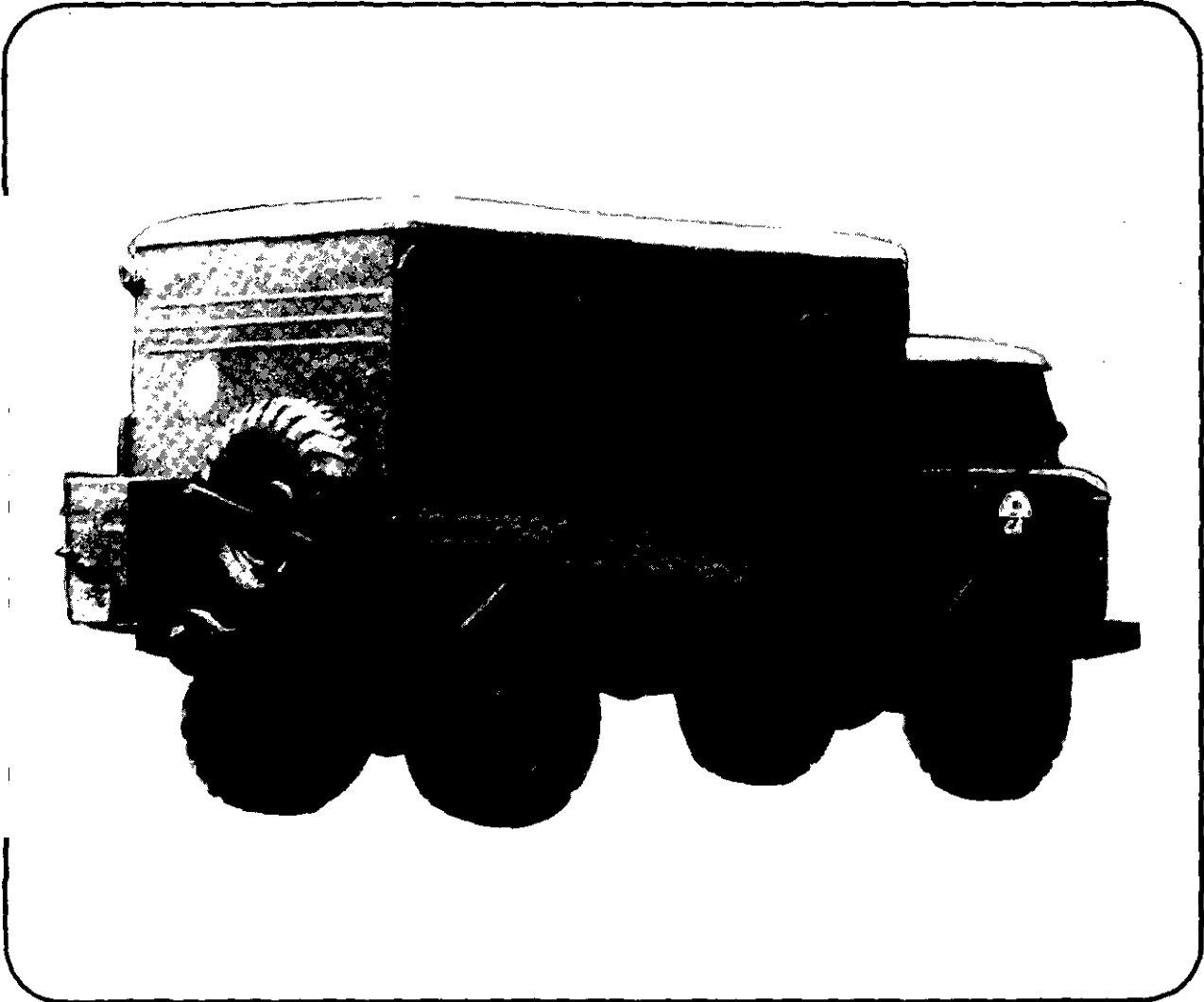
A wide variety of Soviet military box-body trucks, trailers, and vans have a collective protection system with gasketed doors and openings to aid in maintaining a positive overpressure of filtered air. The filtration system consists of a particulate filter, a blower, and an NBC charcoal filter. The blower and filter can be installed inside the vehicle or, as is common, on the upper front walls of truck-mounted box-body vans or upper rear walls

of trailers. Air enters the particulate filter (2) through a weather shield (1) where the majority of dust particles are filtered. From there, the air is drawn through the blower (4); then it passes through the NBC filter (8) before entering the vehicle. The NBC canister uses activated charcoal to absorb chemical and biological agents in the incoming air. An independent direct current electrical space heater (9) is visible in the picture.

Vehicle-Mounted Decontamination Apparatuses

Decontamination Trucks, DDA Series

DDA-66 on GAZ-66



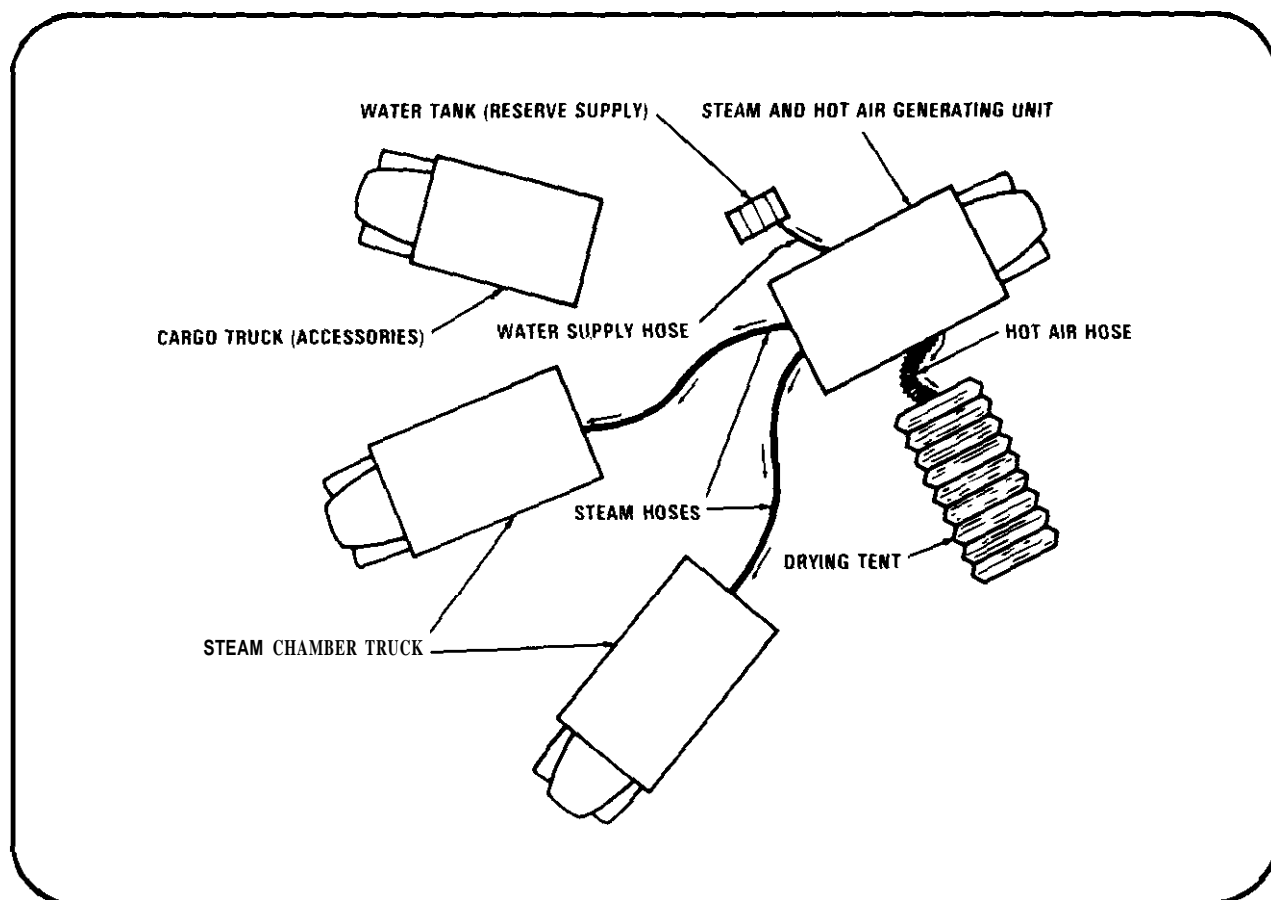
DESCRIPTION/CAPABILITIES:

The DDA series comprises truck-mounted assemblies that consist principally of steam boilers and pressure-tight chambers into which steam is injected to decontaminate clothing and other articles. Included in the equipment are knockdown pipe shower frames, hoses, brushes, duckboards, soap or detergents, and probably a shower tent. In one hour, this system can process up to 80 uni-

forms during the summer and 48 during the winter. Showering capability is 96 men per hour in the summer and 64 men per hour in winter. The GAZ-51, GAZ-63, and GAZ-66 trucks mount the DDA-53, with minor modifications. The GAZ-66 system contains a single steam chamber. Another modern version, Model DDA-2, contains two chambers and is mounted on the ZIL-130.

Decontamination Stations, AGV Series

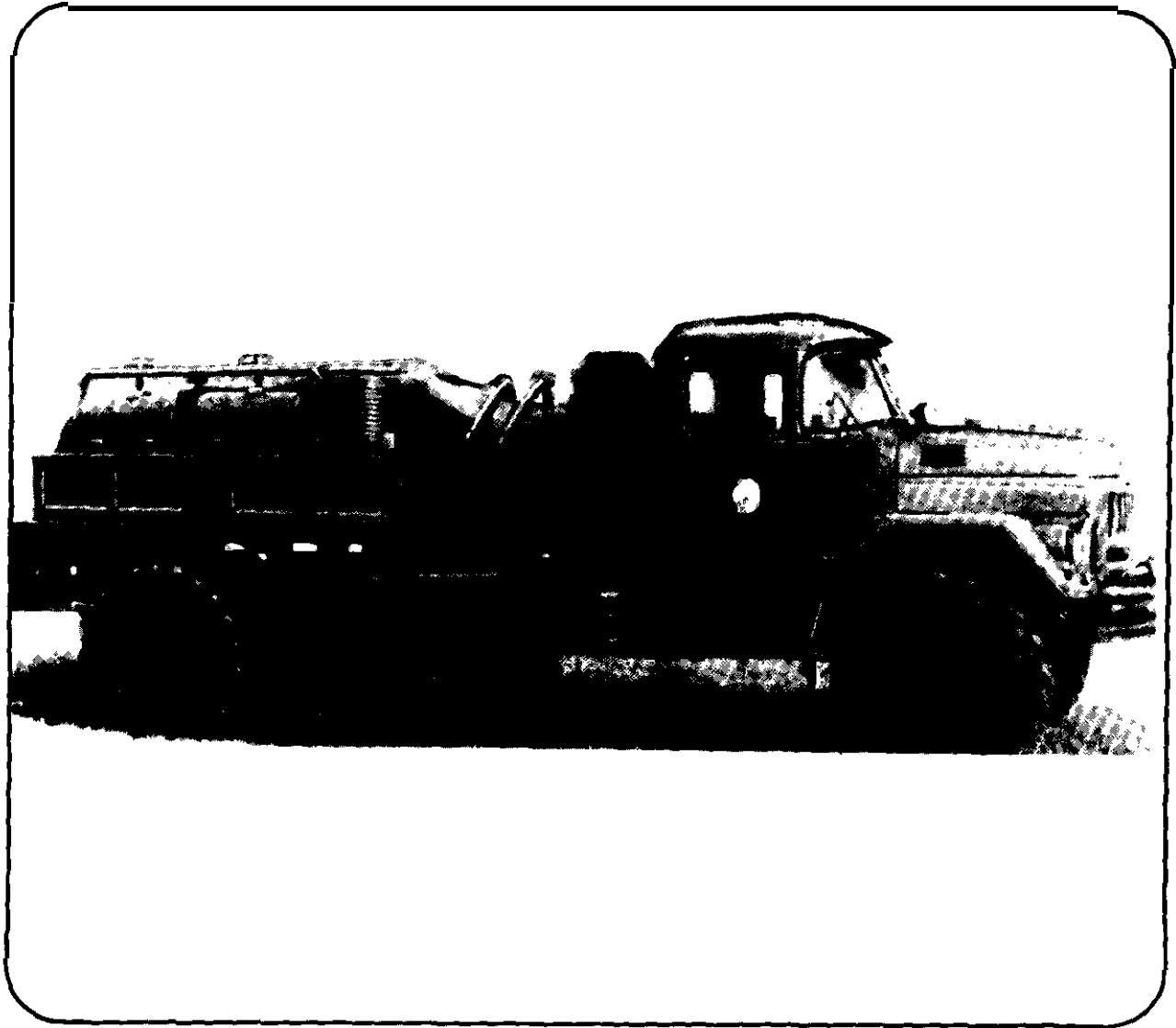
AGV-3M decontamination station

**DESCRIPTION/CAPABILITIES:**

The AGV-3M decontamination station is similar in function to the DDA-53. The AGV-3M comprises four vehicle-mounted decontamination units which process chemically or biologically contaminated clothing and light equipment and provide showers for personal decontamination. The four units include the following: a cargo truck, used for carrying a drying tent; a shower tent and a collapsible water tank; a truck-mounted steam and hot air generator; and two truck-mounted steam chambers. The generator supplies steam to the steam chamber stations for decontaminating uniforms and light equipment;

it supplies hot air to the drying tent for drying decontaminated articles; and it supplies hot water to the shower tent. Ammonia normally is added to the steam flow when chemically contaminated materials are processed in the steam chambers; formaldehyde is used for biological decontamination. The station can decontaminate 50 to 150 sets of uniforms per hour depending on the type of contamination. The AGV-3M is a three-chambered system. There is also a four-chambered system, the AGV-3U.

ARS-14

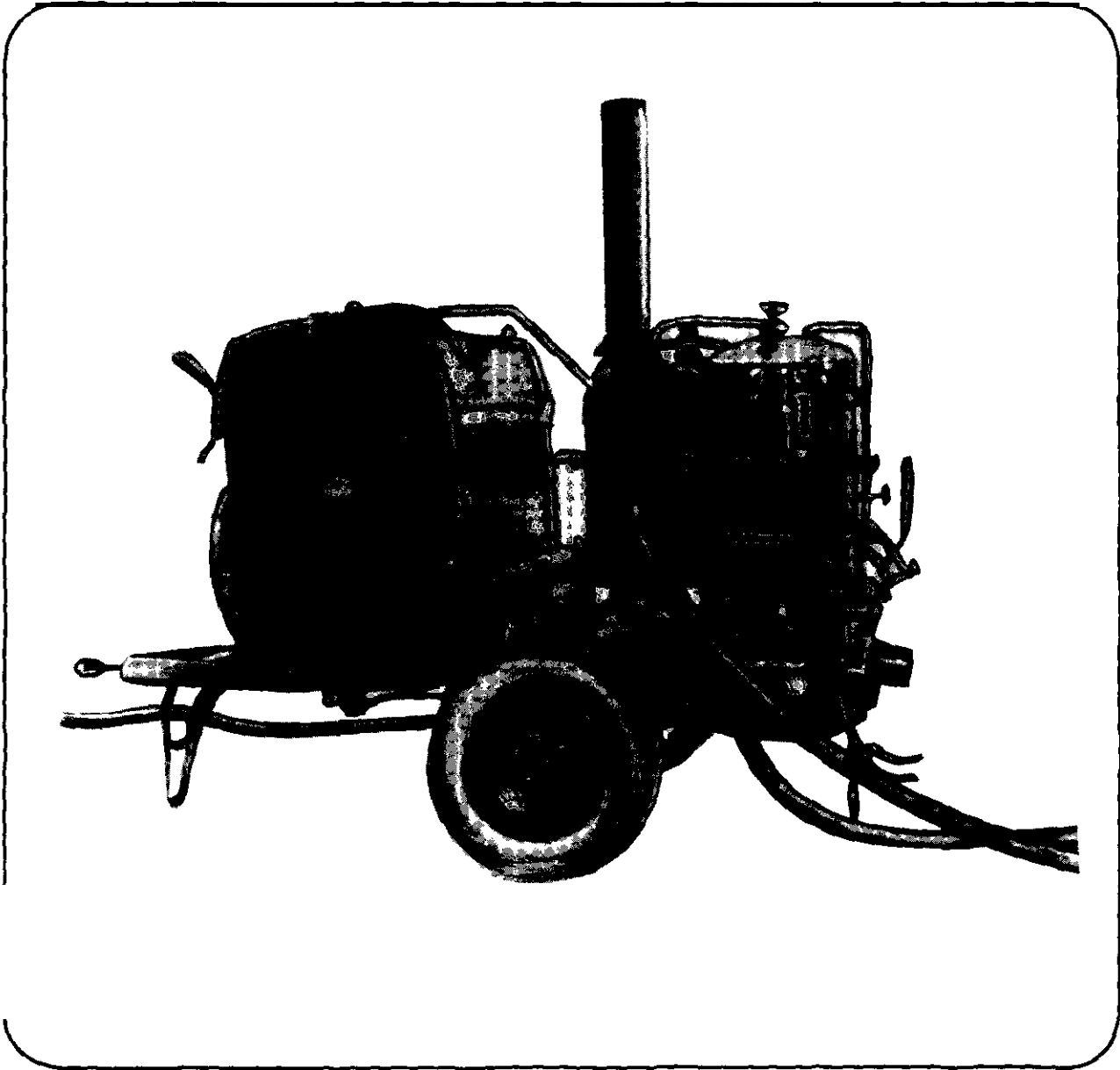


DESCRIPTION/CAPABILITIES:

The Soviets use ARS-12 series and ARS-14 decontamination vehicles to decontaminate vehicles, large weapon systems, heavy equipment, and terrain; to refill portable decontamination equipment; to transport water to other decontamination equipment; to fight fires; and to provide cold showers. Either vehicle carries six chests of accessories alongside the cargo tanks. The ARS-12U is on a

ZIL-157 while the ARS-14 is mounted on a ZIL-131 chassis. Other improvements on the ARS-14 are a slightly larger cargo tank and enhanced arrangement of equipment for better accessibility. One tank of evolution (2,500 liters) with either model can decontaminate 25 tanks, 50 to 80 artillery pieces, or 500 meters of road with a 5-m width.

Decontamination Trailers, DDP-Series

DDP***DESCRIPTION/CAPABILITIES:***

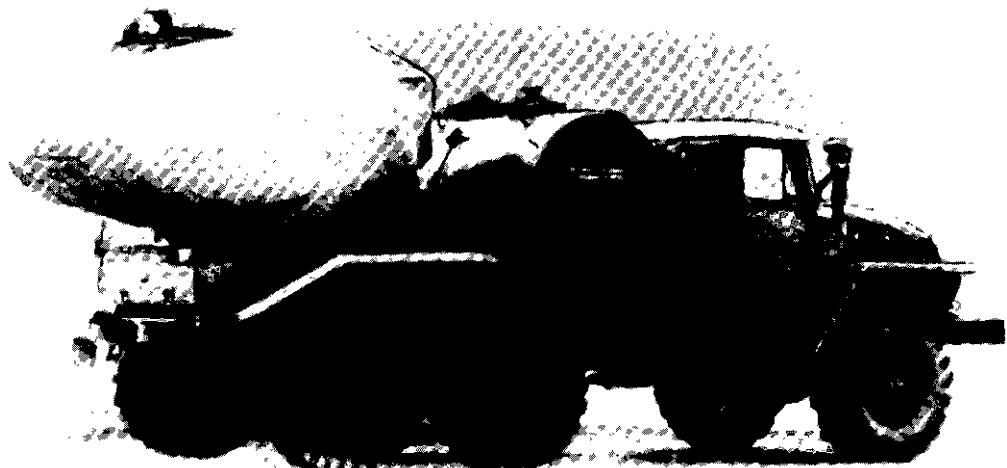
The DDP-series trailer-mounted decontamination units are similar to, and serve the same purposes as, the DDA vehicles. The new Model DDP-2 mounts on a single-axle IAPZ-738 trailer. The

apparatus has one steam chamber. Its boiler and equipment are housed in a thermally insulated body.

