

BALLISTICS

Speed of Bullet Clocked

New electronic device registers the flight of projectile accurately to 1/100,000 of a second. Makes more efficient firing possible.

➤ ARMY AND Navy guns are firing more effectively these days as the result of tests made possible by a new electronic time-interval counter, now in use at the Aberdeen Proving Ground and at other government installations. The new device, precise to 1/100,000 of a second, supplies instantaneously data upon which the performance of a given gun is established and the uniformity of its ammunition checked within a few seconds.

The time-interval counter can be used on any type of gun, from small hand weapons to the more powerful 16-inch rifles. It was developed under the direction of Igor E. Grosdoff, research engineer of the RCA Laboratories.

Each test firing range is equipped with two electrical coils, arranged so that a projectile will pass through them one after the other. By magnetizing the projectile before it is fired, a small electrical signal is produced in each coil as the bullet passes through. In actual use, if

the coils are 30 feet apart, and the time elapsing between signals is one one-hundredth of a second, the bullet is traveling at 3,000 feet a second.

The electronic counter is made up of three essential parts: an oscillator, a gate, and the counter itself. The oscillator, regulated by a vibrating quartz crystal, delivers exactly 100,000 electronic pulses a second. The gate, which is really a vacuum tube circuit, passes these pulses into the counter, which counts each pulse. The counter's gate is opened by an electrical signal from the first coil as the bullet passes through it, and is closed again by the impulse from the second coil.

Indicator lamps show the number of pulses that have passed through between the time that the gate is opened and closed, showing the number of hundred-thousandths of a second during the interval. The operator records the time of flight between coils and computes the ve-

locity. These data are jotted down, along with the record of the particular projectile being tested, for analysis later by ballistic experts.

If all shells from a gun leave the muzzle with the same velocity, they will all fall on the same spot, and the effectiveness of fire will depend only upon the aim and skill of the gunner. To insure this consistent performance, ordnance scientists constantly measure muzzle velocities of all types of guns and with all kinds of powder loads and shells.

Science News Letter, October 7, 1944

AERONAUTICS

Navy Is Now Using Jet Propulsion Takeoffs

See Front Cover

➤ JET UNITS now used by the Navy reduce normal takeoff runs of Navy planes up to 60 per cent, and allow for an increase in loads. The official photograph on the front cover of this SCIENCE NEWS LETTER, shows a "profile" view of a heavy Avenger as it springs aloft with the assistance of four 330-horsepower jet units.

Of particular value on the restricted area of carrier flight decks, JATO, as jet-assisted takeoffs are known in the Navy, will also be extremely useful for lifting heavily-laden flying boats from the water. Resembling bombs, except that they are affixed to the fuselage rather than under the wings or enclosed in bays, jet units contain solid propellents which include oxygen, and are ignited by electrically controlled spark plugs. The escaping stream that follows gives planes the thrust.

Science News Letter, October 7, 1944

PUBLIC HEALTH

The Polio Epidemic Is Dying Out Slowly

➤ THE INFANTILE paralysis epidemic is dying out slowly, increases in cases still being reported in the New England area. For the nation as a whole in the week ending Sept. 23, a total of 1,159 cases were reported by state health officers to the U. S. Public Health Service in Washington.

Although the peak of the epidemic, so far as reports are concerned, was reached the week ending Sept. 2, there probably will be many new cases reported during the coming weeks. The low point is not expected before December.

Science News Letter, October 7, 1944



BULLETS CLOCKED—The range velocity towers record the speed of the shell from this big 90-mm gun through space. The shell is magnetized so that when it passes the hoops it sets up an electric current which is automatically recorded and timed.