

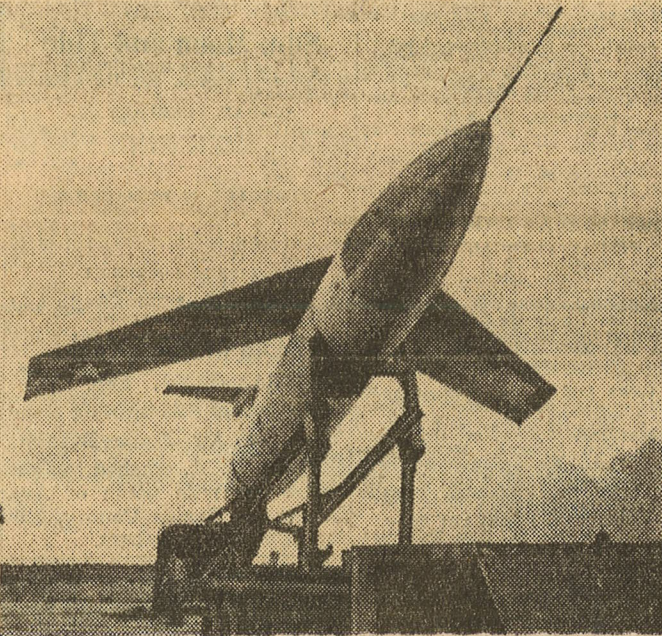
U. S. Leads Guided Missiles Race; Strives to Perfect Intercontinental Rocket

By VERN HAUGLAND
Associated Press Aviation Editor
WASHINGTON, Feb. 26.—
(AP)—The United States claims world leadership in guided missiles, as the deadly race for military power goes on. But the big prize—the IBM, or intercontinental ballistic missile—is still in the distance, apparently, for both major contenders.

As of today the IBM appears likely to be the unbeatable weapon. Once launched, it would follow a bullet's course—much faster than any bullet—to its target thousands of miles away. It would have no electronic guidance devices which an enemy might "jam," or which might malfunction and send it astray.

Senator Russell, Democrat of Georgia, chairman of the Senate Armed Forces Committee, told reporters after three days of closed door testimony by military leaders this week that

Dramatic progress in the field of guided missiles makes it almost certain another major war will be in part a push-button war. Here's a comprehensive survey of our guided missiles program with estimates of Soviet accomplishments and an outlook for the future by an experienced reporter of the latest developments in aviation.



New Guided Missile—the B-61A pilotless bomber, the Matador. —Associated Press Photo.

weapons for retaliatory purposes continues to improve, but he said deliverability is the "real danger."

"The present so called atomic stalemate would be broken if the Russians obtain an international ballistic missile before we do," Jackson said.

VITAL NEED SEEN.

"If the Russians do perfect one first, all this talk about bigger hydrogen bombs would be meaningless.

"It is essential to our security that we leave no stone unturned in an effort to perfect the IBM at the earliest possible date."

Twining disclosed to newsmen that "we are just getting started" with the most ambitious IBM project yet made known, the Convair Atlas. This rocket-powered missile, reportedly in production at San Diego, Calif., is said to have a designed speed of 10,000 miles an hour. Presumably it would be fired many miles into space, where there would be little atmospheric resistance, and then could describe a ballistic arc from the United States to Moscow in thirty minutes.

Twining also disclosed that a second and considerably slower

ke), for example, already is set up in areas surrounding the Nation's major industrial and population centers. It can travel 1,000 miles an hour and lock onto and destroy enemy aircraft. And there are other missiles effective against ships and personnel.

The United States is keeping what it knows about Russian missile developments under wraps. Certainly there is no disposition to underrate a nation which proved itself capable of swift development in the field of atomic energy.

Former German Scientist Walter R. Dornberger, now a missile specialist at Bell Aircraft Corporation, doubts that the Soviets have yet perfected an intercontinental missile which can be fired at American targets. But he says information he has leads him to believe the Reds "are most certainly making progress on it."

