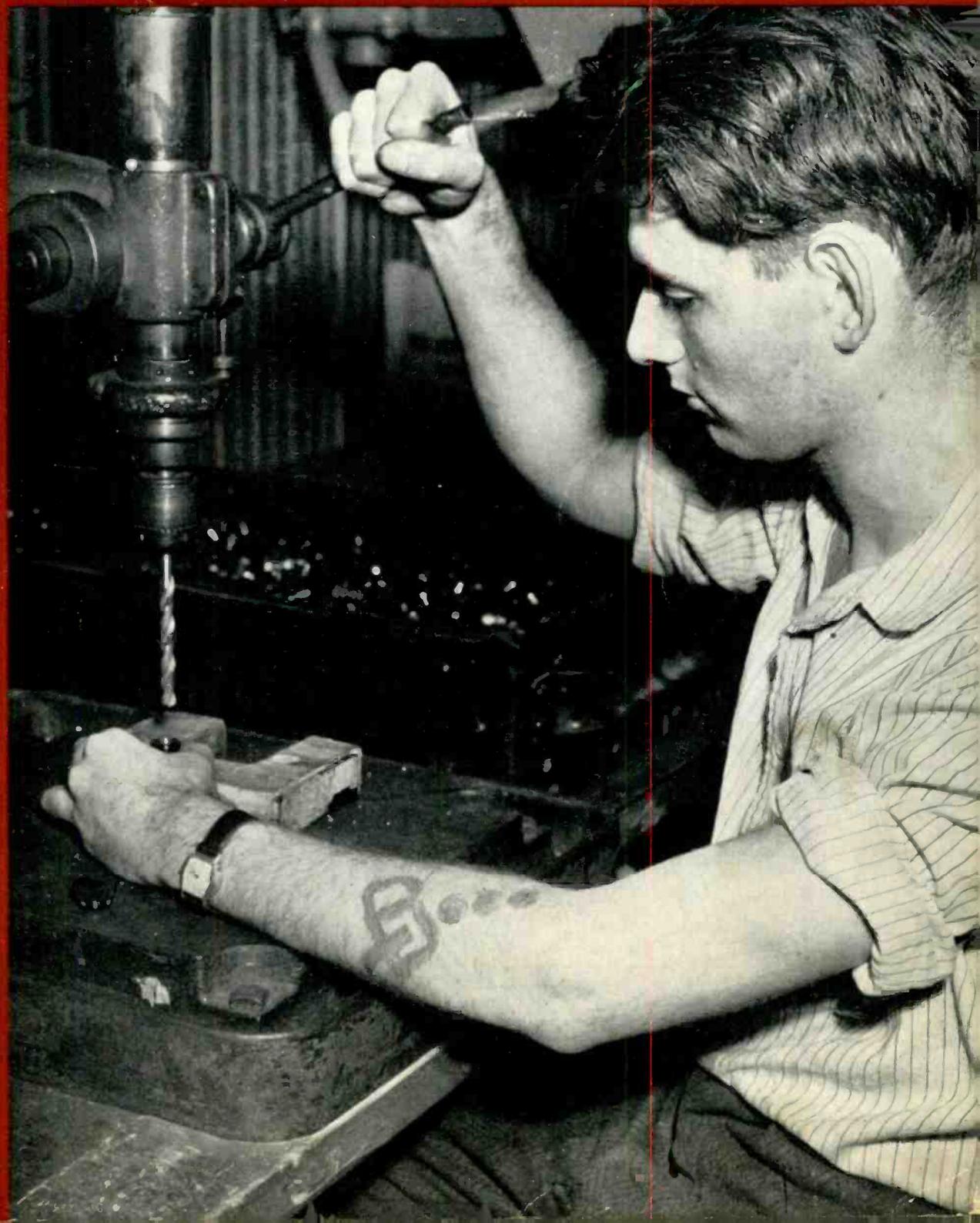


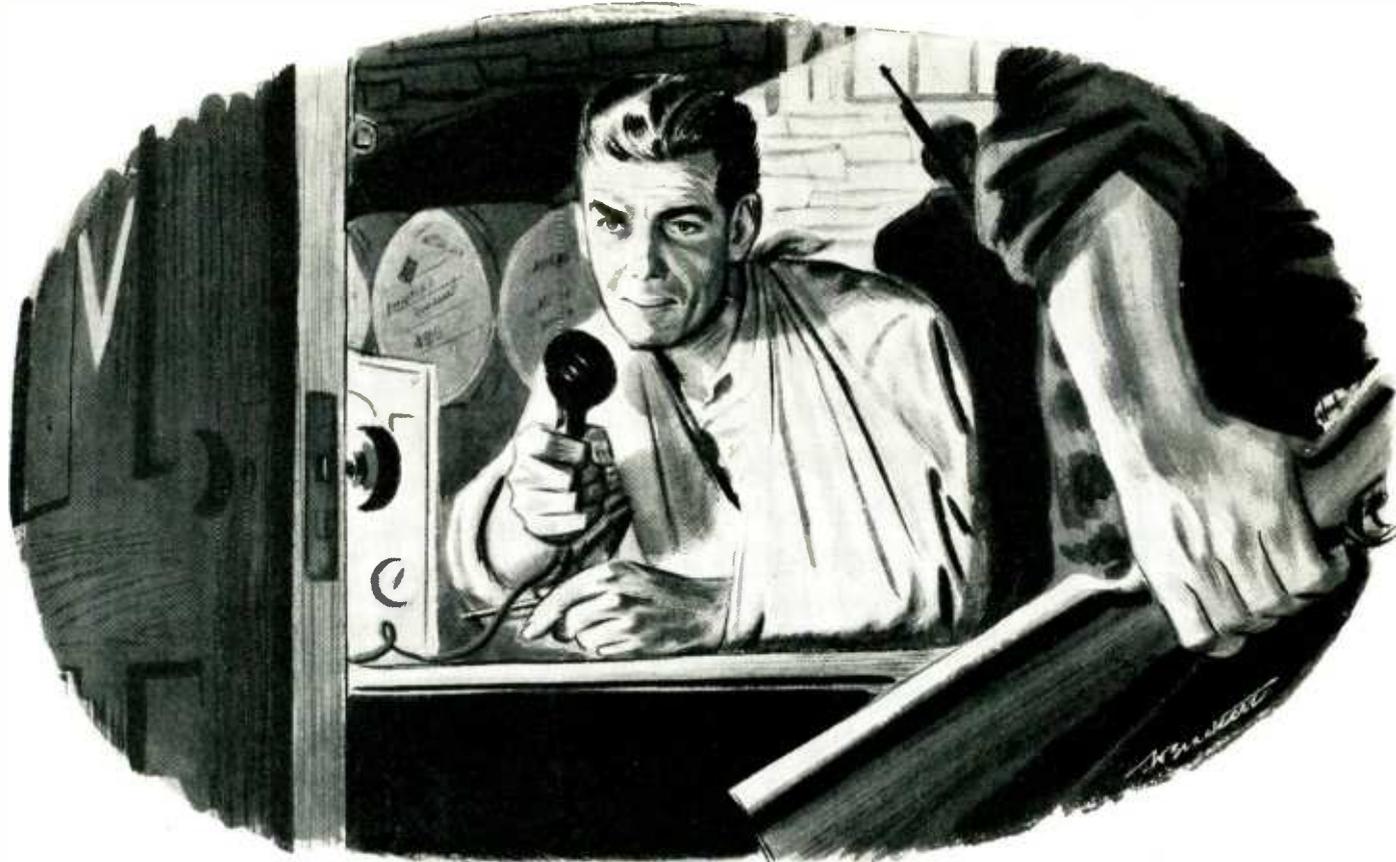
RADIO AGE

RESEARCH · MANUFACTURING · COMMUNICATIONS · BROADCASTING



OCTOBER

1941



"...This is the Voice of Freedom!"

Out of the night's dark secrecy, "somewhere in Europe" an illegal radio speaks. Those who listen risk the concentration camp. Those who broadcast face torture and the headman's axe . . . A FREE RADIO, the birthright of Americans, is *high treason* under European dictatorship.

For dictators know well that they cannot long withstand the power of *uncensored* news, freely transmitted and freely received!

The National Broadcasting Company is proud to have played its part in keeping *American radio free* . . . proud to have abided since the beginning of broadcasting by the spirit and the letter of that "Freedom of Speech" which is written into the American Bill of Rights.

Exponents of opposing views in every field of thought and action have had equal access to the facilities of NBC. They have been free to present those views to Americans . . . and Americans have remained free to listen to what they chose. No American political party, no religious denomination, no economic group has ever found the gates of the American system of broadcasting barred against them. For 15 years, NBC has operated "in the public interest, convenience and necessity . . ."

Freedom of Radio like Freedom of the Press is *today* more vital than ever. The National Broadcasting Company, like all Americans everywhere, will continue to guard that freedom jealously will continue to serve America as *only* a Free Radio can serve it!

NATIONAL BROADCASTING COMPANY

A Radio Corporation of America Service

C. Dammor

~~8-2~~

17-6

THE FIRST ISSUE

RCA-M

RADIO AGE is a quarterly review of progress in the Radio Corporation of America and its associated companies. In story and pictures, the new magazine aims to present factually and concisely the news of RCA services and activities.

Keeping step with the swiftly moving tempo of radio science, art and industry, the Editors hope that RADIO AGE also will catch and reflect the fascination found in these fields of endeavor.

This first issue of RADIO AGE magazine, dated October 1941, was issued to C. Dammer (Charles S. Dammer) who resided at 512 W. Sharswood Street in Philadelphia, Pennsylvania. Mr. Dammer was an employee of RCA in October 1941, located in Camden, NJ. He continued to work at RCA throughout the Second World War when RCA was a Defense Plant. During that time, Mr. Dammer became acquainted with another RCA employee, Alma C. Carson, whom he married in June of 1945.

This particular copy survived all of these many years quite by accident. It was buried in a box of sheet music dating back to the 1920's and 1930's. Back then, Mr. Dammer played violin and accordion in a small Dance Band. The Band eventually died off when its members, one by one, married and moved on in life. The sheet music was boxed up and stored in a dark corner of a closet for many years. As the Dammers moved, the small box moved with them, but was never opened until September of 2014, long after Mr. and Mrs. Dammer had passed away.

This issue of RADIO AGE has awakened – after a long, long nap – to find a new world of Radio Technology that has advanced far beyond the wildest dreams of its original publishers. I'm sure they would be pleased to see that RCA has “kept in step with the swiftly moving tempo of radio science, art and industry” (as expressed in their Mission Statement); and, they would be equally pleased to see that RCA has remained a leader in the industry even to the present day. By providing internet access to RADIO AGE magazines, the roots of our modern day technology will not be forgotten.



