RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

RCA

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951

Radio Age

• MANUFACTURING • COMMUNICATIONS
IROADCASTING • TELEVISION

OCTOBER 1951

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NOTICE

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

Printed in U S.A.

VOLUME 11 NUMBER 1

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

DAVID SARNOFF, *Chairman of the Board*
LEWIS MacCONNACH, *Secretary*
FRANK M. FOLSOM, *President*
ERNEST B. GORIN, *Treasurer*

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

DAVID SARNOFF

COMMEMORATING THE FORTY-FIFTH ANNIVERSARY OF DAVID SARNOFF'S ENTRY INTO THE FIELD OF RADIO ON SEPTEMBER 30, 1906, THIS PLAQUE IS DEDICATED BY HIS ASSOCIATES IN THE RADIO CORPORATION OF AMERICA AS A SYMBOL OF THEIR ESTEEM AND ADMIRATION.

AS A PIONEER OF WIRELESS, HE HAS CONTRIBUTED IMMEASURABLY TO THE DEVELOPMENT OF RADIO, TELEVISION AND ELECTRONICS AS NEW SERVICES TO THE NATION AND TO THE AMERICAN PEOPLE.

A CREATIVE CRUSADER OF PROGRESS ENDOWED WITH A PENETRATING VISION, DAVID SARNOFF HAS CONTINUALLY LED THE WAY ACROSS NEW FRONTIERS IN SCIENCE, ART AND INDUSTRY TO MAKE THE UNIVERSE VIBRANT WITH INTERNATIONAL COMMUNICATIONS.

THESE LABORATORIES, THE RCA VICTOR PLANTS, THE RCA WORLD-WIDE RADIO CIRCUITS AND THE NBC RADIO-TELEVISION NETWORKS, SYMBOLIZE HIS FAITH IN SCIENCE, HIS CONSTRUCTIVE PLANNING AND ENDURING ACHIEVEMENTS.

DAVID SARNOFF'S WORK, LEADERSHIP AND GENIUS COMPRISE RADIO'S PREEMINENT RECORD OF THE PAST, TELEVISION'S BRILLIANT PERFORMANCE OF THE PRESENT, AND A RICH LEGACY IN COMMUNICATIONS FOR THE FUTURE.

THIS LABORATORY OF RCA IS NAMED
THE DAVID SARNOFF RESEARCH CENTER

SEPTEMBER 30, 1951

This bronze plaque, commemorating General Sarnoff's 45 years in the field of radio, has been placed in the entrance foyer of the David Sarnoff Research Center at Princeton, N.J.

Color Television on Theatre Size Screen

As AN impressive climax to its most recent field tests of all-electronic compatible color television, which were held in New York and Washington from October 9 to 19, RCA brought the series to a close with a four-day demonstration of theatre-size color TV at the Colonial Theatre in New York. In addition to the thousands who viewed the programs on direct view receivers installed in Radio City and in an NBC Studio in Washington, an even greater number were admitted to see the large-screen images. Representatives of the press, radio and theatre industries, and the public were unanimous in praise of the lifelike color, clarity and brightness of the pictures. At the same time, untold thousands were able to witness the programs in black-and-white on their home receivers, an accomplishment made possible by the compatible feature of the RCA system.

The color programs were transmitted over WNBT New York, and WNBW in Washington. Furthermore, to demonstrate the adaptability of the system to existing network facilities, the signals were sent to Washington over both coaxial cable and microwave relay. There the pictures were observed by the Washington press, members of the Cabinet, of Congress, the Federal Communications Commission and other interested groups.

In New York, capacity audiences watched the tests on experimental direct view color television receivers in the lounge of the Center Theatre, Radio City. As an aid to a survey of public reaction to the RCA tests, viewers were asked to note their comments on printed questionnaires supplied by the Opinion Research Corporation of Princeton, N. J.

The morning programs at 10 o'clock were transmitted on Channel 4 in Washington and in New York by the same transmitters that normally send out monochrome television programs. Afternoon programs, at 2:15 and 4:00, were transmitted by closed circuits from the studio to the viewing points in the two cities.

Throughout the duration of the tests, three programs were staged daily in NBC's studio 3H, supplemented by outdoor pickups. Starring in the presentations was Nanette Fabray, Broadway songstress who acted as mistress of ceremonies. Others who appeared were Dorothy Keller and Earl Barton, novelty dancers; Gail Manners and Arthur Maxwell, vocalists, supported by a waltz team in a Viennese number; George Burton's lovebirds and a select group of fashion models. Ben Grauer acted as commentator.

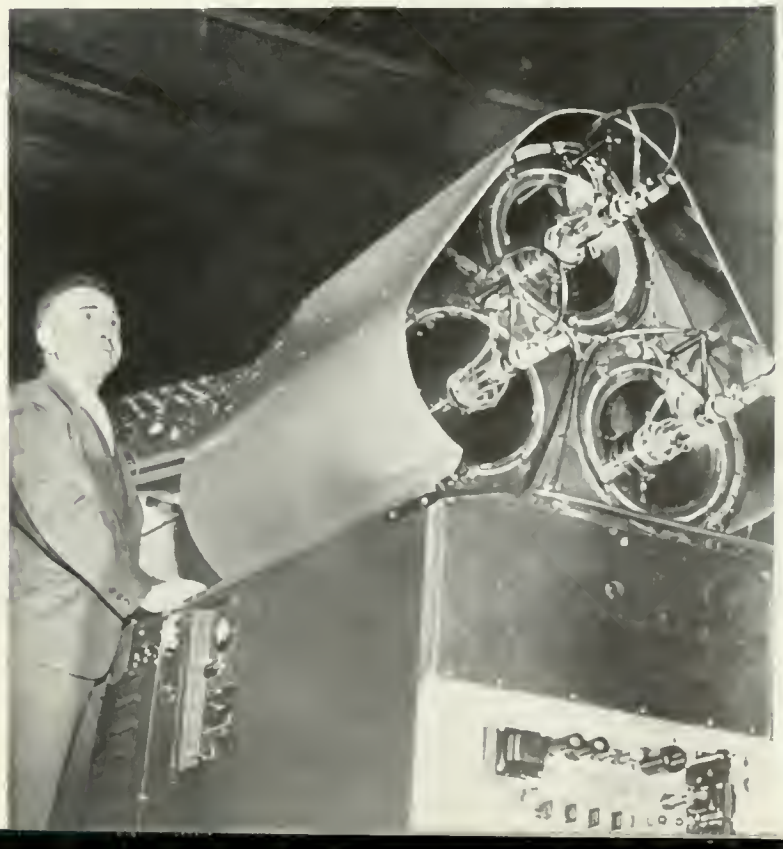
As an added feature to test progress in color television pickups out of doors, an RCA-NBC mobile color television unit transmitted scenes from Palisade Amusement Park, New Jersey. Microwaves carried the outdoor scenes to WNBT.

In a completely unscheduled exposure to the elements, the mobile camera unit proved its ability to operate under conditions far from ideal for outdoor pickups. While one of the programs was under way from Palisade Park, the skies darkened and a heavy shower of rain fell on the participants. Instead of adversely affecting the screen images, the diffused lighting produced excellent color textures. The only precaution taken by the mobile crew was to throw weatherproof covers over the color cameras.

To show the large screen images at the Colonial Theatre, use was made of apparatus consisting primarily of the RCA tri-color receiver-projector developed under the direction of Dr. David W. Epstein of the David Sarnoff Research Center of RCA. The receiver-projector was described as "a painstakingly achieved refinement of one demonstrated by RCA in 1947 at The Franklin Institute in Philadelphia."

Although the unit at the Colonial was mounted in the audience section for the demonstration, it was stated that subsequent models will be designed for a longer projection, permitting installation on theatre balconies. It was further explained that there is no reason why the

Dr. David Epstein of the David Sornoff Reseorch Center ot the controls of the RCA tri-color receiver-projector which provided theatre size screen imoges during recent field tests in New York.



RCA receiver-projector cannot be made to project pictures on full sized theatre screens up to 18 by 24 feet.

It was also pointed out that the projection apparatus utilizes the same type of optical system employed in RCA's black-and-white theatre television projectors, now installed in theatres in New York, Philadelphia, Washington, Chicago, Los Angeles and other American cities. It was recalled that RCA conducted its first public demonstration of big-screen black-and-white television pictures, using a projection optical system installed in the New Yorker Theatre ten years ago.

The improved receiver-projector employs three powerful five-inch projection kinescopes, or picture tubes, each coated with a phosphor which glows in one of three primary colors—red, green, and blue. Powerful and accurate projection lenses take the images from these three picture tubes, each much smaller than those used in present home television sets, and project these images for perfect registration to blend into a brilliant full-color picture on the big screen.

Special projection kinescopes achieve their brightness and effectiveness, in large part, through advances made by RCA since development of the original kinescope by Dr. V. K. Zworykin, Vice President and Technical Consultant of the RCA Laboratories Division. Some of these advances, such as the design of electron guns to operate at higher voltages, and the development of efficient phosphors with a wider range of color, have been under continuous research for many years.

Brig. General David Sarnoff, Chairman of the Board of RCA, in praising the engineers for their achievement, pointed out the three-fold purpose of the demonstration at the Colonial Theatre: (1) To reveal how motion picture theatres of the future may receive and project color television programs on theatre-size screens; (2) To show a new dimension of the compatibility of the RCA color system with black-and-white television standards; (3) To prove that color television transmissions can reach theatres satisfactorily by radio relay, coaxial cable or on-the-air broadcasts.

"This is another effective test of the flexibility of RCA's compatible, all-electronic color television system, and the variety of valuable uses to which it can be put, not only in homes, but in theatres across the nation," said General Sarnoff.

The brightness and clarity of the large-screen color television pictures, General Sarnoff noted, were achieved within present black-and-white broadcast standards. He pointed out that because of this compatibility it was possible with the RCA color theatre television equipment to receive and project transmissions in either color or black-and-white, without changing the apparatus. He also declared that such transmissions can be taken from on-the-air broadcasts of local stations, or over coaxial cable or radio relay.

(Continued on Page 31)

One of the viewing rooms in the Center Theatre, New York, where the public viewed programs transmitted by the RCA compatible color television system.

Artist's interpretation of the large-screen color television apparatus installed in the Colonial Theatre, New York, for the October field tests.

Sarnoff Challenges Scientists of RCA to Make Three Important Inventions

Brig. General David Sarnoff, Chairman of the Board of Radio Corporation of America, speaking at a ceremony in Princeton, N. J., on September 27, commemorating his 45th anniversary in the field of radio, told RCA research scientists that there are three important inventions he would like to have them make before he reaches his 50th radio anniversary in 1956.

Citing contributions RCA scientists already have made to the advance of science and industry, General Sarnoff asked them to invent an electronic amplifier of light for television, a television picture recorder, and an electronic air-conditioner for the home.

The occasion of the triple challenge to RCA scientists was the dedication of RCA's Princeton laboratories as the "David Sarnoff Research Center," in appreciation of General Sarnoff's "faith in science, penetrating vision, constructive planning and enduring achievements in the fields of radio, television and electronics."

"I realize the challenge to your ingenuity in these three new inventions I am asking for," General Sarnoff said, "but I know that you can solve the problems because you have an enviable record of accomplishment in science."

The specifications for the three inventions are as follows:

First, an electronic amplifier of light that would provide brighter pictures for television which could be projected in the home or theatre on a screen of any desired size. An amplifier of sound gave radio a "loudspeaker" and an amplifier of light would give television a "big-looker." He named it a "Magnalux."

"A true photo-amplifier that could produce bigger and brighter pictures in fine detail would greatly advance television in the home," said General Sarnoff. "It is also needed for theatres and industrial purposes. The presently known optical systems cannot accomplish it. We can, of course, enlarge pictures optically, but in the process light is lost and the pictures become dimmer instead of brighter. What is needed is a true amplifier of light itself."

