RADIO AGE

RESEARCH · MANUFACTURING · COMMUNICATIONS · BROADCASTING

RCA

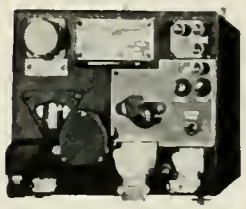
JANUARY 1945

Visibility Zero...

Mission Accomplished...

Communications Completed...

RCA Aviation Radio Transmitter
used in the PBY Catalina



RCA Aviation Radio Receiver used
in the PBY Catalina

THE PBY Catalina has become a synonym for reliability—long staying power—the ability to go anywhere, in any weather—to accomplish the most difficult and lonely missions—and to come back!

Flying with the Catalina on thousands of these missions, RCA Transmitters and Receivers have established their own record for reliability, for staying power, and for the ability to "get through."

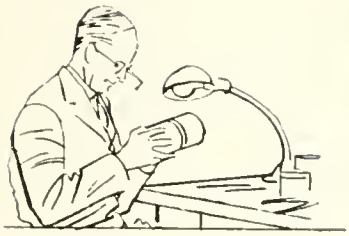
The good engineering, the quality construction, that make RCA Aviation Radio reliable when life and the successful accomplishment of war objectives are at stake, will serve aircraft manufacturers, the air transport industry, and the American flying public equally well after the war.

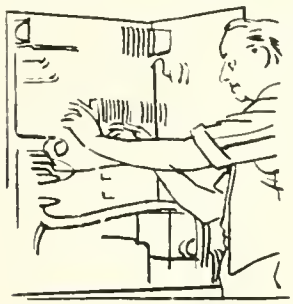
RCA

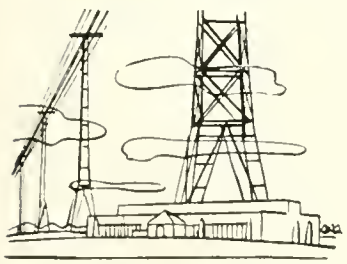
RADIO CORPORATION
OF AMERICA

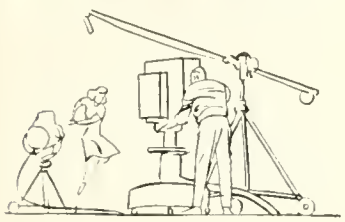
RCA VICTOR DIVISION • CAMDEN, N. J.

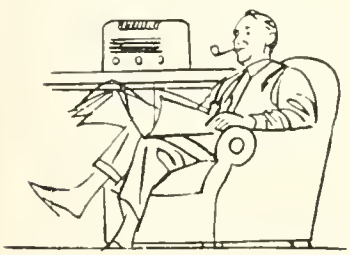
BUY MORE WAR BONDS











COVER — This family group is looking at black-and-white images on a projection-type home television receiver, developed experimentally by RCA.

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VOLUME 4 NUMBER 2
JANUARY 1945

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Radio Age, published quarterly by the Department of Information of the Radio Corporation of America, RCA Building, New York, N. Y., for the RCA services: RCA Laboratories, RCA Victor Division, R.C.A. Communications, Inc., Radiomarine Corporation of America, National Broadcasting Company, Inc., R.C.A. Institutes, Inc., RCA Service Company, Inc.

THE WHITE HOUSE
WASHINGTON

October 12, 1944

Dear Colonel Sarnoff:

Events occurring in the world today remind me that it was twenty-five years ago -- while the soldiers were returning from the First World War -- that the Radio Corporation of America was formed. I remember well that officials of the Navy Department urged the organization of an American radio communication company so that this country would not again be dependent upon foreign companies for communication with other parts of the world.

During these twenty-five years your company has played an important part in achieving pre-eminence of the United States in radio. I congratulate you personally for splendid leadership. Your organization throughout the years has created new wonders and brought into being new services in all phases of radio activity for the benefit of the American people and for people everywhere.

I wish you and all members of the RCA family continued success in pioneering. With television as a new postwar industry of great promise in the fields of employment, entertainment and education, I know that under your guidance and vision RCA will continue to contribute to the economic and cultural values created by radio.

May the next twenty-five years see your fondest dreams in the fascinating world of radio come true.

Very sincerely yours,

Franklin D. Roosevelt

Colonel David Sarnoff,
President,
Radio Corporation of America,
30 Rockefeller Plaza,
New York, N. Y.

New Era in Radio Communications

GENERAL SARNOFF SAYS PERIOD OF CONTROL AT A DISTANCE IS OPENING—REVEALS THAT SCIENCE HAS GIVEN ELECTRONIC FINGERS WITH A SENSE OF TOUCH TO HANDS OF RADIO

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

IN 1944, radio performed services believed impossible in 1940. In meeting the challenges of war, science has given electronic fingers with a sense of touch to the hands of radio communication. A new era in communications is opening —the era of control at a distance.

Television enables us to see action at a distance. After the war by the use of television techniques we shall be able to reach out and operate many of these actions that we see. Just as human fingers press buttons and triggers, snap switches, and release energy to make wheels turn or control machines and vehicles, now radio-electronic fingers touch off new magic.

Science in Modern Warfare

Man has long dreamed of using radio to start, steer, control and operate aircraft, tanks, torpedoes, automobiles, boats, and other objects. With uncanny manipulation of electronics, wartime research has made some of these dreams come true. Man has achieved radio control over wheels, rudders, wings and guns. Rockets no longer move only as phantoms of the imagination.

Already hundreds of radio-electronic devices are used in industry and many more will be available in the post-war period. They regulate the speed of machinery, measure the velocity of projectiles, level elevators, analyze and match colors, sort products, control lighting, create heat, hold materials in exact position during manufacturing processes, and skillfully perform a long list of other tasks. Electronics is a master of accuracy, speed, and efficiency. The electron tube brings a new meaning to the word "automatic" in mechanical and electrical operations.

The year 1944 will be remembered in the annals of radio as one in which much of future research and engineering was moved into the present. It was the year in which science—perverted for destruction by the enemy—was turned against those who used it for ruthless aggression. The impact on the enemy has been terrific; science has paralyzed his wings, sunk his submarines, blown up his ships, plummeted his planes and ripped his armor asunder.

Radio in Every Offensive

Radio in modern warfare is a powerful force in every offensive, at every spearhead of advance, at every beachhead, and on every bombing mission. On every invasion, radio has helped to tighten the global pincers on the enemy. D-Day, June 6, 1944, revealed as no other day in the history of broadcasting, the world-wide service of radio in delivering news at the very instant it happens. People everywhere were listening, for the fate of civilization was at stake.

Radio covered the English Channel and gave the victorious invaders of "Fortress Europe" an "umbrella" of communication and protection that enabled coordination of the battle forces as they swarmed

RADIO OPERATOR ABOARD A NAVY CATALINA "BLACK CAT" BOMBER TUNES THE INSTRUMENTS DURING A NIGHT MISSION OVER THE PACIFIC.

LEFT—ANTENNAS OF THEIR PORTABLE RADIOS RISING FROM SHALLOW FOXHOLES DUG IN THE BEACH AT SAIPAN, MARINES OF THE FIRST LANDING WAVE SET UP COMMUNICATIONS. RIGHT—THESE U. S. COAST GUARDSMEN OPERATING SHIP-TO-SHORE RADIO EQUIPMENT PARTICIPATED IN THE INVASION OF SOUTHERN FRANCE.

across the waters and up the beaches of Normandy. It was radio that helped to shrink the vast distances of the South Pacific as the fleet and the airforce cleared the way to the Philippines and pointed toward Japan.

New Services to Come

Today, only mention can be made of the magic term radar. It is, however, only one of the great wartime developments of science. When we see radiophotos in the news of Japanese battleships afire from stem to stern under direct hits by 1000-pound bombs, we may wonder what part radio had in the triumph. When we read of fighter-bombers dropping 500-pound bombs on industrial centers of the enemy, and accurately hitting their targets, we may wonder again what part radio played in the invisible yet accurate thrusts.

When peace comes it will find, as it has at the end of every war, new inventions awaiting to be applied to every-day life, to bring new services of safety and comfort, entertainment and education.

The outstanding developments in RCA Laboratories during 1944 were devices for the armed services. There are a number of developments, however, not on the secret list.

For example, a 300-megacycle television transmitter, the first of its kind developed to use 5-kilowatts of power for television broadcasting. Primarily, the development of a special electron tube and associated circuits made it possible. Its full use must await the end of the war; caged in a great wire-mesh at RCA Laboratories the engineers are studying the transmitter's performance and perfecting it for the future. Field tests are scheduled early in 1945 in the New York area.

Outside the activity of telegraphic or voice communication the RCA electron microscope has won great renown in science and industry. It may appropriately be classified in the visual branch of communication for it sees deeply into the submicroscopic world and thus "communicates" new intelligence to explorers in the realm of the infinitesimal, which heretofore has been hidden from the eyes of man.

Microbes Seen Electronically

Bacteria, invisible or mere pinpoints under the most powerful optical microscope, when viewed under the electron microscope look like great shell holes as seen in reconnaisance photographs. In fact, microbes, which heretofore always appeared as rounded specks now are seen in definite shapes, some angular, some snake-like, others round and elongated. The doctor looks at these micrographs or pictures, and in an instant recognizes the particular microbe, or virus.

Micro-Analyzer Refined

The micro-analyzer, an offspring of the electron microscope, which makes it possible to determine the chemical elements constituting submicroscopic parts of bacteria and other tiny particles, was further refined in 1944. For example, it will quickly reveal whether any component of a microbe or specimen, contains iron, carbon or other elements.

More than 1,000 RCA engineers have been working on wartime research, development and production of radio-electronic equipment. Worldwide study of the radio spectrum, coupled with tireless efforts of the RCA research and engineering staffs to meet the impact of war, has enabled the engineers to acquire and to expand engineering and manufacturing "know-how." As a result, RCA is an "arsenal" of radio from which the military, naval and air forces are equipped with the finest and most efficient electronic apparatus in the world.

To achieve these goals, several hundred new types of electron tubes have been created during the war, many of them by RCA engineers. Constructing special tubes and new

apparatus of intricate design is a continuing process, the magnitude of which is seen in the fact that RCA has built more than 200 new electron tubes and more than 350 different types of apparatus since the beginning of the war. Previously none of these had been manufactured by anyone.

Developments Make History

The RCA wartime record in production of new designs and diversified apparatus in the electronic communication field is history making. The items are many, and range from acorn-size tubes to powerful battleship transmitters, from submarine apparatus to aviation equipment, from tank receivers to radar and radiosonde, from magnetrons to cathode-ray oscilloscopes, from "lighthouse" tubes to beam-power amplifiers, from radio altimeters to underwater-sound instruments, from antennas to throat microphones, from aircraft to portable infantry equipment.

RCA's men of science are performing new magic with waves that pulse like the heart, while other waves flow through space as continuous streams of energy. Some of these waves are harnessed to function over limited ranges and on lines as straight as an arrow. Others are broadcast to the four corners of the earth.

In a new service known as radiothermics, radio waves are applied to generate heat. The applications of this radio-heat in accelerating wartime industrial processes indicate the new uses to which this invisible "fire" will be applied where heat is needed to weld, mold, bake, vulcanize, laminate, cook, case-harden, solder, glue, purify, and dehydrate materials. For example, one of the outstanding achievements in RCA Laboratories in 1944 was the development of a new all-electronic process for drying penicillin. The use of radio heat completed in 30 minutes a major phase of the dehydrating process which had required 24 hours by ordinary methods, thus making available large quantities of this wonder drug, and at less expense.

Boiled In A Vacuum

The potency of penicillin is reduced if it is subjected to normal boiling temperatures. To avoid this condition it is boiled in a vacuum at RCA Laboratories at a pressure equivalent to that at an altitude of fourteen miles. A very low boiling temperature can thus be used. A new machine, under experimental development, is capable of drying 2,000 bottles of penicillin an hour, which is enough for one treatment each to 10,000 persons.

Years of television progress plus wartime research in electronics convince our engineers that an efficient and dependable nationwide television system can become practical as a post-war service. This conviction is further confirmed by years of wave-propagation investigations, field tests and practical operation of television broadcasting service by the National Broadcasting Company. Wartime developments of RCA and NBC will make it possible to launch television and frequency modulation, or FM broadcasting, as great, post-war industries, and to initiate network operations.

Telecast Army Films

These new branches of the radio industry will serve the American public by bringing new dimensions and quality to entertainment, and add greatly to post-war employment. Indicative of the timeliness of television, the latest Signal Corps films of the war are being telecast by NBC's New York station WNBT.

Radio engineers estimate that a projection television receiver, including standard broadcasting and FM, can be built in the post-war period for less than $400, and that other television receivers, designed exclusively for picture and associated sound reception, will be available at prices within range of the average income.

The same efficiency and craftsmanship which have made the RCA

LEFT—IN THE HURTGEN FOREST OF GERMANY, A "HANDY-TALKIE" RADIO KEEPS THIS INFANTRY SQUAD LEADER IN TOUCH WITH HIS COMMANDING OFFICER. BELOW—AS AN INFANTRY PATROL MOVES TO TAKE THE TOWN OF LIBIN, IN BELGIUM, THE MAN ON THE FAR RIGHT TRANSMITS MESSAGES TO THE REAR WITH A "WALKIE-TALKIE" PACK RADIO OUTFIT.

DEVELOPED IN RCA LABORATORIES, AN EXPERIMENTAL 300 MEGACYCLE TELEVISION TRANSMITTER IS PREPARED BY R. D. KELL AND T. L. GOTTIER, RESEARCH SCIENTISTS, FOR EARLY FIELD TESTS.

monogram the trademark of fine products and dependable service, will be found in television. The characteristics of skilled engineering that give "personality" to an RCA radio-phonograph will bring life-like realism into television. Every RCA instrument, whether it be a radio set, television, FM, phonograph or all of these services in combination, will have behind it the leadership of RCA Laboratories—the foremost center of radio-electronic research in the world.

In this review of the wartime evolution of radio, we salute the devotion to duty, cooperative spirit and patriotic efforts of RCA's 40,000 men and women who established new records in science and industry during 1944. For their achievements in radio, these workers have been honored by the Government through the presentation of six Army-Navy "E" Flags with fourteen stars signifying continued excellence in accomplishment, together with a three-starred U. S. Maritime Pennant, and a Victory Fleet Flag.