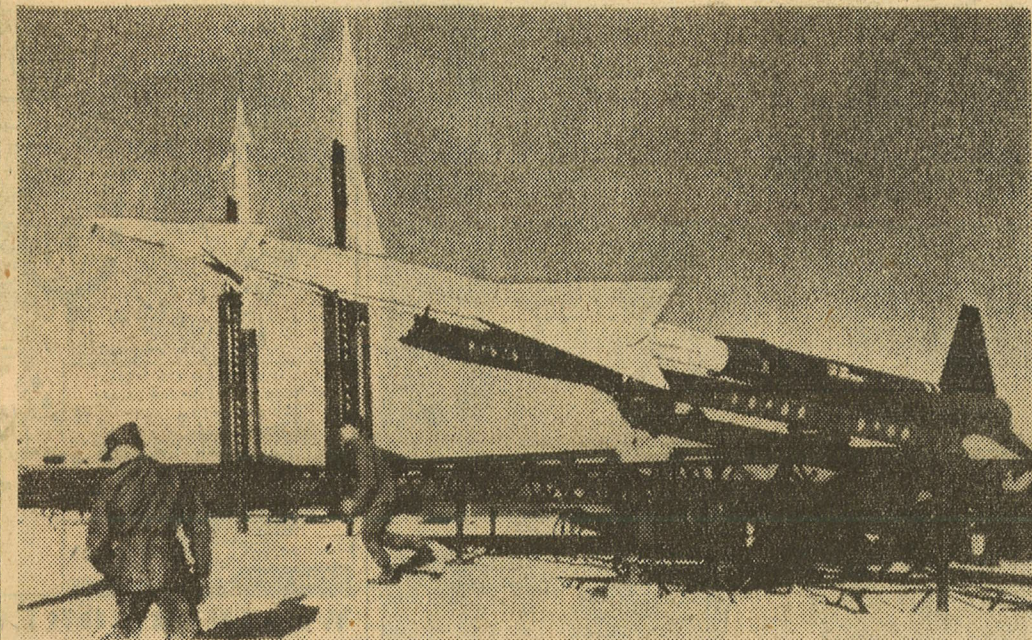
He thinks Russia was ahead of the United States in missile progress three years ago and is on a par now. Three years from now he believes the Russians will be lagging far behind.

The defense department has little to say about United States advances in the field. In fact there are few subjects more thoroughly blanketed by security.

BILLION DOLLAR COST.

But in recent months there has been some relaxation of security surrounding some of our older missile projects—a sure sign considerable progress is being made on newer types.

Maj. Gen. L. E. Simon, chief



The Army's Nike can travel 1,000 miles an hour and lock onto and destroy enemy aircraft. —Associated Press Photo.

surface-to-surface pilotless bomber; the air-to-air Falcon and the surface-to-air Bomarc.

In 1950 Gen. J. Lawton Collins, then Army chief of staff, announced development of a new antiaircraft rocket, the Bendix Loki, capable of firing twelve miles into the air.

For Marine Corps close support the Army has also developed the Lacrosse guided missile, with a reported range of about eight miles. Other Army missile projects about which there has been some speculation include the Hermes, a short range rocket and the Hawk,

surface and the Philco Sidewinder and Oriole, air-to-air.

The Air Force's Matador is in operation in Germany as well as in the United States. It's thirty feet long with a wingspan of twenty-eight and one half feet, is subsonic (under 760 miles per hour at sea level) in speed and has a range of more than 500 miles.

The Air Force says it is "approaching operational use" on the rocket-powered Falcon, an air-to-air missile believed to have a top speed of more than 2,000 miles per hour.

Another officially announced Air Force missile is the Boeing surface-to-air interceptor Bomarc, which the Defense Department admits was announced "somewhat prematurely."

"It is not our ordinary habit to announce weapons at the stage of development where Bomarc now is," said one official.

Bomarc has a rocket engine with auxiliary ram jet (supersonic) engine and is said to be capable of a speed of more than 1,500 miles per hour.

Bell Aircraft Corporation confirms existence of its B-63 pilotless bomber, the Rascal. Unconfirmed reports say its range will be about 100 miles with a speed of about 1,500 miles per hour.

The North American Navaho, equipped with a ram jet engine, is the only other missile with a reported intercontinental range, aside from the rocket-powered Atlas and the jet-powered Snark.

foreign surface-to-air missile, the Swiss rocket-powered Oerlikon, which has a range of twelve miles and weighs 545 pounds. By American standards, it's an inexpensive missile.

Guidance naturally is a limiting factor in trying to evaluate effectiveness of any long range missile. A rocket fired at a moving target may follow any one of three guided systems which have proved useful.

It may ride a radar beam directed along the line of sight between the launching system and the target. The beam can follow the target and adjust to its movements. The missile will stick to the center of the beam.