Decontamination Truck TMS-65



*TMS-65 decontaminating
a BRDM-2rkh*



TMS-65

DESCRIPTION/CAPABILITIES:

The TMS-65 consists of a VK-1 aircraft turbojet engine mounted on the rear of a Ural-375E truck chassis. Mounted on the front of the truck bed is a 3,000-liter tank partitioned into two equal sections: one contains fuel for the jet engine, and the other stores water or decontaminant solution. From a sealed control cab fixed to the left side of the engine, the operator can move the jet engine vertically or horizontally to direct hot exhaust gases at contaminated vehicles. He may mix water or a decontaminant solution intermittently into the exhaust. The TMS-65s normally operate in pairs, positioned on both sides of a road. A contaminated vehicle passing between them can be decontaminated in approximately 2 minutes for radiological and biological contamination, and in about 4 minutes for chemical contamination.

LIMITATIONS:

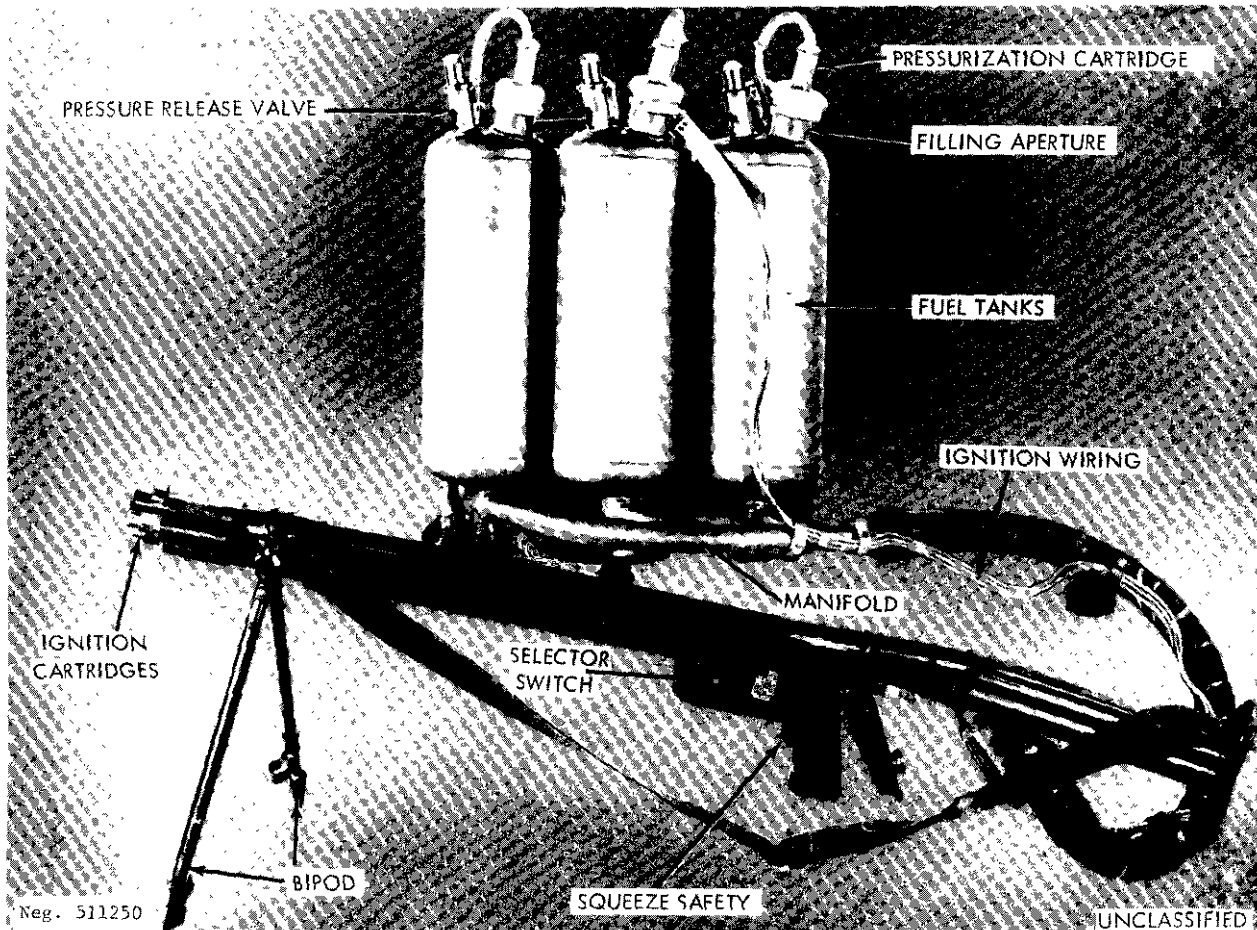
The Soviet concept of maintaining the momentum of attack presupposes a capability to decontaminate armored fighting vehicles rapidly and return them to combat. However, forward employment of the thin-skinned TMS-65, which has no crew protection, makes this system very vulnerable to all types of fire. The VK-1 jet engine also presents a very good signature for heat-seeking missiles.

REMARKS:

The TMS-65 has been in the Soviet inventory since 1974.

Flame Equipment

Portable Flamethrower LPO-50

LPO-50**DESCRIPTION:**

The LPO-50 light infantry flamethrower is man-portable. A slow-burning pyrotechnic cartridge generates pressure for propelling the flame. The flamethrower consists of a tank group, a hose, and a gun group. Firing is continuous for 2 to 3 seconds until the tank is empty. Each of the three tanks contains 3.3 liters of fuel. The complete assembly

weighs 14.8 kilograms empty and 23 kilograms when filled.

CAPABILITIES:

The maximum range is 50 to 70 meters with thickened fuel and 20 meters with unthickened fuel. The flamethrower may have an accuracy of 97 percent at 25 meters and 81 percent at 50 meters.

TPO-50M



DESCRIPTION:

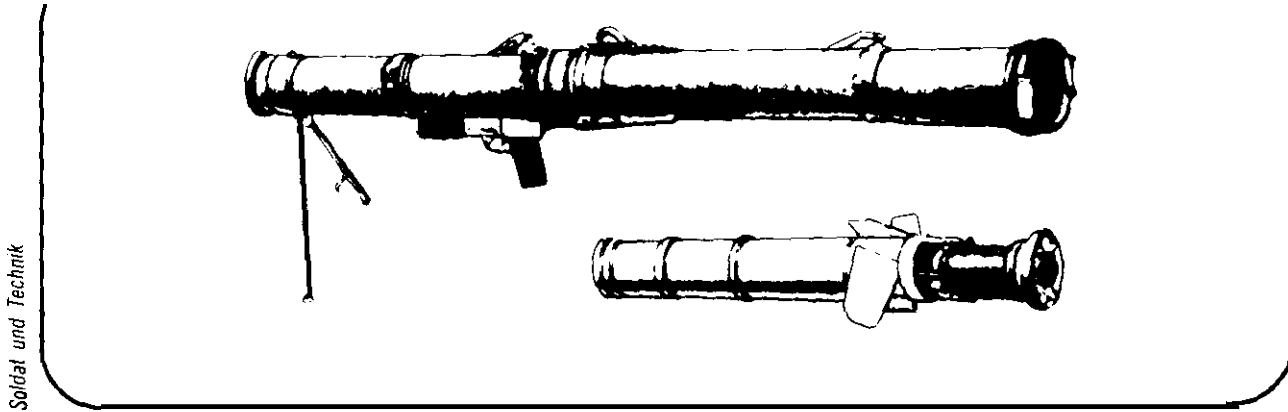
The TPO-50M heavy infantry flamethrower consists of three identical cylindrical flamethrower assemblies mounted on a two-wheeled cart; it has a two-man crew. Each assembly contains 21 liters of flamefuel. The fuel is propelled by gas pressure produced by an electrically ignited pyrotechnic cartridge. The three tank assemblies can fire together or individually. Each assembly is approximately

21 centimeters in diameter and 110 centimeters long. The flamethrower weighs approximately 170 kilograms when filled and 130 kilograms empty.

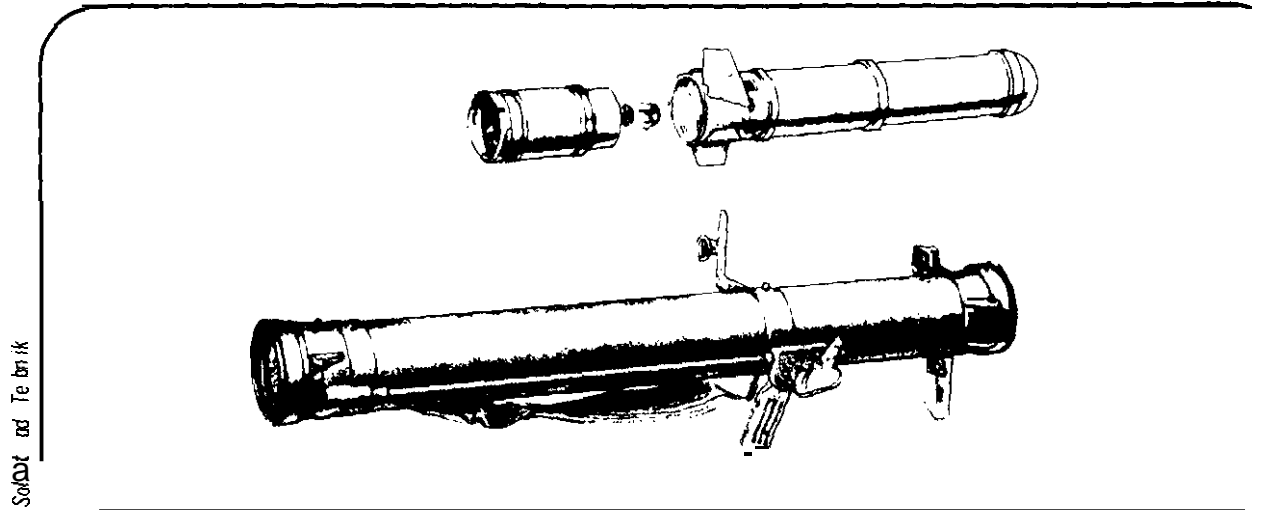
CAPABILITIES:

The maximum range of the TPO-50M is 180 meters with thickened fuel and 65 meters with unthickened fuel.

Flamethrowers RPO and RPO-A

RPO

Soldat und Technik

RPO-A

Soldat und Technik

DESCRIPTION:

The RPO flamethrower is a shoulder-fired weapon. It fires a rocket-propelled napalm round. The RPO is reusable and can be fired at a rate of one shot per minute. It weighs 3.5 kilograms and is 1,440 millimeters long.

The RPO-A is 920 millimeters long and contains only one-half as much incendiary mixture as the RPO. This improved version is a disposable weapon. It can be fired by one operator at an estimated two shots per minute.

CAPABILITIES:

The RPO is capable of firing 4 liters of incendiary mixture to a maximum effective range of

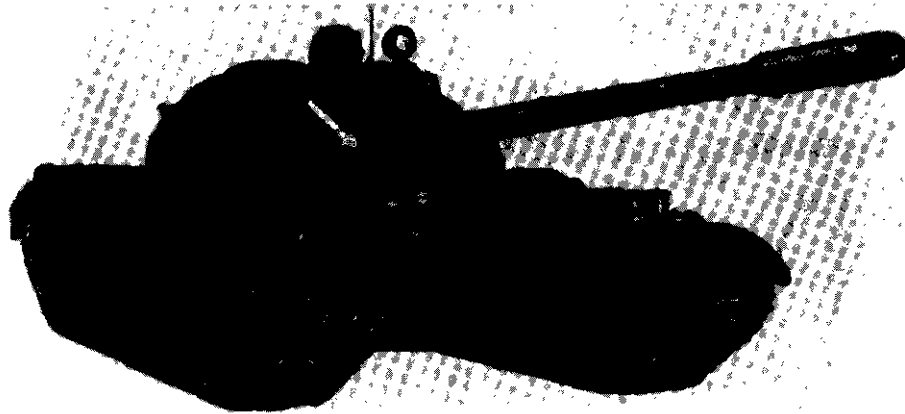
180 to 200 meters. The range and accuracy of the RPO-A are two to three times higher than that of the RPO. Both flamethrowers are effective as anti-tank weapons. Both models may be present in some Soviet airborne units and first-line ground forces units.

REMARKS:

These weapons require little training to use. They are much easier to transport than the jet varieties. Also, their resupply is easier and preparation time is much less. Soviet forces used flamethrowers as antitank weapons during World War II in special flamethrower units.

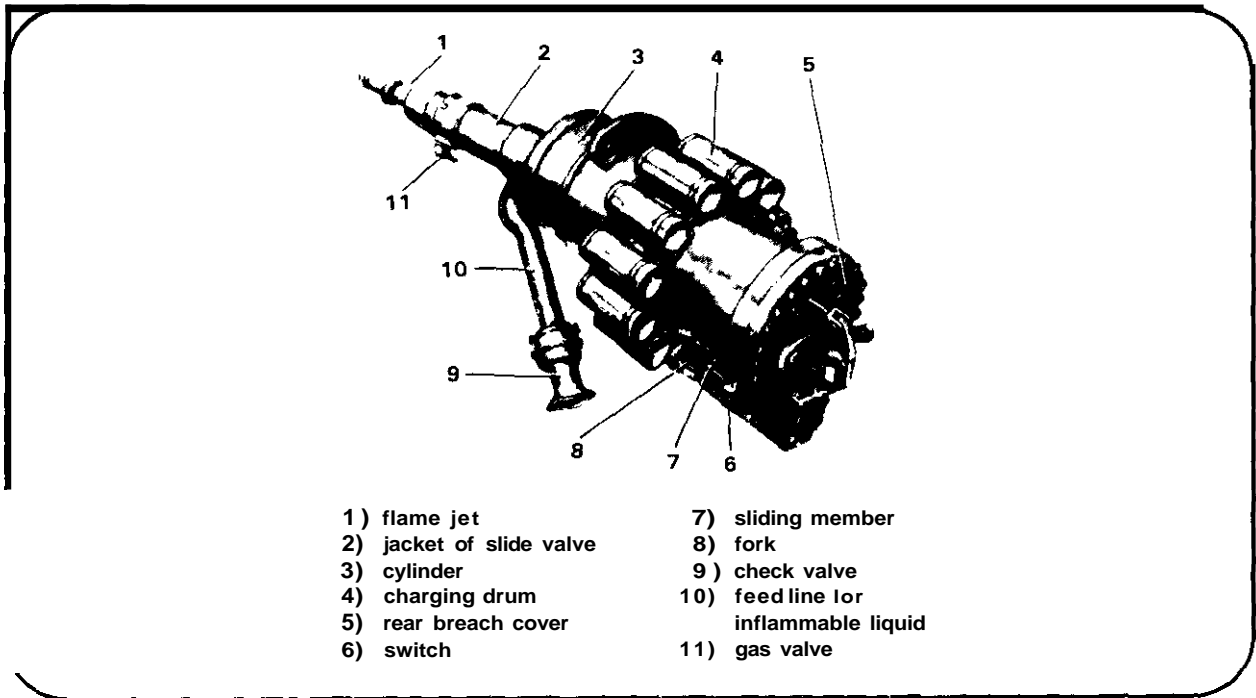
Flamethrower Tank TO-56

TO-56 flamethrower tank



Soldat und Technik

ATO-200 tank flamethrower



DESCRIPTION:

The TO-55 flamethrower tank is a variant of the T-55 with a flamethrowing unit coaxially installed in the standard turret to the right of the 100-mm main gun. The main compartment of the TO-55 houses the special ATO-200 flamethrower. The liquid burning mixture is propelled by a nitroglycerine powder charge and ignited by an ignitor placed within the charge. The 460 liters of flame fuel are propelled by 12 slow-burning cartridges

which can be fired either continuously or in 35-liter increments per cartridge.

CAPABILITIES:

The TO-55 can propel the flame out to 200 meters in the direction the turret is oriented. It has a radiation detection system and can produce a smoke screen by injecting vaporized diesel smoke fuel into the exhaust system.

SMOKE GENERATORS

Smoke Generator Vehicle TDA-M

TDA-M**DESCRIPTION/CAPABILITIES:**

This thermomechanical smoke generator is mounted on a specially adapted GAZ-66 truck. It emits a smokescreen approximately 800 to 1,000

meters long and 100 meters wide under favorable meteorological conditions. It carries sufficient fog oil for four hours of continuous operation.

Decontamination Truck TMS-65 as Smoke Generator

TMS-65**DESCRIPTION/CAPABILITIES:**

The primary mission of this vehicle is to perform rapid decontamination of combat vehicles contaminated by NBC agents. However, the secondary mission is to generate large-scale obscuring clouds. Uses in this secondary mission include: screening rear area installations; generating smoke screens for decoy operations; concealing decontamination

sites; concealing assembly areas and deployment lines; screening movement of attacking troops 2 kilometers from the FLOT; screening river crossings; and providing a smoke cloud for protection from the thermal effects of a nuclear blast. The TMS-65 is mounted on a modified Ural-375E truck chassis.

Vehicle Engine Exhaust Smoke System (VEESS)

VEESS



DESCRIPTION/CAPABILITIES:

Most Soviet combat vehicles have an engine exhaust smoke system. In this system, diesel fuel is injected into the exhaust manifold, evaporated, and ejected with the exhaust gases. Then it condenses in a thick, heavy cloud of white or gray smoke.

LIMITATIONS:

Intensive coke formation on the internal surface

of the evaporation chamber is the most important degrading factor for the VEESS. When smoke is generated for more than one hour, the thickness of the coke formed reaches 10 to 20 millimeters. If the coke is not removed, the VEESS will heat up during a subsequent smoke generation and possibly cause the smoke agent in the evaporation chamber to ignite. This will eject a flame and black smoke (instead of the normal white or gray smoke) through the nozzle.

