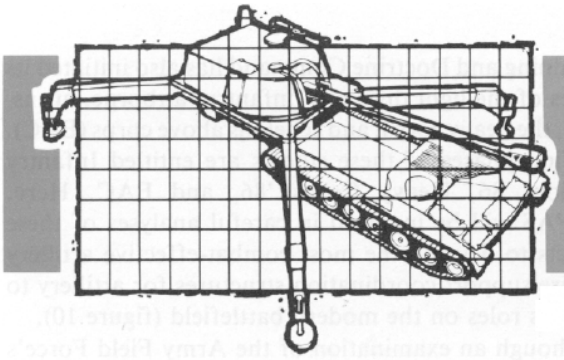


FA Test and Development

design • development • testing • evaluation

Pershing II launch slated for April 1982

First launch of the Pershing II missile now in the engineering development phase of a $1.5 billion program will be in April 1982. A total of 28 firings and simulated launches will be conducted between that date and August 1983, followed by a DSARC III meeting to decide on production. If the decision is positive, initial deployment in Europe would come in late 1983.

The decision to deploy Pershing II and the ground launched cruise missile in NATO, made in December 1979 by defense ministers of the alliance, has had no visible effect on the Pershing program. But Pershing II officials, like their counterparts in the GLCM program, say that if the decision had been negative there would have been an adverse impact.

The April 1982 date marks a major milestone in the Pershing II project. Of the 28 firings that will begin in 1982, prime contractor Martin Marietta will perform the first 14, with close monitoring by the Army development community. The remaining 14 will be strictly Army, with developers as well as operational units participating. Tests in this development and operational test and evaluation (D/OTE) series will take place at a number of locations, including White Sands Missile Range, NM, and Fort Sill, OK. (Only "dry" firings will be performed at Fort Sill.)

Prior to actual test firing, several actions remain to be accomplished. In FY80, for example, continued flight testing aboard helicopters and jet aircraft of the correlator portion of the Goodyear guidance system is slated, material must be procured for the prototype air vehicles and ground support equipment, prototype re-entry vehicles must be fabricated, wind tunnel testing of the Hercules propulsion sections will be performed, and work will continue on a "referencing generation facility" for the guidance part of the program.

In FY81, development testing of the propulsion sections will be completed, preliminary flight readiness testing of the motors will be carried out, wind tunnel testing will be completed, and numerous tests will be made of systems and subsystems that have been used before, but never in the Pershing II "environment."

In FY82, static testing of the propulsion sections is slated, and fabrication of prototype ground support equipment will be completed.

New ground support equipment (GSE) is required since one of the goals of the Pershing II program is to have fewer people involved in the field. The Army has told Congress, however, that Pershing II will be deployed "in a similar manner" to the Pershing Ia now operational in Europe. This concept envisions three US battalions of four firing batteries each with three firing platoons consisting of three erector launchers with missiles. The Army now has 108 Pershing Ia launchers, with the number of missiles being classified. Pershing II would replace the earlier models, however, on a one-for-one basis.

Ammunition resupply improvements studied

The man-machine interface in ammunition resupply has been under intensive study for more than a year. Officials at the Human Engineering Laboratory, Aberdeen Proving Ground, MD, state that results of the tests conducted could have wide-ranging effects on future Army logistics procedures.

The Human Engineering Laboratory Forward Ammunition Supply and Transfer, or HELFAST, project is measuring the Army's current ammunition resupply capability, defining resupply problems, and suggesting remedies. More than 1,200 tests have been conducted in a simulated corps ammunition supply point, duplicating a tactical environment. Tests have been run both day and night and involved loading and unloading various sizes of ammunition on and off trucks.

The HELFAST team expects to submit its final report containing problems and recommended solutions within the next six months.

New air-to-ground data link under development

A vital air-to-ground data link for two major Army weapons systems is now in full-scale development for the Army Electronics Research and Development Command (ERADCOM). The Modular Integrated Communications and Navigation System (MICNS) will be used not only on the Army's Standoff Target Acquisition System (SOTAS) and unmanned vehicles including the Remotely Piloted Vehicles (RPV), but will also play a significant role in the Air Force Precision Location System (PLS).

