THE MISSILE MASTER

INVISIBLE electronic rays reaching away out and high up, take the place of the marksman's eye aligning his rifle's sights on the target.

Miles of intricate wiring and complicated tubes fulfill many of the functions of the human brain.

But at pushbutton consoles and radar scopes and other instruments, effecting the controlling decisions and executing the decisive actions, sit the technically trained men who operate "MIS-SILE MASTER."

The Army has just publicly disclosed some information about this first electronic system for the specific purpose of controlling and coordinating use of NIKE batteries and other AA weapons as they become available.

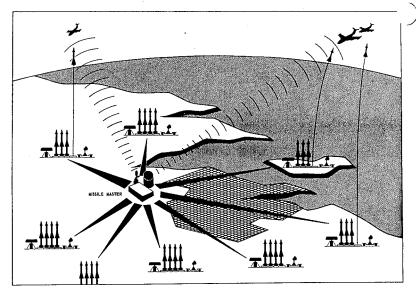
A forerunner has been in experimental operation at Ft Geo G Meade, Md, for nearly two years, the Army says. Others will be established at key locations in the US. Each operates independently, but can be tied-in with the USAF's semi-automatic "SAGE" ground environmental area defense system.

We'll let the Army's own "Fact Sheet" describe it:

MISSILE MASTER is a complete electronic system for the coordination and direction of a large number of NIKE guided missile firing batteries.

The system collects information on the location of aircraft and their identity, presents this information on electronic displays, and distributes these data to the missile firing batteries. In this way, each NIKE battery receives a continuous flow of fresh data on all aircraft within the defense area, and on the activities of the other batteries as well; and each NIKE battery commander is provided with all the information needed to enable him to make a proper selection of a target. In addition, MISSILE MASTER operators observe the activities of all batteries in the system, and where necessary, are able to direct a specific fire unit to a particular target, or to prevent friendly aircraft from being fired upon by our own weapons.

The MISSILE MASTER is a combination of the latest automatic electronic equipment and of human supervision imposed at the most critical points. In this way, the tremendous capacity of electronics for handling information and solving complicated problems almost instantaneously is combined with the judgment of trained operators. Added together, the new MISSILE MASTER systems call for one of the largest amount of electronics equipment ever ordered at one time by the Army Signal Corps.



Schematically, this artist's conception of the MISSILE MASTER system indicates how the personnel in the center's "brain" would coordinate the employment of specific NIKE batteries surrounding a key target area, against specific enemy aerial targets.

Target Detection to Target Destruction

MISSILE MASTER is the first integrated system for tying together all elements of AA missile defense from target detection to target destruction. Each system consists primarily of an automatic data communication network, and of automatic data processing and display equipment. The system is designed to achieve the maximum effectiveness in firings of all NIKE and other AA weapons from any given installation.

Army officials say that experiments with the system at Ft Meade, and other related tests and investigations, have amply demonstrated the ability of MISSILE MASTER to coordinate and control a large number of AA batteries more effectively than ever before against a large number of aerial targets.

Facilities and Personnel

Each MISSILE MASTER system is housed in a large two-story building. Focal point is the operations center within this building where Army personnel at radartype display consoles have a view of the over-all air situation in the local area as well as information on activities of the NIKE batteries under their jurisdiction. Surveillance and height-finding radar on towers, able to provide independent search and surveillance facilities, are installed adjacent to the building.

Key personnel of MISSILE MASTER are: the tracking operators, who monitor early warning information as it enters into the MISSILE MASTER system; tactical controllers, who evaluate the progress of an engagement and assign specific targets to batteries as may be necessary; the "friendly protector," who insures that NIKE batteries do not fire on known friendly aircraft; and the battery commanders able to select o receive target assignments without conflicting with or duplicating the actions of other batteries.

Display Consoles

Each MISSILE MASTER operator has a display console of some form.

Target information appearing on the consoles of trackg operators is displayed with distinctively shaped arkers to indicate different categories of targets.

Tactical controllers have special displays which, with numbers and symbols, give all pertinent information on targets and on battery actions.

Switches enable controllers to view general, or particular marker information on their screens at any given moment.

Collect and Filter Information

Target position information passes directly into the MISSILE MASTER tracking sub-system and is displayed on the consoles of tracking operators. Information consists of position, identity, and velocity data, the size of the target and the priority of the target in cases where a priority has already been assigned.

Target information available to the SAGE System is passed on to MISSILE MASTER. When SAGE information is unavailable, MISSILE MASTER tracking operators are able to generate data of their own from the local surveillance radar.

In either case, the data is stored electronically and distributed to all display consoles in the Operations Center and at the batteries.

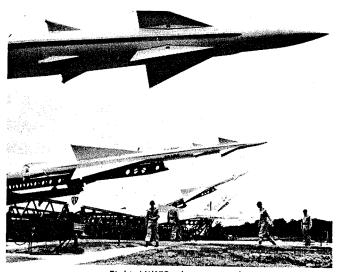
Tactical Control

Tactical controllers normally monitor the air situation and the target selections by individual batteries, but can intervene to assign targets to individual batteries in order to be certain of their quick engagement, to terminate engagements in order to avoid duplition of effort.

At each battery, markers are superimposed on the normal radar display showing information on targets



The "guns" these soldiers "fire" shoot photoctric rays onto radar-type screens to enter gets into MISSILE MASTER'S electronic tracking system.



Eight NIKES above ground at varying angles of elevation, on an operational site in the defenses of Washington.

to help the battery commander make a better selection, and showing also the targets being engaged by other batteries in the defense system.

The Friendly Protector

During engagement of targets, the "friendly protector" watches the position of all known friendly targets and compares this information with the engagement data returned from battery commanders. At any time, this operator is provided with the necessary facilities for taking immediate action to halt the individual engagement of any friendly target.

Typical Target Engagement Sequence

With the approach of hostile targets, identity and other information on targets begins coming in and is displayed on the various consoles in the Operations Center and at the batteries. The tracking operators make sure that the positions indicated by SAGE correspond to the position of the targets as actually seen on the local radar—and establish tracks on those targets not already being tracked by SAGE. Or if SAGE data are unavailable, they track and identify all targets of interest to the defense. The tactical controllers monitor the progress of the engagement, as hostile targets approach close enough to be fired on by NIKEs and insure that targets are engaged in the most effective manner. The friendly protector makes certain that no known friendly aircraft is fired on by a battery.

Flexibility of MISSILE MASTER

MISSILE MASTER combines reliability and flexibility to an unusual degree. Critical elements of the system are provided in duplicate, so that either can carry the load. Operations can continue, however, even with one or more major items inoperative.

Additional evidence of the close interdependence among the Nation's scientific-industrial-military team, the system is an Army product with the Glenn L'Martin Co as principal contractor, aided by the Airborne Instruments Laboratory of Mineola, LI, and the American Machine & Foundry Co, NY.