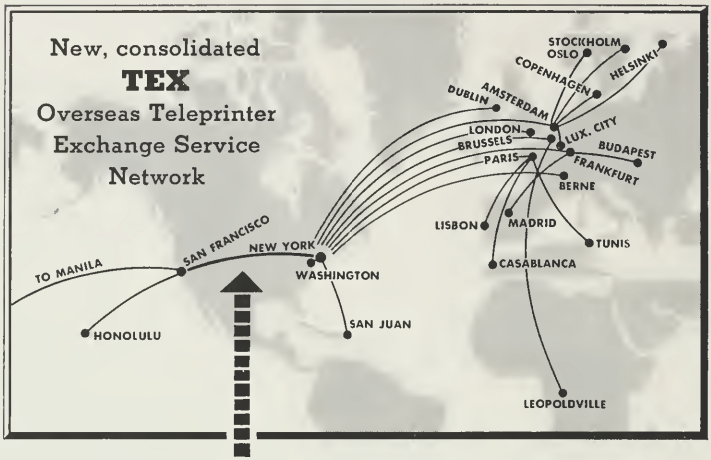
RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

JANUARY 1956

SADLER'S WELLS BALLET PRESENTS "SLEEPING BEAUTY" ON COLOR TV



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The new trans-continental TEX link joins what were formerly separate RCA Atlantic and Pacific TEX networks. *As a result, two-way teleprinter-to-teleprinter connections can now be made between all TEX customers in the United States* and 26,000 subscribers throughout Europe, Africa, the Caribbean, and the Pacific (see map).*

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COVER

Margot Fonteyn starred in the first color TV appearance of the Sadler's Wells Ballet with the NBC presentation of "Sleeping Beauty."

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NOTICE

When requesting a change in mailing address please include the code letters and numbers which appear with the stencilled address on the envelope.

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RADIO CORPORATION OF AMERICA
RCA Building, New York 20, N. Y.

DAVID SARNOFF, *Chairman of the Board*
JOHN Q. CANNON, *Secretary*
FRANK M. FOLSOM, *President*
ERNEST B. GORIN, *Treasurer*

The new RCA pocket-size transistor radio is displayed by Brig. General David Sarnoff.

RCA Achieves Billion-Dollar Business in 1955

Sarnoff, in Year-End Statement, Notes Rise of 320% Over Past Decade: Hails 1955 as the Year Color TV Got "Off the Ground"

THE Radio Corporation of America did a billion-dollar business in 1955 for the first time in its history, Brig. General David Sarnoff, Chairman of the Board, announced on December 27 in a year-end statement in which he hailed 1955 as the year that saw color television get "off the ground" and predicted that it would continue to gain in momentum.

"Total sales of products and services by RCA, in 1955, have exceeded $1,000,000,000," General Sarnoff said, noting that this puts RCA among the top twenty-five industrial companies in the United States. "It is equivalent to more than four million dollars' business for each working day of the year. At the beginning of 1920, when RCA commenced its operations, the volume of business was running at the rate of one million dollars a year.

"From a million to a billion in thirty-five years is a record that gives all of us in RCA a sense of pride in the past and confidence for the future.

"Our achievements in electronics, radio and television establish 1955 as our best year on record. I look forward to 1956 as a year of continuing progress."

General Sarnoff said dividends to stockholders, declared for the year 1955, amounted to $24,069,000 (Preferred — $3,153,000, Common — $20,916,000). Employment totaled 78,000 persons, including 8,000 overseas. Government business accounted for about $220,000,000 of the 1955 total volume, and the current backlog of Government orders is about $275,000,000. RCA's billion-dollar business in 1955 is 320 per cent greater than its sales volume of $237,000,000 just ten years ago, and compares with $941,000,000 in 1954.

Prospects for Color Television

"This year saw color television get 'off the ground' as a new service and become commercially established," said General Sarnoff. "The "initial steps are behind us. With more and more color TV receivers being installed in homes daily, the entertainment value and other advantages of color pictures become increasingly apparent and are stimulating the desire of more people to acquire color sets. To meet the demand, RCA has introduced a complete line of big-screen color receivers, including a table model, consolette and three consoles. As demand increases, production will increase and prices will decrease.

"Color TV will continue to gain in momentum and will make an impact on the American home and the nation's economy. In 1956, color programming will be substantially increased by the National Broadcasting Company and we hope by others in the broadcasting industry. This will accelerate the transition from black-and-white to color."

General Sarnoff expressed the firm belief that "the sale of color sets will eventually exceed the sale of black-and-white sets."

NBC TV Programming

The National Broadcasting Company, a subsidiary of RCA, now has a telecast schedule of Color Spectaculars that is by far the largest in the industry, General Sarnoff pointed out.

A leading NBC color attraction during the fall season was "Alice in Wonderland," adapted for TV.

"In expanding and developing its service to the American home, NBC is concentrating on the *quality* of its programs," he said. "Fully aware of the great educational and cultural opportunities in television, NBC is emphasizing quality not only in programs of popular entertainment, but in all programs — drama, operas in English, education, news and public affairs."

He mentioned "Wide Wide World" as a program esteemed for its educational as well as its entertainment value. He also noted the increased TV attention during the year to informative programs on Government activities.

"The National Broadcasting Company is now entering its thirtieth year and 1955 has been the greatest year in its history," General Sarnoff said. "NBC's emphasis on quality, as well as circulation, stimulates the public's taste for the better programs on the air and encourages others in the industry to follow NBC's path toward higher program plateaus."

Progress In Other Directions

General Sarnoff said industrial uses of TV and electronic controls hold promise of great expansion. He noted that marked progress is being made in RCA's development of an electronic light amplifier; a magnetic tape recorder for television; a high-speed electronic printing process known as Electrofax; an electronic air conditioner; and microwave two-way radio communication for virtually all types of vehicles.

In the high fidelity field, he reported that both instruments and records gained in popularity during the year. To meet the demand, RCA Victor introduced five new Orthophonic High Fidelity "Victrola" phonographs which provide highly realistic reproduction of speech and music for the home.

As for radio communications, RCA's world-wide network now links the United States, its territories and possessions with sixty-five countries, he said. During the year direct customer-to-customer service, known as TEX (teleprinter exchange), was extended and now reaches twenty-one countries, including new circuits to the Philippines, Puerto Rico, Hungary, French Morocco and Tunis.

Major Developments

General Sarnoff listed these five important areas in which new advances are being made:

1. **Transistors:** They advanced technically and production-wise in 1955, and are being used in a number of instances in place of electron tubes to facilitate simplification of design and make electronic instruments lighter and more compact. RCA is now marketing pocket-size, all-transistor radios as well as a larger "personal size" portable set designed for extremely long battery life.

2. **Business Machines:** These machines, including electronic computers and other devices, represent a vast field for development and expansion. RCA has devel-

An NBC camera views San Francisco's famed Seal Rocks for one segment of "Wide Wide World."

This "personal size" portable transistor radio is now being produced and marketed by RCA.

oped a system called BIZMAC for electronic data-processing. A BIZMAC computing system purchased by the U. S. Army is being delivered to the Ordnance Tank-Automotive Command, Detroit, Michigan, where it will complete in minutes inventory control procedures that now require months.

3. **Military Electronics:** New developments in television, radar, radio communications and electronic controls are greatly increasing the effectiveness of virtually every type of military operation.

4. **Radar:** A system, designed by RCA for all-weather purposes, is being installed by five commercial air lines in the United States and by four European air lines to increase the safety and comfort of passengers, and enable the pilot to see storm formations up to 150 miles ahead. A high brightness radar display system projecting images on a four-foot screen for viewing under normal lighting conditions has been developed by RCA for use in air traffic control and other applications where large and bright displays may be required.

5. **Closed-Circuit Television:** Use of this form of TV is rapidly expanding in the fields of education and industry. The first closed-circuit installation of RCA compatible color television is being made at the Walter Reed Army Medical Center, Washington, D. C.

Research And The Future

"RCA has built upon the bedrock of scientific research, development and engineering," General Sarnoff said. "We regard research as the lifeblood of modern industry and the basis for steady growth.

"Progress is born of change as illustrated by the fact that during 1955, eighty per cent of RCA's total sales will be in products and services which did not exist, or were not commercially developed, only ten years ago. The majority of these new products and services were created through pioneering efforts that involved substantial expenditures for research, development and engineering."

He said proceeds from the Corporation's recent $100,000,000 debenture issue, along with other funds, will be used in furthering the expansion and development of RCA's research, manufacturing and service facilities in the electronic and related fields. During the last five years, he pointed out, RCA has spent approximately $160,000,000 for additions and improvements to its properties and facilities.

Sarnoff is Named Chairman of Security Training Panel

Brig. General David Sarnoff, Chairman of the Board of RCA, was named Chairman of the National Security Training Commission by President Eisenhower on November 17. He succeeds the late Maj. Gen. Julius Ochs Adler, who was first vice-president and general manager of *The New York Times*. The appointment was announced as a recess appointment, subject to confirmation by the Senate.

The National Security Training Commission was established to study, inspect and examine all matters concerning the welfare of young men enlisted in the Reserve during their six months' period of military training, and to advise the President, the Secretary of Defense and the Congress regarding the welfare of such trainees.

Presiding at his first meeting as Chairman of the group in November 29, General Sarnoff said:

"An effective Citizen Reserve is essential to our national defense and security. The public has expressed its will on this subject through its representatives in Congress who have translated this will into the law of the land which sets forth a specific program. The job now is to put that program into action and to make it work effectively. This is a big job and it has barely gotten started: for the Reserve Forces Act has been law only since August 9, 1955 . . . All Americans have the obligation, the privilege and the opportunity to help in this vital national effort."

A new peak in home listening pleasure — the RCA Victor Mark I high-fidelity system.

Folsom Foresees Quality Market in 1956

BUSINESS trends and yardsticks across the nation indicate that 1956 will present to most segments of American industry — including radio-television and electronics — one of the greatest quality markets in history as the present excellent state of the national economy advances to new high levels, Frank M. Folsom, President of RCA, asserted in a year-end statement on Dec. 30.

Mr. Folsom, calling attention to the all-time record of $11 billion in sales set by the electronics industry in 1955, cited the following significant facts as pointing to an exceptionally bright outlook for this industry in the year ahead.

— Customer preference for high quality products is bringing higher-priced items into the position of merchandise leaders, thus adding substantially to dollar volume.

— This trend of public preference appears destined to boost color television into the status of a "billion dollar baby" well ahead of expectations: in fact, retail sales of color sets may account for as much as $175 million in the coming year.

— Retailers have experienced their biggest Christmas business in history, and this heavy buying appears destined to carry over into the first quarter of 1956 to give the year a fast start.

— Large-scale orders, already in manufacturers' hands, may be expected to provide a powerful impetus to overall industrial progress.

— New products and techniques, plus competitive stimulation, will expand old markets and create vast new ones.

— Prospects for continued high-level employment and personal income mean increasing purchasing power of consumers to buy better goods and services.

— The nation is experiencing an expanding economy stimulating higher standards of living at virtually all levels of the population.

Predicts $2-Billion Business by 1965

"For its part, the Radio Corporation of America welcomes the trend toward higher quality products in all phases of electronics, including radio and television, as the sign of an expanding and more vigorous industry in which RCA proposes to continue in a leading role, Mr. Folsom said.

"RCA had a splendid business year in 1955, as did the thousands of RCA suppliers and the thousands of merchandisers who sell our products across the country and abroad. For the ninth successive year, RCA sales attained a record high, with the total passing the billion-dollar mark for the first time.

"Ten years from now, RCA will be doing business at the rate of at least two billion dollars a year."

Lists Leading Products

Outstanding sales volume in 1956, declared Mr. Folsom, may be expected in such fields as black-and-white and color television receivers, industrial TV, TV transmitting equipment, electron tubes and components, microwave relay systems, military electronic apparatus,

radio sets, "Victrola" phonographs and high fidelity instruments, and records. The replacement market also should be particularly good, and service operations, including installation and maintenance of products, should attain record dollar volume, he said, and added:

"A trend of major importance that first became discernible only a few years ago continued in the increasing use of new electronic products and services for industrial purposes. The end of 1955 finds sales to industry and government rapidly closing the gap of dollar-volume differential as compared with revenues from communications and home entertainment.