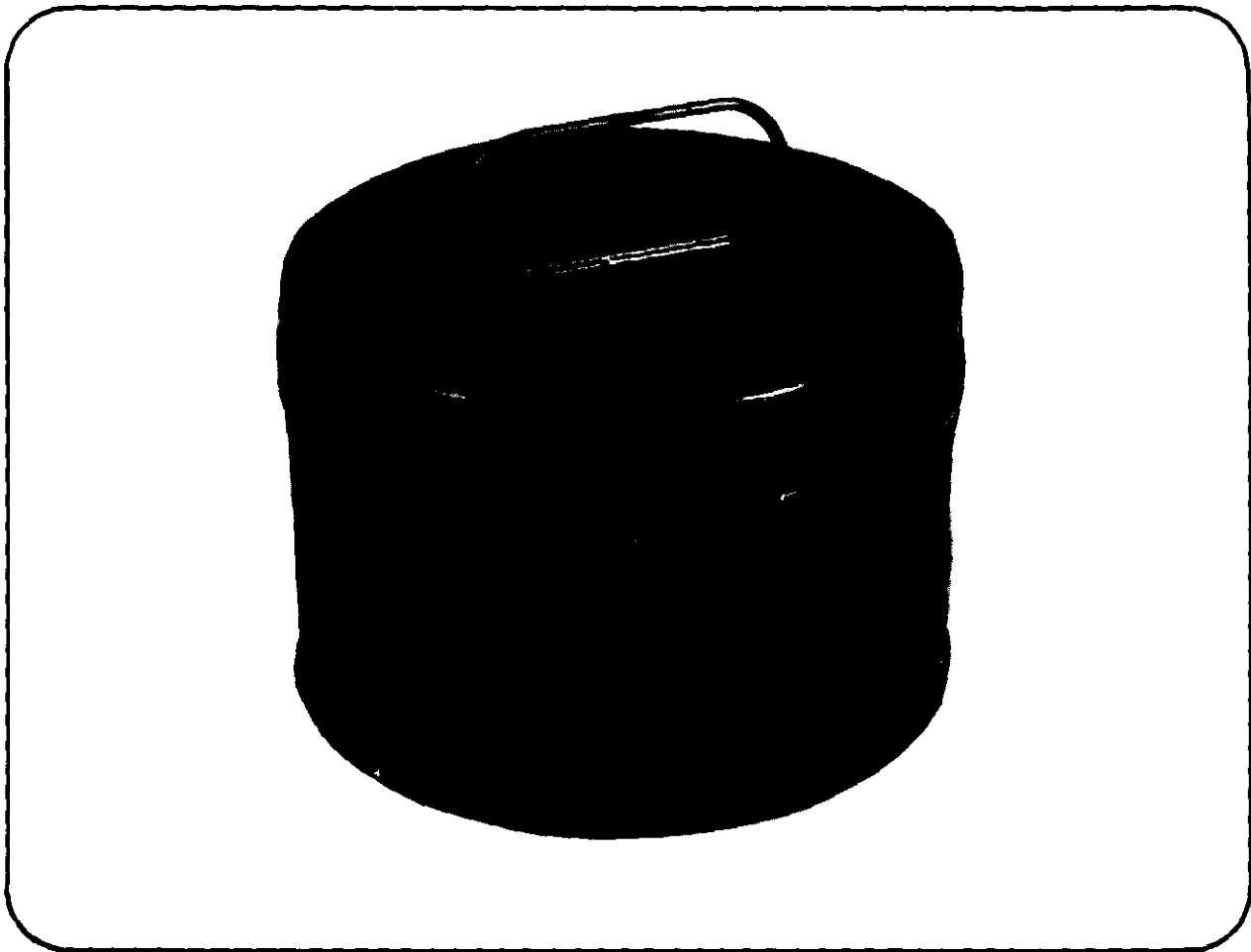
Smoke Pots, Drums, Barrels, and Grenades

The Soviets use smoke pots, barrels, and drums to create small and large-scale obscuring clouds behind their own positions. They also use them to screen semifixed and fixed installations. Electric shock systems, percussion ignitors, or friction fuzes

can ignite these smoke devices, which have a solid obscuring agent as a filler. Units which require the use of quick smoke on the battlefield use smoke grenades. These grenades can fill in gaps in smoke screens established by smoke pots.

Smoke Pot DM-11

DM-11



DESCRIPTION:

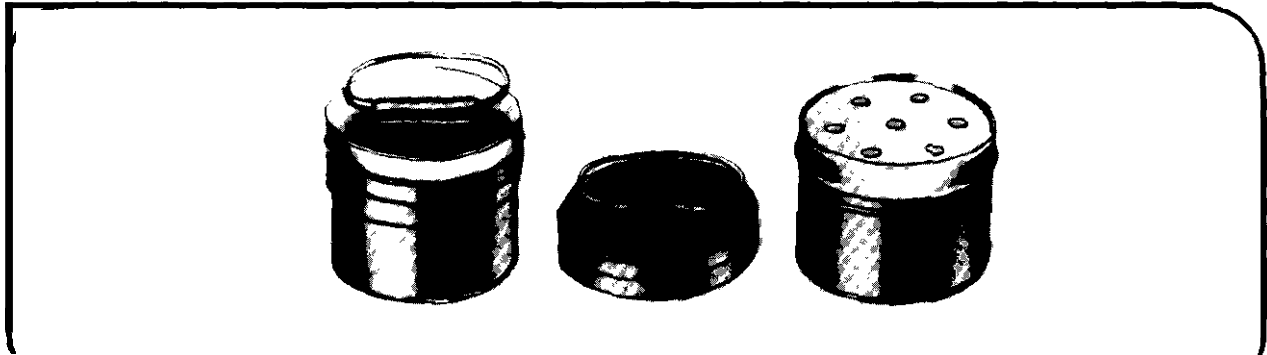
The Model DM-11 smoke pot has a cylindrical sheet metal body with the cover taped to its body to provide a waterproof seal during storage. The top of the body has 10 peripheral smoke emission holes. The DM-11 has a height of 10.67 centimeters, a diameter of 15.2 centimeters, and a weight of 2.22 kilograms.

CAPABILITIES:

The DM-11 filling produces a yellowish white smoke covering 418 square meters under favorable meteorological conditions. The smoke lasts 5 to 6 minutes after a delay of 2 seconds during ignition.

Toxic Smoke Pot YaD-11

YaD-11



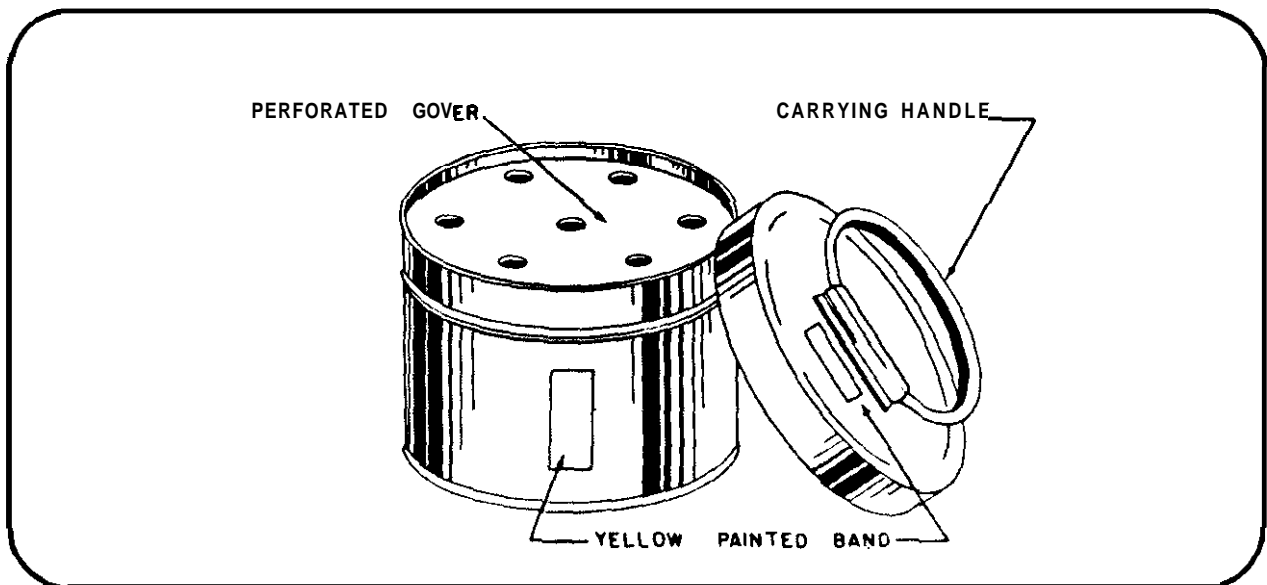
DESCRIPTION/CAPABILITIES:

The Model YaD-11 toxic smoke pot is a squat, cylindrical munition filled with a solid smoke mixture and an irritant, chloroacetophene (CN). Siliceous earth that prevents flaming of the active agent covers this fill. Matchhead igniters are located under the perforated top that has seven

emission holes. A cover with a handle is taped over the top to prevent moisture until the time of usage. The pot has a height of 7.290 centimeters, a diameter of 7.92 centimeters, and a weight of 368 grams.

Toxic Smoke Pot YaD-21

YaD-21



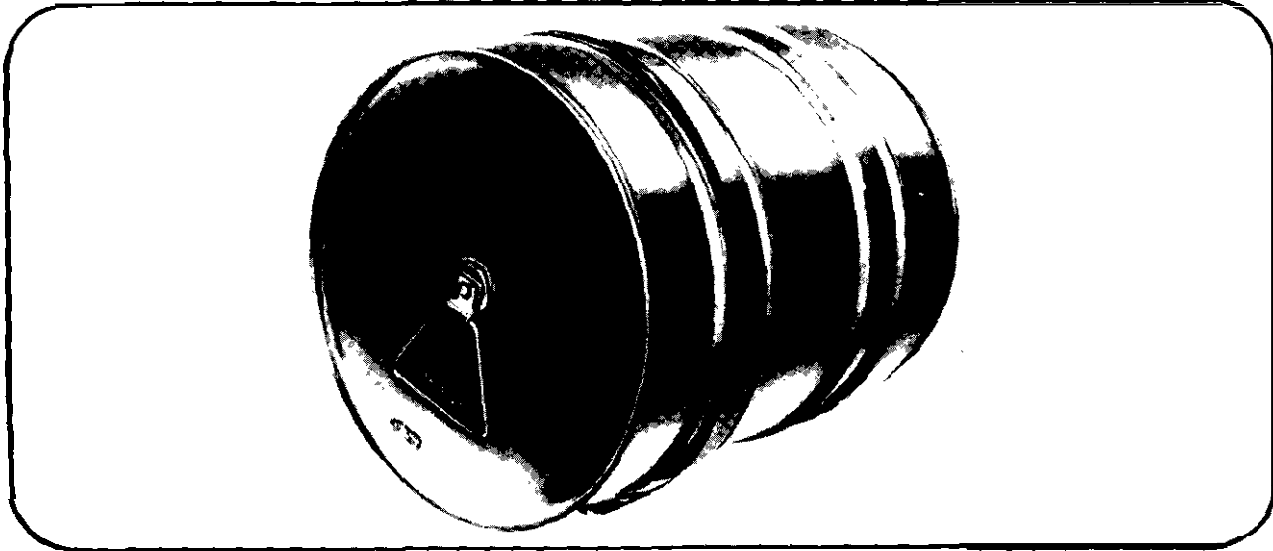
DESCRIPTION/CAPABILITIES:

The Model YaD-21 toxic smoke pot is a cylindrical sheet metal can filled with adamsite (DM) and smoke mixture. It has a perforated top and a removable cover. Activated by the use of a con-

ventional matchhead and a scratcher block, the pot has seven smoke emission holes. The YaD-21 is 10.4 centimeters high and 15.5 centimeters in diameter, and it weighs 2.18 kilograms.

Smoke Barrel DB-II

DB-11



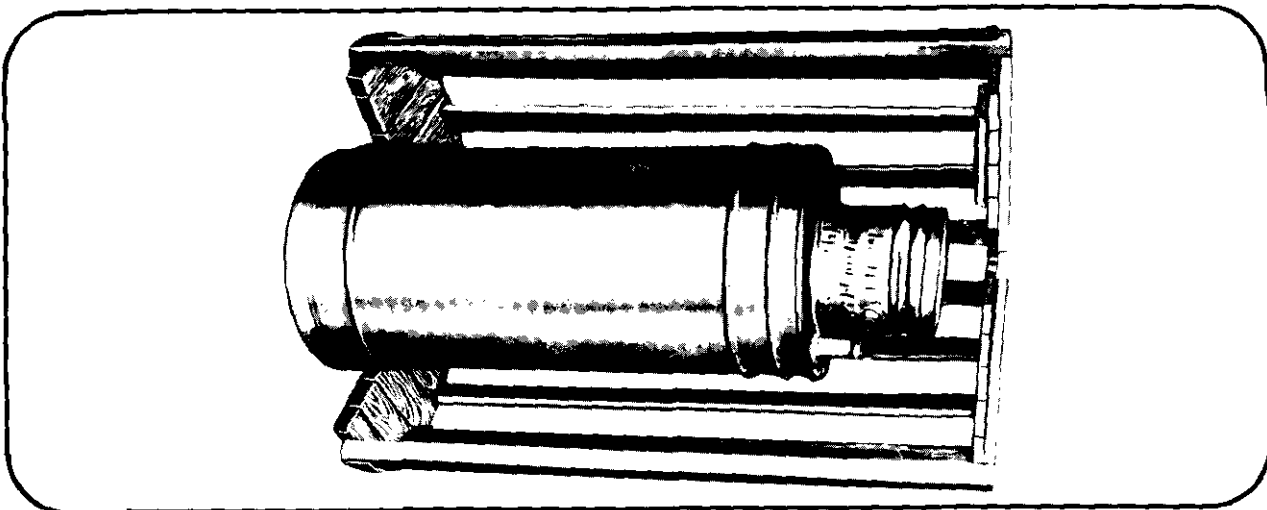
DESCRIPTION/CAPABILITIES:

The Soviets use the DB-11 smoke barrel in large-scale smoke operations. It weighs 44 kilograms and has a 10 to 13 minute burning time. The white

smoke produced by the DB-11 will cover approximately 4,180 square meters under favorable meteorological conditions.

Smoke Drum DSh-100

DSh-100



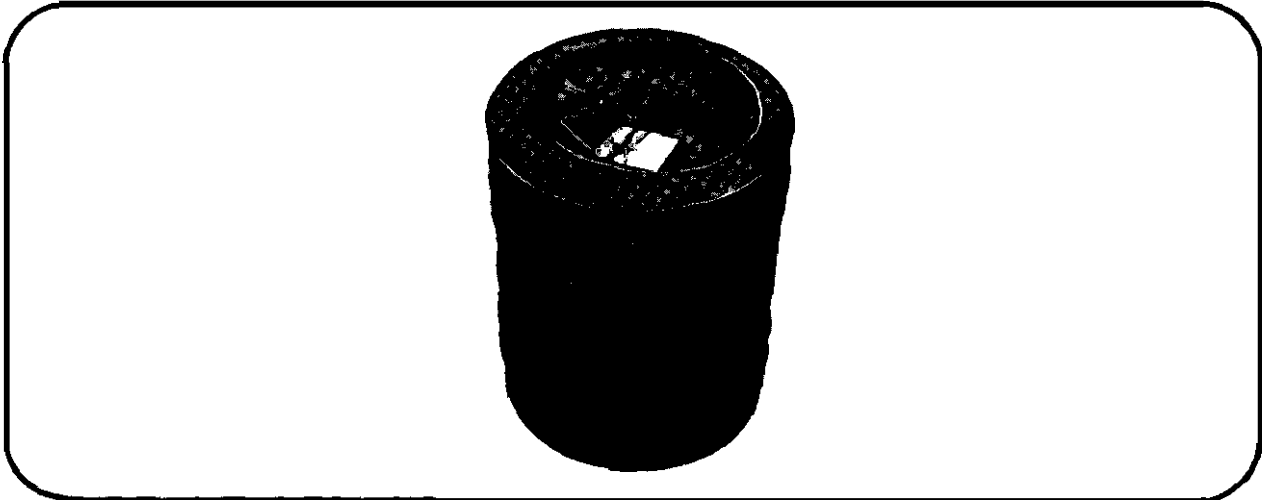
DESCRIPTION/CAPABILITIES:

The DSh-100 smoke drum is a metal cylinder approximately 1.2 meters high and .4 meters in diameter. It contains a 100-kg mixture that burns 10 minutes to produce a white smoke for large-

scale smokescreening operations. After the electrical igniter is inserted into the cartridge receptacle, the drum is electrically ignited by battery.

Large Smoke Barrel BDSH-5

BDSH-5



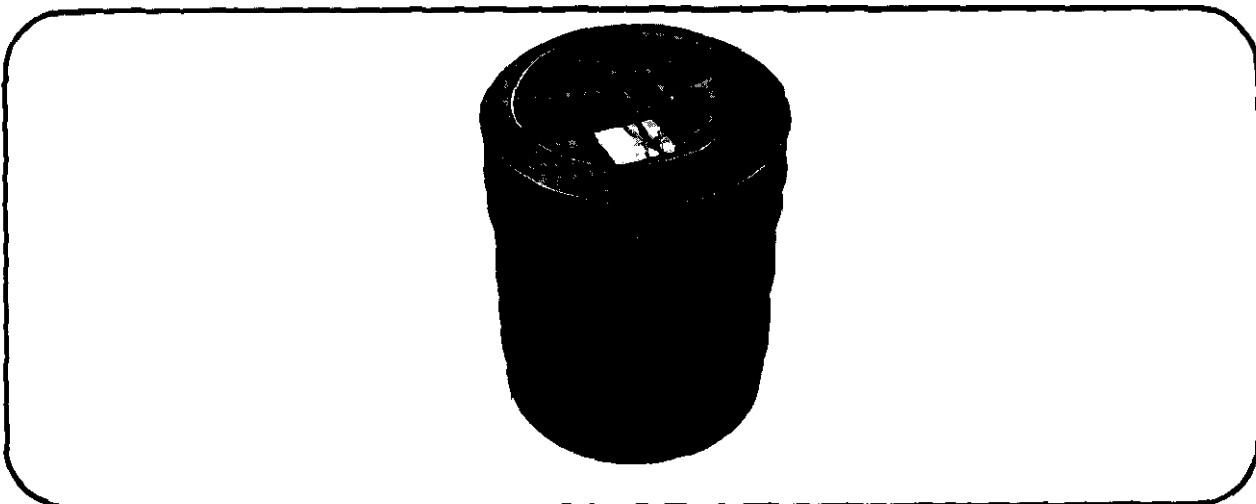
DESCRIPTION/CAPABILITIES:

The BDSH-5 large smoke barrel is a cylinder filled with a smoke mixture; it has carrying handles on each end. A tube at one end contains an ignition device with starter charge. The barrel, which will float in water, is balanced so that the smoke emission opening is always up. This is useful to

screen water crossing operations by large-scale forces. The BDSHd will burn for 5 minutes. It has a delay time fuze of up to 39 seconds. The barrel is .49 meters long with a diameter of .4 meters. It weighs 40.1 kilograms when filled.

Large Smoke Barrel BDSH-15

BDSH-15



DESCRIPTION/CAPABILITIES:

The BDSH-15 large smoke barrel produces white smoke for 14 to 16 minutes over an area of approximately 4180 square meters under favorable meteorological conditions. This smoke barrel is enclosed

in a steel container 48 centimeters long, with a diameter of 39.4 centimeters, and a weight of 38.6 kilograms with filling.

