International Telephone and Telegraph Corporation

41st Annual Report

ITT

1961

41st Annual Report: 1961

International Telephone and Telegraph Corporation

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Directors and Officers

Directors

George R. Brown
Harold S. Geneen
Arthur M. Hill
Charles D. Hilles, Jr.
Allan P. Kirby
Hugh Knowlton
J. Patrick Lannan
Richard S. Perkins
Warren Lee Pierson
Louis T. Rader
Ellery W. Stone

Executive Committee

George R. Brown
Harold S. Geneen
Arthur M. Hill
Allan P. Kirby
Hugh Knowlton
J. Patrick Lannan
Richard S. Perkins
Warren Lee Pierson

Officers

Harold S. Geneen..... *President*
William T. Marx..... *Senior Vice President*
James F. Lillis..... *Vice President and Comptroller*
Robert S. Alexander..... *Vice President*
Henri G. Busignies..... *Vice President*
John G. Copelin..... *Vice President*
Neil E. Firestone..... *Vice President*
Frederick R. Furth..... *Vice President*
Edward J. Gerrity, Jr..... *Vice President*
John J. Graham..... *Vice President*
M. Richard Mitchell..... *Vice President*
Charles M. Mooney..... *Vice President*
Eugene F. Peterson..... *Vice President*
Louis T. Rader..... *Vice President*
Henry H. Scudder..... *Vice President*
Ellery W. Stone..... *Vice President*
Ted B. Westfall..... *Vice President*
John J. Navin..... *Secretary*
David I. Margolis..... *Treasurer*

Transfer Agents for Capital Stock

Office of the Corporation, 320 Park Avenue, New York 22
Continental Illinois National Bank and Trust Company of Chicago, Chicago 90
Dresdner Bank AG, Frankfurt-am-Main, Germany

Transfer Agent for Cumulative Preferred Stock, 4 % Convertible Series, Cumulative Preferred Stock, 4 % Convertible Series B, Cumulative Preferred Stock 5.25 % Series

Office of the Corporation, 320 Park Avenue, New York 22

Registrars for Capital Stock

First National City Trust Company, New York 15
Harris Trust and Savings Bank, Chicago 90
First National City Bank, Frankfurt-am-Main, Germany

Registrar for Cumulative Preferred Stock 4% Convertible Series, Cumulative Preferred Stock 4 % Convertible Series B.

First National City Bank, New York 15

Trustee for 4 7/8 % Convertible Subordinated Debentures

First National City Trust Company, New York 15

Registrar for 4 7/8 % Convertible Subordinated Debentures

First National City Trust Company, New York 15

General Offices

320 Park Avenue, New York 22

Highlights

	1961	1960*
Sales –		
United States	$335,190,962	$355,613,011
Foreign	504,662,311	433,227,881
Total sales	839,853,273	788,840,892
Telephone, Cable and Radio Operating Revenues	90,646,658	80,666,066
Total sales and revenues	$930,499,931	$869,506,958
Net Income (Excluding Special Items below)	$ 36,059,034	$ 32,103,309
Per Average Share	$2.18	$1.96
Special Items – Net Profit on Sale of Investments, Etc.	$ 7,620,000	$ 7,902,032
Per Average Share	$ .47	$ .49
Average Shares Outstanding during Year	16,265,222	16,088,654
Dividends per Share	$1.00	$1.00
Net Current Assets (Working Capital)	$268,422,268	$279,163,997
Ratio of Current Assets to Current Liabilities	1.8 to 1	2.0 to 1
Plant, Property and Equipment, less Reserves	$391,347,228	$341,385,575
Orders on Hand –		
United States	$207,000,000	$197,000,000
Foreign	524,000,000	432,000,000
Total	$731,000,000	$629,000,000
Telephones in Service	454,401	430,391
Backlog Telephone Demand	246,152	244,871
Number of Employees	149,000	139,000
Number of Stockholders (including 4,477 preferred stockholders in 1961)	94,719	87,818

** 1960 restated to include data relating to companies acquired in 1961 on a pooling of interests basis.*

President's Summary

". . . the Company moved forward as planned in 1961 . . . In terms of both current gain and building for the future it was a decisive year for ITT."

TO OUR SHAREHOLDERS:

On behalf of the Board of Directors and Management, I am pleased to report that the Company moved forward as planned in 1961.

We increased our sales and revenues. We improved our earnings. We expanded our plant capacity. We broadened our product lines. We strengthened our world market position. In terms of both current gain and building for the future it was a decisive year for ITT.

Consolidated sales and revenues from our worldwide manufacturing and communication operations reached a new high of over $930-million for the year. This was a gain of 7 per cent over the previous high of $869-million in 1960.

Consolidated earnings in 1961 also advanced to a new high of over $36-million from the previous high of $32-million in 1960. This was a gain of 12.3 per cent. Consolidated earnings per average common share rose to $2.18, representing an 11 per cent advance from $1.96 per average common share in 1960.

Special earnings of $7.6-million, or approximately 47 cents per average common share, in addition to the $2.18 per average common share earned from operations, resulted from certain nonrecurring items.

Included in all totals are certain acquisitions made by the Company during 1961, and the 1960 figures have been restated for comparability.

Our European manufacturing sales showed an over-all gain of 18 per cent. This reflects the underlying strength of the System's major markets and its position as a leading accredited supplier to the communication systems of every major government in Europe and many elsewhere. It is also evidence of our position as the largest supplier of telecommunication equipment and systems to the rapidly growing underdeveloped markets. Our Latin American sales showed gains over 1960. We gained in sales in our U. S. commercial lines and showed much improved earnings, but our U. S. defense earnings were down as a result of a drop in hardware procurement programs and an extended strike in one of our major operations. Our communication companies located throughout Latin America had a substantial growth in revenues. They registered an over-all gain of approximately 18 per cent.

The Pôrto Alegre division of our Brazilian telephone operating subsidiary was seized by the State of Rio Grande do Sul on February 16, 1962. Further details of the seizure are discussed in the telecommunication operations section of this report.

There were many contributions to the year's new records. In the main, however, two major factors were responsible: diversity of our operations in such growing areas of world trade as the European Common Market, the Latin American Common Market, the United States market, and markets of many underdeveloped countries; also, our steadily improving capability of keeping pace with the increasing requirements of these markets.

This improved capability is the end result of organizing our management, manufacturing, research, and engineering forces into a coordinated program that can design, manufacture, and deliver more and better products where and when they are needed.

During 1961 our System-wide research staff of 8,000 scientists and engineers contributed significantly to the Company's strong advances. We have worked to develop new fields such as satellite communication and related space activities, and we are prepared to take part in the international satellite

communication experiments scheduled for this year. We refined our techniques in present product areas and in the engineering of customer orders. We are also proud that we continued to be a major supplier of defense products and systems to the U. S. Government.

In Europe, our marketing and product strategy began to prove out. Sales gains under our new coordination and single-market approach foreshadowed increased production opportunities that will be progressively opened up by the European Common Market.

Important as our new sales and revenues and earnings levels are, it is equally important in summarizing the year's operations to review the steps taken to assure our continuing growth. As we look to the future we have yet to see any limit to our expansion potential.

To benefit from a rising demand in world markets, we have launched the most comprehensive plant construction, extension, and improvement program ever undertaken by the Company. It commits us to build into our future, year by year, the productive capacity required for earnings growth.

The major portion of our initial expansion is taking place in Europe, to provide needed production increases in the fast-growing European Common Market. At the same time, new plants and extensions have also been completed, and others started, in the United States, Latin America, and the Pacific.

The product lines involved in the European portion of the program range from our classic telecommunication products to new products such as epitaxial planar semiconductors of the latest type. Our European plant expenditures in 1961 totaled $28-million, compared to an average of $18-million for the five previous years, and are budgeted at $39-million for 1962.

It should also be noted that very little of the effect of these additions and expansions has been reflected in results for 1961, and only part of it will be reflected in 1962, as the new facilities go through their start-up periods.

Our growth potential was further improved by five acquisitions which increased our productive capacity, broadened our products base, and strengthened our market position.

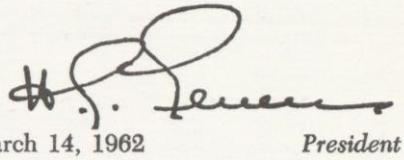
In the United States we acquired Jennings Radio Manufacturing Corporation of San Jose, California, makers of vacuum capacitors and switches, and Surprenant Mfg. Co. of Clinton, Massachusetts, manufacturers of specialized wire and cable. We also acquired the remainder of the interest in our worldwide communication company, American Cable & Radio Corporation, in which we had held 56 per cent of the capital stock.

In Germany we acquired 100 per cent ownership of the Alpina company, which will provide expanded facilities for the production of telephone switching equipment and teleprinters; and the remaining interest in the Eduard Winkler company, makers of electronic hardware.

In order to help support its continuing expansion, the Corporation has filed with the Securities and Exchange Commission a registration statement relating to its proposed public offering of $50-million of sinking fund debentures due April 1, 1987. Net proceeds of the issue would be used to repay outstanding short-term bank loans, increase working capital, and finance in part proposed capital expenditures.

Our 1961 achievements are significant because they have provided us with the solid assurance of continuing growth. It was the most active year in ITT's history. Throughout our worldwide System we have added substantially to our strengths. In doing so, we have moved well down the road to our objectives. To put the credit where it is due, our record is a collective one. It was made possible only through the sustained efforts of the 149,000 men and women of the ITT family at all levels of our operations, and the continued cooperation of our suppliers. I would like to take this opportunity to express my appreciation to them for a job well done.

For the Board of Directors



March 14, 1962 *President*

Building Our Business

". . . As we look to the future we have yet to see any limit to our expansion potential."

In 1961 the Corporation embarked on the most comprehensive plant expansion undertaking in its history. The purpose of the program is to provide basic support for planned earnings growth by increasing, as required, ITT's System-wide productive capacity.

Looking ahead, your management feels that future requirements for communication and electronic products must inevitably multiply. We live in an increasingly developing technological age. We are also crossing the threshold of the space age, which is already making vast new demands on the telecommunication and electronics industry.

We have chosen the direct road to continuing growth by expanding our facilities in our already well established businesses, where demand is mounting. Efforts were centered this year on Europe, but we are also enlarging our capacities elsewhere, both in the production of telecommunication equipment and systems, and as operators of telecommunication services.

This expansion is being accomplished by the construction of new plants or the leasing of available plants, major additions to existing plants, and extensions of plant space, and by the acquisition of companies to broaden our products and services.

In 1961 we completed fifteen new manufacturing facilities, exclusive of extensions and acquisitions, as follows:

In *England* – 3 new facilities for Standard Telephones and Cables Limited: one at *Paignton* for components, one at *Southampton* for submarine cables, and one at *Hastings* for television and radio receivers.

In *France* – 1 new facility for Compagnie Générale de Constructions Téléphoniques: at *Massy,* for telephone switching equipment.

In *Germany* – 2 new facilities for Standard Elektrik Lorenz AG: at *Straubing* and *Rastatt* for components, microwave, and transmission equipment.

In *Italy* – 1 new facility for Fabbrica Apparecchiature per Comunicazioni Elettriche Standard S. p. A.: at *Maddaloni,* for telephone subsets and other equipment.

In *Norway* – 1 new facility for Standard Telefon og Kabelfabrik A/S: at *Økern,* for cable.

In *Spain* – 1 new facility for Standard Eléctrica, S. A.: at *Madrid,* for private automatic branch telephone exchanges.

In *Switzerland* – 1 new facility for Standard Téléphone et Radio S. A.: at *Zurich,* for general telecommunication equipment.

In the *United States* – 2 new facilities for ITT Kellogg: one at *Corinth,* Mississippi, for telephone subsets and switching equipment, and one at *Milan,* Tennessee, for telephone switching assembly.

In *Australia* – 1 new facility for Standard Telephones and Cables Pty. Limited: at *Sydney,* for manufacture of telephone switching equipment.

In *New Zealand* – 2 new facilities: one at *Wellington* for Standard Telephones and Cables Pty. Limited, for telecommunication equipment, and one for our associate, Austral Standard Cables Pty. Limited, at *Christchurch,* for wire and cable.

At the same time, as part of the overall expansion program, we completed 15 extensions of existing plant space. We improved existing plant layouts. We installed new production equipment. We established new and more efficient manufacturing methods.

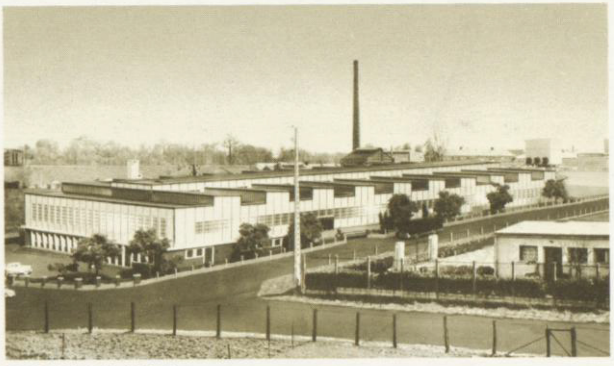
We also began or planned for start of construction in 1962, twenty-two additional new manufacturing facilities, exclusive of extensions and acquisitions, as follows:

In the *United Kingdom*—5 new facilities for Standard Telephones and Cables Limited: one in *Northern Ireland,* one in *Northern Scotland,* and three in England: at *Harlow, Basildon,* and *Southampton,* for cable and other traditional ITT product lines.

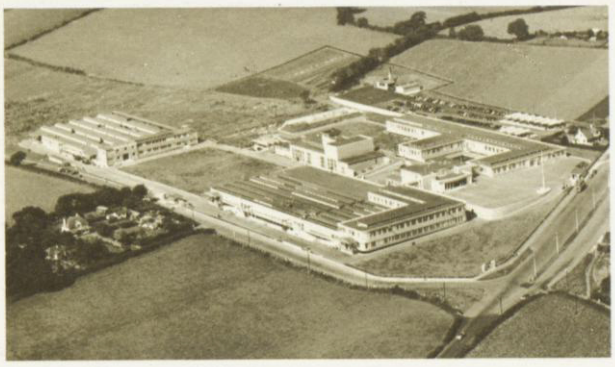
In *Austria* – 1 new facility for Standard Telephon und Telegraphen AG, Czeija, Nissl & Co.: at *Eggenburg* for private automatic branch telephone exchanges.

In *Belgium* – 2 new facilities for Bell Telephone Manufacturing Company: at *Ghent* and *Wasme,* for avionics and telephone subsets.