Accelerated "Electronizing" is Foreseen

"Further acceleration appears assured in 1956 in 'electronizing' production techniques, inventory control, food inspection and protection, military equipment, scientific research, biological explorations and other widely separated areas of endeavor.

"Closed-circuit television for non-entertainment purposes made impressive headway in 1955, and should expand to an even greater extent during the coming year. It is providing electronic 'eyes' to many sections of industry and is proving to be an effective tool in manufacturing, education and medicine.

"On the entertainment side, black-and-white television receiver production in 1955 set an all-time record of 8,300,000 units, representing a retail dollar value of nearly $2 billion. Of this total, the RCA Victor Television Division manufactured and sold more than a million receivers.

"Not only has RCA paced the field in black-and-white TV, but almost single-handedly we have continued to lead the way in color — which is the brightest hope the industry ever had, the phenomenal progress of black-and-white TV notwithstanding.

Sees Big Sales of Color TV in 1956

"Color television is with us as a potential billion dollar baby. As 1955 closed, it was fully apparent that 1956 will be the first big year of color production and sales, pointing to mass output and lower prices.

"During the coming year the RCA Victor Television Division will manufacture and our distributors will sell upwards of 200,000 color receivers. Color will be an important part of our sales and profit picture — while we will continue to produce whatever quantity of black-and-white receivers necessary to satisfy public demand.

"To give a general idea of our proposed stepped-up rate of color TV production, we plan to produce about twice as many color receivers in the first half of 1956 as were produced in the last half of 1955."

Mr. Folsom reported that heavy sales of radios were experienced in 1955 as consumers purchased approximately 13,000,000 receivers, bringing to more than 125,000,000 the number of sets in use.

He said there is a continuing boom in high fidelity music reproduction systems, with sales estimated at $50 million in 1955, and forecast that sales of phonograph records would show a marked increase in the coming year because of the public's greater appreciation for better music, higher quality records and more attractive packaging of records.

Government Activities

Mr. Folsom said government work for the Armed Forces continued to have an important effect on RCA operations with the year-end backlog of government orders standing at approximately $275,000,000. A total of $220,000,000 in government contracts was completed during the year, he noted.

"RCA's outlook in foreign markets continues bright after an excellent year of sales," he stated. "The coming twelve months should witness a further impressive increase in business, particularly in Latin America, Canada, the Middle East and the Far East.

"Sales included virtually all phases of communications, with an increasing accent on television and microwave systems. Radar sales also were stepped up, and radio sets, 'Victrola' phonographs and records moved ahead satisfactorily. Mounting activities were reported by RCA associated companies in thirteen countries."

New self-contained 45-rpm RCA Victor record players come off the production line at Combridge, Ohio.

RCA's BIZMAC Goes to Work

A MASSIVE and critical task for the nation's security — controlling the supply of replacement parts for Army combat and transport vehicles at depots throughout the world — is about to be taken over by BIZMAC, RCA's great new electronic data-processing system.

A $4,000,000 BIZMAC installation, capable of converting months of paperwork into minutes of "push-button" operation, is now being made at the United States Army's Ordnance Tank-Automotive Command in Detroit, Mich. Developed by RCA over a five-year period, the extensive system is specifically designed for standard business operations. At OTAC, it will enable military officials to keep an up-to-the-minute account of the supply of all vehicle replacement parts — an account which has, until now, involved voluminous paperwork and has of necessity run several weeks late in its reporting of vital inventories.

The purchase was announced jointly by Frank M. Folsom, President of RCA, and Brig. General Nelson M. Lynde, Commanding General of OTAC, and the announcement was accompanied by the first published details of BIZMAC. Outlining the comprehensive task to be handled by the electronic system, General Lynde said:

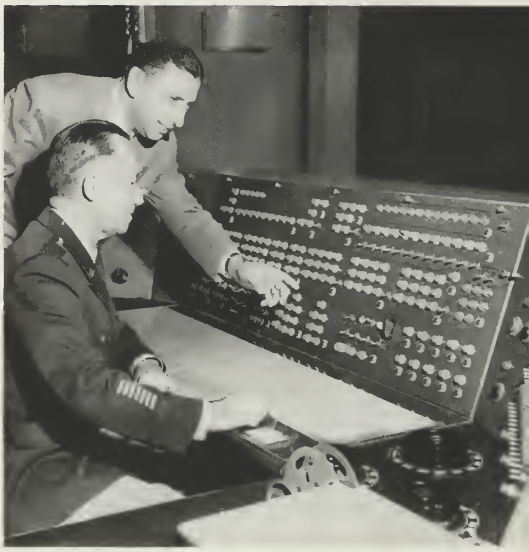
"The RCA BIZMAC system will effect major operating economies at OTAC. The system can perform in minutes inventory control procedures that now take months for the Army's vast Tank-Automotive supply program. The program involves control of replacement inventory of more than 200,000 different categories of parts, ranging from nuts and bolts to fan belts and engines, needed to keep military vehicles operative.

"The BIZMAC system will be used to provide speedy and accurate information on inventories, to determine in minutes the current supply of any item at any Ordnance depot in the nation, and to compute forecasts of future requirements."

Versatility is Emphasized

The versatility of the new system was emphasized by Mr. Folsom, who said:

"BIZMAC is specifically designed for a wide range of business tasks which, in addition to computations, normally involve the handling and processing of tremendous volumes of paperwork. At electronic speeds, it will compute, sort, extract and file data, process inventory information, forecast materiel requirements, recommend procurement action and stock distribution, produce budget and fiscal summaries, and prepare manuscripts for parts catalogs.



Brig. General Nelson M. Lynde, Commanding General, Ordnance Tank-Automotive Command, reviews with A. L. Malcarney, General Manager, Commercial Electronic Products, RCA, the operation of the main console of RCA's BIZMAC data-processing system.

"This RCA system is designed to make molehills out of the mountains of paperwork which OTAC must move daily. Its tremendous speed, flexibility and accuracy can be expected to introduce new efficiency and simplicity into OTAC's operations and produce important reductions in time, cost and space requirements for the full run of standard clerical functions.

"It will provide to an unprecedented degree, fingertip control of information, analysis and projections essential for quick, sound decisions and long-range planning. It will deliver on request a pin-pointed picture of any and all phases of the replacement parts operation. BIZMAC, in a large sense, will enable OTAC to view with startling accuracy the course of current and future operations."

200 Units, 13 Types of Equipment

BIZMAC incorporates approximately 200 units of 13 different but fully integrated types of electronic equipment. With lightning speed and accounting accuracy,

it will perform electronically most of the voluminous clerical procedures involved in OTAC's world-wide stock control program. In particular, BIZMAC will:

1. File on a single reel of magnetic tape, 10½ inches in diameter, more than 2,500,000 characters — or all the information contained in approximately 8,500 of OTAC's parts inventory records;

2. Electronically "read" and "write" at the rate of 10,000 letters or digits per second, and operate at a tape speed of 80 inches per second;

3. Add, subtract, multiply and divide with electronic speed, and "remember" specified information indefinitely for recall in a few millionths of a second;

4. At a speed of 600 lines a minute, print OTAC's inventory procurement recommendations, shipping orders, and other business paperwork involved in the operation of the parts control program.

Details of the System

To do all these things, BIZMAC is equipped with a variety of electronic talents embodied in its different parts.

The heart of the system is an RCA-developed computer which adds, subtracts, multiplies, divides, and "remembers." The RCA computer has an exceptionally large program-storage capacity for business applications. It also is capable of processing data having both variable and fixed word and message length — a feature offering maximum flexibility, economy and speed in the preparation, storage and processing of file data. Up to 4,000 instructions, each with up to three parts, can be stored in the computer.

The nerve center of the computer is a magnetic core memory matrix — a compact and reliable assembly of copper wires and ferromagnetic "washers" developed at the David Sarnoff Research Center of RCA. Operating as an electronic "scratchpad," the high-speed memory can hold its stored information indefinitely and, on signal, relinquish any or all of it in a few millionths of a second.

The complete BIZMAC system includes input devices for preparing and feeding information and instructions into the system; storage devices for filing data within the system so that it is readily accessible on demand; processing devices for sorting and filing information, for computing, and for performing business arithmetic as dictated by the instructions; and output devices for providing finished copies of information as desired.

BIZMAC offers numerous features and services:

1. *Dual recording.* Information fed into the system is recorded twice, simultaneously, assuring maximum accuracy and reliability in recording and reading.

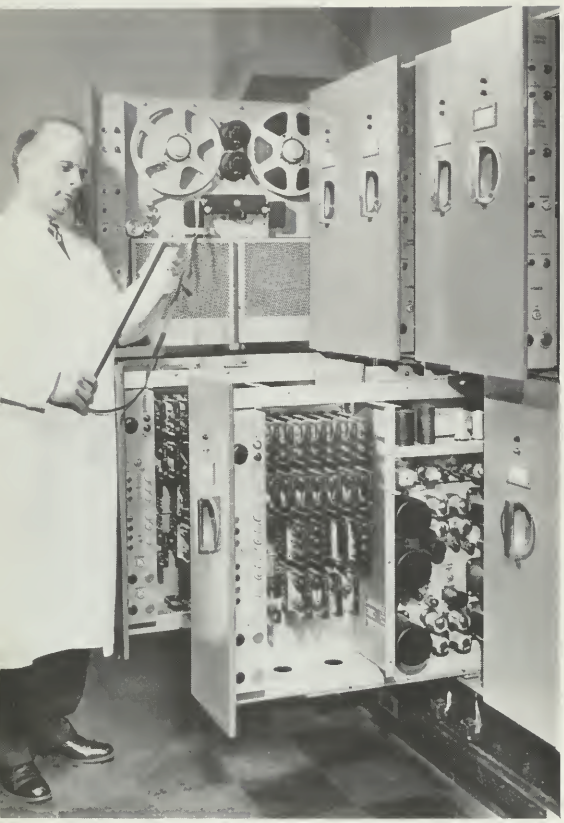
BIZMAC's electromechanical printer, shown here, can turn out finished paperwork at 600 lines a minute.

2. *Variable word and message length.* The BIZMAC system records words and messages in actual length to minimize both the number of tape files required for storage of given data and the time required for processing transactions.

3. *An Electronic Sorter,* especially suited for an application requiring considerable file maintenance and sorting. The sorter handles such file maintenance activities as extracting data for processing, deleting obsolete information, and filing current and new records.

4. *An Interrogation Unit,* which can be switched immediately and directly to the appropriate tape file for extracting and printing required data. The interrogation unit facilitates handling of urgent, unanticipated requests without interfering with the computer working on scheduled assignments.

5. *System Central.* Work-dispatching center of the BIZMAC system is a unique central operations control and switching unit which operates like a telephone switchboard and enables the operator at a master console to direct, control, and integrate the simultaneous opera-



J. Wesley Leas, chief engineer of BIZMAC project, examines mognetic tape in one of mony tape files used for filing information in the system.

tion of all the various electronic units in the system. The System Central increases utility and minimizes idle time since units which have completed assigned tasks can be switched immediately to new assignments. The central control also minimizes manual handling of tape files and permits connection of any tape to any processing unit.

System Units

The BIZMAC system consists of 13 electronic and eight mechanical types of units which are designed for integrated operation.

Major system units include:

Input Devices: a Tapewriter, which simultaneously produces a punched version, in machine language on paper tape, of given information and a typed copy; a Tapewriter Verifier, which verifies the punched tape for maximum accuracy; a Tape Transcriber, which transfers the data from the punched tape to magnetic tape at the rate of up to 12,000 characters per minute; and a Card Transcriber, which transfers data from punched cards to magnetic tape at a rate of 400 cards per minute.

File Storage: compact and economical Tape Files, complete with electronic reading and writing capabilities, where the "files" — data-enscribed reels of magnetic tape — are stored. Each tape file can be made accessible to other units in the system at the push of a button.

Data Processing Devices: the RCA computer, in which can be stored up to 4,000 three-address instructions; and the Electronic Sorter, for file maintenance tasks, which will keep OTAC's computer free for major assignments.

Output Devices: Electromechanical Printer, for printing at the rate of 600 lines per minute an original and three carbon copies of the data on the magnetic tape; Magnetic Tape Transcriber, which transfers data from magnetic tape to a punched paper tape.

RCA Scholarships Awarded to 28 College Students

TWENTY-EIGHT students at colleges and universities throughout the country have been awarded RCA Scholarships for the current academic year, according to an announcement by Dr. C. B. Jolliffe, Vice-President and Technical Director of RCA. These scholarships, with grants of $800 each, enable undergraduates to continue studies in science, industrial relations, music and drama — fields which are related directly to the electronics and broadcasting industries.