7,850 in Armed Services

At the opening of 1945 more than 7,850 RCA employees were in the armed services. Sixty-five of these brave men have given their lives for their country.

Many RCA engineers and officials have been called on special missions in science and communication; their successes have been recognized by citations from the War and Navy Departments. Three men of RCA have been awarded the Legion of Merit for "exceptionally meritorious conduct in performance of outstanding service" and for "conspicuous achievements of lasting benefit."

In 1944, the Radio Corporation of America passed the milestone of its first twenty-five years of leadership and service to the public.

Within this 25-year period more than 21,777,000 RCA radio and phonograph instruments have been put into use throughout the world.

Since 1930, RCA Victor has produced 294,000,000 phonograph discs performed by the world's great artists.

There are 1,000 broadcasting stations in the United States; 325 use RCA transmitters and hundreds of others use RCA studio equipment and electron tubes.

More than 2,000 industrial plants are equipped with RCA industrial sound systems; 6,000 theatres use RCA theatre-sound equipment.

RCA operates more than 50 direct radiotelegraph circuits between the United States and foreign countries; they handled more than 145,000,000 words during 1944, including 1,300,000 Expeditionary Force Messages to and from men and women in the armed services.

Victory Is Chief Task

No ship on the Seven Seas need be out of touch with land, or with its home port; approximately 80 per cent of the American Merchant Marine is equipped with RCA apparatus.

More than 57,000,000 broadcast receivers are in use in the United States. America's No. 1 Network—operated by the NBC—comprises 149 stations from coast-to-coast, and brings the most popular programs and up-to-the-minute news to millions of homes.

Since 1930, RCA alone has sold more than 452,000,000 electron tubes; millions of them are in service in homes and on every fighting front.

RCA enters its second quarter century with virtually all facilities contributing to the winning of the war. The gigantic task is to continue unabated the drive to Victory.

HIDDEN IN THE ATTIC OF A WRECKED BUILDING "SOMEWHERE IN FRANCE", THESE SOLDIERS RADIO BACK INFORMATION ABOUT APPROACHING ENEMY AIRCRAFT.

BRIGADIER GENERAL DAVID SARNOFF, PRESIDENT OF RCA, SPEAKING AT COMPANY'S 25TH ANNIVERSARY DINNER DECEMBER 1.

Anniversary Dinner

GENERAL INGLES, ADMIRAL REDMAN, GENERAL SARNOFF SPEAK AT RCA 25th BIRTHDAY EVENT—CHARTER EMPLOYEES HONORED

IN a distinguished gathering marked by tributes to radio's wartime achievements and citations of radio's great advances during the last quarter of a century, the Radio Corporation of America held its twenty-fifth anniversary dinner at The Waldorf-Astoria in New York on December 1, 1944.

President Roosevelt sent a message to Brigadier General David Sarnoff, President of RCA, complimenting the Company for its important role in achieving the pre-eminence of the United States in radio. Addressing the assembly were Major General H. C. Ingles, Chief Signal Officer, United States Army; Rear Admiral Joseph R. Redman, Director of Naval Communications; General Sarnoff, and his son, Lieutenant Robert Sarnoff, U.S.N.R., who spoke in a surprise radio transmission from somewhere in the Pacific.

Guests of honor included fifty-four of RCA's sixty-two Charter Employees, to whom were presented engraved lifetime fountain pens as a token of recognition for their services. Among guests at the speakers' table were Owen D. Young, founder and first Chairman of the Board of RCA; Edward J. Nally, the first President of RCA; Will Hays, President of the Motion Picture Producers and Distributors of America, Inc.; Major General James A. Code, Assistant Chief Signal Officer, and Major General Frank E. Stoner, Chief of the Army Communication Service.

On the entertainment program were artists of the stage, opera and radio, among them Maestro Arturo Toscanini, Dr. Frank Black, Miss Gladys Swarthout, Lauritz Melchior, Hildegarde, the Bernard Brothers and members of the NBC Symphony Orchestra. Dr. James Rowland Angell, Public Service Counsellor of the National Broadcasting Company, was toastmaster, and Lowell Thomas was master of ceremonies. The grand ballroom of the Waldorf-Astoria was decorated with floral arrangements, banners and backdrops appropriately designed for the occasion.

Dr. Angell read the message from President Roosevelt which recalled that RCA's formation in 1919 followed suggestions by Navy officials that an American radio communication company be organized so that this country would never again be dependent on foreign companies for communication with other parts of the world.

"During these twenty-five years your company has played an important part in achieving pre-eminence for the United States in radio," the Presidential message continued. "I congratulate you personally for splendid leadership. Your organization throughout the years has created new wonders and brought into being new services in all phases of radio activity for the benefit of the American people and for people everywhere.

"I wish you and all members of the RCA family continued success in pioneering. With television as a new postwar industry of great promise in the fields of employment, entertainment and education, I know that under your guidance and vision RCA will continue to contribute to the economic and cultural values created by radio.

"May the next twenty-five years see your fondest dreams in the fascinating world of radio come true."

General Sarnoff, who returned recently after eight months of military service overseas, as Special consultant on Communications to SHAEF, declared that America's entire radio industry deserved high praise for record-breaking achievements in supplying the fighting forces of the United Nations with the finest radio-electronic instru-

MAJ. GEN. HARRY C. INGLES, CHIEF SIGNAL OFFICER, U. S. ARMY, CONGRATULATING THE MEN AND WOMEN OF RCA AT THE ANNIVERSARY DINNER.

ments of war—equipment so necessary to attain Victory in the increased tempo of battle on the far-flung fighting fronts.

In addressing the men and women of RCA, General Sarnoff said while the "all-powerful part radio is playing in the war cannot be told until hostilities are over," it violates no military secret to say that "Whether it be research, engineering, manufacturing, broadcasting, or communications, you are doing a magnificent job." He then announced approval by the Board of Directors of an RCA Retirement Plan (see story on page 11) providing pensions for life, for service prior to December 1, 1944, and life annuities for RCA employees based on equal contributions from the employees and the Company after that date.

General Sarnoff asked that the occasion of the anniversary be regarded as an observance rather than a celebration, saying: "Let us make it a tribute to radio men and women in the armed services, in communications and on the production lines. Only by Victory can we win the right to celebrate." He disclosed that sixty-five RCA employees have lost their lives in the war, and 7,835 others "have left our family circle to join millions in the Armed Forces who are driving toward Victory."

"It has been America's good fortune to encourage the development of radio in every field of its activity," he asserted. "As a result, this country had a great radio industry to convert to the production of instruments of war. The entire industry deserves high tribute for its record-breaking accomplishments in supplying the finest radio-electronic apparatus to the United Nations.

Salute to Amateurs

"Ready to meet the impact of war, America had a world-wide communications system and a broadcasting system second to none. To operate these vastly expanded radio services, America had thousands of self-trained amateur and commercial operators who quickly enlisted. Today these young men are in the front lines of communication with the Signal Corps; they are in the Navy and Coast Guard, on warships, transports and aircraft while thousands of others are in the Merchant Marine. We salute the radio amateur as an effective contributor to America's wartime radio communications.

"The unprecedented part that broadcasting is playing in this war, in binding together the people of the United Nations, and in bringing in some light to countries darkened by dictatorships, can best be realized when one is in the very vortex of it. I found myself in such a spot on D-Day, June 6, 1944. At an undisclosed location in the United Kingdom, the news came in directly from the beaches of Normandy and that news was broadcast instantaneously to all the world.

"People ask me what about television in the war; what about facsimile and FM? What about radar? The answers are the secrets of war and only Victory can reveal them fully. We can be certain, however, that what we have learned through their use in war will help substantially to increase and expand the products and services of radio in peace. The future of radio is boundless.

"Tomorrow holds the promise of television and of many other new electronic wonders which will aid our economy, help maintain employment, and broaden our cultural enjoyment.

"Our fighting men—over there—are on the road to Victory. Those of you who are on the production line are soldiers, too. The men over there are depending upon you. I have seen what can be done with American equipment in the field. In action, it is a vital link to Victory. I have listened on foreign soil to radio as the Voice of Freedom. If you only knew what it means to the liberated people over there, and what it means to our soldiers who comb the air impatiently for news from home, for baseball and football scores and their favorite entertainers. Radio is their only means of reaching out across the sea, literally to feel the pulse of home. I have joined with them in the field, listening to America; I have flown across the oceans and knew what a safety factor radio can be up there in the darkness where enemy patrols may be lurk-

LEFT—AMONG GUESTS OF HONOR AT RCA 25TH ANNIVERSARY DINNER WERE, LEFT TO RIGHT, MAJ. GEN. FRANK E. STONER, MAJ. GEN. JAMES A. CODE, REAR ADMIRAL JOSEPH R. REDMAN, BRIG. GEN. DAVID SARNOFF, AND MAJ. GEN. HARRY C. INGLES. BELOW—EDWARD J. NALLY, FIRST PRESIDENT OF RCA, RECEIVES FOUNTAIN PEN FROM HANDS OF GENERAL CODE AND OWEN D. YOUNG.

ing. You never get away from radio, no matter where you go in this war."

General Sarnoff recalled that the Radio Corporation of America began operations twenty-five years ago with 457 employees and today more than 40,000 are on the pay roll, 55 per cent of whom are women.

"Our road ahead is marked by great responsibility and golden opportunity," General Sarnoff concluded. "The achievements of radio during the past twenty-five years will be greatly surpassed during the next twenty-five years. May you all be here to celebrate in peace, your Golden Jubilee."

RCA's wartime service to the Nation received high tribute from General Ingles. He said: "Men and women of RCA, workers, technicians, engineers and management, you may well be proud of your contribution to the war effort. Through your continuous research and development, you have added to the general fund of scientific knowledge. Through your energy, brains and sacrifice, you have greatly aided in furnishing American soldiers with the finest communication equipment in the world. Through you, I take this opportunity to pay tribute to the great role played by the electronics industry in this technical war.

"The Radio Corporation of America like the Signal Corps has pioneered in communications," General Ingles continued. "For two decades it has been among the foremost in the development of radio art. Since its organization, RCA has established a world-wide communication system that gives the United States pre-eminence in radio communications. RCA developments in communications, broadcasting, research, engineering and manufacturing have proved their value in this global war. Not only have they rendered tremendous service to the government but, through Lend-Lease, they have accomplished the same important mission for the governments with which we are allied in arms."

Commends Sarnoff

General Ingles spoke of the close relationship of RCA and its associated companies with the Signal Corps and the Army, adding, "You have attached your President, Colonel David Sarnoff,* to the Signal Corps from time to time as occasion demanded. Colonel Sarnoff's exceptionally meritorious conduct in the performance of outstanding services has gained him the Legion of Merit award, a decoration which he richly deserved. I can add nothing to the citation given to him by the War Department, which said, in part: 'Colonel Sarnoff's outstanding devotion to duty, his courage and great diplomacy in handling French citizens have aided materially in overcoming great difficulties.' I can assure you that Colonel Sarnoff's work in Europe was only one instance of his services to the Signal Corps and to the Nation."

Admiral Redman called attention to the fact that today the United States Congress is studying the possibility of a merger of the American communications services in the international field.

"We are on the threshold of reorganization and this subject is vital to our future," he declared. "Just as it was necessary for us to take decisive action after World War I, so it is necessary that we prepare ourselves for the future after this conflict by putting into effect a well prepared and efficient plan of operation that will permit the United States to maintain and

* Promoted to Brigadier General December 6, 1944.

REAR ADMIRAL JOSEPH R. REDMAN, DIRECTOR OF NAVAL COMMUNICATIONS, RECALLS FORMATION OF RCA IN ADDRESSING 25TH ANNIVERSARY DINNER.

BELOW—AT ONE OF THE CHARTER EMPLOYEE TABLES, WILLIAM H. TAYLOR OF RCAC RECEIVES HIS FOUNTAIN PEN AS HENRY CHADWICK, LEFT, ALSO OF RCAC, AND HENRY J. SULLIVAN, RCA CONTROLLER, WATCH. RIGHT—GENERAL SARNOFF, PRESIDENT OF RCA; MR. NALLY, FIRST PRESIDENT, AND OWEN D. YOUNG, FIRST CHAIRMAN OF THE BOARD.

improve its position in the field of international communications. Such a plan must be founded upon correct basic principles in order to endure. One of these basic principles is that the overall interests of the United States must come first and that all other interests, including the operating companies, must be coordinated in order to achieve that objective."

Admiral Redman, complimenting those whose farsightedness brought RCA into being, reported that advances in radio communications had made valuable contributions to the conduct of Naval warfare, and, looking to the future, asserted: "I envisage a remarkably efficient and modern international communications system. I can see great central switchboards on which terminate various circuits, each circuit operating through filters dividing it into many channels for all classes of service. I believe the Radio Corporation of America is alert to these future problems, just as it always has been in the past and will not fail to retain its leadership in the international field of communications."

Sarnoff's Son Speaks

The surprise of the evening came when the clear and vibrant voice of Lieutenant Robert Sarnoff, speaking from an undisclosed base in the Pacific, brought a special greeting and a report of what radio is doing to win the war in that theater of operations.

"The magnitude of the job that radio has done in this war and the many ways in which it has contributed directly to Victory will not be fully known until we are again at peace," he declared. "But I can assure you, from personal observation and experience, while in the Naval service, that it is a story to challenge the wildest fantasy.

"Radio is the eyes and ears and voice of the Navy. It searches out the enemy and having sighted him, it helps direct his destruction. It transmits vital orders and reports and in turn it listens for them. In the Pacific, distances are measured in terms of thousands of miles. Yet radio spans those miles in a mere fraction of a second. Without radio it would be impossible to move vast quantities of men and materiel with the high degree of efficiency which has become standard operating procedure with the United States Navy. Radio makes possible the effective employment of huge task forces of battleships, aircraft carriers, cruisers, submarines and smaller craft such as the world has never before seen. The recent disastrous defeats suffered by the Japanese Navy in the Second Battle of the Philippine Sea can be attributed in large measure to radio.

"I have seen RCA equipment in places where the influence of civilization had hardly been felt prior to this war . . . on islands that were not so long ago cannibalistic. And I have seen aboard our fighting ships everything from small tubes to large intricate machines that serve as the Navy's mechanical brain. And you at home in the factories and laboratories can rightfully feel that you have played a major part in this success story. For without the equipment which you and others like you are turning out day after day, and without the research constantly perfecting that equipment and creating new instruments, it would be impossible to fight a war of such scope and to defeat our enemies so thoroughly."

