

RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION



JANUARY

1949

DR. VLADIMIR K. ZWORYKIN



"We're terribly worried about him. Television seems to be warping his outlook."

IN THE PAST CENTURY, it was Tom Sawyer who captured America's juvenile readers. Then, a generation ago, Mickey Mouse began charming the half-price movie-ticket trade. Today, a televised marionette takes complete charge of the young.

It happens weekdays at 5.30, as an estimated 81,000 sets light up for the appearance of Howdy Doody. Such is the impact of his guileless antics on the lives of small viewers that all matters of food, work, play, temper or sleep must await the conclusion of each afternoon's session.

So, if parents are forced to know each machination of Mr. X . . . to be thoroughly acquainted with Clarabelle the Silent Clown . . . to see again carefully edited movie comedies, they are aware of how much good fun can be packed into television viewing.

And when the moppets have been shoofed off to bed, adults will find their own pleasure in the dramas and sports, the variety shows and news, the concerts and comedy that mark the range of balanced entertainment on America's No. 1 Television.

WNBT CHANNEL 4 NEW YORK
THE NATIONAL BROADCASTING COMPANY



A General Electric Company

RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION



VOLUME 8 NUMBER 2

JANUARY 1949

CONTENTS

COVER

Dr. V. K. Zworykin, vice president and technical consultant of RCA Laboratories, who, on January 17, will receive the 1948 Poor Richard Club Award for achievement, an honor given annually "to the most deserving of contemporary American citizens."

	PAGE
RADIO IN 1948-1949 <i>by Brig. General David Sarnoff</i>	3
CHANGES IN RCA MANAGEMENT	7
NEW PHONOGRAPH AND RECORD	9
TELEVISION IN BOSTON <i>by Frank M. Folsom</i>	11
TELEVISION COVERAGE EXTENDED	13
PEACE IN A CHANGING WORLD	14
FILM RECORDING AT "411" <i>by H. D. Bradbury</i>	16
NEW TRANSMITTER BUILDING ERECTED FOR STATION WCC	19
RCA FREQUENCY BUREAU <i>by Philip F. Siling</i>	22
FACT ENDS YEAR-OLD BAN ON RECORD MANUFACTURE	25
LARGE-SCREEN TELEVISION <i>by Ralph V. Little, Jr.</i>	26
CASTING FOR TELEVISION <i>by Owen Davis, Jr.</i>	27
TELEVISION NETWORKS JOIN	28
ELECTRONIC READING AIDS	29
DR. ZWORYKIN RECEIVES POOR RICHARD CLUB AWARD	31



Services of RCA are:

- RCA Laboratories Division
-
- RCA Victor Division
-
- RCA Communications, Inc.
-
- Marine Corporation of America
-
- National Broadcasting Company, Inc.
-
- RCA Institutes, Inc.
-
- RCA Service Company, Inc.
-
- RCA International Division

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

DAVID SARNOFF, *Chairman of the Board* FRANK M. FOLSOM, *President*
LEWIS MACCONNACH, *Secretary* ARTHUR B. TUTTLE, *Treasurer*

Radio Age is published quarterly by the Department of Information,
Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N. Y.



AERIAL VIEW OF RCA LABORATORIES, PRINCETON, N. J., SHOWING NEW WING AT EXTREME RIGHT WHICH PROVIDES ADDITIONAL SPACE FOR THE PATENT DEPARTMENT AND LIBRARY.



TELEVISION BRINGS NEW FORMS OF ENTERTAINMENT AS WELL AS NEWS INTO THE HOME. SHOWN ABOVE IS THE RCA VICTOR TABLE MODEL, CALLED THE "BYSTANDER".

Radio In 1948 - 1949

Wide Public Acceptance of Television Speeds All Phases of The New Industry, Says Head of RCA in Year-End Statement — More People Will Eye-Witness Truman Inauguration Than All Who Saw Thirty-One Presidents from Washington to Roosevelt Take The Oath of Office

By Brig. General David Sarnoff
*Chairman of the Board,
 Radio Corporation of America*

THE year 1948 was the most successful in the history of the Radio Corporation of America. The rapid expansion of television as a service to the public was a major factor in this record result.

Because of its continued progress in all phases of radio and television, RCA is today the *World Leader in Radio—First in Television.*

RCA operations in television—research, engineering, manufacturing and broadcasting—have, in great measure, enabled the United States to maintain preeminence in television. As a result, this new science is fitted into the country's program of national security, offering eyes to the fleet, to the air force, and the army.

The past year has provided practical experience—additional engineering "know-how"—to confirm the validity of our vision, optimism and plans. The present and future of television are charted by actual service, not by hopeful promises. Definite accomplishments, coupled with inborn faith in science and public enthusiasm for this new art, have justified our years of pioneering to bring television into the service of the American people.

In 1948, television achieved such high popularity with the public that it became physically impossible to meet the demands for receiving sets and television tubes. This was true chiefly because it was not possible for the industry to obtain manufacturing machinery as rapidly as needed. This condition will continue at least through 1949.

Television set production, for the

industry as a whole, in 1949, will total approximately 2,000,000 receivers. This, according to the best available studies, will be stepped up in succeeding years, and by 1953, the industry's annual television set production is expected to reach close to 5,000,000. By the end of that year the total number of sets in operation would be about 18,000,000. Also, by 1953, it is believed that a coast-to-coast television network service will have been made possible by radio relays and coaxial cables.

So appealing is television to the American public, in all walks of life and at all ages, that the industry at the opening of 1949 will be two years ahead of the dates set by the most optimistic forecasts made at the end of the war.

This accelerated progress has lifted radio and television, in com-

mination as an industry, to a two and a half billion dollar a year enterprise. If the rate of growth continues as the market indices and public acceptance indicate it will, radio-television should rank as one of the ten foremost industries in the United States by 1953.

Radio and television now give employment to hundreds of thousands of people and bring new forms of entertainment as well as news into millions of homes. The American dependence on radio entertainment, acquired over the past 28 years, is being more deeply ingrained by television, which enables people in ever-increasing number to eye-witness events as they happen.

Many millions of Americans, in homes and schools from Boston to Richmond, along the Great Lakes and as far west as St. Louis, will see the inauguration of President Truman on January 20. This telecast will mark an historic milestone in civics as well as in broadcasting, for it is the first event of its kind to be televised. It is estimated that at least 10 million people will eye-witness the Truman inauguration—more than all who saw the thirty-one presidents from Washington to Roosevelt take the oath of office. Forty stations are expected to be in the television hook-up, in contrast to the 21-station radio broadcast of the Coolidge inauguration in 1925—which was the first presidential inaugural broadcast.

Today, 122 television stations have been authorized by the Federal Communications Commission. Forty-nine are on the air. Seventy-five other applicants have permits to construct stations, and 312 additional applications are pending. Television networks are expanding across the nation—opening new markets for receiving sets and constantly increasing television's "circulation" as an advertising medium of powerful sales appeal.

The National Broadcasting Company owns five television stations,

four of which—in New York, Washington, Cleveland and Chicago—are on the air. The fifth, in Hollywood, will begin regular service immediately after the first of the year. Eighteen additional television stations have affiliation arrangements with NBC.

On January 12, 1949, NBC's East Coast and Midwest television networks will be joined by coaxial cable and radio relay into a single network. Comprising initially 15 stations, other affiliates will be added to the NBC-TV network as rapidly as inter-connecting facilities become available. As the networks expand, each new city adds to the available sources of future television programs.

At the opening of 1949, NBC is broadcasting an average of 32 hours of television programs a week. Of this total, 39 per cent is made up of

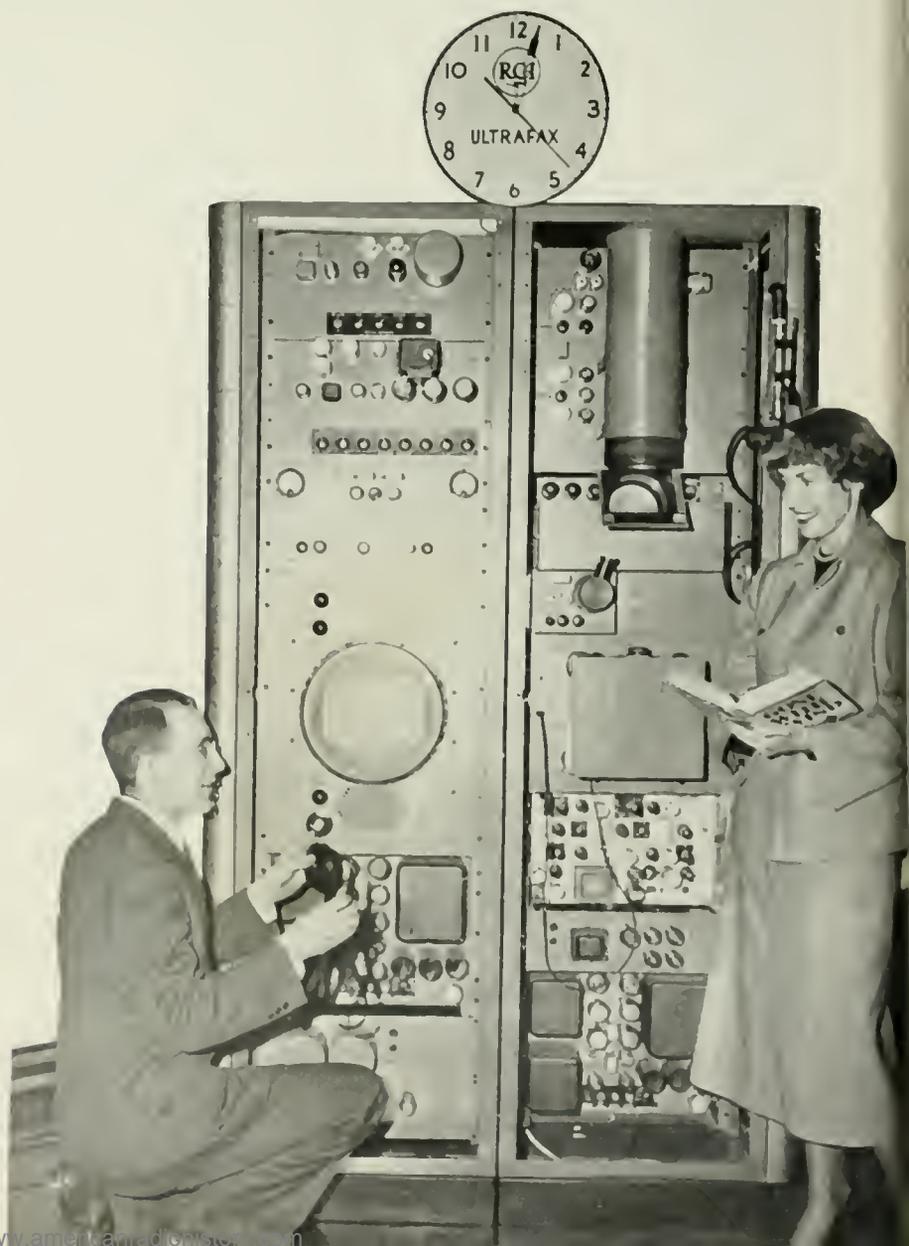
sustaining programs and 61 per cent is commercially sponsored.

Recently, Chairman Wayne Coy of the FCC estimated that in another two years there will be 400 television stations on the air, and 1,000 stations in seven or eight years from now. He also pointed out that nine-tenths of everything we learn comes through our eyes, and added: "Television enables us to reach the mind via electronics at the speed of light. It is costly to build and to operate a television station. But the advertisers will find it the most powerful, most effective and most profitable medium for mass merchandising yet devised."

So swift has been the scientific and engineering development of television transmitters and receivers that those responsible for the artistry and showmanship of television have found it a real challenge

ULTRAFAX RECEIVING TERMINAL SHOWING THE CLOCK WHICH TIMED THE HISTORIC TRANSMISSION AT THE LIBRARY OF CONGRESS IN WASHINGTON, D. C., ON OCTOBER 21, 1948.

[4 RADIO AGE]





NEW TABLE MODEL TELEVISION RECEIVERS MOVE IN INCREASING NUMBERS DOWN PRODUCTION LINES AT THE RCA VICTOR PLANT, CAMDEN, N. J.

to keep the pace. Nevertheless, the great improvement in programs at this year-end reveals such progress that it guarantees continued advances in the development of this new art.

Ultrafax Demonstrated

Combining the great advances made by television with sensational achievements in radio relays and photography, the Radio Corporation of America in 1948 introduced Ultrafax, a new system of high-speed television communication, capable of transmitting and receiving handwritten or printed messages and documents, and even complete books, magazines and newspapers, at the rate of a million words a minute. It was demonstrated publicly for the first time by RCA on October 21, 1948, in the Library of Congress, Washington, D. C. This development which splits the second and utilizes each fraction for high-speed transmission of intelligence, promises to be as significant a milestone in communications as was the splitting of

the atom in the world of energy.

While many uses for Ultrafax are foreseen, its scope will multiply with time and experience. We foresee the day when through television and Ultrafax, a radio newspaper may be delivered through the air into every home equipped with a television set. It will be possible to have the same transmitter that broadcasts a television program broadcast the radio newspaper simultaneously. In fact, the same home-receiver, with proper attachments, could print the newspaper without interrupting the television program.

As a radio-mail system, Ultrafax could deliver the equivalent of forty tons of mail coast-to-coast in a single day.

We can also envisage the day when Ultrafax will provide us with a new service of international television. First, however, a radio "air-lift" must be provided across the Atlantic. With twelve to fourteen suitably equipped communication planes flying over the ocean and properly spaced, an overseas air-

borne radio relay system could be established between the U. S. and Europe to provide not only an exchange of television programs, but also to handle the equivalent of tons of mail, news and other services. Ultrafax would make all this possible with lightning speed and mobility.

It is for these reasons that Ultrafax should prove one of the most significant technological advances in the history of communications.

Radio Broadcasting

While television and Ultrafax dramatically held the spotlight in the advance of radio in 1948, sound broadcasting continued to move forward in its 28th year of service to the American public. The National Broadcasting Company—a service of RCA—completed in 1948 its 22nd year of operation. NBC, with its nation-wide network of 170 broadcasting stations, had the largest volume of business of any year since its formation in 1926.

Radio broadcasting provided the firm foundation of experience and

public service upon which television is being built. Sound and sight combined are weaving a pattern that is more appealing to the mind than sound alone, so a gradual fusion of these two great services is to be expected. More than 1,700 standard broadcasting stations are operating in the United States and construction permits for approximately 300 more have been granted. There are 39,000,000 homes equipped with radio receivers in this country, which means that more than 90 per cent of American families have radio sets.