HASTINGS, ENGLAND

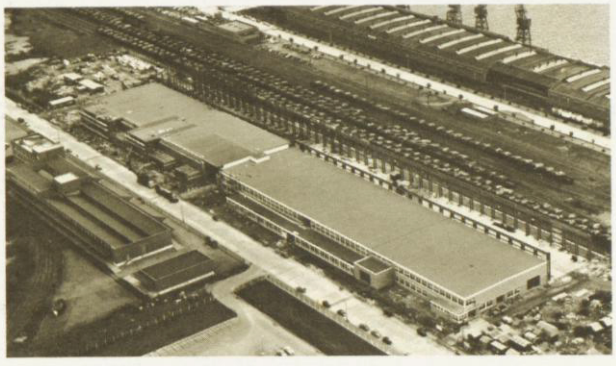


MASSY, FRANCE



PAIGNTON, ENGLAND

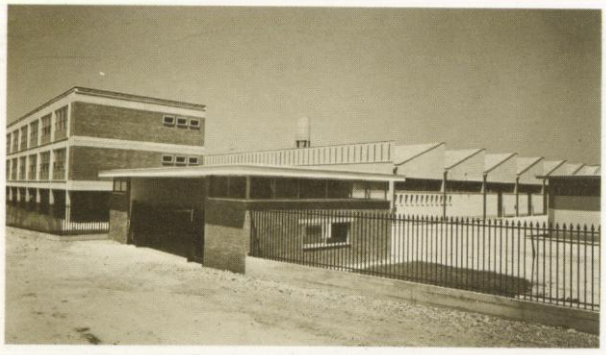
RASTATT, GERMANY



SOUTHAMPTON, ENGLAND

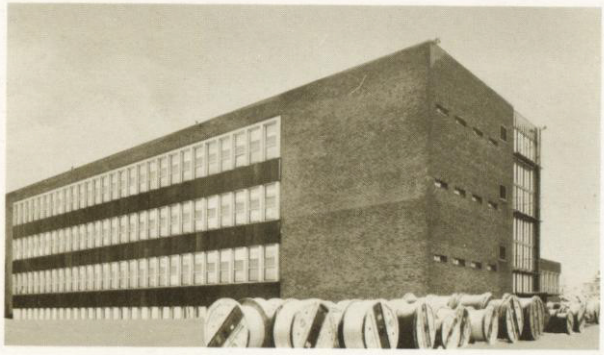
STRAUBING, GERMANY

Building Our Business



MADDALONI, ITALY

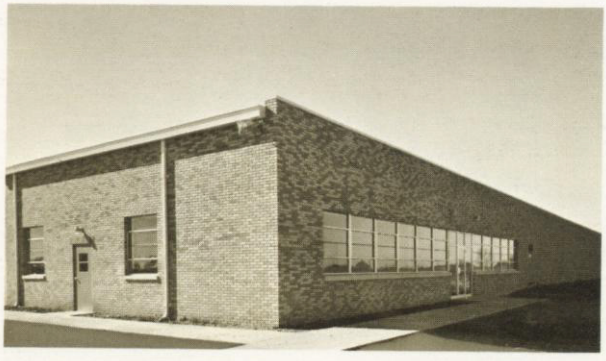
ZURICH, SWITZERLAND



ØKERN, NORWAY

CORINTH, MISSISSIPPI, U. S. A.

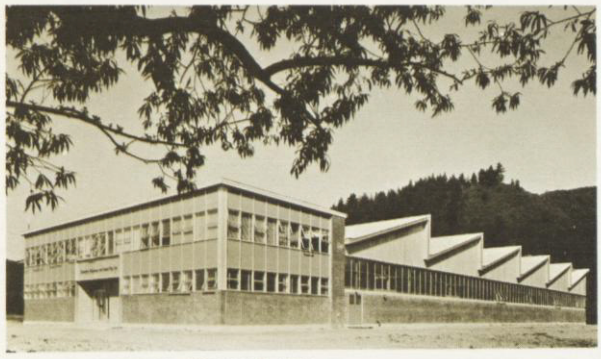
MADRID, SPAIN



MILAN, TENNESSEE, U. S. A.

SYDNEY, AUSTRALIA

CHRISTCHURCH, NEW ZEALAND



WELLINGTON, NEW ZEALAND

In *France* – 1 new facility for Le Matériel Téléphonique: at *Laval,* for switching equipment and television.

In *Germany* – 6 new facilities for Standard Elektrik Lorenz AG: one at *Dortmund* and another at *Gunzenhausen,* for switching equipment and television; one each at *Esslingen* and *Mannheim,* and two at *Stuttgart,* for microwave and transmission equipment, cables, and related products.

In *Holland* – 1 new facility for Nederlandsche Standard Electric Maatschappij N. V. : at *The Hague,* for additional administrative and production space.

In *Portugal*–1 new facility for Standard Eléctrica, S. A. R. L. : at *Lisbon,* for telecommunication equipment and television receivers.

In *Spain* – 2 new facilities for Standard Eléctrica, S. A. : one at *Madrid* and another at *Málaga,* for telephone switching equipment and telephone subsets.

In *Sweden*–1 new facility for Standard Radio & Telefon AB: at *Stockholm,* for expansion of ITT's entire general line.

In the *United States*–1 new facility for Jennings Radio Manufacturing Corporation at *Moss Landing,* California, for manufacture of high-voltage, high-current vacuum switches, and related equipment.

In *Latin America* – 1 new facility for our telecommunication equipment manufacturing company in Puerto

Rico, for production of Pentaconta telephone switching equipment and telephone subsets.

By the end of 1962, this initial phase of our new and continuing expansion program will have added 37 major manufacturing facilities to our System-wide operations, and it will have increased by approximately 20 per cent our capability of meeting the growing requirements of steadily developing world markets.

Supplementing this expansion were our acquisitions in the United States of Jennings Radio Manufacturing Corporation, Surprenant Mfg. Co., and the remainder of the interest in our American Cable & Radio Corporation, and in Europe, of 100 per cent ownership of the Alpina company and the remaining interest in the Eduard Winkler company, both of Germany. These acquisitions improved our productive capacity and market position both in the United States and Europe.

Telecommunication Equipment and Systems

During the year we maintained and improved our position as the largest American-owned international enterprise engaged in the development and manufacture of electronic and telecommunication products. We enlarged our share of foreign markets and also expanded our markets in the United States.

Our Kellogg division in the United States continued to increase its markets and sales. Its low-price, high-reliability automatic toll-ticketing equipment, a recent addition to the Kellogg line, captured a large percentage of the independent ticketing market in 1961.

Kellogg's modern, low-cost carrier telephone equipment was installed at several U. S. operational Atlas missile sites. This economically competitive standard equipment has resulted in large savings to the government, and its operational effectiveness has established the soundness of its design.

The unique commercial advantages of this carrier equipment have been recognized by Bell System and independent telephone companies, which have begun to employ it in certain long-haul situations comparable to those at missile sites. Kellogg-type rural carrier equipment, now being produced by ITT Canada Limited, is also contributing to modernization of the Canadian rural telephone network.

An all-time high in orders was achieved in 1961 by our Creed & Company Limited of Croydon, England, a leading manufacturer of teleprinters and data-processing equipment. The new level represents a 28 per cent increase over 1960. During the year, Creed engineered and installed in the United Kingdom a major network of Creed teleprinters for the Aluminium Limited of Canada group of companies (ALCAN). The system links 24 offices of ALCAN and its associates and connects with Montreal via transatlantic cable, bringing widespread plant facilities on both continents within minutes of each other in a closely integrated pattern of operational control. Extensions of this network to several countries in Europe are now being planned.

Our Pentaconta crossbar telephone switching system continued to make inroads in major world markets. Developed by our Compagnie Générale de Constructions Téléphoniques (CGCT) of France, its production is now standardized in eight countries. As one example of the success Pentaconta has achieved in the export markets, CGCT cut into service in 1961 a total of 10,000 lines in Chile and also received additional orders of 13,000 lines for the same country.

In France, CGCT supplied the telegraphic transit center exchange for the French Air Navigation Department at Orly Airport in Paris. This Pentaconta continuous tape telegraphic transit exchange forms part of the ground services of the international air telecommunication network interconnecting Orly with other world airports and providing communication with regional services such as weather forecast and regional control centers.

Our Le Matériel Téléphonique sub-

The French Line's new queen of the seas, the France, *received the traditional New York harbor welcome as she arrived on her maiden voyage early in 1962. The complete telephone facilities aboard the liner were supplied by our French company, Le Matériel Téléphonique. Part of the Pentaconta crossbar switching equipment is shown below.*

sidiary of Paris supplied with Pentaconta equipment the complete telephone facilities for the French Line's new liner *France*, which recently completed her maiden voyage. The facilities on board include 1,300 subscriber telephones, of which 1,000 are designated for passenger use and 300 for general services. In addition, a security network is provided whereby a manual board can be connected to 60 special security booths as well as 80 wall plugs.

Our Bell Telephone Manufacturing Company (BTM), Antwerp, completed the major portion of the development of its fully transistorized multiplex equipment for carrier telephony on cables and radio links for systems up to 600 channels. Some of this new equipment has already been delivered and further orders have been received.

Continuing its position of leadership in the world switching markets, BTM put into service in 1961 several significant projects – among other places, in Egypt and Mexico – and received large orders for Pentaconta for Brazil, Denmark, and Puerto Rico.

Our Standard Elektrik Lorenz AG (SEL), Stuttgart, is in process of installing a 960-channel microwave network in Mexico which will form the basis of that country's national long-distance network. A similar project is also underway in Chile.

In the field of private exchanges, SEL supplied several large installations of its Citomat equipment including a 1,000-line exchange for the Korean Government in Seoul.

Standard Telephones and Cables Limited (STC), London, received an order for a 1,000-line exchange for Kingston-upon-Hull Corporation Telephone Department, Inc.—a newly developed electronic system for the registration of subscribers' calls. STC is collaborating with other major manufacturers and the British Post Office in the development of an electronic telephone switching system, of which the first experimental allocation will be put into operation in London later this year.

STC is now in production on a new line of high-power, high-frequency radio transmitters that provide high quality telephone and telegraph channels for intercontinental use at competitive prices. The company continues to supply super-high-frequency radio link systems throughout the world. Projects currently on hand include systems for Canada, Greece, Malaya, South Africa, Sweden, and the United Kingdom.

In Latin America, our Standard Eléctrica, S. A., Rio de Janeiro, has progressed with installation of manufacturing machinery for Pentaconta.

Our Compañía Standard Electric Argentina (CSEA), Buenos Aires, successfully cut into service its first trial unit of 1,000 lines of Pentaconta equipment, paving the way for progressive replacement of existing equipment. It has already scheduled the installation in 1962 of three new Pentaconta offices with a capacity of 15,000 lines, and has received an order for a long-distance Pentaconta automatic tandem office. The company has completed installation of machinery required to manufacture Pentaconta equipment frames, and is in production. CSEA successfully entered the market for teleprinters. It also installed high and very-high-frequency communication equipment and radio navigation systems on new Argentine ships constructed in Argentina, Spain, and Yugoslavia.

In Chile, our Compañía Standard Electric S. A. C., Santiago, had a record year with sales rising substantially over 1960. It is now partially manufacturing automatic central office equipment as well as manual equipment, telephone sets, and carrier and microwave radio equipment.

In Australia, our Standard Telephones and Cables Pty. Limited, Sydney, expanded its marketing program. It set up a traveling exhibit of its telecommunication product line aboard an Australian Trade Mission ship that displayed its wares on a tour of southeast Asian ports. As a result, the company has been given orders, against worldwide competition, for its high-frequency broad-

cast transmitters, and the number of inquiries it has received concerning other equipment displayed in its traveling exhibit indicates expanded exports in 1962.

STC-Sydney also received new orders from the Australian Post Office for types of carrier telephone equipment not previously made in Australia. Newly designed 48-channel group translation and group carrier supply equipment was accepted by the Post Office. Transistorized channel panels and group translating equipment for broadband coaxial and radio links were put into production by the company, and a new transistorized 12-channel open wire carrier system was developed and completed during the year. The company also made its first export to Europe of Australian manufactured radio link equipment with delivery to Greece of 10 terminals to be used as part of a major microwave network installed by our Standard Elektrik Lorenz AG of Germany.

Industrial/Commercial Equipment and Systems

Our production of equipment and systems for industrial and commercial markets in 1961 matched the accelerating improvement and expanding reach of our telecommunication operations for the year. Our European companies, especially, reflect the general growth of automation and the dynamic post-war recovery of Western European industry.

In England, our Standard Telephones and Cables Limited (STC), London, fitted the new de Havilland Trident transport airliner, soon to make its initial flight, with high-frequency radio communication equipment, an aircraft intercommunication system, eleven antennas serving various functions of communication and navigation, and radio altimeters for automatic landing. This STC altimeter, the heart of the new automatic blind landing system "Autoland", has completed 8,000 successful automatic landings at the Blind Landing Experimental Unit in England. The altimeter, which is in advance of any similar equipment currently available, is also being fitted as standard on the Vickers VC-10 and the Short Belfast aircraft.

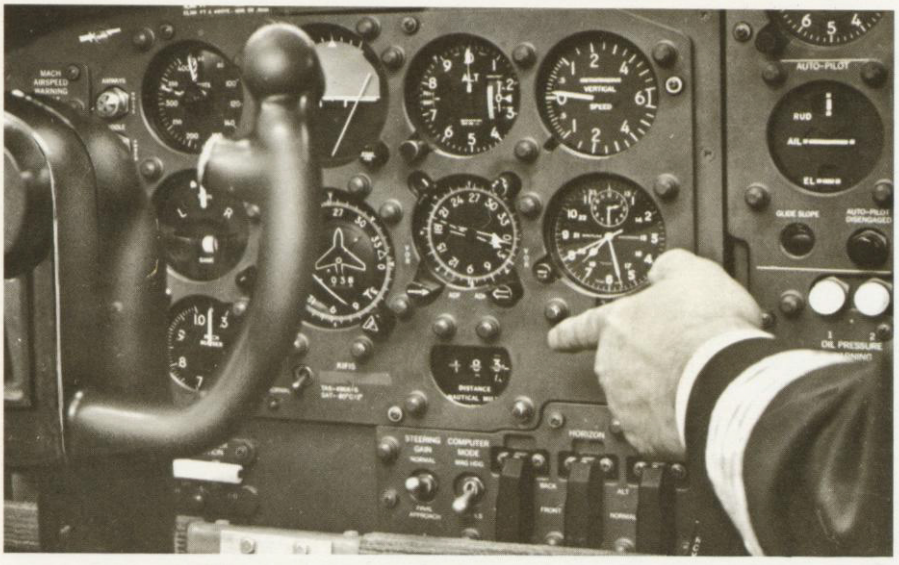
It is also under test by KLM Dutch Airlines in an auto-flare system that is the next step to fully automatic landing. The altimeters have been evaluated by the Federal Aviation Agency in the United States, which has reported favorably on their suitability for automatic landing systems.

STC-London has also been vitally involved in another major item of equipment in "Autoland": the ILS system developed by STC and already adopted by the British Ministry of Aviation as its standard instrument landing system is now being evaluated to determine its suitability for azimuth guidance in automatic landing operations.

STC also developed new automatic ground radio direction-finding equipment for aircraft and introduced a new lightweight very-high-frequency airborne communication and navigation system during the year. The heart of the latter system is a low-consumption, fully transistorized transmitter/receiver designed primarily for the growing "executive" and light-aircraft market, although also valuable for emergency use in large aircraft.

British European Airways placed a £2.5-million contract with STC covering a new push-button seat-reservation system. The first part of the new system will be in operation late in 1963 and the system will be in full operation by the end of 1964, when it will be dealing with 3,000 telephone callers, 280 personal callers, and 500 telegraph messages per hour. Among other aviation activities, our British and German companies have collaborated in developing a system for computing the weight-balance of aircraft loads. Through use of a computer, the system calculates in a fraction of the time previously required and thus handles a large number of flights simultaneously. It is now in operation on Scandinavian Airlines System.

Building Our Business



One of American Airline's "Astrojet" passenger planes streaks across the country. The line's entire jet fleet carries Distance Measuring Equipment (DME) developed by ITT Federal Laboratories. This device, indicated by the pilot, shows the distance of the plane in nautical miles from specially equipped ground radio facilities.

The British Central Electricity Generating Board has ordered direct-wire, remote control, and telemetering equipment for a number of power stations and grid control systems, while the British Railway electrification and modernization plans have absorbed a large part of STC equipment for controlling distribution of high-voltage traction power to overhead supply lines.

In Germany, our Standard Elektrik Lorenz AG (SEL), Stuttgart, added to its outstanding record in the field of air navigation and equipment with a contract from French authorities in Berlin to equip West Berlin's Tegel Airport with ILS. The company also obtained two orders for radar units, one for the U. S. Mission in Berlin, and the other awarded by the German Federal Agency for Air Safety, for Frankfurt.

Noted for its production of track diagram interlock railway signaling systems for railroads in the German Federal Republic and abroad, SEL installed several systems of a new and improved type during the year and filled an even greater number of orders for inductive train-control equipment.