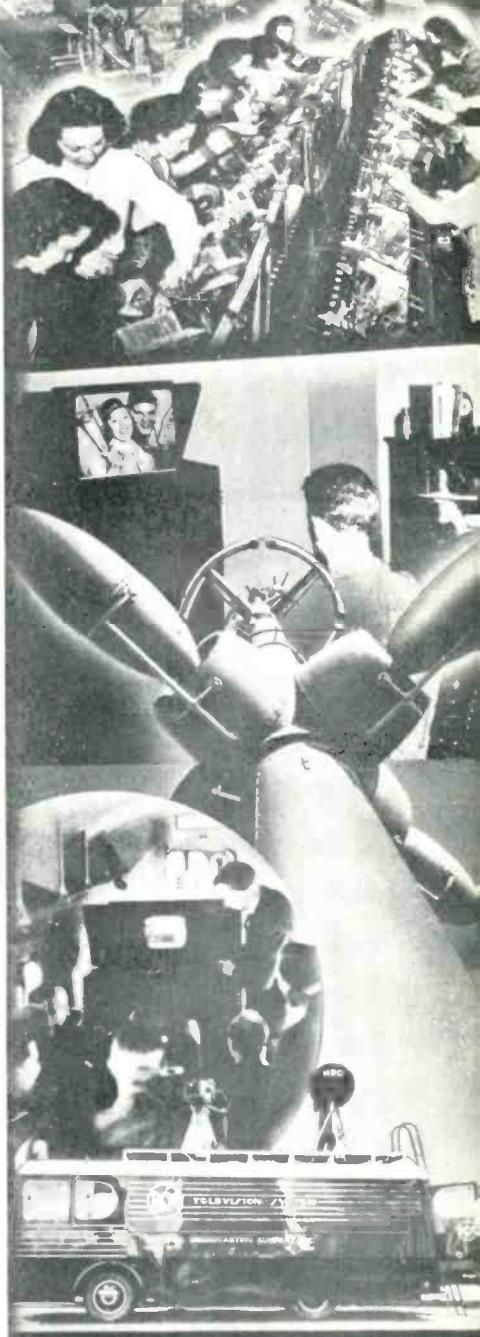
RADIO AGE

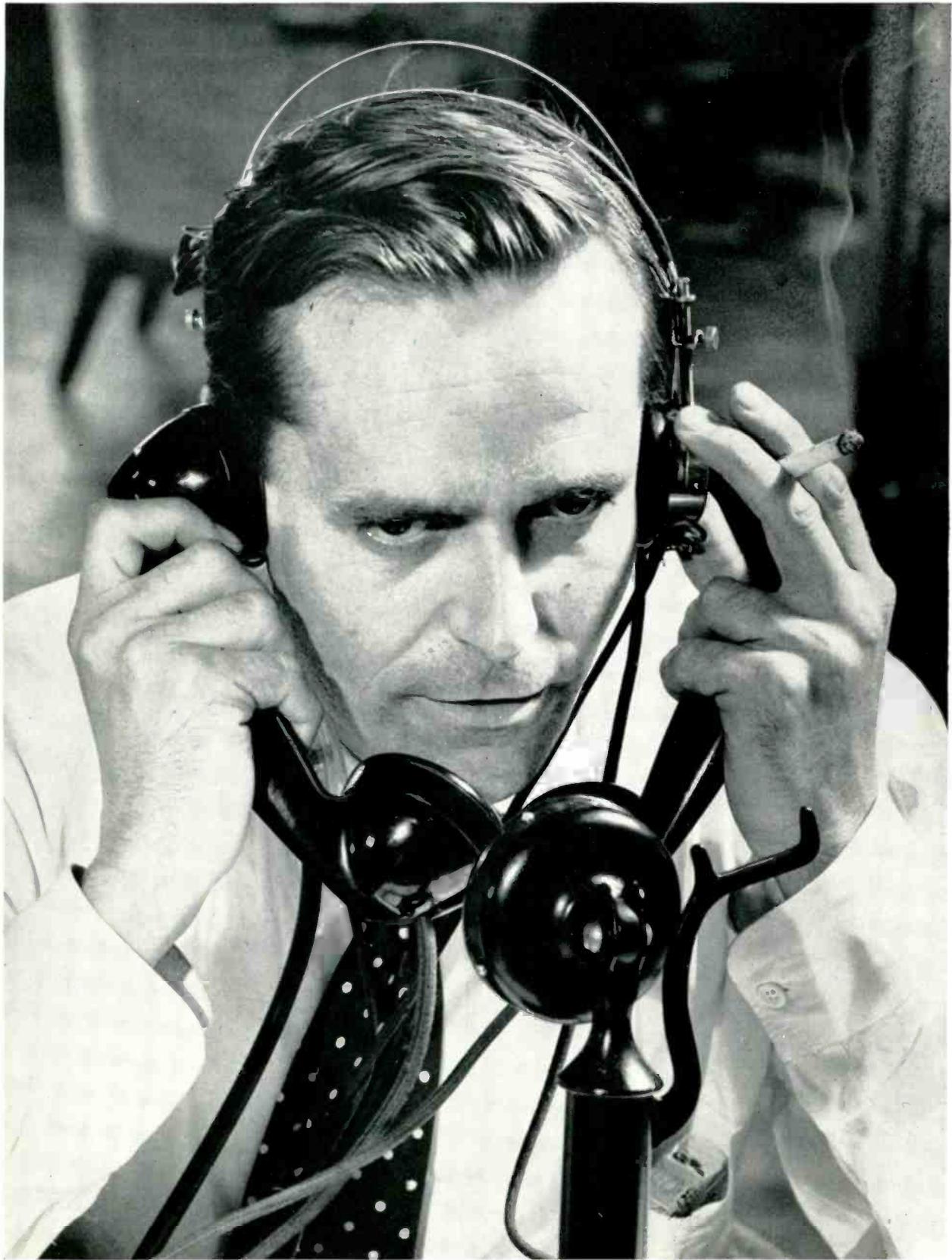
October, 1941

"Beat the Promise" —	3
<i>By Thomas F. Joyce</i>	
Gateway to the Hemispheres	6
<i>By John Elwood</i>	
Work Begins at Princeton	9
<i>By Ralph R. Beal</i>	
Television Goes Commercial	12
<i>By Alfred H. Morton</i>	
Close Harmony	15
600 Enroli	16
Glass Reflection Reduced	17
RCA Alert Goes to Camden	18
"Magic Brain"	20
Radiophotos From Russia	21
Aurora Spells Radio Trouble	22
Radio at Sea	23
Listening Post	24
Penetrating New Worlds	25
Radio Across the Atlantic	26
<i>By George H. Clark</i>	
"V" in Radio	28

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Vol. 1, No. 1.





"Listening in" to the world, at NBC. Story on page 24.



“BEAT THE PROMISE”— . . .

20,000 RCAM Employees in Five Plants Pledge Outstanding Production for National Defense

By THOMAS F. JOYCE, Vice President,
RCA Manufacturing Company, Inc.

MORE than 20,000 members of the RCA Manufacturing staff today are in the thick of an intensive “Beat the Promise” campaign to exceed their pledges, made several months ago, in connection with production for the national defense preparedness program.



T. F. Joyce

The campaign, which is in progress at each of the five company plants, has a two-fold purpose:

1—To do an outstanding job in any activity that in any way is connected with national defense. To beat the promise on defense orders.

2—To encourage departments engaged in commercial work to handle their activities in such a way that na-

tional defense production will be facilitated. To beat the promise on commercial orders.

This campaign is a brand new industrial forward movement for defense. Differing in degree from the now well known drives to sell more goods, its aim is to sell to each of the thousands of RCA employees the idea of increased production to meet the nation's urgent needs for defense equipment.

Radio Age, a quarterly journal of information concerning Radio Corporation of America and associated companies, is dedicated to the cooperative spirit of the men and women comprising those organizations.

The campaign got off to a flying start on September 2, when assemblages of workers at the Camden and Harrison, N. J., Bloomington and Indianapolis, Ind., and Hollywood, Calif., RCA plants heard, through loudspeaker amplification, the words of David Sarnoff, president of the Radio Corporation of America, as he said: “Defense has had and will have the right of way in all of our plants and with all of our fellow workers.”

When he finished speaking, Mr. Sarnoff, who, in the early days of the radio, was one of its best-known wireless operators, tapped out the “Beat the Promise” slogan followed by the letter “B”, its symbol, on a telegraph key at his desk. This message was the touch-off for an outburst of cheering, flag-waving, and patriotic music at each of the Company plants.

The exercises were stimulated by the presence of high-ranking officials of the Army and Navy and a number of



Posters used in RCAM's campaign to increase production for defense.

popular stars of the screen and radio. Lucy Monroe, concert and radio artiste, and RCA Victor's Director of Patriotic and American Music; Barry Wood, popular radio singer; Lanny Ross, tenor; Ronnie Mansfield, another radio celebrity, and others led the singing at the different plants.

The crowds joined lustily in the campaign song, "Gonna Beat The Promise", sung to the tune of "Casey Jones." They stood at attention with heads uncovered when Miss Monroe sang "The Star Spangled Banner." Scores of neighboring manufacturing plants cooperating with the "Beat the Promise" campaign provided sound effects by repeating the code for "B"—one long blast followed by three short ones.

Intensive Preparation

Launching the "Beat the Promise" movement simultaneously in all RCA Manufacturing Company plants required weeks of intensive preparation. A central committee was set up in Camden. Similar campaign units were established in each of the four other plants.

Advance interest in the campaign was engendered when each employee received with his mid-August paycheck a radiogram signed by G. K. Throckmorton, president of the RCA Manufacturing Company. It read: "Fellow Worker: —. . . This is a radio code for a symbol that has tremendous significance to the U. S. A., you and me. You and I will see it, hear it, strive for it and learn more about it soon."

Shortly afterward, posters containing only a large letter "B" with the code of a dash and three dots, were conspicuously placed in all plants of the Company.

Later, the meaning of the letter and its accompanying symbol were made clear with the issuance of the first edition of "Beat the Promise" news, a semi-monthly campaign publication. This paper outlined in detail the campaign and its purpose. Subsequent is-

sues will contain special pages of "localized" news concerning progress at each of the five Company plants. The inserts are edited locally. At intervals of two weeks until the end of November, posters designed to enliven interest in different phases of the program will be distributed. A number already have made their appearance.

A life-sized cut-out of Uncle Sam is awarded each week to the department doing the best "Beat the Promise" job in each division. To a department winning the coveted honor four times, a life-sized reproduction of Uncle Sam congratulating the department head, also in cut-out, will be presented as a permanent trophy.

For departments that fall behind schedule, there is a life-sized cut-out figure of a drowsy Rip Van Winkle. This cut-out bears the words "Wake Up; Uncle Sam Needs You."

The "President's Flag," symbol of plant accomplishment and personal prize contributed by Mr. Throckmorton, will wave from the mast of divisions doing the most outstanding job each month during the campaign.

Additional interest will be stimulated through the pages of "You and I and RCA," a regular Company publication, distributed with the semi-monthly pay checks. As part of the campaign program the committee has set up a suggestion unit to receive and pass upon "Beat the Promise" ideas advanced by employees.

A Solemn Pledge

To Uncle Sam:

I pledge myself to put forth my best efforts not only to fulfill the obligations which we have undertaken to meet the requirements of our National Preparedness Program, but, wherever possible, to Beat That Promise!

You and I and RCA

Prizes including trips to Miami will be awarded to fifteen employees who submit the best suggestions. Other attractive prizes will be awarded for meritorious performance. Workers whose departments "Beat the Promise" on work schedules four weeks during the campaign will receive a distinctive merit decoration. This is a bar pin resembling a military service emblem designed in gold, red, white and blue. A star is added for every additional two weeks in which schedules have been beaten.

Enthusiasm High

Never before in the history of the RCA Manufacturing Company has so much enthusiasm been aroused by a campaign. Competing in friendly rivalry for the coveted honor of delivering for national defense, plant strives against plant, department against department and division against division.

Already the "Beat the Promise" campaign has attracted much favorable notice from Army and Navy Departments interested in stimulating national defense production. Stories and pictures about the campaign have appeared in hundreds of newspapers and magazines. Many other industries engaged in national defense work have asked for information on the campaign, with a view to adapting the ideas to their plants. The net result should be reflected in a greater awareness of the urgency of the country's national defense needs, and, what is more important, help to increase production and delivery of equipment essential to national defense.

REALISTIC EXPERIENCE

A desire for realistic experience in working under blackout conditions led members of RCA Manufacturing Company, Inc.'s Emergency Volunteer First Aid Crew to go blindfolded through a practice drill held recently in the ruins of Camden's big fire of last year at 9th and Cooper Streets.

The First Aid Crew included twelve members, six men and six girls, who



Camden, N. J., employees cheer campaign inauguration



Lucy Monroe, singer; G. K. Throckmorton, RCAM president; Barry Wood, singer

carried out the standard Red Cross first aid relief routine. Voices of "victims" who lay covered with fallen timbers and other debris guided the rescue crew to their aid. The "rescuers" operated entirely through their senses of touch and hearing. In this manner, "bodies" were located and either given "emergency" treatment where they lay or were carried out to waiting ambulances.

The Emergency Volunteer First Aid crew at RCAM is one of a number of similar units now being organized in defense industries. It is the first among them to receive its certificate from the Camden County Chapter of the American Red Cross, under whose sanction it operates and with which it cooperates in emergencies.



"RCA all the way"



Radio City headquarters of NBC's International Division, where short-wave broadcasts are prepared.

GATEWAY TO THE HEMISPHERES

NBC International Division Talks to the World
Via Short-wave and the World Answers

By JOHN ELWOOD, Manager,
NBC International Division

BROADCASTING music, and talking to the world for sixteen hours daily in six languages, the National Broadcasting Company uses studio 2-C in the RCA Building, New York, as a gateway to the hemispheres.

And the world answers, pouring thousands of letters of appreciation and commendation—with a sprinkling of constructive criticism—onto the



John Elwood

desks of the sixty-five writers, announcers and producers who make up

NBC's foreign language staff. Seventy-six thousand of these letters were received last year, despite censorship and restrictions brought about by the war. The total for 1941 promises to be comparable with last year's, even though today the crime of listening to a foreign broadcast is punishable by death in many countries.

The story of the growth of international short-wave broadcasting is of necessity, a kaleidoscope of improved technical facilities, expanding program ideas and a never-ending process of weaving and reweaving each flashing pattern into a homogeneous and well-defined picture.