Second, a television picture recorder that would record the video signals of television on an inexpensive tape, just as music and speech are now recorded on a phonograph disk or tape. Such recorded television pictures could be reproduced in the home, or theatre, or elsewhere, at any time. He called it a "Videograph."

BRIG. GENERAL DAVID SARNOFF

"I would like to ask you now . . . for three presents that I wish you would give me some time between now and my 50th Anniversary in radio."

"The television art needs an electronic recorder of television picture signals," said General Sarnoff. "Today when a television program is recorded, the pictures pass from the camera through the major portion of the television system and first reproduce the picture on the face of a kinescope. Another and special camera placed in front of the kinescope, photographs the program on motion picture film. But that technique is costly, time-consuming and limited. The pictures pass through all the possible hazards of the television system, and then through all the photographic process with its possible

degradations. As a result, the recorded picture suffers in quality.

"In contrast with present kinescope recordings on film, the instantaneous recording of the actual television picture signals on tape would be more economical, would save time in processing, and would simplify certain problems of distribution. Also it would solve the national time-zone problem in telecasting. Any number of copies of such tapes could be made instantaneously, and copies could be preserved for historic reference or other use. The Videograph would be a new instrument that could reproduce television programs from tape at any time, in the home or elsewhere, in much the same way as the present phonograph reproduces the music you want when you want it."

Third, an electronic air-conditioner for the home that would operate with tubes, or possibly through the action of electrons in solids, and without moving parts. It should be small, noiseless and inexpensive and should fit into any size room. He named it "Electronair."

General Sarnoff called attention of the scientists to the discovery and recent applications of electrons working in cold solids instead of heated vacuum tubes.

"Electrons in solids offer tremendous possibilities," said General Sarnoff, "and I bid you to harness them to work in 'solid comfort,' instead of subjecting them to red-hot heat. Indeed, cold electrons are a great challenge, the promise of which is already manifested in tiny transistors, now being developed for use as detectors and amplifiers in radio, wire and cable communications. You have succeeded in throwing away the spinning wheels in television, and I am sure you will also succeed in discarding the wheels and noise in air-conditioners.

"These are essential inventions for which there is a basic public need. They would expand existing industries and create new ones," said General Sarnoff. "I hope you will have them ready for service by the time I celebrate my 50th radio anniversary in 1956."

While some work has been done along the lines indicated, General Sarnoff said, much work remains to be done before practical solutions are found to the problems involved in these new developments

"Naturally, I look to the scientists and engineers of RCA to be first in solving these problems," he continued. "But it is in the American spirit of competition under the private enterprise system that I call attention, publicly, to the need for these inventions. Whether it be the lone inventor in the attic, or the scientists in competing industrial laboratories who will produce these inventions, the results will spell new opportunities for service and progress for all.

"I realize the challenge to your ingenuity, but I know that you can solve the problems because you have an enviable record of accomplishment in science and invention.

"RCA scientists and engineers have made marvelous contributions to the advance of science and industry, especially in the realms of radio, radar, television and electronics.

"World-wide communications, radio broadcasting, talking pictures, microphones, phonographs and records, public address systems and industrial devices have been developed and advanced by RCA research and engineering.

DR. C. B. JOLLIFFE

"We are all very happy to have you recognize General Sarnoff's interest in technical matters. It is a pleasure for us to work with him . . ."

GEORGE DE SOUSA

"General Sarnoff's outstanding achievements in the service of RCA have justly earned for him our highest admiration and devotion."

DR. GANO DUNN

". . . David Sarnoff's life has been an inspiration for me and I deeply feel the honor of being asked to take part in this ceremony."

"From RCA Laboratories have come the kinescope — now the universally used television picture tube — and the famous image orthicon television camera tube. The electron microscope — the basic inventions in the microwave radio relay — ultrafax — are the products of your genius.

"Your research and inventive skills have produced the present system of all-electronic black-and-white television and the compatible color television system.

"The tri-color tube, which I consider to be a scientific marvel of this age, has been created and developed by the RCA.

"Through your explorations in space you have extended the radio spectrum for more and more useful purposes. Through pioneering research in our laboratories and by experimentation at our Bridgeport station, you have pioneered and opened up the ultra-high frequencies to practical use. These achievements will extend the service of television to all parts of the Nation.

"Television in itself," said General Sarnoff, "is like a new book, and on each new page you turn you will find new ideas and challenges just as all inventors have done in turning the pages of radio.

"The wireless I knew 45 years ago is not the radio of today. The television you know now as pioneers will not be the television of tomorrow. Indeed, we have only turned its page one, in Chapter 1 of the Electronic Age. So I bid you study well the past and to achieve in the present by creating for the future.

Project "Typhoon"

"As busy as you are in research, you may not have had time to realize what your inventive skills mean to our country and to the world. For example, consider the project in our Laboratories known as 'Typhoon.' In the past the design of guided missiles has necessitated an expensive trial and error process. There was no guarantee that a new missile would perform as expected. Now, through a super-brain known as an electronic computer equipped with 4,000 electron tubes, designed and built by RCA Laboratories in cooperation with the Bureau of Aeronautics, U. S. Navy Department, missile design has been greatly simplified and speeded with mathematical accuracy.

"Within the past ten months nearly 1,000 test runs of proposed guided missiles have been made before the missiles were actually built and flown. This has saved our government $250,000,000.

"This latest computer has contributed so effectively to the guided missile research program of the United States that years of valuable time as well as hundreds of millions of dollars are being saved in the development of these important weapons.

"You who work directly in the research fields of radio and television may find new ideas and challenges in the fact that your brother scientists working in nuclear physics in our Laboratories have successfully derived electrical voltages from radioactive materials. This achievement — still in its initial stages — holds tremendous promise for the future."

A bronze plaque, (see frontispiece) unveiled at the luncheon in General Sarnoff's honor, was presented by Gano Dunn, President of The J. G. White Engineering Corporation, and Director of the Radio Corporation of America. Included in the many congratulatory messages received by General Sarnoff and read at the luncheon were telegrams from President Truman and Governor Dewey. Said the President:

"Congratulations on your forty-five years of great achievements in the field of radio, television and electronics. Through your leadership in American industrial life and in science, you have contributed immensely to the growth of America and its preeminence in communication. It is most fitting therefore that RCA Laboratories at Princeton be named the 'David Sarnoff Re-

(Continued on Page 31)

Five Types of Tri-Color Kinescopes

Vast Scope of Research and Engineering in Developing Electronic Picture Tubes for Color Television Disclosed by RCA

DISCLOSING the vast scope of its research and engineering in developing electronic picture tubes for color television, the Radio Corporation of America announced on October 23 that it has built at least five types of tri-color tubes, each one capable of operation on all known television systems, including the RCA compatible all-electronic system, as well as the field sequential method and standard black-and-white.

The announcement coincided with publication of eleven technical papers by RCA scientists and engineers, making public their work on various aspects of color television tube design, in the October issue of the Proceedings of the Institute of Radio Engineers.

The five types of color television tubes illustrate basic designs covering a wide range of principles, according to Dr. E. W. Engstrom, Vice President of the RCA Laboratories Division. He said that RCA research scientists have studied and investigated many ideas and concepts of color picture tubes, including some later shown by persons outside of RCA.

Dr. Engstrom pointed out that the five prototypes of tubes developed by RCA include those employing viewing screens formed of color phosphors arranged in patterns of dots, lines and checkerboard. Although the dot structure has been adopted for the tri-color tube now used experimentally in the RCA compatible color television system, other designs, he said, can incorporate any one of the several screen textures or a variation of them, without affecting the system.

In commenting on the information, which the technical papers make available to the industry, Dr. Engstrom said:

"The development of the tri-color picture tube is one of the outstanding scientific achievements to come out of the electronic industry since the end of the war. The selection by RCA of one particular tube as a production model does not mean that the other tubes are not promising. Practical reasons made it desirable, at this time, to narrow the choice to one tube for pilot-plant production. By initially concentrating the major part of our work on five tubes instead of one, we had a five-fold better chance of coming up with one which would be best suited to our present needs."

The scope of the effort involved in the development of the tri-color tubes is indicated by the fact that several hundred people, recruited from many different Divisions of the Corporation, were involved in the project.

Engineering details for the tri-color tube RCA is using in current field tests were turned over to the television industry in July, 1951, together with actual working models.

"As an objective for a good color reproducer," Dr. Engstrom continued, "we aimed at a tube which would give us good color, would perform on any known color system, and would also reproduce pictures in black-and-white from present television broadcasts.

"The RCA tri-color tube now being used meets all these requirements. It is a high performance tube. It provides high-quality color pictures and it operates with all known television systems. It does not impose external limiting factors on picture size."

Dr. Engstrom also said that "RCA's wide engineering and manufacturing experience in electron tubes enabled us to take both cost and performance factors into account in choosing the tube.

"A tri-color tube," he continued, "is the keystone to a successful color television receiver. But no color tube by itself affects compatibility — that is, the ability of a standard black-and-white receiver to get color broadcasts in black-and-white. This is a quality which must be inherent in the color television system itself.

"The RCA color television system," he emphasized, "is completely compatible."

Methods Tried

In a general discussion of the basic requirements for a good color television picture tube, E. W. Herold, a member of the staff at the David Sarnoff Research Center of RCA at Princeton, N. J., tells of methods suitable for reproducing color television pictures.

The tri-color tube now in pilot-plant production at the RCA tube plant in Lancaster, Pa., is described in detail in an article by H. B. Law, of the Research Center This is a three-gun tube for either simultaneous presentation of the three primary colors — green, red and

Four scientists of RCA examine five of the tri-color television picture tubes developed at the company's laboratories at Princeton, N.J., and Lancaster, Pa. They ore: (left to right) E. W. Herold; Dr. E. W. Engstrom, Vice President in Charge of RCA Laboratories Division; H. B. Law, and Dr. V. K. Zworykin, Vice President and Technical Consultant of the Division.

blue — as in the RCA system, or sequential presentation of the same colors.

This tube comprises a glass plate and a metal shadow mask. On the plate are 600,000 small, closely-spaced phosphor dots, each .014 inch in diameter, arranged in triangular groups. Each group consists of three dots which glow in the three primary colors, — red, green, blue — when hit by the scanning electron beam.

Behind the phosphor dot plate is the shadow mask. This is a thin metal sheet perforated with 200,000 tiny holes, and acts as a mask so that each electron beam as it scans can "see" only one dot of each color group. In the neck of the picture tube are three electron guns. These generate the beams of electrons which "paint" the color pictures on the phosphor plate.

The other four tri-color picture tubes described in the papers are basically similar in that the color is created by the action of electron beams on color phosphors.

Tube with One Electron Gun

One of these four tubes, described by R. R. Law, of the Research Center, is similar to the three-gun production model, except for the use of one gun instead of three. This tube and the three-gun model were shown publicly in Washington, D. C., in March, 1950. The other tubes, however, are disclosed for the first time publicly in the Proceedings.

Another tube, called a "line-screen color kinescope" is described in an article by D. S. Bond, F. H. Nicoll, and D. G. Moore. In this tube, narrow parallel strips of color phosphors are used in place of dots. The single electron gun scans the phosphor strips in an unorthodox manner, the beam being deflected up and down in stairstep fashion in such a way as to scan each color in synchronism with the received color signal during each journey from one side of the screen to the other.

An entirely different tube is described by P. K. Weimer and N. Rynn. In this, the axis of the electron gun is placed at a 45-degree angle to the phosphor screen. The scanning electron beam passes through slits in the phosphor screen and is then reflected back onto the phosphor. The emitted color is controlled by the deflection of the electron beam in the immediate vicinity of the phosphor screen. This makes the color control entirely independent of the scanning process.