FM (frequency modulation) broadcasting continues to advance as indicated by the fact that the number of FM stations on the air increased from 300 at the beginning of 1948 to nearly 700 at the close. More than 300 construction permits for additional FM stations have been issued. The number of radio sets equipped for FM reception increased to more than 3,000,000 in 1948.

As a pioneer in standard broadcasting as well as FM, RCA has built and installed approximately one-third of both types of transmitters now on the air. During 1948, RCA supplied the first two 50,000-watt FM transmitters in the United States, one at Milwaukee, Wis., and the other at Birmingham, Ala.

Radar Continues Advance

Radar has continued to advance, and its application to peacetime uses is being extended as a navigational aid in the marine field as well as in aviation. During the past year Radiomarine Corporation of America—a wholly owned subsidiary of RCA—made several hundred radar installations on board ships, including 20 units for the U. S. Coast Guard and 217 for transports of the U. S. Army Signal Corps.

Scientists and research men at RCA Laboratories made outstanding progress during 1948 in the development of many new devices and in the fundamental explorations of radio and electronics. A new study of radio frequencies above 500 megacycles, as a medium for the expansion of television broadcasting, was made by RCA engineers in Washington, D. C., during

the latter part of 1948. The results were made available to the industry and to the FCC, and are expected to be of invaluable assistance in helping to chart the future area of television's growth.

Progress in Nuclear Physics

Further progress is being made by RCA Laboratories in developing a research program of nuclear physics, especially in relation to all fields of radio and electronics. The technique of radio-active tracers is being applied in research work on electron tubes, and the Laboratories has made substantial advances in the development of radiation detecting devices for the protection of persons who work with radio-active materials.

In medicine, science and industry, the electron microscope continues to play an increasingly important role. Today, nearly 300 RCA electron microscopes are in use throughout the world. To enhance the usefulness of the microscope in biological and medical problems, RCA Laboratories has concentrated on the development of techniques that enable the study of virtually untouched specimens. This is accomplished by growing bacteria directly on the membrane that supports specimens in the microscope.

By this method, it is possible to follow the growth of several organisms including, in particular, those of tuberculosis, and the action of several bacterial viruses. When this technique is combined with the use of a specially designed lens, some of the structural changes can be observed as they occur in growing bacteria.

Industrial electronics, with its widespread possibilities for useful application, continues to challenge our scientists and engineers. For instance, in 1948, RCA introduced a new electron tube, which acts as a "transducer," converting mechanical vibrations into electrical pulses that can be studied as audible or visual signals. The tube is smaller in diameter than a cigarette and only half as long. It weighs 1/16th of an ounce. It is so sensitive that it can measure the vibrations made by a fly walking on a steel beam. Therefore, it is easy to see what great possibilities it has for use in

such diverse fields as the detection of defects in airplane construction, the causes of dynamic unbalance in rotating machinery, the measurement of the effects of oil well blasts, recording blood pressure, studying under-water sound and numerous other applications.

We can look forward with assurance to many new developments in the field of radio, television and electronics in 1949—the fourth year of intensive study and peacetime application of the scientific discoveries and inventions in this field which contributed so much to hasten victory in World War II. Some of these advances are already in the public service. Others will go to work in the coming years.

But so wide is the scope of radio science today, and so great its possibilities for the future, that it is beyond human power to foresee all the new advances that will appear. It is safe to prophesy that some developments will overshadow in significance many of the achievements of the past. This much is certain—our scientists and engineers will continue to devote their energies and skills toward extending the usefulness of the electronic and communication arts, so that Radio Corporation of America will remain *World Leader in Radio—First in Television!*

Two Television Images Shown on One Screen

The first split-screen television image in which two pictures from different origination points appeared side-by-side on the same kinescope picture tube was displayed by NBC on December 8 during the Television Broadcasters Association Clinic at the Waldorf-Astoria Hotel in New York. Television set owners who were tuned to WNBT, New York, and WNBW, Washington, D. C., witnessed the unusual program.

This split screen picture was transmitted through a new piece of equipment, the "Image Splitter," developed by the National Broadcasting Company Engineering Department, under the supervision of O. B. Hanson, NBC vice president and chief engineer.



BRIGADIER GENERAL DAVID SARNOFF



FRANK M. FOLSOM

Changes in RCA Management

Frank M. Folsom Advanced to Post of President of Radio Corporation of America; David Sarnoff Continues as Chief Executive of the Company and Chairman of the Board of RCA.

THE Board of Directors of the Radio Corporation of America at its regular meeting held on December 3, upon the recommendation of Brigadier General David Sarnoff, Chairman of the Board, elected Frank M. Folsom as President of the Radio Corporation of America, effective as of January 1, 1949.

Mr. Folsom, Executive Vice President in Charge of RCA Victor Division, has administered the far-flung production and merchandising activities of RCA for the past five years.

At the same meeting, John G. Wilson, Vice President and General Manager in Camden, was elected Executive Vice President in Charge of the RCA Victor Division, succeeding to the post filled by Mr. Folsom.

General Sarnoff, who has occupied both the offices of President and Chairman of the Board of the Radio Corporation of America since the retirement in 1947 of the

late General James G. Harbord, continues as Chairman of the Board and will remain Chief Executive Officer of the RCA, as well as Chairman of the Board of the National Broadcasting Company and RCA Communications, Inc., both wholly owned subsidiaries of RCA.

In announcing the changes, General Sarnoff declared: "The Board of Directors of the Radio Corporation of America is gratified in being able to find the men within its own organization who, by the record of their achievements in the service of the company, have proved themselves worthy of promotion and able to share in the highest management responsibilities.

"Frank M. Folsom, who now takes up the administrative load, has the background and experience to function also on the policy levels demanded by the many problems resulting from the healthy growth of RCA's business in a rapidly expanding art and industry.

"And John G. Wilson, who now

succeeds Frank M. Folsom, has proved by his work as Vice President and General Manager of the RCA Victor Division his capacity to head up the growing and extensive manufacturing and merchandising activities of the RCA.

"The Corporation has labored for more than 25 years to bring about the creation of a great television industry and other new services and products made possible by research and progress in the radio and electronic arts. Both of these officers have proved more than equal to their opportunities and responsibilities in the expanding management requirements of the RCA family."

Folsom Joined RCA in 1944

Frank M. Folsom joined the Radio Corporation of America as a Director and Vice President in Charge of the RCA Victor Division on January 1, 1944, and he was elected Executive Vice President in Charge of the RCA Victor Division on June 1, 1945.

Prior to his association with RCA, Mr. Folsom had been active for 30 years in merchandising and had served for nearly two years as Chief of the Procurement Branch of the United States Navy Department. For outstanding service with the Navy, he was awarded the Medal for Merit by President Truman and received the Distinguished Civilian Service Award, the Navy's highest civilian honor.

Mr. Folsom was born on May 14, 1894, in Sprague, Washington. He is the son of Anna Wilson Folsom and Edward P. Folsom, a direct descendant of John Folsom who settled in Hingham, Massachusetts, in 1638. He attended schools in Washington and Oregon and received honorary LL.D. degrees from the University of San Francisco and St. Joseph's College, Philadelphia.

Mr. Folsom began his business career with Lipman Wolfe Department Store, of Portland, Oregon, in 1910. Three years later, he became an apprentice buyer at Hale Brothers in San Francisco and in 1914 joined the firm of Weinstock & Lubin in Sacramento, remaining there until 1917, when he entered the Air Service, U. S. Army.

At the end of World War I, Mr. Folsom resumed his position as buyer with Weinstock & Lubin, and continued there until 1923. He then rejoined Hale Brothers as General Merchandise Manager and in 1928 became a Director and General Manager.



JOSEPH H. MCCONNELL

[8 RADIO AGE]



JOHN G. WILSON

Four years later, Mr. Folsom joined Montgomery Ward & Company as Manager of Pacific Coast operations for both Mail Order and Retail Stores. In 1933, he was elected Vice President in Charge of Merchandising and a Director of Montgomery Ward, with headquarters in Chicago. He resigned in 1940 to become Executive Vice President of Goldblatt Brothers, Inc. of Chicago.

Mr. Folsom was one of the first industrialists to enter Government service prior to World War II. He joined the National Defense Advisory Commission upon its formation on July 1, 1940, as Assistant Coordinator of Purchases. He continued in that position through 1941, when the Secretary of the Navy appointed him a special assistant to the Under Secretary of the Navy and Chief of Procurement. He also served as Chairman of the Procurement Policy Board of the WPB, coordinating agency for procurement policy of all war services and agencies.

Wilson Came to RCA in 1944

Mr. John G. Wilson joined the Radio Corporation of America in June, 1944, as Administrator of Accounts and Finance for the RCA Victor Division. In June, 1945, he was elected Operating Vice President and two years later he was elected Vice President and General

Manager for RCA Victor Division.

Prior to his association with RCA, Mr. Wilson had been active for over twenty-five years in the accounting, financial, operating and merchandising fields.

Born in Alma, Illinois, on August 17, 1900, Mr. Wilson attended Illinois public schools and Northwestern University.

In the first World War, he served as a Captain in the Coast Artillery.

Mr. Wilson began his career at Price Waterhouse & Company, Chicago, in 1920. In 1924, he joined the Blackhawk Press in Chicago. Three years later, Mr. Wilson became associated with Montgomery Ward & Company as Assistant Controller and later as Controller. He remained at Ward's until 1940, when he left to become Vice President and Controller, and a Director, of Goldblatt Bros., Inc. in Chicago. A year before joining the Radio Corporation of America, he became associated with the United Wallpaper Company as Vice President and General Manager.

McConnell and Buck Advanced to New Posts

Advancement of Joseph H. McConnell of the RCA Victor Division and Walter A. Buck of Radiomarine Corporation of America to new posts in the RCA organization were announced early in the new year.

(Continued on page 31)



WALTER A. BUCK

New Phonograph and Record

Unique Record and Record Player Introduced by RCA Victor Provide Finest Quality of Reproduction at Low Cost — 7-Inch Discs Operate at 45 Revolutions a Minute.

AN entirely new system for the reproduction of recorded music in the home, resulting in a new type of phonograph and record which deliver the finest quality record reproduction at low cost in the history of the phonograph record industry, was announced by the RCA Victor Division of Radio Corporation of America, on January 10.

The new phonograph and record operate at 45 revolutions per minute and provide completely distortion-free music of unprecedented brilliance and clarity of tone. The small-size record, just under seven inches in diameter, is capable of handling, in a single disc size, all musical classifications from popular to classical.

In his formal announcement of RCA Victor's development of the new system for the reproduction of recorded music, J. G. Wilson, Executive Vice President in charge of the RCA Victor Division, declared:

"This is the best phonograph record ever made. It was developed jointly with its own unique record player. The combination of these two makes available to the American home recorded music of a quality and fidelity never before possible at low cost."

The new record player, Mr. Wilson stated, contains the fastest record-changing mechanism ever devised and its radically advanced design eliminates 75 percent of the problems encountered in conventional changers.

Another important aspect of the new system, he added, lies in the fact that the distortion-free, noise-free performance made possible by the new 45-rpm record player and records opens the way for the development of home instruments of wider frequency range and truer fidelity. RCA Victor, he disclosed, is planning along these lines.

The new record and record player climax more than 10 years of research and refinement in this field by RCA.

In addition to the record, three new instruments incorporating the new system have been announced. These instruments are an automatic record-playing attachment and a complete automatic phonograph, both remarkable for their small size, simplicity and ability to provide high quality performance; and a combination console instrument incorporating a radio, a conventional 78-rpm record player, and the new 45-rpm player in a cabinet smaller than conventional models.

The record developed for this new system is a light-weight, water-thin, non-breakable vinyl plastic disc unusual also for its 1½ inch center spindle hole.

Because of the operating speed of record and player, the short playtime requirements of popular selections as well as the lengthier playtime of symphonies and other classical selections, can be handled.

The record delivers up to five minutes and 15 seconds of playing time per side, and, with the rapid action of the new changer, up to 42 minutes of undistorted music.

The heart of the new instrument is a revolutionary automatic record changer mechanism, the outstanding characteristic of which is the large, 1½-inch red plastic-capped center spindle which houses the trigger-fast drop mechanism. It holds up to eight records. The action of the mechanism is entirely noiseless and even the drop of the record is scarcely audible.

Operation Virtually Noise-Free

Each of the new instruments has a small tone arm, exerting a pressure of only 5 grams on the record, and equipped with a Silent Sapphire permanent-point pickup, contributing to virtually noise-free reproduction.

Emphasizing that for the first time the industry now has record playing equipment and records for



EIGHT OF THE NEW SEVEN INCH RECORDS, WHEN PLACED ON THE SPINDLE OF THE COMPACT AUTOMATIC RECORD PLAYER, PROVIDE 42 MINUTES OF UNDISTORTED REPRODUCTION.

the home that are made for each other. Mr. Wilson declared: "The new instruments and records represent a logical, significant advance in the evolution of recorded music.

"Recognizing this as an evolutionary advance," he continued, "we firmly believe that the market for conventional 78-rpm records will not be seriously affected immediately, but will continue strong for many years to come.

"In homes throughout America," he said, "there are 16 million record players designed for use with the 78-rpm records which have been standard for 50 years. This market must, and will, be serviced. Mindful of this, RCA Victor will continue a heavy production schedule on records of this type. The company will also continue to support dealers with the full weight of its advertising, promotion, and merchandising programs on Victor's 78-rpm records.

"All of our planning is based on our belief that the new 45-rpm reproducing system and record are of an evolutionary, rather than a revolutionary nature."

Pointing out that the introduction of this new system has been long

and thoroughly considered, Mr. Wilson stated:

"RCA Victor is the only manufacturer making both phonographs and records, and has the largest stake of any organization in both fields. Our confidence in the new system and the sound, constructive values inherent in our presentation of it to the industry at this time are implicit in our decision."

Joseph B. Elliott, Vice President in charge of the RCA Victor Home Instrument Department, revealed that the new record and instruments have been demonstrated to phonograph and record manufacturers, as well as phonograph equipment manufacturers.

"Manufacturers who have witnessed these demonstrations have expressed extreme enthusiasm," he said, "and many are now planning to adopt the new system, manufacturing rights to which are available to the entire industry in accordance with long-established RCA practice."

The new line of instruments and records, Mr. Elliott added, will be introduced in the early spring.

J. W. Murray, Vice President in charge of the RCA Victor Record Department, also disclosed that a substantial catalogue of the new 7-inch 45-rpm records will be available at that time. All new material,

he declared, is now being recorded simultaneously at 78 rpm and 45 rpm, and new releases will be made available in both types of records.