In concluding, Lieutenant Sarnoff said: "To all of you, from assembly line worker to the President of RCA, I send my congratulations and may you continue to earn the Navy's highly prized symbol, 'To All Hands, Well Done.' Goodbye and Good Luck from Lieutenant Robert Sarnoff in the Pacific."

NBC Stations Lead In Listening Habits Poll

Nationwide Survey Shows Network With Margin of 128% Over Nearest Competitor

IN 1077 cities through the United States, National Broadcasting Company network stations lead their closest competitor in nighttime "most" listening by 128%, according to the first report from the 1944 Nationwide Survey of Listening Habits released January 10.

The report was made public at a luncheon meeting held at the Ritz-Carlton Hotel, at which Niles Trammell, president of NBC; Roy C. Witmer, NBC Vice-President in Charge of Sales; Charles P. Hammond, NBC director of advertising and promotion, and James H. Nelson, network sales promotion manager, were speakers. Attending the session were leading executives of advertising agencies, program sponsors, representatives of the press, the NBC Management Committee and the NBC Station Planning and Advisory Committee.

230,000 Families Polled

An overall analysis of the survey, presented through slides, shows that in the 1077 cities having more than 10,000 population 57% of the radio families listen most to NBC, after 6:00 p.m., local time. These 1077 cities account for 16 million radio families, equivalent to 56% of the nation's total.

The survey reveals that in the nation's 14 largest cities, with populations of 500,000 or more, NBC leads all other networks; in the 37 cities with populations of 250,000 or more, NBC leads all other networks in 36; and in the 92 cities with populations of 100,000 or more, NBC leads all other networks in 81.

Covering all cities of 10,000 population or more in the United States, the survey polled 230,000 families, or one out of every 140 radio families in the country, representing radio families in every county in the country. Questions asked were: "What stations do you listen to regularly?" and "Which one of these stations do you listen to MOST?"

This first report of the 1944 Nationwide Survey of Listening Habits records listeners' answers to the selective question, "Which one of these stations do you listen to MOST—at night, after 6 P.M.?"

Summing up by cities, the report concludes that NBC leads by nearly 6 to 1 over the nearest network in the category, "listened to most at night." NBC leads all other networks in 860 of the 1077 polled.

RCA Inaugurates Retirement Plan

MORE THAN 85 PER CENT OF ELIGIBLE EMPLOYEES ENROLL FOR PARTICIPATION—BENEFITS INCLUDE PENSIONS AND ANNUITIES FOR LIFE — COMPANY MATCHES MEMBERS' CONTRIBUTIONS

ENROLLMENT in Radio Corporation of America's new employee Retirement Plan, announced by Brig. Gen. David Sarnoff, President, at RCA's 25th Anniversary Dinner on December 1, totaled more than 85 per cent of all eligible employees at the year end, and was expected to go still higher, according to officials of the Company. The plan provides pensions and annuities for life to members.

In both Radiomarine Corporation of America and RCA Institutes, the enrollment was 100 per cent of eligible employees; in RCA Laboratories, it was 97 per cent; in the National Broadcasting Company, 90 per cent; in R.C.A. Communications, Inc., 90 per cent, and in the RCA Victor Division, 83 per cent. Final reports from some departments and divisions have not yet been received.

Participation Voluntary

Membership in the plan, which became effective December 1, 1944, subject to approval by RCA stockholders and the U. S. Treasury Department, is open to all persons regularly employed by RCA and its domestic subsidiaries who have reached the age of 25 and have completed three years of service. Participation is voluntary.

Benefits, which are designed to supplement Social Security, normally start at age 65 and consist of:

1. The pension, which is to be financed entirely by the employer and amounts to ¾ of 1 per cent of the first $250 of the member's monthly earnings on November 30, 1944, plus 1¼ per cent of such earnings in excess of $250, for each year of continuous service prior to December 1, 1944, up to 20 years after excluding the first three years of service and any service rendered prior to age 25.

2. The contributory annuity, which depends upon the amount of combined contributions of the employee and the employer made at each age and the annuity rates then in effect. Each member will contribute 2 per cent of the first $35 of basic weekly earnings, plus 4 per cent of the next $25, plus 6 per cent of basic weekly earnings in excess of $60.

The Company contributes a like amount and the combined contributions will be used to purchase contributory annuities for each member.

The RCA Retirement Plan is designed to provide in typical cases of employees having long service, retirement benefits which, with Social Security payments, will approximate one-third to one-half pay.

Special provisions are made under the plan for optional retirement benefits, and benefits in case of death or other termination of service.

While a contributory annuity normally provides an income payable for life of the member, his beneficiary will receive the difference if, at his death, the annuity payments received by him have not equalled the amount of his own contributions plus interest to his retirement date. The pension normally provides an income for the life of the member only.

Optional annuity and pension benefits available under the plan are:

1. A joint and survivor annuity providing for reduced retirement benefit payments to the member during his lifetime and for the continuance of such payments after the member's death, in full or in one-half the amount received by the member, to a joint annuitant named by him for life.

2. An adjusted annuity for members who retire before age 65, providing larger payments until age 65 to take account of the fact that Social Security benefits do not begin until that age, and smaller payments afterwards.

In the event a member dies before retirement, his beneficiary receives the full amount he has contributed, with interest. The present interest rate, which is guaranteed for all contributions made before December 1, 1949, is 2 per cent compounded annually.

The plan also provides that upon termination of service, an employee may withdraw the amount of his own contributions with interest.

Paid-up Annuities

If the employee does not withdraw his contributions upon termination of service after five years of contributory membership, according to the plan he will receive the paid-up annuity purchased by both his and the employer's contributions.

Should termination of service occur after ten years of contributory membership and after attainment of age 50, he will receive not only the paid-up annuity purchased by both his and the employer's contributions but also a right to any pension financed for him for service prior to December 1, 1944. The paid-up annuity or pension may commence any time after age 55.

The annuities will be purchased from The Equitable Life Assurance Society of the United States, under the terms of a Group Annuity Contract, and the pensions will be financed with J. P. Morgan & Company, Inc., as Trustee, under a Pension Trust Agreement.

Among those participating in the plan are employees of the Radio Corporation of America, including RCA Victor Division and RCA Laboratories; National Broadcasting Company, Inc.; R.C.A. Communications, Inc.; Radiomarine Corporation of America, and RCA Institutes, Inc.

IN NEW YORK, JOSE ITURBE, FAMED PIANO VIRTUOSO, LISTENS TO PLAYBACK OF HIS FIRST RED SEAL RECORDING AFTER BAN IS LIFTED. THE SELECTIONS WERE "ROOGIE WOOGIE ETUDE" AND "BLUES."

MUSIC RECORDING RESUMES

RCA Victor is First of Companies Affected to Get Back Into Production Following 27-Months' Ban — Many New Selections are Distributed.

FOLLOWING a 27-months' ban, RCA Victor resumed the recording of instrumental music on November 12 after an agreement had been signed with James C. Petrillo, head of the American Federation of Musicians. Fewer than 18 hours later, the first instrumental popular music to be recorded by Victor in over two years was being waxed in RCA Victor's Manhattan studios. Several hours later, in the same studio, RCA Victor sound engineers were recording the first post-ban Red Seal record.

First to resume recording after the lifting of the ban, RCA Victor was also the first to put the new discs on sale. Just over 24 hours after the first recording session, copies of the disc were on sale in Philadelphia. Before the week was over, more than 160,000 copies of this new disc had been distributed to RCA Victor dealers throughout the country.

The first to record instrumental music for Victor after the signing of the agreement was orchestra leader Vaughn Monroe, whose band was readily available to the New York studios. His offering, recorded within a few hours after the ink was dry on the Petrillo contract, was "The Trolley Song," backed by "The Very Thought of You."

That same evening, Jose Iturbi, world famous pianist, became the first classical artist to record. On a 10-inch Red Seal disc, he performed two piano compositions by Morton Gould — "Boogie Woogie Etude" and "Blues." Mr. Iturbi went into the RCA Victor recording studio shortly after an appearance on the RCA "Music America Loves Best" radio program.

As word of the signing of the agreement with the AFM was flashed to RCA Victor recording centers in Hollywood and Chicago, where recording crews were standing by, the studios turned into beehives of activities. Pre-arranged plans which have long been awaiting the signal were immediately set into motion. Popular band leaders and

BELOW—IN NEW YORK, VAUGHN MONROE AND HIS ORCHESTRA PERFORM "THE TROLLEY SONG" BEFORE THE RCA VICTOR MICROPHONE, MAKING THE FIRST VICTOR INSTRUMENTAL MUSIC RECORDING IN 27 MONTHS. RIGHT—IN PHILADELPHIA, THE FOLLOWING DAY, "THE TROLLEY SONG" DISCS GO ON SALE.

ABOVE—IN CAMDEN, N. J., LEOPOLD STOKOWSKI, FAMED CONDUCTOR, GOES OVER A SCORE WITH AL PULLEY, RCA VICTOR'S CHIEF RECORDING ENGINEER, IN PREPARATION FOR NEW RECORDINGS WITH HIS OWN ORCHESTRA. RIGHT—IN CHICAGO, CHARLIE SPIVAK, WITH TRUMPET, MAKES HIS FIRST RECORDING UNDER THE VICTOR LABEL.

singers, with tunes already selected and arranged, hurried into the Victor recording studios as schedules permitted. They came from theatre stages, from swank hotel dance rooms, from night clubs and motion picture lots.

In the classical field, the world's greatest artists on Victor's roster—famed instrumental virtuosi, singers, orchestra conductors—also began to record as studio schedules and their own engagements permitted. To cities where larger recording groups were located, a crew of engineers rushed portable recording equipment.

To set a new industry record in recording - to - counter time, "masters" of the Vaughn Monroe cutting were rushed to Victor's Camden, N. J. plant from New York by special messenger. In Camden a special crew worked through the night to process the "masters" and turn out the first lot of discs that rolled off the presses and into a Philadelphia store the next afternoon.

Within six weeks after recording was resumed, Victor had released or was set to release 21 popular discs. Fifteen of RCA Victor's 20 active pop recording artists were recorded in this time and every tune on the Hit Parade had been covered.

With production of new discs made possible by the lifting of the recording ban, RCA Victor is again in position to supply both the home front and fighting front with new selections by the world's greatest artists. Efforts are being made to meet quickly the strong pent-up demand by the public for recordings by classical and popular artists, and the demand for recordings of hits introduced by radio and the stage during the war.

The resumption of recording, however, does not mean an increase in production of discs. While it offers the public fresh, new music, total output remains unaffected as the company is still confronted by the problems of manpower, machine, and packing material shortages.

IN HOLLYWOOD, TOMMY DORSEY, SEEN HERE WITH ONE OF HIS VOCALISTS, FREDDY STEWART, COMPLETES THE CROSS-COUNTRY PARADE OF NEW RCA VICTOR INSTRUMENTAL RECORDING SESSIONS.

New NBC Transcriptions

NBC's Radio Recording Division resumed operations Monday, November 13, after a "vacation" of 27 months, caused by the Petrillo edict to members of the American Federation of Musicians. This order by the union president caused a suspension of virtually all recording activities in which musicians were required.

However, during that period of more than two years, NBC was able to supply transcriptions for its Thesaurus library subscribers using choral groups and a capella ensembles. It was possible to continue the Division's dozen or more recorded program series because the scripts were either talks, comments or straight dramas with sound effects.

When the ban was lifted, orchestras directed by Vincent Lopez and Sammy Kaye went into action immediately.

WELCOME HOME AUDITIONS

NBC Seeks Radio Talent Among Men and Women of Armed Services, Hoping to Aid in Rehabilitation Work—Network Stations Also Benefit.

By C. L. Menser

Vice President in Charge of Programs, National Broadcasting Company

THE Welcome Home Auditions started with a very simple idea. Having heard hundreds of formal and informal discussions on the subject of rehabilitation and post-war plans, and having felt about these discussions much as Mark Twain felt about the weather—as something which everyone was talking about but no one doing very much about—I decided that NBC should contribute something practical.

It occurred to me there must be hundreds of men and women in the service with talents which post-war radio might use. Two things about these talents seemed fairly evident. One was that in many instances they were being developed during the period of service by performances and entertainments at camps, or by such informal items as playing the piano or singing in various service recreation quarters.

Entertainments which the service personnel provided for themselves were undoubtedly helping amateur "emcees" to get experience and the confidence and expertness which go with it; quartets or trios that started with impromptu "barbershop" harmonizing to develop more professional presentations; scrip writers to progress from very simple announcements to black-outs and comedy routines and dramatic scenes; in fact, all types of talent—announcers, actors, writers, performers — to improve their own latent abilities by using them in hundreds of camp entertainments.

The second evident fact was that no one in the radio industry seemed to be doing very much about finding out whether these talents were being developed or to what extent they might be used.

Both of these factors were emphasized by the general situation with respect to talent throughout the radio industry. It has long been my feeling that this was pretty haphazard, and that something should happen to make it more definite. It is true that most stations have some sort of audition system by which they hear and appraise the talents of those who request auditions. But in part because the industry has grown so rapidly, and in part because the need was not so apparent until the war took a great number of people away from radio, there has never been a definite system in the industry which would guarantee the greatest possible use of most of the available talent.

So it seemed perfectly natural that if we could make a start toward appraising the potential talent of service personnel, both men and women, and, having made that appraisal, acquaint all our stations with the results, we might be of great service to the stations and at the same time provide a practical answer to the returning soldier whose question is: "Where do we go from here?"

It was obviously necessary to get the official approval of all branches of the service. When they were acquainted with the purposes of the plan, their response was immediate and enthusiastic. They cooperated whole-heartedly in informing the men and women in the service as to how they might be auditioned. Notices were posted in camps and printed in service papers.

NBC made frequent announcement of the plan on the air. These announcements carried the simple facts that any man or woman now in the service or recently discharged from the service would be given an audition and interviewed, and that he might make application either in person or in writing.

We then set up a small unit to devote its entire time to these auditions. This unit was placed under the general supervision of George Maynard, Assistant Production Manager, assisted by Mrs. Kathryn Cole, whose husband and son are in the service, and Miss Jane Revels. These three persons form the nucleus of a larger group, which involves Miss Helen Korday and

FORMERLY AN AERIAL GUNNER IN THE ALEUTIANS, COWBOY SINGER WHITEY CARSON WAITS WITH OTHERS FOR HIS WELCOME HOME AUDITION AT NBC. HE WON THE FIRST PROFESSIONAL ASSIGNMENT RESULTING FROM THE AUDITIONS.