Incendiary Grenade, Fragible, Model? _____

No photograph available

DESCRIPTION/CAPABILITIES:

This grenade has been standardized to permit launching from a cup-like launcher. The grenades are packed in earth or sand in wooden boxes. The Soviets use two known standard fillings. The first, "KS liquid (white phosphorous in carbon disulfide), ignites immediately upon exposure to air. A small amount of water or oil and a wooden stopper prevent the liquid from making contact with the air until the grenade ruptures against a target. This fill burns for approximately 2 minutes at a temperature of 850 to 1000 degrees Centigrade. The

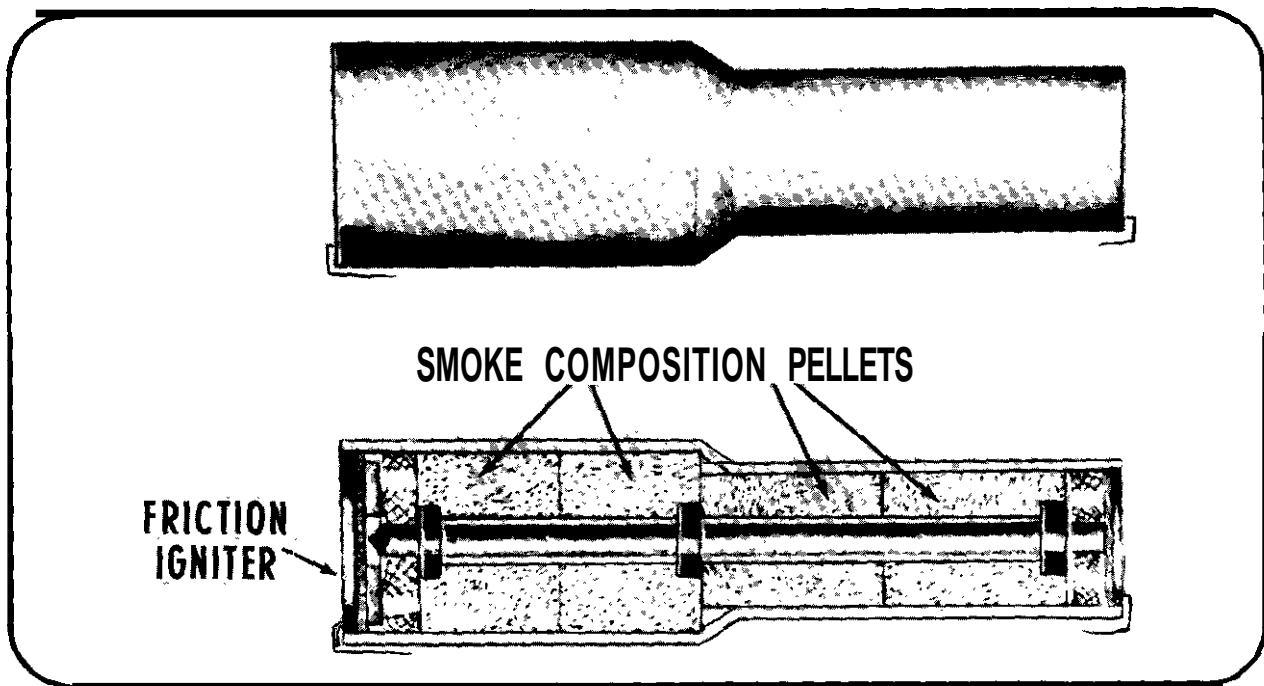
second filling, "mixture No. 1," is a yellowish liquid which is ignited by a WP ampule inserted into the bottle just prior to firing. The fuel adheres to the surface of the target and burns for approximately one minute, producing a black smoke and temperatures of 700 to 850 degrees Centigrade.

REMARKS:

This incendiary grenade should not be confused with field expedients such as the "Molotov Cocktail" used by Soviet forces during World War II.

Smoke Grenade RDG-1 _____

RDG-1



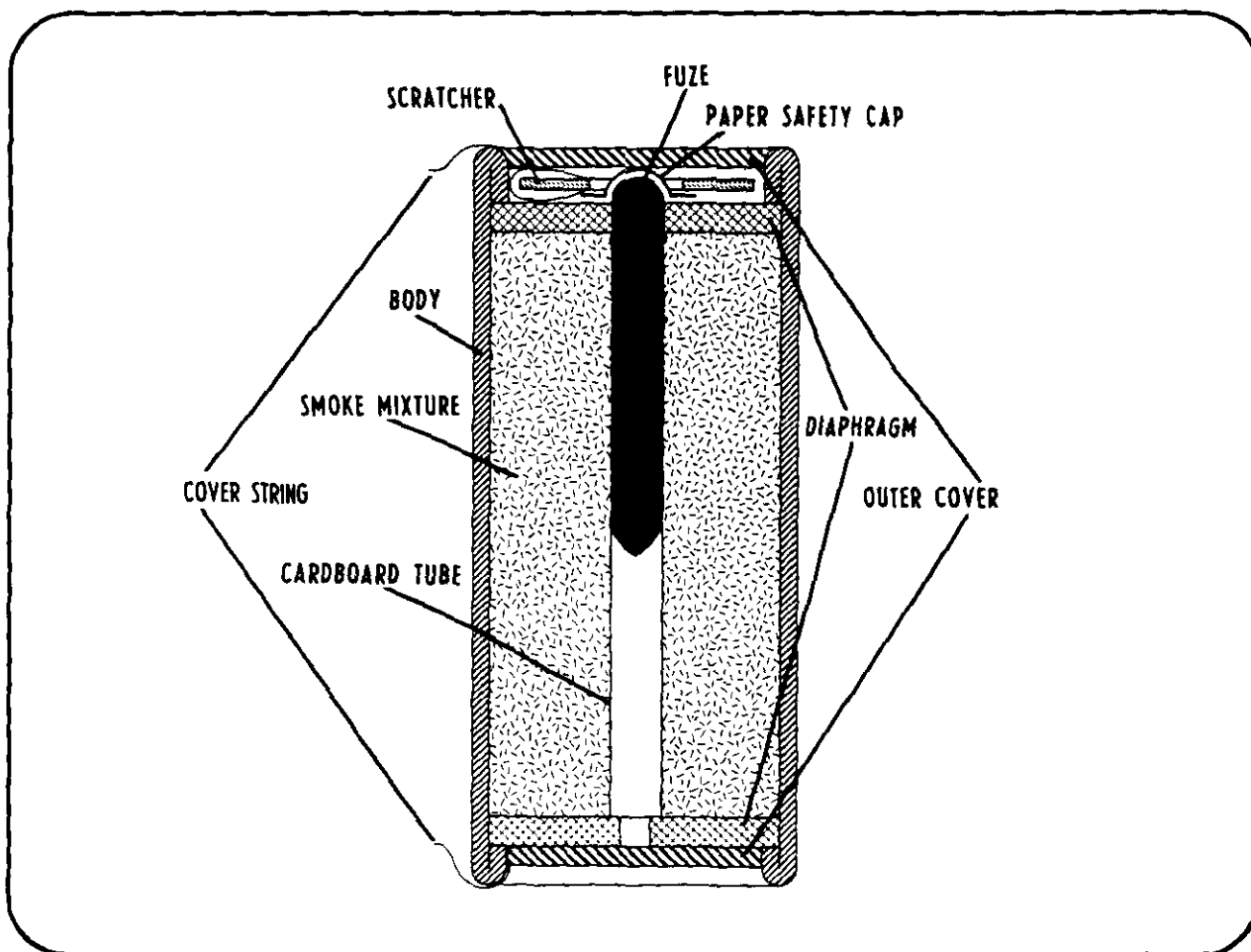
DESCRIPTION:

The RDG-1 grenade is a burningtype smoke grenade made of cardboard with a wooden handle. It contains a black smoke mixture. A friction fuze with a 3.5-second delay ignites it. The grenade floats and can generate smoke over a large body of water. The RDG-1 weighs .50 to .59 kilograms and is 22 centimeters long.

CAPABILITIES:

The average hand-thrown range is 35 meters. Area coverage is approximately 460 square meters under favorable meteorological conditions. The 1.2 to 1.5 seconds burning time provides a quick screening device for attacking forces.

RDG-2

**DESCRIPTION:**

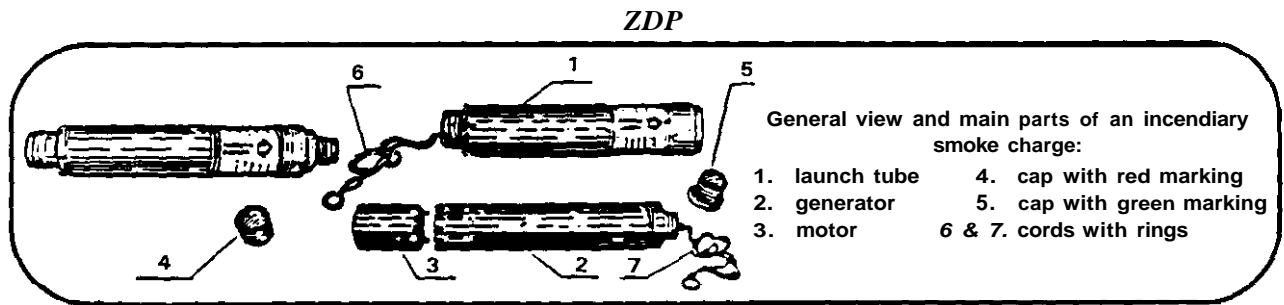
The RDG-2 smoke grenade is a waxed cardboard cylinder filled with a smoke mixture that produces a screen of white smoke. This white smoke will cover an area of approximately 334 square meters under favorable meteorological conditions. Each end of the cylinder has a diaphragm that serves as an inner cover to hold the smoke mixture in place and an outer cardboard cover with an attached string. A cardboard tube, containing a friction fuze at one end, extends through the center of the grenade. At the fuze end, between the diaphragm and the cover, a scratcher is attached to

a string. A RDG-2 weighs .50 to .58 kilograms.

CAPABILITIES:

The average hand-thrown range is 35 meters with a burning time of 1.0 to 1.5 minutes. The RDG-2 is used to conceal the maneuvers of small combat elements. To activate the grenade, the cover strings must be pulled and the cover discarded. After the scratcher is rubbed over the friction fuze, the user holds the grenade for 2 or 3 seconds before throwing. A match can ignite the RDG-2 if the scratcher does not ignite the fuze.

Incendiary Smoke Cartridge ZDP



DESCRIPTION/CAPABILITIES:

The ZDP incendiary smoke cartridge comes in a metal tube which weighs .75 kilograms, is 290 millimeters long, and has a diameter of about 50 millimeters. To activate the charge, the user must unscrew the green cap on one of the ends, pull the ring on the cord of the pressure-friction fuze, and handthrow the ZDP to a minimum of 25 meters. The ZDP can also be propelled by a rocket

motor up to 560 meters. In this case, the user unscrews the red cap on the other end of the charge, pulls the ring on the cord, and rests the launch tube against one of the following: the swivel of a firmly seated automatic rifle, the safety catch of a rocket launcher, or the support of a machine gun.

Vehicle-Launched Smoke Grenades

T-72 variant with smoke grenade projectors



DESCRIPTION/CAPABILITIES:

Until the 1970s, the Soviets did not mount smoke grenade projectors on their combat vehicles. They did, however, put two smoke barrels on the rear of the T-54 and T-55 tanks. These obscured the tanks from the enemy while they maneuvered. This system was only effective when the tanks were retreating, because of the positioning of the smoke barrels. The new vehicle-launched smoke grenades provide a rapid means of shielding the vehicle and personnel during evasive maneuvers from antitank weapons. The grenades give some protection to crews when they are dismounting from disabled

vehicles. The grenade projector consists of two components: a tube assembly mounted on the exterior of the vehicle, and a firing mechanism or control unit mounted inside, where it is operated by the gunner or commander. The smoke grenade consists of a fuze, body, and fin assembly.

REMARKS:

The Soviets now mount this type of vehicle-launched smoke grenade on some BMP-1s; on the BMP-2; on the BTR-80; and on the T-62, T-64, T.72 and T-80 tanks.

LOGISTIC EQUIPMENT

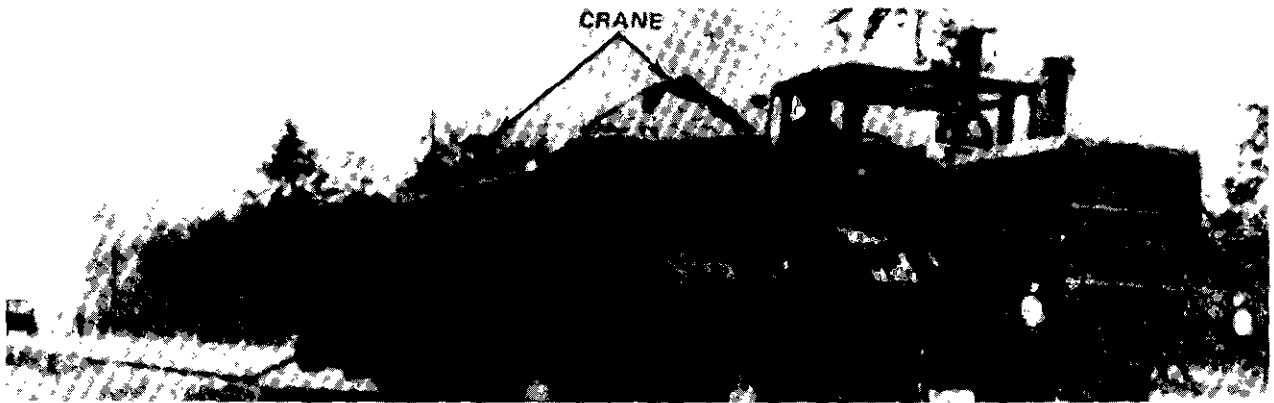
Advancements in the logistic equipment and capabilities of the Warsaw Pact countries have been continuous. Some new items have been introduced and older items upgraded. For a complete descrip-

tion of transport and other logistic equipment, see TB 381-5-22A and DST-1150528087. (Complete citations are given in the Reference section of this manual.)

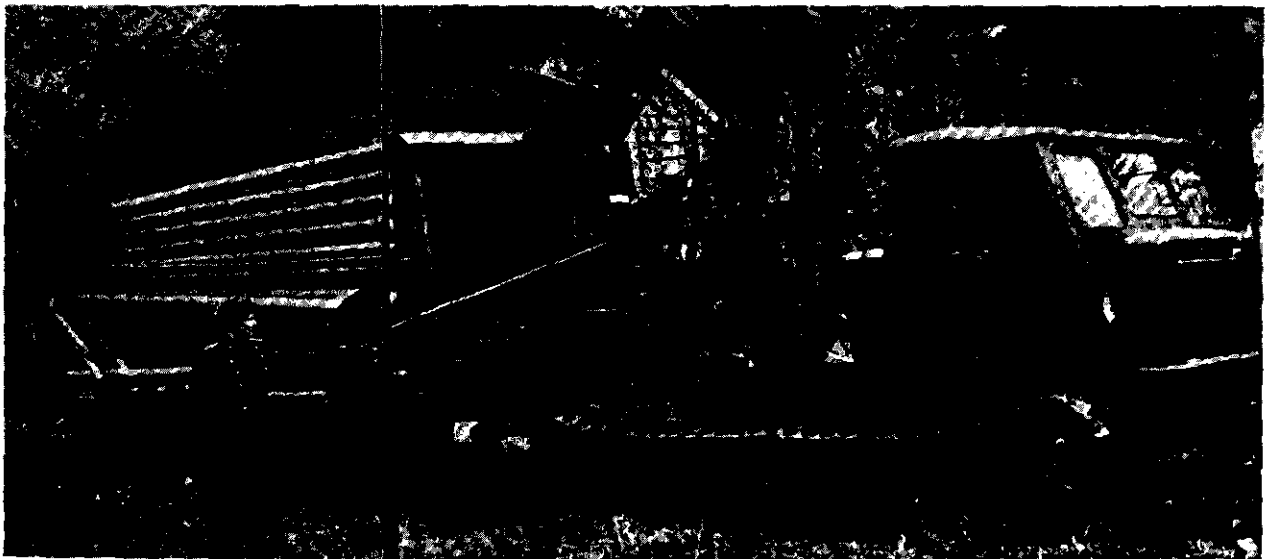
Pipelaying Machines

Automatic Pipelaying Machines TUM-100 and TUM-150

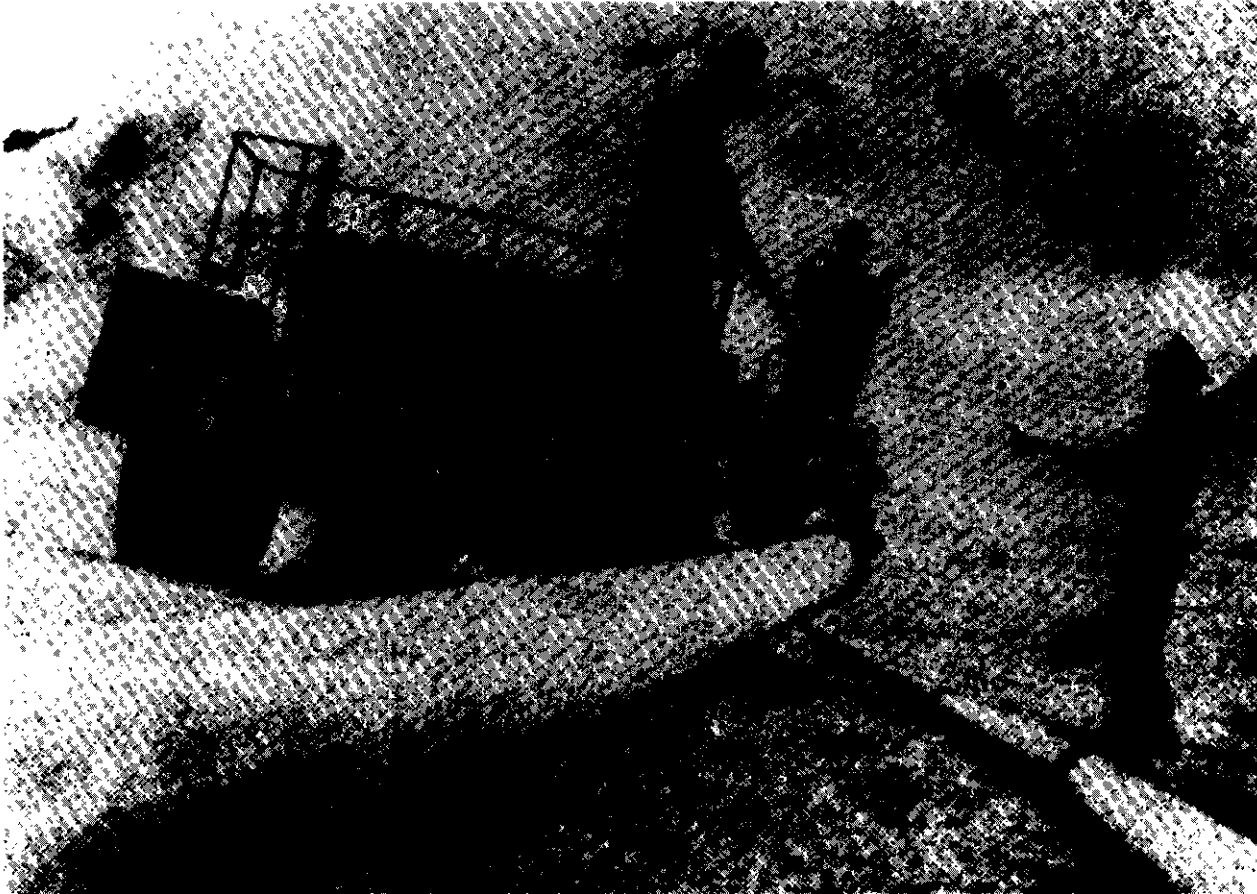
TUM-100



TUM-150



Automatic Pipelaying Machines TUM-100 and TUM-150 (continued)

New TUM variant**DESCRIPTION/CAPABILITIES:**

The TUM-100 automatic pipelaying machine consists of a wheeled prime mover and a semitrailer with a pipe hopper, an assembly device, and a crane. It uses pipes which are 100 millimeters (approximately 4 inches) in diameter. Except for the size of pipes, the TUM-100 functions much the same as the TUM-150.