Announcing the awards, Dr. Jolliffe said:

"Under an expansion of RCA's program of aid to education, three RCA-NBC Scholarships in the dramatic arts are being awarded for the first time at Carnegie Institute of Technology, Iowa State College and Yale University. These scholarships were established in April by RCA and the National Broadcasting Company. They are intended to help replenish the fund of talent which the NBC network constantly draws upon for its many dramatic productions.

"This is the eleventh consecutive year that RCA has awarded scholarships under a program that originated in 1945. During that time, more than 230 students have been assisted in their college education by RCA Scholarships and Fellowships.

Sylvester L. Weaver, Jr.

Robert W. Sarnoff

Weaver Named Chairman of NBC; Robert Sarnoff Becomes President

THE BOARD of Directors of the National Broadcasting Company has elected Sylvester L. Weaver, Jr., Chairman of the Board and Robert W. Sarnoff President of NBC.

The election of Mr. Weaver and Mr. Sarnoff was announced Dec. 7 by Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, parent company of NBC. General Sarnoff who will continue as a director of NBC, declared:

"Two years ago this month, Pat Weaver was elected President and Bob Sarnoff was elected Executive Vice-President of the National Broadcasting Company. The brilliant record of achievement of NBC during these past two years, under the direction of Pat and Bob, is well known throughout this country and abroad. My associates and I are proud of the record made by these young men.

"The beginning of the third year of their operations seemed to me a fitting time to recommend that Pat Weaver succeed me as Chairman of the Board of NBC. He, in turn, recommended that Bob Sarnoff succeed him as President of the Company. Accordingly, at a meeting of the Board of Directors of the National Broadcasting Company held today, these recommendations were acted upon and approved.

"Through my duties as Chairman of the Board of RCA and as a Director of NBC, I will continue my active interest in the affairs of the National Broadcasting Company. I am confident that, under the continued leadership of Pat and Bob, NBC will achieve even greater heights of success in serving the American public and our industry."

The record of achievement of NBC during the two-year Weaver-Sarnoff administration was outlined for the representatives of more than 120 of NBC's affiliated stations at their annual meeting in Chicago. Harry M. Bannister, NBC Vice-President in charge of Station Relations, who made the opening address at the meeting, listed among the major achievements of the Weaver-Sarnoff administration the creation of new national television viewing habits through the NBC Spectaculars such as "Peter Pan" and other specially scheduled programs, the establishment of color television as a national commercial service, introduction of new television sales concepts which created a broader advertising base and increased the medium's over-all utility, and building of a solid base for the future of network radio through such programs as "Monitor" and "Weekday" which provided programming and sales innovations adopted in varying degrees by other networks.

By a unanimous vote, resolutions congratulating both Mr. Weaver and Mr. Sarnoff were adopted by the affiliates at the Chicago meeting. They cited Mr. Weaver for "his creative imagination (which) has vastly enlarged the scope of television as a service to the public and advertiser," and Mr. Sarnoff for "his personal contribution in advancing the NBC Television Network to new and higher plateaus of leadership." Scrolls inscribed with the resolution were presented to Messrs. Weaver and Sarnoff by Walter Damm, Vice-President and General Manager of Station WTMJ-TV, Milwaukee, Wis., and Chairman of the NBC-TV Affiliates Committee.

Automation and Economic Growth

(Following are excerpts from a talk given by Dr. E. W. Engstrom, Senior Executive Vice-President, RCA, at the Centennial Symposium on Modern Engineering, University of Pennsylvania, in Philadelphia, on November 11, 1955.)

THE term automation has come into use in recent years to describe the introduction of sensing and feedback controls which enable the machine to take over some of the control functions normally provided by human operators.

This concept is more than just an evolutionary process in our industrial development. An essential ingredient of the Industrial Revolution was the removal of the limitations of power imposed by the capabilities of humans and animals. Now it is the limitations of humans in decision making and control which are being superseded. Electronic systems can handle information and can control mechanisms at enormously greater speeds and accuracies and, therefore, in vastly greater quantities than humans can. Thus, while the intelligence of the human being will never be superseded by a machine, there is no question but that electronic systems already have surpassed human information handling capabilities. Because of this, some of the new concepts of automation are revolutionary, and the coming of automation is sometimes referred to as the Second Industrial Revolution. . . .

Automation and Electronics

In the electronics industry we find a two-sided interest in automation. In the first place, much automatic equipment is electronically controlled. Electronics provides the means of replacing human judgment and control. It provides the sensing devices, the means of communication, and the computing devices. . . . In the second place, mechanized processes are used for the production of electronic equipment. In some cases, a high degree of mechanization is already in use. In other cases, theories of modular design are being developed which may introduce true automation to short-run products. . . .

In the production of television and radio receivers, where large production runs of complicated equipment are encountered, there has recently been a very rapid growth of mechanization. Production techniques have recently been modified by the development of the printed-circuit technique, which uses a laminate consisting of an insulating layer coated with a copper sheet which is etched through in such a way that the remaining copper provides the electrical connections to be made. Electronic components are then threaded through holes in such a printed-circuit board to make contact with the proper copper strips. All of these contacts can then be soldered by one operation. Because the board is regular in shape and puts all of the conductors into one plane, the electronics industry is thus provided for the first time with the means of handling its product in automatic machinery. . . .

A Necessity for Economic Growth

It is certain that we will see the introduction of more and more automation as our economy continues to expand. In fact, with our economy growing faster than our labor force, automation appears to be necessary if we wish to keep improving our standard of living. On the other hand, I think it is extremely important to realize that, while automation provides a means to an expanding economy, it will not be the only significant controlling factor in the expansion. We must recognize that the future outlook of the consumers and of the business population will continue to be important in determining the future health of our economy. . . .

With automation, we shall no longer have large groups of people who are themselves part of a production machine. Instead, we will have many persons employed to design, to build, to service, to control, and to make decisions. This will call for greater skills and for more training and education. It will mean a general upgrading of personnel. . . .

While automation is bringing about new and broader patterns in the use of labor, it will also create a large group of managers of a new type, men who will be the directors of the new automation traffic of materials, products and marketing. Here in the work of the administrator of business, will be the real revolution of automation. To be efficient and effective, systems of automation must be directed toward an integrated business. . . .

To make its task easier, the management of the future will work with much improved and more current data on the operations of its business. This will be the direct result of the use of constantly improving electronic business machines. It will also result from the character of automation as a system that feeds back data and information to control its operations and to permit effective management decisions. . . .

Automation will necessitate many adjustments by both labor and management but will increase the assurance of full use of the contributions of each. Automation is a way to an expanding economy, to a higher standard of living, and to happier living for all.

Through a glass panel, Chicagoans will be able ta watch action before the color cameras at WNBQ.

The First All-Color TV Station

THE WORLD'S first all-color television station will begin operations this spring, broadcasting some ten hours of color programs daily to viewers in the Chicago area.

The pioneer station is WNBQ, the NBC-owned station in Chicago, with studios in the Merchandise Mart. Its conversion to color involves the remodelling of station facilities on the 19th and 20th floors of the huge building to accommodate three color studios with five live and two film cameras. When the work is done, WNBQ will begin telecasting all of its own locally originated programs in color, in addition to the frequent NBC network color transmissions.

The WNBQ conversion is one phase of a $12,000,000 program announced by NBC to expand color television facilities in New York, Chicago, and Hollywood. The other highlights of the program are:

1. Construction of a second color studio at NBC's Color City in Burbank, Calif.
2. Construction of a second color studio in Brooklyn, in an area adjacent to NBC's present color facilities there.
3. Conversion of the Ziegfeld Theatre in New York into a color studio.
4. Construction of an office building at Color City.
5. Tripling of technical work space at Color City to house the new master control, color-recording, film broadcasting and other technical facilities.
6. Addition of four new color film chains to the network's facilities.
7. Installation of equipment in Color City for recording color programs for rebroadcast.
8. Construction of the latest-type master control center at Color City for all West Coast originations, replacing the present master control at the Hollywood studios.

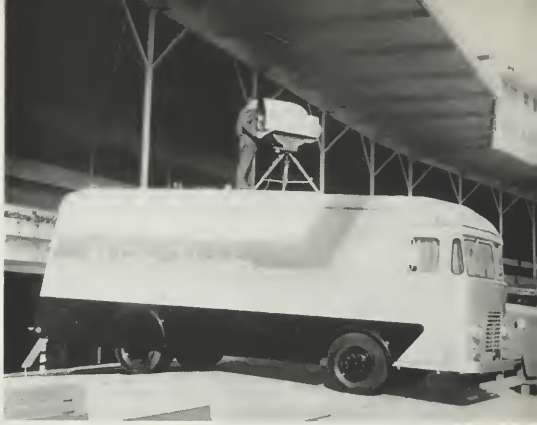
Of the total of $12,000,000, approximately $4,750,000 is to be spent in New York, $6,000,000 on the West Coast, and $1,250,000 in Chicago.

Press Conference via Color TV

The WNBQ conversion plan, erecting a new milestone in the advance of color television, was announced by Brig. General David Sarnoff during a special press conference which itself involved the first intercity use of closed-circuit color television for such a purpose. General Sarnoff spoke before the color TV cameras at NBC's Colonial Theatre in New York City: with him on the stage were New York press representatives. The Chicago press gathered at the WNBQ studios. During a question period following General Sarnoff's statement, a split screen arrangement permitted two-way vision and conversation over the 700-mile distance.

Describing the plan for complete replacement of WNBQ's black-and-white equipment with color equipment, General Sarnoff said:

Artist's sketch of the RCA-NBC Exhibition Hall to be built at WNBQ shows color receivers and windows through which visitors may watch action in the studio.



The new RCA "color studio on wheels," which is being leased to TV stations for originating colorcasts of local events or to augment present equipment.

"We have chosen Chicago for this pioneering step because Chicago has always been a key city in the operations of the National Broadcasting Company and the radio and television industry generally. Chicago has had many 'firsts' in broadcasting, both in radio and television. And now we have another first for Chicago in color television.

"All the know-how, all the lessons we learn in this Chicago pilot operation will be made available to other television stations interested in advancing color television as a regular service to the public."

As to the motives for establishing a local color program service, General Sarnoff stated his conviction that the future of television lies in color and cited the steps taken by RCA and NBC "to break through the black-and-white curtain," adding:

"Network color, which we pioneered, is now well established. Many outstanding television programs have been telecast in full color and even more are planned... But we know that network service must be supplemented by good local color programs. That is the next step that must be taken to make color television a full and complete service. That is the step we are taking now."

Work Already Started

Participating in the press conference with General Sarnoff were Sylvester L. Weaver Jr., then President and now Chairman of the Board of NBC; Robert W. Sarnoff, then Executive Vice-President, now President of NBC, and Charles R. Denny, Vice-President of NBC Owned Stations and NBC Spot Sales.

Mr. Denny reported that work already had started on the new all-color installation, for which NBC has leased 50,400 square feet of roof space at the Merchandise Mart. Planned construction includes a television production and service shop, with the remainder of the space available for expansion and outdoor studio use.

Three studios on the 19th floor are to be used for broadcasting color, including one large studio which will house more than a dozen permanent sets for a variety of programs. All three color studios will be served by centralized color control equipment.

"This new color studio will in every way be the very latest thing in studio design," said Mr. Denny. "It will incorporate all the techniques we have learned in our network operations but will be specifically planned to meet the somewhat specialized requirements of local station programming. We are seeking to make it a model station plant.

The target date for WNBQ's conversion to color is April 15, and Mr. Denny announced that after completion of the project the Chicago public will be invited to see color television in operation at an Exhibition Hall on the 20th floor surrounding the new color studio. Color receivers will be in constant operation. When WNBQ happens to be transmitting a black-and-white network program, the receivers will carry a special demonstration color pickup from the new studio.

The metamorphosis of WNBQ highlighted a general increase in color broadcast activity featured by these other developments:

1. An announcement by Mr. Sarnoff that 31 NBC television affiliates, serving areas which include nearly half of all homes in the country, are now originating their own color programs, and that 102 NBC outlets are now equipped to rebroadcast color programs originated by the network;

2. Purchase of a complete RCA 100-kilowatt VHF (very high frequency) installation by a new color TV station in Portland, Ore. The purchase involved approximately one million dollars, representing the largest single installation of RCA equipment for an independently owned color television broadcast station, as well as the first installation of its kind in the country;

3. Completion of an RCA color television "studio on wheels" as a new television service which will enable broadcasters in various areas to originate colorcasts of local events for local or network broadcasts.