BOTH ENTHUSIASTIC OVER THE TALENT SO FAR REVEALED, NBC PRODUCER GEORGE MAYNARD (LEFT) AND NBC VICE PRESIDENT C. L. MENSER LISTEN IN THE CONTROL ROOM TO ONE OF THE SERVICE PERFORMERS.

others of the Personnel Department, and Sheldon Hickox and others of the Station Relations Department.

The plan involves two general aspects—one of collecting the information, and the other of disseminating that information. The first has to do with the audition proper. Each applicant is interviewed to learn his present status with respect to the service, his home town and his desire as to location when he is discharged, and is then given an audition to determine his ability. In the event that he is not so good in one line, an attempt is made to learn whether he has abilities along another line. His picture is taken and a recording is made of his voice so that his future employer may know what he looks like as well as what he sounds like. In the case of script writers, they may submit examples of their work. As many pertinent facts as possible are set down in connection with the applicant. He is given a card certifying that he has had an audition with NBC, so that when he gets back home he can go to his nearest NBC station and present this card to the program manager and be considered for a position.

When properly assembled, the data are turned over to the Personnel Department who, in conjunction with the Station Relations Department, make up a monthly report to be sent out to all of NBC's affiliated stations. The net result of this is that over a period of months every NBC affiliate will have accumulated a file of reports to which they can turn for confirmation when the applicant presents himself, or from which they can make inquiry when they come to fill vacancies.

Though the auditions have been in operation only a short time, stations have already made frequent inquiries about particular men or women whose records interest them. Many have asked for and received audition recordings, and a number of auditionees from among those recently discharged from the service have been given jobs.

From the point of view of the applicants, there is an apparent eagerness for these auditions which has far exceeded our expectations. The original plan was to assign three hours on Saturday morning on the assumption that many men in service on weekend passes might find Saturday a convenient time to audition. We have had to add a mid-week audition period, and current indications are that we may have to add yet a third. When we have worked the "bugs" out of the system, we hope to extend it to the other NBC Division Points, namely, Chicago and the West Coast, and possibly to all our owned and operated stations in Washington, Cleveland, Denver and San Francisco.

One particular point I should like to emphasize. It is that the title "Welcome Home Auditions" was chosen because it was my feeling that in addition to learning about the abilities of the service personnel, we should plan to integrate those abilities into the work of the stations in or near their home towns. One of the cardinal principles of the system is to decentralize talent. The effectiveness of the plan would be much less if it merely resulted in bringing a horde of radio performers into New York City. Many of the performers already in New York would be better off if they would make a place for themselves in some of the smaller stations. To professionals already in the field, this is a difficult point of view to get across. It is my hope that it will not be so difficult with those who plan to enter radio and would welcome positions in places where the competition is not so severe. The second thing is that I have no delusions about the size of the contribution this plan may make to the general problem of returning soldiers. It is, to be sure, only a minute bit. If, however, it should turn out that during the next two years NBC had heard some thousands of returning service men and women, and had helped them to determine whether or not they belonged in radio—and if so, where they might fit—both the network and its stations will have considered the plan successful.

Iraq Awaits Television

The Arab of the Middle East looks forward to the return of free trade by which he may obtain American goods and products, according to Hafidh Al-Kadi, RCA Victor distributor in Iraq, and a member of the Iraq delegation which attended the recent International Business Conference at Rye, New York.

Sayid Hafidh, accompanied by the Iraq delegation, visited RCA Victor's headquarters at Camden, N. J., where they were received by Jay D. Cook, Managing Director of the company's International Department.

In his first-hand report on wartime conditions in Arabia, the RCA Victor distributor said that one of the developments of modern science in which the people of Iraq are most keenly interested is television.

RCA ELECTRON MICROSCOPES, LIKE THIS COMPACT DESK MODEL, ARE EXPECTED TO OPEN MANY NEW POSSIBILITIES FOR CIVILIAN APPLICATION EARLY IN THE POSTWAR YEARS.

MICROSCOPE AIDS DENTISTRY

RCA Electron Instrument Reveals Details of Teeth Never Seen Before—Society Elects Hillier President, Banca Secretary-Treasurer.

ELECTRON microscopes developed by the Radio Corporation of America and now used extensively in the war effort have opened many new possibilities for civilian application after military pressure diminishes, according to papers presented at the November meeting of the Electron Microscope Society of America in Chicago. Attending the three-day conference were electron microscopists representing more than a score of leading college and industrial laboratories. Dr. James Hillier, of RCA Laboratories, Princeton, N. J. was elected President, and M. C. Banca, of the RCA Victor Division, was re-elected Secretary-Treasurer of the Society.

It was disclosed that the electron microscope, by means of which a tooth area one-tenth the width of a toothbrush bristle can be photographed and studied, holds far-reaching prospects for dentistry. Dr. C. H. Gerould, research engineer with the Dow Chemical Company, Midland, Mich., explained it this way: "It is as though the darkened laboratories of dental technicians suddenly were flooded with light. With the electron microscope, tooth structures whose very existence had been in doubt can be seen, measured and examined."

One of the examples cited by Dr. Gerould were tiny canals within teeth. Micrographs obtained with an RCA electron microscope, he said, revealed each human tooth to contain 50,000 miles of these canals, which no eye had ever seen. He showed pictures of a cross-section area of a tooth, magnified 5,300 times, in which the openings appeared as huge craters.

The increased knowledge of tooth structures and the greater opportunity for earlier detection of diseases of the teeth which the electron microscope has made possible should, in Dr. Gerould's opinion, help dental researchers in the further development of methods of tooth preservation.

"Preliminary work on tooth structures," he said, "has indicated that the electron microscope can be used successfully towards giving the dental research worker a new tool for application in his field."

The micrographs, shown by Dr. Gerould at the meeting, were all stereoscopic views, showing three dimensions. So exact is the operation, it was explained, that a magnified image can be adjusted to within one-sixteenth of an inch at 20,000 diameters. This corresponds to the actual movement of the specimen to an accuracy of three one-millionths of an inch. A square area 2 1000 of an inch on the side, when magnified 20,000 times, becomes 40 inches on a side. To complete a mosaic it would require 400 regular 2" x 2" micrographs and were these enlarged to 100,000 times, it would require photographic paper sufficient to cover an area one-quarter of an acre in size.

Perry C. Smith, Manager of the Electron Microscope Section of RCA, reported that thousands of micrographs had been made since August, 1941, when a special group was organized at the RCA Victor Division to handle advanced work, production and design of RCA's electron microscopes. He and his assistant, Dr. Robert G. Picard, described in a paper the two latest RCA electron microscopes. The models represented four years of intensive research and engineering by Dr. V. K. Zworykin, Associate Research Director of RCA Laboratories, Dr. Hillier and Mr. Smith. One of the instruments is a streamlined version of the electron microscope now being utilized in wartime research by large medical, industrial and university laboratories. The other is a console model for the nation's disease fighters, food processors and industrial research men working in smaller laboratories.

A revelation which attracted wide interest at the conference dealt with our future wearing apparel. Post-war pants may not bag at the knees so quickly or post-war shirts clutch so tightly at the neck; woolen sweaters may come out of the washer the same size as when they went in. These prospects came from studies made with the RCA electron microscope by D. H. Reynolds and J. A. Rich of the Monsanto Chemical Co., Dayton, Ohio.

These experts explained that the microscope permitted such detailed examination of the fibers of clothing materials that the effect on these materials of water and other substances could be accurately determined. It was found that treating the fibers with certain types of

resin increased their resistance so enormously that the problems of shrinkage and loss of shape were largely solved.

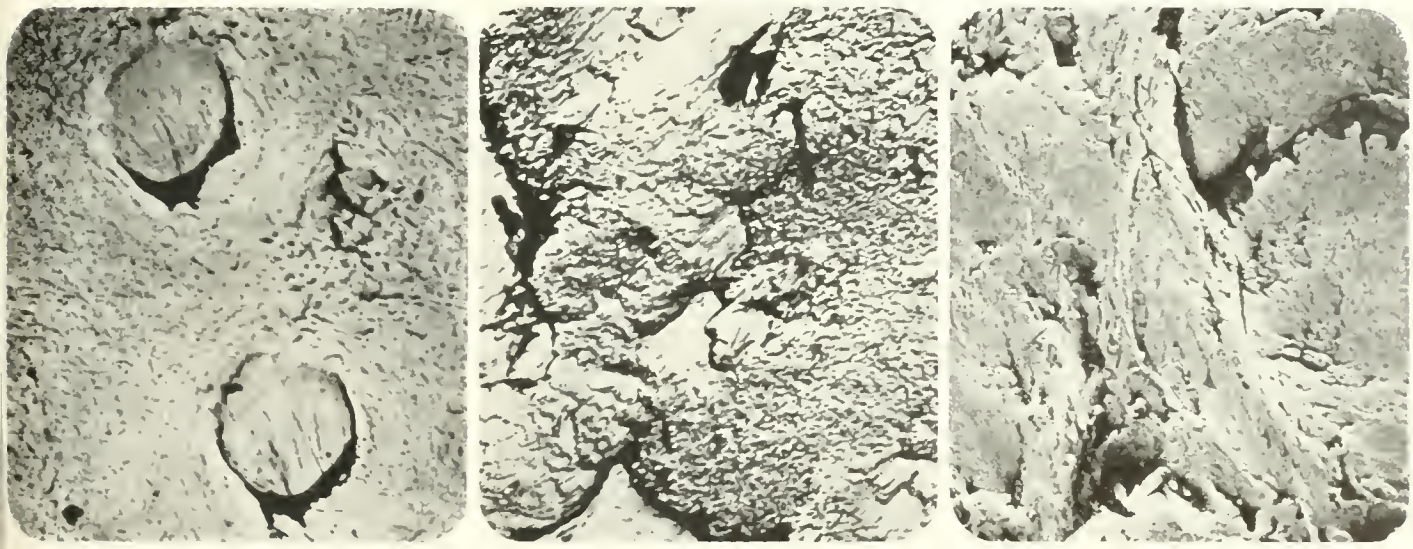
Plans are under way, it was indicated, for resin treatment of many types of clothing material after the war.

Among micrographs shown at the meeting was one of a surface which had been marked with 15,000 lines to the inch. In the picture, which had been enlarged thousands of diameters, the lines, invaluable for purposes of measurement, appeared one-quarter of an inch apart.

It was explained in another paper that natural rubber, when examined by means of the electron microscope, reveals the factors that early synthetic rubber lacked and which accounted for the natural product's greater durability and elasticity. This information has now been applied in the manufacture of synthetic rubber with satisfactory results, according to L. H. Willisford, Research Laboratories, the Goodyear Tire & Rubber Co., Akron, Ohio.

Heard at the meeting also were papers by L. H. Matheson and R. D. Heidenreich of the Dow Chemical Company; R. T. Phelps, A. L. Langer and Earl A. Gulbransen of Westinghouse Research Laboratories; Harold C. O'Brien, Jr. of St. Joseph Lead Co., Monaca, Pa.; John Turkevich, Department of Chemistry, Princeton University; Thomas F. Anderson, University of Pennsylvania; E. W. Schulta, P. R. Thomassen and L. Marton of Stanford University; Harry E. Morton of the Pennsylvania School of Medicine; L. O. Brockway of the University of Michigan; R. F. Baker and F. H. Nicoll of RCA Laboratories; L. S. Birks and H. Friedman of the U. S. Naval Research Laboratories, Washington, D. C., among others.

DETAILS OF HUMAN TEETH NEVER SEEN BEFORE ARE REVEALED IN THESE MICROGRAPHS MADE WITH AN RCA ELECTRON MICROSCOPE: LEFT—TRANSVERSE SECTION OF A NORMAL TOOTH SHOWING DENTINAL CANALS, APPROXIMATELY 50 MILES OF WHICH EXIST IN ONE TOOTH. CENTER—IRREGULARITIES OF STRUCTURE IN ENAMEL SURFACE. RIGHT—EXTERNAL CEMENTUM, OR COVERING, OF THE SURFACE OF THE ROOT.



TELEVISION REPORTS VOTE

November Presidential Election Returns Seen By Video Audiences in New York and Philadelphia—NBC Visualizes Results of Balloting.

APPROXIMATELY 4,000 homes in New York City and suburbs, and 200 in Philadelphia knew the results of the November election ballotting seconds and sometimes minutes ahead of their neighbors equipped only with standard radio receivers. Television signals transmitted by the National Broadcasting Company from its station WNBT on the Empire State Building and relayed by WPTZ, Philadelphia, made possible the speedy service.

Nerve center of the television network was a small studio in Radio City, equipped with AP teletypes and an assortment of charts and other visual aids which provided viewers with an instantaneous record of the vote as it varied from minute to minute.

In the studio, banks of hundreds of lights made brilliant a scene of orderly confusion. Cameras shuttled back and forth on their rolling platforms trailing snaky coils of wire with them. Producers and directors wearing telephone head-sets that brought orders from the control booth high against the ceiling, signaled with waving hands, pointing fingers and cabalistic signs.

Moving in turn from a blackboard carrying last minute compilation of returns arranged by states to dual thermometers labelled "Roosevelt" and "Dewey" on which indicators were shifted constantly, cameras made it possible for viewers to see at a glance the progress of the contest.

RADIOPHOTO IN ADVERTISING

International Department of RCA Victor Plans to Use Service in Postwar Program of Global Advertising—Advantages Outlined.

A POSTWAR program of global advertising which would utilize RCA Radiophoto to flash copy and layout for simultaneous release to publications throughout the world has been announced by the International Department of the RCA Victor Division of the Radio Corporation of America.

The new plan for speedy worldwide placing of advertisements will rely upon the transmission of copy by RCA Radiophoto to world capitals which are equipped with this type of communication. From these radiophoto centers, which are expected to be more numerous after the war, the advertisements will then travel by airmail to an additional network of far-flung cities, making possible the synchronized appearance of advertising copy in publications serving in widely separated world markets.

The practicability of this program has been demonstrated by RCA on two different occasions during the last year. The most recent use of radiophoto ad transmission occurred during the observance of RCA's 25th Anniversary, when an advertisement describing the company's pioneering contributions in the field of radio and electronics was speeded to publications in Europe, Australia, Africa, India and the Middle East. This advertisement was an adaptation of copy originated by the parent company and widely used in the anniversary campaign throughout the United States.