The TUM-150 automatic pipelaying machine consists of a tracked prime mover and a semitrailer with a pipe hopper, an assembly device, and a crane. It uses aluminum pipes which are 150 millimeters (approximately 6 inches) in diameter and 6 meters long.

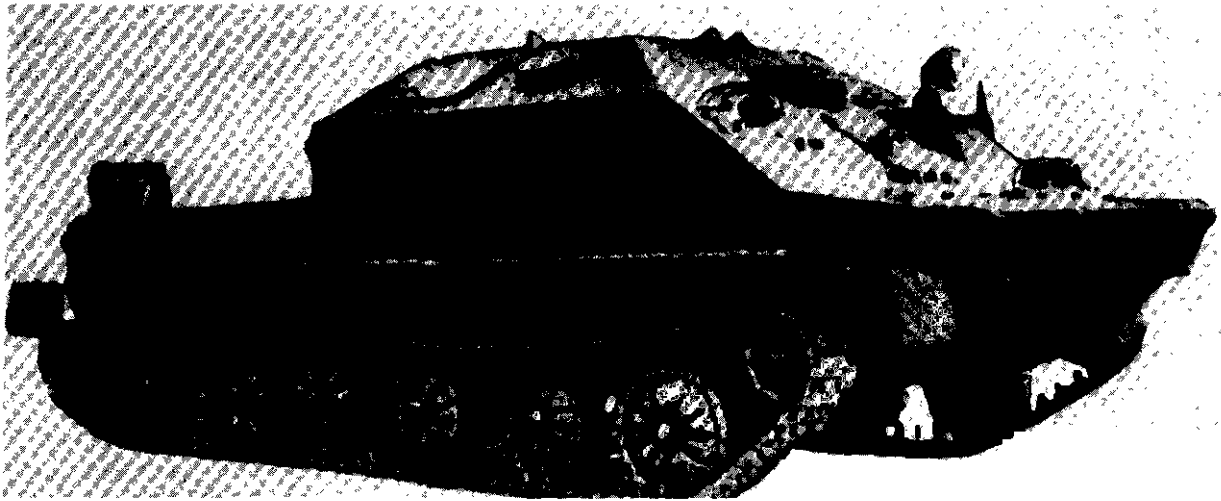
Using the traversing crane, the machine loads pipes from a pipe-carrying tractor-trailer transport vehicle onto its integral hopper. It then feeds the pipe from the hopper into the assembly line, couples the pipe sections, and lays the pipe in place. It lays pipe at a rate estimated at one to three kilometers per hour.

The TUM-150 is organic to the pipeline brigade of a front. It is capable of laying tactical pipelines from front to army levels in an offensive operation and even down to division level in a static situation. A new variant of the wheeled TUM (which stands for *trubo-ukladochnaya mashina*, or pipe laying vehicle, in Russian) appeared in 1986.

Maintenance Support Vehicle

Amphibious Armored Maintenance Support Vehicle MTP _____

MTP



DESCRIPTION:

The MTP is a BTR-50P variant developed to provide servicing, maintenance, and recovery support of the BMP infantry combat vehicle. The power train compartment in the rear and the driver's compartment at the front have retained the general characteristics of the BTR-50P. The centrally located working compartment has an armored roof raised high enough to allow the maintenance crew to work while standing. The working and driver's compartments probably have a collective NBC filtration system. Firingports in

the hull sides are like a BMP's; they allow the crew to fire their personal weapons without disrupting the protective seal.

CHARACTERISTICS	MTP
Crew	3-4
Weight (kg)	16,000
Length (mm)	6,910
Width (mm)	3,140
Height (mm)	2,500

Armored Recovery Vehicles
 Armored recovery vehicle characteristics

CHARACTERISTICS	T-54/55-T	T-62-T	BREM-1
CREW	3-5	3-5	2-3
WEIGHT (kg)	Approximately 32,000	Approximately 32,000	INA
LENGTH, overall (m)	7.47	6.63	INA
WIDTH, overall (m)	3.27	3.30	Approximately 3.46
HEIGHT, overall (m)	1.89	1.90	INA
ARMAMENT	None	None	1-2 machine guns
DOI	1965?	1977	1984
STATUS	Standard	Standard	Standard

Armored Recovery Vehicle T-54/55-T

T-54-T



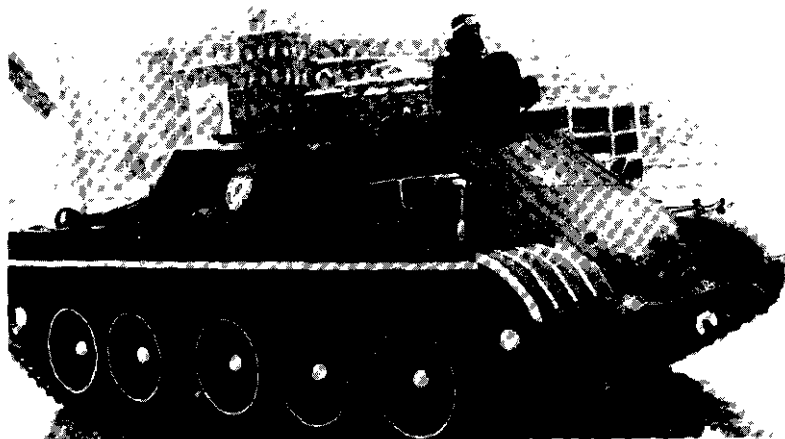
DESCRIPTION/REMARKS:

The T-54-T and T-55-T armored recovery vehicles are based on modified chassis of the T-54 and T-55 medium tanks, respectively. The recovery vehicle variants have a crane able to lift up to 3,000 kilograms, a loading platform, and a spade on the

rear of the vehicle. They can mount a snorkel for deep fording. Performance figures are the same as for the T-54 and T-55 tanks. They have been in service since around 1965, replacing older tank recovery vehicles based on the T-34 tank chassis.

Armored Recovery Vehicle T-62-T

T-62-T



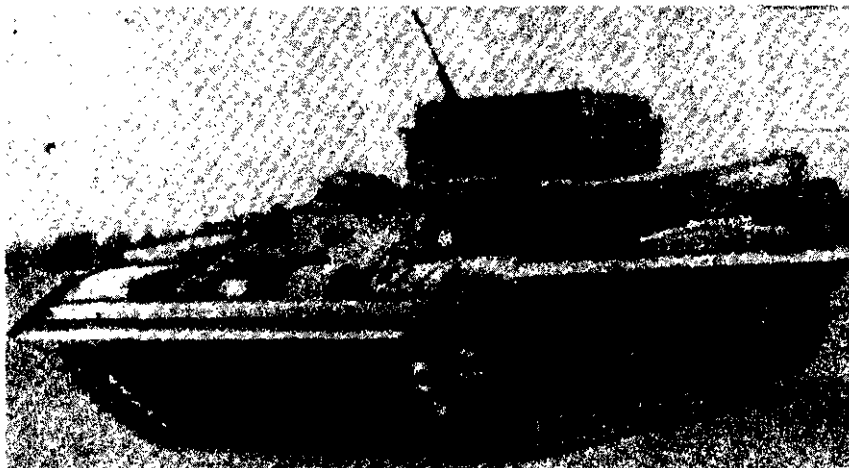
DESCRIPTION/REMARKS:

The T-62-T armored recovery vehicle is based on a modified T-62 medium tank chassis. It was

first observed in the November 1977 Moscow Red Square parade.

Medium Tank Recovery Vehicle BREM-1

BREM-1



DESCRIPTION/CAPABILITIES:

The BREM-1 is based on the T-72 tank chassis. Instead of a turret, it has a rectangular platform on top of the hull for work and loading. It has a 19-mt capacity hydraulic crane, a 25-mt capacity winch with 200 meters of cable, a hydraulically operated dozer blade, as well as a telescoping

snorkel. It probably has collective NBC protection for its crew of two to three. It mounts one or two machine guns of unknown type and caliber.

REMARKS:

The BREM-1 was introduced in 1984.

HELICOPTERS
Helicopter performance characteristics

CHARACTERISTICS	Mi-2/ HOPLITE	Mi-6A/ HOOK	Mi-8T/ HIP	Mi-17/ HIP H	Mi-24/ HIND	Mi-26/ HALO A	Mi-28/ HAVOC A	Ka-2/ HOKUM A
CREW	1	5	2-3	2-3	3	5	2	2
PASSENGERS (troops)	6-8	65	24	24	8-10	100+	0	0
NORMAL PAYLOAD (kg)								
Hovering takeoff	700/800*	8,000	4,000/3,000*	4,000/3,000*	3,600	20,000	0	0
Rolling takeoff	INA	12,000	INA	INA	3,800	20,000	0	0
NORMAL TAKEOFF WEIGHT (kg)	3,300	39,000	11.100	11.100	10,000	49,500	INA	INA
MAXIMUM TAKEOFF WEIGHT (kg)								
Hovering takeoff	3,500	42,500	12,000	13,000	12,000	56,000	INA	5,500
Rolling takeoff	INA	46,800	INA	INA	12,200	INA	11.400	INA
SERVICE CEILING (m)	4.000	3,000	3,500/4,500**	5,000	2,100	4,500	INA	INA
SPEED (km/hr)								
Maximum @ sea level	210	300	250	250	320	295	300	350
Cruising	190	250	225	240	310	255	280	INA
RANGE (km)								
Maximum payload	340	200	160	460	490	800	INA	INA
Maximum fuel	580	610	410	495/950***	540	1,200	INA	INA
COMBAT RADIUS (km)	170	300	200	INA	160	300+	240	250
DIAMETER, main rotor (m)	14.50	35.00	21.30	21.30	17.00	32.00	17.20	INA
LENGTH, fuselage (m)	12.00	33.00	18.20	19.30	19.00	33.727	16.85	INA
HEIGHT, overall (m)	3.80	9.90	5.70	5.60	4.30	8.145	4.81	INA
DOI	1965	1961	1963	1981	1972	1982	early 1990s	early 1990s

FOOTNOTES *Internal/sling

**Depending on role

***Without/with auxiliary fuel tanks

Light Helicopter Mi-2/HOPLITE

Mi-2/HOPLITE



DESCRIPTION:

The HOPLITE is a general-purpose, light helicopter. It has an all-metal, semimonocoque, pod-and-boom fuselage with fixed tricycle landing gear and a tail skid. Twin 400-shaft-horsepower (shp) engines are mounted side-by-side above the cabin. There is a three-blade main rotor and a two-blade tail rotor. There have been as many as 20 different civilian and military versions of the basic HOPLITE design. Military versions may carry a variety of armaments, with or without external weapon support racks.

No standard configuration exists for the armed military versions of the HOPLITE. The weapon mix is generally adjusted to meet the particular needs of the mission. There is normally a provision for a single fixed 23-mm gun to be mounted on the left side of the fuselage just below the cockpit; however, some HOPLITEs may be built with a fixed 23-mm gun on each side of the fuselage. Another common armament is a flexibly mounted 7.62- or 12.7-mm machine gun in the window of the cabin door on the left side. Twin or single fixed forward-firing 7.62- or 12.7-mm machine guns can be mounted on both external weapon support racks.

HOPLITEs sometime carry a variety of additional armaments, but not simultaneously. These may include, on each side of the fuselage: a 16-shot 57-mm rocket pod; two AT-3c/SAGGERC ATGMs; one 50- or 100-kg bomb; or up to two SA-7/GRAIL missiles, which are for anti-air protection. Some versions carry auxiliary fuel tanks rather than add-on armaments; the external tanks cannot be installed when a weapons rack is in place.

CAPABILITIES:

The HOPLITE can perform a variety of combat support and administrative roles that require either an unarmed or lightly armed helicopter. Its primary applications are liaison and reconnaissance; it may also serve in passenger, cargo, or air ambulance roles. As a passenger transport, it can carry six to eight passengers. The cargo version can carry 700 kilograms internal cargo or 800 kilograms as a slung external load. In an ambulance role, it can accommodate four litters and a medical attendant in the cabin. The HOPLITE has also been observed with a smoke-generating device, possibly to augment the smoke-laying capabilities of the

Light Helicopter Mi-2/HOPLITE(continued)

ground forces. The HOPLITE is organic to division-level helicopter squadrons, as well as to general-purpose helicopter squadrons at both army and front levels.

LIMITATIONS:

When carrying the possible armaments described above, the HOPLITE can be classed as an armed helicopter. However, it still should not be viewed as an attack helicopter.

REMARKS:

The Mi-2/HOPLITE was first seen in 1961 and has been in service in the Soviet Army since 1965. The Mil Design Bureau in the Soviet Union designed and developed the HOPLITE. However, its production was transferred in mid-1965 to the Swidnik Aircraft Factory in Poland, which manufactures it under Soviet license for both civilian and military use. Armed variants were introduced in 1974.

Mi-6A/HOOK**DESCRIPTION:**

The HOOK is a heavy-lift helicopter, twice the size of any Free World helicopter. It has a semi-monocoque, pod-and-boom fuselage, with fixed tricycle landing gear and clamshell rear doors. It has twin 5,500-shp turboshaft engines mounted above the cabin and large detachable wings mounted on the upper fuselage just to the rear of the engines. There is a five-blade main rotor and a four-blade tail rotor. Most HOOKs used for tactical roles have a 12.7-mm machine gun in the fuselage nose.

CAPABILITIES:

The primary mission of the HOOK is to transport heavy equipment and cargo (12,000 kilograms internally or 8,000 kilograms slung). The cargo hold has a floor length of 12 meters, a cabin width of 2.65 meters, and a cabin height varying from 2.01 meters at the front to 2.50 meters at the rear. Thus, the HOOK can carry one BRDM-2 scout car, one BMD-1 combat vehicle, one GAZ-66 truck, or variants of these vehicles in its cargo compartment. It can carry towed 120-mm mortars, 122-mm howitzers, or ZU-23 AA guns. Alternatively, it can accommodate a loaded 7,500-liter

POL truck, or it can carry up to 12,000 liters of fuel in soft bladders. Thus, it can serve as a forward area refueling point for tanks, infantry combat vehicles, other vehicles, or helicopters. The HOOK also has a secondary mission to transport troops. It can carry up to 65 troops.

The large, hydraulically-operated clamshell doors permit rear ramp loading and unloading of personnel, vehicles, and a wide range of bulky cargo. The wings offload the main rotor in cruising flight; however, they are normally removed when the HOOK operates in a flying crane role, carrying external cargo.

REMARKS:

When first observed in 1957, the HOOK was the world's largest helicopter. It entered service in 1961 and served as the basis from which the Mi-10/HARKE A and Mi-10K/HARKE B flying crane helicopters were developed. Since 1982, the even larger Mi-26/HALO A has been replacing the Mi-6/HOOK in the heavy-lift squadrons of front-level transport helicopter regiments.

Medium Helicopter Mi-8T/HIP

Mi-8T/HIPC*Mi-8T/HIP E***DESCRIPTION:**

The Mi-8T/HIP medium helicopter has an all-metal, semimonocoque, pod-and-boom fuselage, with fixed tricycle landing gear and external fuel tanks. Twin 1,500-shp turboshaft engines are mounted above the cabin. On later models, the engines may have air-intake covers, particle separators, and IR suppressors. There is a five-blade main rotor; a three-blade tail rotor is mounted on the right side of a small vertical stabilizer. The HIP has a sliding, jettisonable main passenger door at the front left side of the cabin and large clamshell cargo-loading doors at the rear. It carries a winch and hook for external loads. Several versions of the Mi-8T, both armed and unarmed, are in military use.

The Mi-8T/HIPC is the basic medium transport assault helicopter. It may have optional twin racks outboard of the fuel tanks on each side of the fuselage for a variety of external weapon systems. Its armament may include four 16-shot 57-mm rocket pods, four 250-kg bombs, or two

500-kg bombs. Aside from the external weapon stores, the HIP C may mount a 12.7-mm machine gun in the right clamshell door in the rear. Each window in the transport section has a support bracket to allow infantrymen to fire their assault rifles or light machine guns at ground targets. The Mi-8T/HIP C may also be configured for minelaying and ELINT collection roles.

The Mi-8T/HIP D airborne command post variant is similar in appearance to the HIP C. However, it has a rectangular canister, rather than weapons, on each outboard rack, and it carries added antennas.

The Mi-8T/HIPE is the standard gunship version, with triple stores racks on each side of the fuselage for external weapon systems. Its armament may include six 32-shot 57-mm rocket pods, four 250-kg bombs, or two 500-kg bombs suspended below the racks. It normally has four radio-guided AT-2c/SWATTER C ATGMs

Medium Helicopter Mi-8T/HIP (continued)

mounted on rails above the racks. The HIP E has a swivel-mounted 12.7-mm machine gun in the nose and possibly a 12.7-mm machine gun in the right rear clamshell door.

The Mi-8TB/HIP F is an export version of the HIP E on which the ATGM armament is changed to six wire-guided AT-3/SAGGERS.

The Mi-8T/HIP G airborne command post variant has rearward-inclined antennas projecting from the rear of the cabin and from the underside of the tail boom. It also has a box under the tail boom for a Doppler radar.

The Mi-8T/HIP J is an ECM version with additional small antenna screens and small, square boxes on the sides of the fuselage fore and aft of the rear legs of the tricycle landing gear.

The Mi-8T/HIP K is a radio-jamming version with a large crossed-dipole antenna array on each side of the cabin, aft of the rear landing gear legs. It has no Doppler radar under the tail boom.

CAPABILITIES:

The HIP C serves primarily as an assault transport and general cargo transport helicopter. However, it may also perform armed support roles. It can carry 24 troops or 4,000 kilograms of cargo internally, or 3,000 kilograms as a slung load.

The HIP E and F gunship versions are also capable of carrying troops. They have assault rifle support brackets for firing at ground targets from the side windows. All Mi-8T versions can be converted for an air ambulance role, accommodating 12 litters and a medical attendant.

The HIP C is organic to division-level helicopter squadrons, in the HIP squadron of some army-level attack helicopter regiments, and in the

medium-lift squadrons of front-level transport helicopter regiments. Along with the HIP C, the HIP E is used in army-level attack helicopter regiments. The HIP J and K are organic to the front-level helicopter ECM squadron.

LIMITATIONS:

The HIP C lacks the ATGM capability of the HIP E or F versions. In the general cargo role, the HIP C is most often limited to 3,000 kilograms internal cargo, due to power limitations. The HIP K ECM variant also has power limitations.