Two short-wave stations, WRCA and WNBI, owned and operated by

NBC, are located at Bound Brook, N. J. Rated at 25,000 and 50,000 watts, these transmitters are on the air simultaneously on individual channels, from 9 o'clock in the morning until 1 A.M. the next day.

Manipulation of directional beams in order to project programs towards those geographical sections of the globe where they will do the most good at specified times of the day, involves close teamwork by the program, traffic and engineering departments.

A careful analysis of the listening habits of a world-wide audience, which speaks many languages and has widely divergent tastes in radio programs, has given NBC the solution to many

broadcasting problems. At the present time, eight hours a day of programs are directed to Europe in French, Italian, German, Spanish, Portuguese and English. The other eight hours are directed to the Americas in Spanish, Portuguese and English.

The broadcasts to Europe start at nine o'clock in the morning and continue uninterruptedly until five in the afternoon. The hours of reception are, of course, five and six hours later, European time. Then the directional beam is swung south, and programs, especially produced by a highly trained staff of foreign language experts, are broadcast to the 130,000,000 listeners of South and Central America, Mexico and the nations of the Caribbean.

Started in 1929

This is the general outline of what is being done today by the National Broadcasting Company in the field of short-wave broadcasting. So now, let us go back for a moment to the beginning of this story of achievement. NBC started to broadcast to foreign countries in 1929, at which time regular domestic features were fed to the short-wave transmitters without special programming of any kind. By 1934, several hours a week were being devoted to special broadcasts, but the language pattern—that is, the special programming with regard to idiomatic and geographical divisions of the world—was not undertaken effectively until late in 1936, when NBC started regular broadcasts in its present language arrangement. Since that time, NBC's short wave broadcasting has progressed by leaps and bounds. The granting of a commercial license by the Federal Communications Commission and the important contribution that radio brings to the national defense effort, have been features of this advance.

In the field of commercial broadcasting, NBC began with a broadcast in Spanish of the first Louis-Godoy fight, which brought a response of 24,000 letters from all parts of the American continent. Since that day in February, 1939, several concerns

have featured short-wave programs in their export advertising, sponsoring a variety of shows ranging from grand opera and news commentators to prize fights and jazz bands.

In the realm of national defense, NBC has again taken the lead, with special programs designed to give listeners all over the world an insight into the trends of thought on the current international problems, in the United States and other countries. These programs, prepared by experienced international newspaper men on the staff of NBC, are presented every day in six languages. Although they primarily stress the national defense effort of the United States, they also bring to listeners the facts of what is going on in the conquered nations of Europe and point out the story behind the news. They are based on information collected from the American press and from reliable sources around the globe.

The handling of straight news dispatches is one of the notable features of the work of NBC's International Division. There are five daily fifteen-minute news periods in English, seven in Spanish, two in Portuguese, two in French and one each in German and

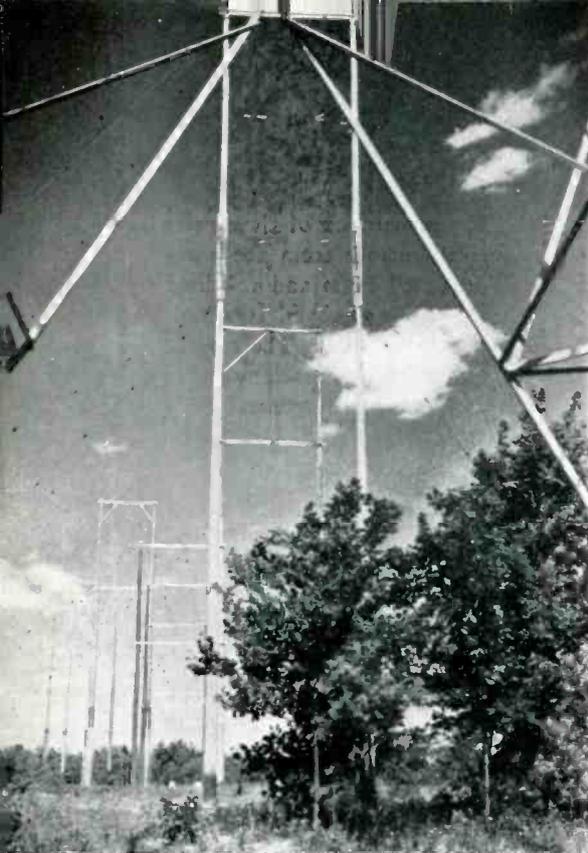
Italian. The preparation of these news reports, taken mainly from the wires of the Associated Press and re-edited into the various languages, is a task which takes much time. The careful checking and editing of each story, to make it conform to the general news policy of the International Division as a whole, and to the requirements of style and presentation of each of the various language and geographical divisions served by NBC, requires the concentrated efforts of veteran newsmen, all familiar with newspaper and radio work in at least one foreign language.

News Schedule

A regular schedule of news is followed every day, but more and more programs that require special writing and special production are being presented by short-wave. Taking at random from the programs for the past few weeks we find the following special features: dramatization of the lives of President Roosevelt, Prime Minister Churchill, Joseph Stalin and Adolf Hitler; an interview with Alexander Brailowsky, Russian pianist, who talked in English, Spanish, and Portuguese; a talk by the Rev. Walter Van

Watching the action on the screen of an RCA television receiver, Buck Canal gives Spanish listeners in South America a blow-by-blow fight description.





Short-wave directional antenna at WRCA's transmitters in Bound Brook, N. J.

Kirk, Executive Secretary of the Department of International Justice and Good Will of the Federal Council of Churches of Christ in America; and musical salutes to Bolivia and Mexico on their independence anniversaries.

In addition to all these particular programs, the International Division featured a special one-hour show, inaugurating its Mexican network of 23 stations, headed by powerful XEW of Mexico City. This program marked the beginning of NBC's Pan-American network, recently set up by NBC Vice-President John F. Royal during his trip through Latin America. This network, consisting of more than 90 stations, was dedicated in a special broadcast on October 12. The dedication of the Mexican portion of the network entailed pickups from Mexico City, Santiago de Chile and Washington, and featured musical numbers originating both in Radio City and in Mexico, together with good-will addresses by Dr. Ezequiel Padilla, Mexican Minister of Foreign Affairs; Mexican Ambassador to Washington, Dr. Francisco Castillo Najera; and Adolph Berle, Jr., Assistant Secretary of State of the United States.

Eight

One of the most interesting features of NBC's foreign language broadcasting is the handling of speeches by President Roosevelt and other high officials of the United States Government. As many as 100 stations in Latin America have rebroadcast the words of the President, voiced in their own language by NBC's Spanish or Portuguese announcers.

The text of the President's message is usually received at the NBC office anywhere from two to three hours before the scheduled time of broadcast. It is handed immediately to the translators who, while keeping as close as possible to the English text, transpose it into idiomatic Spanish, French, Portuguese, German or Italian, with every effort to keep the feeling of the President's phraseology.

Inasmuch as the President's speeches usually are broadcast at a time when the transmitters are directed toward South America, Spanish and Portuguese versions of the speech are broadcast simultaneously with the President's own voice. By the use of both transmitters and also point-to-point RCAC facilities, listeners in South America are enabled to choose between listening to the President himself in English, or to a translation in their

own language. Later the same evening, the President's voice and also the foreign-language versions of his speech are rebroadcast by electrical transcription.

The German, French and Italian departments also give the speech in those languages on the hours allotted to them as soon as possible after the actual broadcast. The speech is also rebroadcast to Europe in English, from a recording of the President's own voice. In this manner world-wide coverage in six languages is assured.

And so the work at NBC goes on from day to day, seven days a week. The world is told of what we here in America are doing and thinking; the world is also invited to share in our entertainment, to hear our music and our plays. And above all the sorely-tried peoples of the conquered and totalitarian nations are given the precious gift of truth, and the world answers in unequivocal terms: "Please give us more American broadcasts. They tell the truth. We need the truth today more than ever before."

This is the pleading voice from across the Atlantic—a voice of supplication which is bravely eluding strict military censorship and somehow manages to reach these shores.

Latin American staff of NBC's International Division, Radio City, receives special instructions pertaining to day's activities.



WORK BEGINS AT PRINCETON

New RCA Laboratories To Be Occupied in Spring;
Greater Accomplishments in Research are Foreseen

By RALPH R. BEAL,
Research Director of RCA Laboratories

THE first units of buildings and facilities for RCA Laboratories are under construction on the site at Princeton, New Jersey. Ground-breaking ceremonies took place on August 8 and construction work began immediately thereafter. It is expected that the laboratory buildings will be completed and occupied during the spring of 1942. Upon completion of the construction program now contemplated for buildings and facilities, RCA Laboratories will constitute a center outstanding in radio and electronic research.



R. R. Beal

in radio and electronic research.

This new organization brings together as a department in Radio Corporation of America, all research and original development and patent and licensing activities of the Corporation and its associated companies. It will augment the scope and effectiveness of RCA research in radio and electronics. It is planned and organized to promote the continuing growth of radio as an art and industry, and it will facilitate application of the resources of RCA research in greatest possible measure to the urgent problems of National Defense.

Intensive research in radio and electronics under the stimulation of national emergency produces discoveries and inventions which lead to the creation of important new instrumen-

talities of service and usefulness to the public. RCA Laboratories is organized to facilitate the application of such new knowledge to serviceable purposes, thereby to contribute to the creation of new employment and new industries in the period following the war emergency.

Organization of the Laboratories marks recognition of the lasting significance of the contributions of radio and electronics to our social and economic advancement. Radio has become an indispensable part of our nation's industrial and social development. Through its contributions to human enlightenment and well-being it takes its place beside the older arts and industries which have so greatly contributed to our national progress. Its contributions in the future from such important new fields as ultra high frequencies, television, electronics and electron optics, and facsimile will greatly surpass those of the past.

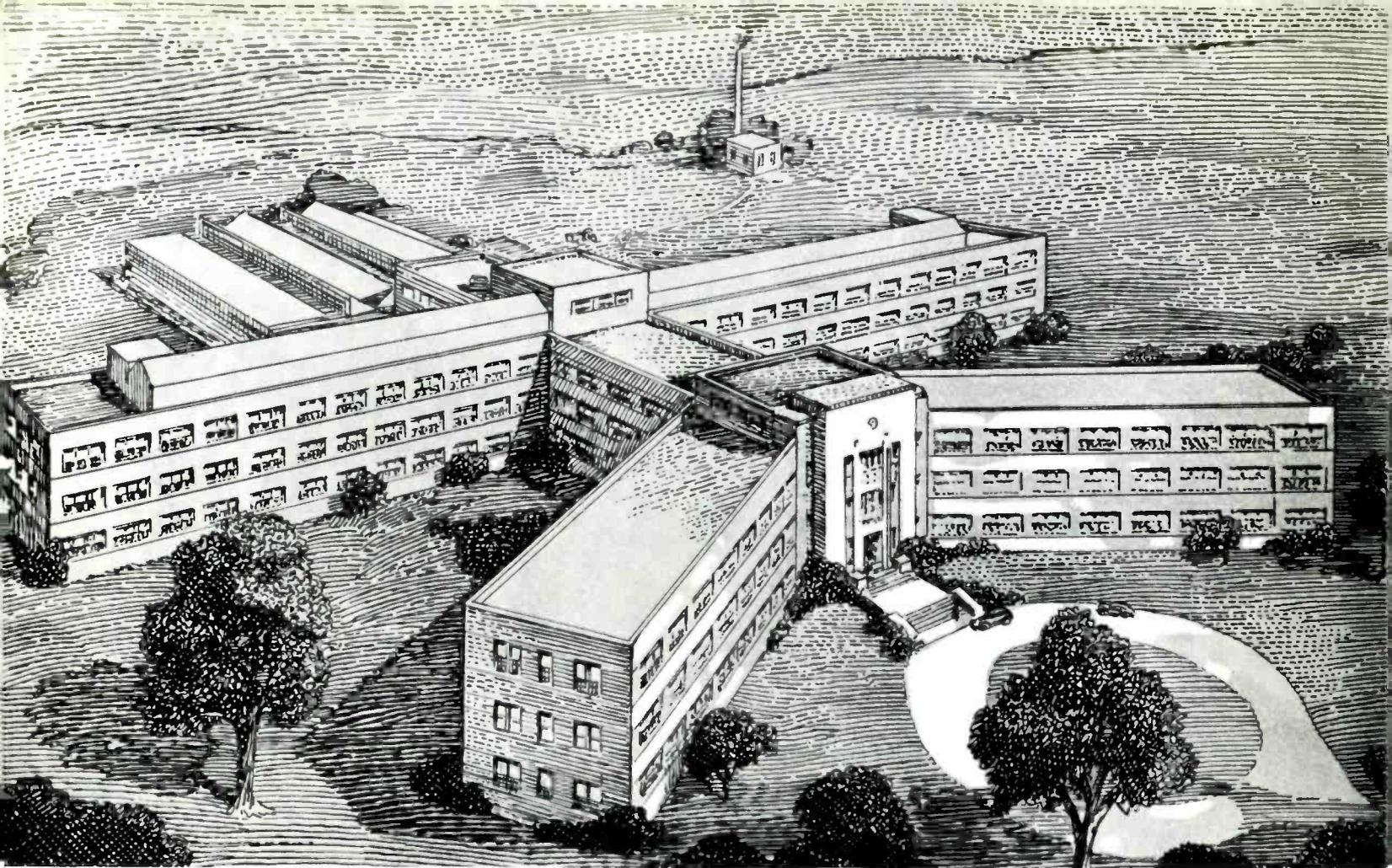
Brought together are units of research which already have achieved distinction. Their pioneering work has made many of the foremost contributions in world-wide radio communications; in the development and application of the electronic system of high definition television; in original investigations and applications of ultra-high frequencies; in acoustics and in the recording and reproduction of sound in national and international broadcasting; in electron optics in numerous applications including the electron microscope, and in many kinds of electron vacuum tubes for radio and industrial applications. RCA Laboratories unifies this research to

facilitate interchange of knowledge and to stimulate discoveries and inventions.