Although price schedules have not yet been determined, Mr. Elliott stated, instruments incorporating the new system will be at least competitive in price with comparable conventional record-playing instruments. He also pointed out that the small size and the non-breakable feature of the new vinyl plastic record are conducive to cost savings. It also effects savings in distributor warehousing facilities and dealer storage facilities.

Background of Development

In describing the background of the new development, Mr. Elliott pointed out that many of the major technical problems in the industry arose from lack of standardization, particularly in records, where differences exist in thicknesses of records, diameters, and other dimensions and record characteristics. Adoption of the new system, he said, would contribute measurably to standardization in the industry and the elimination of these former problems.

"It is worth noting that for the first time in the history of the industry," he explained, "a record and a record player have been specifically designed to complement each other."

It was also pointed out that the small size of record and changer will permit the housing of a complete library of about 1,000 records in an average-size console. This new record virtually eliminates the problem of record storage in the home.

Because this system permits smaller-size instruments, he added, radio-phonograph combinations can be reduced in size by 25 per cent.

"With the smaller, lightweight record," he said, "a customer can purchase several albums and carry them away in his topcoat pocket or under his arm like a book."

In outlining other important features of the new record player and record, Mr. Elliott called attention to the fact that the playing surfaces of stacked records do not touch each other, thus eliminating surface scratches and damage to grooves. This is achieved by creating a "collar" around the label area which is

thicker than the playing area. Air space between records is thus provided. He added that the seven-inch diameter and large center hole permit easy handling of records, eliminating touching surfaces with fingers.

Tremendous possibilities are foreseen for the use of a second record-player in the children's room, with the small-size albums easily stored in present bookcases.

In summing up his announcement, Mr. Elliott said: "RCA Victor is introducing not only a new phonograph and record, but an entirely new system of reproducing recorded music. We believe it has commercial advantages never before available to the industry and to the industry's allied distributor-dealer organizations. We will incorporate it in all our forthcoming record-playing instruments and we know that many other manufacturers in the radio industry, to whom this new system is available, will also incorporate it in their instruments.

"The new 45-rpm instruments and records offer advantages of undoubted appeal to all types of consumers, and we believe its enthusiastic reception by the American public is assured."

861 Veteran Employees Receive Gold Watches

EIGHT hundred and sixty-one active and retired employees of the RCA Victor Division and its predecessor companies, who have completed 25 or more years of service, received gold watches and gold service pins in ceremonies held at the various plant locations, during December. The presentations inaugurated a new Service Award Program for members of the Division.

Recipients of the award included employees in seven of the RCA Victor Division's ten plants and in the RCA Victor Distributing Corporation and the RCA Service Company, Inc.

Distribution of service pins to 20-year, 15-year and 10-year members of the RCA Victor Division will take place in the early part of 1949.

BECAUSE OF THEIR SMALL SIZE, HUNDREDS OF THE DISCS REQUIRE NO MORE STORAGE SPACE THAN A FEW BOOKS.



[10 RADIO AGE]



THOUSANDS OF BASEBALL FANS WATCH THE 1948 WORLD SERIES GAMES ON 100 RCA VICTOR TELEVISION RECEIVERS INSTALLED ON BOSTON COMMON.

Television In Boston

Excerpts from an address by Frank M. Folsom, President, Radio Corporation of America, before the Clover Club of Boston on December 4, 1948.

AS AN historic center of culture, Boston promises to be a pre-eminent stage of television. In Boston, arts and sciences, traditions and teaching, schools and sports come into focus. Here waves the pennant of the National League Champions! And let us not overlook the Red Sox, the annual marathon, your hockey games and the numerous collegiate fields of sport which make this city—the Athens of America—a natural amphitheatre of television. No wonder Boston, with two stations on the air, is one of the first cities on the television map; no wonder the Federal Communications Commission has seven additional applications for stations to picture Bostonian activities and to televise dramatically its glory,

from the Puritans to the Revolution, from the Tea Party to Emerson, Thoreau and Longfellow, and from John L. Sullivan to the Braves!

Since symphony in Boston is ritual, and music an integral part of your social and cultural life, you will be interested in knowing that television has a natural affinity for music. When Arturo Toscanini first waved his baton across television screens in directing the NBC Symphony Orchestra, he opened a new era in musical performance. The 81-year old maestro is a dramatic television personality, for his face and hands are eloquently telegenic. The television audience looks directly into his face to note every expression and every gesture. First they see him close-up and then by a touch of magic the orchestra appears in the background; first in a complete ensemble and then by groups, as the score calls for musical emphasis. With spectacular ef-

fect, the image of the maestro also, from time to time, is superimposed on the orchestra, to reveal a new form of electronic artistry.

The Boston Symphony, the Boston "Pops" and the Berkshire Festival also are destined to be seen afar—as many millions of music lovers gain the added joy of seeing these renowned orchestras broadcast under the direction of Dr. Serge Koussevitzky, Charles Munch, Arthur Fiedler and others.

The famous paintings in your public library and in your Museum of Fine Arts will no longer be confined to gallery walls. They will be viewed on countless screens in homes and schools across the country-side. The monument on Bunker Hill, the crude bridge that arched the flood at Concord, the battleground of the Minute Men at Lexington and all your other landmarks and shrines of liberty, including Faneuil Hall, Longfellow's home, John Hancock's house and Hawthorne's House of

[RADIO AGE II]

Seven Gables, will—thanks to television—become a part of living history in schools throughout the land.

Television not only dramatizes, informs and entertains, but it also is a practical teacher. In medical research and in teaching surgical techniques, television has already proved an ideal lecture hall, in which every student has a front row seat. Noted doctors, including Dr. Arthur W. Allen of Boston, President of the American College of Surgeons, have heralded it as "a teaching medium that surpasses anything we have had in the past."

Boston — Hub of Television

So you see, if any American city is qualified intellectually, artistically and historically to become a hub of television, it is Boston. Topographically too, it meets the requirements of that science. Those of you who own television receivers are probably aware that the very short waves which carry the pictures behave quite differently from the waves of standard broadcasting. Television waves are more akin to light waves. They travel in a straight line-of-sight and go off into space at the horizon. This is why lofty hills and buildings are ideal for television stations, and why high antennas are helpful in plucking the passing pictures from the electronic cavalcade in space.

Boston, as we all know, is built on a ring of hills. Beyond are the Blue hills, Dorchester and Arlington heights, and we must not forget Bunker Hill. Geologically these hills are described as "faults"—but now, in these days of television, they are virtues that will put Boston within range of millions of eyes.

Paralleling the Boston Post Road to New York as the nation's Highway No. 1, there is a new radio route consisting of seven automatic radio relay stations located on seven hills that lie across the New England country-side in the direction of Manhattan Island.

Boston is to be congratulated upon the enthusiasm and spirit of pioneering with which it has taken up television. It may be surprising to you that since Boston's first television station—WBZ-TV—went on the air in June, this year, followed in September by WNAC-TV, this

community has spent approximately \$12,500,000 for television receivers. It is estimated that, in 1949, you will spend close to \$20,000,000. Today, the television audience in the Boston area numbers nearly 200,000. By this time next year it should reach 500,000.

Your television stations, with their engineers and showmen, keep alive the traditional New England spirit of pioneering. Through their efforts the gilded dome of your State House will be a symbol of American independence and culture on television screens throughout the country. And it will be seen as clearly as when viewed directly from the Boston Common! I wonder what the Colonists would have thought had they been here to see one hundred television receivers on the Common so that thousands might watch the 1948 World Series! Would they have called this witchcraft?

Fortunately, wireless, despite its mystery, was not linked with witchery. Much pioneering in telegraphy, radio and electronics has been carried on at Harvard, MIT, Boston University, Boston College, Tufts College and other institutions within this area, along with the historic experiments of Marconi and Fessenden down on the Cape, which put some of the first pulses of radio into the New England air. Radar too—a more recent development—was cradled in the Radiation Laboratory on the Charles.

Two-Way Television

The day will come when Harvard will be seen at Oxford, and Oxford will be seen at Harvard. In fact—believe it or not—we may expect to watch transoceanic debates and interviews in which the participants will appear on your screens as if they were talking face-to-face in the same narrow room, although in reality they will be separated by the broad Atlantic. This will be made possible by two-way television.

Then, the President of the United States, speaking from the White House, may appear on the same screen with the King of England speaking from Buckingham Palace. Or a Metropolitan opera tenor in New York may sing a duet with a

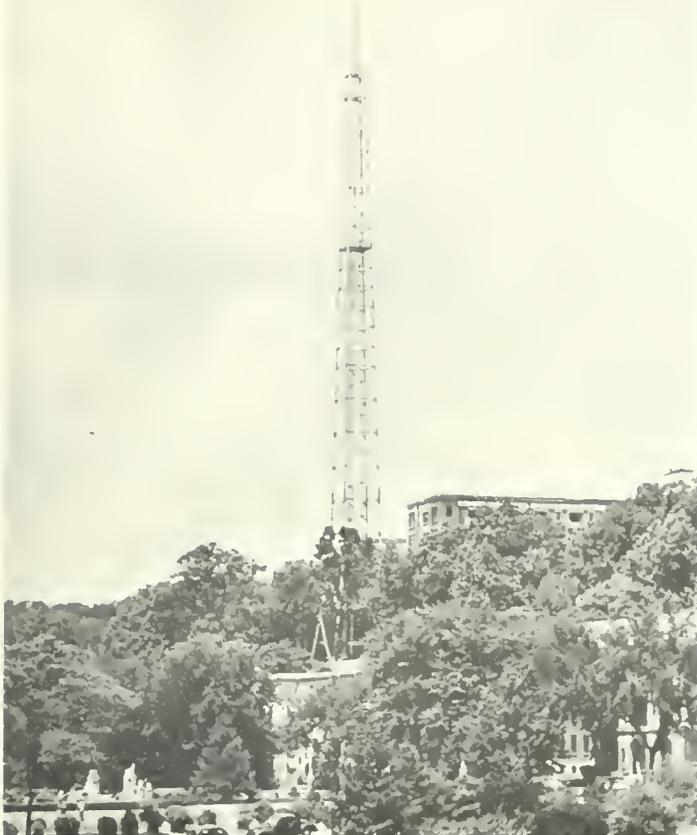
prima donna in San Francisco, both appearing side-by-side, although the continent separates them.

Television, as you probably realize, is not the stage, the screen or radio. It is a new art form, a most effective advertising medium, a great sales force, and has been heralded by Mr. Wayne Coy, Chairman of the Federal Communications Commission, as "The most powerful and profitable medium for mass merchandising yet devised". Indicative of its impact, 300 advertisers were sponsoring local and national television programs in June. Today there are more than 600.

Rapid progress has been made in every phase of television since the end of the war. It has been a gigantic task to get the wheels of this new industry turning in service to the public. Yet there is an even greater task ahead to meet the ever-increasing demands for television programs and for television sets. Every one of the 39 million homes now equipped with radio will want to see as well as hear what is going on in the world. When we stop to think that today there are 1,800 standard broadcasting stations and 700 FM transmitters authorized to serve more than 60 million radio receiving sets in the United States, it gives us some measure of the tremendous market that is anxious for television.

The radio industry, in 1948, will produce and sell \$50,000 television receivers. This means, that as we enter the new year, more than 1,000,000 receivers will be in use. The potential viewing audience will number approximately 6,000,000.

These statistics add up to the fact that television is the fastest growing new industry in the United States. It is rapidly establishing itself as one of the economic bulwarks of the nation. In 1949, it is estimated that 2,000,000 new television receivers will be added to the million already in operation. By 1953, the industry as a whole will be turning out 4,800,000 sets a year—so by the time of the following presidential inauguration in 1953, we may expect that there will be about 18,000,000 television receiving sets in this country, with a potential audience of 50 to 60 million persons.



SYNCHRONIZATION OF SIGNALS FROM STATION WNBW, WASHINGTON, D. C., SHOWN ABOVE, WITH THOSE FROM WNBT, NEW YORK, USING NEW METHOD DEVELOPED BY RCA, GREATLY IMPROVES PROGRAM SERVICE ON RECEIVERS INSTALLED IN "FRINGE" AREAS OF BOTH TELECASTERS.

Television Coverage Extended

Thousands of Viewers in New York and Washington Areas Benefit from Improved Reception as Result of RCA "Synchronizing" of Stations WNBT and WNBW.

FIRST practical use of a newly developed method of extending television coverage by reducing interference between stations on the same channel is under way on a full-time basis between the New York and Washington television stations of the National Broadcasting Company, it was announced December 16 by Brigadier General David Sarnoff, Chairman of the Board of the Radio Corporation of America.

General Sarnoff disclosed that the new method, known as televi-

sion carrier synchronization, has been in regular operation since December 9, employing facilities at RCA Laboratories, Princeton, N. J. He then declared:

"The immediate effect of these operations has been to extend interference-free service to thousands of additional viewing families in the 'fringe,' or outlying service areas, of stations WNBT, New York, and WNBW, Washington.

"These operations, therefore, can be regarded as highly successful and point the way to application of

synchronization to stations in other parts of the country where the co-channel interference has become a problem.

"Use of synchronization permits a closer spacing of television stations on the same channel than is possible without this method of reducing interference between stations. It also enlarges the service area of television stations, thus enabling television to reach out and serve many more people than otherwise could be served. This is of particular importance to rural sections since it makes possible service to such sections which could not otherwise be obtained."

The announcement by General Sarnoff, who is Chairman of the Board of the National Broadcasting Company, followed by less than two weeks an engineering conference called in Washington by the Federal Communications Commission to review the problem of tropospheric interference, as the co-channel disturbance is known to the industry.

Reports on Experiments

At that time, RCA-NBC representatives reported the results of extensive experiments on television carrier synchronization and recommended its general application to provide better service on present television channels.

Commenting on the operation, Niles Trammell, President of the National Broadcasting Company, said:

"Another great engineering advancement in television broadcasting has been achieved by the RCA Laboratories Division of the Radio Corporation of America and we at the National Broadcasting Company are proud indeed to have had the opportunity to put it into operation immediately, thus adding another 'first' to our list.

"We also take pride in the fact that the cooperation of NBC's engineers made possible the accomplishment of this new system of synchronization which already is being used to improve the service of our television stations in New York and Washington, WNBT and WNBW.

(Continued on page 30)

Peace in a Changing World

World Situation Represents New Era and New Challenge to American Thought and to the American People, RCA Head Declares in Address Before Phi Beta Kappa Alumni.

EXPRESSING the belief that it is much easier to observe the changes going on in the world than it is to make peace, Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, declared on December 15 in an address before the Phi Beta Kappa Alumni in New York that the present situation — of neither peace nor war — represents a new era, a new challenge to American thought and to the American people.