The U. S. Department of State ordered for installation in its Paris Embassy early this year our new Automatic Data Exchange System, designed and developed by ITT Information Systems Division of Paramus, New Jersey. ADX is applicable to commercial as well as government use. The first system of its kind, it is capable of storing messages at a switching center, which then automatically directs, assigns priority, and reroutes them. Through the Paris nerve center of this installation, most of the U. S. embassies in Europe will be connected directly to the State Department in Washington. The Paris center itself will be internally handling millions of electronic impulses per second to effectuate its message-processing and message-routing functions.

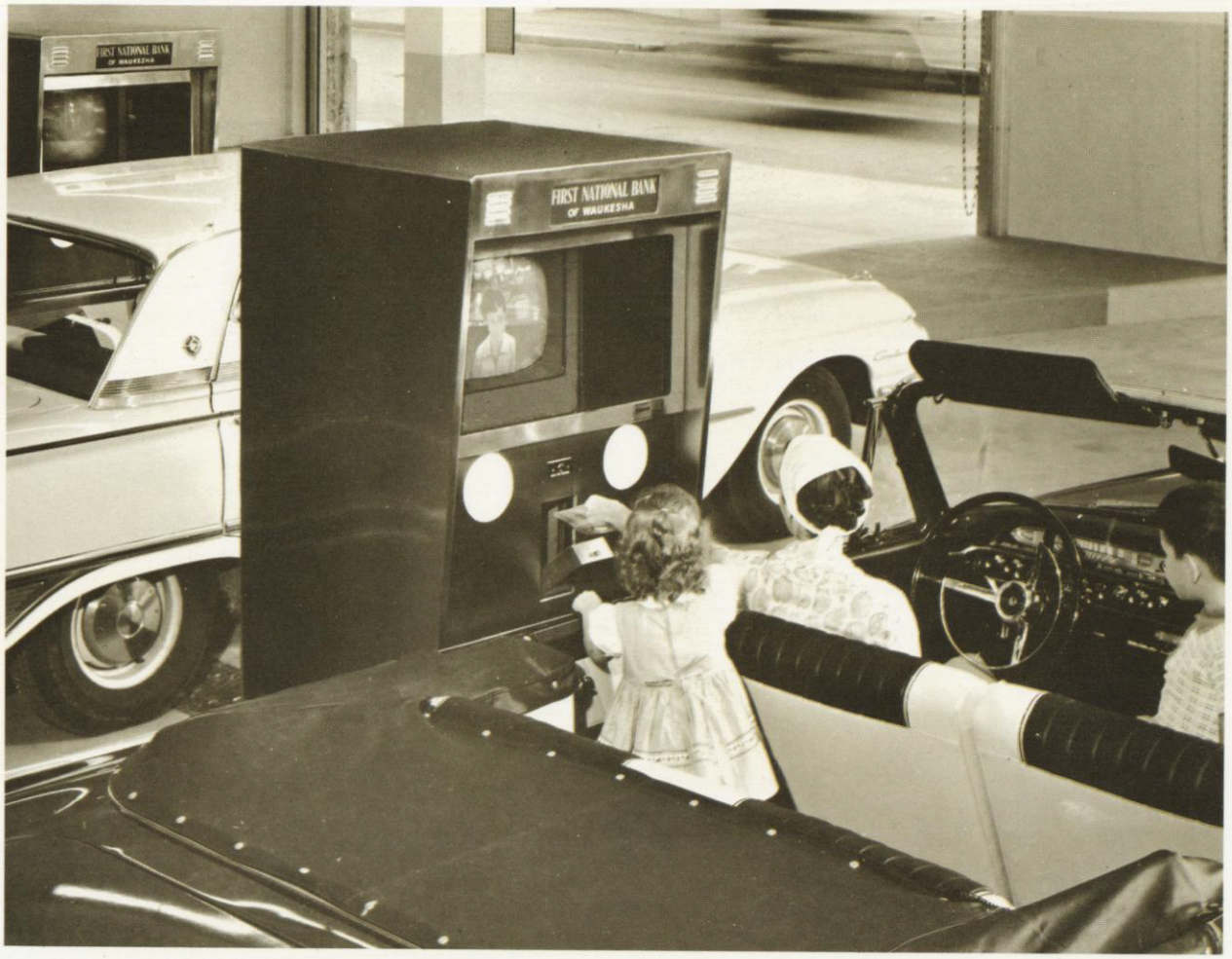
During 1961 we broadened the scope of work in avionics performed by our ITT Federal Laboratories (ITTFL) of Nutley, New Jersey, which continued delivery of Tacan distance measuring equipment (DME) to enable commercial airliners to participate fully in the Vortac program. As a result of the efficiency of this equipment, American Airlines conducted a nationwide advertising campaign to inform the public of the improved service and safety it is now offering with the installation of DME throughout its entire jet fleet – a commercial result of the very large Tacan air navigation military program.

Using advanced Tacan equipment developed and produced by ITTFL, the Federal Aviation Agency (FAA) is investigating the feasibility of employing Vortac ocean stations to guide intercontinental flights. Meanwhile, ITTFL is currently implementing a $30-million Vortac ground station program for FAA, and has designed and produced a new transistorized version of DME that will reduce weight and save valuable aircraft space. The new equipment has already stimulated wide interest from the airlines, and production is planned for this year.

Under another FAA contract, ITTFL has designed a unique air traffic control display system that can ease congestion and reduce hazards at busy metropolitan airports by providing maximum ground control and protection against collision.

Our Industrial Products Division (IPD), San Fernando, California, introduced the first large-screen (14-inch) magnetically deflected sampling oscilloscope with laboratory-quality accuracy. The instrument will compete with many of the five-inch scopes that up to now have dominated the market. Together with two other ITT divisions, IPD also designed and installed in cooperation with Mosler Safe Company the first two "Autobanker" systems in the United States in Waukesha and Wausau, Wisconsin. The Autobanker is a remote-control drive-in banking facility employing ITT closed-circuit television and pneumatic tube carriers.

Building Our Business



The country's first "Autobanker" system, a modern drive-in facility designed by the Mosler Safe Company and engineered by ITT, was installed in 1961 at the First National Bank in Waukesha, Wisconsin. The facility enables customers to transact most of their banking business from the front seats of their automobiles.

IPD also worked closely with ITT Kellogg, Chicago, in the design, engineering, and field-proving of the new ITT Autocom radiotelephone as part of a new mobile communication product line. The Autocom enables users to dial from cars via a mobile common carrier to any telephone in the country and can be integrated into existing private or commercial mobile systems. The significance of this development lies in the predicted growth rate of mobile telephone sets which are expected to increase from the present 20,000 now in use to over one million by 1970.

In Latin America, our manufacturing company in Brazil, Standard Eléctrica, S. A., Rio de Janeiro, strengthened its traditional position as supplier of radio transmission equipment to the Air Ministry, the Navy, and other government departments of that country, as well as to radio communication companies. It also obtained orders for complete shipboard radio installations for freighters of 5,000 to 10,000 tons currently under construction in Brazil.

Our Compañía Standard Electric Argentina, Buenos Aires, installed a Calvert high-intensity approach lighting system in the new Cambapunta International Airport in the province of Corrientes.

In Chile, our Compañía Standard Electric S. A. C., Santiago, continued production of commercial radio transmitters and made the first sale in Latin America of a digital computer, ordered by the University of Chile.

In the Pacific, our Export Department received a $3.8-million contract for modernization of the Manila International Airport. The department is handling the supply and installation of all electronic navigation aids and lighting equipment for this project.

Defense Equipment and Systems

The varied skills and experience which make up the hard core of ITT's unique electronic and telecommunication capabilities continued to contribute to the collective defense of the free world in 1961. We were engaged in major undertakings for the U. S. and allied defense programs, and our companies overseas were similarly engaged in defense activities for their respective governments and allies.

Our U. S. and allied defense efforts included expansion of our work in the development of navigation, communication, and instrumentation systems for all branches of the armed services.

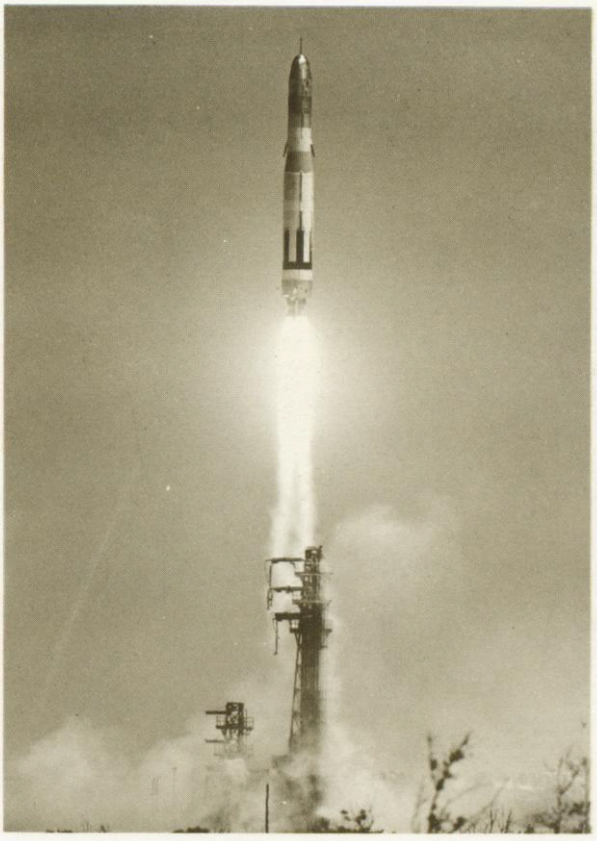
During the year, our ITT Federal Laboratories (ITTFL) received multimillion-dollar production contracts for new, improved versions of our Tacan (tactical air navigation) airborne equipment to guide modern jet military aircraft. These Tacan sets are being installed in supersonic Navy fighters, and also in F-104 jets being supplied for the defense requirements of Western European nations and other allies.

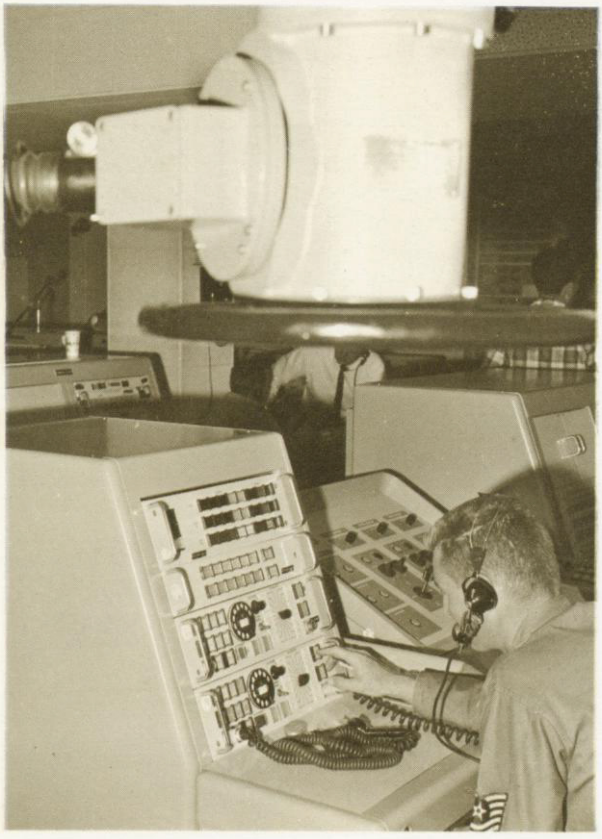
Five of our companies supply equipment for the Tacan program in Europe: Bell Telephone Manufacturing Company, Belgium; Le Matériel Téléphonique, France; Standard Elektrik Lorenz AG, Germany; Fabbrica Apparecchiature per Comunicazioni Elettriche Standard, S. p. A., Italy; and Standard Eléctrica, S. A. R. L., Portugal.

One of the distinctive features of ITT's communication systems is their capability of automating functions required for instantaneous command and control, exemplified in the test system we developed under Project 465L for the U. S. Air Force Strategic Air Command.

Our International Electric Corporation (IEC) passed a major milestone with this system when its operational feasibility was demonstrated in a pilot operation at IEC's test facility last May. Its acceptance by the U. S. Air Force marked completion of the project's planning and engineering phase, and full-scale equipment production got underway in June. When

Building Our Business





Part of the Company's defense work is concerned with the design, manufacture, and installation of communication systems supplying ground support for missile bases. Shown here are the launching of a Titan missile, and the communication console in a control center. Our ITT Kellogg division is the contractor for this system.

operative, the system will give the Strategic Air Command an automated, high-speed method of controlling its missiles, its personnel, and its manned bombers. Progress was also made on the related Project 480L by ITT Communication Systems, Inc., in its engineering of an expansion and modernization program for AIRCOM, the global communication system of the U. S. Air Force.

As prime contractor for the design, manufacture, and installation of the highly complex and vital communication systems supplying ground support for Atlas missile bases, our ITT Kellogg division in 1961 kept pace with the country's expanding missile activities. The Communications Systems Department (CSD) of Kellogg completed the manufacture and installation of 8 ground-support communication networks for Atlas sites located at Air Force bases in 6 states. It completed installation of 3 Atlas intersite communication links, and started work on 3 major communication networks for other Atlas sites.

In addition to its Atlas activities, CSD is engaged in similar ground-support equipment work on the Titan, Minuteman, and Discoverer projects, and it performs 90 per cent of the communications at Vandenberg Air Force Base – research and development headquarters of the Pacific Missile Range.

Our ITTFL received several important contracts aimed at increasing the efficiency of the Atlantic Missile Range. Teamed with Sperry Gyroscope Company, ITTFL was chosen to assist in the electronic outfitting of special picket ships to be stationed in the Atlantic for pinpointing the trajectories of future firings.

ITTFL also produced and delivered during the year vital equipment to the armed services. This included: important contributions to the communication equipment of the U. S. Navy's Polaris missile submarines; the electronic "brain" device providing the pinpoint accuracy of the Lacrosse artillery missile of the U. S. Army; and the high-power radio transmitters that guide the deterrent force assigned to the SAGE (Semi-Automatic Ground Environment) defense communication system of the U. S. Air Force.

Work for the Air Force progressed rapidly during the year on activation of the Titan missile base at Larson Field. The contract was awarded to our Federal Electric Corporation (FEC), which had over 600 men working at the base by the end of the year. FEC continued with its three-year contract for operation and maintenance of Pacific Missile Range instrumentation facilities at Point Arguello, California.

FEC also continued its operation and maintenance of the Distant Early Warning (DEW) Line of radar outposts across Alaska and Canada, and the DEW East extension to Greenland, and received a multimillion-dollar contract from the U. S. Air Force to continue in this role in 1962. The contract was substantially increased by the further extension of the DEW East portion of the system across Greenland to Iceland.

In nearing completion of major sections of the military communication network, ACE HIGH, for the North Atlantic Treaty Organization (NATO), we continued to demonstrate our System-wide electronic and telecommunication strength in this allied defense project, which is designed to serve as an electronic fence protecting the 15 NATO countries against surprise attack.

ACE HIGH has been engineered in its entirety by our subsidiary, International Standard Engineering, Inc. (ISEI) of Paris, under contract with Supreme Headquarters Allied Powers Europe. Extending nearly 8,500 miles from Norway to Turkey, and connected with the British Isles, it is the largest warning network of its kind, and has required the coordinated engineering and productive capabilities of over a score of our companies located in Europe and the United States.

In addition to the engineering-management services of ISEI, telecommunication equipment and services

for ACE HIGH were supplied by our companies in Belgium, Denmark, France, Germany, Italy, Norway, Turkey, the United Kingdom, and the United States.

These ITT System companies also contribute significantly to the defense of their countries by the production of military electronic and telecommunication equipment and systems.

Consumer Products

Our increasing ability to keep step with widening markets in Europe and the newly developing countries of the world was reflected in consumer sales as well as in our basic telecommunication product lines.

Retail consumer products are significant manufacturing items for our companies in Europe and Latin America, and their trademarks command broad markets in those areas and elsewhere. Our products include radio and television sets, phonographs, wire and tape recorders, hearing aids, and a wide range of electric household appliances such as flatirons, percolators, heating pads, kitchen ranges, air conditioners, heaters, and refrigerators.