The activities of the Laboratories will extend over a broad front of research and original development. In addition to applied research directed to specific objectives, fundamental research concerned only with studies of the properties and behavior of matter will be conducted. The scope of these activities will extend from the basic discoveries of fundamental and applied research to final inventions and their coordination into new and improved radio products and services.

The many other fields of research and original development will include radio wave propagation studies to acquire new knowledge directed toward increasing the capabilities and effectiveness of radio waves in all services of communications; research in ultra high frequencies to produce methods and systems to make useful higher and higher frequencies for many new applications and improved services; research in television to greatly expand its capabilities and to extend its usefulness to important new applications; research in electronics and electron optics to extend their benefits to other scientific and industrial fields.

Modern radio makes important contributions to other industries. Electronics has great influence in electrical communications. Electron optics, related especially to television, finds application in the electron microscope which opens vistas to new horizons in biological and other research. The luminescent materials of the television



Architect's drawing of the new RCA Laboratories, which are now under construction at Princeton, N. J.

picture tube have aided in the development of the high-efficiency fluorescent lamp. The photo-electric effect has found a multitude of uses in measuring, safety and control devices. Research will increase the number and effectiveness of radio applications to other industries.

The site for RCA Laboratories consists of about 260 acres of land located a short distance to the eastward of the intersection of Washington Road and U. S. Highway No. 1, and extending from the highway to the Pennsylvania Railroad right-of-way near Princeton Junction. The first units of construction will provide quarters and facilities mainly for the research and original development which heretofore have been conducted in laboratories at the Camden and Harrison, New Jersey, plants of RCA Manufacturing Company. As additional units are constructed, they will be occupied by the Industry Service Section, the Patent Department and Communications Research.

The main building of the present construction will consist of a three-story section of about 112,000 square feet, exclusive of basement space, and a one-story section having an area of about 28,000 square feet. It will be steel frame and brick construction with a full basement under the three-story section. The three-story main wing, which is about 488 feet long, will be occupied by the research laboratories. A short three-story wing at right angles to the main wing provides office space for administrative and other personnel. The one-story section, to the rear of the three-story wing, provides quarters for library, dining room, model shop and other service facilities.

Otto S. Schairer, Vice President in Charge of RCA Laboratories, which includes the Patent Department, will direct the activities of this new organization.

R. R. Beal, Research Director of RCA Laboratories, has general direc-

tion of all research and original development.

C. B. Jolliffe, Chief Engineer of RCA Laboratories, directs and coordinates the broad engineering policies of the Corporation and represents it and directs its representation in engineering matters before the public and governmental bodies.

E. W. Engstrom, Director of the Princeton Laboratories, is in charge of research and original development activities at the Princeton Laboratories, with Dr. V. K. Zworykin and B. J. Thompson as Associate Directors of Princeton Laboratories.

H. H. Beverage, Director of Communications Research, is in charge of research and original development in the fields of long distance communications and of the communications research laboratories at Riverhead and Rocky Point, Long Island, and in New York.

Arthur F. Van Dyck, Manager of Industry Service Section, is in charge

of the activities which render service to domestic licensees of RCA.

A Research Consulting Board consists of the Chief Engineers of Radio Corporation of America, RCA Manufacturing Company, Inc., R. C. A. Communications, Inc., National Broadcasting Company, Inc., Radiomarine Corporation of America, and the heads of RCA Laboratories. This Board is organized for the purpose of coordinating the research, development and engineering work of the RCA companies and of giving RCA Laboratories the advice and suggestions of the principal engineers of these companies.

An Executive Board comprises the Presidents of Radio Corporation of America, RCA Manufacturing Company, Inc., R. C. A. Communications, Inc., National Broadcasting Company, Inc., and Radiomarine Corporation of America, or their alternates, the Vice-Presidents in charge, and the heads of RCA Laboratories. The purpose of this Board is to give the Laboratories the direction and advice of our business managements, to insure that research and original development is conducted with a view to practical needs, and to provide a medium for considering how to make most advantageous public use of the products of the Laboratories.

DEFENSE COMMITTEES

In a letter to the 239 stations which make up the Red and Blue national network services of the National Broadcasting Company, Niles Trammell, NBC president, has proposed the formation of two Planning and Advisory Committees for closer coordination on national defense. Plans call for development of a definite program, organized on a cooperative basis between the stations and NBC. The objective is a still greater integrated broadcasting service geared to the growing demands of the nation's defense requirements.

Eleven

New Materials

As a result of the search necessitated by national defense for alternate materials in radio sets, RCA Laboratories has developed more than forty replacement materials. Twenty of them now are being used in RCA's radio production, as part of its broad, long-term program of conservation.

Maj. Gen. James G. Harbord, Chairman of the Board, RCA, turns a spade of soil at the RCA Laboratories ground-breaking ceremonies. With him are Edward J. Nally, first RCA president, left, and Otto S. Sbaiver, vice president in charge of the laboratories.



Excavation underway on the 250-acre site at Princeton





NBC studio production scene of a Television Fashion Parade

Television

GOES COMMERCIAL

By **ALFRED H. MORTON**, Vice President,
the National Broadcasting Company

AFTER three months of commercial operation, the National Broadcasting Company, holder of U. S. commercial television license No. 1, had signed eleven contracts with advertising sponsors of television programs, of which five were for series of broadcasts. Thus, within a very short time from its commercialization date, July 1, television emerges as a recognized advertising medium.



A. H. Morton

the Brooklyn Dodgers baseball games; three professional fights from Ebbets

Field; the weekly Monday evening amateur bouts; the introduction of a news analyst's series, "The Face of the War"; a women's afternoon hour, "Radio City Matinee;" the first two games of the Brooklyn Dodgers professional football games; the starting of a fashion playlet series, "Fashion Discoveries of Television;" horse racing from Belmont; a weekly Opera Workshop series; a series of civilian defense programs; and the televising of some of sound radio's popular shows—Lowell Thomas, Truth or Consequences, Uncle Jim's Question Bee, and Paul Wing's Spelling Bee. In addition to these highlights, there were dramatic productions, world-travel lectures and films, and an array of variety entertainment.

The first month under the new schedule, saw a total of 70.45 hours of programming, consisting of 46 per

cent outdoor pickups, 29 per cent studio, and 25 per cent film transmission.

NBC's weekly postcard surveys of audience program preference were resumed with the beginning of commercial programs. Through these surveys, each member of the audience has an opportunity to vote on every program presented, on the basis of "excellent," "good," "fair," and "poor." Numerical values of 3, 2, 1, and 0, respectively, are assigned to these ratings. The average of all the first month's programs was 2.03, or a little above "good."

At the end of July, a survey of audience comments on technical reception showed a rating of 1.99, or just under "good." This is below the rating on a similar survey conducted a year ago, and is explainable by the fact that not all of the receivers in the area had been completely converted to the new FCC standards.

The NBC had 3,550 names of receiver owners on file at the end of August. Of these installations, 425 are in public places. These figures, it is estimated, represent approximately 75 per cent of the total in the field, as this file was not complete at that date. Hence the estimate of the total number of receivers in the field is probably between 4,700 and 4,800. A survey conducted during the week of July 28-August 2 showed the following average number of adults and children viewing the programs during the daytime and during the evening, in homes and in public places.

	<i>No. of Adults</i>	<i>No. of Children</i>	<i>Total</i>
Home			
Day	1.8	1.1	2.9
Evening	4.5	1.3	5.8
Public Places			
Day	9.3	1.9	11.2
Evening	19.8	2.1	21.9

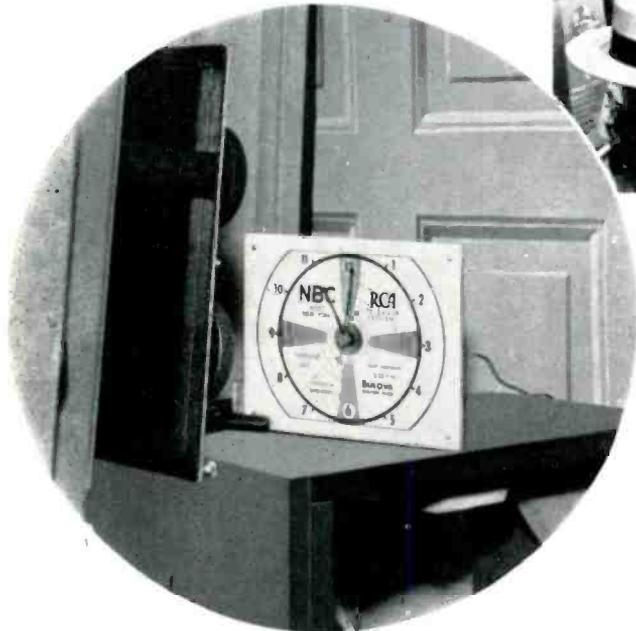
Surveys also have shown that, during July, an average of 55.6 per cent of the receivers in the field were turned on in the daytime, and an average of 80.1 per cent in the evening.

Applying these percentages and the average number of persons viewing to our estimated number of receivers in the field, the actual number of individuals viewing in the daytime totals approximately 11,000, and in the evening approximately 30,000.

Accounts that have been signed on NBC television for 13-week contracts or longer are the Adam Hat Stores, Inc., Bulova Watch Company, Botany



Adam Hats, one of television's first commercial sponsors, helps the men pick out a new style through the eyes of television.



Telev viewers see the Bulova Time by RCA-NBC Television from Radio City.

Worsted Mills, John David, Inc., Bloomingdale's, and Abraham & Straus. Advertisers that have been on for one time broadcasts are the Frank H. Lee Company, Lever Brothers—Spry, Missouri Pacific Railroad, Procter & Gamble—Ivory Soap, and Sun Oil Company.

During the two years prior to July 1, NBC transmitted some 1,400 different television programs, totaling approximately 1,000 hours of time on the air. These programs ran the entire gamut of entertainment and education, from live talent studio productions and film to instantaneous pickups of sports and other events in and around New York.

These facts reflect experience in television broadcasting. They also show that television broadcasting is not a new and untried medium of public entertainment and information. As a matter of fact, neither was television unknown as an advertising medium. During those same two years, NBC, in

cooperation with 125 different advertisers, representing 21 diverse industries, tried out 300 commercial-type television programs. We got our feet wet—and so did these advertisers and their agencies.

In the course of representing television to advertisers, certain arguments have been used in television's behalf to justify it as an advertising medium. In comparing television with other media, these are some of the thoughts that have been used:

First, television has sound, just as in sound radio and sound motion pictures. Second, television adds sight and motion to sound, as in only sound motion pictures. Here, we leave all existing communication and advertising media. Television adds the all-

important factor of spontaneity, or immediacy, or the quality of taking its audience to the scene of instantaneous action. No other medium can put you at the ringside seat of a fight, or at the finish line of a track meet, or in the front ranks watching a parade.

It is the desire to fulfill the experience of being places when things happen that urges people to attend sports events by the millions each year. People want to witness those much sought after, but rare, unscheduled and unexpected turns of events. Television fulfills these human desires.