REMARKS:

The first Mi-8 prototypes, HIP A and HIP B, appeared in 1961 and 1962, respectively. The HIP C, first observed in late 1962, became the standard series production model in 1963. It has been produced in both civil and military forms. Civil versions have larger, square windows in place of the round windows on military versions. The standard civil passenger version, Mi-8P, has seating for 28 to 32 passengers in the main cabin. The deluxe passenger version, Mi-8P Salon (sometimes called Mi-8S), has larger fuel tanks and cabin furnishings for nine or eleven passengers. Although the Mi-8S may be used by the military as a unarmed liaison helicopter, most military versions are variants of the 24-passenger general utility version, Mi-8T. Armed versions of the Mi-8T/HIP C have been in service since 1966. The more heavily armed HIP E was introduced in 1977.

The Mi-14/HAZEA is a derivative of the Mi-8T. It is a shore-based ASW helicopter, introduced in 1975 as a replacement for the Mi-4/HOUNDB.

The HIP H, introduced in 1981, is an improved version of the Mi-8T which the Soviets have designated as Mi-17.

Medium Helicopter Mi-17/HIP H

Mi-17/HIP H

Soldat und Technik

DESCRIPTION:

The Mi-17/HIP H is an improved version of the Mi-8T. It has the same airframe and main rotor as the Mi-8T, but has its tail rotor mounted on the left side of the vertical stabilizer rather than on the right. The HIP H also has an uprated powerplant: two 1,900-shp turboshaft engines. The engines can be fitted with air-intake covers, particle separators, and IR suppressors. The HIP H may also carry a strap-on IR decoy flare dispenser. The winch above the side door of the cargo compartment is slightly modified. As with the Mi-8, the Soviets produce the Mi-17 in various civil and military versions. On armed versions, the 12.7-mm nose machine gun is moved somewhat higher than on the HIP E and F, to the center of the fuselage, and the outriggers support three weapon stations on each side of the fuselage, normally mounting 32-shot 57-mm rocket pods. Unlike the HIP E and F, the HIP H has not appeared with ATGMs.

CAPABILITIES:

THE HIP H can perform a variety of military roles: assault transport, cargo transport, and air ambulance. As an assault helicopter, it can carry up to 24 troops and 1,000 kilograms of ordnance simultaneously. It can be rapidly converted into a cargo transport and can carry 4,000 kilograms of cargo internally or 3,000 kilograms as a slung load. As an air ambulance, it can carry 12 litters and the necessary medical equipment. Men and material weighing up to 150 kilograms can be

recovered with the aid of the external winch above the side door.

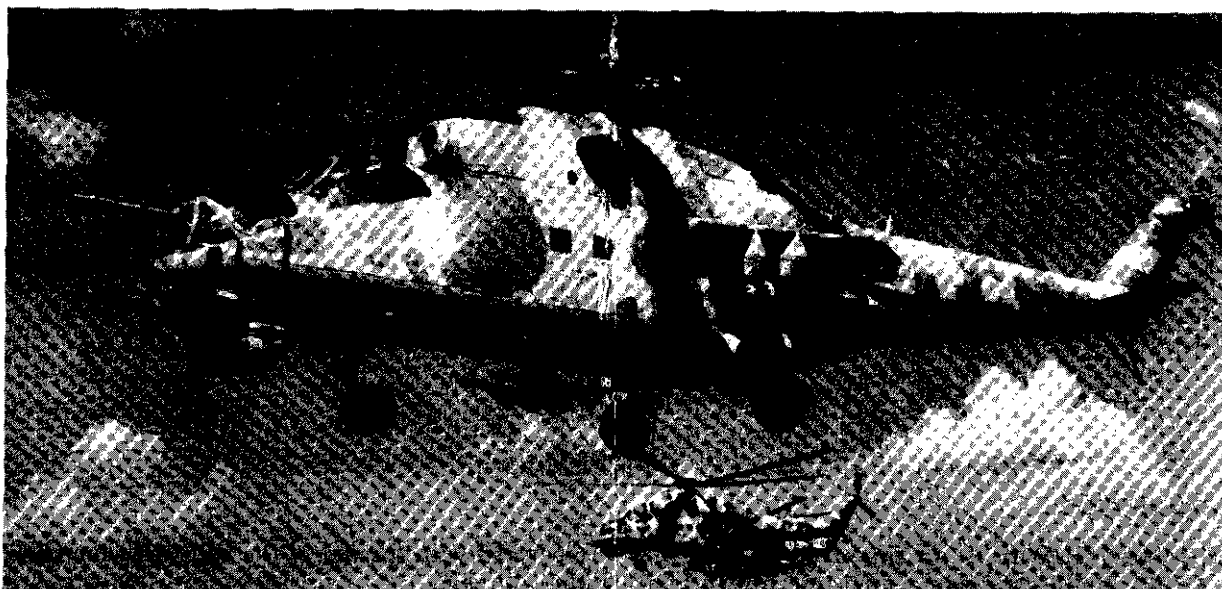
Although its lift capabilities are essentially the same as the Mi-8T's, the Mi-17 has greater performance in terms of speed and range. With a 4,000-kg payload, it can attain a speed of 240 kilometers per hour and a range of up to 460 kilometers. Its maximum speed is 250 kilometers per hour; with normal takeoff weight, the flight range is 495 kilometers without auxiliary fuel tanks and 950 kilometers with auxiliary tanks. If one engine fails, the output of the other increases automatically to a contingency rating of 2,200 shp. The HIP H is organic to division-level helicopter squadrons, army-level attack helicopter regiments, and the medium-lift squadron of front-level transport helicopter regiments.

LIMITATIONS:

Although the HIP H should be capable of carrying ATGMs, none have been observed mounted to date. There are no indications that the HIP H will serve as an antitank platform.

REMARKS:

The Mi-17/HIP H was first seen at the Paris Air Show in June 1981. Civil as well as military versions have small, round windows. Exported armed assault versions seen outside the Soviet Union mount 23-mm machine gun pods on the center pylon mount and 32-shot 57-mm rocket pods at the inner pylon position.

Mi-24D/HINDD**DESCRIPTION:**

The Soviets currently deploy three attack helicopter versions of the Mi-24/HIND. All three share the same basic airframe, powerplant, and rotor system. The all-metal fuselage features structural hardening, with the substitution of steel and titanium for aluminum in critical components, including the underside of the crew compartment. The crew compartment consists of stepped, tandem cockpits under two individual bubble canopies. The gunner's cockpit is in the nose, and the pilot's cockpit behind it is raised to provide an unobstructed forward view. A probe fitted on the upper right corner of the gunner's bulletproof windshield may be part of a low-air-speed sensing device used to indicate optimum conditions for minimum dispersion of unguided rockets. To the rear of the cockpits is the main cabin for carrying light cargo or possibly troops. Twin 2,200-shp turboshaft engines are mounted above the main cabin. The engines can be fitted with air-intake covers, particle separators, and IR suppressors. Above the engines is a five-blade main rotor; a three-blade tail rotor is on the left side of the vertical stabilizer. An IR jammer may be mounted atop the fuselage just behind the cabin, and an IR

decoy flare dispensing system may be mounted under the rear part of the tail boom. Also common to all three versions are the retractable tricycle landing gear and stub wings for carrying armaments. Each stub wing has two universal pylons and a wingtip pylon specifically designed for mounting ATGMs. The three versions differ by the types of armament carried.

The MI-24D/HIND D has a chin turret under the nose, mounting a four barrel 12.7-mm Gatling type machine gun which has a wide range of movement in both azimuth and elevation. A sensor pack protruding below the chin turret houses direct-view optics. The four universal pylons on the stub wings normally mount four 32-shot 57-mm rocket pods. In place on the four 57-mm rocket pods, the universal pylons can also accommodate two 20-shot 80-mm rocket pods with folding-fin, air-to-surface rockets. Four 250-kg bombs or two 500-kg bombs, chemical or conventional, may replace the rocket pods. The two wingtip pylons have launch rails for a total of four AT-2c/SWATTER C ATGMs.

Attack Helicopter Mi-24/HIND (continued)

Mi-24E/HINDE



The Mi-24E/HINDE has the same armament as the HIND D on its nose and universal pylons. However, it replaces the rail-launched AT-2c/SWATTER C with the higher-performance, tube

launched AT-6/SPIRAL ATGM. Instead of rails, the wingtip pylons feature distinctive, I-shaped launch platforms for a total of four SPIRAL missiles (two on each wingtip).

HIND F



Attack Helicopter Mi-24/HIND (continued)

The HIND F has the same stub wing armament as the HIND E. However, it replaces the chin turret-mounted 12.7-mm Gatling gun with a fixed 30-mm twin gun pod mounted on the right side of the fuselage.

The HIND E and F models may carry a second AT-6 launch platform on the outboard universal pylon (in place of the normal rocket pod or bombs); this allows them to mount a total of 8 SPIRAL missiles. They have also been observed with "stacked" AT-6 launch platforms on the wingtip pylon and the outboard universal pylon, for a possible total of 16 SPIRALs. Furthermore, it is possible for auxiliary fuel tanks or sprayer tanks for chemical agents to replace the rocket pods or other ordnance on all four universal pylons.

CAPABILITIES:

The HIND D, E, and F are designed for a primary close air support role. When providing fire support for Soviet ground forces, they are especially effective against enemy tanks. They may escort troop-carrying Mi-8T or Mi-17 assault helicopters. In lieu of passengers, the HIND gunship has the room and payload to carry a full reload for its weapons. HINDs generally operate in pairs (or multiple pairs), closely coordinating their attacks, which frequently come from different directions and can be either simultaneous or staggered. HIND tactics emphasize contour and low-level flying. The HIND D, E, or F attack helicopters are organic to division-level helicopter squadrons and to army-level attack helicopter regiments.

Powerful engines, a relatively narrow fuselage, and downward-angled stub wings give the HIND gunships good maneuverability, compared to earlier Soviet helicopters. All three gunships have high speed (up to 320 kilometers per hour) and good climbing capability (12.5 meters per second). Retrofitting with IR suppressors, IR jammers, and IR decoy flare dispensers has increased survivability against enemy SAMs and air-to-air missiles (AAMs). Some HINDs now have a tail gun blister for added protection and firepower.

LIMITATIONS:

Due to its size, the HIND presents a significant profile. This makes it vulnerable to visual detection. Originally designed for a troop-carrying role, the HIND fuselage is somewhat broad (for an

attack helicopter) in the main cabin area, even though the gunship variants have narrowed the target presented by the cockpit area. When firing ATGMs, the HIND must remain in the zone of AA fire long enough to guide the missile to its target; that is, up to 27 seconds for the SWATTER or 11 seconds for the SPIRAL.

There are indications that the HIND, with its conventional, fully articulated rotor head, may not be as agile as the Soviets would like. It is very difficult to maneuver at low speed or in the hover. It has poor low-altitude flight characteristics. Because of its wide turning radius at high speed, it is ill-suited for fighting enemy helicopters.

REMARKS:

The first flight tests with the Mi-24B/HIND B prototype occurred in 1970 and 1971. A second prototype, designated Mi-24A/HIND A, upgraded its twin powerplant from the original 1,500-shp engines (the same as on Mi-8T/HIP) to the 2,200-shp engines used on all subsequent HIND models. It relocated the tail rotor from the right to the left side of the vertical stabilizer. In 1972, the HIND A entered service as an armed assault helicopter, the flying equivalent to an infantry combat vehicle. These early HINDs were designed to deliver a fully-equipped motorized rifle squad onto the battlefield and to support the inserted troops with fire from on board weapons. Aside from the stub wing armaments later used on the HIND D, the HIND A had only a single-barrel 12.7-mm machine gun in the nose of its "greenhouse" -type cockpit. The pilot and copilot sat side-by-side in the cockpit. The Mi-24U/HIND C is a trainer version generally similar to the late model HIND A, but it mounts no machine gun or ATGMs. Although the HIND A has been replaced by later models, the HIND C is still used for training.

Based on exercise experience with the HIND A, the Soviets decided to redesign the front of the fuselage to give priority to the gunship role. Their first true attack helicopter, the Mi-24D/HIND D, was introduced in 1976. It had tandem cockpits, thick titanium armor under the cockpits, and upgraded nose armament. While the gunship retained the ability to carry 8 to 10 troops in the main cabin, this was no longer its primary role. The Mi-24E/HIND E with the higher-performance AT-6/SPIRAL ATGM system followed in 1978. The HIND F with twin 30-mm guns appeared in 1981. Export models of the HIND D are designated Mi-25 by the Soviets.

Heavy-Lift Helicopter Mi-26/HALO A

Mi-26/HALO A

Soviet Military Review

DESCRIPTION:

The Mi-26/HALO A heavy-lift helicopter has an all-metal, semimonocoque, pod-and-boom fuselage with clamshell rear loading doors and a loading ramp. It has fixed, dual-wheeled, tricycle landing gear and a retractable tail skid at the end of the tail boom. It has an eight-blade main rotor and a five-blade tail rotor mounted on the right side of the swept-back vertical stabilizer. Twin 11,400-shp turboshaft engines with air-intake covers are mounted side-by-side above the cabin.

The cargo hold has a flat floor length of 12 meters, a cabin width of 3.25 meters, and a cabin height varying from 2.95 to 3.17 meters. The length of the cargo area can increase to 15 meters

with the loading ramp trailed. The HALO A has a five-man crew: pilot, co-pilot, navigator, flight engineer, and loadmaster.

CAPABILITIES:

The engines of the HALO A more than double the power of its predecessor, the Mi-6A/HOOK. However, they each weigh 181 kilograms less than the HOOK's engines, and the overall empty weight is only slightly greater than the HOOK (28,200 versus 27,240 kilograms). Thus, the HALO A is able to fly twice the payload of the HOOK at comparable speeds and to greater ranges.

Mi-26/HALO A unloading BMD-1



The internal cargo payload of the HALO A is 20,000 kilograms, the same as its reported external payload. It can carry its full payload of 20,000 kilograms a distance of 800 kilometers. The cargo area, which is larger than that of the Soviet An-12/CUB medium-range fixed-wing transport, is large enough to carry any of the following: over 100 troops, two BRDM-2 scout cars, two BMDs, one BMP, one BRT-60/70/80, one MT-LB, or variants of these vehicles. In addition to the weapon systems which can be carried in the HOOK, the HALO A can accommodate the following: a BM-21 MRL, a 2S1SP howitzer, a ZSU.23-4 SP AA gun, an SS-21/SCARAB TEL, a Ural-375 cargo truck, or a loaded 8,000- to 10,000-liter POL truck. The load and lift capabilities of the HALO A are comparable to the US C-130 Hercules transport aircraft.

The length of the main landing gear legs can be hydraulically adjusted individually to facilitate

loading through the rear doors and to permit landing on varying surfaces. The retractable tail skid permits unrestricted approach to the rear cargo doors. Two electric winches (each with 2,500-kg lifting capacity) on overhead rails can move loads along the length of the cabin.

The HALO A has an avionics package that includes weather radar, radio navigation, Doppler radar, and moving map display. These features give it an all-weather flight capability. It also has a fully automatic pilot.

REMARKS:

The West first identified the HALO A in 1978. Its first public appearance was at the Paris Air Show in June 1981. It has been operational since 1982. It is replacing the Mi-6A/HOOK in the heavy-lift squadrons of the front-level transport helicopter regiment.

Attack Helicopter Mi-28/HAVOC A

Mi-28/HA VOC A



DESCRIPTION:

Preliminary information indicates that the Mi-28/HAVOC A is a ground-attack helicopter similar in appearance to the US AH-64 Apache. It has an all-metal, semimonocoque fuselage. This is probably much narrower than that of the HIND, since the HAVOC A has no passenger/cargo compartment. The fuselage is also slightly shorter than that of the HIND, with stepped cockpits to the rear of the nose for the gunner in front and the pilot above and behind him. Due to the narrow profile, the twin turboshaft engines, fitted with air-intake covers, are not mounted atop the fuselage but rather on the upper sides, just behind the cockpits. Above the engines is a five-blade main rotor; the tail rotor is mounted on the right side of the vertical stabilizer. The fixed, tailwheel-type landing gear has single main wheels on V-struts below the cockpit area. Stub wings below the engines have pylons for weapon stores.

Armament may include a 30-mm cannon in a chin turret and up to 16 ATGMs on the stub wing pylons. In place of the ATGMs, the pylons may also mount rocket pods, AAMs, or modified

SAMs (possibly the SA-14/GREMLIN.) As with other current Soviet helicopters, the HAVOC A may also be fitted with IR suppressors and IR decoy flare dispensers.

CAPABILITIES:

The HAVOC A is designed as a ground-attack helicopter, primarily for an antitank role. It has improved acceleration, low-altitude maneuverability, and low-speed flight characteristics compared to the HIND. Its slim profile, maneuverability, and alternative air-to-air armaments also give it favorable characteristics for a secondary role of engaging enemy antitank helicopters. It is expected to have night/adverse weather capability similar to the Apache's.

REMARKS:

When fielded in the early 1990s, the Mi-28/HAVOC A will supplement the Mi-24/HIND in the ground-attack helicopter role. The Mi-28 probably exists in several variants.

Attack Helicopter Ka-?/HOKUM A

Artist's concept of Ka-?/HOKUM A



DESCRIPTION:

Preliminary information indicates that the HOKUM A is a unique fighter helicopter with a streamlined fuselage and a tapered nose resembling a jet aircraft. It probably has, retractable tricycle landing gear and a distinctive coaxial, contra-rotating, main rotor system. There is no tail rotor on the vertical stabilizer. Two large horizontal stabilizers project from the sides of the tail boom. Twin turboshaft engines with air-intake covers are mounted high on the sides of the narrow fuselage, just behind the cockpit. Large auxiliary wings below the engines have pylons for weapon stores.

Armament may include 23- or 30-mm cannons mounted under the nose and a combination of AAMs and modified SAMs (possibly the SA-14/GREMLIN) on the wing pylons. The HOKUM A is not believed to carry ATGM armament. As with other current Soviet helicopters, the HOKUM A may also be fitted with IR suppressors, an IR jammer, and IR decoy flare dispensers.

CAPABILITIES:

The Soviets apparently have designed HOKUM A as a special-purpose fighter helicopter with a primary air-to-air role. It could have a maximum speed of approximately 350 kilometers per hour. The HOKUM A is likely to employ its AAMs and rapid-fire cannons as a low-level tactical counter-air system. Its primary targets would be enemy close air support aircraft, including antitank helicopters.

REMARKS:

The Kamov Design Bureau probably designed the HOKUM A. It has produced other coaxial-rotor helicopters for Soviet naval aviation. When fielded in the early 1990s, the HOKUM A will give the Soviets a significant rotary-wing, air-to-air capability for which no Western counterpart exists. This helicopter probably exists in several variants.