"For, as a people," he continued, "we are not accustomed to living in a state of doubt. The temperament of the American people is such that we seek decision and demand conclusion. If the action we have to take is serious, we usually say, let us do it and get it over with. We don't like to live with uncertainty. Yet that is our lot today. And I fear it will continue to be our lot for years to come."

Speaking on the subject "Peace in a Changing World," General Sarnoff said that this uncertainty makes it necessary to reorient ourselves to this new situation, and added:

"Indeed, it calls for a psychological and mental reorientation which will free us from the daily irritations and the daily demands to do something about it, because there isn't anything conclusive we can do about it from day to day.

"The situation before us calls for patience, for restraint, and for wisdom. Above all, if 'action' is to be taken, it calls for 'timing' — a most important matter. The right act at the wrong time may cause defeat, whereas, the same act at the right time may bring victory.

"Therefore, my first answer to those who ask why wait, why not do something about it, is that it is better to wait, because in that way there may be an opportunity to achieve peace—and if that should prove impossible, to achieve victory by the use of force, when that finally proves to be unavoidable."

General Sarnoff stated further that it did not seem to him that the two major conflicting ideologies that are now in motion in the world can be reconciled by negotiation, or settled by force, in the immediate future. He said there were "certain forces" now abroad in the world that are "far more powerful than the minds of men."

He asserted that these forces, in one form or another, must have opportunity for further expression; that they must reach a point of definition and clarity where their positive and negative attributes become visible and can be understood by the masses of the people.

Conflict is Between Leaders

"After all," he declared, "the conflict which is now going on — this

cold war — is not between the peoples of the world. It is between the leaders of certain countries of the world. In many countries, the people are wholly uninformed about the nature of the conflict or its cause, or its results, or the possible manner of its composition.

"However much we may dislike it, it appears to me that we are destined, for some time to come, at least, to live in a dangerous world, and we shall have to learn how to live dangerously."

Despite this state of affairs, General Sarnoff said, these very tensions, these very difficulties and problems, furnish us an opportunity for clear thinking and courageous action.

The question is posed for us more specifically from time to time, he added, by those who ask, "Why wait if you think that war ultimately may be inevitable? Why wait until the enemy acquires the same modern weapons that we now have — the atom bomb, guided missiles, and the like? Why wait until they get them? We have them now, and they presumably have not. Why not go ahead and finish the job now?"

Speaking for himself, and not in any sense claiming to be an authority on the subject, he said that he did not believe that war ultimately is inevitable. War may come, but no one can speak with certainty about its inevitability, he asserted.

"The reason it would not be wise, it seems to me, to go to war now is because waging a modern war isn't such a simple problem," General Sarnoff said. "Even if we were only to undertake what is sometimes called a defensive war, a real chance for victory would require the use of every modern weapon that we have or know about, including the atom bomb.

"Aside from our reluctance as civilized people to throw atom bombs on thickly populated cities, aside from all the humanitarian aspects of that question, the destruction of

"WITH CHANGING CONDITIONS IN A CHANGING WORLD, WE SHOULD BE WILLING TO CARRY ON DISCUSSIONS AND NEGOTIATIONS, HOWEVER FRUITLESS OR FRUSTRATING THEY MAY APPEAR AT THE TIME."



lives and the destruction of treasures would be such that the consequences of such a war cannot be predicted. Victory may be a very costly thing.

"We might also—if we undertook to move now—jeopardize our own freedoms. You can't fight a modern war against ruthless dictatorships and at the same time maintain your democratic principles. We have seen the difficulties others have had in maintaining democratic principles, even after a war, if it has been waged over a wide area and extended over a long period of time.

"So the very principles we fight to preserve may be jeopardized, if we undertake the task before we are fully ready, militarily, economically and politically. Nobody—not even the scientists—can measure with accuracy the uncertainties that would follow, in other parts of the world as well as in our own country, an atomic war launched at this time. That is one answer to the question—Why wait?

"There is another answer, and it is this: If you measure the actual knowledge that any one of us has about world affairs, or for that matter, about anything else,—and draw a circle around it, you will find circles of varying dimensions.

Knowledge Based on Facts

"The knowledge within any such circle would be based on facts we have learned and the things we can see. But often, the most important things that affect the safety and the progress of the world, lie outside that circle. These are the invisible factors, or the imponderables,—the things we can't see and the things we can't think about at all. There are times when these assume an importance greater than the facts which were within our view when we made up our minds with such finality.

"In the field of world politics these imponderables are tremendously important. Ultimately they are likely to prove the real factors that will determine whether we shall have peace or war.

"What are some of these imponderables? First, there is the possibility that better informed people in countries with which we

are in conflict, may change their governments. It takes time for people to become better informed. The methods of disseminating information are constantly improving. As I view it, no 'iron curtain' can permanently keep out the electromagnetic waves of radio."

Not only the "Voice of America," but one day, the "Voice of the World" will be heard everywhere from a central point speaking in the languages the listeners understand, he continued.

Satellite Nations Affected

It is also conceivable that some of the satellite nations, who do not seem to be too happy, may as time goes on be affected by the improvements in the standard of living in the neighboring nations who enjoy the benefits of freedom and democracy, he said, adding:

"These satellites may compare the restrictions and limitations imposed upon them by alien powers with the freedom and the better life enjoyed by those who are allowed to govern themselves. That is another imponderable that is working, I think, in the right direction.

General Sarnoff at this point recounted the advance of science, including the acceleration in war and peace of radio and television, technology and chemistry, and examined the need for firm national procedure.

"We must believe in the principles we stand for," he said. "We must believe in the purposes we espouse. And these principles and these purposes in no way involve any aggression on our part. We must be consistent and firm, and we must leave no doubts in the minds of others

about our policy, because evidence abounds that distress follows appeasement.

"With changing conditions in a changing world, we should be willing to carry on discussions and negotiations, however fruitless or frustrating they may appear at the time. I still believe that through discussion we learn something of the ideas and intentions of the other side, and they learn something of ours."

General Sarnoff urged continuation of aid to "our friends across the seas," and stated that we should encourage and advance the idea of a Federation of Western European States. He also urged a military guarantee for the security of the friendly democratic nations.

"No one of these things will, by itself, solve the whole problem," he concluded. "But this combination will, I believe, gain the time needed to increase our preparedness, and enable us to obtain the benefits of the 'imponderables' I have mentioned. This course should be our answer to the question, whether a fair, consistent and firm foreign policy, accompanied by adequate preparedness and a willingness to discuss and to negotiate, can avoid the catastrophe of another World War.

"But if all such honest efforts fail, and, if in the end we are called upon to resolve the issue by force, then the time we shall have gained should equip us to achieve victory. And so, my friends, I conclude as I began, with the thought that we must make time our ally in our efforts to secure peace in a changing world."

"NOT ONLY THE 'VOICE OF AMERICA,' BUT ONE DAY, THE 'VOICE OF THE WORLD', WILL BE HEARD EVERYWHERE FROM A CENTRAL POINT SPEAKING IN THE LANGUAGES THE LISTENERS UNDERSTAND."





A TWO-PIANO TEAM IN THE MAIN STUDIO AT 411 FIFTH AVENUE PROVIDES THE SOUND TRACK FOR A MUSICAL FILM.

Film Recording at "411"

Motion Picture Companies Make Growing Use of Modern Facilities in RCA's Fifth Avenue Studios; Work Done There Includes Music Scoring, Recording of Newsreel Commentaries and Dialogue



By H. D. Bradbury

*Manager
RCA Film Recording Studio
New York City*

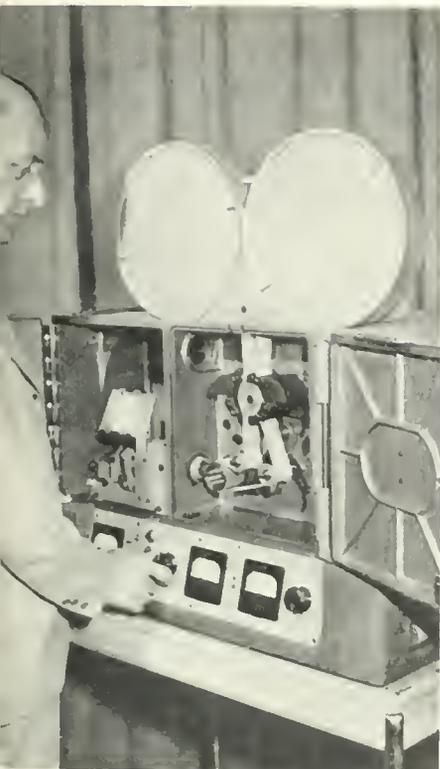
WHEN RCA entered the film recording field in 1928, offices and studios were established at 411 Fifth Avenue, New York. At that time, the studio combined photog-

raphy with recording, making full-length feature pictures. Later, as the recording industry grew, motion picture production was eliminated at "411" and sound facilities were expanded and improved. Today, two decades later, this section of the RCA Engineering Products Department, still at the same address, is rated one of the finest, most completely equipped film recording studios in the country.

The RCA Film Recording Studio, originally called RCA Photophone, Inc., has a staff of skilled technicians and facilities for recording commentary, dialogue, orchestral scores, and complex film track blending jobs, known as mixing. In addition, it has kept its license to produce full-length motion pictures.

Two modern studios at 411 Fifth Avenue provide adequate facilities for the increasing number of film organizations that avail themselves of this special service. These companies, some of them licensees, use the large Studio A principally for music scoring, for rerecording the work of large orchestras, and for mixing jobs too complex for their own facilities. The smaller Studio B is now used exclusively for voice recording.

In a Control Room at the rear of Studio A, technicians operate a mixer console or control board, and disc playback. Through the use of the mixer the engineer is able to combine as many as eight separate sound tracks, maintaining the desired volume with the aid of an oscilloscope.



SOUND TRACKS IN THEIR FINAL FORM, COMBINING COMMENTARY, MUSIC AND SOUND EFFECTS, ARE TRANSCRIBED ON THIS 35MM FILM RECORDER.

phonographs run off sound tracks containing commentary, musical scores, sound effects, etc., which are piped into the mixer console, combined, modulated, and returned to the Machine Room for transcription on RCA 35mm film recorders. The sound tracks are run off many times, and the exact cueing is thoroughly rehearsed by the mixing technician before the final re-recording is done.

Blueprints Provide Cues

For example, when Ben Grauer does his commentary at RCA for his series of technical films, his cues are provided by a blueprint of arrows on the film itself. Paramount's cartoons cue the musical director by means of a bouncing ball.

Prominent among the film producers using the "411" facilities is March of Time, a studio customer since 1938. Speech and sound effects are recorded by them on location, using RCA newsreel equipment, at the same time the picture is made. Later, Westbrook Van Voorhis, the March of Time voice, comes into the studio to do the commentary, and still later the M. O. T. orchestra records the musical score. Subsequently all these sound records are rerecorded (or mixed) to make the final release negative.

Famous Studios, producers of

"Popeye" and "Little Lulu" cartoons (Paramount releases), find studio A ideal for their music scoring and "mixing".

Other companies using RCA Film Recording Studios in New York are: RKO; Pathe, Inc.; Universal Pictures; Warner Bros. Pictures, Inc.; Columbia Pictures Corp.; Caravel Films, Inc.; Grantland Rice Sport Pictures Corp.; W. J. Ganz Company; Mode-Art Pictures, Inc.; and NBC Television.

Early "Talkies" Recorded

In the early Thirties, when the addition of sound to motion pictures was beginning to revolutionize the movies, the RCA film recording department made important contributions to the development and progress of talkies. Such early sound hits as "Sonny Boy", "Lilac Time", and Frank Buck's "Bring 'Em Back Alive", were mixed in the RCA Photophone Studios. About this time, when movie companies were investing heavily in screen tests of well-known stage and opera stars, Katherine Hepburn and Grace Moore made screen tests at "411". Special effects and a Hugo Reisenfeld choir of 100 voices were added to the DeMille classic, "King of Kings". This constituted a small, but important part of RCA's contribution to the early development of sound movies.

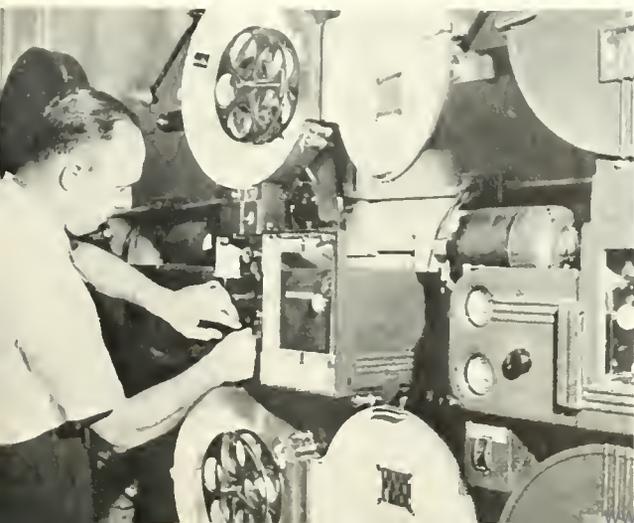
During the war, the RCA Film Recording Studios worked extensively with the Office of War Information, Army, American Red Cross, and Coordinator of Inter-American Affairs. Because of the

When necessary, the disc playback simultaneously cuts a record of the sound tracks being mixed so that the film company representative may recheck certain sections of the recording. The disc playback, as well as all other recording equipment in the RCA studios, is powered and kept in perfect synchronization by a highly accurate Selsyn motor drive system. This Selsyn power unit is installed in the Projection Room where standard 16mm and 35mm projectors are housed.

In the Machine Room, five film

FILM CONTAINING SOUND TRACKS ARE RUN THROUGH THESE FILM PHONOGRAPHS AND ACCURATELY CUED BEFORE THEY ARE FINALLY MIXED AND RERECORDED.

AT THIS CONSOLE THE MIXING ENGINEER FOLLOWS HIS CUES AND COMBINES SOUND EFFECTS, WORDS AND MUSIC IN PROPER RELATION FOR INSCRIBING ON THE FILM.



lack of negative film at that time, RCA had to conserve every possible piece of precious footage. Very often one job was completed, torn off the reel, and the next one started on the same roll of film. One amusing incident resulted from this procedure. After several re-takes for a Swedish customer, an RCA technician followed this method, but in his haste to record a Spanish track for an anxious March of Time Foreign Department representative, he omitted tearing off several hundred feet of previously recorded Swedish dialogue. When the film was developed, March of Time had to employ an interpreter to decode the strange language which prologued their Spanish film.

Complex Problems Solved

Complex problems in recording are expertly solved by the studio staff. Frequently the RCA Record Department calls upon RCA film facilities when an exceptionally fine musical disc recording is required. First, the piano and orchestra are recorded on separate sound tracks in the best Hollywood studios, and

then sent to "411" where they are mixed, and sent by phone line to the RCA Disc Recording Studio at 24th Street, where the Master record is cut.