Grid Control Tube

Still another type of tube, based on principles analogous to the layers of emulsion in Kodachrome film, was developed by S. V. Forgue. In this tube, the layers of red, blue, and green phosphors are placed on three closely-placed screens. By controlling the voltage changes on two intervening grids, the color is controlled. Success-

(Continued on page 31)

Dr. C. B. Jolliffe

Dr. E. W. Engstrom

Jolliffe and Engstrom Promoted to New Posts

DR. CHARLES B. JOLLIFFE was elected to the newly created position of Vice President and Technical Director of the Radio Corporation of America and Dr. E. W. Engstrom was elected Vice President in Charge of RCA Laboratories Division by the RCA Board of Directors on September 7.

Dr. Jolliffe has served as Executive Vice President in Charge of the RCA Laboratories Division since December 7, 1945, and Dr. Engstrom has been Vice President in Charge of Research of the RCA Laboratories Division since that date.

Dr. Jolliffe, in his new position, will be responsible for the development of long-range plans for the Corporation and generally will supervise the execution of such plans by the divisions and subsidiary companies of RCA.

In addition, Dr. Jolliffe will coordinate broad engineering policies of RCA and will direct the representation of the Corporation in technical matters before public and governmental bodies.

Dr. Jolliffe joined RCA in 1935 as Engineer-in-Charge of the RCA Frequency Bureau. He was appointed Chief Engineer of RCA Laboratories in 1941, and early in 1942 he was made Assistant to the President of RCA. In September, 1942, he became Vice President and Chief Engineer of the RCA Victor Division, and three and one-half years later he was elected Vice President in Charge of the RCA Laboratories Division.

Dr. Jolliffe, a native of Mannington, W. Va., was graduated from West Virginia University with a Bachelor of Science degree in 1915 and received a Master of Science degree in 1920. He was awarded a Ph.D. in 1922 at Cornell University, and West Virginia University conferred upon him an honorary LL.D. degree in 1942.

Prior to his election in 1945 as a Vice President, Dr. Engstrom served for two years as Director of Research of RCA Laboratories, supervising research and engineering which resulted in wartime advances in radar, television, radio and other electronic developments. He had previously served for 13 years in various RCA research positions. He is a graduate of the University of Minnesota and a Fellow of the Institute of Radio Engineers. In June, 1949, he received an honorary degree of Doctor of Science from New York University for his contributions as a research engineer.

Dividends Declared

A dividend of 50 cents per share on the Common Stock of the Radio Corporation of America, payable November 26, 1951, to holders of record at the close of business October 19, 1951, was declared by the RCA Board of Directors on October 5.

This payment brings the total dividend on Common Stock for the year to $1.00 per share, and follows the announcement by the Board of Directors on April 3, 1951, placing the Common Stock on a semi-annual dividend basis, provided earnings of the Corporation justify such action.

At the same meeting a dividend of 87½ cents per share was declared on the First Preferred Stock for the period October 1, 1951, to December 31, 1951, payable January 2, 1952, to the holders of record of such stock at the close of business December 17, 1951.

This bat-wing transmitting antenna erected atop West Berlin's City Hall gave German residents their first glimpse of American television.

One of the two microwave relay units used in the Berlin telecasts was mounted on the side of the City Hall tower, one of the highest points in the area.

Germans View American Television

Specially Trained Crews of RCA Technicians Set Record in Assembling Complete Video System for West Berliners

By Richard C. Hooper

Manager, Shows and Exhibits
RCA Victor Division

THROUGH the ingenuity, skill and round-the-clock labor of 29 technicians, directors and administrators specially trained for the project, more than a million West Berliners had their first view of American television during demonstrations held in the German city from August 13 to 26. Thousands of others, mostly youths from the Communist Youth Festival in East Berlin, eluded border guards to enjoy the spectacle which they had never been able to witness on their side of the Iron Curtain.

The program presented in Berlin was, by a wide margin, the most comprehensive and ambitious television exhibition ever staged in Europe, or ever undertaken by RCA. The equipment for the demonstration, valued at $335,000, was packed in 401 cases weighing a total of 35 tons. Included were a complete broadcast station and transmitting antenna, 110 home-type receivers, and two theater TV systems with 15- by 20-foot screens.

Highlight of the Berlin achievement was the construction of a complete television station in the heart of the city, broadcasting on Channel 4, its 500-watt signal blanketing the city. The TV transmitter was shipped from the RCA Victor plant in Camden, N. J.

Under the most favorable circumstances, the task undertaken was one that required great ingenuity and technical skill. However, the circumstances encountered by the television crew were anything but favorable. A wide assortment of problems, none of which could have been anticipated, faced the men from the start.

The crew left by plane in two groups on August 1 and 2. The equipment, which had been shipped ahead,

was unloaded in Rotterdam and transported by train through France and Germany to West Berlin.

When the RCA representatives arrived in Berlin, they learned that, due to the Communist Youth Festival the western sectors of the city were on an "alert," and consequently, all trucks needed to transport the equipment, and all passenger cars scheduled for use by the staff, were confined to a motor pool where they would be handy to cope with any emergency.

Only ten days stood between the crew and the opening date of August 13, yet for seven of those days they had to sit around waiting for transportation to become available. When the trucks and cars finally appeared, the men had 85 hours to build a complete system.

Transmitters and Studios

Probably never before in the history of the industry did a technical crew face a comparable problem.

The 35 tons of delicate electronic equipment had undergone an eight day trip over water, had been slung on and off ship, trucked through a couple of cities, carried many miles on a German military train, and finally loaded and unloaded three times in Berlin. As might be expected, it suffered considerable damage. One transformer had to be rebuilt, and two micro-wave relays and one television camera required complete overhauling.

The five-story Schoenberg Rathaus (City Hall), one of the highest points in the city, was selected as the site of the transmitter and a bat-wing antenna. After a thorough study of facilities it was decided to locate an outdoor studio in Schoenberg-Stadt Park about a block from the City Hall, and an indoor studio in the Titania Palace, West Berlin's biggest theatre.

The outdoor stage, from which the programs were to originate, had to be built before the demonstration could begin. But nature refused to cooperate. During the first week the crew spent in Berlin, a constant, driving rain stopped all work. Finally, with clearing skies on August 11, the men began setting up equipment. The stage was completed shortly before time for the opening program. In fact, while the floor manager was giving the alert sign to the performers on the first "live" program, the German carpenters were gathering up their tools, before departing.

By American standards, the Park studio was anything but elaborate. It consisted of a stage about 40 feet by 75 feet with a canvas roof and drapes on three sides. Control equipment occupied a curtained-off room at one side. Both live and film programs originated from this site, the signals traveling to the transmitter over cable.

At the indoor studio, one camera was stationed in the balcony, another on the stage. The control room was set up in a wing of the balcony, and signals reached the transmitter by micro-wave relay.

Russians Throw a "Party"

Although construction of the studios and transmitter constituted the biggest part of the job, the installation of the receivers was no small undertaking. The 110 home-type sets were distributed throughout West Berlin, in the windows of large and small stores, and in meeting halls, parks, squares, and other public places, some of them 10 miles from the transmitter.

Many of the buildings where the receivers were located were war-damaged six and eight-story structures of which only the first or second floors had been repaired.

During the first telecast, the crowd around the outdoor studio numbered about 25,000. The 16 home-type receivers operating at the park were nowhere near ade-

Curious crowds gathered to watch RCA technicians erect a 15- by 20-foot theatre television screen in the ruins of Potsdamer Strasse.

RCA home-type television receivers, set up in Schoeneberg Stadt Park, attracted up to 25,000 German residents nightly during the demonstrations.

quate, so a projection receiver was added, providing a picture the size of the average movie screen.

The second large-screen receiver was set up in the Potsdamer Platz, only 200 yards from the main crossing point into the Russian zone. Whether by design or accident, the Russians held a celebration just across the border from this installation, the high spot of which was a gigantic display of fireworks, including magnesium flares, Roman candles, and showers of rockets with myriad sparks.

Because the operation of a projection receiver requires semi-darkness for good results, the fireworks occasionally blacked out the television picture. Although many of the spectators at this location were people from East Berlin, they protested the interruption, loudly and emphatically. If the Russian fireworks represented a deliberate attempt to discourage interest in American television, it sadly backfired.

Standing Room Only

RCA transmitted programs every evening during the two-week period, starting at 7:30 and continuing without interruption until sign-off at 11:30. The schedule showed surprising diversity, thanks in a large measure to the assistance of RIAS (Radio In the American Sector), which supplied film and lined up talent.

A typical program would lead off with a fifteen-minute film, followed by variety acts, including gymnasts jugglers, vocalists, orchestral groups, and comedians, from the studio in the Park. Origination would then shift to the Titania for a short play, drama or comedy, a symphony orchestra or a fashion show, and then back to the Park studio for another film, a dance act, and more music. The symbol for signing on and signing off was a reproduction of West Berlin's Freedom Bell, with a Marshall Plan sign superimposed.

Reception in all areas was excellent and, there was no doubt about it: the Berliners loved television. According to police estimates, the crowd that gathered nightly around the studio and receivers in the park averaged between 12,000 and 15,000. Unlike a similar gathering in America, these people did not watch for awhile, and then drift on. Instead, the crowd began to gather several hours before show time, and stayed, standing and applauding, throughout the four-hour schedule.

The receivers spotted around the city were watched by crowds that resulted in serious traffic jams. At two places, the German police asked the TV crew to remove the sets because viewers blocked the movement of vehicles.

The Germans not only enjoyed watching television, but many of them wanted to be part of it. To the TV crew, it seemed that every other person in the city considered himself a television producer, even to the extent of climbing onto the stage, giving cues, instructing announcers and MC's, and rearranging acts.

More than 100 television receivers were installed in store windows, meeting halls, parks, squares and other public places throughout West Berlin.

In addition to the amateur producers, friends and relatives of the talent often clambered on stage. At times, the studio became so crowded with unidentified people that the technical director in the control room and the camera men and floor manager were unable to see each other.

The unexpected visitors from the east were made as welcome as local residents by RCA and the sponsors of the demonstration, the Economic Cooperation Administration and the U. S. High Commission in Germany. Later, the American occupation officials expressed the conviction that the Youth Festival delegates who had made their way into the American Sector had found the television programs a convincing example of western democracy's technical advancement and scientific skill.

In the words of Howard P. Jones, Director of the Berlin Element of the High Commission:

"This technical achievement of the free world will, I'm sure, be remembered for a long time by the thousands of visitors from the east who witnessed the television exhibition."

Major General Lemuel Mathewsen, U. S. Commander in Berlin, described the demonstration as a major success and expressed a "deep sense of indebtedness to the men responsible for its successful presentation".

Good Times Ahead for TV!

By J. B. Elliott
Vice President in Charge of Consumer Products
RCA Victor Division

THERE are good, commonsense reasons for believing that the television industry will enjoy a thriving, profitable fall season, and beyond that, years and years of solid and substantial growth and development, making an immense social and economic contribution to our country.

Production for this year will not reach 1950's record of almost seven and a half million units, but by the end of 1951 we should pass the five million mark. At a reasonably conservative estimate, the industry's unit production, as of right now, is 3,850,000. Between now and January 1st, I believe it is safe to say that the industry will turn out another million and a half receivers—which will bring the 1951 total to about 5,300,000. And I am confident we will sell these and could sell more without any difficulty.

The sales picture in television has improved markedly during recent weeks. Reports from dealers indicate a resurgence of optimism and confidence in the fall and winter season.

There are several factors contributing to the assumption that the current improvement in sales is only the beginning of a profitable season.

One of them, certainly, is the relaxation of credit restrictions.

Another is the recent power increase granted most television stations by the FCC. The extension of effective transmitting power will bring untold thousands of additional American homes into TV range.

The development and convincing field tests of an all-electronic compatible system of color television have done much to lay the bogey of obsolescence that has haunted prospective buyers ever since the FCC's endorsement of the CBS color system.

Another factor is new, better, and more diversified programs.

And, lastly, there is the extension of network facilities to the Pacific Coast.

Slowly but surely the industry's attitude toward broadcasting in the ultra-high-frequency band is changing. Station applicants who were inclined to resist the move "upstairs" are beginning to change their minds.

