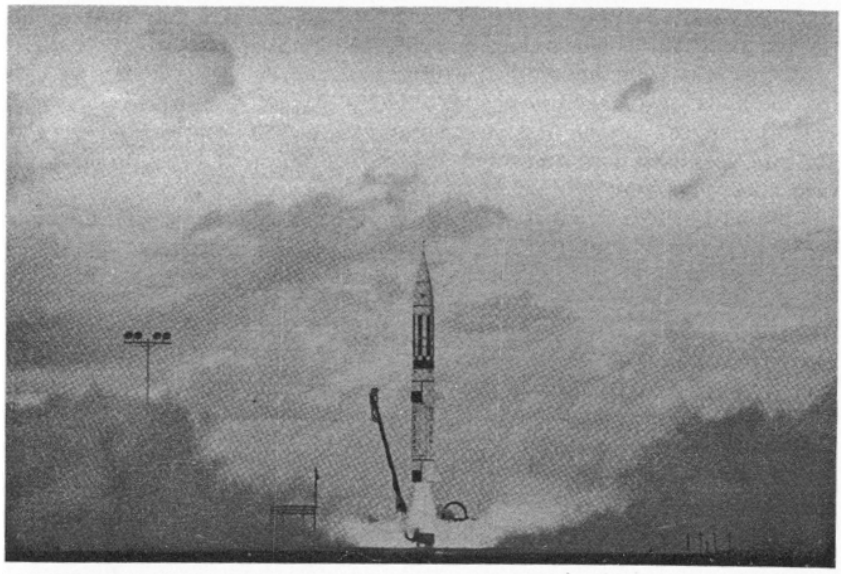
THE PERSHING MISSILE - -

The Army's "Blackjack"



Bearing the proud name of General John J. "Blackjack" Pershing, the Army's newest second generation missile roared skyward recently at Cape Canaveral, Florida. The Pershing missile made its debut on schedule in late February at the Atlantic Missile Range (fig 15), less than two years after the Army awarded initial contracts for the project in March 1958.

Development of the Pershing has been on an accelerated basis. It is designed to eventually replace the Redstone as the field artillery's longest range surface-to-surface weapon. The missile now has officially entered the research and development stage. Only the first stage of the missile has been fired in early tests.

In its tactical version, the 32-foot Pershing is smaller and lighter than the Redstone (69 feet 4 inches). It is a two-stage, solid propellant, ballistic missile, with a selective range reported to be up to 500 miles. Its inertial guidance system is immune to known electronic jamming devices.

The transporter-erector-launcher (TEL), which carries the missile (less warhead), is transported on one XM474 (fig 16). The TEL is an electro-mechanical system and part of the ground handling equipment.

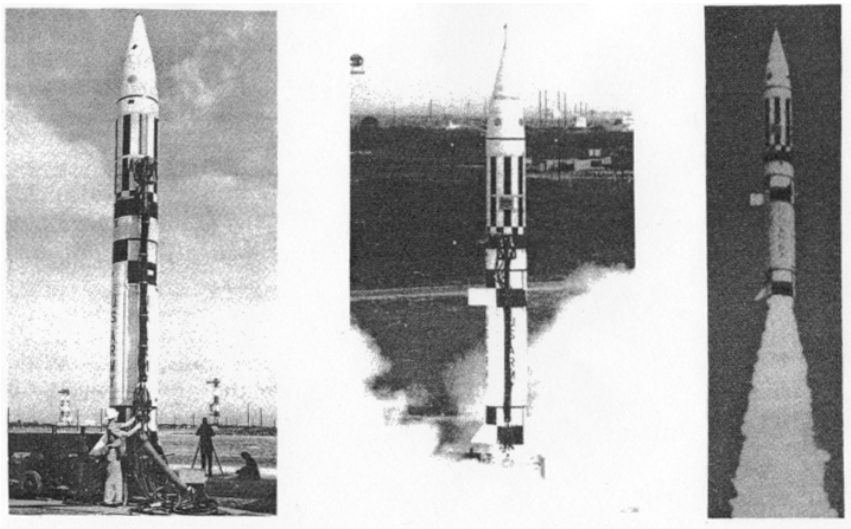


Figure 15. The Pershing in three stages of its initial firing at Cape Canaveral, Florida. The missile is being prepared at left, is lifting off its launcher in the center, and is on its way down range at right.

Figure 16. The Pershing on its transporter-erector-launcher which is mounted here on the XM474 track vehicle. Note the launching platform already on the ground at the rear of the vehicle.

Its function is to mount and erect the missile into its firing position, supporting it accurately at the proper azimuth until the missile lifts off.

The TEL is designed so that it can be transported easily by air as well as on the XM474 vehicle. It has four wheels and pneumatic tires that enable it to be towed short distances, and to be maneuvered into the firing position.

The TEL includes a dual-track erector supported on the transporter chassis. The launching platform is mounted at the rear of the transporter and is pivoted so that it can be rotated to the ground, where it is supported by leveling jacks (fig 16).

MISSILE CARRIED HORIZONTALLY

During transport the missile is carried in a horizontal position on the erector, which is also pivoted at the rear of the transporter. At the firing position, after the launch pad is rotated to the ground and leveled, the erector raises to the vertical position, placing the missile on the launcher (fig 17).

In keeping with the Army's approach to developing this system, all aspects of the Pershing program are being conducted in parallel rather than in series. For example, engineering test firings and Army test firings are scheduled concurrently rather than consecutively.