If a re-take on a Hollywood production is necessary when its star is relaxing in the East, the star can come to RCA's studio and re-record the desired changes for substitution in the original sound track. Recently the RCA Film Recording Department was called in when RKO needed a realistic Carnegie Hall background to record the work of Rubinstein and Ormandy. Portable equipment was sent into the Hall where two sound tracks were made on-the-spot, and two others piped over telephone lines to "411" for recording.

Extending the accommodations of the studios is a Mobile Recording Unit, designed to provide studio facilities outside, and on remote locations.

Apart from the income they produce, the New York studios perform the important function of demonstrating to customers and licensees the superior performance of RCA Film Recording Equipment. Sales

of this equipment are handled from "411" for all the United States, except for a narrow West Coast strip embracing Hollywood.

NBC Video Programs Rank High in Poll

NBC's "Texaco Star Theater" with Milton Berle, ranks first by a wide margin in a poll of East Coast radio and television editors, conducted by *Television Daily* to determine "Your Favorite TV Program." Six other NBC video programs or stars were also honored in the poll, the first of its kind among TV editors.

Fifty newspapermen on the East Coast in cities served by television stations participated in the survey. They ranked variety programs first in preference; dramatic, second; sports, third, and forum, quiz and children's programs in a fourth place tie.

"Philco Television Playhouse," NBC's hour-long dramatic program, garnered a large share of the popularity votes from the editors. "Meet the Press," another NBC video program, was given high rating in the forum category.

In the "most promising new artists" category, NBC stars took four of the five places receiving the most votes. They are songstress Kyle MacDonnell, star of "Girl About Town"; Barbara Marshall, song stylist, who has been heard on "Musical Miniatures"; and Helen King, graphologist, topping the list in the women's division. Bob Smith and "Howdy Doody" lead the list of male artists in this category.

Radiophoto Circuit Opens

A radiophoto circuit is now in operation between Shanghai and San Francisco, H. C. Ingles, President of RCA Communications, Inc., 66 Broad Street, has announced.

Radiophoto service to and from this Far Eastern center is expected to be widely used, particularly at this time, Mr. Ingles declared, pointing out that such circuits are capable of handling written and printed documents, in addition to news photos.

VOICES OF COMMENTATORS ARE RECORDED IN THIS STUDIO FOR MIXING LATER WITH MUSIC AND SOUND EFFECTS TO FORM THE COMPLETED SOUND TRACK OF A NEWSREEL OR TRAVELOGUE.



[18 RADIO AGE]



NEW TRANSMITTER BUILDING OF RADIOMARINE STATION WCC-WIM AT CHATHAM, MASSACHUSETTS.

New Transmitter Building Erected for Station WCC

Chatham, Mass., Selected as Site for Structure to House Modern Equipment and Facilities.

THE modern equipment and more extensive facilities housed in the Radiomarine Corporation of America's newly constructed radiotelegraph transmitting station at Chatham, Massachusetts, have undergone a thorough trial and proved the superiority of the new location on Cape Cod, according to Walter A. Buck, President. WCC and WIM transmitters, operated at Marion, Massachusetts, for 25 years are occupying the new quarters. With the additional new equipment manufactured by Radiomarine, combined with the more efficient antenna location provided by the salt marshland along Nantucket Sound, Mr. Buck said, WCC-WIM is one of the finest coastal radio stations in the world.

Conforming to the locality, the new transmitter building is an adaptation of the Cape Cod style of

architecture. The main structure of brick and stone is 112 feet long and 36 feet wide with a 24- by 42-foot wing. The windows are formed of heavy glass blocks to protect the transmitting and control equipment against damage from the heavy gales common to the area. Offices, storage space and shop facilities occupy the wing.

The new modern 20-kilowatt transmitter operating on medium frequencies and also on the distress frequency of 500 kilocycles; a 10-kw low frequency unit and three 3-kw high frequency units supplement the three 40-kw high frequency transmitters transferred from the previous site to make an impressive and efficient complement of shore station facilities.

A 300-foot self-supporting steel tower on the edge of the marsh

radiates signals from the medium frequency transmitter insuring positive communication with ships in distress and in the handling of regular message traffic. The heavier volume of radiotelegrams to ships at sea goes out to all parts of the world over shortwave antennas for the various frequencies. These antennas are suspended between several rows of poles up to 80 feet in height.

The new station operates in conjunction with the companion control and receiving station located at Chathamport, six miles away. WCC-WIM provides radiotelegraph service for ships and aircraft throughout the world. Hundreds of messages, press dispatches, weather reports and SOS calls from vessels in distress flow through these stations daily. The transmitting equip-

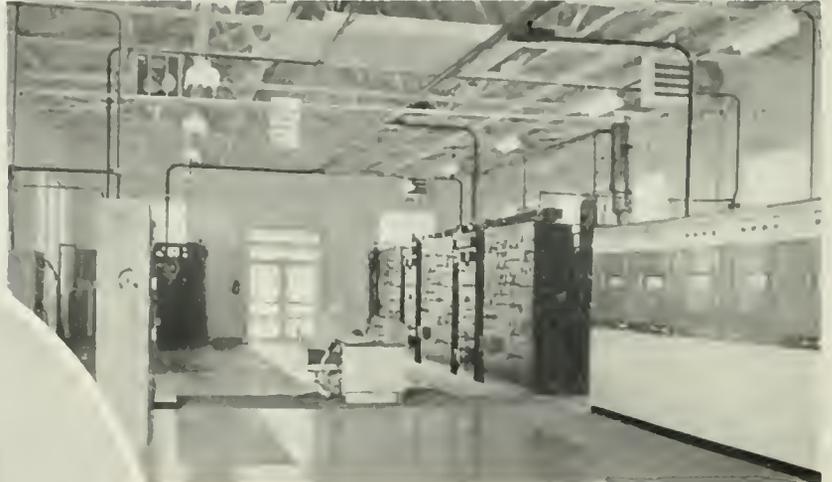
Receiving station of WCC-WIM houses the equipment which controls all transmitters.



New transmitter building (right) and cottage occupied by engineer-in-charge.



Beyond the lines of short masts supporting the station's high-frequency antennas is the high tower of Chatham's 500-kilocycle transmitter.



Interior of transmitter building showing high-frequency transmitters, in rear, and 500-kc transmitter (right). Frank Kremp, engineer-in-charge, at console.

Scenes from Radiomarine Transmitting and Receiving Stations WCC-WIM at Chatham, Massachusetts.

Messages awaiting transmission to ships are kept in this revolving rack at the receiving station.



Operators at the receiving station keep a constant watch on frequencies used by ships throughout the world.



ment is constantly attended by trained technicians and the control receiving station is manned by a staff of thirty highly-skilled code operators who keep continuous "watch" on the numerous frequencies used by marine and aircraft.

The carrying power of WCC's signals has been demonstrated in communications with the Byrd expeditions to the South Pole; to aircraft over Iraq; the lighter-than-air craft, Graf Zeppelin; the ill-fated Hindenburg, and many others. Pilots and navigators of long-distance plane flights have used Chatham for the gathering of essential advance weather reports, and to contact their home bases while in flight. In 1938, when Howard Hughes made his round-the-world race against time, WCC brought continual news of his progress. Just ten years later, in 1948, when Pan American World Airways inaugurated its round-the-world clipper service, WCC linked the plane "America" with newspapers throughout the United States.

Maintains Medico Service

In addition to the normal message traffic handled by Chatham, RCA, in cooperation with the U. S. Public Health Service, also maintains a special service for the benefit of ill or injured passengers and crews of ships at sea. This service, called Medico, was established in 1921 and taken over by RCA in 1922. Since that time, thousands of vessels without doctors have made use of the facilities without cost. Chatham and the other coastal stations operated by Radiomarine, process 75 to 100 Medico cases a month. As each request for aid is received, details of the case are teletyped to the nearest Marine Hospital where doctors on duty study the reported symptoms and file a return message prescribing the method of treatment. Medico messages have been exchanged with ships in the South Pacific, the Indian Ocean, and, in fact, in all the seven seas.

The history of station WCC is the history of marine radiotelegraphy. These call letters, now instantly recognized by ship radio operators on all oceans, were first assigned in 1913 to a pioneer station of the Marconi Wireless Telegraph Com-

pany of America at South Wellfleet, Massachusetts, 30 miles east of the new WCC at Chatham. There, on the ocean side of the Cape, Guglielmo Marconi, in 1903, had erected a transmitter building situated in the center of four 210-foot lattice-work towers which supported an extensive system of antennas for his experiments in transatlantic communications. But the rapid evolution of radio was destined to out-mode the crude transmitting apparatus, and in 1911, Wellfleet was abandoned to weather and the seas.

In order to continue his operations, Marconi erected a new receiving station at Chathamport on the Bay side of the Cape, about three miles from the town of Chatham, and a new transmitting station was built at Marion, near where the Cape joins the mainland.

However, World War I soon intervened and both properties were taken over by the Navy. The government retained control until shortly before the Radio Corporation of America was formed in 1919.

For the first two years under RCA ownership, Chatham was a point-to-point station, exchanging messages with Germany, Norway and Sweden. Then in 1921, as plans were made to transfer all point-to-point activities to the newly built Radio Central on Long Island, the Company installed a 500 kilocycle transmitter, with call letters WCC, in the receiving station at Chathamport to serve as a ship-to-shore link. This was supplemented a year later with a second WCC transmitter designed to operate on 2200 meters, a wave length at that time considered ideal for long-range communications. The 500 kilocycle transmitter then assumed the call letters WIM.

Interference Increased

However, with the addition of the 2200 meter equipment, interference problems increased. At that time "wireless" apparatus, beginning to be known as "radio" was relatively crude in comparison with present day standards. To eliminate transmitter interference at the increasingly busy receiving positions meant the removal of the transmitting equipment a considerable dis-

tance from the receiving antennas. Accordingly, WCC's transmitters were moved to Marion.

Overland telephone wires were leased to connect transmitters with the operators' keys at Chatham. This arrangement worked satisfactorily during placid days on the Cape. But with the coming of winter storms, operations were sometimes interrupted by ice formations and by trees which had fallen across the wires. On these occasions, crews were rushed from both ends of the circuit to find the trouble and rejoin the wires.

1927 Emergency Recalled

Oldtimers still at Chatham recall the emergency they faced in 1927 when the Prince of Wales was on his way to this country aboard the *SS Berengaria*. At an hour when message traffic to and from the British liner was at its peak, a windstorm broke connections in several places between Chatham and Marion. With 300 urgent messages waiting to be radioed to the vessel, one of the crack operators, carrying his telegraph key, set out through the gusty night, feeling his way in the dark from pole to pole until he spotted the break nearest Marion. He connected his telegraph key into the line, and in this unorthodox manner, proceeded to operate the Marion station transmitter until the last of the messages had reached the *Berengaria*.

With the advent of "short waves" and the spanning of greater distances, message volume increased rapidly and it was essential that interruptions to service be eliminated. To insure this, RCA engineers in 1937 designed and installed a microwave beam system over which the transmitters at Marion were radio-controlled from Chathamport, replacing the long overland control wires. But the Government services recognized the value of the facilities available at Chatham and they were annexed to play their part in the World War II effort. Today, the new transmitting station with its associated control receiving station, embodying the latest design in electronic equipment stands as a model of efficiency to serve the maritime world.

RCA FREQUENCY BUREAU

Conference Work, License Processing and Publication of Reports Are Among Functions of Bureau's New York and Washington Offices. Expert Advice and Service on Frequency Matters Available to All RCA Divisions



By Philip F. Siling
*Engineer-in-Charge
RCA Frequency Bureau*

AS EARLY as 1930, RCA recognized the need for establishing the frequency bureau, then a part of RCA Communications, Inc., as a separate department. This reorganization was desirable in order that all the Corporation's divisions and domestic subsidiaries could be serviced relative to frequency allocation, station licenses, and related matters. To accomplish this, the "RCA Central Frequency Bureau" was formed.

It continued in existence until 1935, when the allocation of frequencies became increasingly complex. Furthermore, complications from increased governmental and international regulations mounted rapidly and the need grew for expert Frequency Bureau service to aid in policy decisions.

The present RCA Frequency Bureau was established in 1935 to prevent duplication of work and avoid conflict in dealings with governmental agencies. Its scope was greatly enlarged to include more general representation of RCA interests in frequency allocations and allied subjects. In 1945 the Frequency Bureau was made a part of the RCA Laboratories Division, at which time its functions were further extended to include the coordination of aviation activities.

Among its many services, the

liaison work conducted by the Bureau is of primary importance. The RCA Frequency Bureau, maintaining offices in New York and Washington, is the normal contact channel between all RCA divisions and the FCC, other government departments, and international organizations. These contacts involve matters concerning frequency allocations, their uses, applications and assignments; interference between radio stations; station licensing, and policy decisions.

A very large percentage of this work relates to the Federal Communications Commission alone, for through the Frequency Bureau a continuous flow of information on RCA activities is channeled into interested offices and branches of the Commission.

Similarly, the RCA Frequency Bureau keeps interested officials of RCA and its affiliates continuously informed of all Commission actions which might affect their operations. Due to the lapse of time between

the issuance of new FCC regulations and their actual publication by the government, the Frequency Bureau set up its own publication system to make regulation changes promptly available to all concerned in the Company.

The analysis and distribution of all FCC reports, public notices, news releases, proposed frequency allocations, orders, hearing calendars, proposed and final decisions, has become an increasingly useful function of the Bureau.

Aviation Field Represented

Other government agencies with which the RCA Frequency Bureau has regularly established contact include the State Department, War and Navy Departments, Bureau of Standards and Civil Aeronautics Administration. An aviation expert adequately represents RCA before all organizations in this category. With the objective of unifying industry views and adding to the store of information on frequency utilization, the Bureau performs informal contact work with the Washington headquarters of innumerable radio and allied administrations.

The RCA Frequency Bureau's principal foreign contact work consists in the clearance of cases and disputes arising from radio inter-

WAYNE MASON, (SECOND FROM RIGHT) MANAGER OF THE RCA FREQUENCY BUREAU'S NEW YORK OFFICE, DISCUSSES A LICENSE RENEWAL WITH GERALD GOULDRUP (SEATED), HEAD OF THE MARINE DEPARTMENT, AND FRANK TYSON, DEPARTMENT MEMBER.





FELIX SCHLEENVOIGT, (LEFT) ASSISTANT MANAGER OF THE BUREAU, AND PATRICK MORRIS, (SEATED, LEFT) IN CHARGE OF THE FREQUENCY MEASUREMENT SECTION, CONFER ON COMMUNICATIONS PROBLEMS.