FIXED-WING AIRCRAFT
Fight/Interceptor/Ground Attack Aircraft

Fight/interceptor/ground attack aircraft characteristics

CHARACTERISTICS	MiG-17/FRESCO	MiG-19/FARMER	MiG-21/FISHBED	MiG-23/FLOGGER B / G
TYPE	fighter/interceptor/ground attack	fighter/groundattack*	fighter/interceptor****	fighter/interceptor****
POWERPLANT	1 turbojet	2 turbojets	1 turbojet	1 turbojet
MAXIMUM SPEED				
At altitude (km/hr)	1,145	1,450	2,250	2,500
At sea level (km/hr)	1,125	INA	1,100	1,350
COMBAT RADIUS (km)	500700	285	465925	1,300
REMARKS	May carry a variety of ground attack and air-to-air weapons	May carry a variety of ground attack weapons	May carry a variety of ground attack and air-to-air weapons, including 23 mm or 30-mm guns, bombs, rocket pods, and AAM. The MiG-21 was originally placed in service in 1960 as a high performance day interceptor but it has undergone numerous modifications. Most variants have a ground attack capability.	Has a variable-geometry wing system and may carry AAM.

FOOTNOTES
 *Possible nuclear weapon delivery capability
 **Possible electronic warfare configuration
 ***Possible reconnaissance capability
 ****All of the above characteristics apply

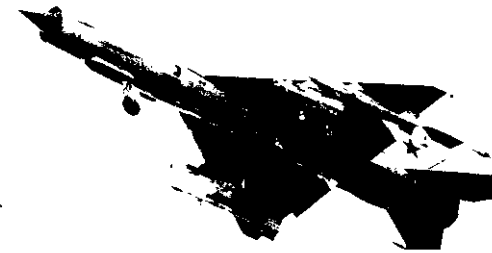
MiG-17/FRESCO



MiG-19/FARMER



MiG-21/FISHBED



MiG-21/FLOGGER B



Characteristics (continued)

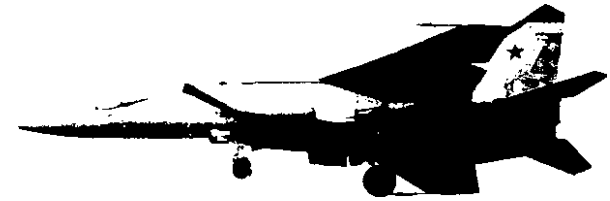
CHARACTERISTICS	MiG-25/FOXBAT A/E	MiG-25/FOXBAT B/D	MiG-27/FLOGGER D/J	MiG-29/FULCRUM A
TYPE	fighter/interceptor***	fighter/reconnaissance**	fighter/ground attack*	counterair fighter
POWERPLANT	2 turbojets	2 turbojets	1 turbojet	2 turbojets
MAXIMUM SPEED				
At altitude (km/hr)	3,010	3,010	1,800	2,500
At sea level (km/hr)	INA	INA	1,300	INA
COMBAT RADIUS (km)	1,450	900	1,200	800
REMARKS	May carry AAMs. Designed to counter high-altitude threats, but has limited low-altitude capabilities.	May be used as ELINT collector. FOXBAT B carries five nose-mounted cameras and infrared line-scan equipment, providing coverage of a corridor of up to 70 km. FOXBAT D relies on side-looking airborne radar (SLAR).	Has a variable-geometry wing system and may carry a wide range of ground attack weapons, including a 23-mm twin or Gatling type gun, bombs, rocket pods, and ASMs.	All-weather, with look-down/shoot-down capability and beyond-visual-range (BVR) AAMs. May have a secondary ground attack role.

FOOTNOTES
 *Possible nuclear weapon delivery capability
 **Possible electronic warfare configuration
 ***Possible reconnaissance capability
 ****All of the above characteristics apply

MiG-25/FOXBAT E



MiG-25/FOXBAT B/D



MiG-27/FLOGGER D



Soldat und Technika

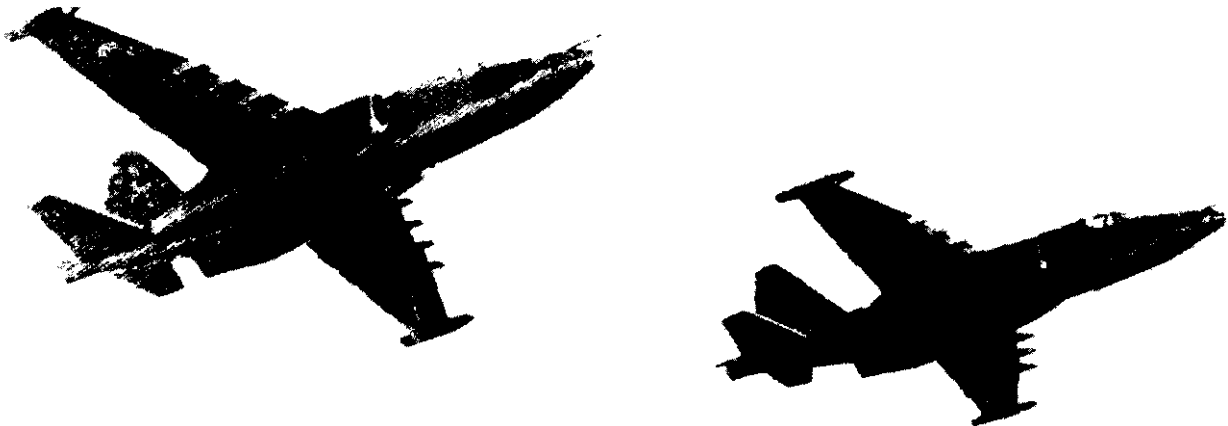
MiG-29/FULCRUM A



Characteristics (continued)

CHARACTERISTICS	Su-25/FROGFOOT A	Su-27/FLANKER B	Yak-28P/FIREBAR B
TYPE	ground attack	counterair fighter	fighter/interceptor
POWERPLANT	2 turbojets	2 turbojets	2 turbojets
MAXIMUM SPEED			
At altitude (km/hr)	880	supersonic	2,000
At sea level (km/hr)	INA	INA	INA
COMBAT RADIUS (km)	556	INA	965
REMARKS	May carry a variety of ground attack weapons, including a 30-mm gun, 4,000 kg of bombs, rocket pods, and ASMs.	All-weather, with look-down/shoot-down capability and beyond visual-range (BVR) AAMs. May have a secondary ground attack role.	May carry two AAMs.

Su-25/FROGFOOT A



Su-27/FLANKER B

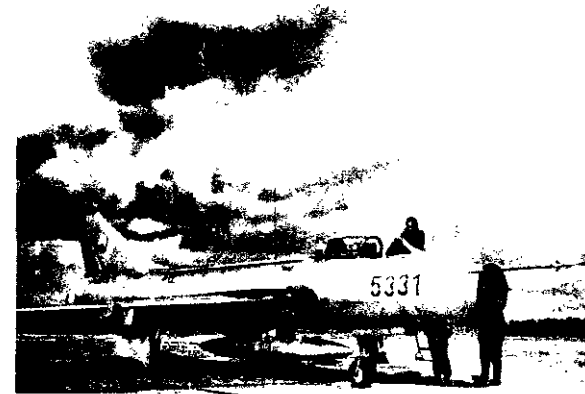


Characteristics (continued)

CHARACTERISTICS	MIg-31/FOXHOUND A	Su-7B/FITTER A	Su-17/FITTER C / D / H	Su-24/FENCER
TYPE	interceptor	ground attack* **	ground attack****	fighterbomber/ground attack
POWERPLANT	2 turbojets	1 turbojet	1 turbojet	2 turbojets
MAXIMUM SPEED				
Altitude (km/hr)	INA	1,930	2,230	2,320
At sea level (km/hr)	INA	850	1,285	1,530
COMBAT RADIUS (km)	INA	320/485	360/700	400-1800
REMARKS	MIg-25 variant deployed since 1981 Has look down shootdown capability	May carry a variety of ground attack weapons, including S M s	May carry a variety of ground attack weapons, including two 30 mm guns, bombs, rocket pods, and ASMs The Su 17 was introduced in 1970 It is basically a variable-geometry variant of the Su 7B/FITTER A	Has variable-geometry wing system May carry a variety of ground attack weapons, including one 23-mm Gatling-type gun, bombs, rocket pods, and ASMs The FENCER is the first modern Soviet aircraft developed specifically as a fighter-bomber for the ground attack role Although the FENCER somewhat resembles the MIg-27/FLOGGER, it is actually a much larger two seat (side by side) aircraft

FOOTNOTES *Possible nuclear weapon delivery capability
 **Possible electronic warfare configuration

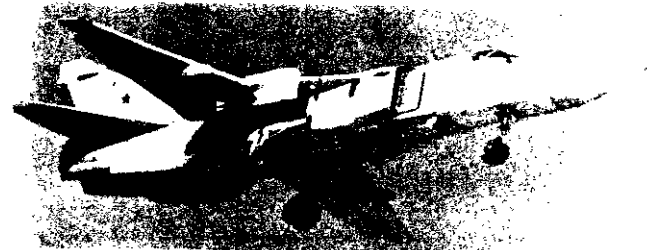
Su-7B/FITTER A



Su-17/FITTER C



Su-24/FENCER



MIg-31/FOXHOUND A

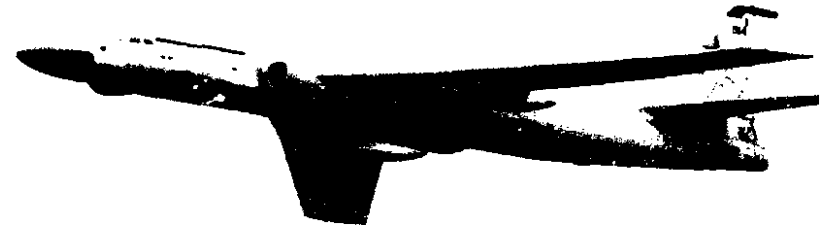


Bomber Aircraft
Bomber aircraft characteristics

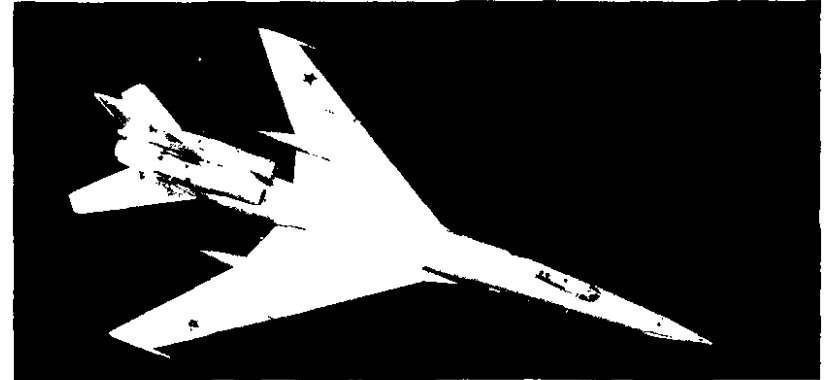
CHARACTERISTICS	Yak-28/BREWER	Tu-16/BADGER	Tu-22/BLINDER	Tu-22M/BACKFIRE B
TYPE	light bomber/ interceptor*	strategic bomber*	strategic bomber*	strategic bomber*
POWERPLANT	2 turbojets	2 turbojets	2 turbojets	2 turbofans
MAXIMUM SPEED				
At altitude (km/hr)	1,175	945	1,480	2,040
At sea level (km/hr)	INA	INA	INA	1,075
UNREFUELED COMBAT RADIUS (km)	925	2,400-3,180	2,250	4,025-4,750
REMARKS	May carry a variety of ground attack and air-to-air weapons	May carry ASMs	May carry a variety of ground attack weapons including ASMs	Introduced in 1974. Has variable geometry wing system. Carries either bombs or AS-4/KITCHEN ASMs. Capable of nuclear strike, conventional attack, antishipping, and reconnaissance missions. Low-level penetration capability. Can be equipped with probes to permit in-flight refueling.

FOOTNOTE *Possible nuclear weapon delivery capability, possible electronic warfare configuration, possible reconnaissance configuration.

Tu-16/BADGER



Tu-22/BLINDER



Tu-22M/BACKFIRE B



Yak-28/BREWER



Characteristics(continued) Tu-160/BLACKJACKA
strategic bomber'

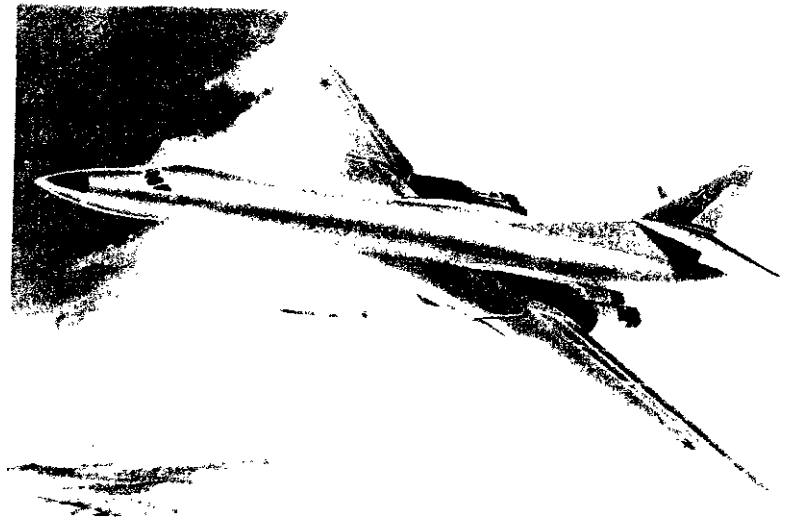
CHARACTERISTICS	Tu-95/BEAR4	Tu-160/BLACKJACKA
TYPE	4 turboprops	4 turbofans
POWERPLANT	926	2,225
MAXIMUM SPEED	INI	INA
At altitude (km/hr)	8,300	7,300
At sea level (km/hr)		
UNREFUELED COMBAT RADIUS (km)		
REMARKS	May carry ASMs	Has a variable geometry wingsystem Capable of lone range subsonic cruise with supersonic high-altitude dash and subsonic/transonic low-level penetration Probably a multiple role aircraft that can deliver both freefall bombs and air launched cruise missiles to intercontinental range

FOOTNOTES Possible nuclear weapon delivery capability
**Possible electronic warfare configuration possible reconnaissance configuration

Tu-95/BEAR



Tu-160/BLACKJACK A



Transport Aircraft
Transport aircraft characteristics

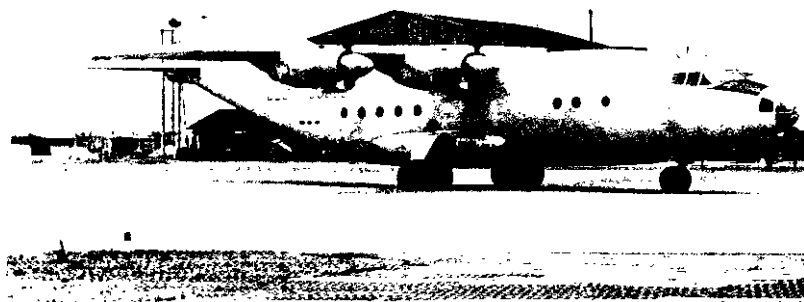
CHARACTERISTICS	An-12/CUB	An-22/COCK	An-26/CURL	An-32/CLINE
TYPE	medium transport*	heavy transport	light transport	light transport
POWERPLANT	4 turboprops	4 turboprops	2 turboprops	2 turboprops
MAXIMUM SPEED (km/hr)	775	740	540	INA
CRUISE SPEED (km/hr)	670	680	425	510
COMBAT RADIUS (km)				
With maximum payload	1,500	2,500	450	400
With maximum fuel	1,800	5,500	1,125	1,100
PAYLOAD				
Cargo	20,000	80,000	5,500	6,000
Combat-equipped troops	90	175	40	40
Paratroops	60	175	40	30
Stretchers	INA	INA	24	24
REMARKS	CUB B, C, and D are ESM/ECM variants			

FOOTNOTE *Possible electronic warfare configuration, possible reconnaissance configuration.

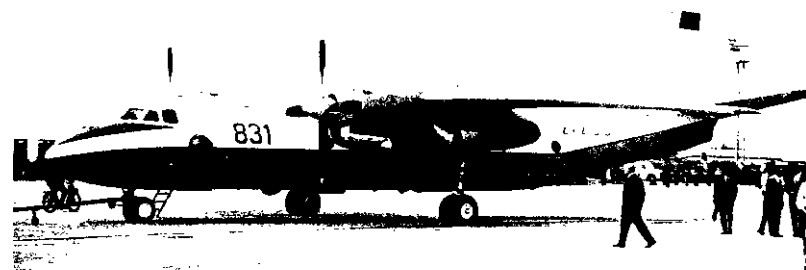
An-22/COCK



An-12/CUB



An 26/CURL

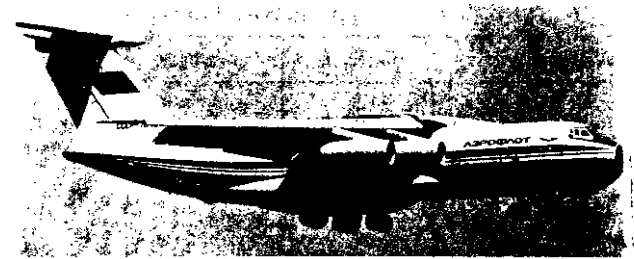


Characteristics (continued)

CHARACTERISTICS	An-72/COALER	Il-18/COOT	Il-76/CANDID	Il-86/CAMBER	An-124/CONDOR A
TYPE	medium STOL transport	medium transport*	heavy transport**	wide-body transport	heavy transport
POWERPLANT	2 turbofans	4 turboprops	4 turbofans	4 turbofans	4 turbofans
MEDIUM SPEED (km/hr)	INA	675	900	INA	INA
CRUISE SPEED (km/hr)	600-700	INA	850	900-950	INA
COMBAT RADIUS (km)					
With maximum payload	500	1,600	3,350	1,800	2,900
With maximum fuel	1,600	2,600	4,900	2,300	INA
PAYLOAD					
Cargo (kg)	6,500	13,500	40,000	INA	150,000
Combat-equipped troops	40	122	150	350	415
Paratroops	40	INA	140	INA	320
Stretchers	24	INA	INA	INA	INA
REMARKS			Some versions have a rear gun turret.		