The factors of immediacy and suspense are also typified in television studio productions where the informality and intimacy of action glue people to their receivers by the hour. The factors of suspense and spontaneity put the elements of life itself into things; and it is these factors that television motivates. These are the factors that broadcasters must learn how to exploit through television to attract people to this new contribution to society.

Television is the only advertising medium that affords a manufacturer the opportunity of having his best salesmen and most effective combina-

R.C.A. INSTITUTES

SCHOOL OF RADIO
TECHNOLOGY

•

TECHNICAL COURSES IN
ALL PHASES OF RADIO
AND TELEVISION

•

For information write

R. C. A. INSTITUTES, INC.

HOLLAND PLAZA BUILDING
75 Varick Street New York

•

*A Radio Corporation of
America Service*

tion of selling ideas presented right in the home. In this use, television departs from the normal concept of an advertising medium.

The early user of television establishes for himself a place of recognition and prestige with the public and the industry. We have but to recall the early sound programs and consider the number of times the names of products and advertisers were linked with these shows on through the years. A statement of dollars and cents value of these mentions and space would be very impressive.

Television commands 100 per cent active attention from its audience compared with a certain percentage of passive listening which sound broadcasts permit, and against the inattentive reading of advertisements in magazines and newspapers, or the actual thumbing of pages without noticing the advertisements at all. Out of a potential television audience, a television program obtains a higher actual audience than sound programs; because television, with sight, sound, and motion, has more universal appeal; and because there are fewer simultaneous television programs on the air to split the audience.

After two years, the most veteran of our television audiences are still enthusiastic about the service. This contradicts certain early beliefs that audience enthusiasm for television would wane after the novelty had worn off. Facts and figures gleaned from thousands of weekly questionnaires show consistently that audience interest is ever building. If there was any novelty value, it is giving way to, and being replaced by, solid human interest, and the satisfaction of human needs, wants, and desires.

NEW SOUND DEVICE

A new loudspeaker baffle, which, projects sound uniformly over a 360° area has been developed by RCA Manufacturing Company, for use in paging and announcing in industrial plants.

Receives Medals



Dr. V. K. Zworykin

IN recognition of his notable work in the field of electronics, Dr. Vladimir K. Zworykin, Associate Director of RCA Laboratories, received the Rumford Award from the American Academy of Arts and Sciences at a recent meeting in Boston, Mass.

Presenting the award, consisting of two medals, one gold and the other silver, Dr. Harlow Shapley, head of the Harvard University Observatory and president of the Academy, said:

"He (Dr. Zworykin) is an expert in photocells and their application, has played a major role in the development of television, assisted materially in the development of the electron microscope, and is the writer of many scientific papers. His entire record is such that the Academy feels fully justified in selecting Dr. Zworykin as the latest recipient of this honor."

Responding, Dr. Zworykin lectured to the Academy on the subject of the electron microscope, tracing its development from the beginning to present-day commercial and high-voltage experimental types.

MMUSIC of the American Society of Composers, Authors, and Publishers is expected to return to the air over the networks of the National Broadcasting Company almost any day, possibly before this first issue of Radio Age is in circulation, after an absence of more than ten months.

Immediately prior to press time, the NBC management was preparing to sign an agreement with ASCAP officials, marking the end of one of the most vigorous controversies in the history of broadcasting. Before signing, NBC was awaiting agreements from its affiliates to refund to NBC, for payment to ASCAP, 2¾ per cent of each station's compensation for network commercial business.

Endorsed by NAB

The overall agreement between ASCAP and the networks having been endorsed September 9 by the Executive Committee of the National Association of Broadcasters and also agreed to by the Columbia Broadcasting Company, NBC expected early compliance from all its member-stations, excepting, of course, those located in States where such refunds are prohibited by law.

As revealed some weeks ago, the NBC-ASCAP agreement called for NBC to pay ASCAP 2¾ per cent on network commercial business; NBC managed and operated stations to pay 2¼ per cent on local and national spot business; NBC to pay a license fee of \$200 for each managed and operated and affiliated station for the use of ASCAP music on all network sustaining and public service programs. A schedule of fees also was worked out for local sustaining programs on managed and operated stations. Affiliated stations were left free to make their own contracts with ASCAP for local broadcasting. Broadcast Music, Inc., organized to provide a source of music after ASCAP music went off the air December 31, 1940, will continue to function.

It is estimated that under the new agreement, the broadcasting industry

CLOSE HARMONY

NBC Ready to Sign Agreement with Ascap; Terms are Outlined

will pay ASCAP approximately \$3,000,000 annually. In 1939, under the old contract, broadcasters paid ASCAP about \$4,300,000.

There had been disagreement between broadcasters and ASCAP almost since the inception of broadcasting. In the beginning, the question was whether, since radio was a public service, non-profit enterprise, it should be obliged to pay for the privilege of using ASCAP music. Later, when broadcasting became profitable, the question was how much the broadcaster should pay.

Until 1932, stations operated under a straight licensing system by which they paid a fixed fee to ASCAP. However, ASCAP contended that radio, by rapid popularization of new tunes, destroyed the sale of sheet music and phonograph records, and requested that this deficiency be made up by larger contributions from the broadcasters. The latter felt that broadcasting was not solely responsible for the decline in music sales and contended, on the other hand, that broadcasting, by popularizing music, had created a demand for sheet music and records.

Paid a Fixed Fee

In 1932, an agreement was negotiated by which broadcasters were to pay a fixed fee for the use of music on sustaining programs, plus 3 per cent of their receipts from the sale of time the first year, 4 per cent the second year, and 5 per cent the third year, at which time the contract expired.

Under this contract, network broadcasters, as such, did not pay ASCAP, although their owned and managed stations did. Each network member-station paid, on commercial network broadcasts, a percentage of the amount

they received as their share of the total sum paid by the advertiser for the broadcasts.

This contract was renewed at the 5 per cent rate in 1935 for a period of five years ending December 31, 1940.

The bill paid by broadcasters to ASCAP rose from \$10,000 to \$1,000,000 annually between 1923 and 1931. In the following eight years it more than quadrupled, amounting to \$4,300,000 in 1939, although from 10 to 15 per cent less music was being used than had been a few years earlier. Of ASCAP's revenues, broadcasters were paying 67 per cent, five times as much as any of the society's other customers.

BMI Is Launched

Broadcast Music, Inc., was launched at a special session of the National Association of Broadcasters late in 1939, after broadcasters determined to resist if ASCAP's demands upon expiration of its contract were felt to be too high.

Under sponsorship of NAB, BMI issued licenses and sold stock to more than 300 stations representing approximately 75 per cent of the entire business done by the industry. These stations and the networks paid in approximately \$1,300,000 to the new organization, whose purpose, in addition to making certain a source of supply should it become necessary to cease playing ASCAP tunes, was the promotion of the writing of new music and lyrics by giving opportunity to new authors and composers.

BMI also began making new arrangements of music in the public domain—a vast source of raw material comprising approximately 80 per cent of the world's music and including about 40 per cent of ASCAP's catalogue. It also began buying rights to other non-ASCAP catalogues, and soon had some 5,000 numbers ready for use.

In March, 1940, ASCAP presented its new schedules for 1941. Basing its primary demand upon a new charge

for music used by networks amounting to 7½ per cent of commercial business, the society asked broadcasters to pay, according to impartial estimates, between \$8,000,000 and \$8,750,000 in 1941. NBC and CBS, feeling that this charge would eat up 90 per cent of annual net profit on network operations, notified their affiliates that they would not use ASCAP music in 1941 on the basis of those demands.

In April, 1940, the networks began to use non-ASCAP music on sustaining programs, and by October 1, all orchestras on NBC sustaining shows were required to play at least three non-ASCAP compositions on each broadcast period. On November 15, NBC eliminated all ASCAP music on sustaining programs and CBS did likewise on December 1. By December 23, practically all ASCAP music had been eliminated on both sustaining and commercial programs.

Wide public interest was created in the situation, especially during the first week of January, 1941, when broadcasting continued as usual, using BMI music.

Trammell Proposal

Negotiations between the broadcasters and ASCAP continued with but little progress in the next several months. Finally, on May 11, the Mutual Broadcasting System reached an agreement with ASCAP, whereby it was to pay 3 per cent royalty on all network programs for four years and 3½ per cent for the remaining six years of the contract. Affiliated stations were to pay a similar amount for local broadcasts. It was agreed that, should the other networks receive more favorable terms, Mutual would be granted a corresponding reduction.

Niles Trammell, president of NBC, on June 27, proposed to ASCAP that NBC pay it 2½ per cent on network commercial programs and that its individual stations pay 2 per cent on local and national spot business. From this proposition, the present agreement resulted, being reached on July 30.

600 ENROLL

**RCA Institutes Reports
Record Registration at
N. Y., Chicago Schools**

LARGELY due to the increased tempo of business and industry resulting from the national preparedness program, RCA Institutes, Inc., has started its new scholastic year with public interest in radio technical training at an all-time high. Registration of new students established records for both the New York and Chicago schools. More than 400 applications for enrollment were accepted in New York and more than 200 in Chicago. On October 1, the combined registration of the two schools totaled 1,160.

Requests from employers for trained personnel have kept pace with increased enrollment. Both schools report practically all graduates placed in some branch of the radio industry. Graduates of the two-year General Course are in great demand. Increasing numbers of young men are being placed as engineers in the laboratories of RCA Communications, Inc., Radiomarine Corporation of America, and RCA Manufacturing Company, Inc. A few August graduates have been engaged as student engineers by the General Electric Company. Still others are doing television work at NBC and CBS, while Mutual has added several to its long list of RCAI-trained studio and transmitter engineers.

Radio and Television Service Course graduates were used in the recent conversion of television receivers in the New York area. Many men trained in this course are doing test, inspection, special apparatus assembly, and test equipment maintenance work at Harrison and Camden. Calls from dealers and distributors for competent servicemen continue at a high rate as their employees go into military service or take higher-salaried positions in defense industries.

Accelerated activity in merchant shipping has created an unusual demand for licensed graduates of the

Commercial Radio Operating Course. The shortage of operators in this field has necessitated a relaxation of experience requirements so that Institute graduates may now be assigned immediately to "one-man" ship jobs. Owners of smaller broadcasting stations are constantly losing men to the armed services and to more lucrative positions, with the result that RCAI finds itself swamped with requests for replacements from all parts of the country.

Expansion of commercial airline services has stepped up the demand for graduates of the new Aviation Communications Course. These young men are now serving as operators on the Clippers, maintenance men and ground station operators with Pan American, United, American, T.W.A., and other air lines.

At a recent meeting of its Board of Technical Advisers, A. F. Van Dyck, Manager of Industry Service Section, RCA Laboratories, accepted the chairmanship of a committee of RCA engineers which is to prepare technical examinations to be taken by all General Course graduates to help assure the continued adequacy of their training.

PRONOUNCE IT

Diacetoacetylparaphenylenediamine, according to the RCA Laboratories, is a compound useful in high-speed electrolytic facsimile recording. So is chloroacetoacetanilide, or for that matter, acetoacetylcyclohexylamine.

NEW NBC STUDIOS

Incorporating advanced radio studio design with the atmosphere of the intimate theater, two new studios at NBC's Radio City headquarters are expected to be ready for broadcast service by November 1. Construction of the studios has been completed, and the work of decorating and equipping is now under way.

Adding to the world's largest radio studio plant, the new units rise two stories from the sixth floor. Each is 100 feet long by 50 feet wide.

GLASS REFLECTION REDUCED

Television Research Leads to New Chemical Method with Wide Practical Applications

RESearch in television in RCA Laboratories has led to a new chemical process to reduce extraneous reflections from glass. It now becomes possible virtually to eliminate the streaks that glare across show windows, framed pictures, ground-glass screens on cameras, and other glass surfaces or panels. For example, the glass faces of electric meters and the multiplicity of dials that confront airmen, as well as those of automobiles, now can be made reflection-proof, minimizing chance of error in reading.

Success in the conquest of reflections, which have bothered man ever since he first used glass, has been achieved by scientists in RCA Laboratories while striving to improve contrast on television cathode-ray tubes. They observed that the picture contrast always is greater when the screen is viewed in a dark or semi-darkened room. Since the images are "painted" on the glass face of a cathode-ray tube, thence to be passed on through a thick glass protector plate to a glass mirror, the challenge of reflections was baffling. The experts in their study went back as far as 1900 to pick up an important clue dropped by Lord Rayleigh, noted English physicist.

Follows Up Clue

He had jotted down in the record of his observations that hydrofluoric acid, diluted one part in 200 of water, removed a thickness of glass corresponding to about one-quarter wavelength of light each hour. Following up this clue, the RCA research experts discovered further that an application, such as Rayleigh used, could impose on a glass surface an almost invisible film of low reflecting power.