In Germany, our Standard Elektrik Lorenz AG (SEL) manufactures under its Schaub-Lorenz trademark a complete line of television, radio, and phonograph equipment and combinations. In 1961 its transistorized "Touring" portable auto radio, which can be detached and used as a portable, continued as a profitable item occupying a leading percentage of the market. Manufacturing facilities of SEL's Schaub division were increased during the year to fill expanding orders. Further increases are expected from SEL's broadened television capacity.

In the United Kingdom, our Kolster-Brandes Limited manufactures a complete line of radio and television receivers. Substantial increases in volume are expected in 1962, partially due to recent tie-ins with television rental companies.

In Belgium, our Bell Telephone Manufacturing Company produces consumer goods for both the domestic and export markets: radio and television sets, window air conditioners, freezers, and self-service food display freezer cabinets. Sales improved in 1961, especially in refrigeration equipment. Further growth is expected as a result of the rapidly growing demand for frozen food in Europe.

In Norway, our Standard Telefon og Kabelfabrik A/S also manufactures home freezers for the domestic and export markets.

Some of our European companies continued activity in the sale of telephone handsets direct to the user and anticipate increased sales in 1962. Consumer marketing techniques successfully applied include availability of the instrument in a choice of colors, media and direct-mail advertising programs, and modern packaging and counter displays.

We have also expanded our European sales activities by assembling our consumer products and distributing them in European market areas not reached before.

In Brazil, consumer products activities showed a good return on investment despite the strong inflationary trend of 1961. Our Standard Eléctrica, S. A. in Rio de Janeiro doubled its share of the Brazilian television market and also raised substantially its share of the portable radio market.

Cable and Wire Products

The momentum achieved down the line in our development of markets during the year contributed to results shown in the manufacture of our cable and wire equipment.

Our plants produce every variety of telecommunication cable, including coaxial and submarine. Located in the United States, Argentina, Australia, Canada, England, Germany, Norway, and Spain, they have provided, and are continuing to provide, much of the equipment required for long-distance communication networks.

One of the most popular consumer items manufactured by our German company, Standard Elektrik Lorenz AG, is its "Touring" portable auto radio. It not only fits securely into a dashboard rack for use while driving, but is also easily removed from the car for use as a portable radio. It is shown here in both positions.

Building Our Business

At year's end, the main transatlantic section of CANTAT, longest submarine telephone cable system ever designed and built in Great Britain, was inaugurated by Queen Elizabeth II. Our Standard Telephones and Cables Limited (STC), one of the world's leading manufacturers of submarine telecommunication cable, supplied 97 submerged repeaters, 12 submerged equalizers, 75 miles of armored and screened submarine cable, and special shore-based terminal equipment for this single-cable two-way system. STC was also awarded a substantial contract from the British Post Office to supply equipment for the United Kingdom-Germany submarine cable project. This is STC's first order for its newly developed 120-circuit shallow-water submerged repeater.

Other submarine cable systems recently put into operation include one between New Jersey and Bermuda which was supplied by STC as a complete system comprising cable, repeaters, and terminal equipment; and the SCOT-ICE system between Scotland and Iceland. STC is also currently establishing a new factory at Southampton to produce submarine cable for American Telephone and Telegraph Company.

Our German company, Standard Elektrik Lorenz AG (SEL), increased its sales of cable and wire for communication and signaling, and expanded its manufacturing capacity accordingly. A major customer was the German Department of Posts and Telegraphs. SEL also added a number of new types of high-frequency cable in anticipation of requirements of the current expansion of the West German television transmitting network.

In Norway, our Standard Telefon og Kabelfabrik A/S completed a notable undertaking with delivery of the longest high-voltage submarine power cable ever produced in that country. Approximately 16 miles long, it connects the island of Vaerøy in Lofoten with the Norwegian mainland. It will provide power for the island community and for a number of new industries.

We increased our productive capacity and strengthened our market position in the cable and wire field by our acquisition of the Surprenant Mfg. Co. of Clinton, Massachusetts, a leading producer in the United States of specialized wire and cable for missile systems, computers, and other military and industrial electronic uses.

During the past year, Royal Electric's products found new applications of significant market potential. The close of the year saw Royal's coaxial cables being used in such demanding projects as the Atomic Energy Commission's underground nuclear experiments at Carlsbad, New Mexico and Mercury, Nevada; the Ballistic Missile Early Warning System (BMEWS); and the atomic shipbuilding program underway at Newport News, New York City, and Groton, Connecticut. Royal's wiring device division developed a new type of "S" fuse, required under the National Electrical Code for all new construction, which has given us a competitive marketing advantage in this field. Royal also manufactured miniature cable which can be laid down from a helicopter traveling at high speeds. This cable is capable of carrying many concurrent messages, and while it was produced primarily for the military, it has a number of commercial applications—particularly in disaster and construction areas. Our engineers at ITT Federal Laboratories developed and delivered during the year cabling and connector systems for the U. S. Navy's growing fleet of Polaris submarines.

As a result of the newly developing markets for communication equipment in the Far East, our cable and wire producing activities expanded significantly. ITT companies supplied substantial amounts of wire and cable to Thailand and Vietnam.

In Buenos Aires, our Compañía Standard Electric Argentina worked at full capacity to fill the year's orders for insulated and sheathed switchboard cable, and Neoprene-jacketed drop wire.

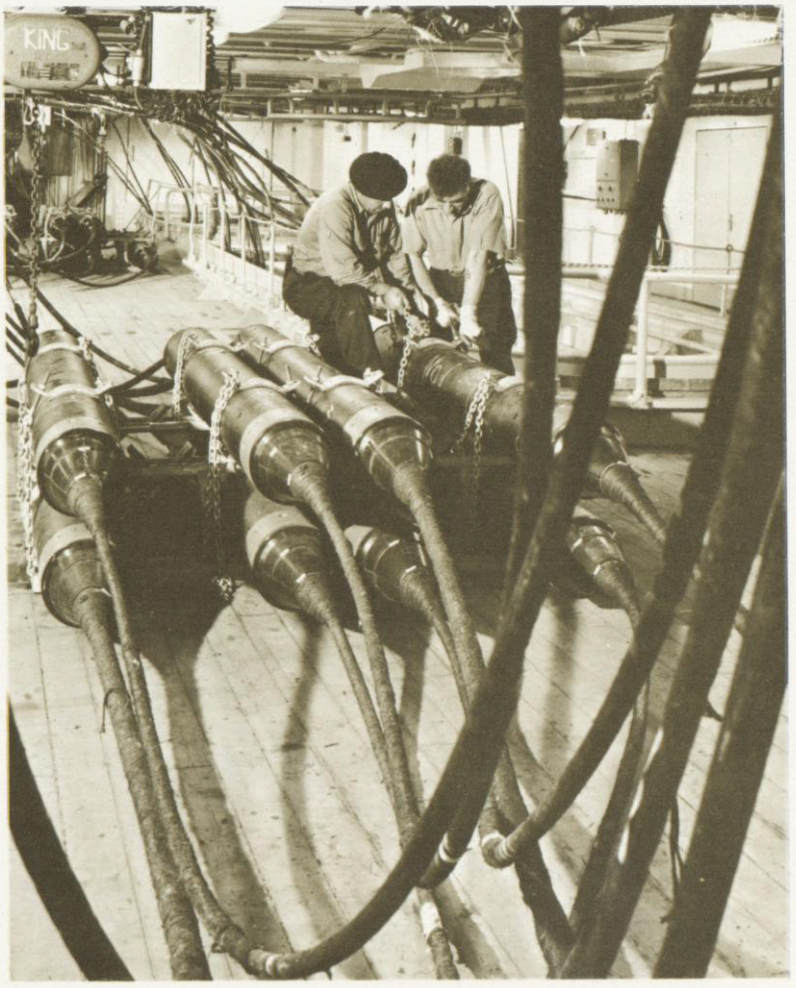
Components and Materials

Communication and other electronic equipment is no better than the components that go into it. To maintain high standards and constantly improve them, ITT System factories and laboratories around the world devote much effort to these key electronic building-blocks.

Our engineers and production men have the advantage of working closely with government and private customers in many lands, climates, and economic circumstances. Therefore our components, like our equipment, provide many advanced solutions at the lowest possible prices to such problems as stability, reliability, small tolerances, and durability under extremes of climate or mechanical stress.

ITT components are developed, manufactured, or assembled locally where markets warrant. Our present and future plans call for a much larger and increasingly effective marketing effort through organizations established for the purpose.

As part of our work for the U. S. armed forces, we have developed a series of silicon rectifiers for use in military equipment that places a premium on ruggedness, minimum size, high efficiency, and resistance to extreme temperatures. One of our European companies has developed a line of silicon rectifiers of simple design, which can be manufactured



Our English Company, Standard Telephones and Cables Limited, is one of the world's leading manufacturers of submarine telecommunication cable and related equipment. Photo shows submarine repeater manufactured by the company about to be laid for the northern sector of the Scotland-Faroes-Iceland telephone cable.

at greatly reduced cost. The same company has lowered costs of small-area rectifier plates used in electric power converters by fully mechanizing their manufacture.

The silicon epitaxial planar transistor was put into production in 1961, and aggressive mechanization is producing a steadily increasing flow of these promising new devices.

Our versatile parametric amplifier, which virtually eliminates internally generated receiver noise, expanded its usefulness in the low-electric-noise environment of space, and is expected to find increasing application as plans unfold this year for development of a worldwide satellite communication system. This amplifier permits reception of signals from satellites, from space vehicles, and from the tropospherically oriented antennas that are used in ITT's long-range scatter systems for earth communication.

The acquisition of the Jennings Radio Manufacturing Corporation of San Jose, California added to our ability to serve our customers in the important field of radio and television transmitters, where now in addition to our power transmitting tubes we can also supply variable vacuum capacitors.

Vacuum relays providing the world's first and largest coaxial cross-point for switching high radio-frequency power transmitters to various remote antennas are part of the Jennings program, as well as high-current vacuum switches which are being increasingly applied for load-balancing and as circuit-breakers for electric utilities, and for the switching of industrial electric furnaces.

Our tube facilities in the United States, Great Britain, France, and Germany provided the electronics industry with various new tube types for both industrial and entertainment use. Improved tubes, developed by our laboratories and put into production during the year by our factories, include: a tube enabling an observer to see an image by virtue of invisible infrared (heat) radiation, which it converts to visible light; ceramic-enveloped hydrogen thyratrons; a ceramic power tube for industrial radio-frequency heating, and for radio and television applications. Continually improved high-current photocells designed and built by ITT Industrial Laboratories for testing nuclear weapons are making important contributions to the U. S. nuclear arsenal.

In the United States our straight-wall wet electrolyte tantalum capacitors have received military approval, and the successful qualification of other types appears imminent.

In Europe we introduced, apart from many other improvements in capacitor types, the production of thin-film circuits using latest sputtering techniques for the capacitors and vacuum deposition for the resistors.

A notable contribution to the field of miniature electronic components was made by developing a line of miniature and subminiature glass-sealed contact units and relays. It is expected that this line will find wide acceptance in world markets.

Acquisition of the Winkler company in Germany, makers of a complete line of electromechanical switches, plugs, and related components, has strengthened our position in an important field.

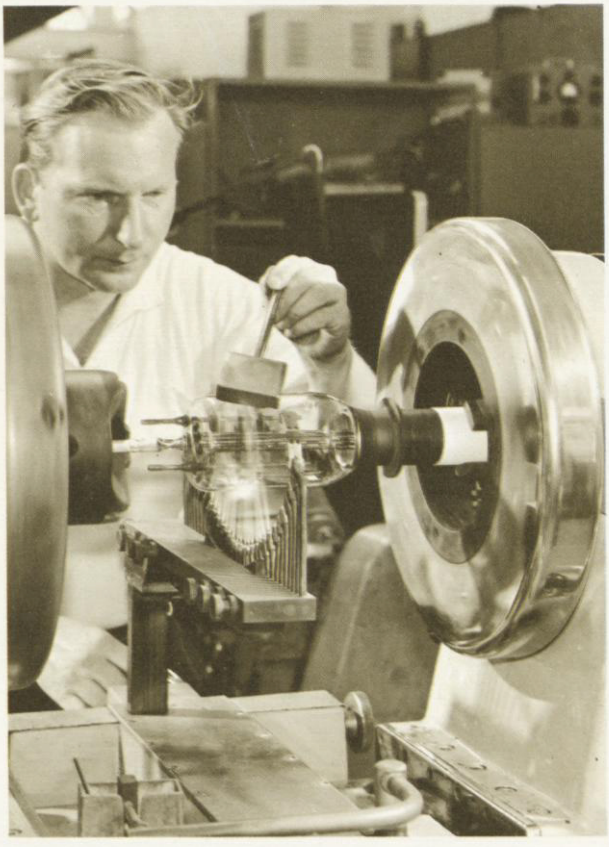
Valuable contribution to our line of loudspeakers was made by considerably increasing the production capacity and improving the quality of our speakers in order to make them better suitable for application in television receivers.

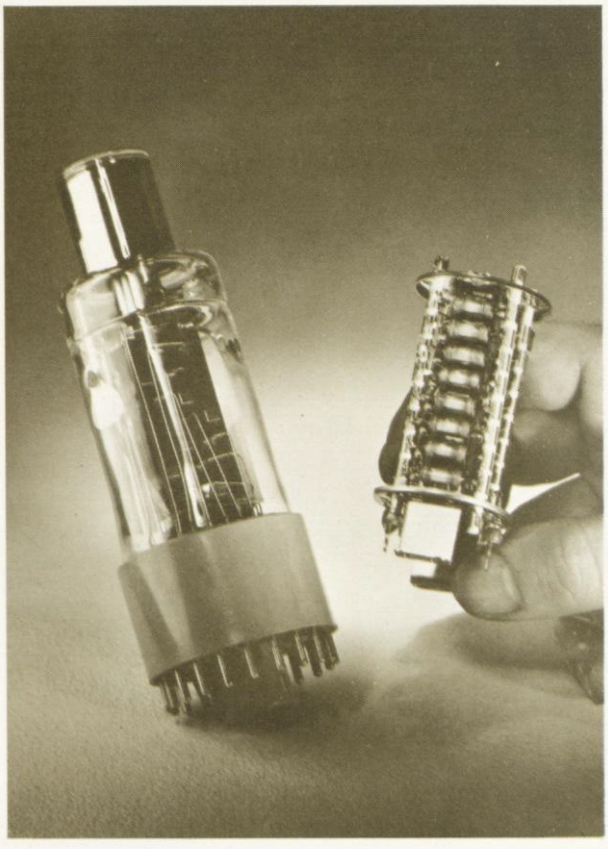
We succeeded also in appreciably increasing the efficiency of our small battery motors which, in view of the transistorization of all types of record-players, is an important feature.

Our facilities for producing quartz crystals in the United Kingdom are being expanded to meet steadily increasing demand.

Telecommunication Operations

We took long steps forward during the year in the expansion and upgrading of our telecommunication





We expanded our production of traditional components and introduced new ones in 1961. Left, sealing a power tube at Standard Telephones and Cables Limited, London. Right, a "tubeless" electron tube developed by ITT Industrial Laboratories, Fort Wayne, for use in the high-vacuum conditions of outer space —shown here compared with a conventional tube.

operating services. These are centered in Latin America and provide local, long-distance, and international communications by landline, cable, and radio.

Our five telephone operating subsidiaries provide comprehensive telephone service in Chile, Puerto Rico, and the Virgin Islands; in the State of Paraná in Brazil; and the capital city of Lima, Peru, and its outlying districts. We also have a 50 per cent interest in undersea telephone cable facilities and tropospheric-scatter microwave telephone and television facilities between the United States and Cuba, and in the deep-sea repeatered twin telephone cables between the U. S. continent and Puerto Rico.