Can Originate Network Programs

The new mobile unit, announced on December 15 by A. R. Hopkins, Manager, RCA Broadcast Products Department, represents the first service of its kind offered to broadcasters. It will permit TV stations modified for color transmission to lease an RCA color television unit completely equipped with video and audio facilities and two "live" studio cameras. It will be operated by the personnel of the lessee station for originating color programs in the field or in the studio.

For stations which already are equipped to originate color programs, the mobile unit may be leased to augment present equipment. In addition to local broadcast, its pickup can be transmitted nationally over network facilities whenever desired.

The first mobile unit, assembled at the Camden, N. J., plant of RCA, has been made available to TV stations within a 150-mile radius of Philadelphia, and it is anticipated that additional units will be added in the future to extend the mobile service to other major television broadcasting centers. The pioneer user of the first unit was station WCAU-TV, Philadelphia, which employed the mobile equipment to originate a color broadcast of the annual Mummers' Parade in Philadelphia on New Year's Day.

Said Mr. Hopkins:

"This studio-on-wheels concept has been developed to provide stations with a practical, economic means for originating colorcasts of important local events. Pending installation of permanent origination equipment, the RCA color mobile unit will enable such stations to improve their service to viewers and sponsors and to acquaint engineering and programming personnel with equipment and techniques for local colorcasting."

3-Point National Security Program Urged by Sarnoff

A THREE-POINT program to meet the Communist challenge on the military, civilian defense, and propaganda Cold War fronts was outlined by Brig. General David Sarnoff at the Navy Day dinner of the Chicago Council of the Navy League of the United States on October 27.

The national security structure, said General Sarnoff, "should consist of three major wings, all closely and harmoniously integrated.

"First, we must maintain our military strength at the point where the fear of reprisal will deter any nation from attacking us. Second, we must develop a Civil Defense program to insure the maximum support of our armed forces if hostilities do come. Third, we must pursue victory in the so-called Cold War as resolutely as the Navy has always pursued victory in Hot Wars."

As for the Cold War, he said we must recognize that it is "not simply a preliminary bout but the main event."

At the dinner, General Sarnoff was presented with a plaque bearing this citation:

"A pioneer in the field of communications who has demonstrated great courage, vision, inspiration, and leadership, Brigadier General David Sarnoff has made outstanding contributions to the United States Navy, our nation, and to better living for people everywhere. To mark his many brilliant achievements, this citation for distinguished service to the United States Navy, the nation, and the American people, is presented to General Sarnoff on the thirty-fifth anniversary of the introduction of commercial radio."

Earlier, General Sarnoff told a Fordham University audience in New York that the Cold War between East and West has entered "a new and more dangerous stage."

Speaking at the Golden Jubilee Celebration of the Fordham University School of Law, which presented him with an honorary degree of Doctor of Laws, General Sarnoff warned against "wishful thinking" and urged the necessity of a coordinated national security program and said:

"We cannot evade the responsibility inherent in the challenge of Godless Communism which destroys freedom and disregards law. We must meet it courageously, with righteousness as our shield. The spirit of free men is our strongest ally."

WHAT'S THE LATEST?

These electronic developments have recently made news at RCA

☆☆☆☆

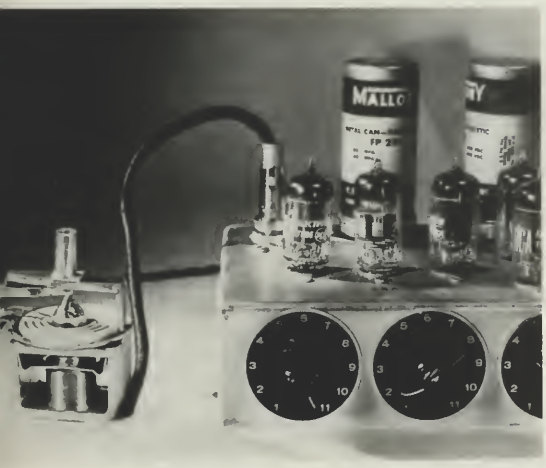
LENS SPEEDS COLOR TV TUBE PRODUCTION — This specially-designed optical lens, displayed here by Peter Kaus, of RCA Laboratories, is being used in a projection process to help achieve simply and rapidly the precise location of more than 1,000,000 color phosphor dots on face of large-screen color TV tubes.

☆☆☆☆

REMOTE CONTROL FOR TV — The compact control unit at right has been developed by RCA to operate all important TV set adjustments from up to 30 feet away. It can be used to turn on the set, change stations, adjust volume and fine tuning, and turn the set off.

☆ ☆ ☆ ☆

ELECTROFAX PRINTING PLATES — RCA's Electrofax process of electrostatic printing can be used as shown here to produce printing plates with unprecedented speed. Image projected directly onto plate is "developed" with magnetic brush. In background is plate with developed image, ready for the engraver.



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VIBRATION REDUCER — Object at left is an experimental vibration reducer which can counter or absorb machine vibration by electronic means. Downward pressure on top of the reducer is detected, signal is amplified in amplifier at right, and returned to the reducer, which may either exert counter pressure in opposite direction, or absorb the original vibration.

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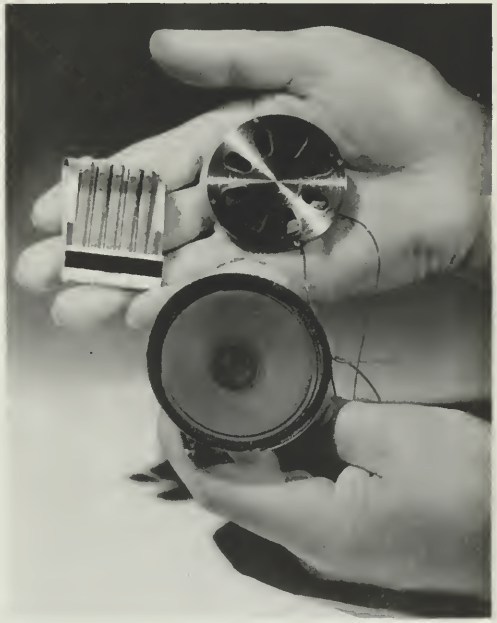
LARGE-SCREEN RADAR — Using a new viewing tube developed at RCA Laboratories and a projection system, RCA has achieved this four-foot radar display bright enough to be viewed in surroundings as brightly lighted as the average living room.



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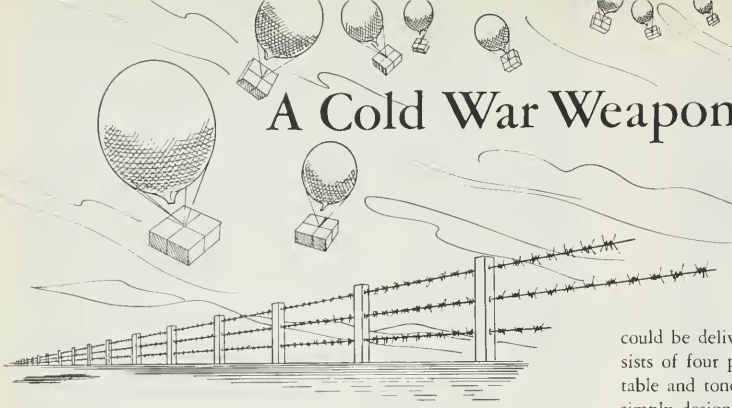
MINIATURE LOUDSPEAKER — At top in this picture is tiny loudspeaker designed at RCA Laboratories for pocket-size radios. Employing novel design principles, it is only 2⅛ inches in diameter and less than ½ inch thick — far smaller and lighter than current type held in foreground.



A Cold War Weapon for 50 Cents

A NEW weapon in the Cold War — an inexpensive, hand-operated phonograph designed to deliver recorded messages from the free world by air-dropping behind the Iron Curtain or direct distribution in critical areas — has been developed by RCA and is being field-tested in the Near and Far East and in Africa.

The seven-ounce, unbreakable device was demonstrated publicly for the first time on November 10 by Brig. General David Sarnoff, who displayed it at the Overseas Press Club of America in New York and emphasized that it could reach millions of persons living in areas without electric power and, unlike radio communications, its messages could not be "jammed."

According to General Sarnoff, the phonograph can be manufactured for 50 cents or less, so that "millions could be delivered gratis." He pointed out that it consists of four parts — a metal handle, and a base, turntable and tone arm of unbreakable plastic — and is so simply designed that it can be assembled and operated by anyone. He said that both the phonograph and the seven-inch records designed for it could be "dropped from the sky like leaflets."

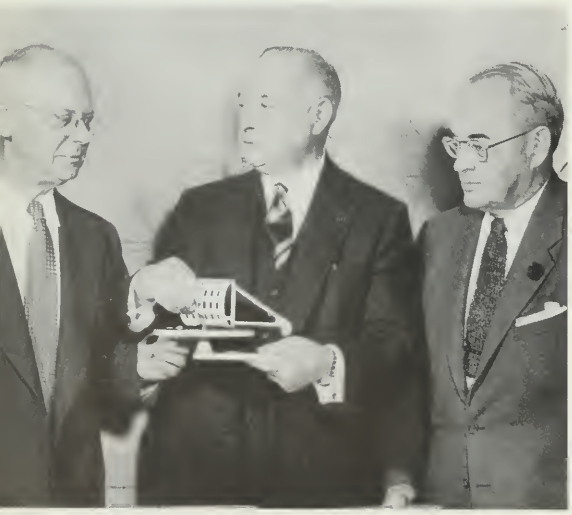
Plans Offered Gratis to Government

During a question and answer period, General Sarnoff revealed that RCA had offered the design and plans for the phonograph gratis to the government, and that a few hundred of the machines produced by RCA would be field-tested by the United States Information Agency.

The phonograph was developed by Arthur Van Dyck, Staff Assistant to the Vice-President and Technical Director of RCA. At the demonstration, Mr. Van Dyck placed a special record on the turntable, held the instrument by its base, inserted the small metal handle into the turntable spindle, and cranked slowly. The output was a message on the meaning of American freedom, clearly audible to everyone in the audience. The record was one of a type developed by the RCA Victor Record Division, using a low cost vinylite material and holding three minutes of sound on each side. Special foreign language discs of this type have been prepared for use in Burma, Laos, Thailand, Vietnam and elsewhere.

The record is turned at 78 revolutions per minute — or as close to it as the operator can come. Mr. Van Dyck explained that this speed was selected as the most common throughout the world, and because it is easier to maintain manually than slower speeds.

He pointed out to the correspondents that the machine is an adaptation of early phonographs, which were cranked by hand and used direct connection between the needle and the amplifier. Packed for distribution, the instrument fits into a cardboard carton approximately eight inches square and four inches deep.



The new RCA hand-operated phonograph is demonstrated by General Sarnoff to Louis Lochner, head of the Overseas Press Club of America, as Arthur Van Dyck, its developer, looks on at the right.

The seven-ounce, unbreakable phonograph, made largely of plastic, is operated by turning the crank.

At the demonstration, both General Sarnoff and Mr. Van Dyck emphasized that part of the phonograph's value lay in the fact that it is fun to operate. They reported that nearly everyone who had been shown the instrument, including President Eisenhower, had delighted in spinning the turntable to produce sound.

Following the demonstration and accounts of the phonograph in the press so many inquiries were received by RCA that an information kit was prepared to answer the questions of manufacturers about the instrument's specifications and characteristics. The kit describes one design of such a phonograph, and the information is being made available to any company interested in studying the question of manufacturing the instrument, without restriction as to its use. According to Mr. Van Dyck, the queries have come not only from manufacturers, but also from government agencies, from religious and educational groups, from sales promotion organizations, and from the general public. Among them, he reported, have been one from a nationally-known medical school which is considering the phonograph as a device for teaching hygiene to Indian tribes; another from a museum which has an idea that such phonographs might be supplied to tourists as self-guides; and one from a sportsman who requested a phonograph and a record imitating duck calls, with the comment that "this is the answer to a hunter's prayer."

Voice of America Adopts New Slogan

The Voice of America is using the station identification "For Freedom and Peace" for its English and some foreign language broadcasts, it was announced on December 23 by Theodore C. Streibert, Director of the United States Information Agency.