The copy, prepared by the J. Walter Thompson Agency of New York, was radioed to the Eastern Hemisphere by RCA Communications offices at New York and San Francisco as the first stage of transmission. As soon as the copy was received in London, Cairo, Stockholm, and Sydney, the distributing agency at each capital working with the local Thompson agency representative, arranged for publication in these centers. The copy was then rushed to other large cities by airmail.

From London the radioed copy was airmailed to Lisbon, Madrid, and Cape Town for distribution to Spanish, Portuguese, and South African publications. From Cairo the radiophoto was flown to Istanbul and Bombay for publications in North Africa, the Middle East, and India. Copy received at Stockholm was dispatched to Swedish publications. Sent from San Francisco to Sydney, the radiophoto advertisement went into production for other cities in Australia and New Zealand.

By the combined use of radiophoto and rapid airmail delivery, the RCA Anniversary advertisement was made available to 12,500,000 persons in 47 countries in a matter of hours and days instead of the weeks and months ordinarily required for this type of coverage. Transmitted in English, the advertisement was translated at the point of receipt and appeared in a total of 274 newspapers and magazines published in 18 different languages and dialects: Afrikaans, Arabic, Dutch, English, French, Portuguese, Spanish, Swedish, Turkish and nine Hindu dialects.

The anniversary advertisement as transmitted was prepared in four sizes, including one 14 inches, two columns by 7 inches, the size indicated by the Office of War Information as most acceptable for the countries in which RCA is cooperating with the OWI on advertising. The illustration which accompanied the international message depicted the symbol, RCA, in a striking sunburst.

Earlier in the year, RCA successfully used radiophoto transmission for an advertising campaign in connection with Motion Picture Academy Awards to RCA-recorded films. The day after the awards were announced in Hollywood, an RCA advertisement, carrying the names of the winning motion pictures and their principals, was transmitted by radiophoto to London, Cairo, Sydney, and Buenos Aires for relay by airmail to other countries.

This successful advertising use of the radiophoto method caps a twenty-year period of communications development by RCA. It was in 1924 that RCA first transmitted a photograph across the Atlantic by radio.

Experience gained in the combined use of radiophoto and airmail delivery of advertisements on the two recent occasions will be applied to campaigns to be conducted in many countries throughout the world after the war, it was stated by William J. Reilly, advertising manager for the RCA Victor International Department.

RCA Victor's postwar plan will include the international distribution of a selected line of household appliances in addition to the distribution of its own products to a wide market extending into 120 countries and territories.

Star to Laboratories

A THIRD star for continued outstanding achievement in the war effort was awarded in December for addition to the Army-Navy "E" Flag won in 1943 by RCA Laboratories at Princeton, N. J., according to word received by O. S. Schairer, Vice President in Charge of the Laboratories. Notification of the award was made by Admiral C. C. Block, USN (Ret.), Chairman of the Navy Board for Production Awards.

RCA Laboratories' new award brings to nineteen the number of stars for continued outstanding achievement which have been added to the war production flags and pennants won by RCA divisions and subsidiaries. A summary of the awards follows:

RCA Laboratories — Army-Navy "E" flag and 3 stars.

RCA Victor Division — Army-Navy "E" flag and 4 stars to the Camden, New Jersey plant; "E" flag and 3 stars, Harrison, New Jersey plant; "E" flag and 2 stars, Indianapolis, Indiana plant; "E" flag and 1 star, Lancaster, Pennsylvania plant.

Radiomarine Corporation of America—Army-Navy "E" flag and 3 stars, Maritime "M" Pennant and 3 stars, and the Victory Fleet flag.

RCA Communications, Inc. has been awarded the Certificate of Appreciation by the U. S. Army Signal Corps.

Sarnoff Receives Top TBA Award

RCA PRESIDENT, CALLED "FATHER OF AMERICAN TELEVISION," CITED AT CONFERENCE FOR INITIAL VISION AND LEADERSHIP — ZWORYKIN HONORED AS TECHNICAL PIONEER

Called the "Father of American Television," Brig. Gen. David Sarnoff received the major citation among awards made by the Television Broadcasters Association, Inc., at the Association's First Annual Conference Dinner on December 12 at the Hotel Commodore in New York. The citations and medals "in recognition of those who have brought television to its present state of development," were presented by Paul Raibourn, Chairman of the TBA Committee on Awards. His remarks and General Sarnoff's response were transcribed as follows:

MR. RAIBOURN: Now we come to a gentleman who long has had a vision. The Committee was certain that there were times when he did not feel so sure of his vision, but communing with himself he always decided that that vision was right.

He has lately been out of this country. He knows conditions throughout the world with respect to electronics and with respect to television and his citation is *for his initial vision of television as a social force and the steadfastness of his leadership in the face of natural and human obstacles in bringing television to its present state of perfection.*

The Committee wishes to call him *The Father of American Television.*

Gentlemen, I give you General David Sarnoff, on leave from the Presidency of the Radio Corporation of America.

GENERAL SARNOFF: Mr. Chairman, Honored Guests, Ladies and Gentlemen:

First, I should like to make it clear that while I have the honor of wearing the Army uniform, I am not here representing the United States Army.

Secondly, I should like to make it clear that while I have the honor in civilian life of being President of the Radio Corporation of America, I am not here tonight representing RCA.

I am here really in the person of an old wireless operator who has never ceased to marvel at the new things of radio, whether it be in sight or in sound.

I am deeply appreciative of the high honor you have paid me tonight. It was not until two days ago that I had learned of your intention and so my extemporaneous remarks are offered in place of a prepared speech. But, on the other hand, I would be less than frank if I said that after all these years in radio, I need preparation in order to tell you what is in my heart and in my mind when I speak of the great art and industry to which you and I are attached.

A Dream That Cost Millions

I was very happy that Dr. Zworykin put the calendar back a bit and reminded me of the days when he first came to my office. He was not as much of a dreamer as he would have you believe. In fact, he was a very good salesman. I was the dreamer for I believed him. He explained to me the intricacies of the Iconoscope and the storage principle, about which I did not know very much then and do not know too much today. But he did make it very clear in response to my question as to how much it would cost; that it would cost about $100,000. I was the dreamer, for since then it has cost more than $10,000,000. However, I have no regrets.

With all the genius that has been exhibited before you tonight, I still believe that the sum total of their imaginations will, five years or ten years, or twenty years from tonight, be regarded as having fallen far short of the realities.

It is not so long ago that I spent two weeks with the late Senatore Guglielmo Marconi on his yacht, the Elettra in the days before the war when I used to visit him annually and at times witness the various experiments in which he was engaged. At that particular time, he was experimenting with short waves, endeavoring to establish a form of communication with Australia from the English Channel.

I could not be very helpful to him as a scientist, but perhaps I was a little helpful as just an operator, for I sat at the key in that laboratory on his yacht communicating with my friends in Australia.

It was five o'clock in the morning when we had finished those experiments and were about to retire when Marconi said to me, "David there is one thing I would like to know before I die." And I said "Senatore, what is that one thing?"

BRIG. GEN. DAVID SARNOFF, PRESIDENT OF RCA, RECEIVES A MEDAL REPRESENTING HIS CITATION BY THE TELEVISION BROADCASTERS ASSOCIATION, INC., FROM PAUL RAIBOURN, CHAIRMAN OF THE TBA COMMITTEE OF AWARDS.

He said, "I would like to know *why* this thing works." And that was Marconi.

Ladies and Gentlemen, it is a great thrill to me to be here tonight after having spent some eight months on the other side from which I only recently returned.

A Contrast With War

I wonder if anyone here has been impressed with the simple fact that you can, at this hour of the evening, assemble in one lighted room and sit in peaceful surroundings and listen to discussions about post-war possibilities and leave the hall and enter lighted streets and get your taxis and return home, and during all of that time, have no thought of a buzz bomb or a V-1 or V-2 or V-X, that might come to interfere with your evening's program.

I have not had that privilege and millions of others have not had that privilege for some time and I just cannot help remarking about that very simple, little fact. You are thrice blessed in living here and I know that one need not remind you of all the things you are doing and will continue to do to help end the war over there as quickly as possible and to restore peace and tranquility and to replace darkness with light over there as well.

I am thrilled to come back and to find on an occasion such as this, such perfect unanimity, such harmony within the industry that I have not known for twenty-five or thirty-five years. I have not heard anybody here argue tonight about frequencies or colors or dimensions or lines, and I submit, Ladies and Gentlemen, that this is a good place and this is a good time to bury those arguments.

I do not believe that anyone in America, in any organization, has any different purpose or different objective. Surely, we all know that television is not a finished art. We hope it will never be finished, for when an art is finished, the industry is finished too.

Surely we all know that there are bound to be developments as we go on from year to year, but we cannot wait for the unknown developments to reach a point of perfection in the laboratory before we make the products available for service to the public.

I might tell you that although I was not abroad for the purpose of studying television, I could not help learning or finding out what was going on over there in my contacts with the various laboratories, radio, and communication organizations.

Of course, you will not expect me to discuss anything remotely relating to military affairs, nor to tell you in any detail how great has been the contribution of television to war communication activities, whether it be on the sea, or under the sea, or on land, or in the air.

But, after all is said and done, radar, itself, is but a simplification of television and that is no secret. Many of the devices born out of television have been applied in the daily tasks of warfare.

America Leads In Television

But, I can tell you that I have seen the technical developments in the field of television in several countries in Europe, primarily in England, which, I believe, is far ahead of any other country in Europe in the technical development of television.

And I can say to you without reservation that in my judgment there is nothing on the other side that is technically superior or technically in advance of the technique of television in the United States. I do not believe that they are ahead of us technically. In fact, I believe the contrary to be true. I believe that we are ahead of Europe in the technical development of television

Having said that much to you, however, frankness compels me to add that in the matter of *planning* for the *use* of television immediately after the European hostilities cease, I believe that England is far ahead of the United States in that planning.

And so, you have here almost a repetition of the circumstances which prevailed at the time England first introduced television as a public service. I think we were then as far advanced, if not farther, than England in the technical development of television, but England was first in making it available for service to the public.

Unless such remaining differences as may exist within the industry are composed, and unless the United States proceeds with its planning for a public service of television, as soon as the war is over and as soon as materials and the necessary frequencies are made available, I believe that England will once more take the lead in the establishment of television as a public service.

Of course, their problems are somewhat different from ours. Their country is smaller. The problems of inter-connection will be smaller but nevertheless, we have solutions that can be applied to the larger problems which exist in America. We have larger resources and I think larger manpower and organization to solve these larger problems.

We enter now a new phase in the development of television. Whatever its possibilities or whatever its limitations, one thing you may be certain of, there is not only national but world-wide interest in the great promise of television as a post-war art and a post-war industry. That nation which establishes television first, will undoubtedly have the first great advantage in establishing its designs, its patterns, its standards in the rest of the world and thus gain a great advantage in export markets.

It is of vital importance to America not only from the standpoint of rendering a new service made possible by television, but from the standpoint of not being out-distanced in the important export fields, that we be ready at least as soon as any other exporting nation of the world may be ready, and I should hope sooner.

The Birth of Three Industries

Now, before I conclude, may I say to you that it is not given to many men to have the privilege of witnessing the birth of three great branches of an industry, or perhaps three separate industries, in the course of one lifetime, and that has been my privilege. I witnessed the birth of broadcasting which followed the end of the First World War. I attended the first meetings of broadcasting associations and manufacturing associations which were then established at a time when there was a great deal of doubt as to whether the little music boxes that we introduced as radio broadcast receivers had significance as an instrumentality for dissem-

inating information and entertainment and culture or whether they were merely a passing fancy, a little gadget, something with which the amateur in the attic succeeded in arousing interest. That was the birth of the broadcasting industry.

I witnessed the birth of the radio communication industry when stations were erected to compete with age-old cables that lay on the bottom of the Seven Seas. There were many who doubted that a transoceanic radio circuit ever could successfully compete with cables. Radio was not secret, said they. It was full of static, etc. Well, you all know what has happened in the field of international communication. You know to what extent the world now is dependent upon radio circuits. You know what a part radio communication is playing in this war everywhere in the world.

And now, before the Second World War is over, it is my good fortune to be present with you tonight and to witness the launching of another new industry of radio—Television—sight being added to sound.

Sights' Relation to Sound

I subscribe to all the predictions which have been made here tonight. I believe that television has a boundless future. I believe that it will be a greater industry and a greater art than broadcasting, but I do not believe that the two are mutually competitive or mutually exclusive.

Rather, I believe that sight and sound will be united in order to serve the human brain by the ear as well as the eye with a message of information, of entertainment, of culture, and of Government.

Therefore, I would not place any limits on anyone's imagination about the wide scope and the untold possibilities of this great, new art but I should like to make just one observation.

When I was much younger, I used to believe that the great job of the scientist and the engineer, and the industrialist, was to create new inventions, new instrumentalities, and new equipment. I still believe it is their job. But as I have grown older and as I have seen some other developments in the world—particularly during the present war—I can no longer be content with the belief that the job of creation is the only responsibility of the scientist, of the engineer, and of the industrialist.

This world is interested not alone in the *creation* of a new instrumentality, but also in its *use*, a very important aspect of our social progress. In fact, our technological progress has been so rapid in the past decade or two, that our social progress has lagged behind. This lack of equilibrium has done much to complicate the affairs of the world.

I do not believe that science is to blame for this war. Rather, I believe that science will help to destroy dictatorship and to preserve freedom and democracy. Science ultimately will provide man with his basic needs—food, shelter, and clothing — and thus enable world peace to rest on a solid foundation.

In the interim, and during these periods of transition, let us not lose sight of the fact that while electromagnetic waves travel through space with the speed of light, 186,000 miles a second, they can carry a *lie* with the same speed that carries the *truth*. Since they both travel with the same speed, the use made of these radio instrumentalities is vitally important.

It will be even of greater importance when, to the art of exposition, there will be added the art of demonstration, when sight and sound combine to bring its message into every home in our land and in the world may that message be of good will and of peace for a world that needs both.

Dr. Zworykin Honored

First award for technical pioneering in television was presented by TBA to Dr. V. K. Zworykin, Associate Research Director, RCA Laboratories. The transcription of the presentation by Paul Raibourn and the reply of Dr. Zworykin follows:

MR. RAIBOURN: We now turn to the engineering awards. . . . . .

These awards, now to be made, are more or less coordinate and from the standpoint that no one individual has made television what it is today. They are all equal.