In addition, we operate radio communication subsidiaries in Argentina, Bolivia, Brazil, Chile, Cuba, and Puerto Rico which provide international radiotelephone service and, except in Puerto Rico, international radiotelegraph service as well. The radio subsidiary in Brazil also operates a nationwide network linking 31 cities, and the Bolivian radio subsidiary operates certain domestic telephone and telegraph services by landlines.

Our 1961 revenues from these operations increased 18 per cent over 1960, and considerable progress in service expansion programs was made by our Puerto Rico Telephone Company, Compañía de Teléfonos de Chile, and the Virgin Islands Telephone Corporation.

Puerto Rico Telephone Company, which continued its Island-wide accelerated expansion and improvement program, begun in 1959, completed a number of important projects during the year. It converted the metropolitan areas of San Juan and Ponce from 5 to 7-digit dialing, required for introduction in 1962 of direct distance dialing within the Island and eventually to the mainland. It placed in service over 18,000 terminals in Pueblo Viejo, Cataño, Santurce, Ponce, and Rio Piedras, and it installed intertoll dialing equipment as well at the Santurce and Ponce exchanges.

Together with our Radio Corporation of Puerto Rico, the company increased the number of its international submarine cable circuits. It installed a total of 184 new channels on microwave and converted the Bayamón manual exchange to automatic operation.

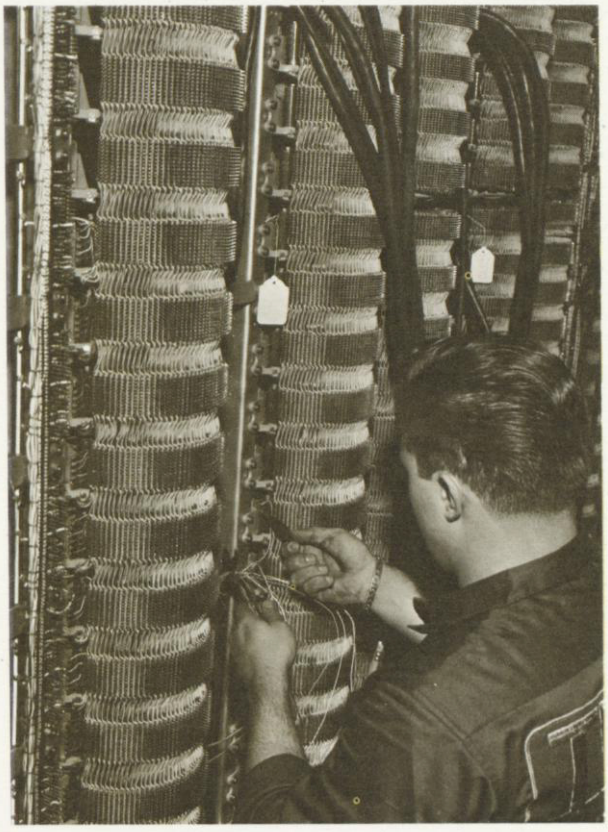
In the first three years of the expansion program, $51,480,000 was spent, and an additional expenditure of $53,342,000 is contemplated for the remaining two-year period. The company plans to file an application for a rate increase in connection with this program.

Our Compañía de Teléfonos de Chile also effected significant service improvements. These included the inauguration of automatic service in four cities and expansion of two automatic offices in Santiago for a total of 9,500 new automatic lines. The company moved forward in its work on converting the cities of Antofagasta and Punta Arenas to automatic service, and in providing automatic extensions and conversions in Santiago and Valparaíso-Viña del Mar for a total of over 17,000 new automatic lines. It inaugurated a new radio channel between Santiago and the port of Chañaral and undertook substantial toll construction, including a 60-channel microwave extension between Santiago and Valparaíso.

In late January 1962 the Chilean Government instituted a dual rate of exchange for Chilean currency in certain transactions. The effect of this on our company's rate structure and construction programs, and on the rate at which dividends, interest, and service fees may be remitted from Chile to the United States, is presently unknown.

The Virgin Islands Telephone Corporation neared completion of its program to provide local service improvements followed by conversion of the Islands' telephone facilities from common battery and magneto to dial operation.

During the year, all engineering for conversion was completed; central



We made substantial progress during the year in meeting the growing requirements of our telecommunication operating services. Left, testing new automatic telephone equipment installed by our Puerto Rico Telephone Company as part of its Island-wide modernization and expansion program. Right, new automatic telegraph exchange (telex) equipment installed by our American Cable & Radio Corporation at its New York headquarters.

office equipment and all outside plant materials were ordered; the Charlotte Amalie headquarters building was completed, and the Christiansted and Frederiksted buildings neared completion; the St. Thomas-St. John submarine cable was installed; and overseas facilities were increased as follows: St. Croix-San Juan, from 2 to 4 circuits; St. Thomas-New York, from 3 to 4 circuits; St. Thomas-San Juan, 3 dial circuits added.

In Peru, efforts of our Compañía Peruana de Teléfonos Limitada, Lima, met with success in February 1962, when the government granted rate revision that will permit resumption of the company's expansion program, suspended the past three years. Present unsatisfied demand is estimated in excess of 72,000 telephones.

In Brazil, the long and unsuccessful efforts of the Pôrto Alegre division of our telephone operating subsidiary, Companhia Telefônica Nacional (CTN), to establish rates that would permit a fair return on investment culminated, early in 1962, with illegal seizure of the division and its property by Governor Brizola of the State of Rio Grande do Sul, on grounds of "public interest". At the same time, the Governor, who espouses state ownership of public utilities, purported to fix the amount of $400,000 in cruzeiros as the compensation payable for our business and properties, whose fair value we place at about $10-million. The Curitiba division of CTN and other ITT operations in Brazil were not affected by the decree.

For some years, the State of Rio Grande do Sul has fixed the division's operating rates at a level which would not permit recovery of depreciation, let alone a fair return on our investment, and the rate base on which we were operating at the time of the expropriation was less than one-sixth of replacement value. In commenting on the seizure, the U. S. Department of State, while recognizing the right of Brazil to expropriate foreign properties if adequate indemnity is paid, characterized the Governor's proffered $400,000 as "so far below book value that the evaluation appears to have been made unilaterally." The company had not been afforded opportunity for a hearing before the illegal seizure took place.

We are of the view that the Federal Republic of Brazil is required to assure the prompt, effective, and adequate settlement that is its responsibility under international law.

Our Radio Corporation of Puerto Rico handled 27 per cent more calls between Puerto Rico and the United States during the year than in 1960, following installation of equipment that increased the cable facilities from 50 circuits to a possible maximum of 85. Three one-way dial circuits from the Virgin Islands, and a third radiotelephone circuit between Puerto Rico and the Dominican Republic were placed in operation to meet increased traffic demands. Also, a microwave system was installed between the Radio Corporation's cable terminal building and the Dorado receiving station, thus making available telephone cable facilities urgently required for other services.

In Buenos Aires, our Compañía Internacional de Radio, S. A. (CIDRA), increased the capacity of its radiotelephone facilities to New York from 4 to 6 channels in September and from 6 to 8 channels in December. It established a direct telex circuit to Copenhagen simultaneously with installation of automatic error-correction devices for record communication on the existing message telegraph circuit. It expanded its international telex service by completing arangements for reaching West Germany, and it carried out tests with Lima to convert the existing circuit to automatic error-correction operation. Tests were also conducted to interconnect CIDRA's international telex switchboards with the domestic network that will initially comprise 580 lines in six major Argentine cities.

American Cable & Radio Corporation

On February 6, 1962, the Federal

Communications Commission approved the application of the Commercial Cable Company, an AC&R operating unit, to discontinue the use and operation of its transatlantic submarine telegraph cables, and to use instead leased facilities in the new multichannel transatlantic submarine telephone cables operating between the United States and Canada and the United Kingdom.

This change provides a more efficient operation, improves service to the public, and materially reduces operating expenses. The addition of these new leased facilities brings to a total of 97 the modern full-speed teletype cable channels operating between the United States, and the United Kingdom and Europe.

These facilities make it possible for AC&R to meet the continually growing demand for telex and leased-channel customer-to-customer services, and to provide improved handling of regular message traffic. Similarly, radiotelegraph channel facilities have been augmented during the past year in the Latin American area and the Far East by installation of additional multichannel, automatic error-correction equipment.

Plans for installation of automatic switching equipment in AC&R's New York and San Francisco telex terminals have moved ahead. It is expected that this equipment, which will permit AC&R teleprinter subscribers to connect their machines automatically to teleprinters abroad, will be in full operation this year. This will increase the speed of service, provide better control of traffic, and result in more efficient operation at lower cost. AC&R is also planning early installation of automatic techniques for its message operating centers.

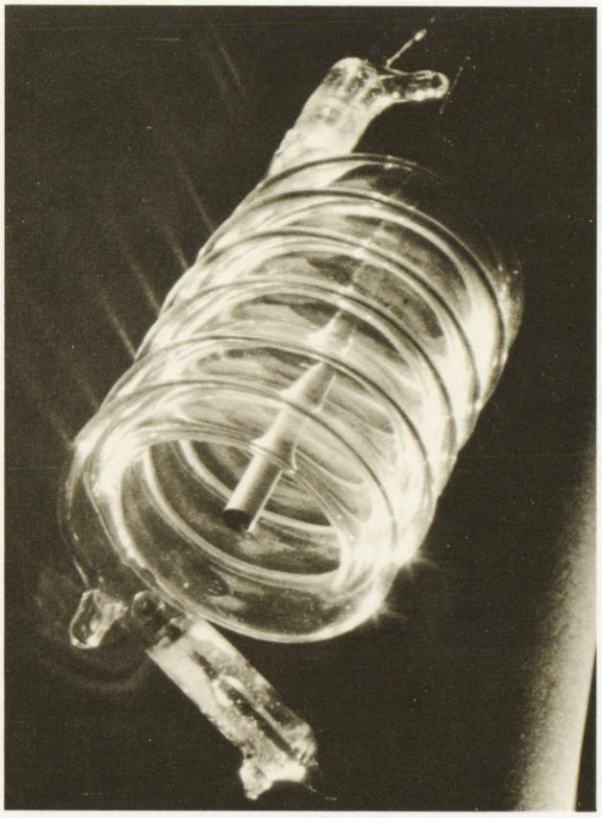
Marine Radio

During 1961, the Marine Division of AC&R's Mackay Radio subsidiary continued operation of eight coastal stations, seven in the United States and one in Manila, for ship-to-shore telegraph communication. Headquarters for this operation and for the sales and service functions of the Marine Division are located at Clark, New Jersey, where manufacturing facilities and a development laboratory for design of shipboard communication and navigational equipment are maintained.

At the close of 1961, the Marine Division retained a leading position in contract awards for equipping new ship construction in the United States with communication and electronic navigational devices. One of the more important contracts was for complete electronic equipment on 10 additional Lykes Bros. ships, bringing the total awards for this company's new ship construction to 23. Among many other important orders was one received to equip the new American Telephone and Telegraph Company cable ship, now under construction in Germany, with high-power communication apparatus.

Our International Marine Radio Company Limited, Croydon (England), had on hand as of August, 1961, orders for complete marine radio installations for 60 ships, compared to a total of 24 such installations on hand in August of 1960.

Our marine radio company in Spain, Compañía Radio Aérea Marítima Española, S. A., supplied radio equipment to the Spanish merchant and fishing fleets during 1961.



New products and techniques recently developed by our scientists and engineers include: Left, a ruby laser, showing ruby crystal and flash tubes, developed in France by our Laboratoire Central de Télécommunications. The laser is a device that opens the possibility of communicating by light beams on earth and in outer space. Right, model of a new device developed by ITT Federal Laboratories to display air traffic in three-dimensional form.

Research and Engineering

". . . our System-wide research staff of 8,000 scientists and engineers contributed significantly to the Company's strong advances . . ."

The unique capability of our System-wide research and engineering skills contributed significantly to the growth momentum generated in all areas of the Company's operations.

We continued to expand our research and development program, which is one of the longest-continued on a worldwide scale in communications, electronics, and electromechanics. As the technical foundation of the Company, the program is necessarily dynamic and contributes to our assurance of growth by developing new and improved products and systems in fields that are becoming progressively more complex and demanding in their requirements.

The progress achieved by the Company in its telecommunication and defense activities during the year has been summarized in the preceding sections of this report. Following are some examples of fundamental contributions of our research and advanced development program, contributions that will find increasing application in support of our major activities.

Telecommunication

Supercooled Parametric Amplifiers: The parametric amplifier is a device that will amplify an electrical wave, usually a radio signal, without adding as much electrical noise as do other amplifiers. It thus has wide applications in both civil and military communication systems where broadband signals, carrying large quantities of telephone or telegraph traffic, must be received and amplified – as, for instance, between large cities. Other uses are in the fields of satellite communication and radio astronomy. The noise characteristics of the parametric amplifier, already low, are still further reduced by ITT's supercooling technique. In this respect its performance approaches that of the maser, but with less complexity and expense. This improvement permits the use of less costly antennas and transmitters without affecting performance.

Special Receiver Techniques: The Company also leads in development of other techniques that permit efficient reception and amplification of radio signals. These, which complement the supersensitive methods already mentioned, are intermediate-frequency diversity-combining, and frequency-following. Whereas conventional diversity systems select the stronger of one or more received signals, diversity-combining is a system of receiving a desired radio signal on two receivers and *adding* the signals to obtain increased signal power and quality. The duplication insures that the quality of the signals will be maintained under fading conditions. Frequency-following is a technique for reducing the apparent bandwidth of a receiver, and hence reducing its susceptibility to the electrical noise that accompanies all radio signals, without losing any of the desired signal itself. It is used in tropospheric-scatter systems, satellite communication systems, and other cases where the received signal is weak, and also has applications in many commercial communication links, where multipath signals are received and in military communications, where jamming is encountered.

Lasers: The ITT System is devoting substantial effort, both here and abroad, to the study of lasers, devices that generate and amplify light waves. By this technique a beam of light in free space, or in a pipe along the ground, can carry a tremendous amount of information—for example, several hundred TV channels or hundreds of thousands of telephone channels. It may offer the means whereby communication will contribute further to progress by opening up entirely new fields, such as phone vision and electronic mail. Some discoveries concerning the polarization of light from ruby lasers have been made, and work is also underway on gaseous lasers and the applications of both these devices to military communication problems. Problems of modulating, transmitting (through "light pipes"), and detecting wideband signals riding on a beam of laser light are underway.

Work is now in process in our Paris laboratories on a detailed study to determine the types of atomic transitions in various substances that might be employed to widen the applications of laser-type devices.

Millimetric Waveguide Transmission Systems: Work is continuing on these systems, which were mentioned in last year's Annual Report and apply to heavily loaded communication systems between major cities. Experimental transmission equipment has been set up and field trials are scheduled for 1962. Extremely high-capacity transmission, free of fading and interference, is foreseen through use of a waveguide of tightly spiraled wire, using radio waves one-third of an inch long, or shorter.

High-Speed Data Transmission: Foreseeing an extremely rapid expansion in the use of commercially available telephone circuits for high-speed transmission of digital data ("computer talk") in the next few years, our European companies have been investigating the characteristics of such circuits with the aid of telephone operating authorities. Development of a line of equipment to transmit data and to detect and correct error is proceeding in Europe, in anticipation of the expanded commercial opportunities inherent in the developing Common Market.

Electronic Switching: The ITT System has already scored many history-making achievements in its continuing research program in this field. One major effort, which has reached the stage of field testing by our laboratories in Paris this year, has produced a system that takes millions of instantaneous samples of all conversations flowing through an exchange, converts them into digital form, and routes them between the proper wires according to the directions constantly received from a common, central "electronic brain". Another type, designed for private automatic exchanges and using semiconductor matrices for high-speed switching and routing of calls, is in pilot production. Electronic switching systems are expected to furnish more economical solutions, require less space and maintenance, and give to users special services that electromechanical systems cannot provide.