Extending the investigation of the effects of hydrofluoric acid liquid and vapor on glass, new signposts were found for clearer vision in television

and in the wide fields in which glass is used, whether in tiny lenses or big show windows. Of particular interest to the optical field is the fact that, as the amount of reflection is reduced, the light transmitting quality of the lens substantially increases and greater contrast results.

Developed by Nicoll

Dr. F. H. Nicoll, research scientist of RCA Laboratories, developed the new formula. His process is based upon the exposure of the glass surface to hydrofluoric acid vapor. The vapor etches away a small amount of surface, leaving a thin, transparent film of calcium fluoride measuring in thickness approximately one-quarter wavelength of light. This film is purple, indicating that yellow and green, to which the human eye is quite sensitive, are not being reflected. Exhaustive tests show that the film withstands hard rubbing, that it can be washed with water, alcohol and a number of other solutions, and can be subjected to relatively high temperatures without impairment.

Ordinary window glass, it is explained, has an average measured light transmission of approximately 90 per cent. The other 10 per cent is lost through reflection. It is this relatively small amount of glass reflection that often troubles human vision. By reducing the 10 per cent to one per cent or less, Dr. Nicoll achieves a minimum power of reflection.

Discussing the numerous applications of this reflectionless glass, Dr. Nicoll sees it as a boon to accuracy and safety in cases where aviators and engineers must glance quickly at meter dials and respond instantly to what they see. Details of numerous commercial applications are being worked out by the RCA Manufacturing Company at Camden, N. J.



Three spectacular examples of how the new chemical method reduces reflections from glass to a minimum. Half of the glass covering the two pictures and the meter dial has been treated.

RCA ALERT GOES TO CAMDEN

Manufacturing Company Designing Air-raid Warning Device for Commercial Production

ESTABLISHED as the most effective means of instantaneous and widespread air-raid warning so far developed, the RCA Alert Radio Receiver now is being commercially designed at the RCA Manufacturing Company in Camden, N. J. It is expected that production will start within the next few weeks.

Following the Alert's first public demonstration in New York, in which David Sarnoff, president of RCA, and Mayor F. H. LaGuardia as Director of Civilian Defense participated, there was immediate public and official enthusiasm. RCA was nearly swamped by the flood of inquiries that came from Government sources, broadcasting stations, local defense organizations in all sections of the country, and from many police and fire departments.

Other demonstrations were arranged at once. These were held in Washington, D. C., for the Federal Communications Commission and the Defense Communications Board; in Seattle before the Pacific Coast convention of the Institute of Radio Engineers, and in San Francisco and Los Angeles—before sectional meetings of the IRE. The most recent demonstration was staged September 29 before the St. Louis convention of the International Municipal Signaling Association, which is composed of police and fire department representatives.

Arthur F. Van Dyck, director of the RCA License Laboratory, who, with Stuart W. Seeley and Harmon B. Deal, developed the Alert, has been appointed by Mayor LaGuardia as a member of the Liaison Communication Committee aiding the Office of Civilian Defense and the Defense Communications Board.

As demonstrated in July by Mr. Sarnoff and Mayor LaGuardia, the Alert Receiver is a small, simple device employing in the first models

three tubes, although this number may be increased to four or five in final production models.

Deriving its name from the fact that it is always alert to a special inaudible signal that can be transmitted from any broadcasting station without interrupting program service, the receiver springs immediately into life, ringing a bell or turning on a light to attract the attention of listeners. When the warning or special announcement comes over the air from the broadcasting station, it is reproduced through the Alert's own loudspeaker. Another, different inaudible signal turns off the receiver.

Ordinarily, the Alert's loudspeaker circuit is open, and is closed only by contacts on a special electrical relay in the receiver. This relay is sensitive to, and only to, a very low audio frequency such as 36 cycles. When the

Alert receives this low frequency, the relay goes into operation, turning on the loudspeaker, ringing a bell or turning on a light. Another relay, sensitive to another low frequency, say 24 cycles, turns off the loudspeaker from the transmitting station when desired. An Alert using four or five light duty tubes would add only about 2 or 3 cents daily to the usual bill for household electricity.

The equipment needed at the transmitter also is simple, being an oscillator to supply the low frequency inaudible signal, which can be fed to the lines through conventional microphone plug-in facilities. The output of the oscillator, when imposed on the carrier wave of the broadcasting station, does not interfere with the regular program. Although it has not been tested, due to the lack of equipment available, it is believed the Alert's operating signals could be transmitted throughout an entire network as well as over a single station.

Among the many possible peacetime uses of the Alert that have been suggested are program selection in



David Sarnoff, president of RCA, and Mayor F. H. LaGuardia participate in demonstration of the new RCA Alert Receiver at LaGuardia Field.

broadcasting sound or sight, fire and police operations, and amateur radio services. Especial interest has developed among volunteer fire departments, which, having no electrical call system, must rely on sirens or bells to summon fire-fighters. The Alert could be used in this instance to call only those directly connected with the service, thereby relieving the community as a whole of nervous strain and excitement.

One of the first questions asked by British defense officials of Mr. Sarnoff and Mayor LaGuardia in a broadcast, originating in New York and London following the July demonstration, was whether the Alert would make possible the elimination of their "wailing winnies," the name applied to air-raid sirens. RCA experts believe the Alert would largely reduce the use of sirens.

Many specialized services could be operated on the principles of the Alert, since there is a considerable number of channels available in the sub-audible spectrum. Furthermore, a given portion of the sub-audible spectrum may be used in many separated localities, just as a given radio fre-

quency may be used in different areas throughout the country. It also is true that any radio frequency that provides satisfactory program transmission, whether long wave, standard broadcast band, short wave or ultra-short, will carry satisfactorily sub-audible transmissions.

ALUMINUM SAVED

How industry and the government can work together to save on materials needed for national defense was shown recently when the RCA Manufacturing Company made known that, on one item alone, there have been more than 66,000 pounds of aluminum conserved by the substitution of steel in the manufacture of radio receiving set cases for the Army.

The suggestion that the use of steel be extended where aluminum previously had been used, was made some time ago by the Signal Corps Laboratory, at Fort Monmouth, N. J.

At the present time, RCA has on order a large number of receiving sets to be completed by 1942 for the Army.



Arthur Van Dyck, H. B. Deal and Stuart W. Seeley, of RCA License Laboratory, look on as NBC engineer H. E. Kenny operates Alert transmitting equipment.

A Variety of Music for a Variety of Moods



VICTOR RECORD

Musical Smart Sets

Including:

Artie Shaw

The most sensational hits by this fabulous young man of music, and his super-orchestra. Fresco; Begin the Beguine; Star Dust; Back Bay Shuffle; Dancing in the Dark; Traffic Jam; Moon Glow; Serenade to a Savage. Album P-85.

'Round the Camp Fire

"Texas" Jim Robertson, the famous radio ranger, in the cream of his cowboy ballads. Home on the Range; The Cowboy's Dream; O Bury Me; Not on the Lone Prairie; In Texas for the Round-Up in the Spring; Red River Valley; The Border Affair; Ridin' Old Paint; The Texas Song. Album P-81.

Tangos by Xavier Cugat

A companion album to the Maestro's collection of "Rumbas". Jabonise; Tina; Inspiration; Medias de Seda; La Cumparsita; Caminito; Dusk; Gypsy Airs. Album P-83.

Only \$2.50 each

To hear Victor Records at their best, play them on the new RCA Victrola

The World's Greatest Artists are on

VICTOR RECORDS

A Service of the Radio Corporation of America
In Canada: RCA Victor Co., Ltd., Montreal

"MAGIC BRAIN"

New Automatic Record Player Provides 2 Hours of Uninterrupted Music

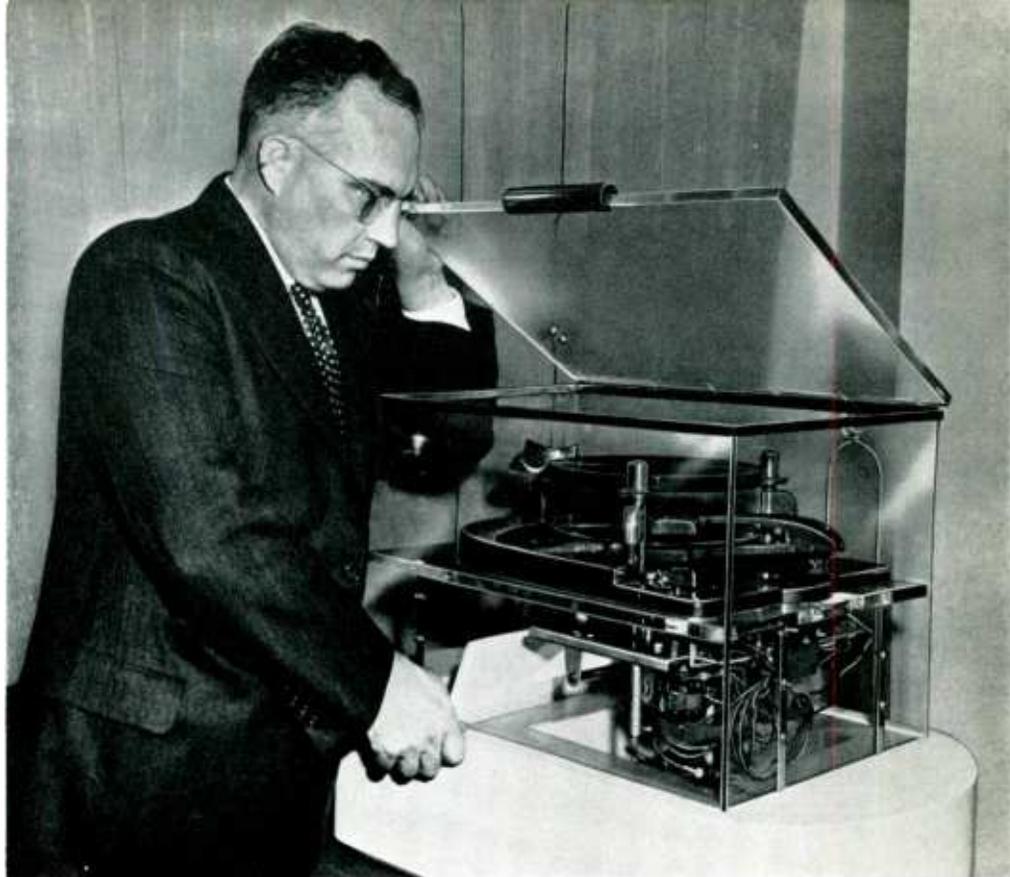
BASING their interpretation on the avalanche of press clippings that is still rolling in, the Press Division of RCA Manufacturing Company, Camden, N. J., reports the new "Magic Brain" RCA Victrola has won greater and more enthusiastic public acceptance than any other RCAM product has in many years.

The "Magic Brain," which provides two hours of uninterrupted recorded music at the touch of a button, was introduced this Summer at press previews staged simultaneously in six key cities, New York, Philadelphia, Chicago, Kansas City, Atlanta, and San Francisco. The press gave it critical acclaim, and as it began to appear in the show-rooms of dealers the public who saw it was equally responsive.

The new instrument, with its Tandem Tone Arm, is a revolutionary type of automatic record changer. Its mechanisms eliminate the use of old fashioned needles, extend record life indefinitely, and set a new standard in tone quality for home devices. The Tandem Tone Arm plays both sides of a record without turning it over, and as many as fifteen records may be played without attention after the instrument has been started.

Major Advance

Combining several important developments perfected by RCA research engineers after many years of study and experiment, the "Magic Brain" is said to represent one of the major advances in the 43-year history of the RCA Victrola. Among the new features are the Magic Tone Cell (the pickup cartridge), the Flexible Tone Bridge, and the Jewel-Lite Scanner. These developments, together with other improvements, produce a quality described as never before attained commercially.



B. R. Carson, RCA Victor design engineer, inspects his newest device, the "Magic Brain" Victrola

The Tandem Tone Arm actually is two arms and two pickups, one for playing the top and the other for playing the bottom of a record, and is shaped something like a tuning fork. After the bottom record of a stack has been dropped to the turn-table, the tone arm plays the top side, swings clear while the direction of the record is reversed, then plays the bottom side. After both sides of the record have been played, the tone arm swings away while the record is deposited gently in a felt-lined compartment and a new one drops into place.