But in another sense, there is a First Award. There were about three hundred fifty answers to questionnaires which the Committee sent out as to who should receive these types of awards, and about one name they were particularly unanimous. That name is the name of Dr. Vladimir K. Zworykin of the RCA Laboratories, Princeton, New Jersey.

The citation is for the development of the iconoscope and the storage principle of picture pick-up resulting in the first practical television pick-up equipment.

Gentlemen, I give you Dr. Zworykin.

DR. ZWORYKIN: Thank you, Mr. Raibourn.

Ladies and gentlemen, it gives me great pleasure to receive this award.

I am asked to say a few words about the future of television. One can speak hours concerning the future of television, but since I am

A MEDAL REPRESENTING THE FIRST AWARD FOR TECHNICAL PIONEERING MADE BY TBA IS PRESENTED TO DR. V. K. ZWORYKIN, ASSOCIATE RESEARCH DIRECTOR, RCA LABORATORIES, BY PAUL RAIBOURN.

limited for three minutes only, I can say very little.

But before speaking about the future of television, I cannot help but say just a few words about the past.

Many, many years ago—it seems like ages in the television standard of time, as a matter of fact, about seventeen years ago — a dreamer came to a gentleman who was in charge of controlling the destiny of research and told him about his dream.

This gentleman, instead of laughing at his dream and telling him that he was a fool, listened to him and said, "That sounds good. How much do you need to finish this development?"

Dreams of Future

Well, the name of this gentleman is Mister, and now, General Sarnoff.

From that day, it is possible to trace many developments, many tubes which are used in present day television.

Regarding the future, as I said before, I can say very little, but I would like to tell you about one of my dreams. I will not promise you that it will happen tomorrow nor that it will happen two days after the end of the war but it will probably happen in the future.

Let us start first with what we have now. A great deal has been said about the iconoscope, about pick-up for television, which utilizes storage principles.

Due to this storage principle, it is possible to increase enormously the sensitivity of pick-up devices. It has also been said a great deal that the present iconoscope utilizes very small advantages of this storage principle for some technical reasons.

So, starting from this point, we can dream that all these advantages will be fully realized. Then we will have a pick-up tube for television which can pick up the images, not just with great light, not during the daytime, but at any time when the human eye can see something.

Then we can dream still further. We can dream that all this equipment can be made smaller so that the whole pick-up tube and such equipment can be made in a small camera, similar to a Graflex, so we can put it around our neck and transmit television by means of a little strap behind our shoulder, something like the walkie-talkie at the present time, with the antenna on our back.

Then, since that can be done on centimeter waves, it will not be difficult to get a great number of channels. At least, I hope so.

We can send out a number of television reporters. They will televise anything they see that in their opinion is worthwhile, and all these pictures will be received by television.

You may see the pictures all the time and you may have the editor look at them, select the best, and switch them on the television broadcasting transmitter.

Then we will have the program all the time and we will have no difficulty with the Program Committee.

Furthermore, since such equipment is so small, we can put it into any place where we would hesitate to do it now. For instance, we can put it in a lecture room and transmit a lecture of a famous professor. We can put it in a surgical room and transmit the operations of famous surgeons.

We can also put it on top of a mountain and transmit some kind of celestial event. More than that, the camera does not need to have an operator, so we can make it automatic. We can send it to different parts of the world. We can put it in a burning building. We can put it on the bottom of the sea and if you wish, we can put it in a rocket and send it to the moon.

Thank you.

Award to NBC'S WNBT

NBC's television station WNBT in New York, along with WRGB, Schenectady, and WPTZ, Philadelphia, was awarded a citation for its pioneering in television network operations by the Television Broadcasters Association, Inc., during the Association's First Annual Conference in New York on December 12. The citation read:

"For the first examples in the world of network operation and resulting division of program costs."

Cited By Signal Corps

Chester W. Latimer, Vice President and Chief Engineer of R.C.A. Communications, Inc., has been awarded the United States Army Signal Corps' Certificate of Appreciation for "excellent cooperation and patriotic service." The presentation was made at Mr. Latimer's offices at 66 Broad Street by Colonel Jay D. B. Lattin, Signal Officer of the Second Service Command, representing Major General H. C. Ingles, Chief Signal Officer, U. S. Army.

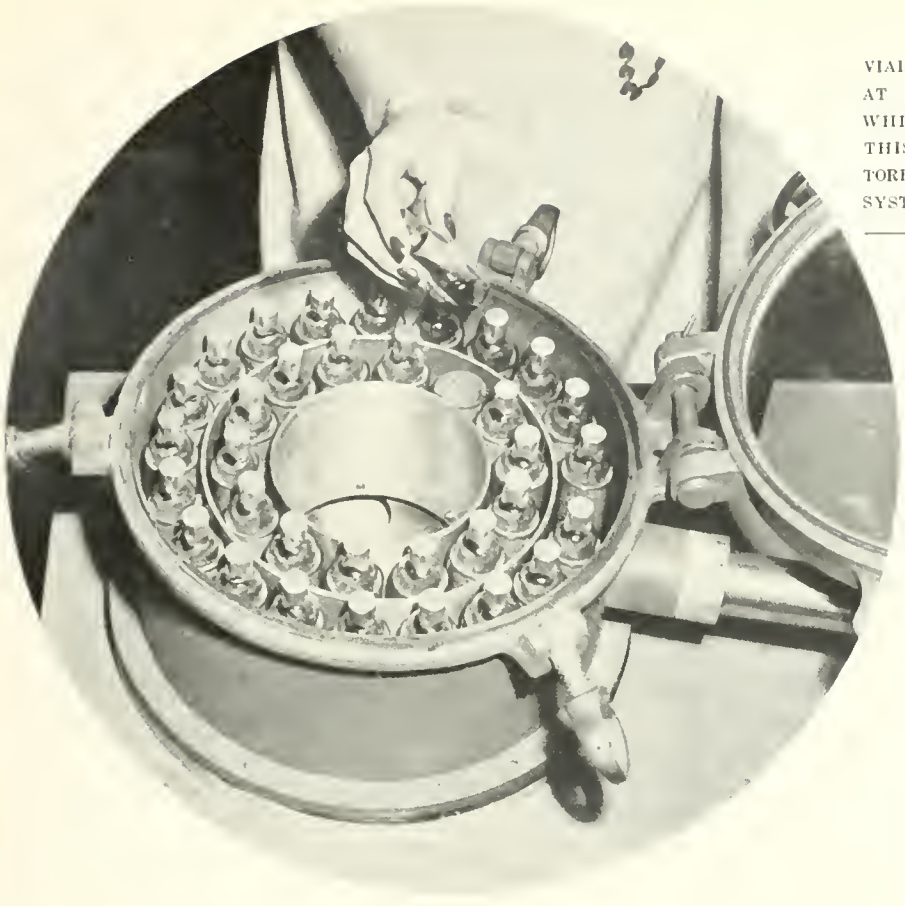
Television Aids Vets

Television broadcasts are of great interest and value in the psychiatric treatment and reconditioning of mentally ill patients, according to a staff report submitted to the commanding officer of one of the 8 service hospitals near New York City, which have been equipped with television receivers.

Wounded and ill servicemen, the report continues, enjoy all types of programs. In sports, they favor boxing over wrestling but dramatic productions also have wide appeal.

According to figures supplied the National Broadcasting Company, the average audience per hospital television set is 35.

At the present time, 55 sets, supplied through the cooperation of Radio Corporation of America, NBC, and others have been installed in the hospitals.



VIALS OF PENICILLIN CONCENTRATE ROTATE AT 3,000 RPM UNDER MODERATE VACUUM WHILE RADIO FREQUENCY HEAT IS APPLIED IN THIS CHAMBER DEVELOPED AT RCA LABORATORIES, AS A PART OF ITS ALL-ELECTRONIC SYSTEM FOR DEHYDRATING THE WONDER DRUG.

NEW SYSTEM FOR PENICILLIN

First All-Electronic Drying System for Producing Wonder Drug, Developed at RCA Laboratories, Is Announced at Exposition.

SPECTACULAR progress of the Radio Corporation of America in efforts to eliminate one of the chief bottlenecks in the production of penicillin was revealed at the National Chemical Exposition in Chicago on November 18. Appearing there in a symposium of experts on high-frequency heating, Dr. George H. Brown, of RCA Laboratories, announced completion of the first all-electronic drying system for producing the wonder drug —a process by which ready-to-use ampuls of penicillin can be obtained at the rate of 200,000,000 Oxford units an hour from a single RCA installation. This is much faster than the conventional "freeze-drying" method.

Output at this rate, based on around-the-clock operation, would in one month exceed the combined production of all the penicillin plants in the United States during a 30-day period six months ago, according to Dr. Brown. Yet, he told the audience of chemists at the Chicago Coliseum, the electronic installation requires less floor space than an average business office, 20-by-20 feet.

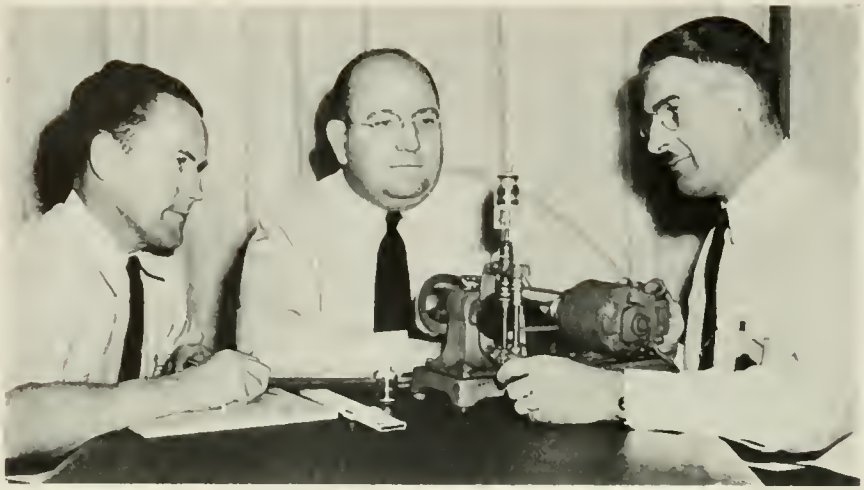
Recalling that last June he and his associates, R. A. Bierwirth and C. N. Hoyler, built and installed at the penicillin plant of E. R. Squibb & Sons the first part of the new system, Dr. Brown said that it consisted of an electronic dehydrator, about the size of an up-ended desk. This completed in 30 minutes an operation that required 24 hours by "freeze-drying" in the bulk-reduction of penicillin solution, a vital step in production.

Success with the equipment at Squibb's led to experiments in which Dr. Brown and his associates attempted to apply the electronic science of radio-frequency heating to the final phase of production— that of reducing the concentrated penicillin solution of 100,000 Oxford units per cubic centimeter to a dry state in ampuls or vials for shipment to places of urgency designated by the War Production Board.

Since ordinary heat methods destroy the effectiveness of penicillin, plants under WPB control have been achieving bulk-reduction of penicillin solution and the final drying process through the use of dry ice and a high vacuum at below freezing temperatures. The RCA scientists discovered that in a moderate vacuum they could boil and evaporate the solution at 50 degrees Fahrenheit, a temperature that does no harm to the drug during its brief period of exposure.

This knowledge was helpful in tackling the final problem, but it was found that when the vacuum was applied to the 20 cc. bottles containing 1 cc. of concentrated penicillin solution, the liquid foamed and much of it was lost. This appeared to be an insurmountable obstacle for a while. Then it occurred to the scientists that revolving the bottles at a speed high enough to cause the liquid to form a thin layer around the walls of the bottle might solve the problem.

Dr. Brown and his associates designed such a rotator and were rewarded by the discovery that it not only worked but the thin layer of liquid would evaporate much faster than anticipated. They next built a vacuum chamber out of — of all things — a reconditioned porthole frame and window—and in it they placed thirty-four rotators that could spin up to 3,000 revolutions a minute. They used three metal belts between the circling rows of the rotators as electronic plates and caused radio-frequency current to flow between the plates.



DR. GEORGE H. BROWN, INVENTOR OF THE ALL-ELECTRONIC SYSTEM FOR DEHYDRATING PENICILLIN, AND HIS ASSOCIATES, C. N. HOYLER AND R. A. BIERWIRTH, STUDY AN EXPERIMENTAL SET-UP DESIGNED TO ELIMINATE FOAMING OF PENICILLIN BROTH.

Next they conceived a revolving table with six of the unique radio heat chambers atop of it in such a manner that three of the chambers could be exposed to the current at one time. The table turns 60 degrees at one-minute intervals, thus giving each of the thirty-four ampuls of penicillin in the chambers three minutes of current and at the same time allowing for the unloading and loading process as the chambers make the circuit.

This electronic turntable has a potential output of 2,000 ampuls an hour, with each of the ampuls containing the standard of 100,000 Oxford units of the drug, for a total of 200,000,000 Oxford units an hour. This is sufficient for 10,000 normal doses.

It was discovered for perfection in drying, however, additional heating was necessary. This is achieved through the use of electrically heated domes into which the vials may be placed in aluminum casting containing 102 each. In one hour, the entire process is completed.

The whole setup works on a push-button arrangement and may be started or stopped at will without endangering the drug under process. But its great advantages are that it affords a continuous production at a fixed rate of speed, necessitates only a fraction of the floor space required by the conventional freeze-drying systems and operates at cost far below that of the other system, Dr. Brown pointed out.

RCA's electronic bulk-reducer used in the first step consists of three large glass bulbs, connected in vertical series, and attached to a pump that maintains a relatively low vacuum. To the setup is connected a 2,000-watt radio-frequency generator. Electrodes carrying the output of the electronic generator are attached to the base of the lowest glass bulb which, when the unit is in operation, holds about 2,000 cubic centimeters of liquid. From the base of the bulb, a glass tube extends downward for several inches, so that when a beaker of penicillin broth is placed on a platform beneath, it almost reaches the bottom of the beaker.

As the vacuum pump starts, the suction draws the solution into the base of the lower bulb. The radio current is turned on and, as the current passes through the solution, heat up to 50 degrees is created and the liquid boils. This causes an evaporation at the rate of two litres an hour.

It was revealed that interest in the all-electronic system has been shown by several of the United Nations governments. Representatives of Great Britain, China, Russia, and Brazil have made direct inquiries. Arrangements have not as yet been made for the manufacture of the equipment.

