ITT FEDERAL LABORATORIES - A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

JOSEPH A. ABBOTT

ON THE SITE of former Yountakah Country Club, where duffers once muttered over muffed putts, the Nutley headquarters of ITT Federal Laboratories were established in 1945· The suburban club atmosphere has changed over the past 16 years. Now instead of the warning shout “fore,” you’re more likely to hear the “five, four, three, two, one,” of a mock missile countdown.

Since taking up residence in Nutley, ITT Federal Laboratories has become one of our country’s leading sources of military and commercial electronic systems.

The roots of the International Telephone and Telegraph Corporation’s research division can be traced to the earliest days of the electronic age.

One of the pioneers in this field was Dr. Lee de Forest, whose discovery of the vacuum tube oscillator made present-day electronics possible. Dr. de Forest worked at Federal Telegraph Company in California. That organization later moved to Newark where it became Federal Telephone and Radio Corporation.

ITT Federal Laboratories emerged first then, in 1945, as a separate division with headquarters in Nutley. The firm’s title was changed in 1958 to ITT Laboratories and to ITT Federal Laboratories in 1960.

Today, the combined experience of over 5,500 of these “neighbors” is at work to create dramatically new electronic systems. These range from navigation systems to guide interplanetary travelers to a device that computes and records small loan data for financial institutions.

In the field of air navigation, radio aids have been developed for both military and civil aircraft capable of pinpointing their positions instantly and automatically over virtually any distance.

Typical of these is Tacan (Tactical Air Navigation), installed by the U.S. Navy and Air Force, and now being integrated into the nation’s common military-civil air navigation system, Vortac.

The first Tacan antenna, an operating system used to demonstrate and evaluate early developments, was mounted atop the Laboratories’ 300-foot microwave research tower. It was the prototype of the drum-shaped antenna clearly visible on the main-masts of the USS Forrestal, USS Saratoga and many of the other aircraft carriers now on active duty with the U.S. Navy.

In the vitally important field of guided missiles, the Laboratories has developed the airborne guidance for Talos and Terrier, Navy antiaircraft missiles; the entire computing, ground, air and tracking system for the Army’s

“deadly accurate” artillery weapon; Lacrosse launching and firing controls, test and checkout equipment for Air Force Bomarc, a ground-to-air interceptor missile, and a modified transistorized guidance system for Talos.

The Laboratories is also responsible for the installation of a 450-mile missile “electronic scoreboard” along the west coast of Florida - Eglin Gulf Test Range for evaluating and testing Bomarc missiles.

Still another group of engineers with the aid of slide rules, drawing boards and electronic measuring instruments, are waging a silent war within the walls of ITT Federal Laboratories. It is a conflict, not of bullets or ballistic missiles, but of invisible radio waves, radar, and-above all-human ingenuity.

To the outsider the activities of the Electronic Countermeasures (ECM) group resemble a game. Simulating the electronic offensive moves of hostile forces, the engineers “counter” with defensive or counter-offensive equipment.

The impartial judgment of a computer, unprejudiced device in the mock conflict, names the winner.

ECM activity covers three broad areas: reconnaissance and information-gathering devices, heart of all countermeasures; active systems to deceive and disable hostile fire-control radar; and passive countermeasures designed to detect and interpret enemy electromagnetic (radio-radar) signals.

The Laboratories has continued to maintain its leadership in the field of radio communication. The world’s first three commercial “over-the-horizon” microwave radio links, including the first to carry television were engineered by the Laboratories and installed in 1957.

Forerunner of these was an experimental “hop” from Nutley to Southampton, Long Island, which enabled engineers to develop the principles and equipment for “sophisticated” commercial systems.

In the rapidly developing field of satellite communications, ITT Federal Laboratories has already contributed heavily in furnishing the ground communication equipment for the U.S. Army’s Courier communication satellite. A complete experimental research facility for earth-space moon and satellite communication experiments has been set up at Nutley.

Research in other fields has produced smaller, more efficient components and brought to telephony for the first time, a number of all-electronic devices. One of those systems is the Automatic Message Recorder being installed at Newton and Flemington.

