

RADIO AGE

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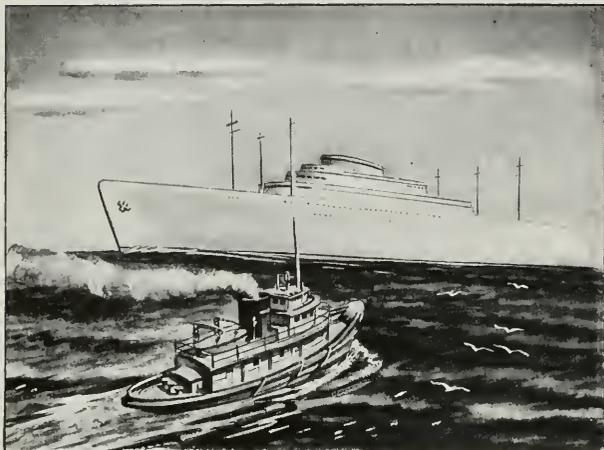
APRIL

1946

AIRBORNE TELEVISION

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Radiotelephone equipment aboard large merchant ships, fishing vessels and work boats protects life and property, saves time, increases operating efficiency and profits.



600 watt Radiotelephone Transmitter. The most powerful of its kind installed aboard American vessels. This unit provides for 30 different channels. Privacy for conversations is obtained through a speech inverter or "scrambler."



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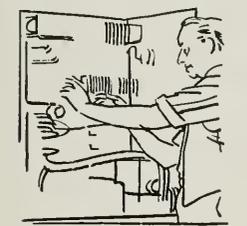
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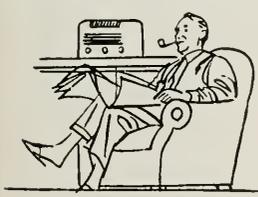
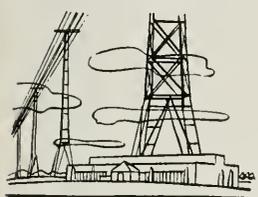
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VOLUME 5 NUMBER 3
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COVER — The Navy's "Gorgon" is a jet-propelled bomb guided unerringly to its target by an RCA television camera in its plastic nose. The flying bomb has a top speed of 550 m.p.h. and carries a ton or more of explosive.

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IN THIS TEMPLE
AS IN THE HEARTS OF THE PEOPLE
FOR WHOM HE SAVED THE UNION
THE MEMORY OF ABRAHAM LINCOLN
IS ENSHRINED FOREVER



A TELEVISION CAMERA FOCUSES ON THE STATUE OF ABRAHAM LINCOLN WITHIN THE SHRINE ERECTED TO HIS MEMORY ON THE BANKS OF THE POTOMAC.



BRIG. GENERAL DAVID SARNOFF, ASSISTANT SECRETARY OF NAVY FOR AIR JOHN L. SULLIVAN, AND CHARLES R. DENNY, ACTING CHAIRMAN OF THE FCC, AT THE DEMONSTRATION OF AIRBORNE TELEVISION, HELD MARCH 21, AT ANACOSTIA, D. C.

Airborne Television Demonstrated

TWO SYSTEMS, DESIGNATED DURING WARTIME AS "BLOCK" AND "RING," ARE REVEALED TO PUBLIC FOR FIRST TIME IN SPECTACULAR AERIAL EXHIBITION AT NAVY AIR STATION, ANACOSTIA, D. C.

REVOLUTIONARY television news coverage over long and short distances, from cars, boats, planes and helicopters is foreseen by Brigadier General David Sarnoff, President of the Radio Corporation of America, as one of many possibilities opened by two systems of airborne television revealed to the public for the first time on March 21, in a joint Navy-RCA demonstration at the Navy Air Station, Anacostia, D. C. During the war the systems had been classified by the Navy under the security pseudonyms of "Block" and "Ring."

Naval authorities assigned to the demonstration a fast, high-flying JM-1 Marauder plane carrying Ring transmitting units capable of transmitting high-quality television pictures up to 200 miles. The plane cruised over Baltimore and soared

on to Annapolis, picking up scenes and action along the way and transmitting the images directly to a bank of television receivers arrayed before guests in the Gymnasium Building at Anacostia.

Then proceeding to a rendezvous, miles away, the Marauder trained its television eyes on mock combat scenes that might have been duplicated in real battle only a few months ago—dive-bombing, smoke-screen laying, strafing, dog-fights. Instantly, the receivers at Anacostia came alive with authentic pictures of the action and viewers became eye-witnesses of events that were actually beyond the horizon. In this manner, command posts of the future will be able to see instantly combat action in distant terrain and make tactical decisions immediately.

During the period while the Ring-equipped plane was en route to the target area, two smaller planes with short-range, light-weight Block installations picked up scenes along the Potomac and over the capital, demonstrating another system of airborne television which has vast possibilities for usefulness to the armed services and to peacetime enterprises.

One of the Block-equipped planes was the two-motored RCA Victor "Flying Laboratory" and the second was a Navy training model. It was possible at Anacostia to bring in views flashed by first one and then the other and to receive a transmission from the No. 2 plane picking up No. 1 as the latter headed back toward the Air Station. As a finale in this phase of the demonstration, the No. 2 plane

Public Library
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[RADIO AGE 3]

flew over the route followed by the visitors to the base and zoomed in low, buzzing the building in which guests were viewing the show. It then pulled up into traffic pattern, figuratively taking the television audience with it, and came in and landed.

Captain Robert Morse, Commanding Officer of the Navy Air Station, welcomed guests to Anacostia and introduced Rear Admiral H. B. Miller, Director of Public Information, U.S.N., and General Sarnoff.

Army and Navy Used Block

The Block airborne television system was used during the war by both the Army and the Navy. Admiral Miller announced, with the Navy handling all procurement, design and production problems in cooperation with RCA. He said the longer-range Ring system was developed in the latter stages of the conflict by the Navy and engineers of the National Broadcasting Company, RCA subsidiary.

The names Block and Ring were chosen as designations least likely to provide clues to the enemy as to the nature of the projects.

Secret wartime uses of the television systems by the armed services included:

Application as "eyes" in remote-controlled aircraft and surface craft guidance—such as directing pilotless, overage bombers or crash boats laden with explosives against enemy targets; for ob-

servations of gun fire and reconnaissance; use in observation planes for general artillery spotting, gun control, map-making and other reconnaissance work; transmission of messages including maps and charts between ships and aircraft; for observation of dangerous operations from protected or remote positions; for guidance of free-falling, radio-controlled aerial bombs, flying torpedoes, or assault drones; as a means of directing explosive-laden gliders against land or sea targets; for reading meters, gauges and other instruments in connection with tests during aircraft design, and for obtaining the equivalent of eyewitness information under conditions of space, speed or peril which would preclude the gathering of required information by personal observation or by other means.

Applications Are Disguised

The Army and the Navy, it was revealed, had security pseudonyms for some of these applications. For instance, a Block-equipped glider was known as "Blomb"; a Navy crash boat with television eyes was "Campbell"; Block's use in over-age bombers was "War Weary" and the television system for guiding bombs took the fabulous name of "Roc." During early tests the airborne equipment had the equally unrevealing sobriquet of "Jeepette."

Television pick-up and transmitting equipment that once might have filled a large room was redesigned, modified and built to "suitcase" compactness for military uses in the Block system. In fact, an entire unit built by RCA Victor Division for one Army application weighs but 50 pounds.

New Electron Tubes Designed

An important phase of the project after it emerged from RCA Laboratories was the designing of a wide variety of electron tubes for sending and receiving equipment. This phase, it was explained, was completed by engineers in the RCA Tube Department plants at Harrison, N. J. and Lancaster, Pa., who began work on tubes for television-guided bombs as early as 1939.

The tube engineers had built for portable field equipment an iconoscope (television's original pick-up tube invented by Dr. V. K. Zworykin of the RCA Laboratories Division, Princeton, N. J.) one-third the size of studio models. Toward the close of the war, use of the super-sensitive Image Orthicon tube extended Block's effectiveness in twilight hours and under adverse light conditions.

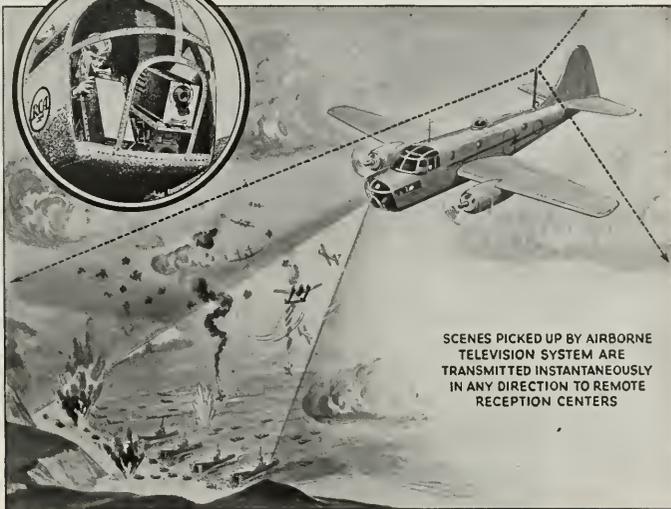
Pictures obtained in the Block equipment are viewed by the control operator on the screen of a special 7-inch kinescope—or electronic receiving "eye"—in a monitoring receiver.

BELOW: ENGINEERS MONITOR THE INCOMING SIGNALS AS THEY ARE PICKED UP FROM NAVY AND RCA PLANES DEMONSTRATING "RING" AND "BLOCK" AIRBORNE TELEVISION SYSTEMS IN THE AIR OVER WASHINGTON AND BALTIMORE. RIGHT: ACTUAL PHOTOGRAPH OF TELEVISION IMAGE TRANSMITTED BY "BLOCK"-EQUIPPED PLANE FLYING OVER SOLOMON ISLANDS, MD., AT AN ALTITUDE OF 1,000 FEET.





TELEVISION CAMERA OPERATOR POINTS THE SENSITIVE ICONOSCOPE THROUGH NOSE OF PLANE TO PICK UP TERRAIN BENEATH. RIGHT: DIAGRAM SHOWING HOW AIRBORNE TELEVISION SYSTEM WOULD BE UTILIZED IN AN AMPHIBIOUS OPERATION TO TRANSMIT SCENE OF ACTION TO COMMAND POSTS ON SHIP OR LAND.



SCENES PICKED UP BY AIRBORNE TELEVISION SYSTEM ARE TRANSMITTED INSTANTANEOUSLY IN ANY DIRECTION TO REMOVE RECEPTION CENTERS

The Block television unit produces 40 frames a second in sequential scanning, with 350 lines on the receiving screen. Its transmitter has a peak power output of 60 watts at 264 to 372 megacycles, and special transmitting antennas have been designed for each of its 10 workable channels.

NBC began work on the Ring System in 1939, and had succeeded in testing airborne transmission and reception before the war halted commercial research. The Navy became interested in the project in 1942, and in 1943 NBC installed a unit in a Navy plane for experimental purposes.

Tests Made Over Washington

In tests over Washington, D. C., last July, Ring showed its capability of transmitting high quality television pictures over a 200-mile radius from an altitude of 22,500 feet. Even at dusk, it was able to observe movements of traffic and recognizable landmarks. The Ring equipment employs two cameras, one in the nose and one in the waist of a plane.

Ring uses interlaced scanning such as that in commercial television broadcasting. But even greater resolution is achieved, it was said, by reducing the field frequency from 60 to 40, and the

frames from 30 to 20 a second. This enables production of 567 lines on the receiver screen, as compared with 525 lines in commercial television. The Ring transmitter produces a peak output of 1.4 kilowatts at 90 or 102 megacycles and a specially designed antenna gives uniform radiation in all directions from the plane.

"Walkie-Lookie" is a Prospect

General Sarnoff, who is Chairman of the Board of the National Broadcasting Company, said that he foresees airborne television opening the way for coverage of events with instantaneous transmission of eyewitness views at the scene and at the exact time of their occurrence. This coverage can include fires, floods, train wrecks or other happenings of public interest and, he added, the way is opened for development of the "walkie-lookie"—a light-weight, portable television camera with which a reporter might cover street scenes as readily as he does now with a news camera.

O. B. Hanson, Vice President and Chief Engineer of NBC, described the Ring development as "a major pioneering achievement which greatly enhances television's flexibility."

Mr. Hanson said the work on the

Ring system was conducted under the direction of Robert E. Shelby, NBC Development Engineer, G. M. Nixon, Assistant Development Engineer, Harold P. See, senior television supervisor, and others including F. J. Somers, L. R. Moffett, A. L. Hammerschmidt, W. L. States and A. E. Jackson of the NBC engineering staff.

Credit for developing the Block system went to Dr. Zworykin, for originating the idea; R. D. Kell, of RCA Laboratories Division, and W. J. Poch, RCA Victor engineer, for advance developments; Merrill Trainer, David Cole, Anthony Wright and Kenneth Chittick, RCA Victor engineers, for product and design; and Otto H. Schade, Dr. R. B. Janes and C. E. Haller, of the RCA Tube Division, for electron tube development.

Navy personnel who assisted greatly in the development of the two airborne television systems include: Lieutenant Commander Forrest Griffiths and Lieutenant W. E. Thorp, electronics design engineers of the Bureau of Aeronautics, and R. S. Taylor, civilian Navy engineer, who assisted in Block television arrangements for this show; also Commander T. W. Chew and C. L. Stee, of the Special Weapons Section, Electronic Division, Bureau of Ships.

History of Airborne Television

TWELVE YEARS AGO, LONG BEFORE START OF WAR, DR. ZWORYKIN OUTLINED PLANS FOR AERIAL TORPEDOES GUIDED BY SELF-CONTAINED TELEVISION CAMERA AND TRANSMITTER.