NBC ELECTION RETURNS WIN BIGGEST AUDIENCE

Hooper Survey Shows Network's Program Held Lead Consistently During Period Covered.

THE listening audience, more than half again as large as that of a typical Tuesday night, showed a decided preference for the election returns program broadcast November 7 by the National Broadcasting Company, according to a survey made by C. E. Hooper, Inc. NBC held the lead consistently throughout the period covered by the survey.

With radio sets in use varying from 40 per cent to 57 per cent of the total sets in the United States, NBC's treatment of the election earned average audience ratings from 13.2 to 23.3 per cent. The smaller audience was checked between 7:00 and 8:00 p.m., the larger between 9:00 and 10:00. Between 7 and 10:30 p.m., the survey period, NBC's audience rating averaged 49 per cent over the next highest network and 41 per cent above the combined total of the third and fourth networks.

To accomplish this complete coverage, NBC concentrated activities in Studio 8H, the world's largest radio studio. Network commentators from Washington and New York occupied a central dais giving them a view of the 50-foot election chart erected against the rear wall of the studio. Tabulators seated at tables on the stage compiled the material as it was received from AP, UP and INS on a battery of teletype machines, and relayed the information to markers who transferred them to the chart.

Direct lines to headquarters of both major parties and to Kansas City and Columbus, home cities of the vice presidential candidates, gave NBC additional sources of election news and trends, as reported by NBC analysts stationed there.

NBC's audience-building plan of election night operations, originated and supervised by William F. Brooks, NBC director of news and special events, placed emphasis on maintaining a constant flow of returns.

NBC DRAMATIZES HOME LIFE

Newest Course Presented by NBC University of the Air Is Called "Home Is What You Make It"—Material Is Factual and Timely.

FOURTH and newest course to be presented under the auspices of the NBC University of the Air is "Home Is What You Make It," a 28-week series of half-hour dramatizations heard Saturdays at 9:00 a.m. (EWT).

The new home economics course is devoted to the men and women of the nation who are concerned with the many elements that go to make up successful home life. The series is sponsored in cooperation with the NBC University of the Air by the General Federation of Women's Clubs, the American Home Economics Association and the National Congress of Parents and Teachers.

Factual and timely, popular in style, and educational in purpose, the broadcasts take the form of dramatizations of the important aspects of home life. Directed primarily to the homemaker, and designed to bring her a thorough understanding of her new and ever-changing problems, "Home Is What You Make It" stresses the importance of cooperative family relations, and contains material of vital interest to every member of the family.

In addition to the dramatizations, each program presents an outstanding expert in the field under discussion. The course is divided into the following subjects:

HOUSING (planning for the new home and remodeling the present one);

HOME DECORATION (and the purchase, use and preservation of home equipment);

CHILD CARE AND TRAINING (the development of personality; helps for new mothers);

SCHOOLING (progressive and conservative educational measures);

HEALTH (in relation to nutrition as well as to the medical requirements of the family);

CLOTHING (home sewing and the purchase of new clothing);

GARDENING (for city dwellers as well as for small-town folk);

BEAUTY AND GROOMING;

BUDGETING (the wise use of money);

STERLING FISHER, DIRECTOR OF THE NBC UNIVERSITY OF THE AIR.

CIVIC INTERESTS (one's responsibility to the community);

CULTURAL AND SPIRITUAL VALUES (music, art, books);

PROBLEMS OF YOUTH (in urban and small-town environments);

For "Home Is What You Make It," as for other NBC University of the Air courses, a handbook of background material and suggested reading accompanies the series. This handbook differs from the others in that separate chapters are written by authorities in the various fields under discussion.

Narrator and program host for the series is Don Goddard, well-known WEAF and NBC news commentator. Supervising and coordinating "Home Is What You Make It" is Jane Tiffany Wagner, newly-appointed Director of Home Economics for NBC.

The NBC University of the Air is directed by Sterling Fisher, under the general guidance of Dr. James Rowland Angell, NBC Public Service Counselor. Other NBC University of the Air courses now on the air are the history series, "We Came This Way" (Fridays, 11:30 p.m., EWT); the literature course, "The World's Great Novels" (Saturdays, 7:00 p.m., EWT), and the music series, "Music of the New World" (Thursdays, 11:30 p.m., EWT).

PROGRAM HOST AND NARRATOR OF NBC'S COURSE IN HOME ECONOMICS IS DON GODDARD, SHOWN HERE AT HOME WITH HIS FAMILY.

IN CIRCLE—FABIEN SEVITZKY, CONDUCTOR OF INDIANAPOLIS SYMPHONY ORCHESTRA. BELOW—REGINALD STEWART, LEFT, CONDUCTOR OF THE BALTIMORE SYMPHONY ORCHESTRA, AND EFREM KURTZ, CONDUCTOR OF THE KANSAS CITY PHILHARMONIC ORCHESTRA.

ORCHESTRAS OF THE NATION

Five Major American Orchestras, All Broadcasting from Home Cities, are Participating in 24-Week Schedule Arranged by NBC

ORCHESTRAS of the Nation," one of the National Broadcasting Company's great musical presentations, has a purpose over and above its value as entertainment, according to Samuel Chotzinoff, manager of the NBC music division, and that purpose is to show all of America what the orchestras in various sections of the country are doing.

Inaugurated on the air last season when NBC presented a group of broadcasts by the Chicago Symphony Orchestra under the direction of Desire Defauw, the series was resumed on December 16. It is being heard on Saturdays, from 3 to 4 p.m., EWT.

Five major American orchestras are participating in the current season, all of them broadcasting from their home cities.

Featured orchestras and their conductors for the 24-week 1944-1945 schedule are the Kansas City Philharmonic conducted by Efrem Kurtz, the Indianapolis Symphony headed by Fabien Sevitzky, the Baltimore Symphony directed by Reginald Stewart, the Eastman School (Rochester, New York) Symphony led by Dr. Howard Hanson, and the Chicago Symphony under Defauw.

The Kansas City group opened the season with the broadcasts of December 16 and 23. The Indianapolis group followed for the dates of December 30 through January 13. Baltimore takes the microphone January 20, through February 3. On February 10, the Indianapolis Symphony returns for three dates ending February 24, and the Baltimore group also encores for three concerts, March 3 through 17.

On March 24, the Chicago Symphony starts its second season on the series, holding the microphone each Saturday through April 21. Dr. Hanson conducts the Eastman School Symphony April 28 through May 26, when the season closes.

Three of the conductors represented on the series—Efrem Kurtz, Reginald Stewart and Desire Defauw — are remembered by NBC audiences for their guest appearances with the NBC Symphony Orchestra in past seasons.

"It is the duty of a great network," Mr. Chotzinoff said, "to reveal what the entire nation is doing in the way of good music. This cannot be achieved by featuring just a single orchestra from one city."

ABOVE—DESIRE DEFAUW, CONDUCTOR OF THE CHICAGO SYMPHONY ORCHESTRA. BELOW—DR. HOWARD HANSON, CONDUCTOR OF THE EASTMAN SCHOOL (ROCHESTER) SYMPHONY ORCHESTRA.

DAVID SARNOFF, PRESIDENT OF RCA, RECEIVES THE STAR DENOTING THE RANK OF BRIGADIER GENERAL OF THE U. S. ARMY FROM MAJ. GEN. HARRY C. INGLES, CHIEF SIGNAL OFFICER, U. S. ARMY.

SARNOFF BECOMES A GENERAL

Nominated for Rank of Brigadier General by President Roosevelt Following Overseas Duty, His Promotion is Confirmed by Senate December 6.

SHORTLY after his return from eight months' service overseas as a Colonel in the United States Army, David Sarnoff, president of the Radio Corporation of America, was elevated to the rank of Brigadier General. His nomination for the promotion, sent by President Franklin D. Roosevelt to the U. S. Senate on November 21 was confirmed on December 6.

Attached to Supreme Headquarters, Allied Expeditionary Force, in England prior to D-Day and in France after D-Day, as a special consultant to General Eisenhower on communications, General Sarnoff on October 11 was awarded the Legion of Merit Medal for "exceptionally meritorious conduct in the performance of outstanding service."

His citation in full read:

"Colonel David Sarnoff, (Army Serial No. 0208338), Signal Corps, United States Army, for exceptionally meritorious conduct in the performance of outstanding service while serving as Assistant to the Deputy Chief Signal Officer, Supreme Headquarters, Allied Expeditionary Force, from 23 August 1944 to 16 September 1944. Colonel Sarnoff was largely responsible for reopening communications in Paris, thus enabling press communications to resume both to the United Kingdom and to the United States. His ingenuity and resourcefulness made it possible to restore cables which had been severed by the enemy, and allowed French radio experts who had not worked for many years during the occupation, to return to their former duties. Colonel Sarnoff's outstanding devotion to duty, courage, and great diplomacy in handling French citizens have aided materially in overcoming the great difficulties in attaining this objective. Entered military service from New York."

NBC WINS 14 FIRSTS IN RADIO DAILY POLL

Information Please and Bob Hope Take Double Honors in First "Certified Survey"

NBC stars and programs garnered fourteen of twenty-six available places to sweep the All-American Radio Program, released by *Radio Daily* on January 10.

In its "first certified survey," the trade paper sent interviewers into the field to collect the votes of 1,051 editors and writers of newspapers, magazines and trade press of the nation.

"Information Please" and Bob Hope won double honors. The former was chosen as the favorite commercial program and favorite quiz show. Bob Hope was named favorite entertainer and also favorite comedian. Bing Crosby and Dinah Shore were tops among popular vocalists and John Charles Thomas drew most votes as favorite male classical vocalist.

In the comedy field, Joan Davis was elected favorite comedienne and Fibber McGee and Molly, favorite comedy team. Bill Stern topped the sports commentators and Don Wilson drew peak honors as radio announcer.

Favorite news commentator selected was Lowell Thomas. Arturo Toscanini was named favorite symphonic conductor and "One Man's Family" was chosen favorite dramatic serial.

Two additional classifications placed "I'll Walk Alone" as the favorite song of 1944 and "Holiday for Strings" as the favorite musical composition of the year.

New Series On NBC

A significant new public service program, "America United," which for the first time makes available the facilities of a national network at a regular period each week to major labor, agricultural, and business groups for the discussion of cooperative efforts and mutual objectives, has been announced by Niles Trammell, president of the National Broadcasting Company. Program time is Sundays, 1:15 to 1:30 p.m.

SEES VAST NEW TUBE MARKET

Increasing Uses of Electronic Power and Electronic Controls Will Create Huge Demand in Manufacturing, Processing, Teegarden Says.

A VAST new postwar market for electron tubes, far exceeding the prewar demands of radio and communications, will be found in manufacturing and processing industries as a result of increasing uses of electronic power and electronic controls, according to L. W. Teegarden, manager of the RCA Victor Division, Radio Corporation of America.

The rated power represented by a single order recently received by RCA for power oscillator tubes for electronic power heating, Mr. Teegarden said, was equal to the combined rated power of all radio stations in the United States.

"Improvement in the quality of products and dramatic savings in process time are being realized from the use of electronic power for an ever-increasing list of industrial heat-processing operations," he said. "These now include hardening, welding, and soldering of metals; preheating of plastic materials for molding; glue-bonding of wood; drying of textile yarns; bulk-reduction of solutions, and many other processes. Added advantages found in many instances are savings in space, equipment, and costs.

"As a result, it appears that industry's postwar demand for power tubes, which constitute the heart of any electronic power generator, may be many times the total prewar demand, which came principally from the broadcasting field. The growth of electronic power heating applications also presents an increasing market for other types of tubes, such as rectifiers and control tubes."

An electronic power generator is essentially the same in principle as a radio broadcast transmitter, Mr. Teegarden explained, except that it is less complex in operation, and the high-frequency output is fed into the industrial material being treated, instead of being coupled to a transmitter antenna.

"The particular types of power tubes used in many electronic power generators now being manufactured," Mr. Teegarden said, "are the RCA-892-R, the RCA-833-A, and the RCA-9C21. These are three-electrode transmitting types, designed for use as high-frequency power amplifiers, oscillators, and Class B modulators. The RCA-892-R and the RCA-833-A are air-cooled; the RCA-9C21, water-cooled. They are ideally suited for industrial use by their rugged construction, dependability and high efficiency as power converters.

"Tubes such as the RCA-8008 half-wave mercury-vapor rectifier are used in many of these generators to supply high-voltage d-c power to the plates of the power tubes. In some types of automatic generators, control tubes such as the RCA-2050 perform an additional service. The RCA-2050, a sensitive, gas-filled, four-electrode thyratron of the hot-cathode type, is especially useful for industrial heating control applications because it is virtually unaffected by temperature changes.

"All of the tubes mentioned are long-life types that have proven themselves in industrial as well as broadcast services."

RCA RADIO STATION MOVED BY AIR

A COMPLETE commercial short-wave radio station, weighing twenty-five tons, has been transported hundreds of miles by air for the first time in history, from Italy to "Somewhere in Southern France," according to word received here by RCA Communications, Inc.

Moved at the request of the U. S. Army, the equipment was transported within a few hours some weeks ago by the coordinated efforts of the Army Signal Corps, RCA technicians under the supervision of Thomas D. Meola of Skaneateles, N. Y., and the Twelfth Airforce. In operation, the station is limited to Government, press, and EFM (Expeditionary Force Message) traffic. No straight commercial messages may be accepted.

In a radiogram describing the station's movement by air, Merrill Mueller, National Broadcasting Company correspondent attached to Supreme Headquarters, Allied Expeditionary Forces, in France, said:

"Fourteen C-47's moved entire twenty-five tons of equipment, which included generators so heavy it took heavy cranes to load and unload them, in a few hours, whereas surface transportation on both sea and land would have taken days and, perhaps, weeks. Thus, another important step has been taken to facilitate communications with Southern France within a few weeks through the day and night-long work of all concerned."

This is not the first time that this station, soon to be on the air in Southern France, has met an important wartime communications need, according to RCA officials. It was shipped from New York last winter, and went into service at Naples transmitting Government and press messages. Its location was then identified as "Somewhere in Italy." More than twenty RCA men, working with Mr. Meola, went along to install and operate it.

On June 13, a second RCA station which had been shipped from the United States, went into operation at Rome, first of Europe's war capitals to fall to Allied armies. Its installation and operation also were handled by the RCA staff working in cooperation with the U. S. Signal Corps and the Board of War Communications.