Use of this identification was proposed by Brig. General David Sarnoff in his memorandum "Program for a Political Offensive Against World Communism," submitted last April to the White House.

J. R. Poppele, the Agency's Assistant Director for Radio and Television, said that constant repetition of the words as part of the Voice of America's station identification would help to convey to listeners around the world the truth about United States policies and its goals of freedom and peace.

Expansion of RCA Marine Operations

PLANS OF RCA for expanded operations in the field of marine radio communications, manufacturing, marketing and servicing, to fill the needs of increasing numbers of customers were announced on December 28 by Frank M. Folsom, RCA President.

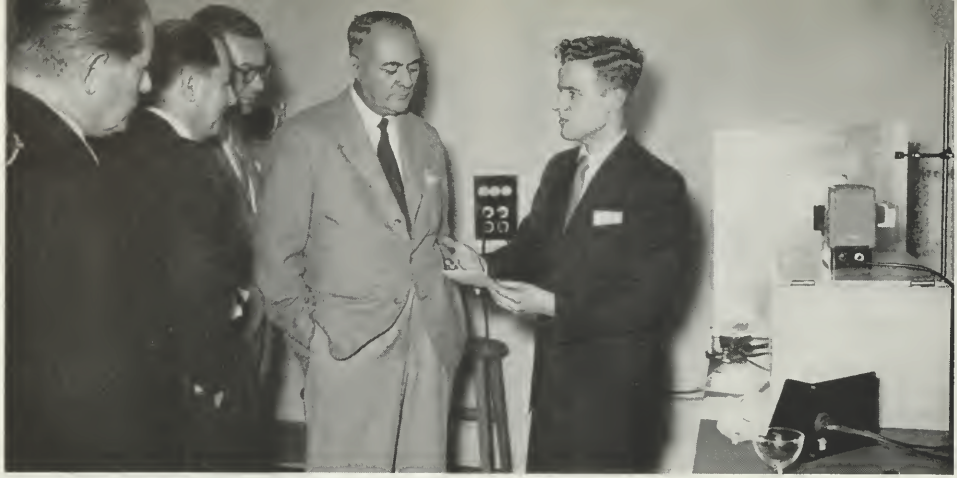
According to Mr. Folsom's announcement, the following rearrangement of basic functions of the Radiomarine Corporation of America, a service of RCA, is being made:

1. If the Federal Communications Commission approves, marine radio traffic operations of the Radiomarine Corporation will be transferred to RCA Communications, Inc., also a service of RCA.

2. Radiomarine service activities will be handled by the RCA Service Company, Inc., wholly-owned subsidiary of RCA.

3. Radiomarine's existing sales, engineering and manufacturing operations will form the nucleus of a strong Marine Equipment Organization within the RCA manufacturing divisions.

"The communications and service activities of Radiomarine, as well as Radiomarine sales, engineering and manufacturing operations, will continue for the time being in their present locations," Mr. Folsom said. "These plans with respect to Radiomarine have two main purposes — to fill the needs of the growing numbers of customers with respect to a broader range of products, marketing facilities and servicing; and to provide RCA customers with a coordinated world-wide communications service to overseas points and ships at sea."



Visiting "open house" in Zurich was C. M. Odorizzi, Executive Vice-President, RCA Sales and Services.

Laboratories RCA, Ltd.

By C. G. Mayer

European Technical Representative, RCA

RCA ELECTRONIC research and development have become active in the European scene with the establishment in Zurich, Switzerland, of Laboratories RCA, Ltd. The new organization, incorporated as a Swiss company, went into operation approximately four months ago and is now engaged in research and in service to RCA's European licensees.

The reasons for establishing the Zurich facilities are three-fold: the desire to provide a new environment in which some of RCA's American scientists may encounter a refreshingly different approach to some of their current problems; the desire to encourage participation by talented young European research specialists in RCA's research program; and the desire to make available to RCA licensees in Europe a service similar to that provided to RCA licensees in the United States through the Industry Service Laboratory, RCA Laboratories.

Considering both types of activity — research and industry service — Zurich was selected as an ideal European location. Among its advantages are an atmosphere that is stimulating both culturally and technically, owing in part to the proximity of the famed University and the Swiss Federal Institute of Technology, one of the world's foremost technical institutes. In addition, Zurich is one of the most conveniently located cities on the continent, with excellent road, rail and air connections to all parts of Europe, while Switzerland itself is free of restrictions upon travel or foreign exchange.

Research in Solid-State Physics

In this environment, a research program has been initiated under the direction of Dr. Albert Rose, an eminent scientist from the staff of RCA Laboratories at Princeton, N. J. The program centers upon experimental studies in the field of solid-state physics, and it is motivated by the same corporate philosophy that has inspired the extensive research supported by RCA in the United States.

This philosophy recognizes that fundamental research — the quest for original knowledge — is basic to all technical progress, and that responsibility for its

Among the facilities at the new Zurich laboratories of RCA is this library stocked with the latest technical reports on RCA research and engineering developments.

support rests upon industry as well as upon the great academic centers. It recognizes also that fundamental research cannot be scheduled like the production of goods, and that it is best conducted away from the atmosphere of a development or manufacturing program.

Considering the emphasis on basic research conducted by RCA and others to discover and develop new electronically-active solid materials such as semiconductors, magnetic and luminescent materials, it is natural that the new Zurich laboratory should undertake an extension of research in solid-state physics. European and American scientists on the Zurich staff will be giving special attention to the electronic and optical properties of insulators, with emphasis on the electronic properties of the insulator, which still require extensive investigation.

This program is already under way. As an important phase of the activity, visits from other researchers in universities and industries are being encouraged, and members of RCA Laboratories in the United States are being brought to Zurich to work on a rotating basis.

Service to RCA Licensees

The second major function of the Zurich laboratory — service to RCA licensees in Europe — is handled by a staff of experienced engineers under the direction of Jack Avins, a senior member of RCA's Industry Service Laboratory. The task of the group, like that of the parent laboratory in the United States, is to disseminate to all licensees technical information on new developments or new services originating with RCA, and to give consultative help at the request of any licensee to assist him in solving his particular engineering problem.

The new Zurich facility, equipped with the most modern testing devices and an experienced staff, will provide European licensees with the personal contact through which much of the detailed information on RCA developments is conveyed. And behind the Zurich facilities and staff stand the extensive resources of all of RCA, including engineering specialists who will be called to Zurich for short visits from time to time with the most up-to-date information to apply to particular problems.

Like the Industry Service Laboratory in the United States, the Zurich group is prepared to cooperate in technical matters relating to industry and international standardization. A recent example has been the use of the Zurich facilities for measurement of receiver radiation. A committee of experts of the International Electrotechnical Commission, representing several European governments, spent a week at the Zurich laboratory studying various proposals and making investigations toward its objective of producing an acceptable standard for measurement of high-frequency oscillator radiation.

Visitors at the first "open house" for RCA in Zurich examine samples of color television transmitting equipment on display at the laboratories.

Two floors of this modern building in Zurich are occupied by Laboratories RCA, Ltd., for research and service to RCA's licensees in European countries.

At the RCA exhibit in Karachi, Pakistan, NBC Chairman Sylvester L. Weaver, Jr., on a world tour, looks over equipment with Hassi Ali Bokhari, head of Radio Pakiston.

The Far East Sees TV

by Richard H. Hooper

Manager, Shows and Exhibits
Radio Corporation of America

FROM Jakarta, Karachi, and New Delhi, the reports were the same:

"Television has demonstrated to millions of Asians — with more impact than possible through any other medium — the benefits of free enterprise and the American way of life."

Behind this statement of vast accomplishment is a story of months of careful planning and cooperation between the Radio Corporation of America, the U. S. Department of Commerce and the State Department. It began early last Spring when Roy Williams, Director of the Department of Commerce's Office of International Trade Fairs, called upon W. Walter Watts, RCA Executive Vice-President, Electronic Components.

Mr. Williams outlined his mission. For the first time, the United States planned to participate in a series of expositions in Asia and elsewhere in the world. The objective was to display the output of American industry and agriculture and, generally, to "sell" the American way of life by, as President Eisenhower has expressed it, "telling adequately the story of our free enterprise system and to provide effective international trade promotion cooperation."

No Easy Assignment

It was no easy assignment, Mr. Williams pointed out. For several years, Russia and other Soviet bloc countries had erected costly and imposing structures at the trade fairs where Uncle Sam now planned to exhibit. The Soviets had skillfully utilized their participation to exploit propaganda dealing with their industries, agriculture, trade possibilities and working conditions.

In short, it was a two-pronged undertaking. In addition to promotion of foreign trade, the U. S. program had been created to counteract efforts of "iron curtain" masterminds to expose millions of persons attending these trade fairs to a misleading, if not totally false story, of how America operates under a free political economy and how our productive capacity is dedicated to peaceful purposes and the progress of free nations.

Mr. Watts recalled that, in the early days after World War II, the Government — working with RCA — had faced a similar problem in Western Europe. Why not use the marvels of television, as had been done in Europe, to put across Uncle Sam's story?

Plans Take Shape

And so the plans commenced to take shape.

The Radio Corporation of America would provide the equipment and a team of globe-girdling engineers and technicians to install and operate it. In specially designed and constructed buildings financed by the Government, various American businesses and industries would display their wares — and everything would be televised by closed-circuit to RCA Victor large screen receivers throughout the fair grounds.

John Vassos, internationally-known industrial designer and consultant to RCA, was retained by the Commerce Department to design the pavilion used at

New Delhi and to assist in mapping plans for parts of the exhibit structures at Karachi and Jakarta.

Fifteen experts of the RCA Service Company, many of whom had earlier demonstrated television in Western Europe, were selected to carry out the assignment. Arrangements were made to ship 35 tons of equipment — including cameras, monitors, amplifiers, receivers and the myriad other pieces of apparatus — so that it would arrive on a precise schedule for installation at the required time. In all, the equipment was valued at more than $500,000.

Curtain Goes Up

The curtain was rung up on the first fair at Jakarta on August 18. The American portion of the show, which starred RCA television, was an immediate hit. As one of the local newspapers put it:

"At the American pavilion, Indonesians are constantly jamming the opening space outside the glass-walled television studio, where simultaneously they can see the same scene on the stage and on a number of screens outside the studio. RCA TV exhibits really 'stole the show.' Live television programs, produced in a big circular theatre, and twenty-four TV sets on a closed-circuit, gave the people opportunity to watch mechanics of production, engineers, technicians, professional talent and themselves as the cameras picked up audience shots now and then."

Everywhere the story was the same. Massed crowds daily witnessed the five hours of programs carried throughout the fair grounds. In all, an estimated 12,000,000 Asians viewed television for the first time at the three expositions.

The New York Times, in a dispatch from Karachi on the opening day of the fair there, summed up at least part of the benefits of the U. S. participation in these words:

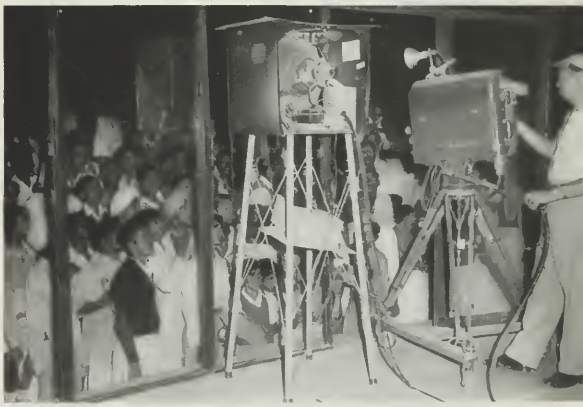
"The Soviet representatives were obviously annoyed when their outdoor display of trucks and automobiles was blocked off by the backs of several hundred television fans."

And so television proved anew that it is much more than a medium of entertainment. It can be — and is — a potent instrument for factual international understanding of the benefits of freedom.