DR. V. K. ZWORYKIN HOLDS THE IMAGE ORTHICON WHOSE HIGH SENSITIVITY MADE POSSIBLE THE DEVELOPMENT OF AIRBORNE TELEVISION.

THE idea behind airborne television, the revolutionary form of sight transmission which was demonstrated publicly for the first time last month, originated twelve years ago, according to an account of its history disclosed by E. W. Engstrom, Vice President in Charge of Research of the RCA Laboratories Division.

It was in the spring of 1934—five and a half years before the start of World War II—that Dr. V. K. Zworykin, Director of the Electronic Research Laboratory, RCA Laboratories Division, formulated plans for such a system to serve as “electronic eyes” in guiding radio-controlled flying torpedoes.

Taking cognizance at that early date of formation by the Japanese of a Suicide Corps to control aerial weapons, Dr. Zworykin, recognized television pioneer, was revealed to have written:

“There have been quite a number of attempts to devise an efficient flying weapon. The aerial bomb is the simplest form, and the recent improvements in aerial ballistics make these bombs a most formidable modern weapon. The use of such a bomb requires usually a close approach of the bombing airplane to the target, thereby subjecting the plane to the barrage of the anti-aircraft batteries. It follows that simultaneous improvement in anti-aircraft artillery as aerial bombing is developed has considerably lessened the effectiveness of the latter weapon.

“Considerable work has been done also on the development of radio-controlled and automatic-program controlled airplanes having in mind their use as a flying torpedo. The possibilities of such airplanes were demonstrated repeatedly in various countries during the past few years. Both these methods,

however, have the same fundamental difficulty, viz., that they can be used efficiently only by trained personnel at a comparatively close range, thereby being subjected to anti-aircraft gun-fire. Both radio and automatic-controlled planes lose their efficiency as soon as they are beyond visual contact with the directing base.

Japs Organized Suicide Corps

“The solution of the problem evidently was found by the Japanese, who, according to newspaper reports, organized a Suicide Corps to control surface and aerial torpedoes. The efficiency of this method, of course, is yet to be proven but if such a psychological training of personnel is possible, this weapon will be of the most dangerous nature. We hardly can expect to introduce such methods in this country, and therefore have to rely on our technical superiority to meet the difficulty.”

Dr. Zworykin then declared that “one possible means of obtaining practically the same results as the suicide pilot is to provide a radio-controlled torpedo with an electric eye,” and added: “This torpedo will be in the form of a small steep angle glider, without an engine, and equipped with radio controls and iconoscope camera. One or several such torpedoes can be carried on an airplane to the proximity of where it is to be used, and released. After it has been released the torpedo can be guided to its target with the short-wave radio control, the operator being able to see the target through the ‘eye’ of the torpedo as it approaches.”

He pointed out that the carrier plane would receive the picture viewed by the torpedo while remaining at a distance beyond anti-aircraft barrage, and remarked that it would be unnecessary to have direct visibility of the target from this plane, since the informa-



BY SKILLFUL DESIGN, ELEMENTS OF THE "BLOCK" SYSTEM HAVE BEEN COMPRESSED INTO THE 50-POUND UNIT SHOWN ABOVE AT LEFT. RIGHT: THE SAME EQUIPMENT INSTALLED IN ITS PLACE IN THE PLANE'S NOSE.

tion would be supplied by the torpedo from a much closer range. As the torpedo neared the target, its "eye" would provide a picture facilitating aiming with great accuracy.

"This," Dr. Zworykin commented, "introduces an entirely new principle in ballistics, since in all existing methods the operator has no way of controlling the projectile once it has been released."

The RCA television pioneer included in his memorandum details as to radio-control equipment involved in the flying torpedo, and went so far as to estimate that this entire equipment, the television transmitter and all, could be built to weigh only 140 pounds.

In that memorandum and in a supplementary memorandum written in the latter part of 1935, a year and a half later, Dr. Zworykin told how the system might be applied

in more elaborate form to an explosive-carrying plane which, like the flying torpedo, could be radio-controlled and guided to enemy targets by television. Such aircraft, he pointed out, had the advantage of easy launching from land points or from vessels at sea. His estimate of the total weight of a satisfactory radio and television system for this use was 160 pounds.

Test Flights Made in 1937

As early as 1937, television research engineers of RCA Laboratories, under the direction of R. D. Kell, made flight tests with airborne television transmitting equipment, and Waldemar J. Poch, an RCA Victor development engineer, had solved many of the technical problems involved in reducing the size of the television equipment.

Research work on the project

progressed steadily and before United States' entry into the war, RCA had succeeded in building aerial television equipment that weighed but 113 pounds. This weight was further diminished by improvement of equipment and reduction of the size of the television pickup tube.

Aids to Military Supremacy

In summarizing his report, Mr. Engstrom pointed out that Dr. Zworykin's 1934 vision came true on all counts—Japanese use of the Kamikaze or Suicide Corps became for them an effective and dangerous weapon, but out of America's technical superiority emerged radar, the proximity fuse, airborne television and a host of other ingenious devices which all played an important part in achieving military supremacy.

GROUP JOINS WITH NBC IN UN PROJECT

The American Association for the United Nations, one of the country's leading educational groups, will cooperate with the National Broadcasting Company in NBC's

long-term United Nations' project, according to a joint announcement by Clark M. Eichelberger, director of the A.A.U.N., and Sterling Fisher, head of the NBC University of the Air. Activities of the Association are devoted exclusively to the fostering of United Nations'

understanding through 12 regional offices and 61 branches.

With the cooperation of more than 40 of America's greatest civic, educational and religious groups, the A.A.U.N. has officially adopted NBC's United Nations Week, scheduled for observance in September.



BISHOP G. BROMLEY OXNAM AND BRIG. GENERAL DAVID SARNOFF
AT THE CONVENTION OF THE FEDERAL COUNCIL OF CHURCHES
OF CHRIST IN AMERICA, HELD AT COLUMBUS, OHIO.

URGES CLERGY TO GUIDE MANKIND IN ATOMIC ERA

Technological Advances are Outstripping Spiritual Progress. Gen. Sarnoff Tells Federal Council of Churches of Christ in America.

CIVILIZATION now is at the crossroads because "technological advances have outstripped our spiritual progress," Brigadier General David Sarnoff, President of the Radio Corporation of America, declared in an address before the Federal Council of the Churches of Christ in America at Columbus, Ohio, on March 5. The address was broadcast to the nation over the network of the National Broadcasting Company.

"Man is out of stride with the march of science," General Sarnoff said. "He must rise spiritually and intellectually, as well as technologically, if he is to become not the slave but the master of science. Should he fail in this objective and release atomic power to blow up the spiritual and humanitarian barriers that hold back the Apocalypse, then death, famine, fire and pestilence, inflamed by war, will race across the hemispheres."

General Sarnoff asked the question: "Who can open the mind of man to this fearsome possibility of

annihilation?" His answer was: "Not the engineer—for he is concerned with machines. Not the politician—for he deals with men as he finds them. The church, therefore, must awaken man to the fact that, as never before, he is his brother's keeper. There is no security in isolation."

Cooperation Through Strength

Cooperation with our fellowmen can be achieved "only through strength," asserted General Sarnoff, and added: "To be weak or unprepared, is to live in fear, and that would not be conducive to peace and brotherhood. America must be strong. Our Nation must not neglect its moral and physical strength, or its national security, if we are to assist in rehabilitation of a world suffering from the ravages of war.

"Science and industry," he continued, "are equipped to create new instrumentalities and services and to make them available for the welfare of mankind. But the clergy-

man and the educator must help to stimulate their proper use and to discourage their misuse. . . . They must inspire the motives that are the mainsprings of man's intelligence.

"Our great national concern, therefore, should center on man himself, and not revolve solely around machines or electrons.

Man is More Complex

"We know how to build and control machines and how to make them work. But man is more complex. We must look into his heart, and his mind. Through such instruments as the electron microscope, science peers deeply into the sub-microscopic world to see virus and bacteria, but it cannot look into the soul, or scan the inner consciousness of man. Even to the church, man is a mysterious creature. While the engineer learns more about the machine, the problem of the clergy is to learn more about man so that it may guide him spiritually in his technological advance."

In the field of radio, for example, so rapid were the wartime advances that scientists achieved what they themselves would not have believed possible five years before, General Sarnoff said. He stressed the fact that it is the *use* of the invention—not the invention itself—which is significant. Recalling that radio travels at the speed of 186,000 miles a second, he pointed out that it can spread an untruth as easily as a truth, at the same speed. Therefore, it is the *use* to which radio is put that determines its contribution to the welfare and peace of mankind.

"Your own Federal Council of the Churches of Christ in America," General Sarnoff declared, "was among the first to realize the great value of radio science as manifested in broadcasting. Early radio listeners will long remember the venerable Dr. S. Parkes Cadman. He showed the way for the use of the microphone in the church."

Now through television and frequency modulation, popularly known as FM broadcasting, the church finds new servants at its command, he added, and declared: "Television comes not with the threat to re-

place the rural church and city cathedrals. Instead, it presents new opportunities to those who will adopt it to their purposes and the needs of the modern world. . . . Again through science, the church has found a new missionary. And again we see evidence that science and religion are two powerful forces, which can work for the good of all mankind."

General Sarnoff described television as "a tree of science with many branches," and cited the fact that out of its techniques scientists have produced the famed electron microscope and radar, the wartime miracle. He said that radar's recent epic achievement in contacting the moon represented "far more than man's ingenuity at work in such a triumph."

World Is Uneasy

Pointing out that the wartime science that split the atom—the science that created radar and a host of other inventions—has created an uneasy peace, General Sarnoff described the world as uneasy not because of scientists, but because all nations wonder what man will do with the handiworks of discovery and invention.

"Ever before us, like the recurring phrase of a symphony," he said, "is the question—what will man do with atomic energy? There is no assurance as yet that he will limit its use to peacetime industrial purposes, and to the improvement of our daily life. The ominous possibility that radio-controlled atomic bombs may be aimed across the oceans or projected across the hemispheres has made man apprehensive."

General Sarnoff referred to forthcoming experiments with the atom bomb in the Pacific to study its effect on old warships as targets, and declared: "Whether we shall go on from this great atomic experiment at Bikini Atoll to harness the atom for greater destruction, or whether we shall apply the new power to peace for the welfare of

man, is yet to be seen. One thing is certain—the world definitely has passed into the Atomic Age."

It would be a tragic end, warned General Sarnoff, if man should turn to science for implements of atomic warfare in which he will lose his soul and obliterate civilization.

Man Must Decide Quickly

"Therefore," continued General Sarnoff, "it is imperative that man think quickly how he can use these newborn forces for the betterment of the world and the preservation of peace. The atom's power for good far exceeds its power for evil, if man—with faith in himself and his fellow men—works as hard and with as much ingenuity to achieve a higher degree of national and international morality, as he has worked to produce steam, electricity, electronics and atomic energy."

Calling the attention of his audience of churchmen to the importance of spiritual guidance in the days ahead, General Sarnoff stated: "The task of awakening the soul of man and raising his moral level is your mission, your privilege, and your opportunity. You are the custodians and guardians of the spiritual lives and aspirations of mankind. For neither science nor politics is a substitute for religion. Science and religion are not opposed to each other. Both seek the eternal truth.

"Science alone cannot guarantee

security for civilization. Yet the problems facing man cannot be solved without science. Sometimes it seems as if the Lord challenges man to use his intelligence. He makes some lands fertile, others arid; He hides coal and oil in the rocks and fish in the seas. He makes the electron and the atom infinitesimal and the radio waves invisible.

"Man has been on earth a long time; he has had to toil by the sweat of his brow and he is tired by that toil. He has had to go into the mines and into the forests for fuel; he has had to go into the fields to cultivate the soil and to depend upon the elements for his harvest. Much of his work is unproductive, for even in converting energy into electric light, most of the energy is lost in useless heat. Man cannot survive without food, shelter and clothing; yet, all people on this earth do not share equally in these basic needs of life. And this inequality breeds discontent, hostility and war.

"Man stands facing a great threat and a thrilling opportunity. The possibilities of science enable him to look bravely at the stars and to seek a finer destiny. He needs most, the faith and the spiritual guidance that would lead him to apply his new knowledge to peaceful pursuits. For the hope of peace that is lasting and a world that is free, lies within the soul and heart and mind of man."

"NOW THROUGH TELEVISION AND FREQUENCY MODULATION, THE CHURCH FINDS NEW SERVANTS AT ITS COMMAND."



Trade-Mark With a Heritage

FOR 45 YEARS, THE FAMILIAR PAINTING OF "NIPPER" HAS BUILT GOODWILL AND SALES FOR VICTOR RECORDS AND VICTROLA PHONOGRAPHS.



By Abraham S. Greenberg
Patent Department,
Radio Corporation of America

THE trade-marks of Radio Corporation of America have a sound heritage, a heritage acquired through the happy combination of the 26-year radio engineering prestige of RCA and the 47-year musical eminence of Victor, supported by the courageous vision and faith of Eldridge R. Johnson, founder of the Victor Talking Machine Company, and Brigadier General David Sarnoff, President of RCA. Over the years, these trade-marks have become one of the Company's most valuable assets, yet the history of their conception and development has never been fully recorded.

Universal Goodwill Created

The story starts with "His Master's Voice," one of the most famous trade-marks in advertising annals. This painting of the alert black-and-white fox terrier, now familiarly known as "Nipper," is said to be more widely known than any work by Rembrandt or Whistler. Yet few know the painter's name or how he came to use the dog for his model. Nipper's lifelike pose, typical of his breed, has amused people whenever products bearing the trade-mark have been sold. Millions of dollars have been spent to make the symbol popular and the outlay has been more than justified by the returns. It is doubtful if any manufacturer has ever created such

a backlog of universal good-will through a trade-mark, as RCA has done through ownership and use of the illustration.