The Magic Tone Cell, secret of the instrument's remarkable tone quality, is an important part of each tone arm. It is composed of the Flexible Tone Bridge and the Jewel-Lite Scanner. The tone bridge is a fine wire filament scientifically designed to eliminate at the source all objectionable needle chatter. This in itself is a tremendous forward step, engineers say, because until now needle chatter has been one of the biggest negatives remaining in the reproduction of recorded music. The scanner is a carefully ground sapphire point which replaces the needle.

The perfectly balanced Magic Tone

Cell exerts a minimum of pressure on the record and this, combined with perfect tracking, avoids needle chatter and assures indefinite life for the sapphire point and the record.

The Magic Brain has been built into the 1942 RCA Victrola Model V-225, which is housed in a Chippendale style cabinet. Radio features of the instrument also are of the most advanced design.

Designed by Carson

Many of the Magic Brain's new developments are incorporated in other less expensive Victrola models.

B. R. Carson, RCA Victor engineer and designer of the Magic Brain record changer with Tandem Tone Arm, has been responsible for the design of all RCA Victor automatic record changers since 1924. During his connection with RCA, Mr. Carson has greatly improved the performance of automatic record changers and consistently designed new models that result in simpler operation and reduced manufacturing costs. In addition to these important contributions, he is also the designer of a 16mm projector and a transcription turntable bearing the RCA trademark.

RADIOPHOTOS FROM RUSSIA

RCAC Scoops World on War Picture
Transmission in Tests with Soviets

APPEARANCE in the American press on July 9 of Soviet war photographs marked a new era in international radiophoto transmission and reception. On July 8, the first radiophotos ever transmitted directly to the United States from the Union of Socialist Soviet Republics were received in New York by R. C. A. Communications, Inc.

Traveling across 4,615 miles between Moscow and New York, passing through one of the most turbulent magnetic regions in space, the radiophotos came as a surprise to newsmen. Only a week earlier, the magazine Newsweek commented on the dearth of news pictures from Russia, said that in the absence of radiophoto equipment in Moscow arrangements were being made to bring out pictures by plane over a round-about route.

Meanwhile, RCAC, aware of Russian efforts in the radiophoto field, was cooperating in arrangements to set up a series of tests between Moscow and New York. Concrete results in the form of pictures of good quality came on July 8, and RCAC immediately made them available at no cost to news photographic services for distribution to the American press. The three pictures released on the first day showed Russian soldiers examining a German plane shot down over Soviet territory, Russian motorcycle troops moving up to the front, and a trio of Russian infantrymen.

Further tests, looking toward the establishment of regular commercial radiophoto service between Moscow and New York, were carried out by RCAC from July 8 to July 17. On the latter date, RCAC, following negotiations with Moscow, filed a commercial tariff schedule with the Federal Communications Commission.

RCAC pioneered the development

of radiophoto, and has made remarkable technical progress in the art since transmitting the first pictures by radio from London to New York in November, 1924. Indicative of this progress is the fact that radio pictures, once easily recognized by streaks or lines, now appear unfurrowed and well-defined. They reproduce as standard half-tones, and it is difficult to know whether or not they were transmitted and received by radio.

Established radiophoto circuits maintained by RCAC link New York with London, Berlin, Buenos Aires, and San Francisco with Tokyo. There also is an American trans-continental circuit between New York and San Francisco. Photographs are received by radio at a speed of about one linear inch every two minutes.

News commentators point out that, in contrast with the speedy radio transmission of photographs today, during World War I, when radiophoto did not exist, days and often weeks were required to get photographs from Europe to the United States by boat.

U. S. BUYS MICROSCOPE

The National Bureau of Standards of the U. S. Department of Commerce has purchased an RCA electron microscope for use in its laboratories at Washington. The instrument will be used for various purposes, among them being determinations of particle size and shape of ceramic products such as clays, cement, and hydrated lime, and for the study of the nature of hydration products of hydraulic building materials, according to Dr. Lyman J. Briggs, Director of the National Bureau of Standards.



Radiophoto receiving apparatus at RCAC, New York



Radiophoto of Soviet soldiers received in test transmission from Moscow by RCAC.



AP Photo

Aurora Borealis lights up skies over New York in rare spectacle viewed by thousands.

AURORA SPELLS RADIO TROUBLE—

**But RCAC Outwits Elements by Sending
Trans-Atlantic Messages Around "Elbow"**

VISUALLY, the Aurora Borealis is one of nature's most sublimely beautiful and most spectacular displays; but from the short-wave radio communications viewpoint the weird and colorful Northern Lights spell trouble—trouble, however, that can be overcome.

Scientists associate unusual displays of the Aurora, especially as seen south of the United States-Canadian border, with great magnetic storms, which erupt from the sun. The more powerful the magnetic storm, the greater the interference to short-wave radio.

So, prepared as they were by their own bag of scientific tricks, the men of R. C. A. Communications, Inc., outwitted the elements on September 18, when a severe magnetic storm struck

the earth making the Northern Lights vivid in New York, even along the gay white way. Long observation has indicated that during magnetic disturbances, short waves traveling north and south are subject to less interference than are east-west or west-east waves.

Taking advantage of this phenomenon, RCAC flashed its messages from New York to London via Buenos Aires, involving a detour of 12,000 miles. Since radio waves travel with the speed of light, the detour around the "elbow" meant no appreciable loss in transmission time. Another "ace-in-the-hole" for RCAC was their long-wave alternators of World War I fame, located at Rocky Point, Long Island. Magnetic storms usually have

a minimum effect on long waves, and throughout the recent, as well as other disturbances, these veteran transmitters helped to keep open the trans-Atlantic radio lanes.

Although there are many popular explanations of how and why the Aurora Borealis occurs, the one offered as the result of the latest scientific study involves the actions of streams of electrically charged particles, possibly protons and electrons, from the sun. These particles, it is believed, strike the atoms and molecules of the earth's outer atmosphere and, in so doing, strip off electrons, thereby producing colorful luminescence. The discharges from the sun are attracted toward the earth's north and south magnetic poles.

RADIO AT SEA

Radiomarine Is Ahead of Schedule on Ship Building Requirements

FORESEEING three years ago the demands to be made upon the radio industry by the U. S. Maritime Commission's plans for expanding the American Merchant Marine, Radiomarine laid its keel accordingly. Research and engineering development facilities were expanded, manufacturing space was enlarged, personnel was increased and trained for the high degree of perfection required for the most modern marine radio production.

The result is that Radiomarine has been able to operate at a greatly increased tempo. Past orders have been delivered in advance of contract agreements. Orders for future delivery have been accepted in the full knowledge that, subject to the availability of materials, it will continue to stay on top.

Statistically, the story is:

Of 392 vessels of the "C" class contracted for by the Maritime Commission, Radiomarine is radio-equipping 350. The majority of these ships are of the cargo type.

Eighty-eight T2 type tankers, under construction by the Sun Ship Company, are to be radio-equipped by Radiomarine.

Forty Standard Oil Company of New Jersey tankers are being equipped with special life-boat radio installations.

Large amounts of marine radio equipment are being built by Radiomarine for the United States Government.

Great advances have been made in recent years toward increasing the safety and efficiency of shipping. Since radio is the only known method of communication over considerable distances at sea, it is an indispensable adjunct to ships of every type; hence, the importance of every improvement

radio science contributes to communication.

The contrast is sharp between the old spark-type transmitting and receiving equipment of World War I days and the new electronic devices of today. A typical Radiomarine installation on a cargo vessel now consists of the following:

A 200-watt main and emergency radiotelegraph transmitter, operating on the intermediate frequencies of 355-500 kilocycles. This unit is used for all normal operations.

A 200-watt short wave transmitter, covering the range of frequencies from 4,000 to 22,000 kilocycles, which is used for long-distance communication.

An intermediate frequency receiver, 15 to 600 kilocycles.

A high frequency receiver, 540 to 30,000 kilocycles.

A radio auto alarm.

A radio direction finder.

With this type of installation, a cargo vessel is prepared to communicate with ships and ports in any part of the world. Adding substantially to the protection of all shipping is the auto alarm, which is always alive to distress signals from other ships at times when radio operators are off duty. In the field of navigation, the radio direction finder of several types is without equal. In a matter of minutes, a vessel so equipped can determine its exact position or the position of another ship. Under conditions of low visibility, the

boat can follow a radio beacon into port.

Equipment on board passenger ships is similar to that of cargo vessels, with the exceptions that the passenger vessel has a separate 50-watt emergency transmitter operating on frequencies from 355 to 500 kilocycles (600 meters distress wave), has one or more life-boats carrying transmitting and receiving units, and does not have to carry an auto alarm. In many cases, the passenger ship is equipped with a radiotelephone, for voice communication between ships and between ship and shore.

In the case of the Sun Ship tankers, special provision is being made to have the 200-watt short wave transmitters cover a frequency range from 2,000 to 22,000 kilocycles. This range includes special bands outside the regular commercial frequencies.

Radiomarine, cooperating with Standard Oil, has developed a new type of life-boat radio unit, by means of which any member of crew or passengers who have been cast adrift can call for help by voice or by radiotelegraphic code if an operator is unavailable. With provisions for radiotelephony and radiotelegraphy, the unit is powered by a hand-driven generator. Instructions for its use, including how to tap out the international distress signal in code, are provided in the unit's cabinet, which is durable and water-proof.

Expert workmen at Radiomarine, New York, turning out precision radio instruments to be used in the nation's great ship-building program.





NBC Listening Post Staff at Bellmore, Long Island. Below right—Monitor uses map of Russian battle front to follow news broadcast from Europe.



"LISTENING POST"

NBC's Radio Ears Keep Tuned to 1941
Tower of Babel; Relay News to Networks

RADIO ears "the better to hear with" are functioning night and day for the National Broadcasting Company on both the East and West Coasts, keeping the American radio public abreast of the air-filling war of words emanating from Europe and the Far East.

Since its dedication in late July before 150 newspaper and radio men, the NBC "Listening Post" at Bellmore, Long Island, former site of the WEAJ transmitter, has been made one of the most sensitive short-wave receiving stations in the world.

Raymond F. Guy, NBC radio facilities engineer, reports that the installation of rhombic type receiving antennas at Bellmore has increased the effectiveness of the unit by a ratio of 10 to 1. Signals from distant lands are reproduced with a clarity equal to those of nearby local American stations.

The new antennas, diamond in shape and 250 feet in length, are mounted on poles rising 60 feet above the Bellmore site. They are pointed in the direction of the overseas stations they cover. One is especially designed for picking up broadcasts from Rome,

Moscow, Paris, Madrid, Lisbon, Berlin, Ankara, and other European stations. Another is directed toward the Free French transmitter at Brazzaville, French Equatorial Africa, and a third points to the Orient, including such places as Tokyo, Chungking, Shanghai, the Dutch East Indies and Siam.

Tuned constantly to Far Eastern short-wave broadcasts is NBC's similar Listening Post at North Hollywood, Calif., which was dedicated in August.

A battery of eight short-wave receivers operates in the building on the Bellmore site of 26 acres. A staff of 24, of which 12 are foreign language experts and 12 are engineers, is in attendance. Minimum qualifications of a monitor, according to Jules Van Item, chief of the post, include a thorough familiarity with at least four foreign languages. Altogether, the staff is capable of understanding and translating 22 different languages.

In operation, the post is connected with NBC's Radio City headquarters by teletypewriter circuits, private telephone lines, a microphone circuit, and

a program transmission line. Electrically operated devices record monitored broadcasts for piecemeal play-back and translation. Translated, the text of an address, an official communique, or a news report is relayed at once over the teletypewriter circuit to Radio City, from where it is put on the air and made available to the press.

Speaking at the dedicatory ceremony of the post, Niles Trammell, president of NBC, said:

"Radio waves, unless harnessed, as in our democracy, for the entertainment and public services of its people can be as deadly to morale as bullets are to bodies. Britain, in the early days of the war, watched as her friends and allies weakened, became confused, and were split by the barrage of radio propaganda from Berlin. We can profit by those mistakes. American radio is ready and trained for this barrage, if it should ever be directed at us. Careful planning, long study have taught us to differentiate between news and propaganda, between fact and fancy."

PENETRATING NEW WORLDS

Experimental High Voltage Electron Microscope Permits Exploration of Thicker Materials

EXPLORATION of thicker materials and organisms than have previously been suitable for inspection under the electron microscope is the object of the experimental development in the RCA Laboratories of a 300,000-volt microscope. Operated at approximately five times the voltage previously used, the instrument has enabled much deeper penetration into the sub-microscopic world.

The electron microscope as developed by RCA permits useful magnifications fifty times greater than is possible with optical instruments, because electrons—infinitesimal bits of electricity—are used in place of light rays. Magnetic and electro-static fields replace glass lenses. Thus, with the electron microscope, a blood corpuscle may be enlarged to the size of a two-foot pillow; a human hair to the size of a giant California redwood tree.