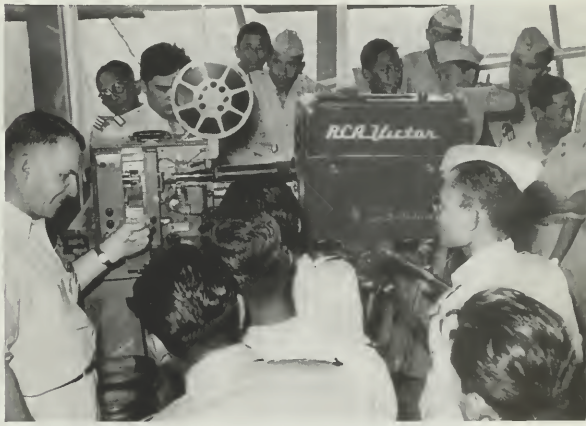
Praise for Demonstration Crews

A bright footnote to the Far Eastern exhibitions was provided by the representative of another American company, who wrote to Frank M. Folsom, President of RCA, in praise of the RCA team which conducted the TV demonstrations. The letter said, in part:

An interested visitor to the RCA television exhibit at the New Delhi fair was Indian Prime Minister Nehru.



At the Jakarta trade fair, Indonesians jammed the area outside the RCA exhibit to see television in operation.



Operation of television film pickup was explained to Indonesion visitors by Chester Davis, of the RCA unit.

"Your people for 42 nights straight came on duty, quietly and efficiently produced the show and usually under far from ideal conditions of climate, etc. They were marvelous to observe, and I felt prouder of them, and the sort of American company that hires, trains and builds such people, than I did of even the best of our actual Trade Fair displays. . . .

"Further, I was in on the setting up of the fair, and saw your men work at uncrating and setting up their entire studio. There was not one word spoken in anger among them, I never saw an evidence of friction or unpleasantness of any kind. When their own show was set up they provided considerable help of every kind to the other people at the American Pavilion. . . . My letter should serve to gratify you considerably concerning the behavior and performance of Americans employed by RCA and sent abroad to such countries as Indonesia, where I can tell you our country and our people need good public relations. . . ."

Commenting on the letter, Mr. Folsom said to the demonstration crews:

"Your performance has made a real contribution toward the prestige of Americans and of RCA. I want you to know how very proud we are of you."

Color TV Show in Dallas

Approximately 2,500,000 persons saw color television — many of them for the first time — during a demonstration staged by the RCA Color TV Caravan at the State Fair of Texas in Dallas, October 7-23.

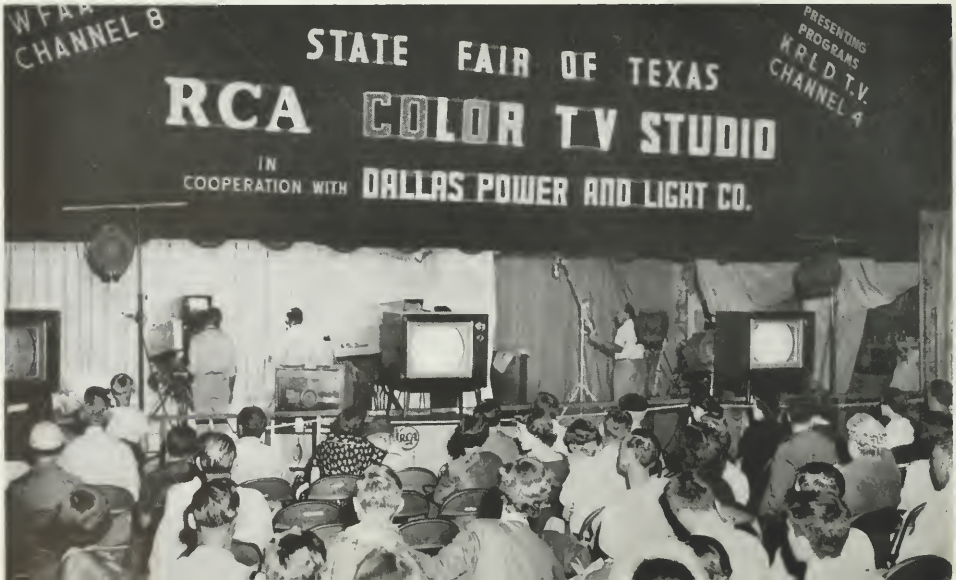
The project — largest of its kind ever held — was put on with the cooperation of the Dallas Power and Light Company and Dallas' two television stations, WFAA-TV and KRLD-TV. During the 16 days and 17 nights of what is regarded as the largest State Fair in the nation, visitors had the opportunity to see between four and seven hours of color television a day, much of it originating locally in the Dallas-Fort Worth area.

The RCA Color TV Caravan set up a fully equipped color television studio in one end of the Agriculture Building on the Fairgrounds. Twenty-four of RCA Victor's new big-screen color receivers were placed throughout the Fair and the Caravan's color TV projector, one of three in existence, picked up network, local and closed circuit color programs and showed them on a theater-size screen. In addition, all programs also were fed to other manufacturers' receivers on display at various Fair exhibits.

Six of the technicians operating the Caravan during its Dallas stay were flown in from Djakarta, Indonesia and Karachi, Pakistan, where similar demonstrations were held in black-and-white television at the International Trade Fairs under the auspices of the U. S. Department of Commerce. Several of the technicians left after the State Fair of Texas for another trade exposition in New Delhi, India.

The Caravan is under the general direction of R. H. Hooper, Manager, Shows and Exhibits. J. P. McCarvill headed the crew during the Dallas demonstration.

RCA color television was a major attraction at the State Fair of Texas in Dallas.



Wide Wide World

By Sylvester L. Weaver, Jr.
Chairman of the Board
National Broadcasting Company

(Mr. Weaver recently completed a trip around the world to investigate television progress in other countries and to explore the possibility of yet broader concepts in programming. In this article, prepared especially for RADIO AGE, *he outlines the philosophy behind "Wide Wide World," and its effect in helping to bring about truly worldwide television in the future.)*

TELEVISION IS big and restless and vigorous, and it must have plenty of room to move around in. With "Wide Wide World," it has at last broken through the four walls of the studio and has moved out onto a stage as wide as the world itself. Here is a program which forever dispels the notion that television must be confined to the small, the intimate, the microcosmic.

"Wide Wide World" takes people to the places they most want to see—from the White House to the Chateau Frontenac in Quebec, from the summit of Mount Washington to a hacienda in Mexico. It has jumped national boundaries and mountain ranges and the stretch of ocean that lies between Florida and Cuba. Through its cameras, viewers see the great spectacles of our continent—an Aztec ritual dance or the Radio City Rockettes, Morro Castle or New York Harbor, the Texas State Fair or Canada's Shakespearean festival at Stratford.

What is more, viewers not only see these places and events; they are there and take part in them. They participate in "Wide Wide World" because this is live television, seen at the very instant the event is taking place and therefore viewed with an anything-can-happen expectancy.

Telecasting "Wide Wide World" requires an immense amount of technical skill, ingenuity and sheer imagination. Executive Producer Barry Wood and his staff have successfully attempted telecasts which a year or two ago would have been considered next to impossible. By linking the United States, Canada, and Mexico, they have given North America its first international television. By sending live pictures from Havana to Miami, they have given this country its first overseas telecast from a foreign land. They have broadcast from the rim of the Grand Canyon, from the depths of the Carlsbad Caverns, from a plane in flight and from the deck of a Mississippi paddle-wheeler.

Just as revolutionary as the programming concepts of "Wide Wide World" are the advertising concepts adopted by its sponsors—General Motors and its Pontiac Motor, United Motors, AC Spark Plug, Guide Lamp and Delco Battery divisions. These advertisers are leading the way in two directions. First they are showing the benefits of qualitative advertising, of being connected in the public mind with programs of great prestige. Second, they are showing that in our economy as it is today, the suppliers who do business with end-product manufacturers must take part in the advertising effort to sell the end-product.

Its Meaning for the Future

What will be the long-run effects of "Wide Wide World?" When you take millions of Americans to Gloucester to watch fishermen bringing in a catch, to Nebraska to watch farmers harvesting wheat, to Cleveland to watch workers pouring steel, then you are bound to increase Americans' understanding of one another and to increase the cohesiveness of the nation as a whole. Likewise when you transport Americans to Canada or Cuba or Mexico by the millions you will bring these nations closer together in interest and understanding.

With transoceanic television already established as technically feasible, it is only a matter of time, and not a very long time, before "Wide Wide World" becomes truly worldwide. Then we will see the steel mills of the Saar, the Biennale of Venice, fishing in the Aegean, farming in Kenya and the ceremonies on the banks of the Ganges. Other nations will see America's art and opera, its industries and its political conventions, all expressed in the reality of television which cuts through prejudice and propaganda and shows things as they really are. When this day comes, television will serve its highest purpose.

TV's First Touring Opera Company

TELEVISION, which has become a medium of major cultural impact through its presentation of musical, dramatic and artistic works to a nationwide audience, is now establishing its first touring opera company to carry the great operatic classics to major American and Canadian cities in a series of English-language productions.

Formation of the NBC Opera Company was announced on December 4 by Brig. General David Sarnoff, Chairman of the Board of RCA, during the NBC telecast of Puccini's "Madam Butterfly." The new company, augmenting the highly successful NBC Television Opera Theatre, will go on tour next fall for a minimum of eight weeks under joint RCA-NBC sponsorship. Its itinerary is to be announced later, but General Sarnoff stated that performances are planned in major cities in the United States and Eastern Canada.

Recalling formation of the NBC Television Opera Theatre seven years ago, General Sarnoff said that a principal objective had been to broaden the audience for opera from a small circle to all of the American public. Until that time, he added, a major factor limiting the popularity of opera was the barrier of language, since all operas customarily were presented in their original Italian, German or French.

"The NBC Television Opera Theatre has pioneered opera in English, and has presented operas on television in black-and-white and in color, with realistic staging and casting," said General Sarnoff. "How well this new form has succeeded can be judged by one simple fact: several million people are tuned to NBC at this very moment.

"The NBC Television Opera Theatre presentations have done more than just attract large television audiences. They have also stimulated a demand for opera performances in English in the theatres and concert halls of the nation. This has encouraged us to go forward with the project which I am announcing today to meet the steadily growing public demand."

Salute from the Met

Formation of the new touring company was hailed by Rudolf Bing, General Manager of the Metropolitan Opera Company, in this message to General Sarnoff:

"The plan itself shows the usual vision that everyone has come to expect from you, and should be welcomed by anybody who has the development of opera in this country at heart. I hope and trust that the expansion of the NBC Opera Company into the field of touring will meet with the distinguished success that has marked its trail-blazing performances in television. Any success in the field of opera is of benefit to all of us in this field.

"My colleagues at the Metropolitan and I wish you the best of good fortune in this new, difficult, important and daring enterprise."

Management of the new company's tour is in the hands of Judson, O'Neill and Judd, with whom a contract has been signed for NBC by Robert W. Sarnoff, President of NBC. The touring operas will be especially adapted for the theatre by Samuel Chotzinoff, producer, and Peter Herman Adler, music and artistic director. At the same time, TV presentations will be continued by the NBC Television Opera Theatre, and additional personnel will be added to NBC's opera department as a part of the expansion, according to Mr. Chotzinoff. He added that the first two operas to be prepared for the new company will be "Madam Butterfly," and Mozart's "The Marriage of Figaro."

"The history of the National Broadcasting Company sparkles with a galaxy of musical firsts," said General Sarnoff. And now, growing out of this rich musical heritage, comes another first — the NBC Opera. Beginning next fall, this new organization will bring operas in English to your communities and help to broaden still further the musical horizons of our land."

An outstanding feature on NBC's Television Opera this season was Puccini's "Madam Butterfly," with Elaine Malbin starring in the role of Cio-Cio San.

Solving a Radio Traffic Problem

By E. A. Laport

Director, Communications Engineering, RCA

CONTINUING expansion of high-frequency radio service making use of the limited frequency spectrum provided by nature has created a world-wide communications traffic problem of major proportions. The result has been increasingly serious interference among stations close to one another in the frequency band, reducing the efficiency of radio communications in fixed and mobile services operated by private, public and government agencies here and abroad.

A long stride toward solution of the problem has now been made by RCA with the development of a new two-way radio system which cuts bandwidth requirements by half, yet is comparable in cost and simplicity to widely used conventional systems employing twice as much of the frequency spectrum. This new equipment is usable for telephony, manual telegraphy, and teleprinter operation over short and medium distances in both fixed and mobile applications. Also, it is adapted to use by non-technical personnel for many of the simpler telecommunications requirements around the world, with utmost bandwidth conservation.

We have designated the new system as the SSB-1 — the initials standing for the single-sideband technique which cuts the bandwidth requirements of the system. While single-sideband technology has been in use for three decades, it has been almost exclusively confined to wire-line carrier systems and long-haul radiotelephone circuits. In the form in use up to now, its cost and complexity have been beyond the means of most high-frequency users.