The history of "His Master's Voice" begins in London, the home of Francis Barraud, originator of the painting. Trained as an artist from early youth, Barraud attained a moderate degree of success in his chosen profession. It was, however, by "His Master's Voice" that he achieved world-wide fame. As a gesture of appreciation, Barraud, in his later years, was pensioned by the Gramophone Company, Ltd., which had purchased his painting for commercialization. Upon Barraud's death on August 29, 1924, Alfred Clark, Managing Director of that company, wrote a eulogy to his memory, a circumstance rare in the annals of trade-marks. Here are the facts of the origin of "His Master's Voice" as narrated by Mr. Clark in his tribute:

"Mr. Barraud's brother had a fox terrier, named Nipper, extremely loyal to his master, and inclined not to be over-friendly with anyone else. Mr. Francis Barraud, shortly after his brother's death, suggested one day that he would like to take Nipper for a walk, and to his surprise Nipper immediately attached himself to him. They became such fast friends that Mr. Barraud

eventually took Nipper to his own home, and there he remained throughout his little life.

"At that time Mr. Barraud was the owner of a small phonograph, of the type that employed wax cylinder records, and when he played these records he noticed the peculiar interest which Nipper took in the sound that came from the trumpet. He would prick up his ears immediately the phonograph began to talk, listening intently until the record had ceased playing. Watching him one day, Mr. Barraud conceived the idea of putting Nipper and the phonograph on canvas and giving it the title "His Master's Voice." I have often talked to Mr. Barraud about this, and he has always assured me that there was nothing more than this to the story of how he hit upon the idea. It simply came to him, and he immediately transferred it to canvas.

A Brass Horn Was Needed

"His first effort, consequently, was a picture in which the old-fashioned cylinder phonograph was shown standing in front of Nipper. He took it to a company then prominent in the sale of wax cylinder phonographs to see whether they were interested enough to acquire it. They did not seem at all im-

FRANCIS BARRAUD, ENGLISH ARTIST, SITS BEFORE THE ORIGINAL PAINTING OF NIPPER NOW WIDELY USED AS SHOWN BELOW TO PROMOTE RCA VICTOR PRODUCTS.



"HIS MASTER'S VOICE"





FROM THIS SMALL MACHINE SHOP ROSE THE GREAT 80-ACRE PLANT OF RCA VICTOR AT CAMDEN, N. J. IN THIS BUILDING, ELDRIDGE JOHNSON, FOUNDER OF THE VICTOR COMPANY, WORKED WITH EMIL BERLINER TO PERFECT "THE TALKING MACHINE."

pressed by the originality and beauty of the picture, but asked for time to think it over. Mr. Barraud was keenly disappointed, and recounted his non-success to an artist friend, who suggested that the picture might be brightened up by painting a brass horn in place of the black horn which was issued on the phonographs of that period. Mr. Barraud had never seen a brass horn, and asking his friend where one could be obtained, he was told that there was a little company in Maiden Lane off the Strand, called The Gramophone Company, which might possibly lend him one.

A Memorable Day in 1899

"And so, on a very memorable day in September, 1899, Mr. Barraud came into the little office of the then infant Gramophone Company in Maiden Lane, and asked for the loan of a brass horn. This somewhat unusual request brought forth explanations, which resulted in Mr. Barraud showing the manager, Mr. William Barry Owen, a photograph of his picture, and in Mr. Owen's immediate request to see the painting itself. The painting, which was then still in the hands of the hesitating phonograph company, was eventually refused and returned to Mr. Barraud, who at once brought it to Mr. Owen, with a suggestion that he could easily paint out the phonograph and paint in a gramophone. It took only a short time to do this, and the original picture then entered into

the possession of The Gramophone Company.

"This original, which now hangs in a special recess over the fireplace in the oak-panelled Board Room of the Company's Head Office at Hayes, still shows traces in relief of the marks of the brush outlining the old wax cylinder phonograph.

"Since then Mr. Barraud has painted a great many copies of the picture, and these occupy honoured positions in various gramophone centres throughout the world. A very fine copy which he recently presented to the Company now hangs at the British Empire Exhibition at Wembley. From the moment of the acquisition of the picture by The Gramophone Company, its unique charm became evident. It was instantly popular. Photogravure copies were made and distributed by thousands, and were framed and proudly hung as works of art in the homes of England."

Story Shifts to America

Our story now shifts to America and to Camden, N. J. One day in 1896 a man named Emil Berliner walked into a machine shop in that city to have some repairs made on a little gadget that had been placed on the novelty market. It was a hand-operated "Gramophone". The machinist was intrigued with the little contrivance, despite its raucous tone and crude reproduction. That machinist was Eldridge R. Johnson. He was quick to recognize the improvement—the first basic improvement—that Berliner had

made in Edison's original development, namely, the flat disc record rather than a cylinder. Being a sensitive inventor as well as a keen business man, Johnson devised a spring motor that unwound at an even speed and which could be manufactured at a reasonable price. The Berliner-Johnson partnership of 1898 lasted until 1901 when the Victor Talking Machine Company was formed with Mr. Johnson as President.

Johnson's Valuable Assets

Eldridge R. Johnson, founder of the Victor Company, acquired the American rights to the Barraud painting in 1901. He had little capital in those days, but he had unlimited faith in his talking machine and especially in the trade-mark of the listening dog. These were his chief assets and, as the world knows, he made the most of them.

Many versions exist as to how the trade-mark "Victor" came into being. It is probable that the versions are exceeded in number only by the places on the Delaware River where Washington is supposed to have crossed. But here is a terse but authentic account, as told in 1944 by Robert Hathaway who was Johnson's secretary:

"There was a very fine bicycle, better than the one he owned, being pedaled around Camden, called Victor, which he would have liked very much to possess; he liked its name, and so when the demand for his talking machines continued to grow he decided to name them 'Victor.'"

Birth of a Famous Name

In 1905, Eldridge Johnson had been revolving in his mind the advisability of a new name for the cabinet type of talking machine in which no horn or amplifier of any kind was exposed. The horn had been turned downward and inclosed in the cabinet of the machine. The machine thus became a piece of furniture, and Johnson was shrewd enough to realize that a new trade-mark was needed for the new product. He desired particularly to avoid using the word "gramophone." In a letter sent to his attorney on June 9, 1905, Johnson wrote:

"The word 'Victrola' is similar

to nothing that I ever heard of and seems to me to have a sound suggestive of music, and would in all probability be the best word to use."

Thus the trade-mark, "Victrola," was born.

A few great artists at first reluctant to make recordings because of early imperfections, were finally induced to record. Enrico Caruso was one of the first. He led, others followed. Soon the greatest music in the world interpreted by the greatest artists was being imprinted on Victor records.

From the beginning, Eldridge Johnson wisely spent much for advertising. Orders poured in; his plant and company expanded. The bicycle shop of 1898 became a huge plant of over 80 acres.

Before long, the familiar "Nipper" pose appeared in every "Victor" advertisement, on all promotion material, on every "Victrola" phonograph, on millions of records and even on all shipping cases. Meanwhile, the "Red Seal" trade-mark had come to signify the finest in musical recordings.

Scene Shifts to New York

Our story now shifts to New York City, where in 1919, Radio Corporation of America was organized to serve the interests of the public and the government and to establish American preeminence in radio. By 1920 the lusty radio infant had definite advertising and publicity plans and ideas, with the matter of names, brands and trade-marks constantly before the management. The trade-mark "RCA" in monogram style was going through an evolutionary process, as related in these pages (RADIO AGE—Oct. 1945).

One memorable evening in 1921, at the Fifth Avenue home of Dr. Alfred N. Goldsmith, at that time Chief Engineer of RCA, were gathered David Sarnoff, Dr. Goldsmith and Elmer E. Bucher. Before them was the very "Radio Music Box" which David Sarnoff had envisioned in 1916. It was a uni-control broadcast receiver operating with miniature tubes on dry batteries and

having a self-contained loud speaker. It was the broadcast receiver which had been christened "Radiola" by General Sarnoff as early as April 1920, at a meeting held in Schenectady to determine what the instrument was to be like.

A Dream That Came True

One can picture the mental reactions of David Sarnoff on that evening a quarter of a century ago as he listened to the programs originating from the Wanamaker store broadcasting station, for early in 1916 he had put his dream on paper in a memorandum to E. J. Nally, first president of RCA:

"I have in mind," the note said, "a plan of development which would make radio a 'household utility' in the same sense as the piano or phonograph. The idea is to bring music into the house by wireless. . . . The 'Radio Music Box' can be supplied with amplifying tubes and a loudspeaking telephone, all of which can be neatly mounted in one box. The box can be placed on a table in the parlor or living room, the switch set accordingly and the transmitted music received. . . . By the purchase of a 'Radio Music Box', . . . members of the family could enjoy concerts, lectures, music, recitals, etc., which may be going on in the nearest city within their radius. . . . Aside from the profit to be derived from this proposition, the possibilities for advertising for the Company are tremendous; for its name would ultimately be brought into the household, and wireless would receive national and universal attention."

The "Radiola" receiver used "Radiotron" tubes. The same three

men, Sarnoff, Goldsmith and Bucher, appear to have been responsible for the trade-mark "Radiotron." The term was chosen after considering a dozen or more names. It was singularly appropriate, for translated it means "Radio Thing." Truly it was the thing or device which made radio possible.

Radio's growth was phenomenal and the three basic trade-marks of RCA soon were blazoned across the country in newspapers, magazines, on billboards and over the radio. They were destined to become household expressions in a radio-conscious decade. Consider these facts: By 1929, at the end of 30 years, the phonograph industry of this country had equipped 13,000,000 homes with phonographs.

Expanding Factory Facilities

RCA Victor Division of Radio Corporation of America today is expanding its manufacturing facilities at Camden, N. J., Nipper's original home in this country. Furthermore, the Company's plants at Hollywood and Indianapolis, are being equipped to take full advantage of technological progress in the manufacture of records, phonographs and radio-phonograph combinations. At all of these places, and at Harrison, Lancaster, Bloomington and Princeton, the marvels of television, tubes and electronics will flow out to a post-war people eagerly waiting for them. These products, too, will bear the established trade-marks. Nipper, who was the household companion of the 1910's and 1920's appears destined to be the most familiar dog of the 1940's.

SINCE ITS ORIGIN IN 1899, THE TRADE-MARK OF "HIS MASTER'S VOICE" IS BELIEVED TO HAVE BEEN SEEN BY MORE PEOPLE THAN ANY OTHER COMMERCIAL SYMBOL.



"Only RCA VICTOR makes the Victrola!"





A GROUP OF RETURNED GI'S STUDY A UNIT OF RADIO EQUIPMENT UNDER THE GUIDANCE OF AN EXPERT INSTRUCTOR.

GI'S GO BACK TO SCHOOL

War Veterans Seeking Training in Radio and Television as Basis for Careers Tax Expanded Facilities of RCA Institutes.



By Charles J. Pannill
*President,
RCA Institutes, Inc.*

ATTRACTED to the school by its 35-year reputation as an educational center for young men seeking a thorough training in radio and electronic fields, more than 900 war veterans have enrolled at the RCA Institutes to acquire the knowledge that will help them gain responsible positions in the field they have chosen for their careers. As students in the Institutes, many of them are supplementing the training they received in radio

operations during their months in uniform. When expert classroom and laboratory instruction is added to this field experience, the graduate leaves the school with a comprehensive knowledge of the science of electrical communication. He should then be able to fill a position in laboratory work with manufacturing organizations, as a studio or transmitter technician with broadcasting stations or as a member of the technical staff of communications companies.

Although the Institutes recently increased its facilities substantially, the expansion was not sufficient to take care of the demand. On March 4, 1200 students were enrolled. Hundreds more are on the waiting list for future sessions. Many of them cannot be accommodated until early 1947.

A staff of 57 instructors and department heads is available for assignment to the day and night classes in the various courses.

RCA has cooperated closely with the Veterans Administration in the training of GI's. The VA subsidizes

the trainee for the matriculation and tuition fees and for the necessary books and supplies. To receive this aid, the veteran must follow a definite procedure. First he communicates with his local VA office and files an application for a Certificate of Eligibility which he then presents to the Institutes with an Application for Enrollment. The courses he takes naturally depend on his previous schooling and experience but the curriculum is broad enough to meet the demands of most applicants.

The General Course is recommended to the man who seeks a thorough knowledge of the radio industry as a whole. Together with the broad, fundamental training, the student in this course receives practical and complete training in each of the basic specialized branches of the art. With this background the Veteran is in a position to choose the field which he intends to follow as a career.

High School Course Essential

Enrollees in the General Course must have completed 4 years of High School including certain requirements in Algebra, Geometry and Physics. For those who lack these prerequisites the Institutes offers a Preparatory Course.

The General Course runs for 2 years with classes held daily for 50 weeks each year.

When the Veteran has completed the course he has acquired solid training in mathematics, physics, electrical technology, audio, video and radio frequencies. He is then prepared to enter any of the many branches of electrical communications. Jobs are open to him as studio or transmitter technician with broadcasting companies testing or field servicing and in the research and laboratory operations of manufacturing organizations.

A high percentage of the students currently enrolled in the General Course are planning to advance into television technology with the intention of becoming technicians in that branch of radio.

ELECTRONIC BEAN-SORTERS

With Uncanny Accuracy, Machines Built Around RCA Cathode-Ray and Phototubes Separate Good Foods from Bad.



By M. J. Carroll

*Equipment Tube Sales,
Radio Corporation of America*

THE fellow who says "it doesn't amount to a hill of beans" has never tried to sort one. Otherwise, he'd know that a hill of beans is nothing trivial. But aided by one of the growing industrial uses of electron tubes, the formerly tedious task becomes a speedy, foolproof, automatic operation.

