

Dupe

RADIO AGE

RESEARCH · MANUFACTURING · COMMUNICATIONS · BROADCASTING

v. 2 - no 3



APRIL

1943



ALTITUDE: 40,000 FEET

Inside this new RCA plastic altitude chamber, aircraft radio equipment is taking a ride at 40,000 feet. As the pressure drops inside the sealed, transparent walls, expert eyes observe every part of the radio mechanism. Defects in design, details of faulty construction that would remain hidden until actual high-altitude flights, can be noticed at a glance *right on the ground*—and corrected *before* the radio is installed in a plane.

For pilots it means greater safety,

better performance, *dependability*—where failure of the radio equipment might mean difficulty for a courageous crew.

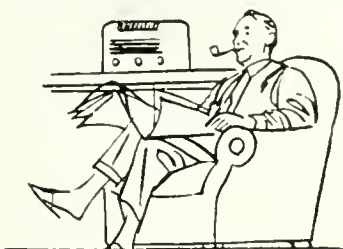
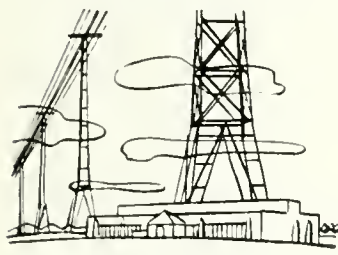
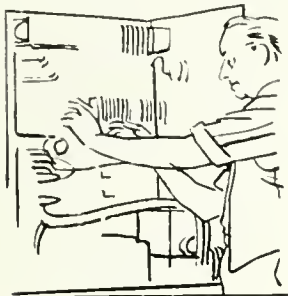
RCA's new all-plastic test chamber represents another step forward in aviation radio research. Because it is entirely transparent—it enables engineers to study the *whole* set at once, to check for high altitude flash-overs and leaks at the same time, to look for tuning shifts and "breathing" parts in the set simultaneously.

This most advanced of high-altitude test chambers is typical of RCA's many facilities for aviation radio research. Today that research has but one goal—to help make America's armed might in the air the most powerful and effective flying force in the world. From that war-time research will come the knowledge, the skills, and the technique that will help *keep* America's wings the mightiest and most useful known to man.



RCA AVIATION RADIO

RCA Victor Division • RADIO CORPORATION OF AMERICA • Comden, N. J.



COVER—This striking photograph made by Ray Hutchens of R. C. A. Communications, Inc., shows one of the long-wave antenna towers, used with Alexanderson alternators, at RCAC's Rocky Point, L. I., station.



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VOLUME 2 NUMBER 3

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RESULTS OF WAR-TIME RESEARCH IN RCA LABORATORIES, PRINCETON, N. J., ARE POINTING TO NEW RADIO-ELECTRONIC SERVICES IN PEACETIME. HERE, A. P. SCHAEFFER OF THE LABORATORIES STAFF REMOVES DEVELOPMENTAL TUBES PARTS FROM A HYDROGEN ATMOSPHERE FURNACE AFTER FIRING.

Radio Research Points to Future

WAR-TIME WORK IN RCA LABORATORIES AT PRINCETON ENABLES SCIENTISTS TO ENVISAGE NEW RADIO-ELECTRONIC SERVICES FOR ALL MEANS OF TRANSPORTATION AND MOBILITY



By E. W. Engstrom

*Director,
RCA Laboratories, Princeton, N. J.*

IN THIS war, much reliance has been placed upon scientific accomplishments. The span from research conception, through embodiment into instruments of war and production for mass use at the battlefront, has been shortened. The pressure is constant to provide some unique and useful tool of warfare. It is natural then that we have several "battlefronts"—research, as one, with the several stages which follow.

In research, we are matching our resources against those of our enemies. There is now ample evidence

to know that we are steadily and surely on the "offensive." Among the United Nations, there has emerged a gigantic research program, relentlessly working on the home front, creating tools to out-see, out-hear, out-wit, out-shoot and out-fight our enemies. In this effort, the industrial research laboratory has, and is doing, an outstanding job. Good as the job has been, a larger job remains to be done and research for this is now pressing forward.