Components

Vapor-Phase Ultrapurification: A new and basically different method of purification has been developed for producing ultrapure materials when the basic zone-refining techniques are not applicable. By converting a raw material to a compound that will evaporate at a reasonable temperature, separations of the desired element from the mixture can be made. An example is tantalum, which boils only at temperatures above 7,400 degrees Fahrenheit, but which can be purified by this technique for use in tantalum electrolytic capacitors. Other applications in ceramic components and perhaps even in semiconductor components are seen. Also under investigation are modern techniques such as vacuum evaporation. Special attention is being given to magnetic materials and magneto-optical properties. These techniques will contribute to highly controlled yields and are aimed at mass production of components.

Components for Space Environment: Components in space vehicles and satellites are continually exposed to damaging radiation and streams of particles. High vacuum in space makes some materials, such as plastics, evaporate, and lack of air presents a cooling problem. Continued work on these projects maintains for ITT the full capability necessary for participation in space projects as required by various governmental agencies. For example, ITT Industrial Laboratories has designed and built for NASA special ultraviolet light sensors to measure radiation encountered by various space satellites and probes.

Microspaced Thermionic Converters: This concept employs heat to "boil" electrons directly from a cathode to a very closely spaced anode, thereby producing electric power di-

rectly from heat. The heat might be provided by atomic power or the sun. Efficiency is eventually likely to exceed that of thermocouple converters. This device is directly related to an important need of communication systems – to provide the power required by unattended radio relay stations of large communication networks crossing undeveloped territory. It may also be used in spacecraft.

Theoretical Approach to Reliability: The extreme reliability and accuracy required of future data transmission equipment and electronic switching equipment, which will use millions of components under strictly controlled conditions, will necessitate development of components having failure rates of the order of 1 per 100-million component hours. Problems of specifying reliability of high-quality components under good conditions are particularly difficult since failures are rare and are difficult to analyze statistically. To supplement ITT's normal engineering efforts on reliability, amounting to more than $1-million per year, work is being carried out by our laboratories in England on a theoretical analysis of the rate of failure of components under normally good conditions, and reasons for the failure. This effort is aimed at giving ITT the techniques necessary to insure the reliability of systems using the most complex electronic equipment.

Epitaxial Planar Transistor: Developed in our British laboratories during the past year, and now in manufacture, the epitaxial planar transistor has very broad applications in electronics, providing a fast-switching device for use in data handling, data-transmission equipment, and computers. Able to switch in about one-millionth of a second, it provides us with a fundamental component for many electronic techniques and much equipment of the near future.

Space

The space communication research station erected in 1961 at ITTFL's Nutley, New Jersey headquarters was selected by the National Aeronautics and Space Administration (NASA) as one of the ground terminals for the Project Relay experimental satellite communication system. The NASA satellite, which will be designed to receive and retransmit signals across oceans and continents, is scheduled for launching in the summer of 1962. Also, our Standard Telephones and Cables Limited, London, was awarded a contract for the supply of a transmitter for use by the British General Post Office in the satellite communication experiments to be conducted this year by NASA in cooperation with ITT, AT&T, RCA, and other industrial partners in the United States, with the governments of the United Kingdom, France, Germany, and Brazil participating. An active repeater satellite to be launched by NASA will make possible tests of television transmission and two-way speech communication between ground stations in England and the United States.

A doppler tracking system developed by our ITTFL Astrionics Laboratory at Fort Wayne made news during 1961 when it successfully tracked the U. S. Navy's Transit IV-A satellite. The ITT station in Fort Wayne was the only industrial installation to follow the satellite, relaying the data to the Applied Physics Laboratory at the Johns Hopkins University in Baltimore. This ITT equipment can receive and convert signals from a satellite whose orbit is known, into a form that can be further processed to establish within less than a mile the location at which these signals are being received. Conversely, it can determine the orbit of a transmitting satellite when the location of the earth station is known. The system thus holds great promise as an aid to navigation, and ITTFL has received an important contract to build similar stations for the Navy's Pacific Missile Range.

The U. S. Navy, always in search of new tools for improving accuracy in navigation, has purchased two ITTFL atomic clocks for use in its

Research and Engineering

Work goes forward steadily in our laboratories in this country and Europe on equipment for the space age. Left, an artist's rendering of the Ranger space probe in flight, when power for its many experiments is supplied by ITT equipment. Right, the powerful radiotelescope at our ITT Federal Laboratories in Nutley, N. J. Known as the ITT Space Communication Center, this facility has been licensed by the Federal Communications Commission to track satellites and space probes. It will participate in Project Relay communication tests scheduled for 1962.

research laboratories. Light in weight and portable, with frequency standards designed to vary less than one second in 1,500 years, these ITT clocks are expected to have important applications in space and undersea navigation. They were delivered to the Navy's Bureau of Ships.

Our Astrionics Laboratory received a contract from the Air Force Missile Test Center at Patrick Air Force Base in Florida for the design, development, installation, and testing of an electronic scanning optical tracker. It will be an improved version of the "star tracker", a proprietary development of ITT. The heart of the equipment is a highly sensitive, electronically-scanning photo-device that was developed in our ITT Industrial Laboratories.

The Industrial Laboratories also received a contract from NASA to design and build a portion of the spaceborne reconnaissance equipment to be installed aboard the Nimbus meteorological satellite, scheduled to be launched in a near polar orbit sometime this year. ITT's contributions will include newly developed electronic instruments capable of determining night-time cloud cover and cloud-top temperatures all over the world.

The first generation of true spacecraft – the Ranger series – will carry vital ITT power supplies for instrumentation operating control, and for communication. These are the latest versions of solid-state conversion systems produced in ITT Industrial Products Division (IPD). Their development was sponsored by the Jet Propulsion Laboratory of the California Institute of Technology through NASA.

IPD was also selected by the Jet Propulsion Laboratory to develop, build, and test sensitive low-noise amplifier portions of Project Goldstone's deep-space information facility radar receiver. This program is concerned with high-precision tracking of interplanetary probes.

Another major assignment for IPD was the design and development of television monitoring equipment for Project Pluto's nuclear propulsion experiments. IPD's earlier proprietary development of a nuclear radiation-resistant television camera led to the selection of IPD as contractor for the design and development of monitoring equipment for the Pluto experiments involving intense radiation environments.

ITT laboratories in Fort Wayne were cited at an Armed Forces Day luncheon for their contribution to the success of Comdr. Alan B. Shepard, Jr.'s sub-orbital Project Mercury flight. Our Fort Wayne laboratories designed and produced the airborne receivers for precisely tracking the Mercury space capsules and speeding their recovery. The same equipment was used for the sub-orbital flight of Capt. Virgil I. Grissom and for the orbital flight of Lieut. Col. John H. Glenn, Jr. An FEC team at Cape Canaveral also performs for NASA vital checkout and calibration functions with respect to the Mercury capsule's telemetry system.

Financial Summary

". . . We increased our sales and revenues. We improved our earnings. We expanded our plant capacity . . ."

Record Results Reported

Consolidated net income for 1961 of $36,059,034 again established a new high for the Corporation. The increase over 1960 amounted to $3,955,725 or 12.3%. Earnings per average common share outstanding were $2.18 as compared with $1.96 for the previous year. These figures do not include the effect of special non-recurring items described below.

Consolidated sales and revenues of $930,499,931 for 1961, also a new high, represented an increase of $60,992,973 or 7% over 1960. The sales of the manufacturing divisions and subsidiaries were $839,853,273, an increase of $51,012,381 or 6.5% over 1960. Revenues reported from utility operations in 1961 amounted to $90,646,658, an increase of $9,980,592 or 12.4% over the previous year.

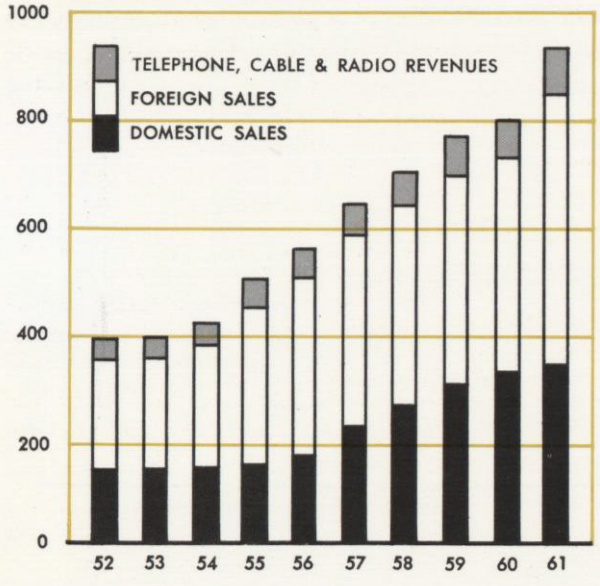
In addition to the $2.18 per share earned from operations, a net non-recurring gain of $7,620,000, or 47 cents per average common share, was realized in 1961 from the sale of a part of our investment in Nippon Electric Company and recovery on a Japanese war claim, offset by provisions for discontinuing the "Strad" data processing product line in England and abandoning of the North Atlantic cable facilities of AC&R. The individual amounts applicable to these items are shown under "Special Items" in the accompanying income statement.

In 1961 we acquired Jennings Radio Manufacturing Corporation, Surprenant Mfg. Co., and the former minority interest in the AC&R System. The results of operations for both 1961 and 1960 have been restated to include these operations for both years under the "pooling of interests" accounting principle.

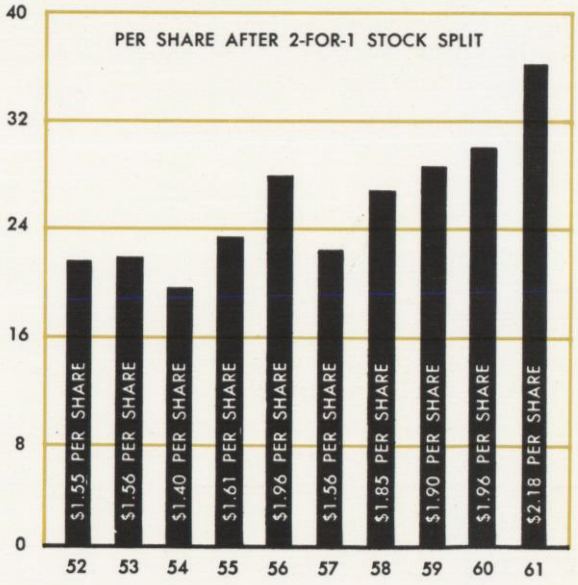
Sales and Revenues Increased

The increase in total sales and revenues of the Corporation of $60,992,973 or 7% over 1960 was achieved largely in the European area, where sales were higher than in the previous year by 18%. Improved sales were particularly significant in our English, German, French and Belgian operations. The revenues of our Latin American telephone companies improved by $7,665,000 or 22%. These favorable results principally reflected rate increases in Chile, which had been delayed from 1960, and the continued economic expansion in Puerto Rico. Increases were also recorded in the radio and manufacturing opera-

Sales and Revenues *in millions*



Consolidated Net Income *in millions*



tions in Latin America.

Our U. S. commercial operations continued the favorable trend of the past two years, with substantial improvement being shown in the ITT Kellogg division. On the other hand, our U. S. defense sales were down, reflecting fewer hardware contracts available to the industry generally, and an extended strike in our largest operation.

Net Income Improves

The consolidated net income of the Corporation of $36,059,034, an increase of $3,955,725 or 12.3% over 1960, reflects improvement in all major areas, with the exception of our U. S. defense operation, which suffered a decline in volume as mentioned above. A tabulation of net income by general source is shown in Note 1 to the Financial Statements.

Dividend Rate Unchanged

A total dividend of $1.00 per share, made up of 25 cents declared in each quarter of 1961, was the same as in 1960.

Plant Expansion Continued

Plant equipment outlays amounted to $105,000,000, an increase of $33,000,000 over the preceding year. Of the total, $45,000,000 was expended in connection with manufacturing and research units throughout the world. Telephone, cable, and radio operating companies made expenditures of $60,000,000, of which $32,000,000 was in Puerto Rico, to fill the continued heavy backlog of telephone applications throughout the System.

Financial Position

Total consolidated cash and short-term investments at the end of 1961 amounted to $43,825,605, and consolidated working capital as of December 31, 1961 amounted to $268,422,268.

During the year the parent Company established lines of credit with a group of major banks to replace the former revolving credit arrangement. Of the $65 million total credit line, $19.5 million had been taken down as of December 31, 1961. In addition, $15 million of matured long-term debt was refunded through private placement with two insurance companies.

Short-term loans to meet working capital needs were undertaken by various foreign subsidiaries during the year. In addition, the following major long-term outside financing programs were completed by our subsidiaries:

Puerto Rico Telephone Company	
5¾% sinking fund debentures due 1986	$12,500,000
6¼% cumulative preferred stock	5,000,000
Common stock	1,634,000
Standard Elektrik Lorenz AG (Germany)	
Bank loans, due 1963-1969 (DM 14,500,000)	$ 3,625,000
Common stock	4,568,000

The total long-term debt structure of the Corporation and its subsidiaries as of December 31, 1961 is shown on page 41 of this report.

To facilitate the financing of certain long-term sale and rental obligations of our manufacturing units, International Telephone and Telegraph Credit Corporation started operations in August 1961. The parent company invested $10 million in this subsidiary through purchase of all of its common stock. In addition the Credit Corporation borrowed $20 million from a group of U. S. institutional lenders repayable over 20 years.

In order to help support its continuing expansion, the Corporation has filed with the Securities and Exchange Commission a registration statement relating to its proposed public offering of $50 million of sinking fund debentures due April 1, 1987. Net proceeds of the issue would be used to repay outstanding short-term bank loans, increase working capital, and finance in part proposed capital expenditures.

Financial Statements

The consolidated financial statements of the Corporation and its subsidiaries consolidated and the opinion of our independent public accountants are shown in the following pages. A ten-year summary of the financial highlights of the Corporation and its subsidiaries consolidated follows the financial statements.