Equipped with RCA phototubes for eyes and an RCA cathode-ray tube for a brain, the electronic sorting machine "looks" at each bean individually and separates the good ones from the bad ones much faster and more accurately than could human sorters.

Approximately 1,000 of these "super sorters", all manufactured by the Electric Sorting Machine Company, of Grand Rapids, Michigan, and employing RCA phototubes, cathode-ray tubes, and control tubes, are now processing about one and one-half million

pounds of food each day in plants from California to Virginia and in Canada. Each installation consists of at least sixteen machines. The foods include beans of various kinds, seed corn, peanuts, coffee, and even potatoes.

Although this application of electronics has recently enjoyed a dramatic growth, the idea is not new. It has met the test of years of practical experience, an installation having been made as early as 1931 in a Grand Rapids plant. A. G. Curtis, president of the Electric Sorting Machine Company, reports that the average life of RCA electron tubes used in this installation has been estimated at more than 8,800 hours.

Light Controls Action

In the sorting of beans, acceptance or rejection of each one depends on the respective percentages of red and green light reflected by it. The mechanical design of the machine provides for feeding the beans, one at a time, through an optical system consisting of an incandescent lamp, a focusing lens, two mirrors, and two phototubes.

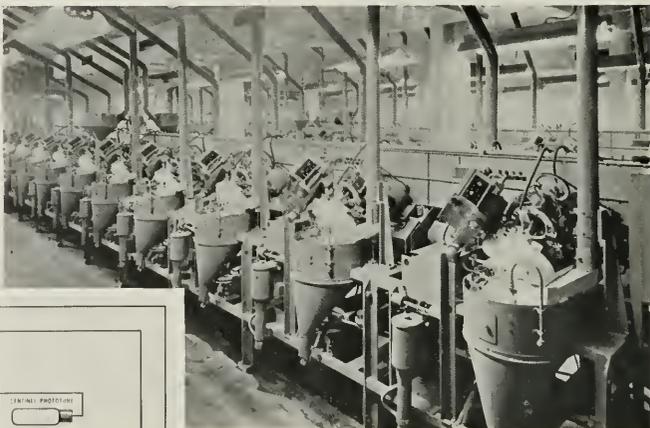
Light from the lamp is reflected by the bean through the lens to the first of the two mirrors. This mir-

ror is what is known as a "partial" mirror or "50 per cent" mirror. It reflects part of the light through a red color filter to the first phototube, but transmits another part of the light to the second mirror, which reflects it through a green color filter to the second phototube. The first phototube is especially sensitive to red light, the second to green light.

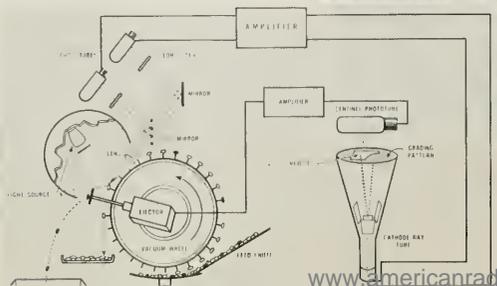
The output of each phototube is amplified and fed to one of the two pairs of deflection plates of a cathode-ray tube. This permits one phototube to control the horizontal sweep of the electron beam in the cathode-ray tube, while the other phototube controls the vertical sweep of the beam. The degree to which the beam is deflected in either direction is governed by the respective amounts of red and green light reaching the phototubes.

A partial mask covers that part of the face of the cathode-ray tube on which the electron beam will appear when controlled by the color range of an acceptable bean. When a bad bean passes through the optical system, the color of the reflected light affects the output of the phototubes, and this in turn alters the sweep of the electron beam so that it appears outside the mask. Any position of the electron beam outside the masked area actuates a third phototube whose output is amplified to operate an ejector mechanism which rejects the faulty bean.

LONG ROWS OF ELECTRONIC SORTING MACHINES IN THIS MICHIGAN PLANT INSPECT EACH BEAN AS IT PASSES INTO THE HOPPER AND REJECT ALL IMPERFECT ONES. BELOW: DIAGRAM SHOWING HOW PHOTOCELLS AND CATHODE RAY TUBES DETECT AND EJECT LOW-QUALITY BEANS.



[14 RADIO AGE]





THE UNITED STATES OF AMERICA

TO ALL WHO SHALL SEE THESE PRESENTS, GREETING:

THIS IS TO CERTIFY THAT THE PRESIDENT OF THE UNITED STATES OF AMERICA IN ACCORDANCE WITH THE ORDER ISSUED BY GENERAL GEORGE WASHINGTON AT HEADQUARTERS, NEWBURGH, NEW YORK, ON AUGUST 7, 1782, AND PURSUANT TO ACT OF CONGRESS, HAS AWARDED THE MEDAL

FOR MERIT TO DAVID SARNOFF

FOR EXTRAORDINARY FIDELITY AND EXCEPTIONALLY MERITORIOUS CONDUCT

GIVEN UNDER MY HAND IN THE CITY OF WASHINGTON
THIS EIGHTH DAY OF FEBRUARY 1946

George Washington
PRESIDENT OF THE UNITED STATES

Harry Truman
PRESIDENT OF THE UNITED STATES



GENERAL SARNOFF RECEIVES THE MEDAL FOR MERIT FROM MAJ. GENERAL H. C. INGLES, CHIEF SIGNAL OFFICER OF THE U. S. ARMY, WHO REPRESENTED PRESIDENT TRUMAN AT THE CEREMONY.

PRESIDENT HONORS SARNOFF

MEDAL FOR MERIT AWARDED PRESIDENT OF RCA
FOR "PERFORMANCE OF OUTSTANDING SERVICES."

THE Medal for Merit was presented to Brig. General David Sarnoff, President of Radio Corporation of America, by Maj. General H. C. Ingles, Chief Signal Officer of the United States Army, who represented President Truman at a presentation ceremony held March 18 at Radio City.

The citation, read by Colonel Jay D. B. Lattin, Signal Officer 2nd Service Command, Governor's Island, said:

DAVID SARNOFF, for exceptionally meritorious conduct in the performance of outstanding services to the United States as President, Radio Corporation of America, from October 1942 to March 1944. Mr. Sarnoff placed the full resources of his company at the disposal of the Army whenever needed, regardless of the additional burden imposed upon his organization. He encouraged key personnel to enter the service, and at his direction RCA engineers and technicians rendered special assistance on numerous complex communications problems. He fostered electronic advances which were adapted to military needs with highly beneficial results. The wholehearted spirit of cooperation which Mr. Sarnoff inculcated in his subordinates was of inestimable value to the war effort.

(signed) Harry Truman

General Sarnoff was previously awarded the Legion of Merit on October 11, 1944, for "exceptional

meritorious conduct in the performance of outstanding service" when he was on military service overseas.

General Ingles, in opening the ceremony, recalled the fact that General Sarnoff had been presented the Legion of Merit by the War Department for his activities during his military service abroad. General Ingles said that he had been delegated by the President of the United States to present the Medal of Merit to General Sarnoff, who, in a civilian capacity, made outstanding contributions to the Government of the United States in war and peace.

General Sarnoff, in accepting the Medal, said that this award was particularly gratifying because it represents recognition of the work of his associates throughout the RCA organization, as well as of him. He praised the outstanding accomplishments of the men and women of RCA who have contributed to the nation's welfare in war and in peace. He assured General Ingles that the workers of RCA would continue to do their utmost to maintain liaison with the armed forces to help promote scientific progress and preparedness, both of which he described as vital to the security and prosperity of our nation.

[RADIO AGE 15]

TELEVISION AT UN COUNCIL

RCA SERVICE ALSO INCLUDES DIRECT RADIOTELEGRAPH CIRCUITS TO MORE THAN FIFTY NATIONS.

USE of television for the first time to facilitate press and radio news coverage of world events, and the installation of facilities for the handling of press matter and official messages to all parts of the world, represent RCA's service to the opening meetings of the United Nations Security Council, at Hunter College, New York City.

A television camera in a balcony booth overlooking the Council auditorium was connected by coaxial cable to twelve RCA Victor television receivers located in a special viewing room near press quarters. These receivers made it possible for 200 press and radio representatives who were unable to find space in the Council chamber to see every gesture and action of UN members

while listening to the proceedings over loudspeakers.

One of the outstanding features of the installation was the Image Orthicon camera tube which made unnecessary the intensely brilliant special lighting required by conventional television cameras. Ordinary room lighting was sufficient to provide a normal picture on the twelve receivers.

Microwave Relay Used

In addition to the television sets at Hunter College, NBC installed six receivers in studio 8G, Radio City, for the use of executives, dignitaries and members of the press. The pictures picked up by the Image Orthicon at Hunter were trans-

mitted by microwaves to Radio City, a distance of eight miles.

To serve delegates of the eleven nations represented on the Council, as well as observers and press representatives of more than forty additional countries, RCA Communications, Inc., installed world-wide radiotelegraph facilities at Hunter College, capable of handling 200,000 words a day to and from Council headquarters.

Two communications centers, each equipped with two printers were set up on the auditorium floor and in the room assigned to the press. Messages filed at either location flashed to the offices of RCA Communications at 66 Broad Street and continued from there over the Company's high-speed circuits to their overseas destinations. Facilities were similar to those installed last year at the UN Conference in San Francisco, from where more than a million words were transmitted throughout the world over RCA circuits.

RCA INITIATES RATE REDUCTIONS

DRASTIC reductions in international telegraph rates, proposed by Thompson H. Mitchell, Executive Vice President of RCA Communications, Inc., have been approved by the Federal Communications Commission to go into effect May 1. Under the new tariff schedules, rates would be reduced to not more than thirty cents per full-rate word from all places within the United States to all points in the world where communications services now are available.

Comments by the FCC

In a public statement expressing satisfaction with the RCA proposal, the Commission said:

"These reductions are in line with the Commission's policy that the public interest, particularly at this time, requires the cheapest, fastest, most abundant international communication service consistent with sound operating economies.

"The reductions are especially

timely because of the contribution that a free flow of information can make toward international cooperation and the stimulation it can afford to world trade in this reconversion era."

At the Bermuda Conference last fall, Mr. Mitchell stated, it was agreed by the United States and British delegates that a ceiling rate of thirty cents per full-rate word should apply from all points of the United States to all places within the British Empire.

The latest action taken by RCA, Mr. Mitchell explained, would provide for extension of the principle to all messages going from the United States to any part of the world including more than eighty additional countries, territories and islands to which the rates currently range from thirty-three cents to one dollar and fifteen cents per ordinary word. This would mean, in effect, he said, that to all points in the world where telegraph charges now are in excess of thirty cents a

word, such rates would be reduced to a uniform basis of not more than thirty cents, with charges of 20 cents a word for code, 15 cents a word for deferred service and 10 cents a word for radio letters. At the same time, RCA proposed to reduce ordinary press rates from a maximum of up to forty-three and a half cents a word to a maximum of six and one half cents a word from its offices in foreign countries outside the British Commonwealth.

Millions Saved in Tolls

"The full effect of these drastic reductions may be expected to save millions of dollars each year in telegraph tolls to the American public," Mr. Mitchell added. "This action by RCA Communications, Inc., is a tribute to American methods of scientific research and technological development under private enterprise, and a demonstration of the benefits that can be enjoyed by the public."



AN RCA IMAGE ORTHONICON CAMERA IN THE BALCONY OF THE UN SECURITY COUNCIL AUDITORIUM SUPPLIES PICTURES AND SOUND TO TELEVISION RECEIVERS IN THE OVERFLOW ASSEMBLY ROOMS AT HUNTER COLLEGE, NEW YORK CITY.

Freedom to Listen

PLAN TO ESTABLISH INTERNATIONAL BROADCASTING SYSTEM PRESENTED TO UNITED NATIONS BY GENERAL SARNOFF.

ESTABLISHMENT on a world-wide basis of the principle of "Freedom to Listen," and the erection of an independent international broadcasting system owned and operated by the United Nations and known as "The Voice of UN," was suggested by Brig. General David Sarnoff at a private dinner given in honor of UN officials by the Radio Corporation of America and the National Broadcasting Company in the RCA Building on April 4. General Sarnoff proposed the following plan for international broadcasting by the UN:

Any medium of communication that would increase the knowledge and understanding of the peoples of the world, about the problems of the world, would increase the effectiveness of the United Nations and advance the cause of world peace.

One effective way to help achieve this purpose is to provide a world-wide system of mass communication that can reach all peoples of the world freely and simultaneously.

A two-point plan for progress along these lines was submitted for consideration by the United Nations:

1. Establish the principle of "Freedom to Listen" for all peoples of the world. This is as important as "Freedom of Speech" and "Freedom of the Press."

2. Establish an independent international broadcasting system to be known as "The Voice of UN." This system should be owned and operated by the UN. It should have a world-wide range and be used for broadcasting the public proceedings of the United Nations, for disseminating its information to listeners everywhere, and for spreading knowledge and understanding among the peoples of the World. "The Voice of UN" should broadcast in the principal languages employed throughout the World. The UN should continue to afford to other broadcasters and the press the privilege of broadcasting and publishing its proceedings and information.

In submitting his plan, General Sarnoff said:

"The practical problems involved in adopting and executing this plan, are both technical and political. The technical problems can be solved. The political problems require for their solution the consent of the member nations of the UN and their united will to make the plan work."

Benton and Lie Endorse Plan

These proposals were endorsed in statements by Trygve Lie, secretary general of the UN, and William

Benton, assistant secretary of state of the United States.

"General Sarnoff has crystallized an idea and hope that has been in many minds," said Mr. Benton. "His experience and position as a great pioneer in the development of domestic and international broadcasting gives any proposal from him great weight. The objective of such a plan, he said, should be to deepen the sense of world community on which the cause of peace rests."

