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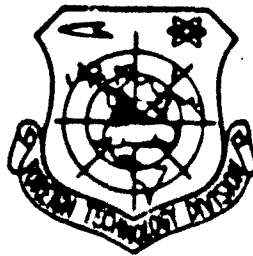
# FOREIGN TECHNOLOGY DIVISION



PRESENT AND FUTURE U.S. AND SOVIET CHEMICAL MISSILES AND CHEMICAL ROCKET PROJECTILES

by

Zhang Guochang



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PRESENT AND FUTURE U.S. AND SOVIET  
CHEMICAL MISSILES AND CHEMICAL ROCKET PROJECTILES

Zhang Guochang

In the Soviet and U.S. arsenal of chemical weapons, chemical missiles and chemical rocket projectiles occupy an especially important position. The missiles are a kind of "risk-free" remote chemical assault device, while the rocket projectiles are powerful antipersonnel weapons effective at close range and over a large area. Both countries have devoted a great effort to the development of chemical missiles and rocket projectiles. Currently, the U.S.S.R. has a clear superiority in the field, but the U.S. is rousing itself to catch up, thanks to its development and broad deployment of dual chemical weapons.

Key words: Chemical bombs, Surface to Surface Missiles, Chemical Warheads, Multibarrel Rocket Guns, Rocket Launchers, Gun Launchers, Assault Weapons, CHEMICAL MISSILES

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Both the U.S.S.R. and the U.S. are equipped with many kinds of tactical surface-to-surface missiles carrying chemical warheads. The chemical combat apparatus of this kind of weapon includes a number of small chemical bombs, each carrying several hundred grams of highly toxic chemical warfare preparations. This kind of chemical warfare unit is exploded by a radar-activated detonator at an altitude of about three kilometers over its target; the area over which the chemicals are spread can be as large as a square kilometer.

The Soviet Army holds that surface-to-surface chemical missiles are the most effective means of undertaking chemical attacks against important objectives (for example, airfields, communications hubs, nuclear installations, harbors and important command centers) deep in the enemy's territory: They offer an element of surprise beyond that of paratroop operations, and are not subject to the threat of antiaircraft fire power. For this reason, among its tactical surface-to-surface missiles, about one-third are equipped with chemical warheads. In the period before the 1970's, the "Frog-7" (range, 65 km), the "Fleetfoot-B" (range, 280 km), and the "Sheetmetal" missiles (range 700-800 km) were all equipped with chemical



Fig. 1. One-third of Soviet tactical missiles are equipped with chemical warheads. This is a "Fleetfoot-B" missile so equipped.

warheads. Since the 1970's, the Soviet Army's tactical missiles have entered a new generation, and their chemical warheads have been replaced accordingly. The most recently supplied SS-21 missiles (range, 120 km; eventual replacement for the "Frog-7"), the SS-22 missile (range, 1000 km, eventual replacement for the "Sheetmetal"), and the SS-23 (range, 500 km, eventual replacement for the "Fleetfoot-B") include chemical warheads among their equipment. The U.S.S.R. also places great emphasis on developing chemical warheads for strategic missiles. For example, among 441 mid-range SS-20 missiles (range, 5000 km), half are equipped with chemical warheads.

American Army chemical missile equipment shows a great disparity in comparison with the Russian. The American Army, which had equipped the now-retired "Sergeant" missile with chemical warheads, currently only has the "Lance" missile so equipped. In order to shrink this gap, the American Army, in its dual chemical weapon plan, has enhanced the development of its dual chemical missile warhead. Among the nearly twenty kinds of dual chemical ammunition in the plan, there are five kinds of chemical missile warheads. These are the warheads for the "Lance" missile (range, 112 km), the joint tactical missile system (range exceeding 200 km), the "Pershing Ia" missile (range, 720 km), the "Pershing II" medium-range missile (range 1800 km), and the medium-range cruise missile (range 2400 km).

On 8 December 1987 the heads of the Soviet and American governments officially signed the medium-range missile treaty. If this treaty can be implemented, the two countries' medium-range and medium/short-range missiles, with a range of 500 to 5000 kilometers, will be entirely eliminated within three years after the treaty takes effect. In this way, the Soviets' "Sheetmetal," SS-22, SS-23 and SS-20 missiles' chemical warheads will also be eliminated. The Americans' plans for developing dual chemical warheads for the "Pershing Ia," the "Pershing II" medium-range missiles and the medium-range cruise missile will also be cancelled. The Soviets' "Frog-7" rocket, SS-21 missile, and the "Fleetfoot-B" missile will still have chemical warheads; the dual chemical warheads that the Americans will continue to develop are those of the "Lance" and joint tactical missile system. The U.S.,

since it will be able to concentrate the manpower and financial resources originally destined for the development of the five kinds of chemical warheads mentioned above on the development of two kinds of chemical warheads, will greatly accelerate its progress; the expectation is that it will develop and manufacture these two varieties within five to eight years.