Much of this research activity has centered in fields of radio, electronics and acoustics. This has been called a radio war. Surely radio and its closely allied fields have a most important part in the planning and actions. Radio and its manifold uses can determine the outcome of an encounter. It ranks, in importance, with fire power against the enemy. As we look back at our peace-time research in radio for communication and entertainment, in television, in facsimile, in electronics, in acoustics and in the multiplicity of the newer offsprings of radio, it may be seen that the conversion to war purposes was in some instances direct application and in others application of techniques. These projects and tech-

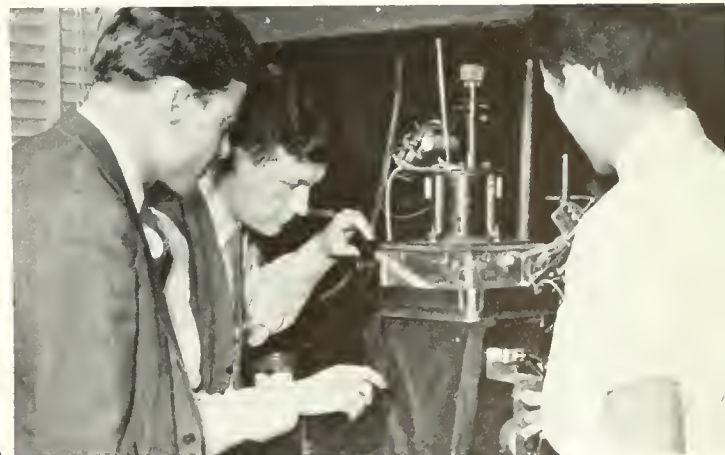
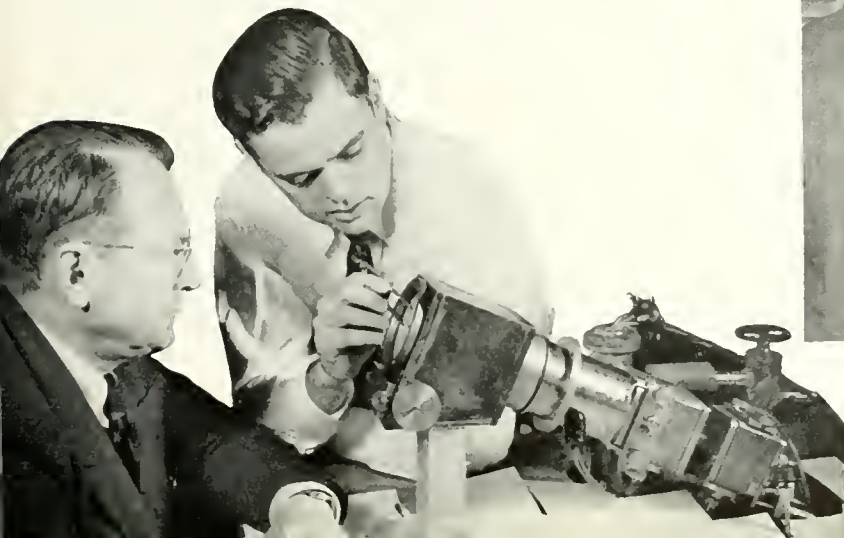
niques all, with certainty and resolution, did march to war.

During peace-time, RCA kept the Army and Navy advised of research having possible military applications. A change-over in objectives for RCA research toward war uses began during 1939. The change-over gained impetus during 1940. By 1941, the major effort was toward war projects and late that year was all toward that end. With thinking directed to possible military uses, as our peace-time research progressed, the conversion to an all-war program was direct and effective.