One of the reasons for this is Wayne Coy, FCC chairman, who several weeks ago, on the occasion of RCA's UHF seminar at Bridgeport, Connecticut, delivered a strong affirmation of the advantages of telecasting in the upper reaches of the spectrum.

Mr. Coy pointed out that UHF is relatively free from some types of interference, and that the primary service area for UHF stations is expected to be as great as that for VHF, possibly greater.

Mr. Coy's remarks, plus the actual demonstration of UHF reception, did much to convince many heretofore dubious engineers that a bright future awaits telecasters in the upper areas.

We have heard talk of shortages of metals and components for more than a year, and because the shortages failed to materialize, at least sufficiently to curtail production, many elements of our business have decided that they never will.

"Just another case of crying 'wolf'," they say.

Material Shortages Are Real

For the benefit of the people who don't take shortages seriously, I have some news. Shortages are real, they are here now, and they are going to continue to plague us for some time to come.

Our production will be hit hard during the balance of 1951, and harder during the first six months of 1952. We're beginning to bump our heads against metal shortages right now. A sharp drop in factory output is inevitable. I consider it a very real possibility that quality TV receivers will be in short supply as early as December 15.

Our first shortage problem is metals—copper, steel, aluminum, and nickel.

The copper situation is pretty well understood. The recent strike put a huge nick in the U. S. output. Imports have fallen off and the scrap copper industry is all but shut down. Copper production is considerably under government expectations, and it is doubtful if the TV set makers can obtain even their original allotment.

The cutback on steel is almost equally serious. The military is requiring more of this metal than planned. In addition to the normal uses of steel, it will have to serve television in some instances as a substitute for

(Continued on Page 32)

History of RCA Institutes

Industry's Oldest Technical School Has Kept Pace with Growth of Radio Communications Since Its Establishment in 1909

By C. E. Tomson
Registrar
RCA Institutes, Inc.

THE international acclaim that followed Marconi's reception on the Newfoundland shore of a faint code signal sent out from Cornwall, England in 1901, had scarcely subsided before tall wireless towers began to appear at strategic points along the Atlantic shorelines. Slowly at first, and then more rapidly, progressive shipowners installed wireless aboard their craft. This activity afloat and ashore created a demand for trained personnel to operate the equipment. Out of this urgency came the RCA Institutes, present-day outgrowth of the first training school founded by the United Wireless Telegraph Company in 1909.

The need for men skilled in Morse code and capable of operating transmitting and receiving apparatus became acute a year later with the passing of the Radio Act of 1910. This law specified that ships of a certain classification must carry wireless equipment and "a person skilled in its use."

Fortunately, radio, like life itself in those years, had not yet become complicated. There was only one way to connect the parts of a radio set, a method that could be easily chalked up on a blackboard. The pioneer school was a 15- by 30-foot classroom atop a penthouse at 42 Broadway, New York City.

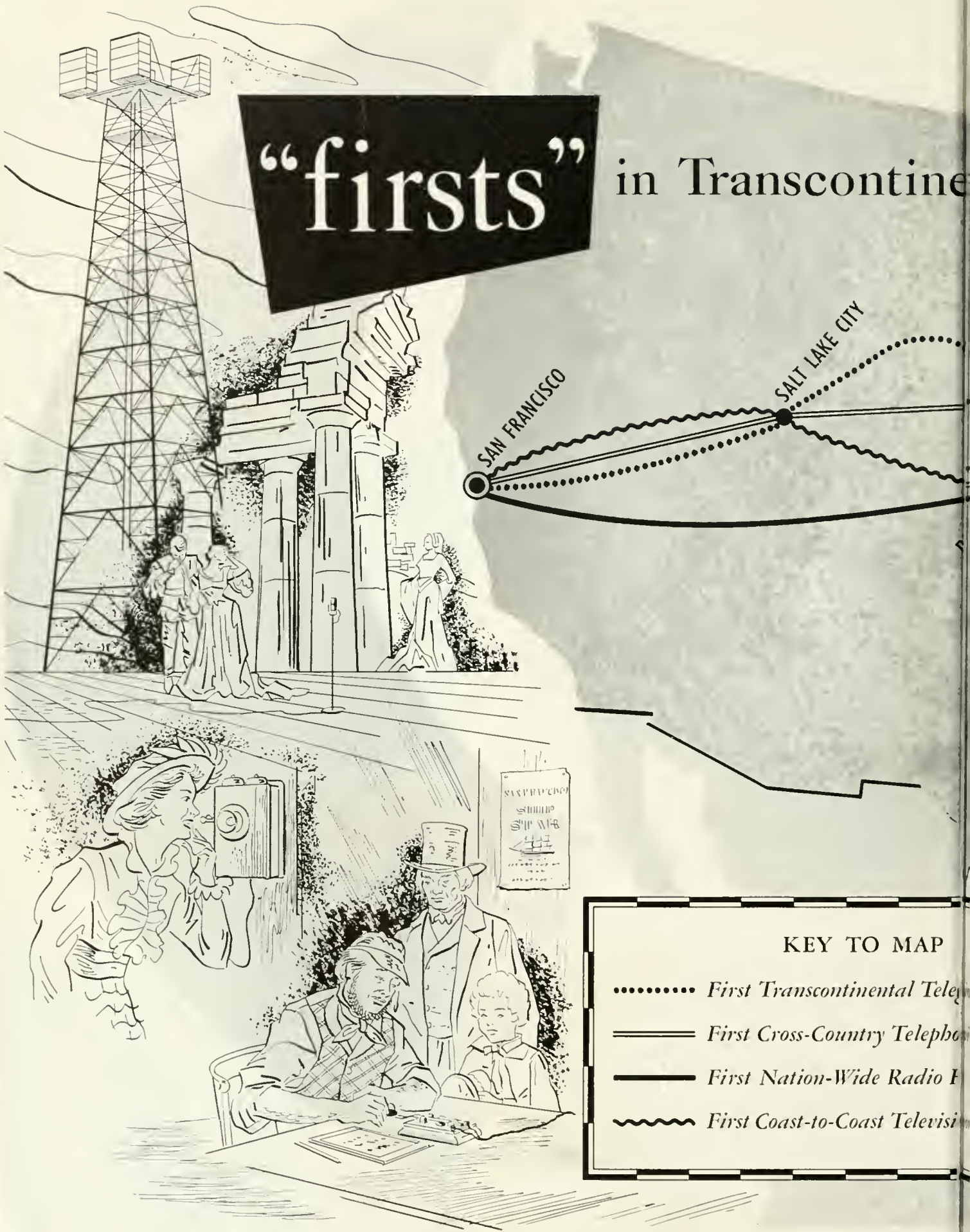
A considerable portion of the early student's time was devoted to learning the functions of motor generators, condensers, tuning coils and helix, as well as the crystal detector. Lectures were concerned primarily with such topics as the necessity for keeping the spark gap chamber free of moisture, checking banks of Leyden jars (devices used for storing quantities of static electricity), cleaning and adjusting critical parts of generators. Because so little was generally known about wireless, a course covering both theory and practice could be completed in two weeks.

During 1912, the United Wireless Telegraph Company was acquired by the Marconi Wireless Telegraph Company of America. In the same year, the Radio Act of 1910 was amended to require two licensed radio operators and an auxiliary source of power on each and every passenger ship. To take care of the increased de-

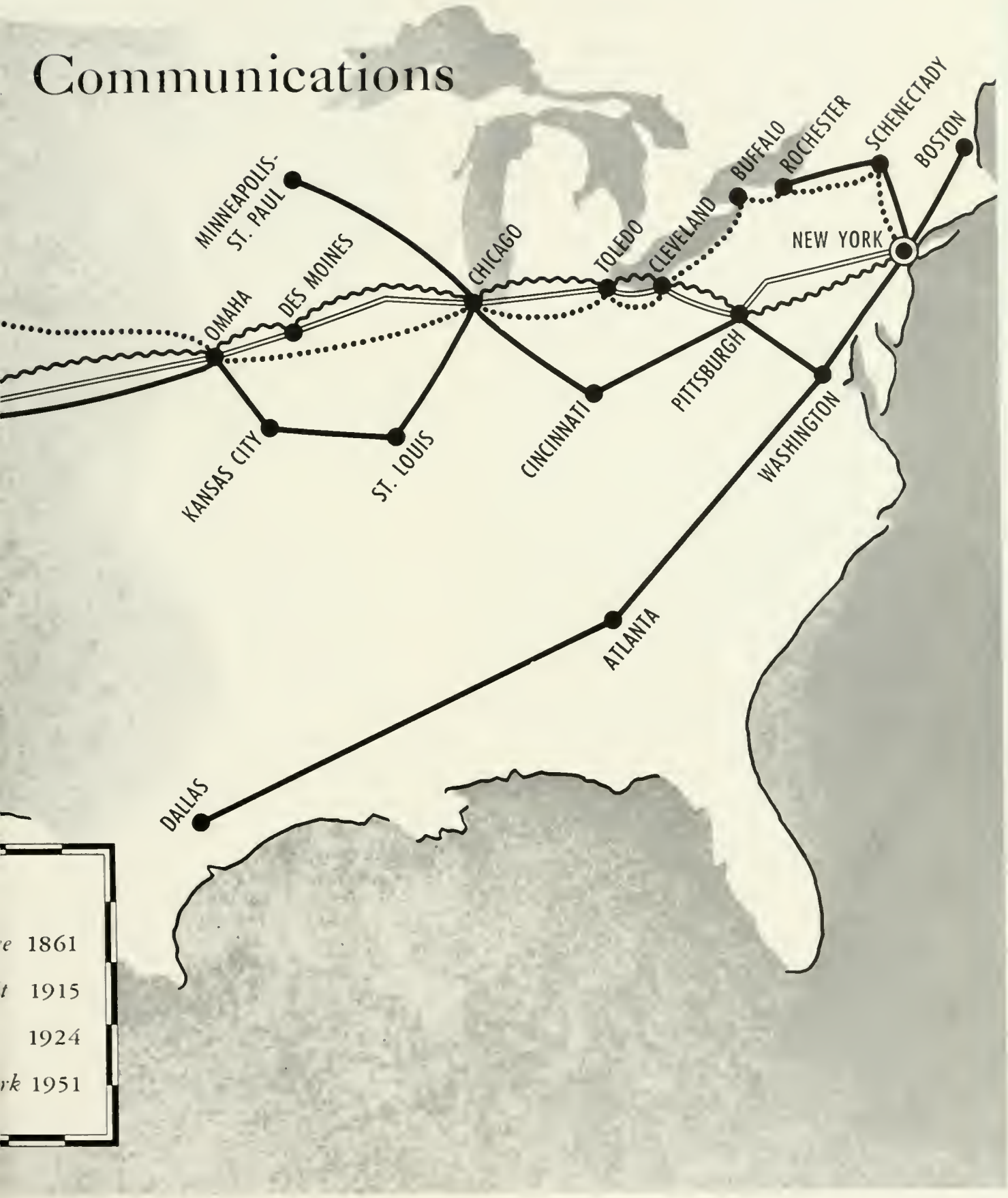
(Continued on page 30)

Radio class of New York's Police Department undergoes o code examinotion at the old Marconi Institute.

Students at present-doy RCA Institutes, study circuit design in the school's modern television receiver laboratory.


"firsts" in Transcontine
SAN FRANCISCO
SALT LAKE CITY
KEY TO MAP
First Transcontinental Tele
First Cross-Country Telepho
First Nation-Wide Radio
First Coast-to-Coast Televisi

Communications



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If the Sound is Audible — RCA Can Record It!

Birds, Beetles, Bells and Babies are on the Long List of Custom Record Performers.

By James P. Davis, Manager
Custom Record Sales Division
RCA Victor Record Department

WHETHER it be a recording of the voice of the historic Liberty Bell or the gentle sound of a fly walking across the ceiling, General MacArthur's impressive address to Congress or the mating call of the Canadian moose that is needed, the RCA Victor Custom Record Division can fill the order.