Advantages of the New Equipment

In the new RCA equipment, single-sideband techniques are provided at a cost that is of the same order as that of the conventional amplitude-modulated (AM) equipment of comparable power employed by most of these services today. At the same time, it can be installed and used by people of little or no technical skill, and it is applicable to both one-way and simultaneous two-way forms of communication. With this development, it becomes possible to use single-sideband transmission for short-haul systems wherever conventional AM is now used.

The SSB-1 was developed for the RCA International Division by an engineering team under the direction of K. L. Neumann, Supervisory Engineer, Radiomarine

RCA's new single-sideband radio is demonstrated by K. L. Neumann, of Radiomarine Corporation of America, who directed its development.

Corporation of America. During the summer, it was tested extensively in communication between fixed shore stations of Radiomarine and vessels on the Mississippi and Ohio Rivers. In these tests, the new equipment showed consistently satisfactory performance at all distances up to the available maximum of 920 miles, and it proved its ability to communicate with conventional AM equipment aboard the vessels.

More recently, units have been acquired by the United States Coast Guard for study and testing in both fixed and mobile applications. Using these units, the Coast Guard has conducted demonstrations for other interested government agencies, including the Federal Communications Commission and the Civil Aeronautics Authority. The interest of the FCC in single-sideband techniques already has been made known, and the Commission has urged study of these techniques by users and manufacturers to provide a sound technical background for future consideration of proposals to increase use of single-sideband operation by a variety of services that now use radiotelephone on frequencies below 25,000 kilocycles.

RCA is now making the SSB-1 available commercially through the RCA International Division in foreign markets, and through the Radiomarine Corporation of America in the United States. We expect that it will contribute substantially to reducing frequency congestion and interference among stations.

Overseas Message Volume Reaches New High

A RECORD volume of overseas message traffic was handled in 1955 by RCA Communications, Inc., through its world-wide network of 84 direct radiotelegraph circuits, Thompson H. Mitchell, President, announced in a year-end statement. He said that the past year was the most successful in RCA's 36 years of radiotelegraph operations.

"More than 7,300,000 overseas telegrams, totaling 188,000,000 words, were carried by our radio circuits," said Mr. Mitchell. "A record number of 104,000 international TEX (Teleprinter Exchange Service) calls also were handled.

"During the year, an expenditure of more than $2,000,000 was made for plant additions, improving and broadening the scope of international communications facilities. Unlike the early days of radio when the bulk of the company's investment was in transmitters and receivers, present-day plant expansion is greatest in the area of terminal operating equipment. This is a direct result of RCA's continuing efforts to improve the speed of its overseas telegraph services by cutting message processing time in terminal offices to a minimum."

TEX Service Is Expanded

Mr. Mitchell said that throughout 1955 there was a continuation of the pioneering and development of RCA's overseas TEX service, which enables subscribers in the United States to engage in direct customer-to-customer teletypewriter communication with their associates abroad.

"In the field of international communications," he stated, "the progress of RCA's TEX service during the past year easily stands as the most significant achievement of the year. In only five years, TEX has grown from a concept to a practical, well-established service that is now available between the United States and twenty-one overseas countries.

"New TEX circuits were opened to Ireland, Puerto Rico, Tunisia, French Morocco and the Philippines. Also connected were the previously separate Pacific and Atlantic TEX circuits by establishing a trans-continental TEX link between RCA's overseas operating terminals in New York and San Francisco.

"The interconnection of the two networks made possible for the first time two-way teletypewriter calls between trans-Atlantic points and TEX terminals in the Pacific. The TEX service likewise was made available much more extensively in the United States.

"The speed with which RCA's correspondents around the globe are improving and developing the facilities to provide TEX service reflects its universal acceptance. By the end of next year, the number of TEX channels in operation is expected to be almost double the size of our present network.

"Sales of Leased Channel service to volume-users of overseas communications in 1955 increased forty per cent over the previous year," continued Mr. Mitchell. "International airlines in particular have found that Leased Channel Service meets their needs for fast and reliable volume communications. We are proud to say that nearly all large international airlines are now using RCA leased channels."

New Radiophoto Circuits Established

Mr. Mitchell said that stock brokers, commodity merchants, and other industrial organizations with interests abroad have also become substantial users of Leased Channel Service. "In fact," he said, "every organization requiring a large volume of fast and economical teletype service is an actual or potential user."

Mr. Mitchell reported that direct RCA radiophoto circuits were established during the year, linking New York with Brussels, Manila, Leopoldville and Taiwan. More than 4,300 spot news pictures, commercial documents, and other graphic material were carried by the company's network of 45 international radiophoto circuits in 1955.

Overseas broadcasts totaling 3,000 hours were also handled last year by RCA's Program Transmission Service. This service is used predominantly by United States broadcasting companies for gathering "live" news reports from their foreign correspondents. The United Nations and Voice of America used these RCA facilities for beaming reports of U.N. developments and news of America to all parts of the world.

"The significant advances made by RCA Communications, in 1955, are a direct result of the program begun by the company ten years ago to modernize completely its world-wide communications systems," Mr. Mitchell stated. "This pioneering program has improved both the speed and scope of RCA's radiotelegraph service, and has produced the newer subscriber services — TEX and Leased Channels.

"For these reasons, RCA has been able to anticipate and be ready in advance to meet the ever increasing communications requirements of the international business community, and the vitally important needs of the Government. Today, RCA is providing a wider variety of overseas radio services to more customers than at any time in its history."

Scatter Propagation

By H. H. Beverage

Director, Radio Research Laboratory, RCA Laboratories

ON A FIFTY-ACRE plot of high ground just north of the United States-Canada border at the upper end of the Adirondack Mountain range, a massive antenna directed toward the south symbolizes yet another major advance in the science of radio communication.

The great antenna, in the shape of a parabola and measuring 40 feet in diameter, stands at the northern end of a research project being conducted by RCA Laboratories, the RCA International Division, and RCA Victor Company, Ltd, associated company of RCA in Canada, to provide information on ultra-high frequency (UHF) long-distance transmission by the "scatter propagation" technique of radio communication. At the southern end 290 miles away, lies the Riverhead, L. I., station operated by the Radio Research Laboratory, RCA Laboratories. The project itself is expected to contribute substantially to the advancement of the new technique, which promises much for the improvement of radiotelephone and radiotelegraph operations—and eventually to the establishment of intercontinental television broadcasting.

"Scatter propagation" is a most promising phenomenon whose discovery in the relatively recent past has touched off a major research and development effort among the leading companies in the field of electronic communications. To understand its principles, we must look first at various types of radio wave employed in communications today.

Long and Short Waves

The longest, known as very-low frequency waves, range about 10 miles from crest to crest. When these are transmitted, they cling to the earth's surface, bending with it somewhat like a fly crawling around an orange.

The short waves, called high-frequency, range from 33 to 400 feet from crest to crest. After transmission, high-frequency waves dart away from the earth until their course is blocked by a layer of ionized air lying miles above the ground. Hitting this barrier at an angle, the high-frequency short waves ricochet downward to earth, where they are once more reflected upward. Thus, batted back and forth, they eventually reach their destination.

The shortest of all are the UHF waves whose length from crest to crest is only measured in inches. These are

From this 40-foot antenna at Covey Hill, Quebec, UHF signals are sent without relays to RCA's laboratory at Riverhead, L. I., by scatter propagation.

the waves of radar, of air navigation systems, of long-distance telephone systems, and UHF television. And they have their own peculiar way of travelling: until fairly recently, it was believed that all UHF waves travelled in a straight line, continuing straight outward beyond the horizon somewhat like a flat stick held against the surface of a ball and piercing through the ionized layer to disappear, forever, into outer space.

To overcome this handicap, UHF communication systems relied upon relay towers set up at approximately 25-mile intervals to catch the signal at the horizon and pass it along to the next relay tower—and so on, to the destination. Such relay towers have become familiar sights on the continental landscape, along the paths of our inter-city telephone channels.

But some four or five years ago, it was discovered that UHF waves did not disappear entirely after all past the 25-mile mark, even in the absence of relay towers. Some signals were being picked up hundreds of miles away—very faint, to be sure, but still perceptible. Obviously, then, some of the waves were being deflected earthward by some medium—probably patches

of air whose temperature and humidity differed from the surrounding atmosphere, just as parts of a sunbeam entering a room may be deflected and scattered by dust particles.

Many contributed to this discovery, and the effect was to open broad new fields of investigation—for if some of the waves were scattering over the horizon, they could be made considerably stronger if more power were put into the transmitted signal. This, in turn, could eliminate the need for intermediate relay stations, and direct UHF transmission over hundreds of miles—and even the transoceanic broadcasting of UHF television—became an exciting possibility. And so it is working out, in tests both in the United States and abroad, with new transmitters and massive antennas capable of sending super-strong UHF signals over distances of 300 or more miles. In Europe, experiments made in the Alps have shown that scatter propagation is affected only slightly by mountainous obstructions along the transmission path—although neither the transmitter nor the receiver should have an obstruction of consequence within its optical horizon.

Antenna is One of Largest

In RCA's own research in this promising new field, the great antenna atop Covey Hill, Quebec, is probably the most spectacular feature. Transmitting at 468 kilocycles, it is one of the largest in Canada and manages to form a considerable landmark with its 50-foot tower on the 1100-foot elevation. With the help of a sharply stepped-up supply of power, it beams its strong signal across both the Adirondacks and the Green Mountains to Riverhead without the help of relay stations. At the receiving end in Riverhead is another outsize antenna—about 28 feet in diameter—of sufficient sensitivity to pick up the scattered signal with a dependability that surpasses that of conventional short-wave communication.

With further study and testing, this relatively new technique of scatter propagation is expected to develop into new and better communications systems for many applications. The advantages are numerous, and here are a few of them:

Point-to-point microwave communications over distances beyond the horizon today require relay stations, and hence each installation calls for preliminary path surveying to locate these intermediate installations. With scatter propagation, the only requirement is a clear horizon in the direction of the other terminal, and the physical profile of the path lying beyond the horizon is unimportant.

This is, naturally, of great importance in areas and countries where chains of relay stations would be both difficult and expensive to locate and build. Scatter propagation, by permitting relay-free transmission, can span forests and jungles, mountain ranges and deserts, where problems involved in laying out relay points would be almost insuperable. On the other hand, this type of transmission involves extra cost because of the antenna and power requirements: therefore it would be unlikely to replace conventional relay systems in built-up areas or over terrain which presents no special difficulties for relay stations.

An additional advantage to scatter propagation is that transmitting and receiving stations may usually be located more conveniently for access and power supply than are stations tied to a relay system. This is the case because great height is not needed with scatter propagation, except when there is particular reason for seeking a low radio horizon.

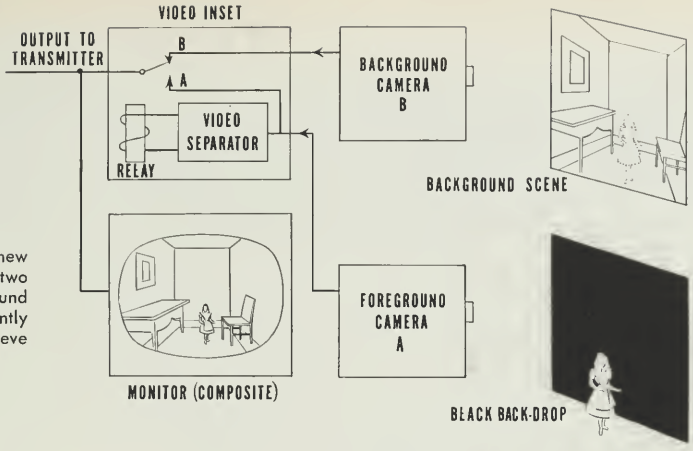
In general, communication at ultra-high frequencies, by either relay or scatter propagation, is more dependable than short-wave, which transmits voices poorly, is subject to fading, and in the polar regions sometimes is out of commission for days because changes in the layer of ionized air from which the short-waves are deflected. Hence scatter propagation, introducing UHF transmission without the need for a costly chain of relay towers, may be expected gradually to replace short-wave radio in areas where relays have been unable to penetrate.