Consolidated Balance Sheets

Assets	1961	1960
CURRENT ASSETS		
Cash, including temporary U. S. cash investments and $15,106,167 and $14,421,290 in foreign currencies	$ 43,825,605	$ 59,211,679
Accounts and notes receivable, less reserves	251,679,605	232,096,801
Inventories	302,713,374	268,210,925
	598,218,584	559,519,405
INVESTMENTS, DEFERRED RECEIVABLES AND OTHER ASSETS		
Finance subsidiaries	13,158,145	1,537,844
Nationalized companies $33,296,039 and $33,320,593 fully reserved	—	—
Other investments, at cost, less reserves of $2,588,528 and $2,583,181	43,654,926	28,859,446
Accounts receivable due subsequent to one year, less reserves	13,303,087	14,272,258
Other assets	28,628,352	23,296,171
	98,744,510	67,965,719
PLANT, PROPERTY AND EQUIPMENT, at cost	631,469,985	585,227,544
Less — Reserves for depreciation	240,122,757	243,841,969
	391,347,228	341,385,575
	$1,088,310,322	$968,870,699

The accompanying notes to the financial statements are an integral part of the above balance sheets.

as at December 31, 1961 and 1960

Liabilities and Stockholders' Equity	1961	1960
CURRENT LIABILITIES		
Bank loans and current maturities of long-term debt	$ 115,978,563	$ 78,607,560
Accounts payable and accrued charges	183,971,887	173,740,216
Accrued taxes	29,845,866	28,007,632
	329,796,316	280,355,408
DEFERRED LIABILITIES, ETC.	75,901,152	69,736,330
LONG-TERM DEBT (Page 41)	182,508,530	153,671,893
MINORITY EQUITY IN SUBSIDIARIES CONSOLIDATED (Page 42)	35,043,370	24,405,272
STOCKHOLDERS' EQUITY		
Cumulative Preferred Stock — Authorized — 300,000 shares, par value $100 per share		
Outstanding — 5.25% Series, 40,000 shares	4,000,000	4,000,000
— 4% Convertible Series, 40,000 shares	4,000,000	4,000,000
— 4% Convertible Series B, 62,278 and 62,292 shares	6,227,800	6,229,200
Capital (common) Stock — Authorized — 30,000,000 shares, without par value (stated value $10 per share)		
Outstanding — 16,375,060 and 16,189,906 shares	163,750,600	161,899,060
Capital surplus	102,230,969	95,875,211
Retained earnings invested in the business	184,851,585	168,698,325
	465,060,954	440,701,796
	$1,088,310,322	$968,870,699

International Telephone and Telegraph Corporation and Subsidiaries Consolidated

Consolidated Income *for the years ended December 31, 1961 and 1960*

	1961	1960
SALES AND REVENUES		
Net sales	$839,853,273	$788,840,892
Telephone, cable and radio operating revenues	90,646,658	80,666,066
Total sales and revenues	930,499,931	869,506,958
DIVIDENDS, INTEREST AND OTHER INCOME	12,972,168	12,484,433
	943,472,099	881,991,391
COSTS AND EXPENSES		
Cost of sales and operating expenses	801,835,321	752,345,769
Provision for depreciation	31,340,862	27,236,921
Interest and other financial charges	17,338,197	13,254,357
U. S. and foreign taxes	54,133,285	54,919,941
	904,647,665	847,756,988
NET INCOME BEFORE MINORITY EQUITY	38,824,434	34,234,403
Minority common stockholders' equity in net income	2,765,400	2,131,094
NET INCOME	36,059,034	32,103,309
SPECIAL CREDITS (CHARGES) (net of applicable income taxes)		
Profit (loss) on sale of investments in –		
Nippon Electric Company, Limited	8,917,000	–
L. M. Ericsson Telephone Company, Ltd.	–	9,045,522
English radio tube business	–	(1,143,490)
Settlement of Japanese war claims	3,683,000	–
Provisions for –		
Abandonment of North Atlantic cable facilities	(2,600,000)	–
Discontinuance of "Strad" data processing product line in England	(2,380,000)	–
NET INCOME AND SPECIAL ITEMS	$ 43,679,034	$ 40,005,341

Consolidated Retained Earnings Invested in the Business

BALANCE – Beginning of year, as previously reported	$156,013,354	$148,920,302
ADD – Undistributed earnings of companies acquired in pooling of interests transactions in 1961	12,684,971	11,618,794
BALANCE – Beginning of year, as restated	168,698,325	160,539,096
ADD (DEDUCT) –		
Net income and special items	43,679,034	40,005,341
Dividends of the Corporation –		
Preferred stock	(209,048)	–
Common stock – $1.00 per share	(15,968,337)	(15,588,395)
Dividends on common stock of American Cable & Radio Corporation (AC&R) to previous minority	–	(467,194)
Adjustment of cost of previous investment in AC&R in connection with pooling of interests in 1961	(11,348,389)	–
Provision to fully reserve for investments in Cuban companies – net of applicable income taxes	–	(15,790,523)
BALANCE – End of year	$184,851,585	$168,698,325

The accompanying notes to the financial statements are an integral part of the above statements.

Long-Term Debt – *December 31, 1961*

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION		
5¼% Promissory Notes, due May 15, 1976	$15,000,000	
4¾% Convertible Subordinated Debentures, due 1983 (convertible into capital stock at $18.50 per share)	6,832,500	$ 21,832,500
UNITED STATES SUBSIDIARIES CONSOLIDATED		
INTELEX SYSTEMS INCORPORATED –		
5¼% First Mortgage Notes, Series A, due monthly to 1980, on plant and property leased to U. S. Post Office	14,065,576	
OTHER	101,370	14,166,946
FOREIGN MANUFACTURING SUBSIDIARIES CONSOLIDATED		
INTERNATIONAL STANDARD ELECTRIC CORPORATION –		
Eighteen Year 4½% Swiss franc Debentures, due 1970-78 – SF 50,000,000	11,610,000	
Sixteen Year 4% Swiss franc Debentures, due 1970 – SF 60,000,000 (guaranteed by the Parent Company) – payments of SF 5,000,000 due annually from 1964-69	13,932,000	
Fifteen Year 4% Swiss franc Debentures, due 1974 – SF 50,000,000	11,610,000	
Five Year 4¾% Swiss franc Debentures, due 1965 – SF 18,000,000	4,179,600	
BELL TELEPHONE MANUFACTURING COMPANY (Belgium) –		
2¾% to 7% long-term bank loans, due 1963-70 – BF 67,950,000	1,359,000	
FABBRICA APPARECCHIATURE PER COMUNICAZIONI ELETTRICHE STANDARD S.p.A. (Italy) –		
3% to 7½% long-term bank loans, due 1963-75 – IL 2,676,100,000	4,281,760	
LE MATERIEL TELEPHONIQUE (France) –		
3¾% to 6% Debentures, to be retired in annual lots to 1981 – NF 10,118,276	2,064,128	
STANDARD ELECTRICA, S.A. (Brazil) –		
13% to 26% (effective) long-term bank loans, due 1963-65 – CR 536,000,000	1,683,040	
STANDARD ELEKTRIK LORENZ AG (Germany) –		
Twenty year 6½% Debentures, due 1964-78 – DM 35,000,000	8,750,000	
4% to 7¾% long-term bank loans, due 1963-69 – DM 68,169,376	17,042,344	
STANDARD TELEFON UND TELEGRAPHEN A.G. CZEIJA, NISSL & Co. (Austria) –		
4¼% to 8% Mortgage and bank loans, due 1964-68 – AS 26,532,248	1,016,185	
STANDARD TELEPHONES AND CABLES LIMITED (England) –		
5½% Ten Year Note, due 1963 – £400,000	1,120,000	
6¼% Twenty Year Note, due 1978 – £1,500,000	4,200,000	
6½% Twenty Year Note, due 1978 – £1,500,000	4,200,000	
STANDARD TELEPHONES AND CABLES PTY. LIMITED (Australia) –		
5½% to 6½% Mortgage Loans, due 1963-76 – A£1,643,750	3,682,000	
OTHER	1,434,422	92,164,479
TELEPHONE, CABLE AND RADIO SUBSIDIARIES CONSOLIDATED		
AMERICAN CABLE & RADIO CORPORATION –		
5% long-term bank loans, due 1963-66	5,000,000	
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, SUD AMERICA –		
7½% Debentures, Series due 1977	10,000,000	
COMPANIA PERUANA DE TELEFONOS LIMITADA (Peru) (held by finance subsidiary) –		
8% U. S. dollar Debentures, Series A, due annually 1963-75 – PS 69,973,190	2,610,000	
8% U. S. dollar Debentures, Series B, due annually 1963-76 – PS 36,595,175	1,365,000	
PUERTO RICO TELEPHONE COMPANY –		
Twenty-Five Year 4¾% Sinking Fund Debentures, Series A, due 1978	4,500,000	
Twenty-Five Year 4¾% Sinking Fund Debentures, Series B, due 1981	4,800,000	
Twenty-Four Year 6% Sinking Fund Debentures, Series C, due 1984	8,000,000	
Twenty-Five Year 5¾% Sinking Fund Debentures, Series D, due 1986	12,500,000	
RADIO CORPORATION OF PUERTO RICO –		
Twenty-Five Year 5½% Sinking Fund Debentures, Series A, due 1984	5,000,000	
OTHER	569,605	54,344,605
TOTAL LONG-TERM DEBT (excluding amounts due within one year included in current liabilities)		$182,508,530

The accompanying notes to the financial statements are an integral part of the above statement.

Minority Equity in Subsidiaries Consolidated – *December 31, 1961*

PREFERRED STOCK		
Puerto Rico Telephone Company –		
6¾% Cumulative Preferred Stock, Series A, of U. S. $100 par value per share – 40,000 shares	$ 4,000,000	
6¾% Cumulative Preferred Stock, Series B, of U. S. $100 par value per share – 50,000 shares	5,000,000	
Standard Telefon og Kabelfabrik A/S (Norway) –		
4%-6% Non-cumulative Preferred Stock of NK 1,000 par value per share – 6,000 shares	970,055	$ 9,970,055
COMMON STOCK AND SURPLUS		
Foreign Manufacturing Subsidiaries Consolidated	13,558,585	
Telephone, Cable and Radio Subsidiaries Consolidated	11,514,730	25,073,315
TOTAL MINORITY EQUITY IN SUBSIDIARIES CONSOLIDATED		$35,043,370

The accompanying notes to the financial statements are an integral part of the above statement.

Auditors' Opinion

ARTHUR ANDERSEN & CO.
80 Pine Street
New York 5

To The Stockholders,

International Telephone and Telegraph Corporation:

We have examined the consolidated balance sheets of International Telephone and Telegraph Corporation (a Maryland corporation) and its subsidiaries consolidated as of December 31, 1961 and 1960, and the related statements of consolidated income and consolidated retained earnings invested in the business for the years then ended. Our examinations were made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. It was not practicable to confirm receivables from certain governments, as to which, however, we have satisfied ourselves by other auditing procedures. Financial statements of certain foreign subsidiaries included in the consolidated statements were not examined by us but we were furnished with reports of other auditors thereon.

In our opinion, based upon our examinations and upon the reports of other auditors, the accompanying consolidated balance sheets and related statements of consolidated income and consolidated retained earnings invested in the business present fairly the financial position of International Telephone and Telegraph Corporation and its subsidiaries consolidated as of December 31, 1961 and 1960, and the results of their operations for the years then ended, and were prepared in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Arthur Andersen & Co.

New York, N. Y.
March 1, 1962

Notes to Financial Statements

1. PRINCIPLES OF CONSOLIDATION

The financial statements include the accounts of all significant majority-owned subsidiaries except for finance subsidiaries. The investments in finance subsidiaries are carried at amounts equivalent to the equity in their underlying net assets. The earnings of these subsidiaries ($1,288,390 in 1961 and $669,618 in 1960) are included in "Dividends, Interest and Other Income" in the consolidated statement of income. A summary of the combined financial position of these subsidiaries as at December 31, 1961 and 1960 is shown on page 44.

The net income of the Parent Company alone amounted to $17,780,504 and $18,672,518 for the years 1961 and 1960, respectively, and its retained earnings at December 31, 1961 amounted to $64,629,901, of which $32,203,119 was available for payment of dividends on capital stock of the Corporation.

The undistributed earnings of foreign subsidiaries included in consolidated retained earnings should not be understood to represent U. S. dollars immediately available, since the retained earnings of some foreign subsidiaries are subject to certain restrictions on the amount of dividends that may be paid and to taxes payable on declaration of dividends.

A general grouping of net assets as at December 31, 1961, and net income for the year 1961 by location and by principal operations is shown below:

	CONSOLIDATED	DOMESTIC	FOREIGN MANUFACTURING	TELEPHONE, CABLE AND RADIO	OTHER FOREIGN INVESTMENTS
			Thousands of Dollars		
NET ASSETS AT DECEMBER 31, 1961					
Net current assets	$268,423	$ 81,251	$166,844	$ 14,674	$ 5,654
Investments, deferred receivables and other assets	98,744	18,263	45,904	10,422	24,155
Plant, property and equipment — net	391,347	55,854	116,580	218,913	—
	758,514	155,368	329,328	244,009	29,809
Deduct —					
Deferred liabilities, etc.	75,901	7,454	56,728	11,719	—
Long-term debt	182,509	35,999	92,165	54,345	—
Minority equity in subsidiaries consolidated	35,043	—	14,528	20,515	—
	293,453	43,453	163,421	86,579	—
Consolidated net assets	$465,061	$111,915	$165,907	$157,430	$29,809
NET INCOME for the year (after allocation of parent company interest and taxes)	$ 36,059	$ 4,257	$ 19,099	$ 10,326	$ 2,377

Procedures followed in translating accounts of foreign subsidiaries into terms of U. S. dollars were consistent with those of preceding years. Net assets are translated, generally, at the applicable rates of exchange in effect at the year end, except for property and investment accounts which are translated at historic cost; and the income accounts are translated, generally, at the average rates of exchange prevailing during the year, except for provisions for depreciation which are translated on the basis of the U. S. dollar equivalents of the related net asset accounts at the beginning of the year. Foreign exchange gains or losses, including those arising from translation of net assets at year end, have been included in consolidated net income.

2. POOLINGS OF INTERESTS

In June, 1961, substantially all of the business and net assets of Jennings Radio Manufacturing Corporation were transferred to a wholly-owned subsidiary of the Corporation in exchange for 170,213 shares of the Corporation's common stock, 40,000 shares of the Corporation's Cumulative Preferred Stock, 5.25% Series and non-transferable Certificates of Contingent Interest representing rights to receive additional shares of the Corporation's common stock as discussed in Note 4. In August, 1961, the Corporation exchanged 115,741 shares of its common stock and 40,000 shares of its Cumulative Preferred Stock, 4% Convertible Series, for all the capital stock of Surprenant Mfg. Co. In November, 1961, substantially all the business and net assets of the American Cable & Radio Corporation were transferred to a wholly-owned subsidiary of the Corporation in exchange for 222,474 shares of the Corporation's common stock and 62,292 shares of the Corporation's Cumulative Preferred Stock, Convertible Series B, after giving effect to shares returned to the Corporation and cancelled in respect of its previously existing 56.55% equity interest in American Cable & Radio Corporation. The foregoing exchanges have been given effect to retroactively (as poolings of interests) in the consolidated financial statements.

3. INVENTORIES

Inventories at December 31, 1961 and 1960, are detailed below:

	1961	1960
Manufacturing:		
Finished goods	$100,085,839	$ 90,520,061
Work in process	149,514,399	122,308,135
Raw materials and supplies	66,895,235	55,092,816
	316,495,473	267,921,012
Less progress payments	27,129,524	11,204,495
Net	289,365,949	256,716,517
Telephone, cable and radio:		
Maintenance and construction materials and supplies, generally at average cost	13,347,425	11,494,408
	$302,713,374	$268,210,925

Finished goods, raw materials and supplies are stated, generally, at the lower of cost or market. Work in process includes substantial amounts of costs accumulated under firm electronic equipment orders and defense contracts. Under the companies' accounting policies for recording profits on these orders and contracts, the inventory amounts are at or below realizable value.

4. CAPITAL STOCK

Under the Corporation's several Stock Option Incentive Plans and a Restricted Stock Option, as approved by the Stockholders, a total of 908,000 shares (net of 22,000 shares for which the authority to grant options has expired) of the present common stock of the Corporation were made available for options to employees of the Corporation and its subsidiaries. Options granted to September 1, 1959 were generally made exercisable in whole or in part by such employees after two years, but not later than seven years after date of grant. Options granted subsequent to September 1, 1959 are exercisable to the extent of one-third of the optioned shares after two

Notes to Financial Statements

years, to the extent of two-thirds after three years and in full after four years, but not after five years from date of grant. The price for the shares covered by each option prior to June 14, 1961 was 95% of the fair market value of the stock on the date such option was granted. The price for the shares covered by each option granted from June 14, 1961 is 100% of the fair market value on the date such option is granted. As at December 31, 1961, 277,215 shares have been issued on exercise of options since the inception of the Plans. A summary of shares subject to options during the year 1961 is shown below:

Balance, January 1, 1961		245,250
Add — Options granted at $43.75 to $59.75 per share		109,500
		354,750
Deduct —		
Options exercised at $14.875 to $38.125 per share	35,715	
Options cancelled	30,000	65,715
Balance, December 31, 1961		289,035

At December 31, 1961, 341,750 shares were available for future options.

Under the conversion provisions of the 4⅞% Convertible Subordinated Debentures, 371,871 shares of the unissued common stock of the Corporation were reserved for conversion of such Debentures at December 31, 1961. During 1961, 92,423 shares were issued in connection with the conversion of $1,713,800 principal amount of these Debentures.

Under the conversion provisions applicable to the Cumulative Preferred Stock 4% Convertible Series and 4% Convertible Series B, 170,466 shares of the unissued common stock of the Corporation were reserved for conversion of such preferred stock at December 31, 1961. During 1961, 21 shares were issued in connection with the conversion of 14 shares of Convertible Preferred Stock.