Pointing out the possible difficulties in securing agreement of what to broadcast from such a station, Mr. Benton said that the effort to secure such agreement would in itself be valuable, "for it would lead to the discovery and widening of the values the nations hold in common. The proposed United Nations Educational Scientific and Cultural Organization would be the appropriate agency to take responsibility for the educational and cultural aspects of the programming."

People Must Understand Aims

"The aims and objectives of the United Nations," Mr. Lie said in his statement, "can only be achieved if they are fully understood by all the peoples of the world. It is particularly gratifying that it should come from one of the greatest private broadcasting organizations in the world."

Mr. Lie also announced that the recommendation for the setting up of an independent broadcasting station had been approved by the Preparatory Commission of the United Nations at the end of last year.

Among the guests at the dinner in addition to Mr. Lie were Dr. Quo Tai-chi, president of the United Nations Security Council; Benjamin V. Cohen, counselor to the Department of State; Wilder Foote, Director of Information of the U. S. Delegation; Benjamin A. Cohen, assistant-secretary general for public information; Arthur Sweetser, special advisor to the secretary general; William H. Stoneman, personal assistant to the secretary general; Vernon Duckworth Barker, chief of the Radio Division, Department of Public Information, and Frank E. Mullen, vice president and general manager of NBC.

NEW FIELDS FOR TUBES

War Experiences Made Industry and Commerce Realize Versatility of Modern "Genii in a Bottle." Now Available for Peacetime Uses.



By L. W. Teegarden

Vice President in Charge of
Tube Department,
RCA Victor Division

THE modern "genii in a bottle" which we know as the electron tube has been mustered out of military service to resume, among other important peace-time jobs, a new career which may well become his greatest. He has come out of the war with his sleeves rolled up and both feet in the factory—a field in which he had scarcely begun to exercise his power and skills before war limited its expansion, but one in which, at the same time, war needs inspired new services.

The electron tube, after a quarter-century of service in the entertainment and communications field, is now ready to realize its full, vast potentialities as a toiler in peace-

ful commerce and industry. We believe that the year ahead will be marked by a substantial start toward that realization, and that eventually our production of tubes for non-radio purposes will exceed that for radio applications.

While the prospect of rapidly increasing industrial electronics applications features our outlook for 1946 and 1947, it is also noteworthy that projected immediate postwar sales of RCA receiving tubes for home radios, which are again in production, show an increase of 153 percent over prewar sales.

Until the close of the war, and therefore during the greater part of 1945, all development and production facilities of the RCA Tube Division, in common with virtually all other RCA facilities, were devoted to fulfillment of the needs of our armed forces and those of our allies, and war production and other home front activities having the common goal of a victorious peace.

When peace returned to the world, the electron tube industry was one of the few businesses which found itself in the fortunate position of having no major reconversion problems requiring modification of facilities. The nature of tubes made by RCA for war purposes was very much the same as that of the majority of those to be

made in the immediate postwar period. Consequently, we were able to begin production of tubes for civilian and commercial purposes just as rapidly as wartime restrictions were lifted and the demand developed.

Total gross sales of RCA electron tubes of all kinds rose to a wartime peak 445 percent in excess of the 1939 level. The immediate postwar level is expected to be 162 percent above that of 1939. An unprecedented demand for power, cathode-ray, and special-type tubes for wartime applications in electronic devices such as radar equipment and vastly expanded communications facilities accounted for the largest portion of the total wartime increase in production.

In the receiving tube field, where general production for home radio receivers was shifted to meet military requirements, production was increased only some 200 percent over prewar levels.

In contrast, production and sales of cathode-ray tubes, used principally before the war in the field of measuring and testing, with a very small number going into television, increased by an astounding 4500 percent—primarily as a result of the application of these tubes in radar. The major postwar field for



ABOVE: DEFT HANDS CEMENT CERAMIC INSULATION IN PLACE ON TUBE ELEMENTS. LEFT: SECTION OF THE AGEING RACK WHERE ALL TUBES UNDERGO SPECIAL TREATMENT BEFORE SHIPMENT.

[IS RADIO AGE]



PART OF THE MILLIONS OF GLASS ENVELOPES AWAITING THE NEXT STEP IN TUBE MANUFACTURE AT THE RCA PLANT, HARRISON, N. J.

these tubes will be television. For the immediate future, we anticipate an increase of about 1200 percent over prewar levels. We foresee a demand far in excess of even wartime levels, however, as soon as television is established on a nationwide basis.

RCA sales of power tubes, which before the war were largely for use in radio broadcast transmitters, increased during the war by about 1400 percent. In the early postwar period they are expected to be about 60 percent above prewar levels. While we foresee a substantial expansion of business in the transmitter field, principally resulting from construction of new television and FM transmitters, the bulk of the increase in demand for power tubes is expected to come ultimately from applications in non-radio electronic equipment.

More Power Tubes Needed

High-frequency heating equipment for industry, for example, will require many times the power tubes currently employed in the radio broadcasting industry. One company alone has recently installed high-frequency heating equipment at a yearly rate of some 10,000 kilowatts total capacity, whereas the total rated output power of all

broadcasting stations in the United States is only 3,700 kilowatts. Another company is contemplating the installation of such equipment with 1,000,000 kilowatts capacity at one plant, with plans to install similar equipment at four other plants if the original installation proves as successful as is anticipated.

Special Tubes in Great Demand

Special-type tubes, particularly the phototube group, found many important military applications during the war, and production and sales of such tubes rose to a peak 611 percent above their 1939 levels. Their potential field of peacetime applications is almost limitless, since electron tubes are now being made to perform all of the functions of the five senses and there is literally no industry which cannot employ electronic devices to advantage in its operations. For the immediate period we anticipate production and sales of special-type tubes at a rate about 105 percent in excess of prewar levels.

It is obvious from the foregoing figures that we face our greatest problem in providing immediate utilization of war-expanded facilities for the production of power, cathode-ray, and special-type tubes. It appears that a number of years will elapse before production of

such tubes will again reach wartime peaks. Nevertheless, we confidently predict that peacetime demand for these tubes will ultimately exceed peak wartime production.

We believe that the prospect for immediate production, sales and employment in the electron tube industry compare very favorably with those of any other industry. As regards long-term prospects, we know of no industry having greater potentialities. There is literally no individual, no industry, no service, that is not a potential customer for electronic products or equipment, and therefore for electron tubes. RCA's potential tube business, and that of the industry, is limited primarily by man's ingenuity in creating the buying power necessary for its realization, rather than by technical considerations or want of ideas.

RCA BEGINS CONVERSION OF TELEVISION SETS

Conversion of pre-war RCA Victor television receivers to accommodate the new frequency channels allocated by the Federal Communications Commission was begun by RCA Service Company, Inc., early in March on a schedule that calls for completion of the work in June.

Under a plan established by RCA, service shops in New York, Philadelphia, Chicago and Los Angeles area will, on request from a set-owner, either direct or through the RCA dealer in the area, bring in the chassis, incorporate revised circuits, and then re-install and test it in the owner's home. All known owners of RCA Victor television receivers have been notified by letter that the service is available at a charge of \$30.

The new allocations have shifted the frequencies of existing television stations, both by changing frequency bands for given channel designations and by moving stations to new channels.

The new allocations are: Channel 1, 44 to 50 megacycles; Channel 2, 54 to 60; Channel 3, 60 to 66; Channel 4, 66 to 72; Channel 5, 76 to 82, and Channel 6, 82 to 88.

RCA EARNINGS INCREASED IN 1945

Annual Report Says Company's Main Peacetime Objective Is to Serve World Through Production of Radio Instruments and Operation of Services Unsurpassed in Quality and Dependability.

THE chief aim of the Radio Corporation of America since V-J Day has been to "serve the world at peace by producing radio instruments and by operating services unsurpassed in quality and dependability," Chairman James G. Harbord and President David Sarnoff speaking for the Board of Directors, reported in a joint statement issued to stockholders on February 27. The Annual Report which was mailed to 215,000 stockholders, covered the 1945 operations of RCA, its divisions and subsidiaries.

Net earnings of Radio Corporation of America in 1945 amounted to \$11,317,068, compared with \$10,263,291 in 1944. After payment of preferred dividends, earnings were equivalent to 58.8 cents a share compared to 51.2 cents a share in 1944.

Total gross income from all sources amounted to \$279,503,615 compared with \$326,421,913 in 1944, a decrease of 14.4%.

Working capital at December 31, 1945, amounted to \$62,108,118, compared with \$57,446,901 at the close of 1944.

The total earned surplus at De-

ember 31, 1945, amounted to \$49,038,127, an increase of \$5,393,040, over earned surplus at the end of 1944.

The Annual Report contained the following tributes to RCA for its contribution to victory: On September 1, 1945, Secretary of the Navy, James V. Forrestal, wrote, "Among the companies which gave our fleet the power to attack, yours has been preeminent. You and all the men and women who have worked with you deserve, therefore, to carry into peace a special pride in a great national achievement. On this day of final victory, the Navy sends you its sincere thanks."

Gen. Somervell's Tribute

Lieut. General Brehon B. Somervell, then commanding the Army Service Forces, in a letter to RCA dated September 7, 1945, said: "Your company has played a very important part in producing equipment and supplies which have been such a decisive factor in winning the war. You and your associates and employees must have a deep sense of satisfaction as you look

back upon your accomplishments on the war and production front. Now that the war is won, I want to express to you the gratitude and appreciation of the Army Service Forces for the magnificent achievements of your organization."

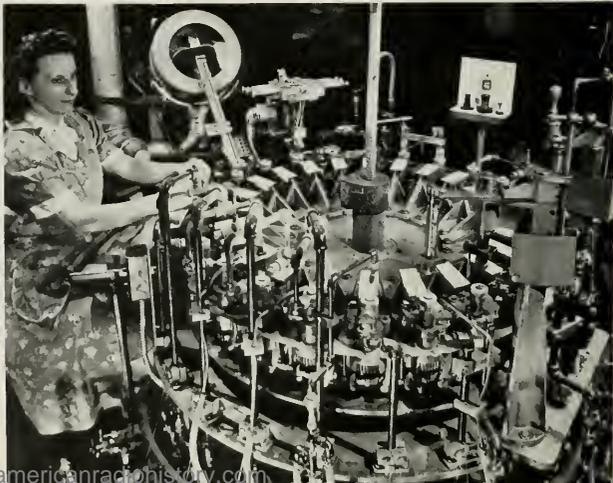
The Report referred to the future of radio as an art and an industry that promises expansion of commercial radio activity through new services, new products and new processes. Declaring that hundreds of electron tubes developed by RCA to meet war demands have been instrumental in opening new fields of usefulness in communication, transportation and manufacturing, the Report disclosed that a record-breaking total of 20,000,000 miniature tubes alone—many of them new types—were manufactured by RCA during the war years.

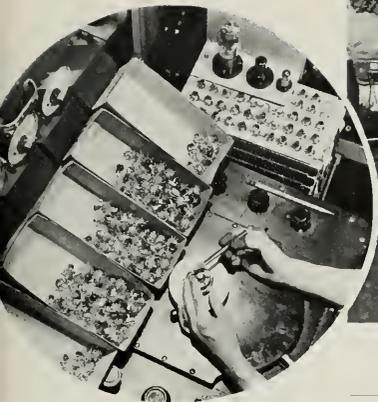
So numerous and so full of opportunities for public benefit were the wartime advances achieved by the RCA Laboratories Division that victory brought no breathing spell to its scientists and engineers, the Report revealed. RCA research, it was stated, turned to the task of



[20 RADIO AGE]

MANY RADAR ANTENNAS, INCLUDING THE TYPE SHOWN AT THE LEFT WHICH WAS USED BY THE U. S. SIGNAL CORPS TO REACH THE MOON, HAVE BEEN MANUFACTURED BY RCA. BELOW: A TUBE-MAKING MACHINE WHICH CONTRIBUTED TO THE COMPANY'S RECORD WARTIME PRODUCTION.





A HIGH DEGREE OF SKILL IS NEEDED TO ASSEMBLE THE SMALL ACORN TYPE TUBES (LEFT) AND ELEMENTS OF THE LARGER TUBES (ABOVE).

applying newly created advances to useful peacetime systems and instruments.

The RCA Laboratories operates on a three-point program which includes development of projects which are speedily applicable to civilian needs and commercial production; research providing for the constant flow of new technical knowledge and developments in radio and electronics; and, continued close cooperation with the military services of the United States, maintaining appropriate liaison for specific military research in radio and electronics to help guarantee the scientific preparedness and security of the Nation.

Scientists Made Radio History

The Report stated that contributions of research scientists and engineers at RCA Laboratories made radio history. Listed among the greatly diversified number of projects in which these scientists were in the forefront are radar, loran (long-range navigation), sonar (underwater sound) and shoran, described as the most accurate system of blind bombing developed during the war. Capable of pinpoint accuracy, shoran is said to be showing great possibilities in air navigation and in mapping the vast unsurveyed areas of the earth.

During 1945, a 300-megacycle television transmitter developed at RCA Laboratories reached the stage at which field tests could be made of a complete system utilizing such an installation, and at the same

time research and development in other phases of television were reflected in a vastly improved black-and-white television system, employing the new supersensitive RCA Image Orthicon pickup tube and a correspondingly sensitized kinescope receiving tube.

New FM Circuit

Development of a new FM circuit, called the "ratio type detector," by RCA Laboratories, and of new types of radar antennas to extend radar's peacetime uses also were described. The new FM circuit aids in eliminating interference and has superior merits over circuits previously employed for FM reception, particularly in low-priced receivers.