"Thumb-Size" Microphone for Radio and TV

A "thumb size" dynamic microphone, the smallest of its type ever developed for radio and television broadcasting, has been placed on the market by RCA's Broadcast and TV Equipment Department. The tiny microphone weighs less than three ounces and is so small that it can be carried completely concealed in the hand.

Designed for walk-around operation, the microphone plugs directly into the studio console, requiring no tubes or special power supply. It can be worn conveniently around a performer's neck, or clipped to lapel or dress, promising performers greater flexibility and freedom of movement in interviews, audience participation, panel and similar types of shows.

The little instrument is only 2 9/16 inches long and 15/16 inch in diameter, and it comes complete with lanyard and a 30-foot flexible cable.



Sketch shows how NBC's new color video inset employs two cameras to control foreground of a TV picture independently of the background to achieve novel effects.

New Visual Effects for Color TV

A SERIES of visual effects new to live television programming added spice to a number of NBC major color programs during November and December, marking the debut of a versatile new tool in telecasting.

The results appeared dramatically for the first time in "Alice in Wonderland," when Alice seemed to shrink in size before the camera while surrounding objects remained unchanged. In the Sadler's Wells Ballet production of "Sleeping Beauty," Margot Fonteyn, as the princess, appeared in one scene to float before the camera as a vision brought to Prince Charming and his retinue in the magic forest.

Behind these and other novel effects in other major programs, lay an ingenious NBC system known as the "color video inset," employing two cameras in a way which permits the foreground of a picture to be controlled independently of the background. The system was developed by the NBC Engineering Department, and was one of the last projects carried out under supervision of Robert E. Shelby, Vice-President and Chief Engineer of NBC, before his death on December 8.

In announcing the successful use of the new system, Mr. Shelby had declared: "This is one of the most important developments to come out of the NBC Engineering Department. With the new system, producers can use camera techniques heretofore impossible in live color television. They can, for example, create giant 'spectacles' in relatively small studios, and they can bring a live outdoor scene into the studio to be used as a background."

How it Works

The "color video inset" works this way:

Two cameras are used simultaneously, one scanning a background scene, and the other scanning the inset object, which is placed against a black backdrop. An electronic mixing device automatically records a silhouette of the inset object (Alice, for example, in the shrinking scene), then "cuts" a correspondingly shaped hole in the background and makes the insert. The process requires precise control in production work as well as in electronic timing, which must be accurate to one ten-millionth of a second.

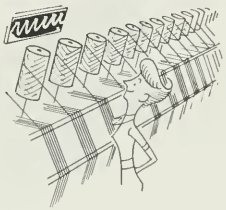
The effect of the inset, unlike that of a superimposed television image, is to present a solid picture without overlapping or transparency. In this respect, the new system is similar to the matting process in film, which requires complex lighting and processing work. Thus the inset permits the instantaneous use of live camera effects which could be achieved formerly only with the use of processed film.

NBC engineers have pointed out that the color video inset broadens the whole scope of color television production. With its use, an actor may be placed against the background of a mountainside, a city street, or a seashore, brought into the studio "live" from any location that can be reached with a television camera.

Or, doing it the other way around, actors may be placed in spectacular settings which may be set up in miniature in the same studio, or even in another studio —the inset system reducing the apparent size of the actor to fit the background.

The color video inset is an extension and refinement of the black-and-white video inset. Both techniques were pioneered by the Development Group of the NBC Engineering Department, which interprets and adapts the laboratory research of RCA to the broadcasting uses of NBC.

RCA news in brief



Cloth-Saver

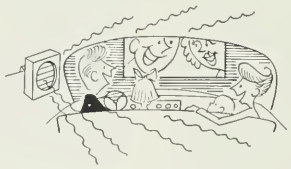
A new type of electronic metal detector, sensitive enough to react to a metallic speck smaller than the period on a typewriter, has been developed by RCA for the continuous inspection of textile fabrics in production. The new machine can keep a careful watch on materials moving along as rapidly as 1,000 feet a minute and is expected to relieve a "tramp" metal problem that costs the textile industry hundreds of thousands of yards of fabrics and damage to machines each year. A product of RCA's Theatre and Industrial Equipment Department, the machine is expected to have important applications also in the plastics field, where materials are processed in sheet form.

Small Package

A four-ounce battery less than 2 inches long and one inch in diameter, and a larger brother weighing 1½ pounds have been developed by RCA's Tube Division for transistor applications — including use in the new transistorized portable radios now in production by RCA. The smaller model was described by D. Y. Smith, Vice-President, RCA Tube Division, as a 9-volt unit with snap fasteners for connections to the battery terminals, engineered for pocket-size radios. The larger type is equipped with a four-hole socket mounted flush with the battery case so that voltages of 3, 6 and 9 volts may be obtained. Both batteries have a suggested list price of $1.35.

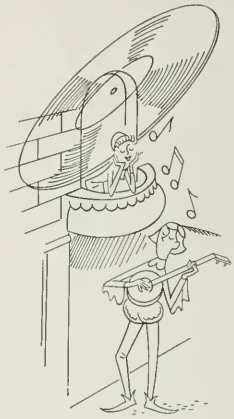
Color and More Color

Six more television stations have decided to go in for original color telecasts with the help of RCA broadcast equipment, including the latest studio cameras for "live" color pickup, and the 3-Vidicon film system for telecasting color films and slides. According to A. R. Hopkins, Manager, RCA Broadcast Equipment Marketing Department, the new studio cameras are going to KMTV, Omaha; WJBK, Detroit, and WTAR, Norfolk, Va., while the 3-Vidicon film cameras have been ordered by the Omaha and Norfolk stations, as well as WTLP, Washington; KPRC, Houston, Tex., and WSLS, Roanoke, Va.



Stretching the Season

Barring blizzards, your local drive-in theatre may be able to entertain you farther into the winter, thanks to a new in-car heater announced by RCA. The new unit, called the RCA Dyna-Heat, is a small and compact affair featuring calrod heating elements and heat-radiating aluminum fins. It can be installed and suspended by a hanger on the theatre's individual in-car speaker post — and it even has a two-tone finish to match the motif of other RCA drive-in equipment.

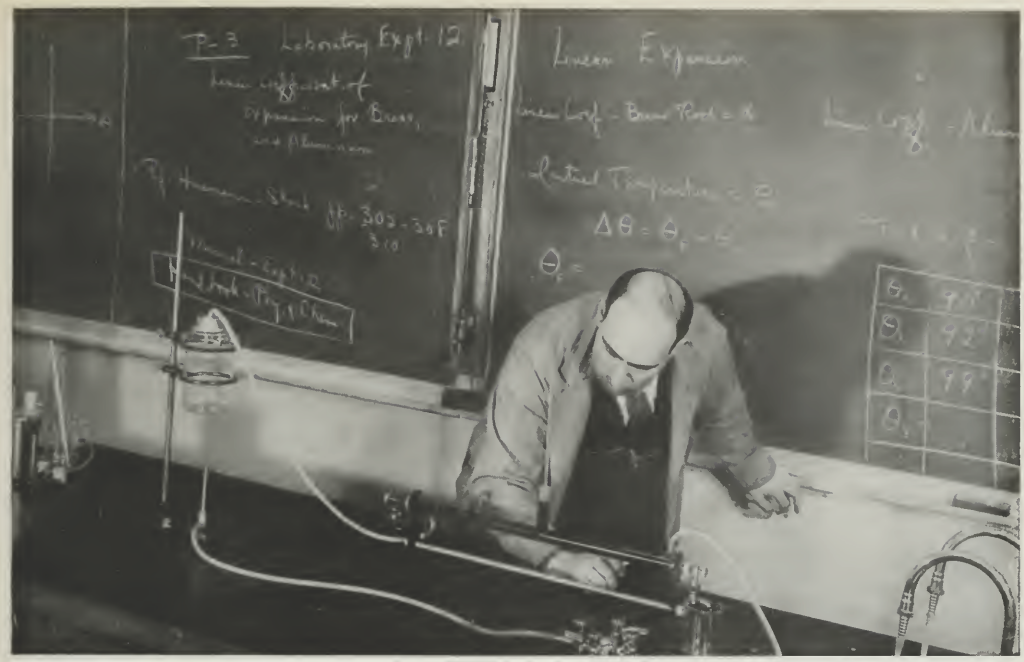


Musical "Oscar"

The Boston Symphony's RCA Victor recording of Berlioz's "Romeo and Juliet" has drawn a special round of applause from France. The "Grand Prix du Disque," of the Academie du Disc Francais, was voted to the recording, and the award was presented to conductor Charles Munch by French Ambassador M. Couve de Murville in a ceremony at Carnegie Hall following the Boston Symphony's first New York concert of the season. The award was signed by French Premier Edgar Faure and composer Arthur Honegger, President of the Academie.

Sharing the Gains

Technical details on RCA's circuit engineering developments in black-and-white and color television were given to engineers representing most of the nation's TV set manufacturers in a recent symposium at the David Sarnoff Research Center in Princeton. The symposium, sponsored by the Industry Service Laboratory, RCA Laboratories, was one of a number held by RCA in the past few years to share on an industry-wide basis the innovations and improvements resulting from RCA research and engineering in television.



A lecture and demonstration in physics

EXPERIENCED ENGINEERS give authoritative technical courses at RCA Institutes

RCA Institutes started its first small classes in 1909 to train "wireless" operators for the only radio service then known—marine communication. As the art developed through the years into the "electronic age," RCA Institutes developed with it. The school now trains large numbers of development laboratory technicians, servicemen, and station engineers—as well as a few radio telegraph operators.

SCHOLASTIC RECOGNITION

RCA Institutes is . . . licensed by the University of the State of New York . . . an affiliate member of the American Society for Engineering Education . . . an affiliate member of the Greater New York Council for Foreign Students . . . approved by the Veterans Administration. The Advanced Technology Course is approved by the Engineers' Council for Professional Development.

ADVANCED TECHNOLOGY COURSE

The Advanced Technology Course consists of 2610 hours of classroom and laboratory work. It requires two and a quarter years (50 weeks per year) in the day school, or six and three quarter years in the evening school. Subject treatment is at professional level; the textbooks are standard college and engineering texts. This course covers such subjects as . . . college physics . . . advanced mathematics and its application to electrical and communication problems . . . English in industry . . . drafting and shop work . . . vacuum tubes and their associated circuits . . . circuit design for receivers and transmitters . . . audio frequency circuits and practice . . . circuit design for television receivers, transmitters and studio equipment. The course omits purely academic and cultural subjects so that competent technologists may be trained in the shortest possible time.

The Advanced Technology Course is specially attractive to . . . high school graduates . . . engineering school graduates wishing a more specialized knowledge of the radio-television field . . . junior college graduates seeking a superior technical-school preparation for entrance into the radio-television industry.

VOCATIONAL COURSES

RCA Institutes also offers shorter, specialized courses in . . . Television and Radio Broadcasting (1½ years, days; or 4½ years, evenings) . . . Television and Radio Servicing (9 months, days; or 27 months, evenings) . . . Radio Telegraph Operating (9 months, days; or 27 months, evenings). A correspondence course in Television Servicing is available.

EMPLOYMENT OF GRADUATES

Graduates of the Advanced Technology Course are readily placed in leading radio-television-electronic manufacturing companies, development laboratories, broadcast stations, and many U. S. and foreign government agencies. Graduates are employed in such positions as . . . engineering aide . . . instructor . . . laboratory technician . . . transmitter engineer . . . intelligence officer . . . electronic technician . . . field engineer . . . technical writer . . . announcer-engineer. Graduates of the vocational courses are in great demand in the fields indicated by the course titles. Many companies interview graduating students at the school by arrangement with the Placement Director.

GENERAL INFORMATION

New classes in all courses are started four times each year. Day classes meet Monday through Friday; evening classes meet on alternate evenings. Prospective students and employers are invited to visit classrooms and laboratories of the school, or to write for a descriptive catalog of courses.

RCA INSTITUTES, INC.

A SERVICE OF RADIO CORPORATION of AMERICA

350 WEST FOURTH STREET, NEW YORK 14, N.Y.

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All over the world, technical "Minute Men" of the RCA Service Company assist the U. S. Army, Navy, Air Force.

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At an Army camp in Northern Japan, RCA engineers check an outlying radar post. At an Air Force base in Florida, RCA specialists track a guided missile in flight. And at a Naval communication center in Guam, RCA technicians hurry to install a transmitter. All over the world, the technical "Minute Men" of the RCA Government Service Department are assisting our Armed Forces.

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