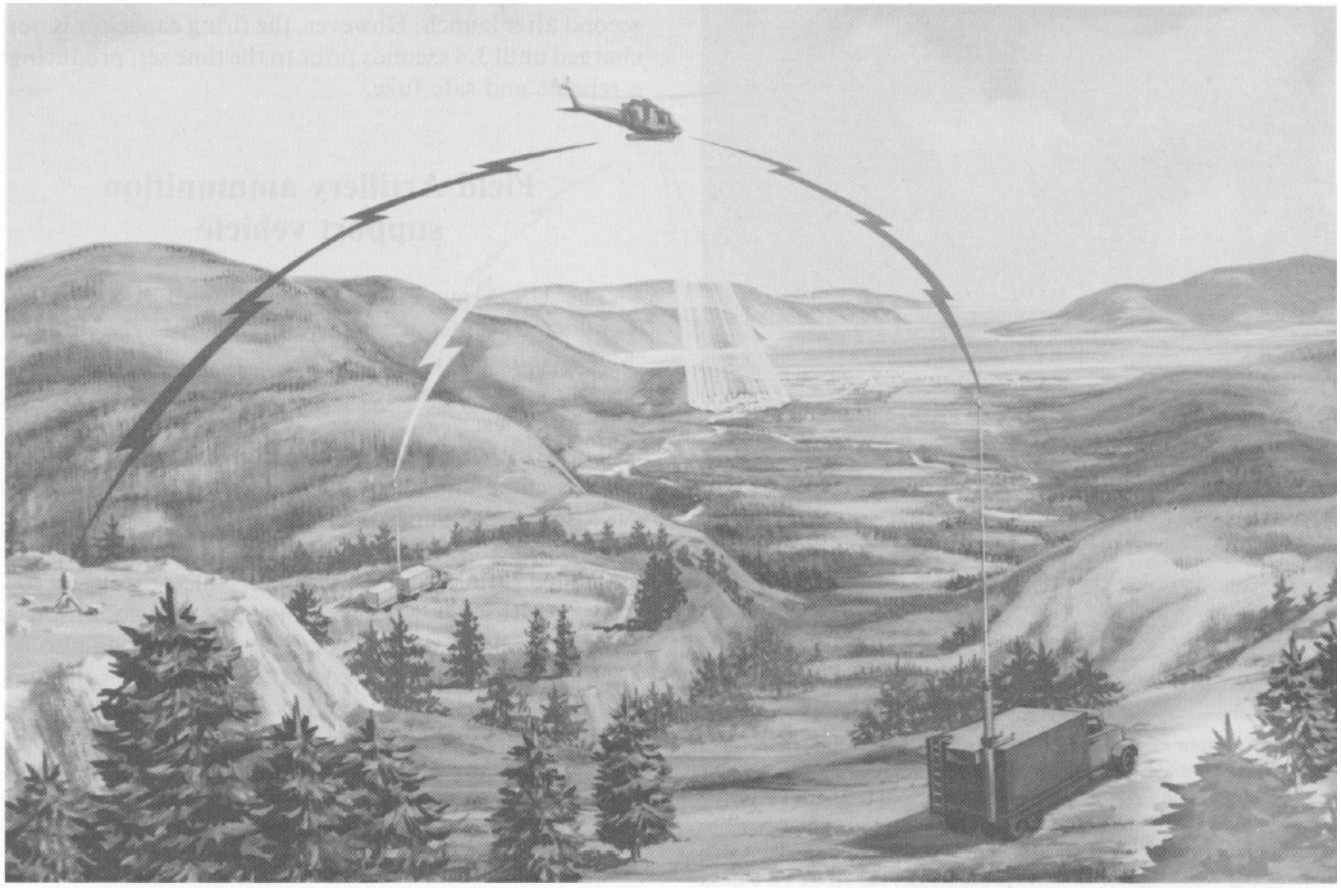
According to the MICNS project officer, Mr. Bernard Reich, "The key feature is its commonality of hardware which make up the airborne and ground data terminals of the system. The design is based on modular building blocks that will give future systems the anti-jam capability for command communications application, including the transmission of video data."

The air and ground data link will use 18 Complementary Metal Oxide Silicon on Sapphire Semiconductors (CMOS/SOS) and eight other high technology custom Large Scale Integration (LSI) circuits used primarily in military applications. These circuits provide high speed data processing using relatively low power. The size, weight, and power problems in the RPV and PLS data terminals dictated their maximum use as well as the application of the LSI and hybrid microwave integrated circuits.

MICNS will be incorporated into the Army's SOTAS, which, in the REFORGER exercises of 1976 and 1977, was called "the single most effective and valuable collector of (targeting) intelligence." The SOTAS radar, mounted on a modified Black Hawk helicopter, can detect and locate moving targets deep within enemy territory even at night. Once generated, the data is transmitted via MICNS to a ground control station where a field commander can determine the most appropriate artillery to use on the target.

In carrying out its prime mission of seeking out targets beyond the forward edge of the battle area, an RPV will use a television camera and with MICNS provide real time imagery of targets which are beyond the range of ground observers.