Still another fast, direct communications link with the European war front was established by RCA Communications on September 16, when a radio circuit between New York and Paris was reopened after being closed since June, 1940, by the German occupation.

AT THE FOURTEENTH AIR FORCE HEADQUARTERS IN CHINA, THIS AMERICAN AIRMAN OPERATES RADIO COMMUNICATION SERVICE WITH RCA TRANSMITTER AND RCA RECEIVER.

RCA TRANSMITTERS IN CHINA

Ten Radio Communications Units Carried Across Trackless Wastes by Truck and Ox-cart Play Major Role in War Against Japanese.

TEN RCA radio transmitters, transported over trackless wastes of China by truck and ox-cart, and often operating from caves and temples, are credited with carrying the burden of American airforce ground communications on that Asiatic battlefront from the arrival of the Flying Tigers in 1941 until the present, it has just been disclosed.

The outstanding performance of military radio equipment was revealed by Major Charles H. Whitaker, communications officer of Gen. Chennault's 14th Airforce on his return to the United States after 26 months of service in the Orient.

The radio equipments described by Major Whitaker were manufactured by RCA Victor Company of Canada, Limited, for the Royal Canadian Air Force through whom it was made available to the Chungking Government.

The transmitters are pioneers in the radio warfare against Japan, Major Whitaker said, for they were obtained to serve the original AVG —or Flying Tigers—in 1941. They provided the eyes and ears of the American Volunteer Group until 1942 when the regular Army Air Force took over operations, and have continued to give reliable service ever since.

The sudden thrust of the Japanese at the Malay Peninsula and Burma changed original AVG plans with the result that the Flying Tigers became engaged in the retreat through Burma, successfully withdrawing their precious communications system with them into China.

"There was lots of good equipment out there," the communications officer related, "but the AT-3's (radio transmitters) had an adventurous and outstanding service record. Much of the time they were Gen. Chennault's sole means of communications. Supplies were so precious that replacement parts were only made when something went dead. The AT-3's never let us down.

"I understand they were first unloaded at Rangoon in the fall of 1941. The fighting started soon after their arrival. The AVG's clung tenaciously to them all during the fighting retreat up the Burma Road. In this ordeal they covered more than 2,000 miles of the world's roughest travel. Trucks banged them over that winding, heavily bombed road and when the road changed to a miry, jungle track they were carried by ox-cart.

"Here is an idea of the travel hazards experienced by the AT-3's and their receivers, the RCA AR-77 sets:

"A truck loaded with radio and other supplies had to ford a flooded jungle stream on a flimsy cluster of logs which operated as a native ferry. In midstream the truck rolled a bit, threatening to capsize the whole business. The driver madly tossed anything and everything into the river until the raft-ferry righted itself. When he checked the cargo he found, much to his chagrin, that he had tossed some valuable receivers into the drink. He almost cried over it. But he kept the rest of the stuff rolling on to its destination."

Arriving in the China war theater, Major Whitaker continued, the equipment became "stations" linking up the air bases. One AT-3 and one or more AR-77's comprised a "station" with a National 100 battery receiver to backstop the equipment in the event of power failure, he said. The usual place of operations was a natural cave or a native temple. The officer said these "stations" survived the rigors of the elements with little damage.

"One set I know operated in a boarded-up cave for a period of 18 months with the only equipment casualty being a resister which went bad from corrosion," he recalled.

When Jap penetration endangered the safety of the station and it had to be shifted, the communications officer declared, the operator and his two Chinese assistants merely tossed the equipment on a truck and started across country to a new spot designated by headquarters. The only insulation provided on these rough journeys was that of a mattress covering the truck-body's floor.

The AT-3 is powered 300 watts for 'phone and 400 watts for c.w. (telegraph). Their normal operating distance was from 700 to 800 miles. However, one of the AT-3's, according to an AVG operator, kept contact with Corregidor about 2000 miles away in the last hours before the Philippine Fortress' capitulation and the AR-77 received the operator's final message from the beleagured station.

The AT-3 has earned the same kind of praise in other battle theaters of the world. It was designed by the Engineering Products Division of the Canadian RCA Victor Company, under the supervision of Edmund A. Laport, now staff engineer for the RCA Victor Division's International Department at Camden, N. J. Modified for the Canadian Army Signals for mobile use, its official designation is Canadian Wireless Set 33. However, due to its outstanding performance with Canadian Army Units in European operations, it is now officially referred to as the "Maple Leaf" transmitter.

Its popularity spread rapidly and today about 1200 are functioning faithfully in action. Six hundred of these have gone to the RCAF. In addition to making them available to the Chungking government, the RCAF has turned over other equipments to the Royal Canadian Navy, the Canadian Army, the RAF Transport Command, the Canadian Department of Transport and the Royal New Zealand Air Force. They are operating in France, England, the South Pacific, the Arctic, Labrador, Newfoundland, Bermuda, Trinidad, Jamaica and along the airways of British Columbia and Alaska.

Another rugged piece of equipment in China service described by Major Whitaker was a 2 kw RCA transmitter which the Chinese had stored away in a cave near Chungking. It had been abandoned for lack of parts but the American Communications men patched it up and used it until the 10 kw three-phase generator gave out. He believes it is back again in operation

A similar record for durability was reported on the performance of the electron tubes which powered the AVG-Fourteenth Air Force equipment.

"These, too, had an exceptional record for service under rough circumstances," Major Whitaker said. "I doubt whether the equipment had a complete change of tubes from the time of its arrival in 1941 until I left. I know that in certain sets tubes had not yet been replaced and they were still going strong on my departure.

BROWDER J. THOMPSON, WHO LOST HIS LIFE DURING A FLIGHT IN AN ARMY PLANE LAST JULY, IS SHOWN HERE IN ONE OF HIS MOST RECENT PHOTOGRAPHS, TAKEN AT RCA LABORATORIES, PRINCETON, N. J.

THOMPSON DIES IN ACTION

Associate Research Director of RCA Laboratories, On Special Mission for Secretary of War, Killed in Mediterranean Theater.

BROWDER JULIAN THOMPSON, Associate Research Director of RCA Laboratories, Princeton, N. J., who had been on leave from RCA since December, 1943, serving as expert consultant in the Office of the Secretary of War, was killed in action during a flight in an Army plane in the Mediterranean Theater while on a special mission for the Secretary of War, it has been announced by the War Department. Mr. Thompson was forty years old.

The announcement said that Mr. Thompson, who previously had been reported missing, lost his life on the night of July 4-5, 1944. It described his mission as "of direct and vital importance to the war."

Mr. Thompson was recognized as one of America's foremost radio research engineers, having completed many outstanding developments, including perfection of the famous "acorn" tube used in ultra-high frequencies. He headed important research work on television tubes and tubes for generating power, and was credited with advances in screen-grid tubes and power pentodes that became mainstays in broadcast reception.

A native of Roanoke, La., Mr. Thompson received a B.S. degree in electrical engineering from the University of Washington in 1925, and was engaged in vacuum tube research for General Electric until 1931, when he joined RCA as chief of the research section of the Company's Radiotron Division at Harrison, N. J. In 1940 he became Associate Director of the research laboratories of the RCA Manufacturing Company, and subsequently was appointed Associate Research Director of RCA Laboratories.

Mr. Thompson was awarded the Morris Liebmann Memorial Prize by the Institute of Radio Engineers in 1936 for his contributions to the ultra-high frequency field of radio. He was a Fellow of the Institute of Radio Engineers and the American Physical Society; a member of Tau Beta Pi; and Sigma Xi. He had been a Director of the Institute of Radio Engineers since 1937.

As individual units, these small, daring craft of the U. S. Navy are considered expendable in achieving desired objectives. But, conversely, as a part of the Fleet, they have proved themselves indispensable.

Their teamwork and remarkable effectiveness is due in no small part to their radio-electronic equipment. Radio direction-finders enable them to know their position and to locate other ships, friend and foe alike, in thick fogs and on inky-black nights. Compact ship-to-shore radio telephone sets enable them to talk with each other, giving and receiving orders with speed and accuracy.

Radiomarine has for many years been a leader in designing and building these types of radio-electronic equipment.

RADIOMARINE CORPORATION OF AMERICA, 75 VARICK ST., NEW YORK 13, N. Y.

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Special LOW RATE MESSAGES

ANY THREE OF THE 237 STANDARD TEXTS NOW AVAILABLE MAY BE USED IN YOUR MESSAGE

To our FIGHTING FORCES

Imagine Charlie McCarthy...

on TELEVISION

brought to you by NBC

Picture how much NBC Television could add to the enjoyment of your favorite radio programs . . . the fun of watching Edgar Bergen's pugnacious, loquacious Charlie, for example . . . *seeing* as well as hearing the great shows of the air.

Imagine how television programs from the studios of the National Broadcasting Company . . . programs presented by the network which now broadcasts the most popular radio shows . . . are going to add to the enjoyment of your home entertainment.

Detailed plans have been developed by NBC which, with the co-operation of business and government will result in extensive NBC networks . . . great links gradually spreading from Eastern, Mid-Western and Western centers . . . finally forming a nation-wide television chain for the whole country in post-victory years.

Moderate-priced television receivers will supply you with sight and sound programs in keeping with the exacting standards of NBC . . . to give you the finest shows in this new field of broadcasting.

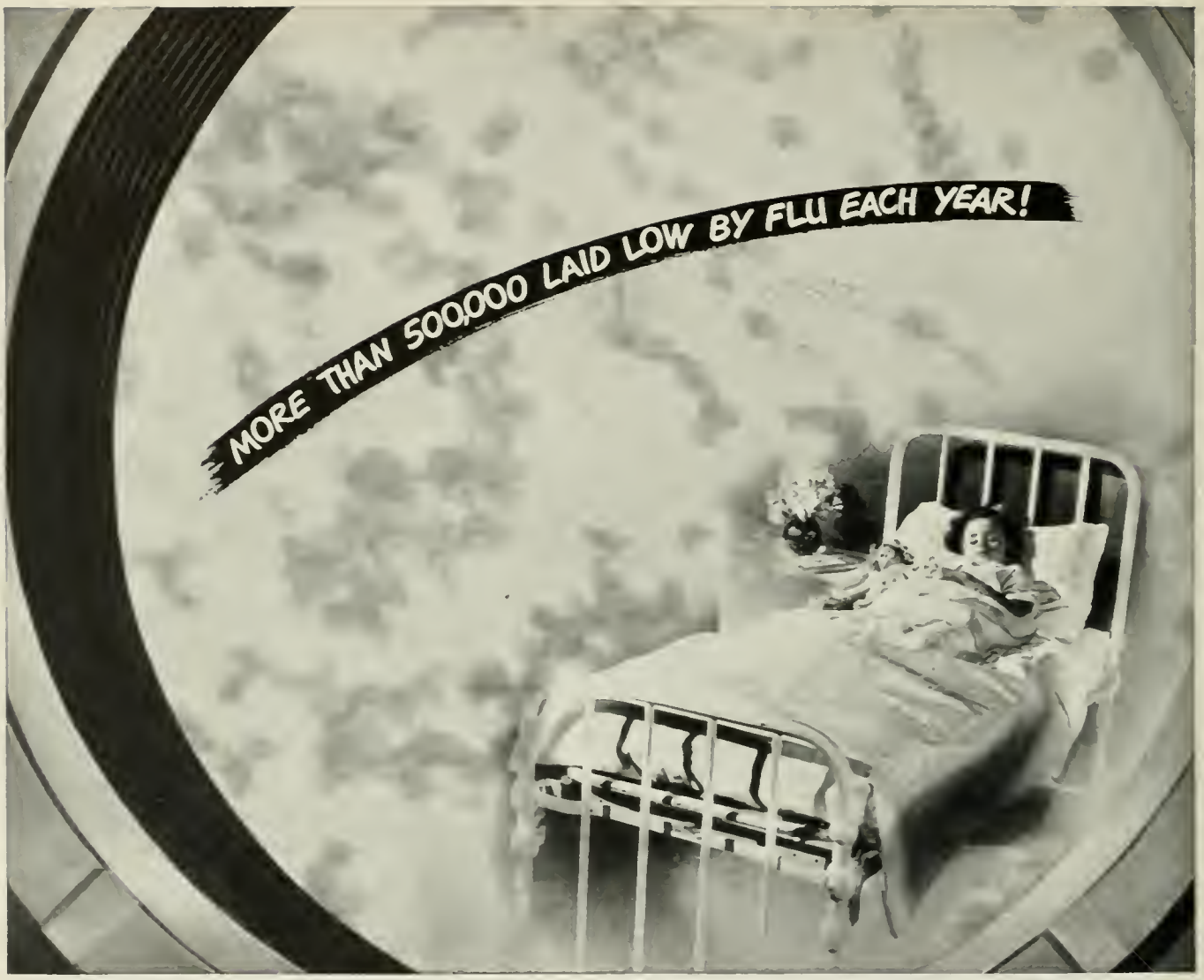
* * *

Look to NBC to lead in these new branches of broadcasting by the same wide margin that now makes it *"The Network Most People Listen to Most."*

National Broadcasting Company

America's No. 1 Network

A Service of Radio Corporation of America



to destroy 'em you have to see 'em

Microscopes are gunsights in Medicine's battle on bacteria.

Optical microscopes, however, were not powerful enough to "draw an accurate bead" on the deadly virus that caused influenza.

But today, medical men have seen what no optical microscope could bring into focus—the infinitesimal influenza virus that previously had lain craftily camouflaged among larger cells.

This revelation came about through the Electron Microscope, developed by scientists at RCA Laboratories. And now, having been seen, influenza may be forced to unconditional surrender, saving the lives of thousands each year.

Here is but one facet of the genius shown by scientists behind RCA research . . . the "ever-onward" research that saves lives or creates a better radio with equal skill . . . the "there-when-you-need-it" research that gave super-secret equipment to the United Nations . . . the "way-ahead" research that goes into everything made by RCA.

When you buy an RCA radio or phonograph or television set or any RCA product, you get a great satisfaction . . . enjoy a unique pride of ownership in knowing that you possess the very finest instrument of its kind that science has yet achieved.

They see what human eyes have never seen before!

Drs. Arthur Vance and James Hillier, scientists at RCA Laboratories, with Mr. E. W. Engstrom, Research Director (standing), examine the RCA Electron Microscope that has useful magnification up to 100,000 diameters, revealing unseen new worlds to the eyes of man.

RADIO CORPORATION of AMERICA

PIONEERS IN PROGRESS

RCA