These are only a few of the thousand-odd assignments that are completed each year in RCA's studios in New York, Chicago and Hollywood. During 1950, the Custom Record Division alone made nearly 10 million transcriptions and recordings to meet the unusual requirements of phonograph and transcription producers, individuals, manufacturers, radio stations and promotional campaigns. Virtually every sound capable of being recorded has been put on discs of vatying speeds, ranging in size from a 6½-inch "Spinner" to a 16-inch transcription.

For education and for fun, in sales campaigns and medical research, custom-made records have become in-

creasingly important. They can help your canary sing, announce the birth of your baby, or tell the world about your better mouse trap. There is no known instance of a bashful swain proposing by disc, but if any such reluctant Romeo does get the idea, Custom Sales will send him away happy, though not with any guarantee of success.

One man in Connecticut was annoyed by a flock of starlings that developed a fondness for the area under the eaves of his house. All else failing, the harassed homeowner hit on the idea of recording the hostile hoots of an owl. Presto! the birds took off for parts unknown. Now, whenever a new family of starlings stakes out a claim under the eaves, out comes the RCA record. It never fails to send the intruders packing.

Out in Hollywood, where the bizarre is commonplace, a famous cinema star had RCA record a dog barking furiously. Whenever she hears a Beverly Hills tomcat meandering on her estate, she plays the record and "Tom" heads for a quieter and safer haven.

Animal sounds are reproduced for a wide variety of reasons. Duck calls were once very popular with hunters, but a recent regulation bans their use. Owners of reluctant canaries have found that their pets are put in a singing mood when they hear recordings of their feathered friends trilling happily.

The Chicago studio filled one unusual order, evidently from a retired fox hunter, for the baying of hounds to harp accompaniment. On the reverse side of the same disc were the frenzied sounds of the hounds chasing and cornering the fox.

A wide range of activity in the audio-visual education field is covered by RCA's custom-made transcriptions. Practically every subject and hobby from music, language-study and stenography, to hygiene records for school health programs, has been put on discs.

The wife of an internationally-known opera star was virtually cured of an almost total deafness in one

A telephone booth provides the minimum atmospheric noise for recording the delicate sounds of beetles chewing leaves.

ar by the use of recorded warble frequencies, ranging rom the growl of 50 cycles to the shrill whine of 10,000 ycles. The Veteran's Administration also has been very uccessful with these discs, using them to correct hear- ng deficiencies which may occur at different points of he audible spectrum.

A group of doctors recently ordered a series of rec- ords featuring the sounds of various normal and ab- ormal heartbeats. The recordings were made for the enefit of general practitioners in outlying sections to elp them diagnose heart ailments. Similar discs have een used by the American Heart Association, and in chool health programs.

Custom records have become valuable aids in the nstruction and entertainment of the blind. The Library f Congress maintains a circulating library of records n which complete stories have been recorded for blind ersons. The New York Guild for the Jewish Blind ad a series of albums made, accompanied by braille irections, which aided sightless people in learning to lay simple musical instruments.

RCA recordings of the languages and musical cul- ure of the Eskimos, Mayan and American Indians, African natives, and many other colorful foreign peo- les are in constant use by lecturers, schools and mu- eums. The Library of Congress maintains a special ection of such unusual and valuable recorded material.

The resounding tones of the world's most famous arillons and church bells have been recorded for pos- erity, just as such important contemporary events as the peech to Congress by General of the Army Douglas MacArthur. Disc reproductions of the bells of St. Peter's in Rome, the carillon at Copenhagen, the famous himes of Big Ben and of French cathedrals have been purchased by numerous churches for playback through their own belfry public address systems. These records are also used as sound effects by broadcasting stations.

Several branches of the armed forces employ RCA records as an integral part of indoctrination and train- ing programs. The U. S. Air Force ordered reproduc- tions of aircraft sounds for use in identifying the many types of combat and transport planes, and for the scien- tific study of motors and plane vibrations.

Similar work has been done for the Navy Depart- ment, including a series of records entitled "Sounds of Battle" for indoctrination of personnel. Another group of technical transcriptions had to be recorded under water and in submarines. These discs were cued to tell what each sound was. For example: "This is a heavy cruiser passing overhead from 500-foot depth", or "This is three PT boats at vector 270 travelling at 40 knots."

The Chicago studio filled one unusual order for a customer with an enterprising commercial scheme. Wall plaques were made from plain records moulded into the shape of a scalloped dish, the center of which was decorated with leaves, fruit, etc.

Most intriguing of all the unique "stars" of RCA custom records were the Japanese beetles that oblig- ingly nibbled on leaves while the microphone caught every faint crunch. This order came from the DuPont Company's advertising department for use in an en- tomology lecture. Another RCA client in Chicago had records made on "Teaching Parakeets to Talk." Only slightly less bizarre was the assignment to record the sound of flies walking across a wall. This was accom- plished by putting the insects into a cardboard box located on top of a microphone.

Aside from the spectacular and unique orders filled each year, a sizable portion of RCA's custom-record business is comprised of electrical transcriptions for radio stations, program producers and advertising agen- cies as well as sound tracks for slide films. In addition, commercial phonograph discs are produced for over 100 small, independent companies which don't have their own recording facilities.

For the Defense of Cities

THE need for a dependable communications system, which could be used to warn inhabitants of cities in the event of air-raids or atom bomb attacks, has led to the development by RCA of a Civil Defense Warning System of wide flexibility. The system has been approved by the Federal Civil Defense Administration and already has been installed in Washington, D. C.

The RCA System consists of a network of electronically operated air-raid alarm stations all remotely controlled by radio from one command center. At this central location, a VHF radio transmitter emits coded pulses to strategically located decoding receivers. These automatically activate high-powered amplifier systems which broadcast siren alarms or verbal instructions over giant loudspeakers throughout the community.

In the event of an alarm, the pressing of two buttons at Master Control instantaneously sets off the entire network of sirens and alerts the entire populace. The system also permits the broadcasting of important instructions by radio to facilitate rescue operation, direct fire control, and supplement the police, fire, and public utilities radio systems during an emergency.

The use of two-way radio as the heart of the system makes it especially flexible. Any community now operating a two-way radio system can incorporate the RCA electronically controlled alarm stations with a minimum of change. When the national emergency no longer exists, the system can continue its important function of warning and communications during fires, floods and other civic disasters.

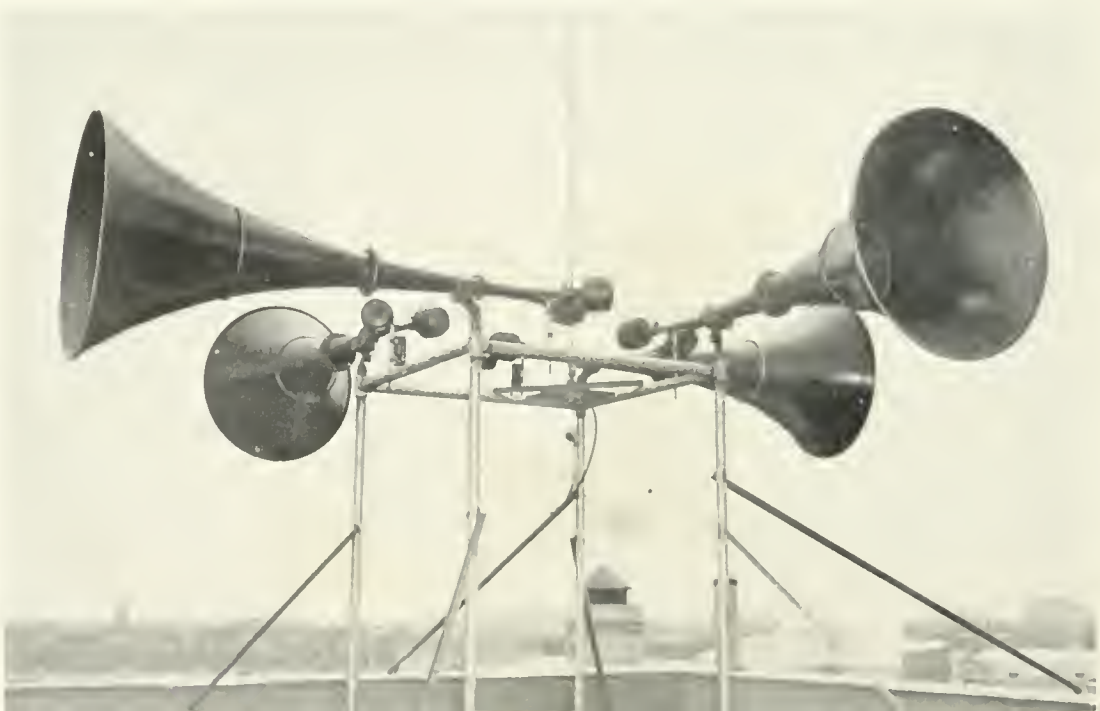
The use of radio makes the Warning System completely independent of land lines which are highly vulnerable to air attack. This also means that alarm stations can be increased at will with no need to tax land lines further for civil defense purposes. Furthermore, large office buildings and factories could easily tie into the radio net by installing one of the radio controlled alarm stations which would sound automatically with the rest of the system.

The radio transmitter at Command Center can contact all the neighboring communities which are included in the mutual aid plan to be alerted and where necessary ask for vital assistance.

The System has other desirable features. The electronic sirens can, for example, generate any tone signal or combination of tone signals to meet changes in future civil defense plans. The system operates under all types of weather conditions and when supplied with its own generator, can operate even when the city's power is temporarily out of operation.

Complete control of the entire Civil Defense radio system originates at the Command Center where the master control console is located. At this nerve center of operations, all warning signals from the Air Force and from other sources are correlated and information and orders disseminated. Coordination with all the control

Centrally-located giant loudspeakers can broadcast civil defense siren alarms or verbal instructions throughout the Washington, D. C. area.



centers is maintained by the station transmitter. The warning system operates automatically and requires a minimum of technical knowledge on the part of the control operator at master control.

To originate a yellow-alert, the operator simply presses two push-buttons momentarily: one sends out the properly coded pulses to activate the alarm stations; the second automatically places in operation an electronic timing device which operates the system sirens according to predetermined setting. Signal lights indicate the type of alarm set off and the sirens are heard on the monitor speaker. The equipment can be left in "on" position or automatically returned to standby readiness.

When it is desired to give verbal instructions over the loudspeaker system, the control operator talks into the desk-type microphone in the same way that the dispatcher in any two-way radio system goes "on air".

Facilities are provided to interrupt any alarm during any phase of its transmission. Manual keying of an alarm is also possible should that become necessary for any reason.

The signals from the Master Control console are fed to the main station transmitter, the power of which is determined primarily by the radius of coverage desired, both for the alarm system and for two-way radio needs. A 250-watt transmitter is recommended for two reasons: to make possible a greater degree of system expansion; and to provide a safety factor for radio transmission.

In smaller communities, 60- or 70-watt transmitters, depending on the frequency, can provide adequate signal coverage. A station receiver, built into the transmitter rack, permits two-way radio communications when desired.

From the Master Control Console at the Command Center, the Civil Defense Director can coordinate all the communication activities of an entire civil defense organization. He can announce an alert to all the Control Centers and adjacent communities by VHF radio without revealing it to the public. He can activate all the sirens to alert the populace, broadcast instructions to the public and civil defense workers throughout the city. From this focal point, the Civil Defense Director can tie together the entire organization within the city, and mutual-aid groups in neighboring communities, into one well-integrated system with the best communications network yet developed.

Alarm reproducing units are located throughout the city. Each reproducing station consists of a VHF receiver, a decoding unit, power amplifiers and four huge horn-type loudspeakers. For emergency use, each reproducing unit can be equipped with its own gas-driven generator power.

The four loudspeakers, making up one cluster at each alarm station, are installed in the four directions of the compass. Should the situation require it, it would be just as simple to place all speakers in one direction to achieve concentrated directivity and sound volume.