The pioneering of RCA in television and microwaves provided basic techniques for the Corporation's outstanding contributions to radar, and the sight that television gave radar for war purposes is disclosed to have now provided new services of safety in aviation and shipping. As a further scientific achievement based upon a combination of television and radar techniques, RCA has developed Teleran—a new and complete system of air navigation for preventing collisions, controlling traffic, performing instrument approaches to airports and assisting in the general navigation of aircraft.

Despite drastic terminations of government war contracts, the Annual Report stated, the RCA Victor Division at the end of 1945 had a

substantial volume of unfilled government contracts for radio-electronic apparatus and electron tubes. Some of the Company's plant facilities, nevertheless, were reconverted to civilian production within eight weeks after the war ended, and by the close of the year 75,000 small radios and table model Victrola radio-phonograph combinations had been built.

Deliveries also were begun on a new line of improved FM (frequency modulation) broadcast transmitters and other broadcasting equipment. Production of motion picture theatre reproducing and sound-film recording equipment, formerly supplying needs of the armed forces, was rechanneled to the commercial market; an all-time high in the production and sale of RCA Victor phonograph records was achieved during 1945, and the company plans to have home television receivers on the market this summer.

New Services Open New Markets

"Television," the Report pointed out, "is only one of the new services which promises to broaden the market for electron tubes, many types of which were developed by RCA for wartime use."

RCA Victor is revealed to have assembled more than 5,000,000 proximity fuses. Created for use in projectiles, the proximity fuse consists of a miniature radio sending and receiving station which detonates the shell at the moment of most devastating proximity.

The Report announced the consolidation of foreign trade activities of the Corporation in the RCA International Division and, with the resumption of world-trade since V-J Day, an expansion of these activities. With distribution strengthened, the outlook for foreign sales is declared to be favorable. RCA operates subsidiary companies in Argentina, Australia, Brazil, Canada, Chile, England, India and Mexico.

The National Broadcasting Company, which throughout the conflict devoted an extensive portion of its program to the war effort, is now on a full schedule of peacetime broadcasting, and at the same time is developing television broadcasting as a service to the public.

Message Traffic Increased

The volume of international radio-telegraph traffic handled in 1945 was the largest in the history of RCA Communications. The traffic represented an increase of approximately 70% compared with 1944. New circuits were established, in cooperation with the United States Army, with Berlin and Nuremberg, Germany and Vienna, Austria, and in the western hemisphere direct service between San Francisco and Rio de Janeiro was inaugurated to supplement the New York-Rio circuit. Service on a normal basis was

resumed with Holland, Belgium, Norway, Czechoslovakia, the Philippines, Shanghai and Japan.

Marine Radio Services

Upon completion of the government's emergency shipbuilding program in 1945, the Radiomarine Corporation of America turned from its task of supplying radiotelegraph and radiotelephone equipment and other electronic devices for war uses to the production of apparatus designed to meet needs of passenger and cargo ships. The Report revealed that Radiomarine built for war uses more than 40,000 major units of marine radio installations. In its peacetime program the Company will make available radar and loran navigational equipment in commercial designs and add to its line new long distance, automatic radiotelephone apparatus. It proposes also to modernize its coastal communication stations.

RCA Institutes Adds Courses

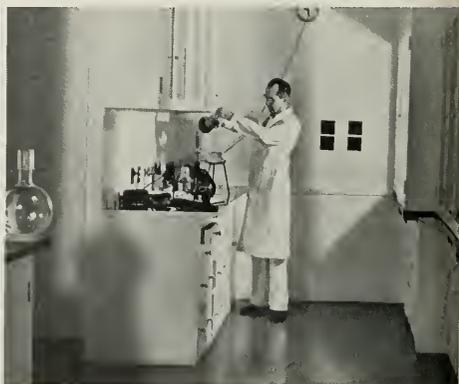
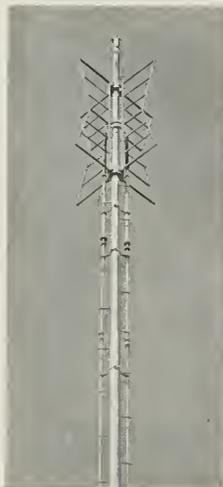
During 1945, RCA Institutes proceeded with the training of radio technicians in regular vocational and technological courses, and added two vocational courses in operation and repair in the interest of returning servicemen. Enrollment reached 1,000 of whom 600 were war veterans sponsored by the Vet-

erans Administration. In addition, special courses in television technology were conducted in New York, Chicago and Los Angeles for the benefit of broadcast station engineers.

The Board of Directors in 1945 approved an RCA Scholarship Plan to encourage the training of promising young students of the physical sciences. Selected upon recommendations made to the RCA Education Committee by the college deans, each of those chosen are designated "the RCA Scholar" at the university where he is enrolled and receives from the Company a scholarship of \$600 for the academic year. The plan provides for the award of as many as thirty scholarships during the academic year 1946-47, fifty during 1947-48, and sixty for each academic year thereafter.

As of December 31, 1945, RCA personnel numbered 32,985, representing an increase of 10,072 over the total at the end of 1939, the last year before national defense activities were reflected in employment figures. From 1940 through 1945, a total of 8,559 RCA employees joined the armed services of the United States. More than 1,818 have returned to the Corporation and others are being employed as they return. One hundred and forty-five employees died in the service of their country.

LEFT TO RIGHT: NEWLY DESIGNED SUPER-FM ANTENNA FOR FREQUENCY MODULATION STATIONS; AN EMPLOYEE EXAMINES PRESSING OF AN RCA VICTOR NON-BREAKABLE RECORD; SCIENTISTS IN RCA LABORATORIES CONSTANTLY EXTEND THE SCOPE OF RESEARCH IN RADIO AND ELECTRONICS.



FROM THE STEPS OF THE LINCOLN MEMORIAL, A TELEVISION CAMERA POINTS ACROSS THE REFLECTING LAKE TO THE LOFTY WASHINGTON MONUMENT.



LOOKING-IN ON THE CAPITAL

NBC Television Brings Lincoln Day Scenes from Washington to New York over New 228-Mile Coaxial Cable that Links the Two Cities.



By **A. Burke Crotty**
*Director, Field Programs,
Television Department,
National Broadcasting Co.*

NBC has added another achievement to its already long and impressive list of television program firsts!

The latest and one of the most significant took place February 12th when the Lincoln Day Ceremonies at the Nation's capital were televised for the pleasure of viewers in the New York and Schenectady-Albany-Troy areas. Television set owners saw, for the first time in the history of visual broadcasting, a complete program relayed from Washington to New York

City, a distance of 228 miles, where it was broadcast over WNBT, and rebroadcast over WRGB, Schenectady. From the opening "shot" until the final view of the towering Washington Monument, audiences were fascinated by the realization that they were watching events as they took place hundreds of miles away.

The ceremonies at the Lincoln Memorial were televised in a program dedicating and inaugurating the first Washington-New York coaxial cable, the first leg of what is shortly to become a nation-wide video network.

The event was unique in another respect. It was the first time that the three New York television stations—the National Broadcasting Company, the Columbia Broadcasting System and the Allen B. Dumont Laboratories—had pooled their equipment and personnel in a joint venture. Each company assumed a portion of the over-all show and the program as a whole was made available to the New York transmitters of the participating firms.

Following a pre-program survey of the sites involved, video and audio lines were ordered and as many arrangements as possible were made in advance to minimize the interference with NBC's New York programming schedule. Timing was figured so closely, in fact, that the engineering crew and the equipment for the telecast did not leave New York until the completion of the Cavalcade of Sports program from Madison Square Garden on the evening of Friday, February 8th. In the early hours of February 9th, NBC's mobile unit rolled away from the Garden on its way to Washington. The full crew consisted of four program people and fourteen engineers.

Early Sunday morning the crews installed the equipment and began to complete arrangements for the telecast, fitting together, like a giant jig-saw puzzle, the hundreds of details to be arranged if the program was to be successful. Tentative camera locations were selected, microphone positions planned, opening script written, band located and announcer rehearsed.

While all of these things were being done at the Memorial, an NBC production man had moved into the Master Control and Switching Position at the telephone company's test board in downtown Washington. To him had been assigned the task of coordinating the entire program and the synchronization of all switches. This would be no trivial assignment in a radio broadcast but this was television with many sound and picture switches that must be made instantaneously. Several hours were devoted to rehearsing these changeovers from New York to Washington; Capital to Studio, Studio to Memorial and so on. It is a credit to everyone involved that each of the eight switches during the program was clean and sharp.

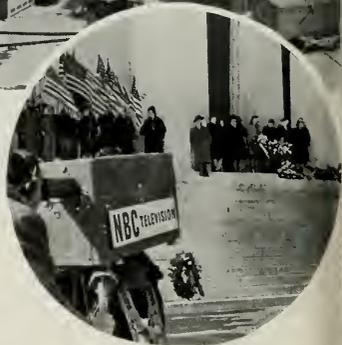
Snow Upset Rehearsal

Original plans had called for a running camera rehearsal at the Memorial on Monday for the purpose of setting a routine and se-

[RADIO AGE 23]



ABOVE: THE ICONOSCOPE CAMERA FOLLOWS GENERAL EISENHOWER AS HE LAYS THE PRESIDENT'S WREATH AT THE BASE OF THE LINCOLN STATUE. AT RIGHT, TOP: NBC'S ENGINEERING CREW UNLOADS EQUIPMENT FOR THE LINCOLN'S DAY TELECAST. BELOW: PART OF THE CEREMONY IS PICKED UP BY ONE OF THE TELEVISION CAMERAS LOCATED AROUND THE MEMORIAL.



lecting the opening "picture shot." However, the plans were treated to a rude shock on Sunday evening when six inches of snow, with no regard for television plans, blanketed Washington. The grounds at the Memorial on Monday were so wet that to run out the camera cables might have jeopardized the entire program. Reluctantly, the field staff did a little testing, ran a few switching rehearsals and called it a day, leaving the major portion of dressing the show to be done in the few hours available on Tuesday morning before the scheduled telecast time.

Engineers Make Final Check

At 6.00 a.m. on the 12th work started. Engineers made their final checks, cameras were put in position for the first time, and a final selection of shots was planned. Two Orthicon cameras were employed outside the Memorial, one well out on the lawn for an over-all shot and the other on the steps to pick up the Marine Band, the laying of the wreaths, and the arrival of General Eisenhower. Inside the Memorial the new camera with RCA Image Orthicon tube was moved into position to provide shots of the famous statue and to show the Chief-of-Staff as he placed the President's wreath.

At 12 noon the program opened

with a short film introduction from New York, and with the words "We take you now to our Nation's Capital" the huge Capitol dome flashed on the screens. From the shot of Washington taken from the Capitol roof the scene switched to the marble steps as four members of Congress and the then FCC Chairman, Paul A. Porter, descended the steps and approached the camera where they were interviewed by announcer Bill Henry.

Following the interviews on the Capitol steps the scene switched again to a studio location in downtown Washington where, through the use of maps and charts, the audience was given a non-technical explanation of the make-up and routing of the new coaxial cable.

Another switch from the studio and television viewers in New York saw the famous Lincoln Memorial as the camera, in a long shot, panned up the walk to a view of the classic structure.

Eisenhower Placed Wreath

At 12:30 sharp, General Dwight D. Eisenhower, Army Chief of Staff, arrived to place President Truman's wreath at the foot of Lincoln's statue. Television cameras followed his progress as he walked between the long lines of the Guard of Honor, composed of soldiers, sailors and marines.

As the General stepped between the marble columns the music stopped and the Image Orthicon picked him up as he approached the statue, stepped back, stood a few moments in reverence and then saluted.

As he turned about to march away the audience was treated to one of those unrehearsed incidents for which television is rapidly becoming known. One of the press photographers realized that he had failed to get satisfactory pictures of the proceedings. He intercepted the departing General and asked him to re-enact the wreath laying. The Chief of Staff, who became an idol of the GI because of his unpretentious, democratic manner, willingly obliged. New York viewers saw him return to the sculpture and repeat the routine.

As the General left the memorial to re-enter his car, the Image Orthicon camera "panned up" to frame a striking distant view of the Washington Memorial and the Capitol Building rising through the ground haze far beyond the Reflection Lake.

A 4-Fold Refresher Course

Engineers from Subsidiaries of RCA International Division Meet in New York to Inspect Company's New Developments.



By E. A. Laport

*Chief Engineer,
RCA International Division*

FOR four action-packed weeks ending in mid-March, RCA's International Division was host to a group of key-men from the Company's foreign subsidiaries who had been invited to New York to participate in an engineering refresher course, the first of its kind to be held by the Division. These men—fourteen in all—were chosen from the sales and engineering staffs of the various Engineering Products Divisions. In the group were representatives from England, Argentina, Brazil, Chile, Peru, Canada and China.

The Refresher Course was instituted because of the need at this time for a renewal and strengthening of liaison between parent company and subsidiaries. For more than five years the world turmoil prevented most of the subsidiary companies from maintaining the usual close relationship with RCA International headquarters. During that time, a whole new world of technology had evolved for the engineer, and sales personnel were faced with a set of changed world conditions in which they must conduct their business.

The Refresher Course was organized with a four-fold purpose: to acquaint all representatives with the latest accomplishments of RCA; to coordinate future sales and engineering activities; to review the

entire post-war program of sales and developments in all fields; and to discuss ways through which mutual efforts might best be coordinated to advance RCA business internationally.

Beginning with their arrival in New York, the group faced an intensive program of meetings, organized tours of plants and laboratories, demonstrations and informal discussions. The first evening was marked by a dinner at the Netherland Club where Mr. F. T. Zinn, Acting Managing Director of RCA International, greeted the visitors and introduced Mr. E. N. Clark, the new Managing Director of International.