THE AUTHOR (LEFT) DISCUSSES NEW GOVERNMENT REGULATIONS WITH RAY SIMONDS AND OTHER MEMBERS OF THE WASHINGTON OFFICE WHICH MAINTAINS CLOSE LIAISON WITH THE FCC.

ference. The discharge of this function, which frequently involves the State Department on diplomatic issues, serves to supply the Bureau with a variety of information useful in allocation questions, and in international conference participation.

Another important phase of Frequency Bureau liaison is the maintenance of inter-Company contact. It furnishes consultation on research and development projects, production and sale of equipment, and communications operations. By carefully watching allocations and prospective frequency assignments affecting RCA-developed or manufactured equipment, the Bureau is in a position to assist in guiding RCA organization policies, and to suggest to government authorities future RCA frequency requirements. This advisory service has been used extensively in connection with television and FM activities.

Thousands of Applications Filed

From ten to fifteen thousand applications for permits, authorizations and licenses, (including license modifications and renewals), are processed and filed annually with the FCC by the RCA Frequency Bureau. Through its understanding of the purposes of the original requests for these filings, as submitted by the Company's various services, the Bureau has been able to avoid duplicate and conflicting applications.

For RCA Communications, Inc.,

applications are processed covering frequencies, antennas, additions to licensed communications points, radiophoto material, and construction permits.

The Frequency Bureau assists the National Broadcasting Company in securing special authorizations to cover remote pickup programs, and by handling construction permits, licenses, and license renewals for standard broadcasting, television and FM stations.

On behalf of the RCA Victor and RCA Laboratories Divisions the Frequency Bureau obtains authorization for field tests and demonstrations of new equipment. The Bureau also secures type approval of new broadcast equipment and for modifications of existing equipment.

A separate Marine Unit of the Bureau processes coastal and ship-board licenses. The approximately 1800 licenses in these categories require frequent modification, assignment, reassignment, cancellation and renewal. An average of over two thousand radio operating matters, relating chiefly to marine service and involving either radio station equipment or radio operators, are handled annually by this Department.

Since the Bureau is responsible for radio frequency allocation mat-

ters, it participates in all FCC hearings on this subject. In carrying out this duty, special preliminary studies are made to aid the Corporation and subsidiary or division involved in presenting its side of the case. The Bureau also conducts and participates in informal engineering conferences preparatory to hearings, and furnishes staff members to give advice and act as expert witnesses.

Participates in FCC Hearings

The types of formal FCC proceedings in which the RCA Frequency Bureau has participated include hearings on general allocations, standards of engineering practice, establishment of new radio services, sub-allocations or regu-



THE AUTHOR AND ANNE LADD OF THE PUBLICATIONS DEPARTMENT EXAMINE ONE OF THE MANY REPORTS WHICH THE BUREAU PUBLISHES REGULARLY.

lations within a particular service, licensing and color television.

In the expanding field of international conference work, the RCA Frequency Bureau insures adequate RCA representation both in the extensive preparatory work and at the conferences themselves. This is of primary importance in maintaining RCA's position in international sales, manufacturing and operations. These conferences may be classified as general (Atlantic City Conferences, 1947) and special (North American Regional Broadcasting Conferences).

General Information Compiled

On the Atlantic City Conferences alone, preparatory work extended over a period of two and a half years, involving preliminary conferences at Rio de Janeiro, Bermuda and Moscow. Prior to both the preliminary and final conferences the Bureau figures prominently in government-industry planning to formulate United States proposals. It likewise participated in separate internal RCA and industry-wide meetings to resolve conflicts and obtain a united industry position. The results of these conferences have been reviewed and comprehensive reports distributed. The ever-increasing scope of international conclaves embraces, among others, those of the telephone, telegraph, radio technical, radio administrative and broadcasting fields.

Its general information service is another extremely valuable function of the RCA Frequency Bureau. In the Publications Department at 60 Broad Street, New York, a vast store of reference material on frequency allocation is compiled and kept on file. Among the voluminous listings are those on stations engaged in international high-frequency operation; active radio stations of the world, based on frequency measurements made at Riverhead, N. Y.; ship radio stations; and revised standard, television, FM, and international broadcasting station lists. One of the Bureau's most important publications is the color-coded frequency allocation chart, which has become almost indispensable to government radio officials and engineers here and abroad.

[24 RADIO AGE]



REPRESENTATIVES OF RCA LABORATORIES AND RCA VICTOR DIVISION MEET WITH STAFF MEMBERS OF THE SIGNAL CORPS ENGINEERING LABORATORIES IN THE FORT MONMOUTH AREA FOR A TWO-DAY DISCUSSION OF RESEARCH AND DEVELOPMENT PROJECTS. THE RCA DELEGATION WAS HEADED BY E. W. ENGSTROM (SECOND FROM RIGHT IN FRONT ROW) AND M. C. BATSEL (ON MR. ENGSTROM'S RIGHT). GENERAL LANAHAN, COMMANDING GENERAL OF THE AREA, AND GENERAL AKIN, CHIEF SIGNAL OFFICER, ARE FIRST AND FOURTH RESPECTIVELY IN THE FIRST ROW.

RCA Participates in N. Y. Book Festival

"Interpreting Industry to the Public by the Printed Word" was the theme of the RCA display at the recent Book Festival of the New York Museum of Science and Industry, in Radio City. During this event, which continued from November 3-11, more than 100,000 persons including businessmen, school children, members of the armed forces and sightseers visited the museum to study the displays of 49 exhibitors.

In the center of RCA's display were copies of the booklet, "RCA What It Is . . . What It Does" opened to pages showing pictures of the activities carried on by the various services of the Corporation. Also in the exhibit were books,

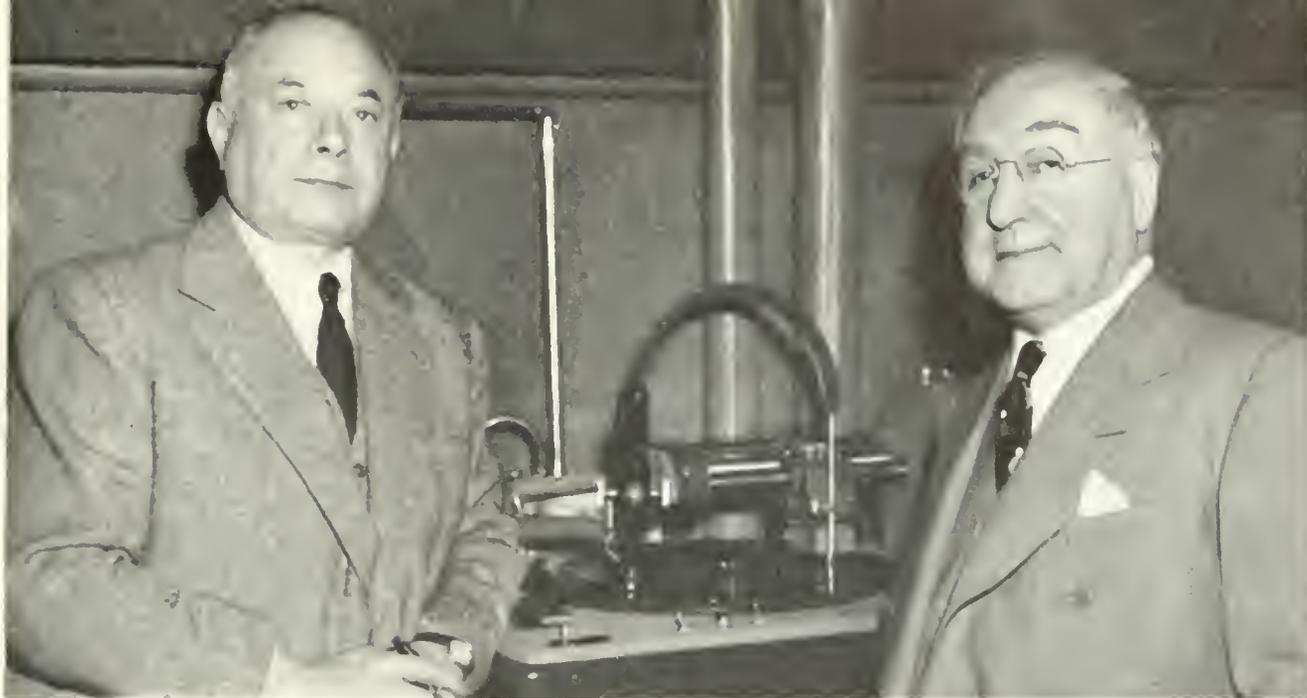
brouchures, catalogues, promotional material and pamphlets published by the Company.

Of the thousands of RCA booklets and pamphlets given away to visitors, the most popular were "The Magic of Making RCA Television Picture Tubes," and RCA Victor's "In the Groove" and "Record Review."

More than 25 books written by RCA employees were gathered for the display. Among them were volumes by Dr. Vladimir K. Zworykin, vice president and technical consultant of RCA Laboratories; Dr. James Hillier and other members of the Laboratories staff: John L. Hallstrom, general merchandise manager, RCA Victor Division, and Charles O'Connell of the Victor Record Department.

PUBLICATIONS OF RCA AND BOOKS BY RCA AUTHORS WERE DISPLAYED AT RECENT BOOK FESTIVAL IN RADIO CITY, NEW YORK.





BRIG. GENERAL DAVID SARNOFF (LEFT) AND JAMES C. PETRILLO, PRESIDENT OF AMERICAN FEDERATION OF MUSICIANS, AT SIGNING OF CONTRACT ENDING BAN ON THE MANUFACTURE OF RECORDS.

PACT ENDS YEAR-OLD BAN ON RECORD MANUFACTURE

FOR the first time since January 1, 1948, musicians began making new phonograph records on December 14, following the signing of an agreement by James C. Petrillo, President of the American Federation of Musicians, and officials of record-manufacturing companies.

The five year agreement, which had been approved by the Department of Justice, provides for a welfare fund for unemployed musicians. The fund is to be financed by imposing a royalty of one to two and a half cents a record, depending on its retail price. The money will be spent to produce free concerts staged by unemployed musicians who will be paid for their services. Samuel R. Rosenbaum, a director of the Philadelphia Orchestra Association was installed as impartial trustee of the fund, which, it is estimated, will receive \$2,000,000 a year from royalty payments.

Within two hours after official notice of the signing of the agreement had been received at the RCA Victor recording studio, 155 East 24th Street, New York City, RCA artists resumed the making of records.

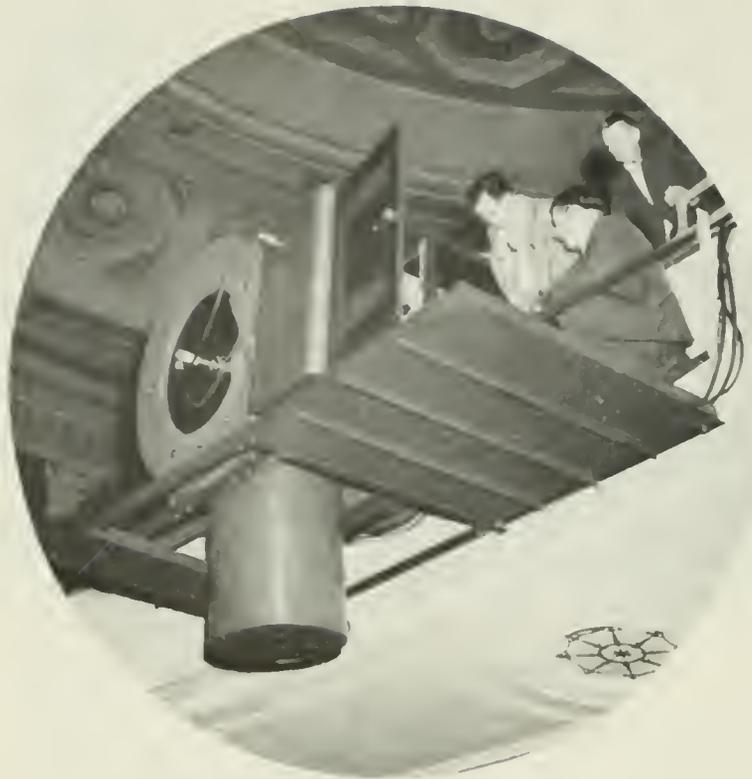
Petrillo's Comment

"I feel that something should be said about a great man who brought

this about, for this is another victory for all of us" said Mr. Petrillo, after the pact had been signed. "And feeling that one man in the industry was a fair man, I went to see General Sarnoff, some five-six months ago and I said 'General, what are we going to do about this thing. Are we going to fight it out like we did before, or are we gonna settle this matter in a nice manner like Americans should?' And he said: 'Jimmy, there shouldn't be any fights; we ought to get together on this thing.' And we did get together. He grabbed hold of the bull by the horn himself, called in the industry—did a swell job—advised me as to what he thought was right and wrong. I mean when I say advised me, he said: 'This is the thing we can do, and this is what we will do, and no more than this,' and so on, and I believed every word that man said. And, Ladies and Gentlemen, believe me that everything he said was God's honest truth. Night and day, when he says this is the truth, this is what's gonna happen—that's exactly what happened. I can't say too much for that man in this industry, and I think that labor has a friend in General Sarnoff."

Triumph for Industry and Labor

"This is almost as great an emotional surprise for me as seeing the first record cut here after a year of silence," said General Sarnoff in reply. "I don't know any appropriate response that I could make to so generous a statement as Jimmy Petrillo has just made about me. All I can say is that this is not the work of any one man. It took patience, restraint, wisdom and some skill in negotiations on both sides to arrive at this settlement. At this happy time of the year I think it is especially fitting to call attention to the fact that there can be harmony between men as well as harmony between singers. In these negotiations Mr. Petrillo has been fair and worked hard, and so did his counsel, Mr. Milton Diamond, who was a resourceful man at all points where we struck snags. As a general, I am a man of peace. And so I preferred a just and peaceful settlement to an unnecessary slugfest. I think this is a great triumph for both industry and labor, but the greatest triumph of all for the American people who will now be free to get selections of their own choice from a highly competitive industry."



DEVELOPMENT MODEL OF LARGE-SCREEN TELEVISION PROJECTOR SUSPENDED FROM THEATER BALCONY. PICTURES AS LARGE AS 18 x 24 FEET HAVE BEEN PROJECTED WITH THIS APPARATUS.

Large-Screen Television

Two Basic Methods of Projecting Theater-Sized Images Now Undergoing Series of Practical Tests



By Ralph V. Little, Jr.,

*Engineering Products Dept.,
RCA Victor Division*

LARGE-screen television systems for theaters and auditoriums have been developed in two forms, both of which are undergoing a series of practical tests. One is the direct projection system by which high-brilliance kinescope images are projected through an efficient reflective optical system; the other,

an intermediate film system using standard motion picture projection technique, after the television images have been photographed on motion picture film and suitably processed.