First delivery of MICNS is expected during the latter part of 1980. Harris Corporation, Melbourne, FL, is the development contractor.



The Modular Integrated Communications Network, an air-to-ground data link, is used to transmit targeting information acquired from helicopter or other airborne radars and sensors to ground-based stations.

Night vision devices

Two contracts totalling more than $12 million were recently awarded for continued production of night vision equipment by the Electronics Research and Development Command's contracting office at Fort Monmouth, NJ. These devices allow battlefield observation during darkness and poor visibility.

Numax Electronics, Hauppauge, NY, received over $5 million for night vision sights for individual and crew-served weapons. The two sights have a common eyepiece, image intensifier assembly, battery, and housing, which reduce acquisition and life cycle costs. Only the objective lenses are different.

The individual weapons-mounted scope (AN/PVS-4) used on the M16 rifle and M60 machinegun provides the capability for delivering accurately aimed fire during darkness. When the scope is hand-held, it aids in night surveillance.

The AN/TVS-5 device is primarily designed for employment on the 106 recoilless rifle, M2 machinegun, and other crew-served weapons. It can also be used as a tripod-mounted forward observer device for adjustment of artillery fires.

The Army's new crew-served weapon sight, AN/TVS-5, represents a giant step forward in night vision technology. The new night sight easily detects and recognizes vehicle-sized targets at night at ranges over 1,000 meters. The 7-pound sight replaces the AN/TVS-2, a 16-pound night sight first used during the mid-1960s. Aside from being much lighter than its predecessor, the AN/TVS-5 does not bloom and cut off when viewing bright lights such as those encountered during tracer fire.

Testing of MLRS fuze

The XM445 fuze, selected for use on the Multiple Launch Rocket System (MLRS), was tested in November 1979 at White Sands Missile Range, NM. Thirteen rounds were successfully fired and all fuzes functioned within the tolerance window of the set time. This tolerance window is required to be ± 50 milliseconds or ± 0.15 percent of the time set on the fuze (whichever is greater).

The fuze was designed and developed by the Electronics Research and Development Command (ERADCOM) and is a product of the Harry Diamond Laboratories. The Army provides the fuzes to the competitive contractors for MLRS—Boeing Company and Vought Corporation—for system test and evaluation.

This electronic, time fuze is remotely set from the fire control panel inside the cab of the MLRS. It employs a gearless safe arm device which must have both acceleration and power to arm. The required acceleration of 130 milliseconds is achieved shortly after launch which in turn activates the timer. After 0.6 second has elapsed, enough power is generated to start the arming device. Thus the fuze is mechanically armed approximately one second after launch. However, the firing capacitor is not charged until 3.4 seconds prior to the time set, producing a reliable and safe fuze.

Field Artillery ammunition support vehicle

The US Army Field Artillery Board (USAFABD) conducted a Concept Evaluation of the Bowen McLaughlin York (BMY) version of the Field Artillery ammunition support vehicle (FAASV) in November and December last year.

The BMY FAASV has a modified M109 howitzer chassis (tube and turret have been removed) with an enclosed cargo compartment. The 10-ton vehicle is fully armored and has a 14,500-pound hauling capacity. It can be loaded with 10 round horizontal pallets through a top door or with single rounds through the rear door using a hydraulic operated conveyor. The conveyor can also be used for passing prepared projectiles and propellant charges into the supported howitzer. Additionally, other ammunition handling equipment (AHE) has been added to facilitate moving of projectiles between the bulk storage area and the conveyor.

The FAASV concept was developed to provide a vehicle with commonality of parts to the M109 series of howitzers, ballistic projection, and suitable AHE to enable more rapid resupply than current equipment.