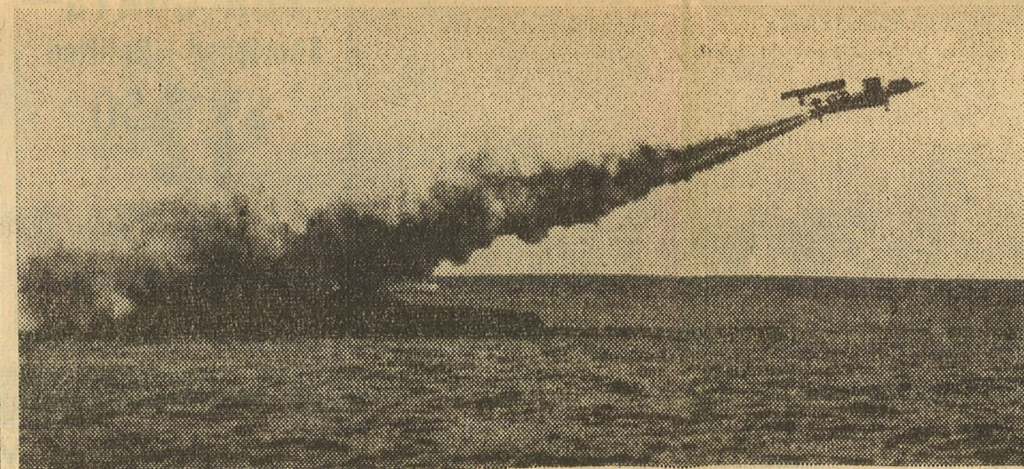
It may follow a homing system in which the missile itself electronically senses changes in the target position and adjusts accordingly.

Finally, a missile screaming toward a moving objective may go by the command system. That means radar at the launching site keeps track of the target, computations are made to adjust for target movement and directions sent by electronic impulses to the missile.

GUIDANCE SYSTEMS VARY.

Missiles fired at stationary targets may be guided by what's called a baseline system, similar to the Loran and Shoran navigational aids used in World War II. In this a missile moves across artificial grid lines representing the target area, reaches the one representing the target and explodes.

is critical to the security of our country. Near the end of World War II the Russians took over German rocket installations and German scientists. This fact, along with the known ability of the Soviets to produce fusion (hydrogen) weapons, makes it imperative that our country



The rocket christened "Loon" by the Navy is shown as it is launched from deck of submarine. —Associated Press Photo.

be first to develop an operational long range missile." **FUTURE FORESEEN.**

Thus it's clear that the next major war, if it comes, will be

of research and development in the office of the Army chief of ordnance, says the United States guided missiles program so far "has cost on the order

said to be a low altitude surface-to-surface missile with a range of fifty miles designed to supplement the Nike. More than 100 experimental models of the Navy's Sparrow

to fixed targets by so-called self-contained systems. That means a missile carries within itself all the information it needs to go to the target—location, and the means of sensing any deviation it makes from the path it should follow to the target.

Information on target location can be stored in such a missile ahead of time. The missile is equipped to compute its own course to the target on the basis of data fed into it at the launching site.

Guided missiles are propelled either by rocket engines fed by fuel plus oxidizer or by one of three types of jet engines fed only by fuel. Engines equipped with oxidizers can operate above the earth's atmosphere but jet engine-powered rockets must stay under 60,000 feet in order to get oxygen for combustion.

In this field of almost unbelievable speeds and force, a natural question is: What next?

As sound an authority as Elwood R. (Pete) Quesada, former Air Force general and now general manager of the missiles division of Lockheed Aircraft Corp., predicts that within ten years guided missiles will be traveling at "speeds approaching escape velocity" — speeds that would permit escape from the pull of gravity into open space, or about 25,000 miles an hour.

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Baby's First Birthday

- BENNETT**—James Douglas, son of Mr. and Mrs. James H. Bennett, 16 Mesa Ave., Mill Valley.
- CLEWIS**—Porter James, III, son of Mr. and Mrs. Porter J. Clewis, Jr., 9511 Empire Road, Oakland.
- da ROZA**—Debra Marie, daughter of Mr. and Mrs. Leal R. da Roza, 2533 Lake St.
- DUCKETT**—Rosemary, daughter of Mr. and Mrs. Robert Duckett, 1948 Buchanan St.
- FERRALIS**—John Luis, son of Mr. and Mrs. John L. Ferralis, 824 Union St.
- HERNANDEZ**—Rafael Peralta, son of Mr. and Mrs. Rafael Hernandez, 1199 Tennessee St.
- MURPHY**—Brian Paul, son of Mr. and Mrs. Denis S. Murphy, 18 Bucarelli Drive.
- SARTORI**—Dennis Alfred, son of Mr. and Mrs. Sergio C. Sartori, 2822 Octavia St.
- Babies above are one year old today and this column of notices has been devised as a very special way of wishing them a "Happy Birthday!" For information

DEADLY — The guided missile "Corporal," has a range of 50 miles and can be equipped with an atomic warhead.

—Associated Press Photo.