The direct projection television system consists of three major elements. One is the projection kinescope which is the source of the light image, the second is the optical system which projects the image onto the screen, and the third is the screen from which the final image is viewed.

The kinescope used in the direct system is similar to the direct viewing tube used in the conventional television receiver, except that projection kinescopes have a much greater light output due to higher voltage operation, for which they are specially designed.

The elements of the optical system consist of a spherical mirror, a correction lens, and a projection kinescope tube. The lenses now used

in large projection systems are made of plastic, formed in glass moulds by a cold-setting process. Lenses as large as twenty inches in diameter have been made by this process.

Reflective optics have been adapted for large screen projection up to 18 by 24 feet. The largest system ever built consisted of a 42-inch mirror, a 26-inch lens and projection kinescopes of either 12- or 15-inch diameter, operating at 80,000 volts. The high cost of the 42-inch mirror system has indicated the advisability of concentrating on smaller optics and increasing the voltage capabilities of the seven-inch projection kinescope in order to make a compromise system which would be successful commercially.

Three Units in Intermediate Plan

The alternate system of large screen television projection is the intermediate film method which consists of three major units. The first is the television recording unit with a quality television monitor and a special 35mm motion picture camera; the second consists of a high-speed processing machine, and the third, the conventional 35mm theater film projector. Such a system can be so integrated that the time elapsing between the appearance of the image on the kinescope and its projection on the viewing screen is less than one minute.

A special camera was devised which would compensate for the difference between the 30 complete images per second as used in television and the standardized rate of travel of motion picture film at 24 frames per second. This camera also provides for sound-on-film recording.

In this camera a precision shutter is required to give the proper exposure to the film. In terms of the television system, the exposure must be accurate to less than one-half of a scanning line or one part in 30,000. Improper exposure shows up as a black or white band when the wrong number of television lines is re-

(Continued on page 30)

Casting for Television

Stars of Broadway and Hollywood, Once Skeptical of Television, Now Look Upon New Medium as Potent Showcase for Talent



By Owen Davis, Jr.

*Director of Program Preparation
and Procurement
National Broadcast Company*

THE casting picture at NBC has changed greatly since, let us say, two years ago. Talent in those days was pretty hard to get; the industry was small, it offered little money compensation and the overhead lights were a great deal less comfortable than those used now. This is not to say that we were unable to obtain top-name stars. We could and we did, for even then there were actors and actresses genuinely interested in learning the ins and outs of the medium.

But today—with many commercial programs on the air and a growing number of dramatic productions seeing the light of day—actors are literally flocking to our doorsteps for a chance to appear on television.

The reason is simple: television is something they want. They like it artistically and they are afraid to be left out of it financially. And since art and finances are the two chief concerns of any actor, we are having little trouble getting good talent for our shows.

All actors today either remember or have been told about the early days of radio, when radio was screaming for talent and the great majority of Broadway and Hollywood actors were ignoring the screams. What happened was that those few who paid attention to the plaintive cries got in on the ground floor and have been making money

ever since. But those many who gave radio the brushoff have had good cause to regret it.

This is something today's actors don't want to have repeated. They see television as something that can coin them a lot of money even if, at present, many of them are not getting rich on it.

If one fact about casting for television stands head and shoulder above all others it is that stage experience is an actor's best qualification. We have auditioned thousands upon thousands of hopeful aspirants for video programs and in virtually every case, the actor who has trod the board, "has it".

Stage Actors Preferable

Stage actors, accustomed to acting with their whole bodies and able to memorize hours of script in comparatively short periods of time, are generally preferable to radio people whose voices are better actors than their bodies and who are better script readers than script memorizers. I say "generally" because there are, of course major exceptions. As to film people, they are in general, too far from us geographically and at present too hard to

get hold of to permit any generalizations.

The actor today sees television as a mighty potent showcase. When an actor goes on television, he knows that his audience may reach into the millions. It would take him many years of appearing on stage to play to that kind of audience.

By and large it is the stage actor—the actor trained to play before "live" audiences without a script—who thus far has been most successful in television. It is the actor who has felt that "rapprochement" with his audience—whose gags or whose lines are timed split-second with the audience's reaction. Actors have told me that appearing on television is like one "first-night" after another on the stage. Once the show is under way on television there are no re-takes, and once the show is over, it is not repeated hundreds of times by the same actors as a stageplay is. So there is something to the attitude of "first-nighters."

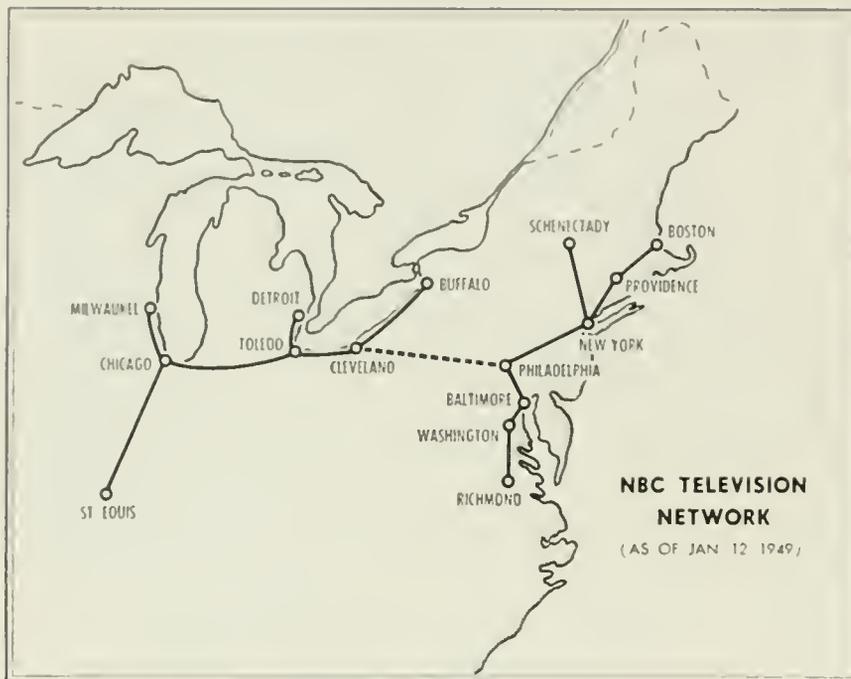
Generally speaking, of course, a good actor will be a successful one in television as he would be in any other medium. Talent, wherever it is found, is talent.

That television can benefit actors and actresses is demonstrated by the list of Broadway and Hollywood contracts that have been signed as a result of appearances on NBC. Ann Irish, Kathleen McGuire, Olive Stacy and Vaughn Taylor all came

(Continued on page 30)

PAT GRAY AND MAURICE MANSON, TELEVISION PLAYERS, AUDITION FOR THE AUTHOR (AT RIGHT).





COMPLETION OF THE COAXIAL CABLE SPAN INDICATED BY THE DOTTED LINE LINKS THE EASTERN AND MIDWESTERN TELEVISION NETWORKS.

TELEVISION NETWORKS JOIN

Eastern and Midwestern Chains Linked January 12 Making NBC Programs Available to 15 Stations.

WHEN President Truman takes his oath of office January 20, millions of people from Boston to St. Louis will be viewing the event, an accomplishment made possible by the completion on January 12 of the coaxial cable link joining NBC's East Coast and Midwest television networks.

The new, interconnected network consists of fifteen stations, eight in the East and seven in the Midwest. Another eight outlets, not yet connected by coaxial cable or microwave relay, will be serviced with kinescope recordings of major NBC television programs, bringing the total to 23.

Of the 23 stations, five are owned and operated by the National Broadcasting Company. This is the limit of ownership permitted by the Federal Communications Commission for any one company. Four of these stations—in New York, Washington, Chicago and Cleveland—will be part of the interconnected network. The fifth, in

Hollywood, is operating, but will not be joined to the rest of the NBC network until a coast-to-coast connection is available at some time in the future. The remainder of the stations are independently owned affiliates of NBC.

This constantly-expanding network is the outgrowth of two stations existing in 1940, WNBT, New York, and WRGB, Schenectady. Television activity was brought to a standstill during the war, but since 1946 the development of video in the fields of set manufacture, programming and station and network construction, has been phenomenal.

Joined by Cable and Relay

NBC's East Coast network was expanded to include Washington, Philadelphia, Baltimore, Boston, Richmond, and, very recently, Providence. These stations are joined by coaxial cable or microwave relay.

During this time, the Midwest web was taking form. NBC affiliates

came into being in Buffalo, Detroit, St. Louis, Toledo and Milwaukee. Linkage was completed between these stations, and on September 20, 1948, the NBC Midwest network was officially launched. Soon after that, their number was increased by two, as NBC's owned and operated stations in Chicago and Cleveland began telecasting.

Early in November the American Telephone and Telegraph Company notified NBC that service by coaxial cable between New York and Chicago would be available in January 1949. Unlike the East Coast connecting cable, which NBC uses full-time, the cables that join both the individual Midwest stations and the main East-west link must be shared with the other networks. This, however, is a temporary difficulty which is expected to be remedied as facilities increase.

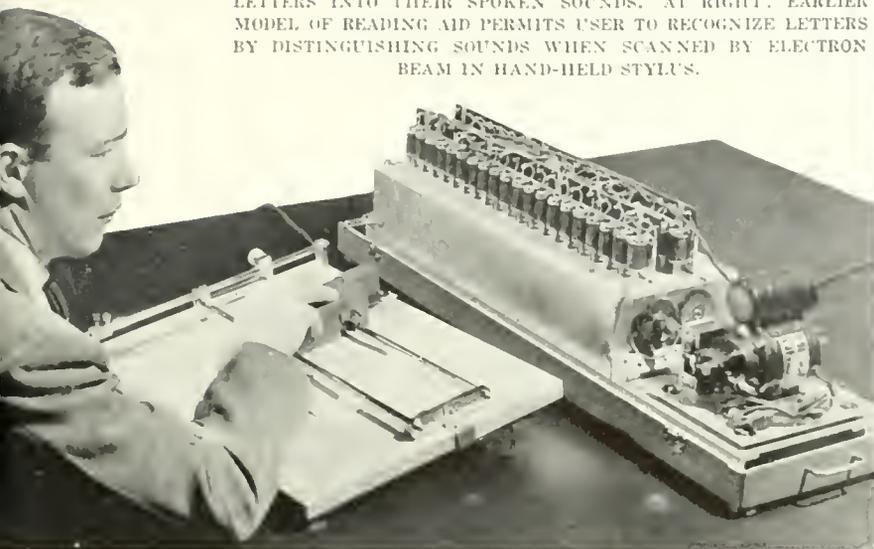
NBC was the first television broadcaster to develop a video network and continues to pioneer in networking its television shows. The role of a network in the development of the new medium is one of vital importance. Although individual stations may operate without the aid of networks, they have found it especially difficult to provide good program fare unless they are located in or near talent centers. Networking of programs, it has long been acknowledged, is the most practical way in which to get the highest quality program to the largest number of viewers at the lowest possible cost.

Signal Corps Purchases 217 RCA Radar Units

Two hundred and seventeen commercial-type marine radar units have been purchased by the U.S. Signal Corps for installation aboard ships of the U.S. Transport Service, according to an announcement by Walter A. Buck, President of Radiomarine Corporation of America.

The units consist of the latest surface-search 3.2 centimeter commercial radars, and represent one of the largest single radar orders received by Radiomarine to date. Other government sales have included units to the U.S. Coast Guard, Army Corps of Engineers and U.S. Navy.

BELOW: THIS MODEL OF ELECTRONIC READING AID CONVERTS LETTERS INTO THEIR SPOKEN SOUNDS. AT RIGHT: EARLIER MODEL OF READING AID PERMITS USER TO RECOGNIZE LETTERS BY DISTINGUISHING SOUNDS WHEN SCANNED BY ELECTRON BEAM IN HAND-HELD STYLUS.



Electronic Reading Aids

Latest Experimental Model Automatically Converts Letters into their Normal Sounds—May be Useful in Translating Coded Patterns.

A LABORATORY model of an electronic device which converts reading matter into the sounds of individual letters has been developed by the RCA Laboratories Division of the Radio Corporation of America. The development work was carried out by Dr. V. K. Zworykin, L. E. Flory and W. S. Pike of the Laboratories staff.

In operation, a line of type is scanned letter by letter with a scanning mechanism containing a miniature cathode-ray tube and an optical system. Each printed letter is scanned vertically with a pinpoint of light at a rate of 500 cycles per second. The scanning, however, is not continuous but is carried out so that the scanning spot pauses momentarily at several points along its path thereby creating the effect of a series of scanned spots arranged in a vertical line. To facilitate the recognition of signals from the individual spots of light, the spots are not present continuously, but are made to appear one after the other in a time sequence. If the series of spots forming the vertical line is now moved manually along the lines of type, the light, normally reflected by the white paper, will be interrupted by the

black portions of letters. These interruptions can then be transformed into electrical impulses by means of a phototube and amplifier.

As a result of the high speed vertical scanning and the manual scanning along the lines of print, the signal output of the phototube amplifier will be in the nature of the scanning frequency, modulated by the interruptions of light.

Five to eight channels or spots of light are present in each vertical sweep of the scanning beam and are separated by a timing circuit and counted by electronic means. The total number of pulses from all channels is unique for most letters of the alphabet.

One of the ambiguities exists in the case of b and d, since the number of counts derived from these two letters is the same. But closer examination of b and d will show a difference in the sequence in which the pulses in the various channels occur. In b, for instance, none of the scanning spots will be reflected at the start of the scanning because of the letter's vertical portion on the left. By contrast, the solid vertical portion of d is encountered by the scanning spots at the extreme right. The informa-

tion thus collected by the scanning process can be combined with the balance of the scanning information to differentiate between the two letters.

The output from the selector circuits is used to operate a magnetic reproducer arranged so that, as a letter is recognized, a single recording of that letter is reproduced through a loud speaker. The individual letter sounds are recorded on separate discs driven by friction from a continuously rotating shaft.

The instrument is believed to have possibilities as a recognition device for the translation of coded patterns such as those which form the basis of teletyped messages.

INDIA PURCHASES THREE SOUND FILM RECORDERS

Three RCA sound film recording systems, purchased by the Indian Government for the production of educational motion pictures and newsreels are expected to play a large part in India's plans to acquaint the people with the duties of citizenship in the new free state, according to official reports received by Meade Brunet, RCA Vice President and Managing Director, RCA International Division. Under the plans, films covering a wide range of progressive topics in social and economic fields will be produced in Bombay and distributed to all parts of the country by the Indian Ministry of Information.

