

## ENGINEERING

# Transcontinental Network

About 7,000 miles of coaxial cables will link the east and west for improved telephone and possibly future television service.

► ABOUT 7,000 miles of coaxial cables will form a coaxial cable network stretching from Boston to Los Angeles to be used to carry up to 480 different telephone channels simultaneously, as well as television pictures, after the war, Harold S. Osborne, chief engineer of the American Telephone and Telegraph Company, told the meeting of the Society of Motion Picture Engineers in New York.

The laying of the coaxial cables underground is already in progress between Terre Haute, Ind., and St. Louis, Mo., but it will probably take about five years to complete the transcontinental network, he stated.

The proposed network will operate on a cable running from Boston to Atlanta, Ga., thence across the country to Los Angeles and the west coast. At New Orleans, a branch route will run north to St. Louis and Chicago, Mr. Osborne announced.

"While the coaxial cable system has been in service in this country for several years, its application up to the present has been narrowly limited," he pointed out.

At present there is only one coaxial cable link between New York and Philadelphia that has been used to transmit television pictures, as well as up to 800 long-distance telephone conversations at the same time.

The coaxial cable consists of a metallic conductor held in the center of a cylindrical metallic sheath by insulators. The atmosphere around the conductor can be of normal pressure, a partial vacuum under pressure, or partially gaseous, depending upon the use to which the cable is to be put.

Coaxial cable networks are elaborate and expensive to build and maintain. While Mr. Osborne gives no estimate of the cost of the network, it has been estimated that a single coaxial cable from New York to Hollywood would cost about \$20,000,000.

Completion of the network will speed the day when a nation-wide network of television stations will make available to urban as well as rural communities the modern wonder of "pictures through the air."

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employs a set of theorems, or general mathematical statements. When used with geometric drawings of the optical units involved and the mathematics of calculus, it enables the optical designer to rapidly predict on paper just how his instrument is going to work before it is built. Not only is the speed with which the result is gained increased, but since there are fewer steps to the process, the chance of a trained worker making an error is greatly reduced. It will also make it possible to perform certain calculations which could not be done before by any convenient method.

One of the primary uses of the Jones system is the solving of problems involving polarizers, crystals used to convert ordinary light into light that has different properties in different directions (polarized light). In this field it is being used to perfect three-dimensional pictures. The system was developed by Dr. Jones while employed by the Polaroid Corporation.

While the Jones system is of greatest value to physicists and chemists, it is so simple that it can be built into an automatic calculating machine for use by less-skilled workers in research laboratories.

In recent years, Dr. Jones collaborated in the development of sirens for air-raid warning, and signalling. One of these sirens is atop the Empire State Building in New York City.

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## OPTICS

# Optical Gunsight

Rockets fired from bazookas are more likely to hit their targets and three-dimensional pictures are nearer to being perfected, thanks to this new gunsight.

► ROCKETS fired from bazookas are more likely to hit their targets and three-dimensional pictures are nearer to being perfected, thanks to a new optical gunsight for bazookas. The design of the gunsight was made possible through the use of a system of mathematical calculation for optics developed by Dr. Robert Clark Jones, now associated with the Bell Telephone Laboratories, Murray Hill, N. J.

In recognition of this mathematical system, which advances the theoretical understanding of complicated parts of optical systems, 28-year-old Dr. Jones received the Adolph Lomb medal,

awarded every two years for outstanding accomplishment in the field of optics by the Optical Society of America, at its meeting in New York.

The new system for calculating optical systems is reported by Dr. Jones to be two to three times faster than other methods for securing the necessary information needed for the design of gunsights, periscopes, microscopes and other complicated optical systems, because it eliminates most of the time-consuming algebraic figuring heretofore required. Instead of going through lengthy equations, and solving many complicated mathematical problems, the Jones system

## MILITARY SCIENCE

## Foot Soldiers Get Airborne Rocket Launcher

► THE ARMY'S newest lethal weapon, designed for use against heavy gun emplacements, looks like a four-foot length of stove pipe mounted on a three-leg tripod, like amateur cameramen used in making pictures.

Actually, it's just one of the tubes from the three-tube rocket launchers now mounted under the wings of warplanes adapted for use on the ground.

Known officially as the M12, it is portable, weighing only 35 pounds when loaded, and it can be carried, set up, and fired by one man. The tube is one foot shorter than the standard bazooka which is fired from the shoulder.

Tube and tripod are set in position a short distance from the target, the rocketier slides in the 45-inch projectile, strings wire from the launcher to the remote control "trigger," and launches the rocket, which packs a terrific wallop.

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