As a part of the exchange for substantially all of the business and net assets of Jennings Radio Manufacturing Corporation as outlined in Note 2, the Corporation issued non-transferable Certificates of Contingent Interest representing rights to receive in annual installments, over a period ending not later than March 15, 1966, shares of common stock having an aggregate value of as much as $8,000,000 if certain increasing annual net earnings goals of Jennings operations after January 1, 1961 are met. The number of shares, if any, to be issued pursuant to the Certificates of Contingent Interest will be determined by the average market price for the Corporation's common stock for specified periods and within certain limits. If all earnings goals are achieved the minimum number of shares which will be issuable under the Certificates is 80,000 shares and the maximum is 320,000 shares.

Pursuant to such provisions, 28,741 shares of common stock having an aggregate market value of $1,600,000 (representing the maximum amount deliverable in respect of 1961 earnings of Jennings), will be delivered to holders of Certificates of Contingent Interest by March 15, 1962.

5. CAPITAL SURPLUS

Changes in capital surplus during the year are shown below:

Balance — January 1, 1961, as previously reported	$102,985,694
Deduct — Excess of par and stated value of capital stock of the Corporation issued over capital of companies acquired in pooling of interests transactions	7,110,483
Balance — January 1, 1961, as restated	95,875,211
Add (Deduct) —	
Net premium on sale of stock of a subsidiary to the public	3,082,040
Excess of value of assets of German companies purchased over stated value of common stock of Corporation issued in exchange therefor	2,218,717
Credits arising from —	
Conversions of debentures and preferred stock	759,517
Exercise of stock options	664,066
Expenses in connection with the issuance of capital stock of Corporation during year	(368,582)
Balance — December 31, 1961	$102,230,969

6. COMMITMENTS AND CONTINGENCIES

Reference is made to page 28 with respect to the seizure in 1962 of a substantial portion of the properties of the telephone subsidiary in Brazil. Consolidated net income for 1961 and 1960 includes relatively immaterial amounts in each year from operations of these properties. The accompanying consolidated balance sheet includes approximately $6,500,000 at December 31, 1961 representing the equivalent U. S. dollar cost of the net assets seized. The amount of compensation to be received is not presently known.

A U. S. Government Agency, has indicated that under the terms of a contract with such agency, the Corporation may be liable for liquidated damages of a substantial amount for failure to meet delivery schedules specified in the contract. The Corporation believes that negotiations presently in progress will not result in the assessment of any significant amount of damages.

The ultimate liability with respect to guarantees, pending lawsuits, taxes, claims, etc., is not considered to be material in relation to the consolidated financial position.

Reference is made to page 37 with respect to the proposed issue and sale by the Corporation of $50,000,000 of Sinking Fund Debentures early in 1962.

ITT Finance Subsidiaries

COMBINED FINANCIAL POSITION

	December 31	
	1961	1960
Cash	$10,806,538	$ 1,235,563
Receivables, less unearned income—		
Affiliated company	4,140,000	4,140,000
Other customers	37,664,806	9,388,255
Net investment in rental contracts	10,462,544	8,609,199
Plant, property and equipment, less reserves	4,859,228	1,005,804
Deferred charges and prepayments	476,548	78,345
Total assets	68,409,664	24,457,166
Long-term debt	38,442,308	15,229,553
Short-term bank borrowings	14,383,063	6,618,704
Accounts payable and accrued charges	2,426,148	1,071,065
Total liabilities	55,251,519	22,919,322
ITT equity in net assets	$13,158,145	$ 1,537,844
ITT equity represented by —		
Common stock	$12,566,559	$ 1,205,952
Reinvested earnings	591,586	331,892
	$13,158,145	$ 1,537,844

Ten-Year Summary*

	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952
					(In thousands of dollars)					
Results for Year										
Sales and revenues	930,500	811,449	765,640	687,451	638,669	544,834	489,746	412,619	397,297	388,620
U. S. and foreign taxes	54,133	50,266	45,343	42,410	41,458	45,237	39,781	31,795	32,960	32,023
Provision for depreciation	31,341	25,066	27,433	24,516	23,048	19,203	17,908	15,688	14,652	13,616
Net income	36,059	30,570	29,036	26,600	22,413	28,110	23,070	20,069	22,378	22,148
Special credits**	7,620	7,902	–	–	–	–	–	–	–	–
Year End Position										
Net current assets	268,422	269,324	222,269	233,963	200,828	203,945	199,986	180,567	156,294	144,752
Plant, property and equipment – net	391,347	288,461	355,115	303,609	260,250	229,842	208,021	190,489	186,529	177,238
Total assets	1,088,310	923,944	932,269	869,006	799,873	760,838	687,452	636,970	602,761	579,706
Long-term debt	182,509	148,478	165,512	158,963	97,293	87,841	78,156	72,324	55,904	53,140
Stockholders' equity	465,061	415,814	415,088	395,739	375,440	365,939	350,747	336,971	324,079	308,878
Per Share					*(In dollars)*					
Net income (average shares)	2.18	1.96	1.90	1.85	1.56	1.96	1.61	1.40	1.56	1.55
Special credits (average shares)**	.47	.51	–	–	–	–	–	–	–	–
Dividends	1.00	1.00	1.00	.90	.90	.90	.65	.50	.50	.425
Common stockholders' equity	27.53	26.52	26.73	26.87	26.16	25.50	24.44	23.48	22.58	21.52
Other Data										
Number of shares (in thousands)	16,375	15,681	15,530	14,726	14,353	14,353	14,353	14,353	14,353	14,353
Number of stockholders	94,719	87,818	88,230	67,112	65,642	62,486	58,889	56,937	57,437	57,033
Number of employees	149,000	132,000	136,000	130,000	128,000	122,000	111,000	102,000	96,000	100,000

** The above data are as reported for the respective years, including Cuban operations for all years prior to 1960, and excluding operations for prior periods of companies acquired in 1961, except that per-share amounts have been adjusted for 2-for-1 stock split effective February 5, 1959.*

*** Net profit on sale of investments, etc.*

International Telephone and Telegraph Corporation

Principal Divisions and Subsidiaries

NORTH AMERICA

Commercial Group

ITT Canada Limited, Montreal, Canada
- ITT Electronics Service Company of Canada Ltd., Town of Mount Royal, P. Q.
- Royal Electric Company (Quebec) Ltd., Pointe Claire, P. Q.

ITT Components Division, Clifton, N. J.
- Kuthe Laboratories, Inc., Newark, N. J.

ITT Distributor Products Division, Lodi, N. J.
ITT Industrial Laboratories Division, Fort Wayne, Ind.
ITT Industrial Products Division, San Fernando, Calif.
ITT Information Systems Division, New York
- Airmatic Systems Corporation, Saddle Brook, N. J.
- Intelex Systems Incorporated, New York
- ISD Engineering Center, Paramus, N. J.

ITT Kellogg, Chicago
Jennings Radio Manufacturing Corporation, San Jose, Calif.
Royal Electric Corporation, Pawtucket, R. I.
- Electric Cords & Supply Corporation, Los Angeles

Surprenant Mfg. Co., Clinton, Mass.

Defense Group

Federal Electric Corporation, Paramus, N. J.
International Electric Corporation, Paramus, N. J.
ITT Communication Systems, Inc., Paramus, N. J.
ITT Federal Laboratories, Nutley, N. J.

Administration and Finance

International Standard Electric Corporation, New York
International Telephone and Telegraph Corporation, Sud America, New York
International Telephone and Telegraph Credit Corporation, New York
Kellogg Credit Corporation, New York

EUROPE, MIDDLE EAST, AFRICA

Austria

Standard Telephon und Telegraphen Aktiengesellschaft, Czeija, Nissl & Co., Vienna

Belgium

Bell Telephone Manufacturing Company, Antwerp
ITT Europe, Inc., Brussels

Denmark

Standard Electric Aktieselskab, Copenhagen

Finland

Oy Suomen Standard Electric AB, Helsinki

France

Compagnie Générale de Constructions Téléphoniques, Paris
- Les Téléimprimeurs, Paris

International Standard Engineering, Inc., Paris
Laboratoire Central de Télécommunications, Paris
Le Matériel Téléphonique, Paris

Germany

Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart
- Alpina Büromaschinen-Werk G.m.b.H., Kaufbeuren
- Eduard Winkler Apparatebau G.m.b.H., Nuremberg
- SEL Finanz G.m.b.H., Stuttgart

Iran

Standard Electric Iran AG, Tehran

Italy

Fabbrica Apparecchiature per Comunicazioni Elettriche Standard S.p.A., Milan

Netherlands

Nederlandsche Standard Electric Maatschappij N.V. The Hague

Norway

Standard Telefon og Kabelfabrik A/S, Oslo

Portugal

Standard Eléctrica, S.A.R.L., Lisbon

Republic of South Africa

Standard Telephones and Cables (South Africa) (Proprietary) Limited, Boksburg East, Transvaal

Spain

Compañía Internacional de Telecomunicación y Electrónica, S.A., Madrid
Compañía Radio Aérea Marítima Española, S.A., Madrid
Standard Eléctrica, S.A., Madrid

Sweden

Standard Radio & Telefon AB, Stockholm

Switzerland

ITT Standard S.A., Basle
Standard Téléphone et Radio S.A., Zurich

Turkey

Standard Elektrik ve Telekomünikasyon Limited Şirketi, Ankara

United Kingdom

Creed & Company Limited, Croydon
International Marine Radio Company, Croydon
Standard Telephones and Cables Limited, London
- Kolster-Brandes Limited, Sidcup
- Standard Telecommunication Laboratories Limited, London

LATIN AMERICA

MANUFACTURING AND SALES

Argentina

Compañía Standard Electric Argentina, S.A.I.C., Buenos Aires

Brazil

Standard Eléctrica, S.A., Rio de Janeiro

Chile

Compañía Standard Electric, S.A.C., Santiago

Mexico

Industria de Telecomunicación, S.A. de C.V. (50% interest), Mexico City
Standard Eléctrica de México, S.A., Mexico City

Venezuela

Standard Telecommunications C.A., Caracas

TELECOMMUNICATION OPERATIONS

Argentina

Compañía Internacional de Radio, S.A., Buenos Aires

Bolivia

Compañía Internacional de Radio Boliviana, La Paz

Brazil

Companhia Rádio Internacional do Brasil, Rio de Janeiro
Companhia Telefônica Nacional, Curitiba[1]

Chile

Compañía de Teléfonos de Chile, Santiago
Compañía Internacional de Radio, S.A., Santiago

Cuba

Cuban American Telephone and Telegraph Company (50% interest), Havana
Radio Corporation of Cuba, Havana

Peru

Compañía Peruana de Teléfonos Limitada, Lima

Puerto Rico

ISE Limited, San Juan
Puerto Rico Telephone Company, San Juan
Radio Corporation of Puerto Rico, San Juan

Virgin Islands

Virgin Islands Telephone Corporation, Charlotte Amalie

1 Pôrto Alegre division seized by State of Rio Grande do Sul, February 16, 1962.

FAR EAST AND PACIFIC

Australia

Standard Telephones and Cables Pty. Limited, Sydney

Hong Kong

ITT Far East Limited, Hong Kong, B.C.C.

Japan

ITT Far East and Pacific, Inc., Tokyo

New Zealand

New Zealand Electric Totalisators Limited, Wellington

Philippines

ITT Philippines, Incorporated, Manila

WORLDWIDE CABLE AND RADIO TELEGRAPH OPERATIONS

American Cable & Radio Corporation, New York
- All America Cables and Radio, Inc., New York
- Commercial Cable Company, The, New York
- Globe Wireless Ltd., New York
  - Globe Wireless Ltd. Philippines, Manila, Philippines
- Mackay Radio and Telegraph Company, New York
- Sociedad Anónima Radio Argentina, Buenos Aires

ASSOCIATE LICENSEES FOR MANUFACTURING

(Minority Interest)

Australia

Austral Standard Cables Pty. Limited, Melbourne

France

Lignes Télégraphiques et Téléphoniques, Paris

Italy

Società Italiana Reti Telefoniche Interurbane, Milan

Japan

Nippon Electric Company, Limited, Tokyo
Sumitomo Electric Industries, Limited, Osaka

Spain

Marconi Española, S.A., Madrid

The World of ITT

North America

22,500 employees
53 locations (factories, major laboratories, service units)
5,400,000 square feet of floor space

Europe, Middle East, Africa

102,000 employees
68 locations (factories, major laboratories, marine radio companies)
15,500,000 square feet of floor space

Latin America (excluding Cuba)

21,000 employees
16 locations (factories, telephone and telegraph operating companies)
1,000,000 square feet of floor space

Far East and Pacific

3,500 employees
5 locations
750,000 square feet of floor space

Total

149,000 employees, including headquarters and service personnel in the United States
142 locations
22,650,000 square feet

Sales representatives in most countries

Principal ITT System Products

Telecommunication Equipment and Systems

Automatic telephone and telegraph central office switching systems
Private telephone and telegraph exchanges – PABX and PAX, electromechanical and electronic
Carrier systems: telephone, telegraph, power-line
Long-distance dialing and signaling equipment
Automatic message accounting and ticketing equipment
Switchboards: manual, central office, toll
Telephones: desk, wall, pay-station
Automatic answering and recording equipment
Microwave radio systems: line-of-sight, over-the-horizon
Radio multiplex equipment
Coaxial cable systems
Submarine cable systems, including repeaters
Data-transmission systems
Teleprinters and facsimile equipment

Military/Space Equipment and Systems

Aircraft weapon systems
Missile fuzing, launching, guidance, tracking, recording, and control systems
Missile-range control and instrumentation
Electronic countermeasures
Electronic navigation
Power systems: ground-support, aircraft, spacecraft, missile
Radar
Simulators: missile, aircraft, radar
Ground and environmental test equipment
Programmers, automatic
Infrared detection and guidance equipment
Global and space communication, control, and data systems
Nuclear instrumentation
Antisubmarine warfare systems
System management: worldwide, local

Industrial/Commercial Equipment and Systems

Distance-measuring and bearing systems: Tacan, DMET, Vortac, Loran
Instrument Landing Systems (ILS)
Air-traffic control systems
Direction finders: aircraft and marine
Ground and airborne communication
Data-link systems
Inverters: static, high-power
Power-supply systems
Altimeters
Flight systems
Railway and power control and signaling systems
Information-processing and document-handling systems
Analog-digital converters
Mail-handling systems
Pneumatic tube systems
Broadcast transmitters: AM, FM, TV
Studio equipment
Point-to-point radio communication
Marine radio
Mobile communication: air, ground, marine, portable
Closed-circuit television: industrial, aircraft, and nuclear radiation
Slow-scan television
Instruments: test, measuring
Oscilloscopes: large-screen, bar-graph
Vibration test equipment
Magnetic amplifiers and systems
Alarm and signaling systems
Telemetering
Intercommunication, paging, and public-address systems

Consumer Products

Television and radio receivers
High-fidelity phonographs and equipment
Tape recorders
Microphones and loudspeakers
Refrigerators, freezers
Air conditioners
Hearing aids
Incandescent lamps
Home intercommunication equipment
Electrical housewares

Cable and Wire Products

Multiconductor telephone cable
Telephone wire: bridle, distribution, drop
Switchboard and terminating cable
Telephone cords
Submarine cable
Coaxial cable, air and solid dielectric
Wave guides
Aircraft cable
Power cable
Domestic cord sets
Fuses and wiring devices
Wire, general-purpose

Components and Materials

Power rectifiers: selenium, silicon
Parametric amplifiers
Transistors
Diodes: tunnel, zener, parametric
Semiconductor materials: selenium, germanium, silicon
Capacitors: wet, dry, ceramic
Ferrites
Tubes: power, transmitting, traveling-wave, rectifier, receiving, thyratron
Picture tubes
Relays and switches: telephone, industrial
Magnetic counters
Resistors
Varistors
Fluorescent starters
Transformers
Quartz crystals
Crystal filters
Printed circuits
Hermetic seals
Magnetic cores

Printed in U.S.A.