[RADIO AGE 29]

Television Coverage Extended by New Method

(Continued from page 13)

"This new system will make the fine programs of these two stations available in more perfect form to many thousands of additional television viewers who live in a wide area between New York and Washington which heretofore has not received satisfactory service. The use of synchronization will soon be extended to other areas which are troubled with the problem of interference where two stations or more are on the same channel."

Reduction of tropospheric interference between television stations on the same channel became an urgent objective of industry engineers after the decision of the FCC in September to impose a freeze on processing of applications for the construction of television stations.

The interference, which occurs for the most part in fringe areas of television coverage, shows up on the screens of television home receivers as moving horizontal black bars, which may be described as a "Venetian blind" effect. The interference is due to characteristics of the troposphere, or upper air masses, which cause television signals to be refracted over long distances with signals from several transmitting stations being received simultaneously in certain localities. The extent of interference depends on the strength of the interfering signal and the difference in carrier frequencies of the stations involved.

Ray D. Kell, head of the Television Section of RCA Laboratories and long a pioneer in the development of television, conceived the idea of synchronizing the carrier frequencies to reduce the cross-bar interference. As the difference in carrier frequencies is reduced, the number of interference bars diminishes; when there is no difference in frequencies, there are no bars.

Mr. Kell's development work, in cooperation with RCA associates and NBC engineers, resulted in the equipment now in use between New York and Washington stations of NBC. This equipment consists of two units. The first is at RCA Laboratories in Princeton, the second

at television station WNBT in New York.

When the system is in operation, signals from New York and Washington stations are compared electronically at the output of two radio receivers located in Princeton.

Information regarding frequency differences of the two distant transmitters is carried as frequency modulation of a 1,000-cycle tone by telephone line to New York. The frequency shift of this tone is utilized to change the frequency of the New York transmitter to maintain it on exactly the same frequency as the Washington trans-

mitter. The operation of the system is entirely automatic and will require little or no attention.

It was pointed out that a similar system could be established, when equipment is available, to synchronize any two or more television stations operating on the same assigned channel. There are 12 channels assigned to television in the country at the present time with a total of 51 television stations using them. Seventy-three applications for construction permits have been granted by the FCC, and 310 applications are on file with the Commission awaiting the end of the freeze.

Casting for Television

(Continued from page 27)

to the attention of stage and film people through NBC video. Then there's Kyle MacDonnell, who had appeared in "Make Mine Manhattan" for about several months without achieving any great fame. After a half dozen shows on NBC Television she had received more publicity—including a cover picture in *Life*—and more big-time offers than she had ever dreamed of getting in so short a time while she was on Broadway.

Actors are notoriously unconventional in their desire to add artistic satisfaction to economic gain. Money, they admit, is important, but so is the pleasure of acting in a medium that provides their acting talents with full outlet.

And television is just such a medium. In television, an actor is not just a voice, as in radio, nor does he portray his part a few minutes at a time over a period of several weeks, as in the movies. In television he gets the artistic and emotional gratification of creating a complete, head-to-toe character every time he appears before the cameras. To the outsider this may appear to be a quite secondary consideration, but to anyone who knows the members of the acting profession, it is as important as the money to be made and the fame to be won.

One trend I've noticed lately is quite significant. Several major radio actors are giving up good money and putting in hard hours during the summer to play before stock company audiences. They're doing it as practice for television.

Large-Screen Television

(Continued from page 26)

corded on the film and will be seen as a region where a gap or overlap occurs making a white line for under-exposure and a black line when over-exposure occurs.

The next unit of a film system is the rapid processing equipment. The Eastman Kodak Company has found that rapid processing, at higher solution temperatures, is entirely feasible. The film generally selected for this purpose is a fine grain positive stock normally used for theater release prints.

The final link in the film system is the standard 35mm motion picture projector.

In performance, large screen projectors are now limited by the quality of signals available for projection. The technical possibilities of the projection system are equal to the best studio television equipment and an inferior picture on the screen is caused usually by a deterioration of the signal between camera and projector.

Dr. Zworykin Receives Poor Richard Club Award

Dr. Vladimir Kosma Zworykin, Vice President and Technical Consultant of RCA Laboratories, Princeton, N. J., has been named by the Poor Richard Club of Philadelphia to receive its 1948 Award for Achievement, an honor given annually "to the most deserving of contemporary American citizens." Dr. Zworykin will receive the award at the Franklin Institute, on January 17, at ceremonies highlighting the annual Franklin Day celebration which will be attended by the Governor of Pennsylvania and other state officials.

After selecting television as the most timely subject, the Club's members, composed largely of executives of newspapers, magazines, advertising agencies, printing concerns, and radio and television stations, unanimously voted that Dr. Zworykin, in developing the all-electronic system, was mainly responsible for bringing television out of the laboratory and making it commercially practical.

In addition to his invention of the iconoscope, television's first electronic "eye", Dr. Zworykin developed the kinescope, electronic picture tube of the television receiver. Presentation of the award coincides with the 25th anniversary of his invention of the iconoscope.

Additional citations have been received by Dr. Zworykin for his research and developments in the video art. In 1934, he received the Morris Liebmann Memorial Prize from the Institute of Radio Engineers. He was given the Overseas Award of the British Institution of Electrical Engineers in 1937 for a paper on the iconoscope, and in 1938 received the honorary degree of Doctor of Science from the Brooklyn Polytechnic Institute. In 1940, the National Association of Manufacturers presented him with the Modern Pioneers Award, and in 1947 Dr. Zworykin was awarded the Howard N. Potts medal of The Franklin Institute. His most recent citation was the Chevalier Cross of the French Legion of Honor which

he received from the French Government in 1948.

Past recipients of the Poor Richard Club award include Brig. General David Sarnoff, Chairman of the Board, Radio Corporation of America,

who received the medal in 1939 for outstanding achievements in radio; Will Rogers; Walt Disney; Capt. Eddie Rickenbacker; Will H. Hays, and Generals Dwight D. Eisenhower and H. H. Arnold.

Changes in RCA Management

(Continued from page 8)

Election of Mr. McConnell as Vice President in Charge of Finance of the Radio Corporation of America was announced on January 7 by Frank M. Folsom, President of RCA.

In 1941, Mr. McConnell joined the Legal Department of the RCA Manufacturing Company, now the RCA Victor Division. A year later, he was named General Counsel of that organization, and in 1945, he was elected Vice President and General Attorney of the RCA Victor Division. He has been Vice President in Charge of Law and Finance of the RCA Victor Division since April, 1947.

Mr. McConnell, who is a native of Davidson, N. C., was graduated from Davidson College in 1927, and in 1931 received a Doctor of Laws degree from the University of Virginia. He practiced law in West Palm Beach, Fla., and in Charlotte, N. C., then in 1933 joined the legal staff of the National Recovery Administration, serving part of the time as head of one of the three sections of the NRA legal department.

Upon leaving the NRA in 1935, Mr. McConnell became an associate in the New York law firm of Cotton, Franklin, Wright & Gordon (now Cahill, Gordon, Zachry & Reindel), where he specialized in legal phases of government regulation of corporate enterprise.

Mr. McConnell is a member of Phi Beta Kappa, Kappa Alpha, and Phi Delta Phi fraternities.

Announcement of Mr. Buck's election as Operating Vice President of the RCA Victor Division, Radio Corporation of America, was made by John G. Wilson, Executive Vice President in Charge of that Division on January 7.

Mr. Buck, a retired Rear Admiral of the U. S. Navy, has served since March 15, 1948, as President of

Radiomarine Corporation of America, a service of RCA. In retiring from the Navy last March, Mr. Buck ended a distinguished career of 30 years in the Navy, the last two of which he served as Paymaster General and Chief of the Bureau of Supplies and Accounts. For his wartime services he was awarded the Legion of Merit.

A native of Oskaloosa, Kan., Mr. Buck was graduated from Kansas State College of Agriculture and Applied Science with a Bachelor of Science degree in Electrical Engineering in 1913, and received a Master of Science degree from the same college in 1916.

He was commissioned an Ensign in the Navy on July 30, 1917, and served in World War I as supply officer on the *USS Canandaigua*. After the war, he received a variety of assignments, including four years in the Planning Division of the Bureau of Supplies and Accounts.

In World War II, he rose from Commander to Rear Admiral, serving with distinction on the staff of Arthur L. Bristol with the Atlantic Fleet, and later with the Office of Procurement and Materiel in Washington. In 1945, he was named Director of the Navy Materiel Redistribution and Disposal Administration and then Chief of the Property Disposition Branch, Materiel Division. Before his promotion to Paymaster General and Chief of the Bureau of Supplies and Accounts, he served for seven months as Assistant Chief of that Bureau.

Wins H. P. Davis Award

Howard Reig, staff announcer of WGY, Schenectady, New York, has been named national winner of the H. P. Davis National Memorial Announcers' Award for 1948. He received a gold medal and a cash prize of \$500.

Another RCA First!



RCA SPECIAL RED TUBES

Minimum life—10,000 hours!

• These new RCA Special Red Tubes are specifically designed for industrial and commercial applications using small-type tubes but having rigid requirements for extra reliability and long tube life.

As contrasted with their receiving-tube counterparts, RCA Special Red Tubes feature vastly improved life, stability, uniformity, and resistance to vibration and impact. Their unique structural design makes them capable of withstanding shocks of 100 g for extended

periods. Rigid processing and inspection controls provide these tubes with a minimum life of 10,000 hours when they are operated within their specified ratings. Extreme care in manufacturing combined with precision designs account for their unusually close electrical tolerances.

RCA Application Engineers are ready to co-operate with you in applying these new types to your designs. Write RCA, Commercial Engineering, Section DR75, Harrison, N. J.

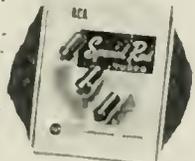
TABLE OF RECEIVING-TYPE COUNTERPARTS

5691	65L7GT
(0.6 A. heater)	(0.3 A. heater)
5692	65N7GT
5693	65J7

RCA Special Red Tubes can be used in most cases as replacements for their counterparts in equipment where long life, rigid construction, extreme uniformity, and exceptional stability are needed.

SEND FOR BULLETIN . . .

Booklet SRT-1001 contains complete technical data on RCA Special Red Tubes. For your copy write: RCA, Commercial Engineering, Section DR75, Harrison, N. J.



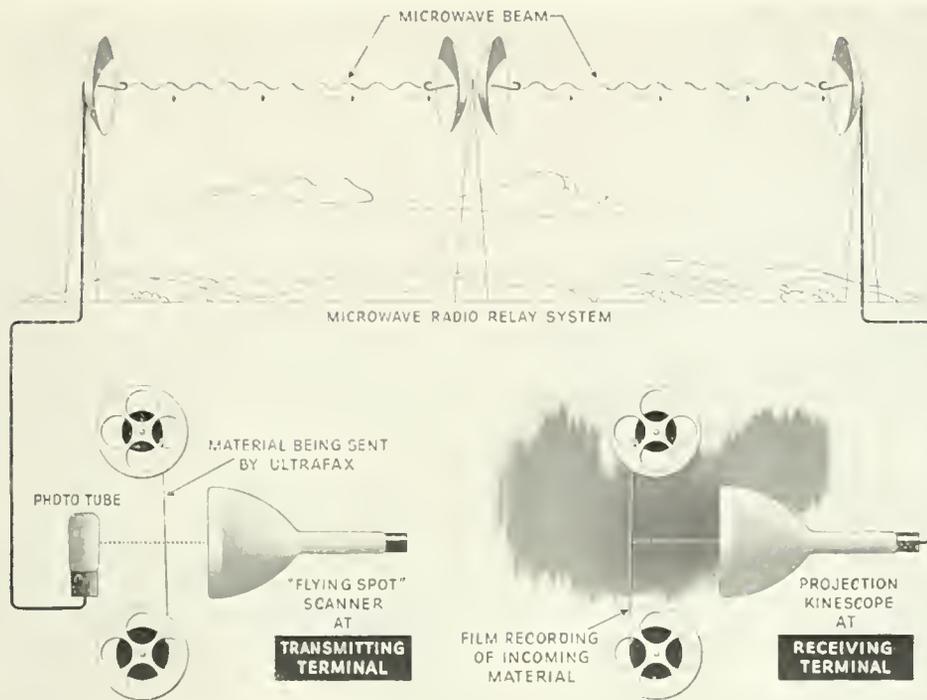
THE FOUNTAINHEAD OF MODERN TUBE DEVELOPMENT IS RCA



TUBE DEPARTMENT

RADIO CORPORATION of AMERICA

HARRISON, N. J.



PERIODICAL DEPT.

SIMPLIFIED DIAGRAM OF A COMPLETE ULTRAFAX SYSTEM SHOWING THE PRINCIPAL ELEMENTS WHICH MAKE POSSIBLE THE MILLION-WORDS-A-MINUTE TRANSMISSION SPEED OF THE NEWLY DEVELOPED MEDIUM OF COMMUNICATION.

Ultrafax: Million Words a Minute

Sarnoff Foresees Ultrafax Opening New Era in National and International Communications—He Urges Study Looking Toward the Establishment of a New National Communications Policy

ULTRAFAX, a newly developed system of television communications capable of transmitting and receiving written or printed messages and documents at the rate of a million words a minute, was demonstrated publicly for the first time by the Radio Corporation of America at the Library of Congress, Washington, D.C., on October 21.

Brigadier General David Sarnoff, President and Chairman of the Board of RCA, declared that Ultrafax, which splits the seconds and utilizes each fraction for high-speed transmission of intelligence, is as significant a milestone in communications as was the splitting of the atom in the world of energy.

Among the possible developments which General Sarnoff foresaw were:

1. The exchange of international television programs achieved on a transoceanic basis.

2. A service of television and Ultrafax by which the same receiving set would bring various types of publications into the home, or a newspaper for that matter, without interrupting the program being viewed.

3. A system of world-wide military communications for this country, scrambled to the needs of secrecy, which with ten transmitters could carry in sixty seconds the peak load of message traffic cleared from the Pentagon Building in twenty-four hours during the height of World War II.

4. The establishment of great newspapers as national institutions, by instantaneous transmission and

reception of complete editions into every home equipped with a television set.

5. The transmission of a full-length motion picture from a single negative in the production studio simultaneously to the screens of thousands of motion picture theatres throughout the country.

6. The possibility of a new radio-mail system with the vast pickup and delivery services of the Post Office Department.

Representatives of the United States Armed Forces, Government agencies, industry and the press witnessed the introduction of this advanced communications system. RCA presented the demonstration as a "progress report" to show that the system has reached a stage of development where plans can be