The joint Army-industry team is keeping the system as tactical as possible throughout its development phase. This means an early introduction of tactical ground-support equipment in the flight test program.

The primary goals of the Pershing system are to develop a highly reliable weapon with a short reaction time. The Pershing's solid propellant is an important factor in obtaining its light weight and high mobility. There is no need for the heavy and cumbersome propellant generating and transporting equipment associated with liquid propellant missiles. Since there is no requirement for loading propellant at the firing position, the Pershing system's reaction time will be considerably shorter.

GROUND-SUPPORT EQUIPMENT

High mobility is further enhanced by the prime mover and the ground-support equipment required to prepare and fire the missile. The ground-support equipment includes the TEL, primary power pack, communication equipment, fire control equipment (computers, azimuth laying equipment, and other system components), test and checkout equipment through all levels of maintenance, plus the necessary huts and shelters. The Pershing system is both ground and air transportable.

All of the ground-support equipment will be carried on lightweight, full-track vehicles capable of moving cross country on all terrain. The prime mover for the missile and all of its equipment is the XM474, a lightweight, low silhouette track vehicle. The use of one type vehicle in the unit should greatly reduce maintenance problems.

The XM474 has a gross weight of about 11,000 pounds. It has an overall length of 16 feet 10 inches, a height of 6 feet 4 inches, and a

width of 8 feet 4 inches. The ground clearance of the XM474 is 16 inches, and it can ford a depth of 42 inches of water. The maximum speed of the vehicle is about 40 miles per hour.

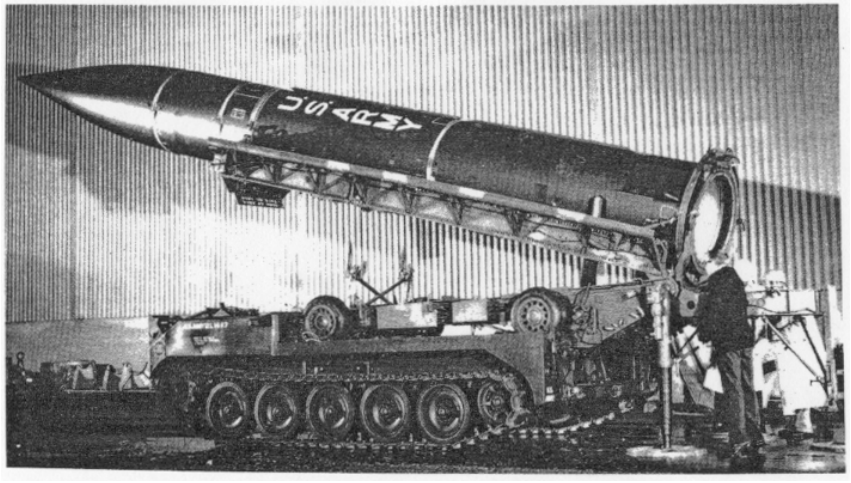


Figure 17. The Pershing being raised by the erector to the vertical position.

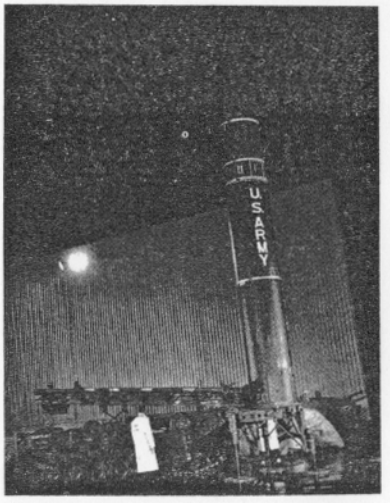


Figure 18. The missile now is in the vertical position and is resting on the launching platform. Note that the erector has dropped away from the missile and returned to the horizontal position.

The erector then returns to the horizontal position (fig 18), leaving the missile resting in a vertical position on the azimuth ring of the launcher. Under command of the fire control unit, the azimuth position of the missile is adjusted accurately before firings.

Control cables, air ducts, and high-pressure air lines necessary to precondition, checkout, and fire the missile are mounted in a cable mast. The lower end of the cable mast is mounted in a bracket attached to the launcher azimuth ring, and the upper end is engaged with electrical and air connections in the missile. During the firing procedure, prior to ignition, the upper end of the cable mast is automatically ejected from engagement with the missile. One of the features of the TEL is that the cable mast is not damaged or destroyed during firing. While the upper end of the mast is ejected a sufficient distance from the missile to provide clearance for firing, a brake in the bracket at the lower end quickly stops the movement of the mast and holds it in a near vertical position. Since the mast is prevented from falling to the ground it is not damaged and may be used repeatedly as a permanent part of the TEL.

Test and checkout equipment, located in the tracked vehicle (XM474) transported fire control hut, accomplishes most of the prefire checkout, and can isolate faults within the missile and ground equipment. The countdown and launch equipment, also in the fire control hut, accomplishes the prefire countdown sequencing and provides for monitoring the same. The portable remote fire control box, which fires the missile, also is a part of this equipment.

The Army Ballistic Missile Agency (ABMA) has technical supervision of the Pershing program. The prime contractor for the complete missile system is the Martin Company.

Through a careful analysis of the Army's needs and by consistently using the latest advances in guided missile technology, the Pershing missile is intended to provide the Army with a truly modern weapon. The mobility, flexibility, and rapid reaction time which will be characteristic of the Pershing system should add considerably to the Army's capability for accurate application of firepower to highly selective targets.

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