Development of the new high-powered microscope, which makes it possible for the electronic "eye" to penetrate objects two to three times as thick as heretofore, has been in progress in RCA Laboratories for many months, under the supervision of Dr. V. K. Zworykin, James Hillier and Arthur W. Vance. The goal of their early work in development of the electron microscope was to obtain maximum resolving power and to simplify and improve construction, so that a practical instrument could be designed to plug into an ordinary light socket for operation. This they did.

The experimental use of potentials as high as 300,000 volts does not increase the resolution of what may be seen through the electron microscope. However, it does make it possible to see internal details of some specimens to better advantage. It also may permit study of cell tissues to a greater extent than previously has been pos-

sible. It is expected that the use of these higher voltages will be applicable particularly to the fields of biology and bacteriology.

The higher voltage causes the electrons to travel with two to three times the velocity of the commercial instrument. The increased velocity provides the greater penetrating power.

"A series of micrographs of an ordinary blood smear on collodion were taken at 50, 100 and 200 kilovolts. The exposure times of the negatives and the prints were adjusted so that the intensity in the image of the clear space in the specimen is the same in each case. The red cells and the thick serum appearing in the micrograph taken with 50-kilovolt electrons were completely opaque, while with 200-kilovolt electrons they were transparent. . . . A comparison between the micrograph of bacillus megatherium taken with 50-kilovolt electrons and the same group of organisms with 200-

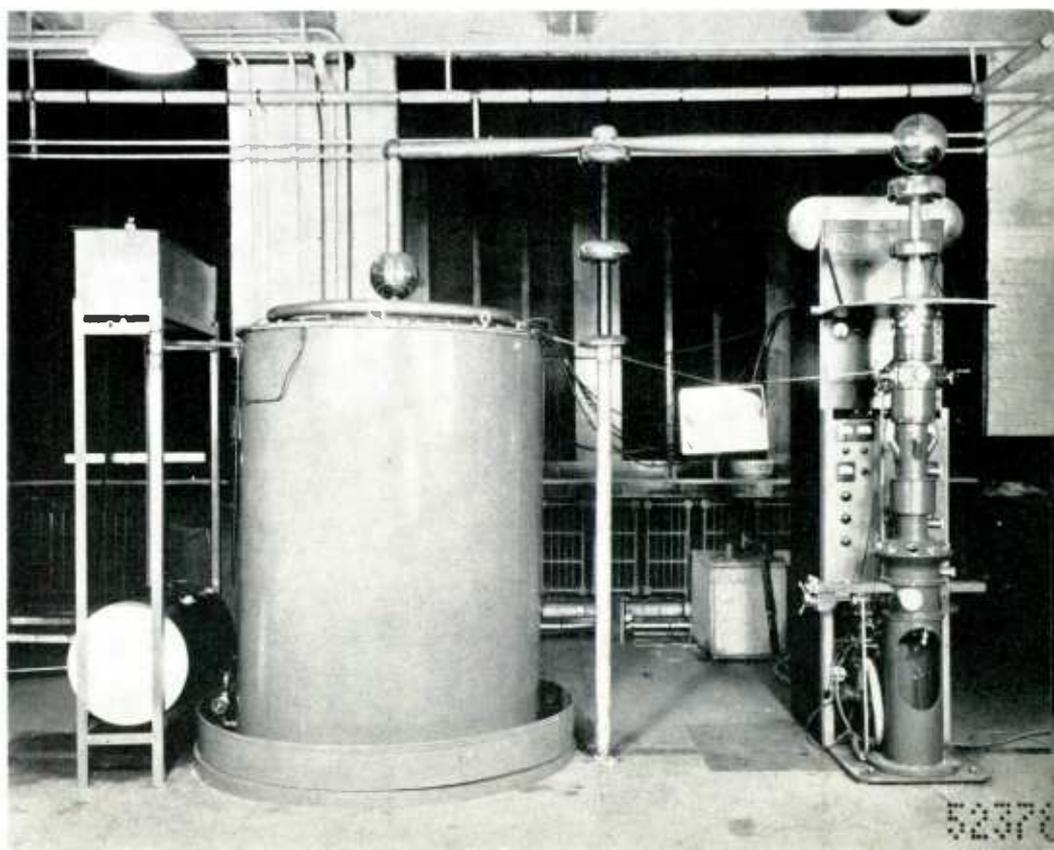
kilovolt electrons shows that a considerable amount of structure becomes differentiated in the inner part of the organisms when it is viewed by 200-kilovolt electrons."

Describing preliminary results from operations with the 300,000-volt instrument, Zworykin, Hillier and Vance report:

"While it is not yet possible to describe any quantitative results obtained with the new installation, it is possible to show a few examples of the results that are being obtained, and which demonstrate the increase in penetration obtained with the use of higher accelerating potentials.

Development of the high-voltage electron microscope has been an experimental project, with no immediate plans for commercialization. The project is one of a series being conducted by RCA Laboratories to determine new methods and applications for the instrument.

RCA Laboratories' experimental 300,000-volt electron microscope. Large tank contains generator. The microscope column and cabinet are at right.





Guglielmo Marconi, with apparatus he used in Newfoundland for first test reception of trans-atlantic radio signal. At right is G. S. Kemp holding, in 1926, the kite used by Marconi in Newfoundland in 1901.

RADIO ACROSS THE ATLANTIC

By George H. Clark

FOR forty days and forty nights it rained—for forty years now there has been wireless across the Atlantic!

Radio celebrates the fortieth anniversary of the first trans-Atlantic signal on December 12, for it was at noontime on that memorable day in 1901 that Marconi listening-in with a receiver connected to a kite antenna, high above the Grand Banks of Newfoundland, heard the letter "S" flashed from Poldhu, on the southwest tip of England.

The world just couldn't believe it. Marconi knew they would find it difficult to comprehend; modestly, he hesitated to announce the big news, and it did not reach the press for several days.

Said Edison, "If Marconi says it's true, it's true." And Pupin, when consulted by those who couldn't believe it, said, "Faintness of the signal has little to do with it; distance was overcome".

The real accomplishment of Mar-

coni's successful test lay in proving the invalidity of the theory, then held by scientists, that wireless waves spread out in straight lines—much the same as the quasi-optical waves used today in ultra-short-wave signalling do—and, therefore, no signals could be received if a "wall" of water or of land intervened between sender and receiver. Such a barrier, 160 miles high, stood between England and Newfoundland. Certainly this could not be hurdled!

Fact disproved theory. The spreading waves followed the contour of the earth, and thus it was that for the first time in history the possibility of long-distance communication by wireless became a proven fact.

Marconi undertook a gigantic task when he built a station at Poldhu, Cornwall, England, equipped with a spark transmitter, the power of which was about 12 kilowatts, the wavelength approximately 1,000 meters. He was pitting his faith against the dicta of the scientists; he was venturing into a new land, where static dis-

turbances were commonly of an intensity which he had never known in his experiments prior to this time; he was to experience fading, and other phenomena of which he knew nothing.

Had Marconi taken with him to Newfoundland only his standard apparatus, especially the coherer, he would have failed utterly, for the tape reception from this sensitive little tube would have been one dash twenty-four hours long; it was merely the chance inclusion of the new microphonic detector with telephone reception that made "S" decipherable from the mysterious and continuous dots and dashes of nature. Fortunate, indeed, was he in obtaining success; had it been otherwise, the progress of radio's development probably would have been retarded a number of years.

Nor were other factors in his test too favorable. Unwilling to spend the vast sum necessary for a tall mast for his receiving antenna, he tried to support this slight wire by a Baden-Powell kite, and this was almost as tempera-

mental as the coherer. Had the wind been a gentle English breeze, the kite would have been manageable, but the gales over Newfoundland were almost impossible to conquer with this flimsy device of bamboo and linen. Balloons, also tried, failed completely.

There was only one element in the entire test which was on the side of success, and that was Marconi's persistence. He listened for hours when nothing intelligible could be deciphered; at last and for a few minutes only, he heard the unmistakable low whine of Poldhu. Even then he insisted on verification, handed the telephone to his assistant, Kemp, asked him if he heard anything. Kemp listened, and at last said: "It's Poldhu. I would know that sound anywhere". Only then did Marconi admit that he had heard the signals before Kemp had taken over the task of listening.

Static has not changed its nature since those days, and anyone who wishes to know what Marconi experienced may go to Newfoundland today,

install an aerial 400 feet high, connect it to a single-circuit receiver with a coherer as detector, then tune in to some European station sending on approximately 1,000 meters. The tape or oscillograph record which he will obtain will be as undecipherable to him as were Marconi's indications, even though the station sending be 100 kilowatts in power instead of one-tenth of that power.

If our modern experimenter wishes to get more of the "atmosphere," as well as the atmospheric, he may even dispense with a steady antenna held aloft by a mast or tower, and use, instead, a wildly gyrating wire held aloft in a Newfoundland gale by a Baden-Powell kite. Compensating from moment to moment for the changes in the constants of this "variable antenna," even by tuning a single circuit only, will add a little zest to the search. And if such a kite may not be easily obtained in the market, RCA still retains one of these in its museum collection!

RCA REVIEW

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"V" IN RADIO

New Victory Symbol
Long a Key Signal in
Communication Tests

V the symbol of victory, is spreading in the air around the world.

Flashing as three dots and dash, "V" was on the wavelengths in 1918. Now it is a spoken letter and is seen on television screens as well as being keyed in the radio code. As a sign of the times, "V" in these modern forms is emblematic of the contribution radio science has made to communications in the past two decades.

Radio, coupled with electronic research, has made it possible to speak and to see the "V" by radio. Science has lifted this symbol of victory from the staff of Beethoven's Fifth Symphony and from the wireless code to

send it afar to anxious ears everywhere, and to eyes beginning to behold the magic of television.

"V" always has been allied with radio. It's the test or warming-up signal—a cue for tuning in a station about to go on the air. As such it has marked many an advance in radio, for as new records were established the station participating in the experiment sent a stream of "V's". As the forerunner of new long-distance records in communication, the "V" tapped in advance enabled operators to tune their receivers sharply for the historic message.

Veteran radio men recall that day in 1919 when the U.S.S. *George Washington* with President Wilson on board bound for the Paris Peace Conference, sent a 600-word message, while entering Brest Harbor, and every word was plucked from space on the Maine coast. That was a victory for science over an ethereal trail blazed by "V".

Such "V's" became signposts. Today, a ship, no matter its latitude and longitude on Atlantic or Pacific, may

send its messages directly into New York, the communications center of the world. Short waves and the vacuum tube are the soldiers that have won these victories for science.

It was in 1919, too, that the U. S. Navy, a pioneer in radio development, sent its radio-equipped flying NC-boats hopping off on the first trans-Atlantic flight. They proved beyond all doubt the value of radio in trans-oceanic flights. Since then research has lightened the radio load, made the apparatus compact, efficient and far-reaching; the airmen may fly blind by radio—they have radio instinct! And so today, because of scientific research, the great Clipper planes are never out of touch with land as they follow the radio beams far out to sea.

No wonder, then, that "V", so vibrant in space ever since the advent of wireless, should now be echoing and re-echoing in space, while more than 50,000,000 American radios and millions of listeners all over the earth hear the "V" and see it as the symbol of victory; a symbol of truth.

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all out for National Defense!

Radiomarine highly appreciates the fact that the U. S. Maritime Commission and most American shipowners, shipbuilders and yachtsmen have selected Radiomarine equipment and service to fulfill their safety requirements.

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It all started in a tent...

AGAINST the horizon of "the spires of Princeton," the world's largest radio research laboratories are to be built by the Radio Corporation of America at Princeton, New Jersey.

The new RCA Laboratories, to be completed before the year-end, are planned to promote the growth of radio as an art and industry, and to meet the expanding demands of national defense. Several

hundred research experts and engineers will coordinate their efforts to create new products and services, and improve existing ones, in all fields of radio and electronics.

The march of progress which has led to Princeton started back in 1919 when the first RCA laboratory was located in a tent, later to be augmented by a shack 15 feet square at Riverhead, L. I. From

that humble beginning, with public service as the watchword, RCA has pioneered in radio manufacturing, international communications, marine radio, broadcasting, sound reproduction and television. Through continuous research it has discovered keys that have unlocked new doors of radio science, and has extended the usefulness of radio into many realms of public service.

Now, RCA research experts on a united front at Princeton are to take another historic step to enhance America's preeminence in radio, and to increase the services of radio to the Government, to the people of the United States and to industry.



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