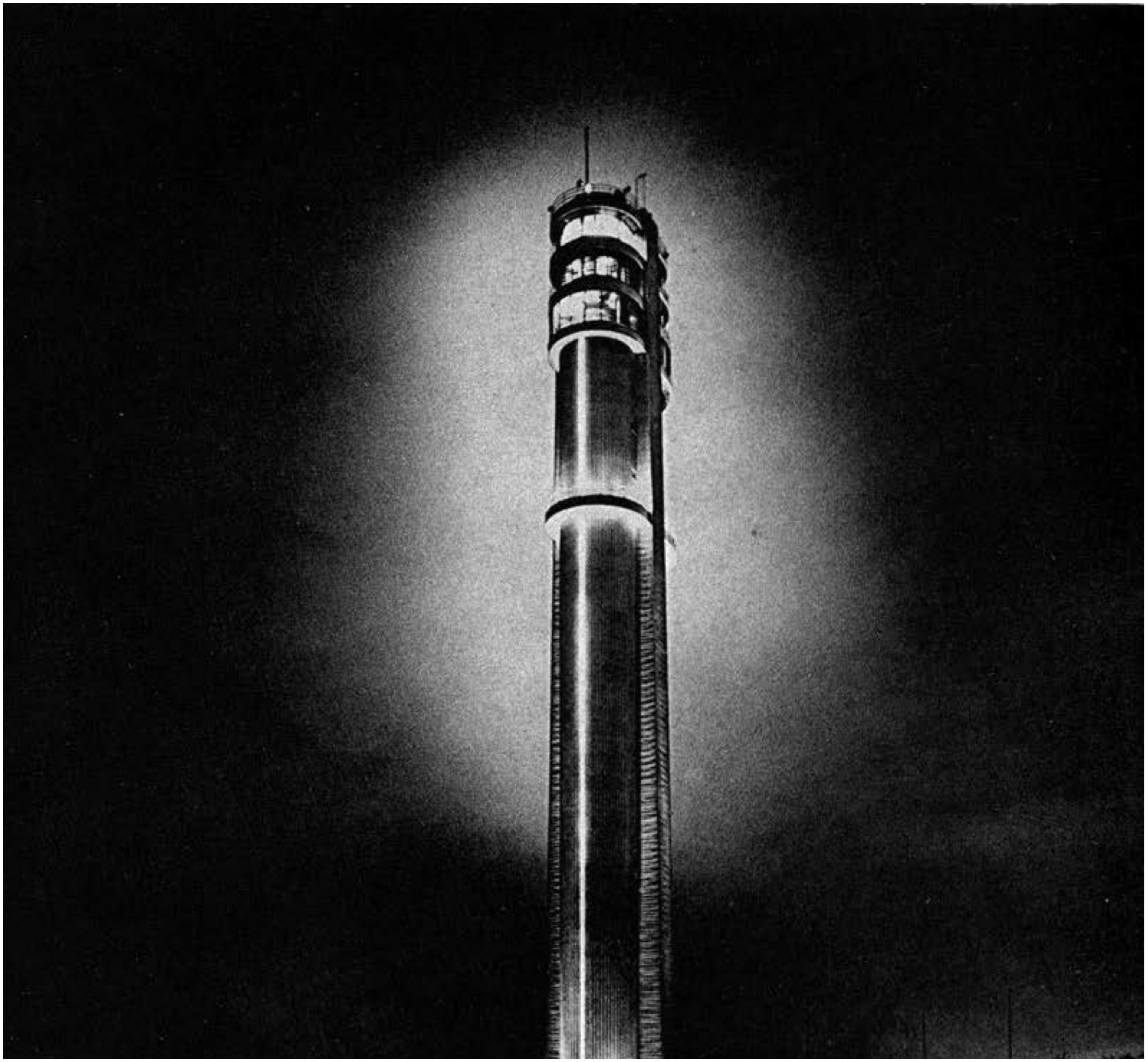
By recording, first on a magnetic drum then on magnetic or paper tape all the information necessary for billing toll calls, the equipment makes it possible for subscribers to dial long-distance calls directly without the assistance of an operator.