Experts Address Visitors

The daily meetings that followed were addressed by qualified experts from the sales, research and engineering staffs of all divisions. Among those heard were W. A. Acton, H. W. Teschmacher, C. S. Harris, T. Robinson-Cox, J. F. Sternberg, D. S. Bond, J. C. Walter, R. D. Kell, M. Trainer, J. Rowe, H. E. Gihring, R. R. Beal, C. W. Latimer, T. H. Mitchell, Geo. Shecklin, I. F. Byrnes, C. W. Hansell, W. S. Sparks, C. F. Frost, H. O. Peterson, F. R. Deakins, J. L. McMurray, J. B. Knox, J. M. Brian, A. B. Oxley, H. M. Hucke, R. R. Welsh, L. F. Jones, H. J. Nevitt,

V. M. Farel, W. Lyons, K. Streuber, D. W. Lansing, M. D. Faige, J. T. MacLamore, E. A. Hinsdale, L. A. Garten, P. A. Cantelli, V. E. Troutant and others.

Inspection trips were made to the RCA Victor plants at Camden, N. J.; the transmitting and receiving stations of RCA Communications, Inc., at Rocky Point and Riverhead, L. I.; the RCA Laboratories at Princeton, N. J.; the National Broadcasting Company studios in Radio City; the NBC international shortwave stations at Bound Brook, N. J., and the operating headquarters of Radiomarine Corporation of America and RCA Communications in New York City. One of the most extensive field trips was to RCA Victor, Ltd., at Montreal, with detours to the Dorval airport and Beaconsfield radio stations, where RCA aviation equipment is in use for airport traffic control, cone of silence marker and communications.

Attending the Course were E. F. Eskenazi, C. de Oliveira and Walter Obermuller of RCA Victor Radio, S.A., Rio de Janeiro; L. C. Simpson, RCA Victor Argentina, S.A., Buenos Aires; R. E. Lee, RCA Representative, Lima, Peru; C. Baumann, Corporacion de Radio de Chile, Santiago; P. A. Turner and Fred Muller, RCA Photophone, Ltd., London; Igor Tornovsky, RCA Victor Company of China, Shanghai; H. S. Walker, K. R. Patrick, K. R. Swinton, E. L. Gardner and J. B. Knox of the RCA Victor Company Ltd., Montreal. In addition, fifteen men of RCA International home office participated in all or part of the course.

ENGINEERS FROM RCA'S FOREIGN SUBSIDIARIES ATTEND A SESSION OF THE REFRESHER COURSE CONDUCTED BY THE INTERNATIONAL DIVISION.



AWARDS TO RCA OFFICIALS

WARTIME ACHIEVEMENTS BRING LEGION OF MERIT MEDALS TO SPARKS AND VAN DYKE, FOLSOM RECEIVES MEDAL FOR MERIT FOR HIS SERVICE TO THE NAVY.

HIGH government honors for their accomplishments in the performance of important wartime projects have been conferred on three RCA officials. Frank M. Folsom, Executive Vice President in Charge of RCA Victor Division, received the Medal for Merit for his services as Chief of the Procurement Branch of the Navy Department's Office of Procurement and Material; Commander Arthur Van Dyck, assistant to Dr. C. B. Jolliffe, Executive Vice President in Charge of RCA Laboratories, received the Legion of Merit for his work as Officer in Charge of Navigational Aids, and Sidney Sparks, Traffic Manager of RCA Communications, Inc., also was the recipient of the Legion of Merit for his achievements as Officer in Charge of the War Department Signal Center at Washington, D. C.

Forrestal Presents Award

Mr. Folsom's award was presented by Secretary of the Navy James V. Forrestal who in August, 1944, had presented Mr. Folsom with the Navy's highest civilian honor, the Distinguished Civilian Service Award.

The Medal for Merit citation, signed by President Truman, noted that Mr. Folsom had recognized "the basic changes in Navy procurement necessitated by the large volume of war production," and that he "improved and modernized the procurement procedures of the Department by instituting new systems of contract clearance, contract negotiation, price analysis and cost controls. His skill and ingenuity in adapting sound business practices to the Navy's wartime procurement needs," the citation concluded, "materially speeded up the procurement of the weapons of war and saved the Navy millions of dollars." Mr. Folsom was Chief of the Procurement Branch from February, 1942 to December, 1943.

Commander Van Dyck received the Legion of Merit from Rear Admiral Monroe Kelly, Commandant of the Third Naval District, acting for Secretary Forrestal. The citation, read by Admiral Kelly, said: "For exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as Officer-in-Charge of Navigational Aids in the Office of the Chief of Naval Operations during the period from

April 19, 1943, to October 1, 1945. Exercising initiative and sound judgment, Commander Van Dyck successfully developed and established the Long Range Electronics Navigational Aids system in the United States Navy and, developing universal operating methods and procedures, formulated world-wide plans for Loran installations. Contributing materially to the successful completion of vital combat operations by coordinating such plans with the United States Army and the military forces of our Allies, Commander Van Dyck greatly increased the striking efficiency of the Allied forces."

Commander Van Dyck joined RCA in 1919, becoming manager of the Technical and Test Department in 1929. He was appointed Manager of the RCA Industry Service Laboratory, upon its formation in 1930 and directed its activities until he was called to active service in the Navy in April, 1943.

Sparks Cited for Technical Skill

Mr. Sparks was commended in his citation for "skillfully applying his technical knowledge and rich background of experience" to Army problems. The citation continued: "His meritorious achievements were a direct contribution to the Nation's war effort and will be of permanent benefit to peacetime communications." Major General Frank E. Stoner, assistant Chief Signal Officer, U. S. Army, presented the award to Mr. Sparks.



SECRETARY FORRESTAL PRESENTS THE MEDAL FOR MERIT TO FRANK M. FOLSOM, EXECUTIVE VICE PRESIDENT IN CHARGE OF RCA VICTOR DIVISION.



ARTHUR VAN DYKE, ASSISTANT TO DR. C. B. JOLLIFFE, RECEIVES THE LEGION OF MERIT FROM REAR ADMIRAL MONROE KELLY, COMMANDANT OF THE THIRD NAVAL DISTRICT.



MAJ. GENERAL FRANK E. STONER CONGRATULATES SIDNEY SPARKS AFTER PRESENTING THE LEGION OF MERIT MEDAL TO THE TRAFFIC MANAGER OF RCA COMMUNICATIONS.

RCA'S NEW RIBBON-LIKE TELEVISION TRANSMISSION LINE (LEFT) SAVES MOST OF THE SIGNAL STRENGTH WHICH WAS LOST IN THE OLD-TYPE CABLE (RIGHT).



BETTER TELEVISION ANTENNAS

Brighter, Clearer Pictures Assured by New Aerial and Transmission Line Which Triples Strength of Signals.

IMPROVED antennas and a new roof-to-living room transmission line which together provide brighter, clearer pictures on home television receivers than any similar equipment previously available have been developed by RCA Victor engineers, it was revealed by Joseph B. Elliott, vice president in charge of RCA Victor's Home Instrument activities, at a meeting of the American Television Society in New York on February 14.

Mr. Elliott also disclosed that RCA Victor plans to produce a deluxe Radio-Television-Victrola combination providing three separate and distinct sources of entertainment in a single cabinet. A low-cost table model sight-and-sound receiver retailing for about \$200 will be available first, Mr. Elliott said.

To help develop the largest possible television audience in the shortest possible time, he said, the first RCA Victor receivers will be

low cost, high quality television sight-and-sound table models, using 7-inch and 10-inch direct-viewing kinescopes.

"The first RCA Victor television receivers, we expect, will be made available for sale during 1946 in metropolitan New York, Albany-Schenectady, Chicago, Philadelphia and Los Angeles, and later in Washington, Cincinnati, and Fort Wayne," Mr. Elliott stated. "By mid-1947, about 24% of the nation's population in 9,086,000 wired homes will be within the effective service range of television, according to conservative estimates."

To Establish Service Stations

Declaring that pre-war experience indicates that television manufacturers should assume a major responsibility for installing and servicing their television instruments, Mr. Elliott revealed that RCA Vic-

tor plans to establish its own service shop facilities, manned by thoroughly competent and trained personnel, in all of the initial television market areas—New York, Philadelphia, Los Angeles, and Chicago. In addition, he said, the company will undertake an intensive, well-planned program of continuous education to train wholesale distributors, retailers, and members of the service profession in the techniques of television installation, servicing, and maintenance.

Technical Improvements

The new RCA Victor "Bright Picture" transmission line forms an important new link in the chain of technical improvements in television equipment which RCA has announced since the close of the war, it was pointed out. It closes the gap between dramatic advances in television cameras and camera tubes, such as the RCA Image Orthicon, and equally important improvements in home television receivers.

The improvement in picture signals delivered by the transmission line is made possible by the use of a new war-developed plastic, known as polyethylene, for the insulating material required to provide uniform spacing between the wires in the line.

Clearer Pictures Result

In homes on the fringe of a television station's coverage area, where the picture obtained with other types of transmission line might be too weak to be useful, Mr. Elliott said, a picture that is three times better is provided when the new line is used. In addition, he revealed, the new transmission line, in combination with the improved antenna and improved circuits in new RCA Victor television receivers, makes it possible for the first time to receive programs from any of the television channels without readjusting the antenna. The new transmission line will shortly be made available through RCA Victor distributors.

[RADIO AGE 27]



INLAND WATERBORNE TRAFFIC IS MOVED FASTER AND CHEAPER WITH THE AID OF NEW TWO-WAY RADIOPHONE SYSTEMS.

receiver with band-switching facilities would not meet the problem since it would require frequent readjustment, and would be limited to receiving only one channel at a time.

Equipment is Automatic

Radiomarine has developed a new type of automatic radiotelephone for the Mississippi and Great Lakes areas which embodies six separately pretuned receivers for simultaneous operation as well as a six-channel radio transmitter, all incorporated in a single cabinet. The receivers for the higher frequency channels, in the 4-, 6- and 8-megacycle bands, are arranged to actuate an automatic bell ringing device so that the land station may dial the vessel's number in order to place a call. The three lower-frequency channels which are in the 2- to 3-megacycle band are connected to a loud speaker. This permits vessels to call by voice, or a land station to do likewise for short-range service.

Since the equipment is automatic in operation, it may be located in any convenient place and remotely controlled from one or two compact remote control units. Normally one of these units is installed in the wheelhouse and the second unit in

NEW 6-WAY RADIOPHONE

Radiomarine Develops Complete Automatic System to Meet Special Conditions of Inland Ship-to-Shore Communications.



By I. F. Byrnes

Vice President in charge of Engineering, Radiomarine Corp. of America

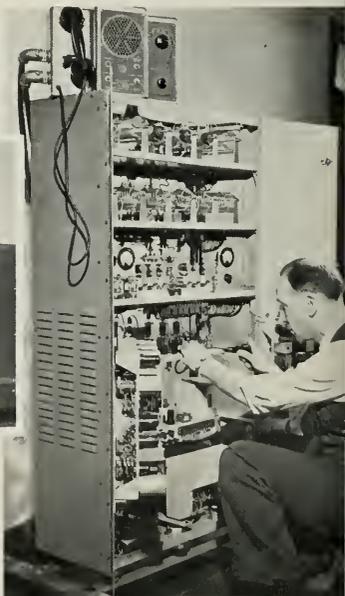
required, not only with land stations, but also with other vessels.

In order to provide efficient coverage for the various ranges, frequencies have been allocated in the 2-, 4-, 6- and 8-megacycle bands. The lower frequencies are suitable for short distance communication, and as the required range increases, the higher frequency channels are employed. This type of service makes it necessary for the vessel to be able to receive calls when any one of the assigned frequencies is used by the land station. A single

MARINE radiotelephone communication on the Mississippi River and its connecting waterways, as well as on the Great Lakes, presents interesting problems. Vessels which operate in these areas require two-way communication over short, medium and long distances. Use of a single frequency, or a narrow band of frequencies, would be inadequate for the continuously changing ranges involved.

For example, a towboat pushing a long string of loaded barges may start its trip near St. Louis and end it at the mouth of the Mississippi near New Orleans. During this long trip, communication is

COMMUNICATION FROM A SHIP TO A LAND STATION IS ESTABLISHED THROUGH THE REMOTE CONTROL UNIT (BELOW) AND THE COMPACT 75-WATT TRANSMITTER AT THE RIGHT.



[28 RADIO AGE]

the Captain's quarters. Upon receipt of a call the user lifts the handset which starts the transmitter motor generator and then places the channel selector switch in the correct position to set the transmitter and its respective receiver automatically to the desired channel.

New Features in Design

Each remote control unit uses an ingenious system of indicator lights located directly above the channel selector switch. When a land station calls the ship through the automatic ringer on any one of the high frequency channels, the appropriate indicator light glows. This tells the Captain the correct channel to be

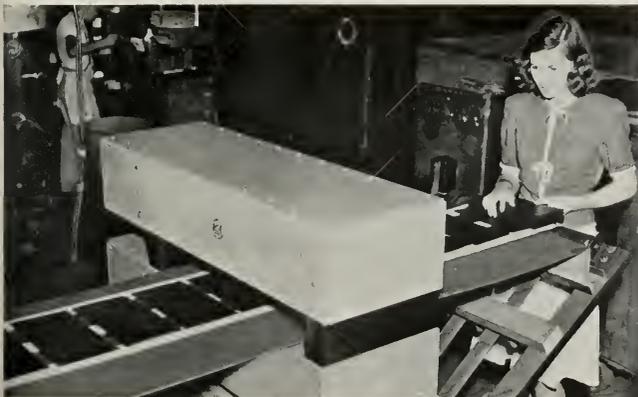
used in answering the call. In the same way, when a call is initiated on the vessel and the channel selector switch placed in the proper position, the radio transmitter and receiver are automatically connected for operation on the desired frequency.