Observed fire trainers

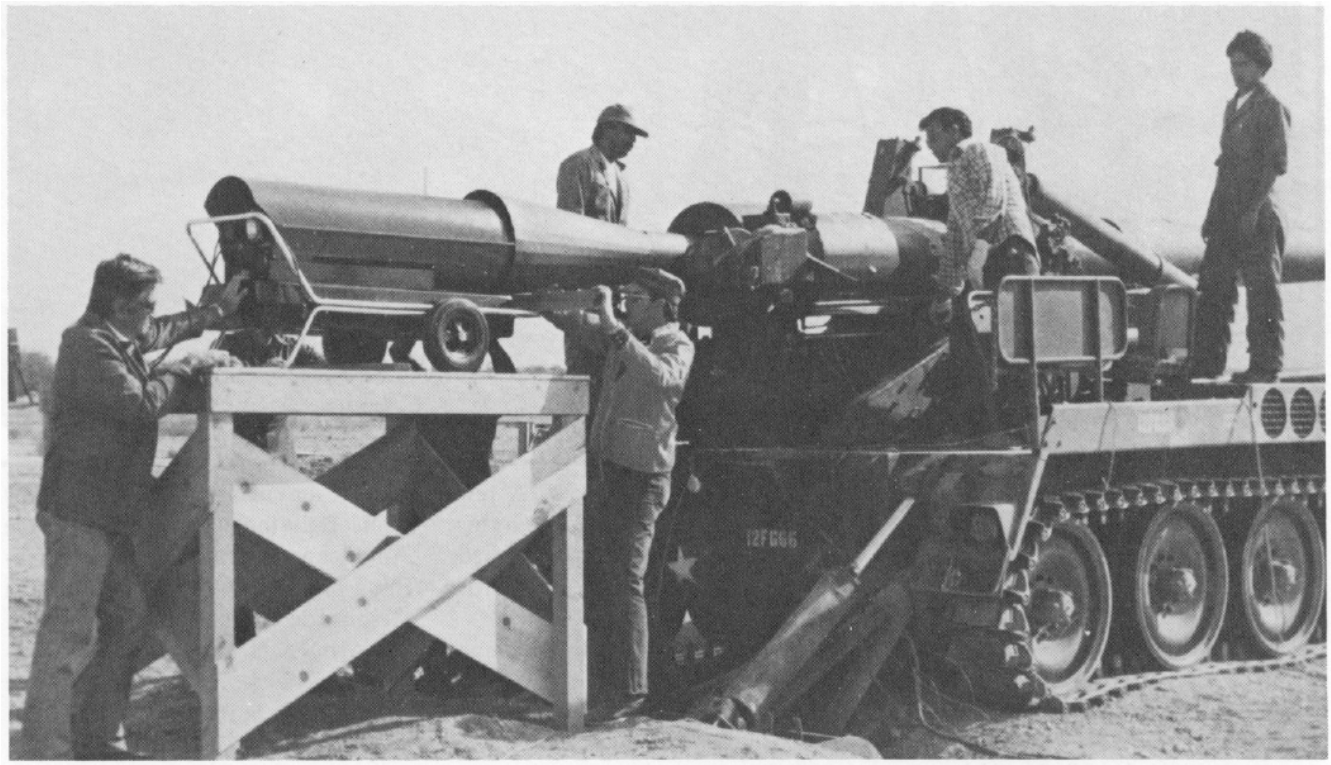
The US Army Field Artillery Board (USAFABD) is conducting an operational feasibility test on two separately contracted observed fire trainers (OFTs). The purpose of this test is to provide data to determine the suitability of the Master Gunner Artillery Classroom Trainer and the Invertron Artillery and Mortar Fire Control Training Simulator.

Test data will be collected and evaluated by USAFABD personnel to determine whether these devices meet the Army's need for an OFT as specified in the Training Device Requirement.

The traditional method in training tactical unit personnel and service school students in forward observer (FO) procedures requires expenditure of live ammunition on an artillery range. This kind of training, however, is costly in terms of ammunition expended and time required of students and instructors. In 1978, the US Army Field Artillery School (USAFAS) was informed of two observed fire trainers under development in the United Kingdom, and subsequently sent representatives to England to observe these devices in operation. As a result, the School determined that both items had excellent training potential, and arrangements were made for the US Army to lease both devices for formal evaluation at Fort Sill.

The Marconi Master Gunner Artillery Classroom Trainer and the Invertron Artillery and Mortar Fire Control Training Simulator display simulated terrain scenes to student observers nearly identical to those anticipated from actual points of observation. The instructor will be able to portray stationary and moving targets on a selected basis. A shell burst presentation with sound effects, to include both ground and air detonation (with or without ground effects) and obscured ground bursts, can be simulated with these training devices. Other capabilities of these systems include coordinated high explosive bursts under illumination and field artillery smoke consistent with wind speed and direction. Both training devices project a field view of 1,200 mils to provide a realistic environment for the student.

The OFTs can operate on a 220-volt, 50/60-hertz, single-phase power source which permits use worldwide and allows training of 30 students simultaneously. A report on the operational feasibility test will be published in May 1980.



Personnel from Yuma Proving Ground maneuver a specially adapted 350,000 BTU space heater into position at the breech of an 8-inch howitzer tube. The heater raises the tube temperature to 130-F for tests of M188E1 propellant charge, thereby saving two-and-a-half hours of firing time and 30 or more full-charge 8-inch rounds normally required to achieve such temperatures. (US Army photo by T. Ockrassa)