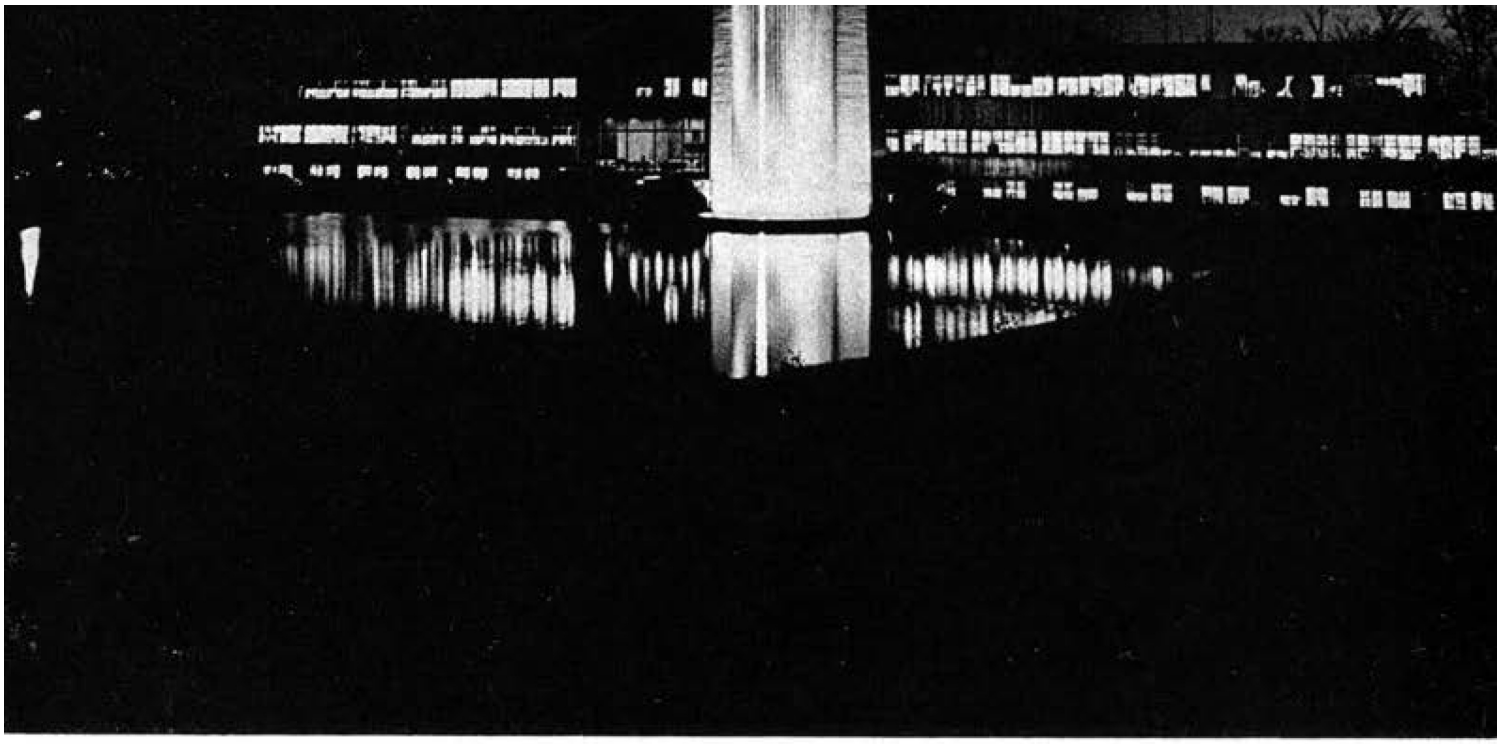
Similar studies led to the development of an electronic spectro-analyzer that

can perform in a matter of minutes chemical analyses that previously took many hours and even days to complete; a plastic tissue equivalent to enable atomic scientists to study the effects of atomic radiation; and a “low-noise” amplifier that promises to add range and reliability to microwave systems in the fields of communication, radar and radio astronomy.

Use of the amplifier in the Army’s March 1959 Pioneer TV space probe, added 150,000 miles to the effective range of tracking radars at the Huntsville, Alabama missile test site.

The Laboratories’ modern research concepts are also bringing the latest electronic tools to inventory control, accounting, data processing and transmission for commerce and industry, techniques that may hold the key to some of tomorrow’s most spectacular scientific advances.





ITT Federal Laboratories Microwave Research Tower

Tags

- ITT
- Businesses