#### CHEMICAL MISSILE PROJECTILES

The effectiveness of chemical weapons depends to a great extent by the suddenness and scale of the chemical assault. Only if a sufficient concentration of antipersonnel chemicals is released suddenly and over an extremely short time in the target area can the objective of causing large-scale casualties be attained. In accordance with this requirement, multi-barrel rocket guns (launching systems) are the chemical assault weapon of choice.

The Soviet Union was the first to recognize this point. As early as the beginning of the 1950's, it provided hydrocyanic acid rocket projectiles for its first model multi-barrel rocket gun (BM-13), and thereafter in succession provided twelve models of chemical rocket projectiles for seven models of multi-barrel rocket guns. The three models of multi-barrel rocket guns currently in active service with the Soviet Army (models BM-21, BM-14, and BM-27) all have chemical capabilities. Of these, the 122 mm 40-barrel BM-21 rocket gun is currently one of the Soviet

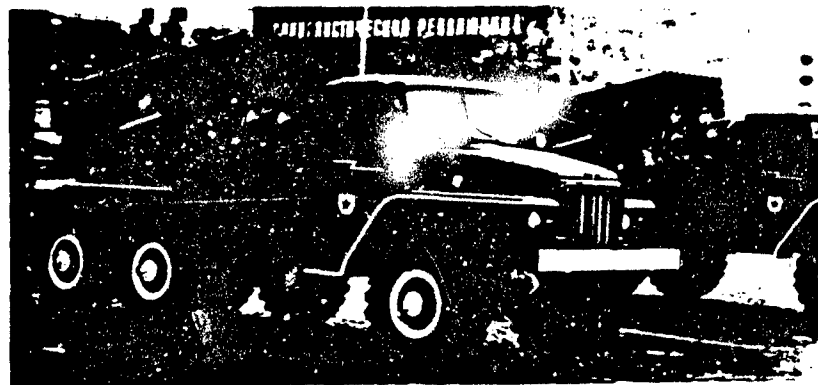


Fig. 2. The Soviet Union's model BM-21 40-barrel rocket gun. It is the Soviet Army's principal weapon for chemical attacks against close-range objectives.

Army's main pieces of equipment for close-range chemical attacks. Every motorized infantry division and tank division of the Soviet army have incorporated a multi-barrel rocket gun battalion, equipped with 18 BM-12 rocket guns capable of launching 720 chemical rocket projectiles within 20 seconds, delivering over 3,000 kilograms of highly toxic nerve chemicals to the target area. Czechoslovakia has already placed in service an improved model of the BM-21, the M1972 rocket gun. The special feature of the M1972 is that it can be automatically reloaded after launching, reducing the loading time from an original ten minutes to five minutes. The M1972 rocket gun is also used by Warsaw Pact countries such as East Germany. The newest model BM-27 multi-barrel rocket gun (range, 35-40 km), with which the Soviet Army supreme command is preparing to equip artillery divisions and group armies, also has chemical warfare capabilities; it is able to fill in the gap between the BM-21 multi-barrel rocket gun, with its range of 20 kilometers, and the "Frog-7" rocket with its 65-kilometer range. Soviet airborne divisions are equipped with towed BM-14 multi-barrel rocket guns, which if necessary can also fire chemical projectiles.

Although the United States also considers it important to have at its disposal the chemical attack power of multi-barrel rocket guns, nevertheless, because it has not appreciated the importance of interchangeability between chemical and conventional weapons, it has taken a roundabout course in its thinking concerning planning, development, and provisioning. The American Army at the beginning of the 1960's provided the M91 115 mm 45-barrel rocket gun, which was specifically designed for chemical projectiles; this kind of weapon suffered from a lack of interchangeability, and gave rise to many problems. For example, in a conventional war, in which chemical weapons were not deployed, the only possibility was to shelve a large number of rocket guns for a long period. Once preparations were made for a chemical attack, the mobilization of chemical rocket gun units equipped with many rocket guns and their vehicles amounted to a issuing a chemical attack warning. For this reason, in the middle of the 1970's, the American Army decided to scrap the

M91 and its associated M55 chemical rocket projectile; nearly 500,000 rocket projectiles (shalin, VX) are undergoing destruction.

In 1983, the American Army began to deploy a kind a very advanced multi-barrel rocket launching system (MLRS). This system was developed by the United States, England, France, West Germany and Italy in cooperation; it is a weapon system for the common use of NATO. During development, special attention was paid to principles of use. In addition to being used with double-use composite combat units, antitank composite combat units, and end guidance antitank composite combat units, it can also be used with dual chemical warfare combat units. Based on reports, the chemicals selected for use with the dual chemical combat units is a dual chemical of medium volatility; it may be a kind of thickened or improved soman. In 1984, this kind of dual chemical warhead had already entered the stage of full-scale development, and been christened the XM-135

chemical warhead. Recently, the American Army has designated the XM-135 dual chemical warhead as one of the critical development projects in its dual chemical planning for the near future. It is anticipated that this warhead will go into production in the early 1990's.



Fig. 3. The most recent multi-barrel rocket launcher system (MLRS) provided by the U.S. Army. The dual chemical rocket projectiles developed by the Army will be distributed to the units in the early 1990's.

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