The loudspeaker method of reproducing siren tones has many advantages over mechanical and wind driven sirens. The loudspeakers are weather-proofed to operate under all conditions of weather and require no warm-up time. There is no lingering effect of siren sounds. Immediate cut-off takes place instantly with cut-off of electronic siren generator at the Command Center. Not only can loudspeakers reproduce siren tones of any type and duration required, but they operate automatically and have the unmatched quality of being able to reproduce verbal instructions from qualified leaders in the community at a time when instructions are most urgently needed to quell panic and save life and property.

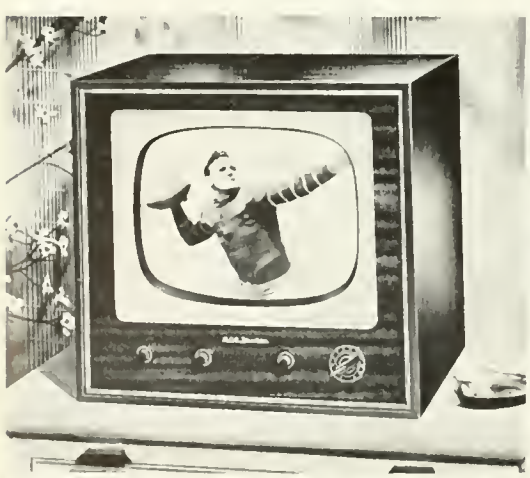
TEN ADVANTAGES OF RCA WARNING AND COMMUNICATION SYSTEM

1. The system is all electronic and works independently of land lines, which are highly vulnerable.
2. An unlimited number of signals can be generated to cover all future emergencies such as gas and "BW".
3. The system being all electronic contains no mechanical rotating parts and is more dependable.
4. Siren tones are immediately recognizable and are distinct from police and fire alarm sirens.
5. The system can be used during floods, fires, and other emergencies, especially when lines are down.
6. All units of the system are mechanically and electrically interchangeable for fast service.
7. The system is capable of continuous operation and is designed to operate in all types of weather.
8. No warm-up time necessary—the sirens sound instantly and cut off immediately. There is no delay.
9. The system is controlled from one point. Alarm sirens operate automatically—no human element involved.
10. Combination of radio, loudspeakers and sirens makes the system the most versatile one yet developed.

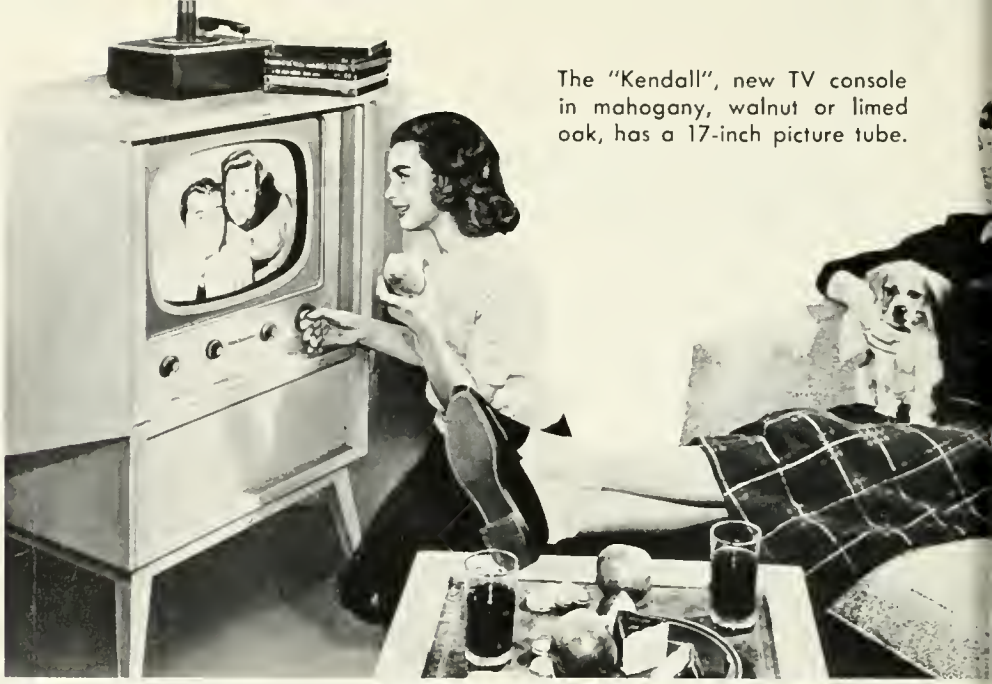
RCA VICTOR introduces New Television Receivers

The "Talbot", table-model receiver with a 16-inch kinescope, is housed in a maroon metal cabinet

The "Bristol" features a 17-inch picture tube and is available in either blond or dark metal finish.



The "Preston" provides a 17-inch television picture and has two different matching bases.



The "Kendall", new TV console in mahogany, walnut or limed oak, has a 17-inch picture tube.

The "Suffolk" features a 21-inch tube in a cabinet of colonial style, appropriate in any setting.

The "Hampton", new television c solette with 17-inch tube, is mod from top to bottom.

The "Donley", functional modern television console with full-length doors, offers a 21-inch picture tube.

The "Haywood" open-faced TV sole has a 17-inch picture tube a 12-inch supersensitive speaker

Radio is Here to Stay

By William S. Hedges
Vice President in Charge of Integrated Services
National Broadcasting Company

RADIO broadcasting has a permanent place in the social and economic structure of the nation because it fulfills a purpose which can be served by no other medium of mass communication.

It is the one medium which is always available—in the bathroom, in the kitchen, on the beach, in your car, in the woods, on remote mountain tops, or in the privacy of your own room. No other medium can simultaneously reach more than 95% of the people of America. As such it is the most comprehensive advertising medium in the nation—greater in circulation than all the newspapers combined.

These radio set owners possess 96,000,000 radio receivers, which represent an investment of more than five billion dollars, not counting the obsolete and discarded models. The very presence of this big stake in radio is a large reason why radio has a continuing place in the sun. The American public is quite unlikely to waste its investment in radio, and on the other hand there will be broadcasters ready to make the continuing use of radio well worth while.

There is only one reason why anyone should raise the question "Has Radio a Future?" That reason is, of course, television. Although it has penetrated into only sixty-seven markets, television is diverting public attention and many advertising dollars not only away from radio but from other media as well. While I am sure that television, when it reaches its full stature, will be the most effective sales force this country has ever known, its attainment of preeminence in the advertising world should not and will not obscure the future of radio broadcasting. However, there will be many changes made and the brightness of radio's future is dependent upon the adaptability as well as the ingenuity of those who are interested in the survival of broadcasting.

In our appraisal of radio it is important to remember that all of those who are looking at television are not subtracted from the radio audience. The combined radio and television audience is considerably higher than the radio audience was in 1948, running from 5 to 30% in certain months in various cities. It must be acknowledged, however, that radio listening is less now than in 1948 in the TV markets. On the other hand, it must likewise be noted that most TV viewers are radio listeners at some time of almost every day.

Actually, television and radio supplement each other to a much greater degree than they compete. While radio blankets all markets, urban and rural, and all income groups, television at this stage of its development is concentrated very heavily in urban areas and gives better coverage of the upper income group than in the lower levels. Furthermore, there are many geographical sections of the country which have not yet been reached by television. For these reasons, radio cannot be abandoned by advertisers whose sales are truly nationwide. But if both radio and television are used, the advertiser is virtually assured of saturating all possible markets.

Radio Must Become Adaptable

There can be no doubt that broadcasting is undergoing a revolution at this particular time. Significant changes in the economic conditions affecting radio are taking place. If those changes are not reckoned with they can prove fatal. Radio must learn to toll with the punches and to become flexible and adaptable if it is to have a prosperous future.

One of the basic foundations of American broadcasting is the program service furnished by networks—programs of a scope and flexibility that individual stations could not develop themselves—programs featuring the greatest entertainment personalities of the times, world wide news services, and informational programs presenting the leaders of American opinion. Such a program service attracts audiences to affiliated stations, builds their position in their communities and enhances the value of the time they have for local and national spot sales.

The network program service is an expensive one. The revenues supporting it must come from network advertisers. Now at this point, let's pause and look at some of the economic trends affecting network radio. In the period of its major growth—during the 40's—the main economic basis for the network medium was the multi-million-dollar advertiser who bought one or more evening hours or half hours or daytime strips. The cost structure and sales policies of the medium were such that the smaller budgeted advertiser was priced out of it. He

(Continued on Page 32)

Mrs. Horton Succeeds Arthur E. Braun on RCA Board

Mrs. Douglas Horton

RESIGNATION of Arthur E. Braun and election of Mrs. Douglas Horton to succeed Mr. Braun on the Board of Directors of the Radio Corporation of America were announced by Brig. General David Sarnoff, Chairman of the Board, following a meeting in Radio City, New York on October 5. Mrs. Horton, who as Mildred McAfee commanded the WAVES in World War II, is the first woman elected to the RCA Board of Directors.

Mr. Braun, a member of the RCA Board since 1921, had served since 1936 on the Board of Directors of the National Broadcasting Company, from which his resignation also is effective. He is Chairman of the Advisory Committee of the Mellon National Bank & Trust Co. of Pittsburgh, Pa.

Last December, Mrs. Horton became the first woman elected to the Board of Directors of NBC. She is Vice President of the Federal Council of the Churches of Christ in America and is a former President of Wellesley College. She had the distinction of being the first woman ever to be commissioned by the United States Navy. She was placed on active duty in August, 1942, as Lt. Commander upon becoming Director of the Women's Reserve, USN, known as the WAVES. She resigned from the Navy in February, 1946, with the rank of Captain and was awarded the Distinguished Service Medal.

Following nine years as a teacher and executive in several colleges, Mrs. Horton was named President of Wellesley College in 1936. She resigned effective June, 1949, to join her husband, Dr. Douglas Horton, Minister and Secretary, General Council of Congregational Christian Churches, New York.

Graduating from Vassar College in 1920, Mrs. Horton received her M.A. degree from the University of Chicago in 1928. She holds 19 honorary degrees from universities and colleges.

Mrs. Horton is a native of Parkville, Mo.

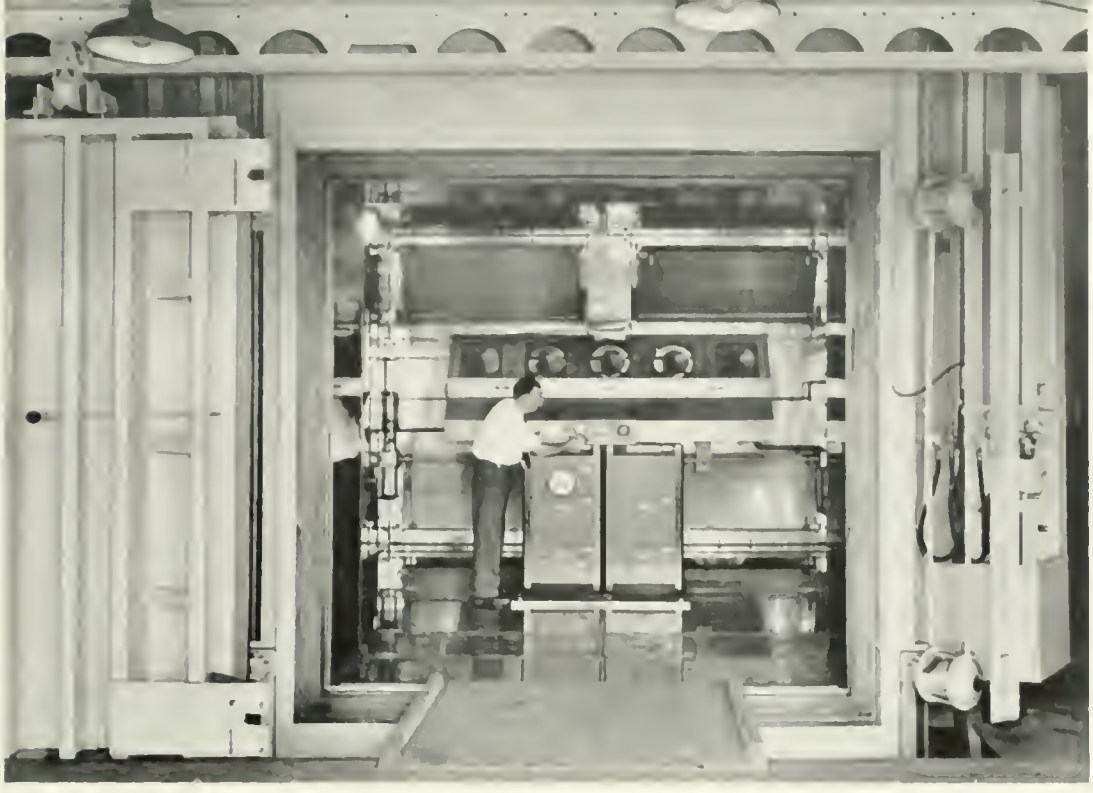
Speeds Preparation of Specimens for Electron Microscope Analysis

A NEW, low-cost shadowing unit to speed preparation of "shadow-cast" specimens for the electron microscope has been developed by RCA.