Noteworthy features of the receiver design are high sensitivity, freedom from adjacent channel interference, and reliable operation directly from the shipboard 115 volt d.c. power supply. All six receivers are "line operated" and require no power conversion equipment. Since the receivers are frequently in operation 24 hours per day, the elimination of rotating equipment or vibrator power sup-

plies, is conducive to long life and minimum "wear and tear." Other circuit features of the receivers include noise limiters, for minimizing sharp interfering static or noise pulses, and flat AVC (automatic volume control) circuits which maintain loud speaker and earphone levels at a uniform value.

Cabinet is Shock-Proof

The complete transmitter-receiver assembly is housed in a shock-mounted aluminum cabinet 60 inches high, 32 inches wide and 14 inches deep. The transmitter motor generator and its automatic starter are located inside the cabinet, thereby eliminating additional wiring for these units.



MINUTE PARTICLES OF METALS EMBEDDED IN THESE PLASTIC SHEETS ARE DETECTED INSTANTLY BY RCA ELECTRONIC METAL DETECTOR.

HIDDEN PARTICLES DETECTED

Electronic "Sherlock Holmes" Gives Warning When Foreign Objects Find Their Way Into Industrial Products.

AN electronic Sherlock Holmes made of metal and plastics, that will "spot and arrest" metal particles of any kind which may be "hiding out" in non-metallic industrial materials, has been designed and built by the RCA Victor Division. This industrial "wonder tool" is expected to be invaluable for the protection of quality and prevention of machinery damage and lost production time in foods, plastics, rubber, textiles, lumber, paper, ex-

plives, and many other industries.

The electric reaction set up in the device when metal is present in materials being inspected 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. Objects or materials can be passed through the inspection aperture on an endless conveyor belt or by means of a chute. The device will accommodate

conveyor speeds up to 600 feet per minute without impairment of inspection efficiency.

The completely self-contained unit is approximately the size of a wardrobe trunk.

Unlike magnetic metal detectors, which will react only to magnetic metals such as iron and steel, the RCA device will detect any kind of metal or alloy, including iron, copper, brass, lead, aluminum, stainless steel, and others. Ultra-sensitive, it will react to minute as well as larger pieces of metal, and the reaction is independent of the depth of the imbedded particle.

In operation, materials passing through the inspection aperture are screened by a high-frequency electromagnetic field, which is generated by coils imbedded in plastic panels at the top and bottom of the aperture. When metal is present in the material being screened, that fact is detected by a sensitive electron tube amplifier which triggers either a signaling device (lamp or bell) or an automatic marking or ejection mechanism, or a combination of both.

The device can be operated in complete safety by regular factory employees.

Television—A Social Influence

NEW WONDER OF MASS COMMUNICATION GIVES EVIDENCE OF BECOMING GREATEST SINGLE DEMOCRATIZING AGENT SINCE INVENTION OF PRINTING



By John F. Royal
*Vice President in Charge
of Television,
National Broadcasting Company*

*From an Address to the General
Federation of Women's Clubs,
Cleveland, Ohio.*

MY VISIT here is to tell you about a new guest coming to your homes in the very near future. The name is TELEVISION, and she will be beautifully gowned in a black-and-white dress.

You have been hearing much about this new wonder of mass communication, this new art of sight and sound combined, and I assume you have a natural curiosity about it.

Except for the spoken and written word, there have been only six major innovations of method in human communications: printing, telegraphy, telephone, the movies, radio—and now, Television. The invention of each, in turn, has resulted in social and psychological changes and advances of a revolutionary nature.

In television are combined in one medium the singular advantages of each of the others. Mass communication became possible, for example, with the invention of the printing press. The telegraph gave wings to the transmission of ideas and messages, made possible their dissemination over great distances in shorter time. The telephone added the intimate quality of the human voice to the transmission of messages. The motion picture film made

it possible for these ideas and messages to be dramatized visually, and recorded for the enjoyment of greater numbers of people. Along came radio—to reduce the dimensions of the globe to the proportions of a loud speaker, as it carried messages instantaneously and inexpensively to and from the farthest regions of the earth into the living room. Radio, within the space of a single generation, eradicated provincialism and fostered the greatest upsurge in all time. And now comes television—adding vision and animation to the speed and immediacy of radio communication.

On or about June 1st, or soon thereafter, television sets should appear in the dealers' windows, but not everywhere. These first sets will be distributed where transmitters are now in operation. This means New York and vicinity, Schenectady, Philadelphia, Chicago and Los Angeles.

Outlook for Color Television

There are some who—crying in the wilderness—are suggesting that television should wait for color. One executive of a company crusading for delay has said that the public will wait indefinitely for color. I feel that to be an absurd statement. Our country was not made great by waiting. Progress never waits.

We have experimented with color and recently gave a public demonstration at the RCA Laboratories in Princeton. At that time we stated that color—I mean good color—will ultimately be a reality in television, but it is far from being ready for public acceptance at this time. That is not the opinion of one company, but rather the joint opinion, the consensus, of the engineering staffs in the entire industry, with a few minor exceptions.

There is nothing in our lives with a greater psychological effect than color, but it must be handled with care. When good and practical color in television is ready for your

homes, our company will have it. Many of you are familiar with the many trying years of color effort by the motion picture industry. Much of the same uncertainty faces us in our color problem in television. Matthew Henry, many years ago, said: "Many a dangerous temptation comes to us in fine gay colours that are but skin-deep." We feel color in television at the moment is only skin-deep.

Entertainment for All

In television, as in sound radio, there will be entertainment and education for all, as the resources of the theatre, the university, the concert stage, the sports arena and the whole wide world are tapped by the television camera and supplemented by motion picture film.

More even than sound, television, which enables man to see as well as hear—and seeing for himself comprehend better—gives evidence of becoming the greatest single democratizing agent since the invention of printing.

Because television will enable many people to observe the same event at the same time, television will build a consciousness of equality and a community of interest. This consciousness will be enhanced by the fact that television will enter directly into the home and have the distinct personal appeal of allowing people to see things for themselves as they really appear.

Educationally, television will enable the best of current thinking about human affairs to be presented vividly to millions of people in their homes as well as to children in schools.

The success of television will be a joint responsibility—yours and ours. Its potential powers will go beyond anything we have ever imagined. We invite your cooperation, your advice and suggestions, and by this means our way of living can be made better, and together we can create a more relaxed and peaceful world.

RCA LEADS THE WAY—AGAIN!

RCA INITIATES

Unprecedented

Low Rates to

ALL FOREIGN COUNTRIES

From any point in the United States

... when approved by the Federal
Communications Commission.

—this new rate schedule permits persons at any telegraph point in the United States to communicate "Via RCA" with any part of the world for the same low rates applicable to the "gateway" cities of New York and San Francisco.



Eliminating extra charges in non-gateway cities—previously ranging up to four cents a word—the proposed schedule calls for low rates as follows—

From any telegraph point in the United States to any telegraph point in the world, messages filed "Via RCA" to cost

NOT MORE THAN

30¢ per Full Rate Word

20¢ per Code Word

15¢ per Deferred Word

10¢ per Night Letter Word

LOWEST RATES IN HISTORY

This standardization and reduction of RCA international telegraph rates is expected to effect annual savings to the American public of well over a million dollars in telegraph tolls.

Telegrams to all parts of the world may be filed at any Western Union office and marked "Via RCA" (no extra charge). Such messages, sent on and after the effective date of the new schedule, will be billed at the REDUCED RATES.

RCA COMMUNICATIONS, INC.

A Service of Radio Corporation of America

Head Office: 64 Broad Street, New York 4, N. Y.

Telephone HA 0ver 2-1811

Teletype NY 1-1346



THE NBC UNIVERSITY OF THE AIR

*The National Education Association
will observe NBC's United Nations Week*

In order to stress the world's need for unity and understanding in the building of an enduring peace, NEA will join with the National Broadcasting Company in the observance of NBC's United Nations Week—September 1 through 7.

In schools throughout the country, NEA, with its 850,000 teacher-members, will co-ordinate its activities with those of NBC's affiliated stations in this worthy project: PEACE NOW—OR NEVER!

The National Broadcasting Company's United Nations project is long-term—beginning many months before its United Nations Week. With the en-

dorsement of the State Department, the co-operation of the American Association for the United Nations and the NEA, NBC launches this activity in early June.

Throughout the nation, NBC affiliated stations in every community will conduct local peace campaigns tying-in with the national project. Beginning June 7, the first of the *University of the Air* courses to be devoted exclusively to the fostering of United Nations understanding will be broadcast. The long-range activities of stations, NBC and participating groups will culminate in NBC's world-wide United Nations Week—a week of peace programs to make America peace-conscious.

National Broadcasting Company

America's No. 1 Network





PORTRAIT BY KARSH—OTTAWA

Marian Anderson

evokes the profound emotional power of Brahms' "Alto Rhapsody" for you in a deeply expressive new recording

Recorded with the San Francisco Symphony Orchestra and Municipal Chorus, Pierre Monteux, Conductor, Two Red Seal Records in Showpiece SP-13. \$2.25 exclusive of taxes.



THE WORLD'S GREATEST ARTISTS ARE ON RCA VICTOR RECORDS





RCA Laboratories provides another great achievement in television—the “mirror-backed” Kinescope, or picture tube.

New “searchlight brilliance” for home television!

Now, large screen television pictures are twice as bright—yes, *twice as bright* as ever before!

You can “count every eyelash” in the close-ups. You’ll almost want to shake hands with the people on your television screen—so great is the illusion that they are actually in your living room.

This new sharpness and brilliance is achieved through the new RCA “mirror-backed” Kinescope, or picture tube, perfected at RCA Laboratories.

It has a metallic film—eight-millionths of an inch thick. This metallic film acts as a reflector, allowing electrons to pass through to the screen but preventing

light rays from becoming lost through the back of the tube. Just as the reflector of a searchlight concentrates its beam—so does this metallic film reflector double the brilliance and clarity of detail in home television receivers.

Similar progress-making research at RCA Laboratories is being applied constantly to all RCA Victor products—assuring you that anything you buy bearing the RCA monogram is one of the finest instruments of its kind science has achieved.

Radio Corporation of America, RCA Building, Radio City, New York 20. Listen to The RCA Victor Show, Sundays, 4:30 P.M., Eastern Time, over the NBC Network.



RCA Victor home television receivers will be available in two types. One model will have a direct-viewing screen about 6 by 8 inches. The other type will be similar to the set shown above—with a screen about 15 by 20 inches. Both instruments are being readied for the public with all possible speed and should be available this year.



RADIO CORPORATION of AMERICA

www.americanradiohistory.com

Science in Democracy

BRIGADIER GENERAL DAVID SARNOFF URGES SCIENTIFIC PREPAREDNESS FOR NATIONAL SECURITY—REVOLUTIONARY CHANGES IN WARFARE AND COMMUNICATIONS FORESEEN.



By Brig. General David Sarnoff
President,
Radio Corporation of America

An address before the American Academy of Political and Social Science in Philadelphia on October 5, 1945.

AMERICA, to be first in Peace and first in War, must be first in Science.

To achieve this, we must have democracy in science as well as science in democracy.

The essence of science is freedom to question and to experiment, with an opportunity to draw conclusions, unrestricted by any forces that would hamper liberty in thinking. The realm of study, investigation and development, must be free. Whether in politics or in science, it is the keynote of democracy that people must be free to think, free to discuss, and free to try their ideas in practice. To impose the opposite is tyranny.

That is one of the great lessons of World War II. We should not embrace victory merely as a tri-

umph and let it rest as such in history books. We should study its lessons to cultivate progress and to safeguard the future. With peace comes the vivid truth that to be strong in this modern world a nation must have science ever ready to march with its Army, to sail with its Navy, and to fly with its Air Force. Indeed, some products of science, such as an atomically-powered missile, must be ready to fly through the air instantly, unattended by sailor, soldier, or pilot; guided to its target by push-buttons in a control room far away.

Such an alliance of science and military power can be achieved most effectively under the democratic form of government. The fate of Germany and Japan is evidence enough. Despite an earlier start by Germany in the creation and development of scientific weapons of war, the democracies were able to outdistance the enemy in this domain. If there be any doubt, let the doubter look to radar and atomic power. Developed and harnessed by democracy, they searched out the enemy and wiped out despotism. Our scientists gave their best voluntarily, while those of the Axis powers worked under duress. Democracy, unhampered by prejudices and obsessions about race and creed, was able to utilize the knowledge and brain power not only of its own scientists but of many who had been ruthlessly banished from their homelands by the dictators.

Freedom to Pioneer

For many years past, scientists from foreign lands have come to our shores and settled here so that they could study and experiment free from oppression, free from commands, and free from regimen-

tation. Prominent among them we find Tesla, Steinmetz, Pupin, Einstein, Michelson, Zworykin, Fermi, and many others. Here they found the environment conducive to study and research, to free exchange of ideas, to experiment and discovery. Our nation has profited by their endeavors, and science has advanced.

America, the cradle of liberty, is also the cradle of invention. The list of our native scientists and inventors is a shining roll of honor. As a result, thousands of wartime scientific accomplishments helped to turn the tide of victory for the United Nations and thus rescue democracy from those who would destroy it. Scientists in democracy must continue to pioneer on an ever-expanding scale. We must be as daring in peace as in war. We must follow our vision with the same confidence if we are to cross new frontiers of progress. Through new products, processes and services that science can create, we should gain a fuller life, increased employment, improved health and national security. We must cultivate our natural talents and resources to meet the promise of science if we are to develop its endless opportunities for securing a higher standard of living for the masses of people everywhere.

Vigorous Policy Needed

It is imperative, therefore, that the United States maintain a vigorous national policy for the promotion of science. Statesmen, philosophers and religious leaders have led in the past—now scientists must join them in the vanguard of civilization. In the future, freedom and science must walk together, hand-in-hand as the spearheads of peace.

For this purpose, every phase of

[RADIO AGE 3]