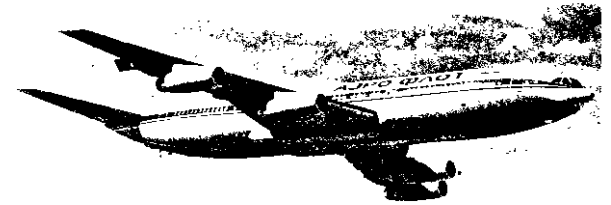
FOOTNOTES. *Possible reconnaissance configuration
 **Possible AWACS configuration

Il-76/CANDID



Soldat und Technik

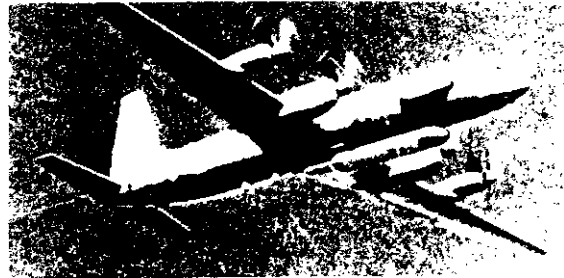
Il-86/CAMBER



An-72/COALER



Il-18/COOT



An-124/CONDOR A



FM 100-2-3

Air-To-Surface Missiles
ASM characteristics

CHARACTERISTICS	AS-2/ KIPPER	AS-3/ KANGAROO	AS-4/ KITCHEN	AS-5/ KELT	AS-6/ KINGFISH	AS-7/ KERRY	AS-9/ KYLE	AS-10/ KAREN
HEIGHT (km)	185-210	650	750-800	320	700-800	NA	NA	NA
Launch altitude	185-210	650	750-800	320	700-800	NA	NA	NA
Altitude	INA	185	300	160	200-220	10	80	8-10
Speed (Mach)	1.2	1.8	2+	0.9-1.2	2.5-3.0	0.6	subsonic	0.5-0.8
PROPULSION	turbojet	turbojet	liquid rocket	liquid rocket	liquid rocket	solid rocket	solid rocket	solid rocket
GUIDANCE	autopilot	autopilot	inertial	autopilot	inertial	—	—	electro-optical
Launch/cruise	autopilot	autopilot	inertial	autopilot	inertial	—	—	electro-optical
Warhead/course	radio command	radio command	inertial	—	inertial	radio command	—	—
Warhead	active radar	—	passive radiation	active radar, passive radiation	active radar, passive radiation	—	passive radiation	possible laser homing
LAUNCH WEIGHT (kg)	4,200	11,000	6,000+	4,800	4,800	1,200	—	—
WARHEAD	HE, nuclear	nuclear	HE, nuclear	HE, nuclear	HE, nuclear	HE	HE	HE
HEIGHT (m)	10.0	14.9	11.3	8.59	10.5	—	—	—
WINGSPAN (m)	9.0	1.85	.50	1.00	.90	—	—	—
WINGSPAN (m)	4.6	9.15	2.45	4.57	2.5	—	—	—
LAUNCH AIRCRAFT	Tu-16/ BADGER C	Tu-95/ BEAR B and C	Tu-22/ BLINDER B, Tu-22M BACKFIRE B, Tu-95 BEAR G	Tu-16/ BADGER G	Tu-16/ BADGER, Tu-22M BACKFIRE B	Su-24/ FENCER, Su-7B/ FITTER A, Su-17/ FITTER C, MiG-27/ FLOGGER D	Su-24/ FENCER and other frontal aviation aircraft	Frontal aviation aircraft (see AS-7/ KERRY)
MISSILES	1	1	1 (BLINDER B) 1-2 (BACKFIRE B)	2	2 (BADGER) 1-2 (BACKFIRE B)	—	—	4?
TYPE	Antiship	Medium/ long-range standoff nuclear against area targets. Strategic.	—	Medium/ long-range standoff missile. Antiship. Antiradar.	Antiship. Standoff strike against land targets from high and low level.	Tactical missile on CAS aircraft.	Tactical missile. Possibly antiship.	Tactical missile on CAS aircraft. Short-range ground attack. Antiarmor.
MARKS	2/3 size of AS-3	Largest ASM. Still operational	Interim weapon on	Supersedes AS-1/KENNEL	Exceptional accuracy.	Normal launch	Large con- ventional	—

RADIOS

Radio performance characteristics

NOMENCLATURE/TYPE	FREQUENCY (MHz)	MODES AND MODULATION	RANGE (km)	OUTPUT (watts)	TUNING	ANTENNA	REMARKS
RADIO STATION	Low HF	INA	INA	900	INA	whip or long-wire	Mounted on two ZIL-151 or ZIL-157 trucks
RADIO STATION	Low HF	INA	INA	INA	INA	INA	Vehicle-mounted, including GAZ-63.
TRANSCEIVER	1.5-4.25 (MF/HF)	AM	INA	20	INA	slant beam, dipole, or long-wire	Manpack or vehicle-mounted, including GAZ-69, employed for MRR and arty regt command nets, being replaced by R-130M
TRANSCEIVER	36-46.1 (VHF)	voice, FM	6-8, 25 with amplifier	1-1.3	continuous	whip or long-wire	Manpack or vehicle-mounted, MRC level, being replaced by R-107
TRANSCEIVER	20-52 (HF/VHF)	voice, FM	6-8	1	continuous, probably four preset frequencies	whip or long-wire	Manpack or vehicle-mounted, company level, also employed with amplifier for TR and arty bn command nets; replacing R-105, R-108, R-109, R-114.
TRANSCEIVER	1.5-19.999 (HF)	voice, (SSB) Morse	6-8, 25 with amplifier	1-1.3	continuous	whip or long-wire	Manpack or vehicle-mounted, employed by arty battery, being replaced by R-107, installations using UM-3 amplifier being replaced by R-111
TRANSCEIVER	21.5-28.5 (HF)	voice, FM	6-8, 25 with amplifier	1-1.3	continuous	whip or long-wire	Manpack or vehicle-mounted, employed by SAM battery; being replaced by R-107; installations using UM-3 amplifier being replaced by R-111
TRANSCEIVER	INA	voice, FM	INA	INA	INA	INA	Replacing R-109M, uses modular construction and automatic tuning circuits
TRANSCEIVER	2.8-4.99 (HF)	voice, Morse, AM	25-60 (voice) 40-100 (Morse)	50 (voice) 90 (Morse)	continuous	whip	Mounted in armored and tactical vehicles, replaced by R-130M
TRANSCEIVER	20-26 (HF)	voice, FM	6-8	INA	continuous	whip or long-wire	Manpack or vehicle-mounted, being replaced by R-107
RADIO STATION	1.5-12 (MF/HF)	voice, Morse teletype, AM	350	400	continuous	zenith	Mounted on GAZ-66, employed by regt and higher.

NOMENCLATURE/TYPE	FREQUENCY (MHz)	MODES AND MODULATION	RANGE (km)	OUTPUT (watts)	TUNING	ANTENNA	REMARKS
R-20M TRANSCEIVER	20-51.5 (HF/VHF)	voice, FM	1655	20-30 (40-70 at halt)	continuous, four preset frequencies	4-m whip or 10-m telescopic	Mounted in armored and tactical vehicles and in fixed installations at company through regt level, can net with all other FM voice command and control radios in Soviet inventory
R-16 TRANSCEIVER	48.5-51.0 (VHF)	voice, FM	2.4	0	continuous, or three preset frequencies (crystals)	whip	Manpack, MRC pit to company
R-12M TRANSCEIVER	1.5-11 (MF/HF)	voice, Morse	30	8	continuous	INA	Manpack
R-130M TRANSCEIVER	1.5-11 (MF/HF)	voice (SSB), Morse teletype, AM	50	12-40	continuous, unknown preset frequencies	whip, dipole, inclined beam	Mounted in armored and tactical vehicles, employed for TB and TR command nets, replaces R-112 and is replacing R-104M in some units
R-143 TRANSCEIVER	F	voice, Morse	20-50	10	INA	whip, long-wire	
R-147 TRANSCEIVER	INA	INA	INA	very low power	INA	INA	Portable, employed in air defense pit of MRB.
R-148 TRANSCEIVER	37-51.9 (VHF)	voice	4-5	low power	INA	whip	Manpack; employed in MRC pit and company, replacing R-126
R-103M RECEIVER	1.5-12 (MF/HF)	voice, Morse, Teletype AM	INA	NA	continuous	INA	Employed with R-118 BM3; R-102M2, and R-103M radio stations
R-155P RECEIVER	INA	INA	INA	INA	INA	INA	Developed as improvement to R-154-2M
R-159 TRANSCEIVER	VHF	INA	INA	INA	INA	INA	Replacing some R-107
R-254M RECEIVER	Low VHF	voice tone	INA	NA	INA	INA	Airdrop assembly aid system, employed by SPETSNAZ, recon units, and paratroopers to locate airdropped BMDs and cargo pallets bearing marker beacon radios
R-255PP RECEIVER	INA	INA	INA	INA	INA	INA	Used for airdrop assembly aid
R-31 RECEIVER	1-15 (MF/HF)	voice, Morse AM	NA	NA	continuous	whip, long-wire, or directional	Manpack or vehicle-mounted, employed to monitor air warning and NBC communications nets

Characteristics (continued)

NONMENCLATURE/TYPE	FREQUENCY (MHz)	MODES AND MODULATION	RANGE (km)	OUTPUT (watts)	TUNING	ANTENNA	REMARKS
R-313-M2 RECEIVER	100-400 (VHF/UHF)	voiceMorse	NA	NA	continuous	whip, long-wire	Probably used with electronic warfare units.
4-350M BURST-TRANSMISSION RADIO	INA	INA	INA	INA	INA	INA	Employed by SPETSNAZ.
R-352 TRANSCEIVER	Low VHF	voice	3	1.2	three fixed frequencies	INA	
R-392A TRANSCEIVER	approx. 44-46 (VHF)	voice	2-3 (estimate)	1-2 (estimate)	continuous, probably six preset	whip	Manpack; probably employed in MR plnt and company.
R401M/R-403 RADIO-RELAY STATION	60-70 (VHF)	four-channel (two voice, two telegraph); FM	40-50	2.5	continuous, choice of 54 frequencies	twin yagi	Vehicle-mountedemployed at regt level and higher.
R-404 RADIO-RELAY STATION	1,500-2,000 (UHF)	multichannel voice, data, facsimile; FM	LOS	10	INA	0.5-m or 1.5-m twin pababolic dish	Mounted in three box-body vehicles.
R-405 RADIO-RELAY STATION	390-420(UHF), 60-69.975 (VHF)	multichannel voice, data, facsimile; FM	LOS	2.5	detent	crossed yagi, planar reflector	Mounted on ZIL-131: employed in division-level and high command and admin nets; R-405 is an R-401 with extra amp and frequency doubler and tripler.
R-409 RADIO-RELAY STATION	INA	multichannel FM	LOS	INA	INA	rectangular grid	Mounted on ZIL-131 or ZIL-157 van; employed at division level and higher.

Glossary

Acronyms, Abbreviations, and Definitions

AA — antiaircraft	C2 — command and control
AAA — antiaircraft artillery	C3 — command, control, and communications
AAG — army artillery group	CAA — combined arms army
AAICV — amphibious airborne infantry combat vehicle	CBU — cluster bomb unit
AAM — air-to-air missile	cdr — commander
ACRV — artillery command and reconnaissance vehicle	CEP — circular error probable
acq — acquisition	CES — chief of engineer services
ACV — armored command vehicle	CGF — Central Group of Forces
admin — administrative	CINC — commander in chief
AGI — auxiliary general intelligence (ship)	cm — centimeter
AICV — amphibious infantry combat vehicle	CMTA — chief of missile troops and artillery
AM — amplitude modulation	CN — chloroacetophene
ammo — ammunition	co — company
amp — amplifier	COMINT — communications intelligence
An-(no.) — Soviet designation for aircraft from Antonov design bureau	COP — command observation post
AP — armor-piercing (round); antipersonnel (mine)	CP — concrete-piercing
APC — armored personnel carrier	CPSU — Communist Party of the Soviet Union
APC-T — armor-piercing capped tracer	CRP — combat reconnaissance Patrol
API — armor-piercing incendiary	CS — combat support
API-T — armor-piercing incendiary tracer	CSS — combat service support
AP-T — armor-piercing tracer	cyl — cylinder
APVO — Aviation of National Air Defense	DAG — division artillery group
arty — artillery	decon — decontamination
AS-(no.) — US designation for Soviet air-to-surface missile	DF — direction finding
ASC — armored scout car	DM — adamsite
ASM — air-to-surface missile	DOI — date of introduction
ASW — antisubmarine warfare	DOSAAF — Voluntary Society of Assistance to the Army, Aviation, and Navy (premilitary training organization)
AT — antitank	DS — direct support
AT-(no.) — US designation for Soviet antitank guided missile	DZ — drop zone
ATGL — antitank grenade launcher	ECM — electronic countermeasures
ATGM — antitank guided missile	ELINT — electronic intelligence
auto — automatic	EMP — electromagnetic pulse
aux — auxiliary	ESM — electronic warfare support measures
AWACS — airborne warning and control system	est — estimated
	EW — early warning; electronic warfare
BAF — battalion assault force (naval infantry)	FAC — forward air controller
BAZ — heavy transport vehicle produced by Bryansk Automobile Plant	FEBA — forward edge of the battle area (US acronym used in this manual as the equivalent of the Soviet term "forward edge")
BMP — Soviet abbreviation for infantry combat vehicle	FDC — fire direction center
bn — battalion	FLOT — forward line of own troops
BTR — Soviet abbreviation for armored personnel carrier	FM — frequency modulations; field manual
btry — battery	FO — forward observer
BVR — beyond visual range	FOP — forward observation post

FM 100-2-3

Frag — fragmentation
Frag-HE — fragmentation high-explosive
Frag-T — fragmentation tracer
Frag-HE-T — fragmentation high explosive tracer
freq — frequency
FROG — free rocket over ground
FS — fin-stabilized
FSE — forward security element (of the advance guard)

g — gram
GAZ-(no.) — medium truck produced by Gorkiy Motor Vehicle Plant
GPMG — general purpose machine gun
grd — ground
GRU — general staff's main intelligence directorate
GTO — All-Union Sports-Technical Complex Ready for Labor and Defense of the USSR

HCF — High Command of Forces
HE — high explosive
HEAT — high explosive antitank
HEAT-FS — high explosive antitank fin-stabilized
HEAT-SS — high explosive antitank spin-stabilized
HEI — high explosive incendiary
HEI-T — high explosive incendiary tracer
HEP — high explosive plastic
HF — high frequency
hp — horsepower
HQ — headquarters
hr — hour
HVAP — hyper-velocity armor-piercing
HVAPFSDS — hyper-velocity armor-piercing fin-stabilized discarding sabot
HVAP-T — hyper-velocity armor-piercing tracer

ICM — improved conventional munitions
IFF — identification, friend or foe
IFV — infantry fighting vehicle
Il-(no.) — Soviet designation for aircraft from Ilyushin design bureau
INA — information not available at the unclassified level
INF — Intermediate-Range Nuclear Forces
intcp — intercept
IR — infrared
IRBM — intermediate-range ballistic missile
I-T — incendiary tracer
ITB — independent tank battalion

Ka-(no.) — Soviet designation for helicopter from Kamov design bureau
KamAZ-(no.) — medium truck produced by Kama River Motor Vehicle Plant

kg — kilogram
KGB — Committee for State Security
kg/cm² — kilograms per square centimeter
km — kilometer
km/hr — kilometers per hour
KRAZ-(no.) — heavy truck produced by KremenchugMotor Vehicle Plant

LMG — light machine gun
LOC — line of communications
LOP — lateral observation post
LOS — line of sight
LRA — long range aviation
LuAZ-(no.) — light truck produced by LutskMotor Vehicle Plant
LZ — landing zone

m — meter
m/sec — meters per second
MAZ-(no.) — heavy truck produced by Minsk Motor Vehicle Plant
MCLOS — manual-command-to-line-of-sight guidance
MF — medium frequency
MG — machine gun
m³/hr — cubic meters per hour
m/hr — meters per hour
MHz — megahertz
Mi-(no.) — Soviet designation for helicopter from Mil design bureau
michman — warrant officer, navy
MiG-(no.) — Soviet designation for aircraft from Mikoyan-Gurevich design bureau
min — minute
mm — millimeter
MOD — Ministry of Defense
MOP — mobile observation post
MPA — Main Political Directorate
MRB — motorized rifle battalion
MRBM — medium-range ballistic missile
MRC — motorized rifle company
MRD — motorized rifle division
MRL — multiple rocket launcher
MRP — mobile reconnaissance post
MRR — motorized rifle regiment
MSD — movement support detachment (engineer element)
mt — metric tons
MVD — Ministry of Internal Affairs

NA — not applicable
NAC — new army corps
NATO — North Atlantic Treaty Organization
NBC — nuclear, biological, chemical

Glossary-2

- NBDF** — nuclear burst direction-finding
- NCO** — noncommissioned officer
- NGF** — Northern Group of Forces. Poland
- OMG** — operational maneuver group
- pl** — platoon
- POL** — petroleum, oils, lubricants
- PPO** — primary party organization: mobile training post
- PGM** — precision-guided munitions
- praporshchik** — warrant officer, army
- PRTB** — Soviet abbreviation for mobile rocket technical base
- PVO Strany** — National Air Defense Troops
- PVO Sukhoputnykh Voysk** — air defense troops of the ground forces
- PWP** — plasticized white phosphorus
- RAG** — regimental artillery group
- RAP** — rocket-assisted projectile
- RAST** — Soviet abbreviation for mobile analytical plotting station (also known as mobile computation and analysis station)
- rd** — round
- rd/min** — rounds per minute
- RDF** — radio direction finding
- REC** — radioelectronic combat
- recon** — reconnaissance
- REG** — repair and evacuation group
- regt** — regiment
- rkh** — Russian abbreviation (literally: radio-chemical) used as suffix in Soviet designations for NBC reconnaissance vehicles
- ROTC** — Reserve Officers' Training Corps
- RTO** — radio telephone operator
- RVGK** — Reserve of the Supreme High Command
- SA(no.)** — US designation for Soviet surface-to-air missile
- SACLOS** — semiautomatic-command-to-line-of-sight guidance
- SAM** — surface-to-air missile
- sec** — second
- SGF** — Southern Group of Forces
- shp** — shaft horsepower
- SIGINT** — signals intelligence
- SLAR** — side-looking airborne radar
- SLP** — semiactive laser-guided projectile
- SP** — self-propelled
- SPAAG** — self-propelled anti-aircraft gun
- SPETSNAZ** — Soviet acronym for (troops of) special designation, also known as special purpose forces
- SRBM** — short-range ballistic missile
- SRF** — strategic rocket forces
- SS** — spin-stabilized round
- SS(no.)** — US designation for Soviet surface-to-surface missile
- SSB** — single sideband
- SSM** — surface-to-surface missile
- STOL** — short takeoff and landing aircraft
- Su(no.)** — Soviet designation for aircraft from Sukhoi design bureau
- TA** — tank army
- TASM** — tactical air-to-surface missile
- TB** — tank battalion
- TBr** — tank brigade
- TD** — tank division
- TDY** — temporary duty
- TEL** — transporter-erector-launcher
- TELAR** — transporter-erector-launcher and radar
- TOE** — table(s) of organization and equipment
- TOP** — technical observation point
- TR** — tank regiment
- Tu(no.)** — Soviet designation for aircraft from Tupolev design bureau
- TV** — theater of war
- TVD** — theater of military operations
- UAZ(no.)** — light truck produced by Ulyanovsk Motor Vehicle Plant
- UHF** — ultra high frequency
- U/I** — unidentified
- Ural(no.)** — medium truck produced by Ural Motor Vehicle Plant
- US** — United States
- USSR** — Union of Soviet Socialist Republics (Soviet Union)
- UW** — unconventional warfare
- VEESS** — vehicle engine exhaust smoke system
- VGK** — Supreme High Command
- VHF** — very high frequency
- VOSO** — Central Military Transportation Directorate
- Voyska PVO** — air defense troops
- VTA** — military transport aviation
- VTOL** — vertical takeoff and landing
- VVS** — Soviet Air Force
- WGF** — Western Group of Forces
- WP** — white phosphorus
- Yak(no.)** — Soviet designation for aircraft from Yakovlev design bureau

FM 100-2-3

zampolit — deputy commander for political affairs
ZIL-(no.) — medium truck from Likhachev Motor Vehicle
Plant

ZRTB — Soviet abbreviation for air defense rocket
technical base

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