The new apparatus permits laboratory personnel to deposit a thin coating of tungsten, molybdenum, or other suitable material by evaporation on as many as six glass microscope slides at one loading in the all-metal vacuum chamber. The specimen contrast is enhanced and the third dimension usually made evident.

The unit consists of a small, steel vacuum chamber which can be evacuated at high speed. Eliminating the handling of heavy, fragile bell jars, the equipment provides ease of specimen insertion. Specimen slide holders provide a wide range of shadowing angles without filament adjustment.

With this newly-developed "shadow-cast" unit, laboratory personnel are able to prepare electron microscope specimens more quickly and economically.



A standards engineer prepares electronic equipment for test in RCA's new "stratosphere chamber", which can simulate any climatic or atmospheric condition.

Weather Made to Order

All the world's weather is now available in a single room 14 feet square and 10 feet high in the testing laboratory of the RCA Engineering Products Department in Camden, N. J.

With this 50-ton chamber, recently installed for the testing of all kinds of electronic equipment under conditions to which it may be exposed in use, laboratory personnel can simulate all temperatures, humidity levels, and other climatic and atmospheric conditions found on or above the earth, to an altitude of 70,000 feet above sea level.

Here, every device made by RCA for military or civilian use in far-away places, from airplane transmitters to walkie-talkies, can be proved under conditions prevailing in the Sahara or Siberia, in the jungles of the South Pacific or atop the Himalayas.

Known as a "stratosphere chamber", it can reduce atmospheric pressure to the level encountered at an altitude of 70,000 feet, which is higher than the accepted altitude record for heavier-than-air craft and almost as high as man has ascended in a balloon. The partial vacuum produced is sufficient to reduce a 29-inch column of mercury to one inch.

Heating and refrigeration equipment within the chamber can create temperatures from 185° F. — more than 50 degrees higher than the highest natural temperature ever recorded on the earth's surface — to minus 85° F. — within a few degrees of the lowest natural temperature earth-bound instruments have recorded. To provide refrigeration for the unit requires 180 horsepower, enough to run 720 average size domestic refrigerators simultaneously.

Humidity within the chamber can range from a heavy fog to almost complete lack of moisture.

Because of its size and weight, the chamber, which cost $150,000, posed a number of installation problems. It was built in three sections and transported from Newark, N. J. to Camden by trailer-truck. Because the chamber overhung the trailer three feet on each side, creating a traffic hazard, special approval from the State Highway Department was necessary, and the trip was made in the early hours of the morning, when traffic was light. The three sections weighed 11, 17, and 21 tons, respectively. In order to get them into the laboratory, a wall area measuring 18 by 20 feet had to be removed from the building.

The door of the chamber weighs about two tons, and is moved into place on rollers fixed at the top of the chamber. To obtain a perfect seal, an air cylinder is fixed on each corner of the door to exert the required pressure. An inner wall of 9-inch-thick insulation is used to maintain temperatures.

Electronic "Detective" Spots Foreign Metal Particles

NEW metal detection equipment for more efficient and speedier location of the most minute metallic particles contaminating non-metallic products, was introduced recently by the RCA Engineering Products Department.

Product lines in which the equipment will have applications include meat, bakery products, candy, plastics, paper, rubber, tobacco, textiles, and explosives.

The new metal detectors, called the "Utility Series", feature four types of small-aperture inspection heads, which will indicate the presence of tiny particles of metals or alloys, whether magnetic or non-magnetic, regardless of their depth in the material. The products pass through an inspection aperture on an endless conveyor belt, or through a chute at rates of 10 feet to 1000 feet per minute.

The detectors can be used to light a warning lamp, ring a bell, stop a continuous process, mark the contaminated object, or deflect it into a special channel or receptacle for rejects. The new equipment is the Company's latest industrial tool for quality control. It is also invaluable as a means of preventing machinery damage, eliminating fires and explosions resulting from tramp metal, and reducing lost production time in industrial processing.

The "Utility" detectors consist of two units. The control unit, which weighs 20 pounds, and is the same for all models and applications, has an overall measurement of 8¼ inches high, 6¾ inches wide, and 10 inches deep. The second unit, the inspection head, is provided in four different styles to meet specialized installation requirements. Two of the box-type heads have rectangular apertures — one measuring $2\frac{1}{2}$ x $7\frac{1}{2}$ inches; the other, 4 x 5 inches — and are designed for detecting metal in candy, chewing gum, pharmaceutical products, and other items that can be carried on a small conveyor belt during processing. The others have smaller, box-shaped heads with round apertures — one measuring $1\frac{1}{8}$ inches in diameter; the other, 2 inches in diameter — and are suitable for ground meat, liquids carried in glass tubes, cigarettes, and similar items that can pass through the small head in a nonmetallic tube or trough.

Materials passing through the inspection aperture are screened by a high-frequency electromagnetic field, generated by scientifically-designed coils embedded in a water-proof material. High-frequency power is fed to the coils from a self-contained electronic oscillator, and the reaction caused when metal is present in the material being screened operates a relay which triggers either a signaling device (lamp or bell) or an automatic marking or ejecting mechanism.

The equipment is practically immune from building and conveyor vibration, while electronic voltage regulation assures freedom from effects of line voltage fluctuations. The units are not affected by normal humidity and temperature changes, and are sealed against dirt, lint, and dust.

Pieces of candy passing through the portals of this electronic detector are rejected automatically if metallic particles of any size are present.

Television demonstrates its effectiveness as an aid in teaching the latest methods in veterinary practice.

TV cameras brought close-ups of this operation on a cow to a convention audience of more than 2,000.

Television Used to Demonstrate Techniques in Animal Surgery

LEADING veterinarians were featured actors in special television programs staged at the 88th annual convention of the American Veterinary Medical Association held recently in Milwaukee. During the convention, specialists in animal surgery, working in front of RCA cameras, demonstrated their techniques before veterinarians from the United States, Canada and 15 foreign countries.

Through the medium of television, an audience of more than 2,000 watched delicate operations on the screens of RCA Victor television receivers installed in Milwaukee's city auditorium. The telecasts, sponsored by Allied Laboratories, Inc., manufacturers of pharmaceutical and biological products, were transmitted from the operating theatre over coaxial cable.

The demonstrations included new methods of anesthetizing pets and farm animals, of diagnosing poultry diseases and the performance of caesarean sectioning.

After witnessing the programs, first of the kind in America, Dr. J. G. Hardenberg, Executive Secretary of the AVMA, expressed his belief that television will prove a useful aid in teaching animal surgery. "The care, skill and surgical techniques of today's veterinarians," he said, "equal those used in hospitals for human patients. We are confident that with television we can still further the knowledge and improve the practice of animal surgery."

Television equipment used at the convention was installed and operated by the RCA Service Company.

Transmitting and monitoring equipment, installed in Milwaukee's auditorium for the veterinarians' meeting.

Four huge vans comprise the modern "TV station on wheels" developed by RCA for the U. S. Army Signal Corps.

"TV Station on Wheels" for Army

THE most complete television station ever mounted on wheels has been constructed for the U. S. Army Signal Corps by engineers of the Radio Corporation of America, and delivered recently to the Signal Corps' Fort Monmouth, N. J., Laboratories.

The mobile television caravan, which was built in close cooperation with Signal Corps engineers, consists of four special 10-ton trucks, each 31 feet long. Two of the trucks are fitted with a complete line of TV transmitting and monitoring equipment, three TV field cameras, ten receivers, a large-screen TV projector which will show life-size pictures, and a radio intercommunication system. The other two trucks contain power supply generators.

The caravan will be used to explore the feasibility of television for field instruction, and to develop instructional techniques via TV. The equipment may prove extremely valuable in televising intricate field exercises and "piping" the picture to expert observers, maneuver umpires, or to classrooms.

Programs picked up in the field, will be "piped" to military classrooms, or to a broadcasting station, by microwave radio link or coaxial cable. If they go to a broadcast station, the programs will then be transmitted in the usual manner; if they are conveyed to classrooms, the programs will be carried to a mobile display unit equipped with both direct-view and projection-type television receivers.

The first vehicle in the television fleet is equipped with three complete TV field camera chains, a microwave transmitter for video signals, and a 46-watt FM transmitter for transmitting sound signals. Associated monitoring and switching control equipment is utilized in accordance with standard TV broadcast practice. Four microphone inputs, and tape and disc recording equipment — all with latest amplifying units — are among the audio facilities. The unit also houses a separate monitor-announce position, and an order-wire radio communication system, utilizing an RCA 15-watt Carfone two-way mobile installation.

The custom-built body of the vehicle houses a complete transmitting studio, which is equipped with a specially-constructed operating desk for portable monitoring, control and power supply units used with the TV field cameras. All equipment is shock-mounted to guard against damage, including lockers provided for transporting the cameras, tripods, cables, and transmitting units. The operating desk is mounted in the rear of the unit, facing large shatterproof glass windows which give a clear view of pick-up activities outside.

The roof of the truck is reinforced to support the weight of both equipment and operators when they

wish to use it as a vantage point for cameras or the relay transmitter. A ladder with hand railing is provided for access to the roof through a self-locking waterproof hatch. Provision has been made for roof-mounting the four-foot parabolic antenna of the relay transmitter as well as whip antennas for the FM audio transmitter and intercom radio system.

The second mobile unit contains the transmitter power supply equipment, which consists of two powerful gas driven generating units. One of the generators is designated for standby use, or to supply power to special lighting equipment for illuminating the scene to be televised. By means of a special switch, the truck batteries are able to supply power to the two-way radio communication system when the caravan is in motion and the generators are not in use.

A receiver-display unit forms the third coach in the caravan. In addition to housing the FM and microwave receiving equipment, it contains ten 16-inch picture monitors, a 16mm TV projector and film camera, slide projector, a large-screen television projector, and a video switching panel for selecting any of several TV signal sources.

The self-contained power supply for the receiver-display coach is housed in the fourth truck. It is similar to the transmitting power supply unit, except that it contains only one generator.

The entire caravan has been carefully built and styled to Signal Corps specifications. Every vehicle is equipped with necessary test equipment and spare parts. Each of the coaches bears the Signal Corps insignia and is painted in traditional Army olive drab, with attractive aluminum strip. The units are completely weatherproofed, with cooling and heating units to condition the interior for all-weather operation.

21-inch Kinescope Uses Full Screen Area

THE television industry's largest metal, rectangular picture tube, a 21-inch kinescope, has been announced by the RCA Tube Department. The new kinescope employs the metal-shell construction, first introduced by RCA over two years ago as a major innovation in the 16-inch round metal tube.

The new kinescope utilizes the full screen area, producing a picture 18 3/8 inches wide by 13-15/16 inches high, with slightly curved sides and rounded corners. Providing pictures with high brightness and good uniformity of focus over the entire picture area, the tube has a white fluorescent screen on a relatively flat face made of frosted Filterglass, which minimizes reflection of bright objects in the room and increases picture contrast.

Conforming to proportions of the transmitted picture, the tube's rectangular shape avoids waste of screen area. This permits the use of a cabinet having about 20 per cent less height than is required for a round-face tube providing pictures of the same width. In addition, the chassis need not be depressed or cut out under the face of the tube, and controls can be located as desired beneath the tube.

Employing magnetic focus and magnetic deflection, the new kinescope is designed with a funnel-to-neck section which facilitates centering of the yoke on the neck. This feature, in combination with improved centering of the beam inside the neck, contributes to the tube's good uniformity of focus.

Other features incorporated in the new 21-inch picture tube are short over-all length, substantially lower weight than that of a similar all-glass tube, a higher-quality faceplate than is commonly used in all-glass tubes, and an ion-trap gun requiring only a single-field, external magnet.

This 21-inch kinescope, developed by the RCA Tube Department, is the industry's largest metal rectangular picture tube.

History of RCA Institutes

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mand for qualified operators, the school was reorganized as the Marconi School of Instruction and moved to larger quarters at 29 Cliff Street.

During the following years, the school was moved to several different locations within New York City as the swelling demand for operators called for more extensive classroom facilities. In 1915, the institution became known as the Marconi Institute and, for the first time, inaugurated evening courses in the Edison Building at Duane and Elm Streets.

With the formation of the Radio Corporation of America in 1919, the Marconi Institute became a part of the Corporation under the new name of the Radio Institute of America. Shortly thereafter, the school was moved to 326 Broadway. In 1922, following the introduction of radio broadcasting, courses were formulated for training radio receiver servicemen. Because of public interest, the school prepared catalogs and advertisements for magazines and newspapers.

Institutes Incorporated in 1929

Progressive expansion of the Radio Corporation of America made it necessary to form a separate organization devoted exclusively to technical training. Therefore, in August 1929, RCA Institutes, Inc., was incorporated as a wholly-owned subsidiary of RCA. Three years later the Institutes then located at 75 Varick Street, established courses in radio broadcasting, radio servicing, sound technique and commercial radio operating. A "General Course" of a higher technical level than had been previously offered was added to the Institutes' curriculum in 1936. This was done to keep pace with the growing need for technicians qualified to design radio equipment. The course included such subjects as electrical physics, transmitter technology, sound reproducing and recording systems, radio receiver instruction and frequency modulation design.

Anticipating the need for trained television technicians, RCA Institutes in 1938 added the servicing of television receivers to the Servicing Course, and integrated the operation, maintenance and development of television circuits in the General Course. The latter course, now called the Advanced Technology Course, requires full time attendance for two and one-quarter years (2610 hours) and offers instruction in the operation, maintenance and development of all types of radio circuits. Graduates of this course are qualified for all types of radio technician employment, particularly development and laboratory work. So thorough is the course that those who complete it are often granted appreciably advanced standing when applying for admission to engineering colleges and universities.

In April 1948, the school was moved to larger and more suitable quarters at 350 West Fourth Street, where it now occupies 40,000 square feet on the second and third floors. A large number of visual aids are used here to supplement instruction in all courses. The Institutes has sound motion picture projectors, disc and tape recorders, and a large library of sound and silent films, film strips and slides. Reference material and the latest textbooks are accessible to all students in the school's well-stocked library.

Inspection Trips for Students

Supplementing regular academic instruction, students of certain courses are taken on inspection trips to important broadcasting and industrial centers located in or near New York City. In addition, representatives of industry and government address senior classes on the various phases of radio, television and electronics.

In common with other schools, most of the students at RCA Institutes come from nearby areas. However, as time goes on, students from abroad are applying in greater number for admission to study here. During the past decade, students have matriculated from Argentina, Bermuda, Brazil, Canada, Chile, Cuba, Ecuador, Iceland, India, Iran, Iraq, Israel, Liberia, Mexico, Pakistan, Panama, Peru, British Malaya, Thailand, Turkey and many other countries.

To assist students in obtaining satisfactory positions RCA Institutes maintains a placement service. A recent survey, made two months after the end of the school year, shows that of a total of 569 graduates during the year, 471 or 82.8 per cent were employed. These graduates became associated with developmnt laboratories of leading electronic companies and broadcasting stations in 43 different states Puerto Rico, Hawaii and Alaska.

Through the years, RCA Institutes has kept abreast of the major changes in radio and television, and has sought to maintain a high level of instruction in the technical institute area of education. Today, the school not only ranks as one of the leading technical institutions of the nation, but is also recognized by the electronics industry as a valuable source of qualified men.

Sarnoff Challenges Scientists

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search Center,' and I extend to you and your staff of scientists my warm good wishes for continued progress.

Harry S. Truman."

The message from New York's chief executive said: "I have just learned that on Thursday you will celebrate the Forty-Fifth Anniversary of your entrance into the radio industry. My heartiest congratulations to you. Throughout your years of service, you have been a vital and imaginative force in the development and expansion of radio. Under your leadership and genius, radio has grown from a very small beginning until today it serves as an integral part of our daily lives, bringing to all of us the best in entertainment, public service and the tremendous news events of these times. May your anniversary be a very happy one indeed and may you continue to guide RCA for many years to come.

Thomas E. Dewey."

Five Tri-Color Kinescopes

(Continued from page 9)

ful experiments were conducted with one and with three electron guns.

The five remaining papers in the series discuss specific technical developments which are needed for the successful engineering of almost any tri-color tube.

The process used in applying the color phosphors to glass plates, used in four of the tubes, is described by N. S. Freedman and K. M. McLaughlin, of the RCA Victor Tube Department. This process, which was developed out of silk-screen printing methods, is used for applying dots and lines, as well as any other pattern.

Miss H. C. Moodey (the only distaff representative on the tri-color engineering team), and D. D. Van Ormer, also of the Tube Department, describe a number of practical designs for the three-beam electron gun.

Two other papers take up the mechanical assembly of aperture mask tubes.

These tubes use metal masks, placed just behind the phosphor plates, which are essential in keeping the electron beams from striking the wrong color dots. If this were not prevented, colors would "bleed" or run in the reproduced pictures. The papers by B. E. Barnes and R. D. Faulkner, also of the Tube Department, describe the design for the aperture masks, and show how the mask and phosphor plate are kept in alignment during the operation that seals the tube together.

D. D. Van Ormer and D. C. Ballard describe the effects of screen tolerances on operating characteristics of the aperture-mask type tri-color tube.

In the final paper, A. W. Friend tells how it is possible to bend the electron beams without interfering with the correct registry of the color images. This is done by well-designed electron deflection systems.

These systems bend the electron beams without distortion in the manner that a good optical lens bends light rays without distortion.

The eleven papers, which are expected to become of major importance as a basis for future developments in color television, are being reprinted as a separate section of the Fall issue of *RCA Review*, technical publication of RCA Laboratories.

Theatre Size Color Television

(Continued from Page 4)

Several research groups at the David Sarnoff Research Center, at Princeton, and engineers of the RCA Victor Division, cooperated with Dr. Epstein and his associates in the Cathode-Ray and Optics Section of the Center, in developing the equipment used in this initial New York showing of the RCA theatre color television system. Special credit also was accorded R. D. Kell, Head of the Television Section of the Center, and his associates; to Saul Lasof, of Dr. Epstein's staff, and to Roy Wilcox, RCA Victor engineer.

RCA to Enter Air Conditioning Field

The RCA Victor Division of Radio Corporation of America plans to enter the home air-conditioning field. The announcement was made by Frank M. Folsom, President of RCA, on October 1. The first room air conditioners to be sold under the RCA Victor name and trademark will be placed on the market in January, 1952.

In a letter to its distributors, RCA Victor revealed that the air conditioners will be distributed through its present nation-wide organization of independent home instrument distributors and retail dealers.

Present plans call for the introduction of three models—a one-third, a one-half, and a three-quarter horsepower unit, the Company told its distributors. New designs and specifications for these units have been completed by RCA Victor design engineers and the units will be manufactured under arrangements with the Fedders-Quigan Corporation of Buffalo, New York. Fedders-Quigan is one of the leading air conditioner manufacturers in the country.

Radio is Here to Stay

(Continued from Page 23)

could not afford to spend almost 1 million dollars—the cost of network time and talent for an evening half hour on an annual basis—in a single advertising venture.

In 1949, 27 of the 28 advertisers spending $5,000,000 and over were in network radio. In 1950, 29 out of the 33 advertisers in this group used the medium. However, network radio was not used in 1950 by half of the advertisers spending between $1,000,000 and $3,000,000, nor by 80% of those spending between $500,000 and $1,000,000, nor by 90% of the advertisers spending between $250,000 and $500,000. These figures demonstrate the great potential of customers available for radio. Taking them all together, there are 549 advertisers spending between one-half million and five million dollars a year. Only 158 of them (or 29%) are using network radio. This leaves 391 (or 71%) of advertisers spending one-quarter million dollars or more who are potential customers for the radio networks, but some of them cannot be sold in accordance with the old formulas.

Attractive to Small Advertisers

With the development of network television, the interest of many multi-million-dollar advertisers has been diverted to it and away from network radio. They can be brought back into the medium if it makes itself more flexible to meet their advertising requirements under the changed conditions of the market. At the same time, the network medium can adapt itself so that it can be used by smaller budgeted advertisers who offer a tremendous new revenue potential. By these means, network radio can regain the revenues needed to support its program structure and can continue to provide a strong service to the public, the advertisers, and the affiliated stations.

In changing times such as these, network radio cannot be frozen to old patterns of operations which were developed in a different advertising era. It must gear itself to new types of opportunities not only for its own preservation but for the preservation of other forms of broadcasting which are dependent on it.

These are not ordinary times. The changes taking place in radio come at a time when the nation faces a more serious threat than we have ever known before. We must be prepared to meet a potential enemy whose resources of materials, manpower and sheer fanaticism exceed anything that we have ever confronted in the history of our nation. If we should ever get into the conflict and should lose, we lose not merely a battle, not merely a war, but the precious heritage which mankind has struggled for centuries to attain.

Broadcasters can do many things to prevent such a tragedy. They can help to keep the American public awakened to these dangers; they can help to build a unity of national purpose. They must protect the medium against sabotage from within; they must be sure of the integrity and loyalty of those whose job it is to serve the public interest.

Yes, radio has a future, limited only by the scope of the imagination of those responsible for its destiny.

Good Times Ahead for TV

(Continued from Page 14)

aluminum, because aluminum is rationed to us at 48 per cent of the rate for the first half of 1950.

The nickel crisis is a very real crisis. This metal is in such short supply that the tube industry will be living hereafter on a hand-to-mouth basis. Even with the development and application of conservation techniques, tube production is going to hit the skids. Glen McDaniel, President of the Radio and Television Manufacturers Association, has forecast that manufacturers will have to start cutting tube production this month unless special relief is allowed. By December 15, he predicts that the production rate will be down to half the present rate.

And after taking a body blow from metals shortages, the industry seems fated to run head-on into a parts shortage some time in the first quarter of 1952, with transformers and coils, as well as tubes, among the hardest-to-get items.

Taking all of these things into account, the RCA Victor Market Research Department has estimated that the industry can turn out 1.8 million TV receivers during the first six months of next year. During the second half, with many shortage problems at least partially solved, the production capacity will increase, and from July to January we anticipate an industry output of 3 million units, giving us a total for 1952 of just under 5 million units. I predict this will not be enough to satisfy the demand.

At RCA, we consider the television and radio business as the most exciting business in the world. We occupy a position of leadership in this business, and we intend to keep it. When other TV factories were shutting down during the dark days of last spring, we continued to produce, warehousing our products against the time when the market would harden. As long as broadcasting endures, we shall continue to produce the finest television and radio receivers we know how to build, and broadcasting will endure as long as organized society endures.