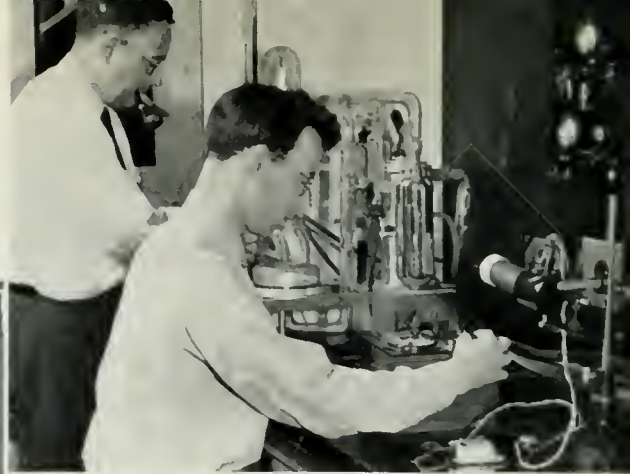
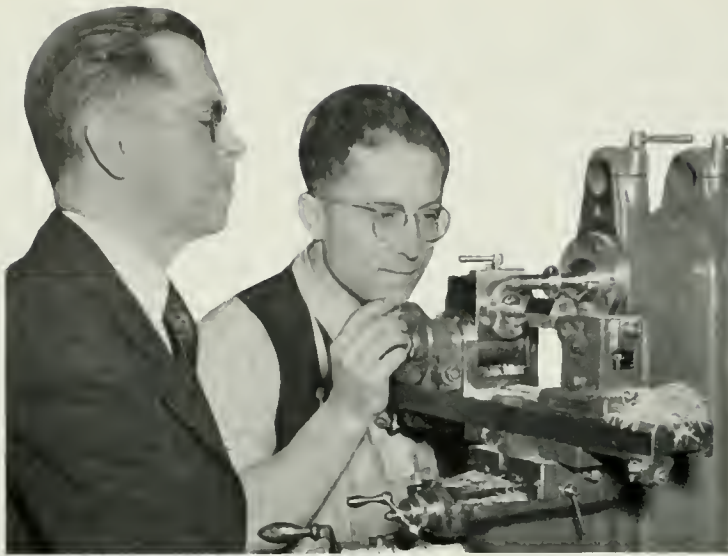
War increased tremendously the research efforts in a variety of fields. This has been brought about through expansion of existing laboratories and establishment of new laboratory groups. When the "will it aid in the war?" test is applied, it is natural to expect emphasis to fall into more restricted classifications than during a peace-time program. Again, with pressure being

THESE THREE RCA SCIENTISTS, B. J. THOMPSON, DR. F. H. NICOLL, AND F. E. WILLIAMS DISCUSS SET-UP USED IN TREATING GLASS TO MAKE IT NON-REFLECTING.

DR. V. K. ZWORYKIN (LEFT) AND DR. JAMES HILLIER AT WORK ON THE DESK-SIZE RCA ELECTRON MICROSCOPE, WHICH IS EXPECTED TO BE IN GENERAL USE SOON AFTER THE WAR.



[RADIO AGE 3]

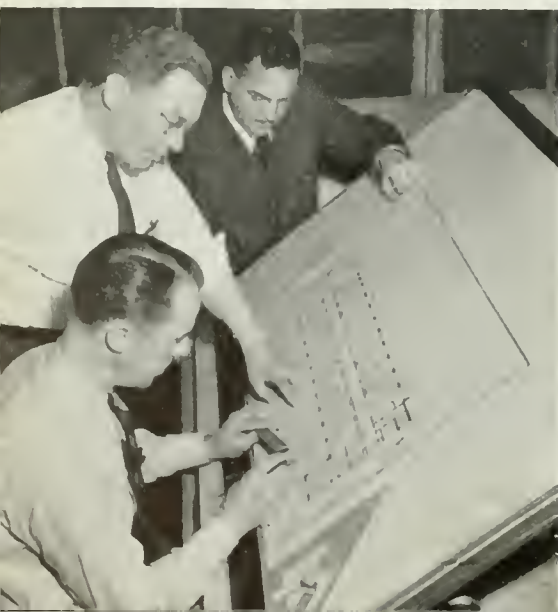


A DEMOUNTABLE VACUUM SYSTEM IS BEING USED AT RCA LABORATORIES BY DR. G. H. MORTON AND R. R. GOODRICH IN THE STUDY OF AN ELECTRONIC PROBLEM.

IN THE MODEL SHOP AT PRINCETON, SCIENTISTS SEE MANY OF THEIR IDEAS TAKE PHYSICAL FORM, F. L. CREAGER AND J. R. DUNPHY CHECK ON A MILLING MACHINE OPERATION.



DR. R. R. LAW (LEFT) AND J. E. MC COOL PREPARE THE GLASS PARTS OF A HIGH-SPEED MERCURY PUMP FOR USE IN WORKING OUT A RESEARCH PROBLEM.



applied toward useful results in the shortest possible time, some of the completeness and finesse of a normal research schedule may be short-circuited. What might take years is compressed into months for many projects and this is as it should be during war. Individuals doing research and research organizations have been quick to see the need and have responded to the challenge with a determination that presages success in advance of the final accounting.

Application of continuing research is all to war projects. Peacetime services continue essentially status quo or are completely arrested and set aside. We look forward to the day when our war job will be done and we may again direct our research to direct benefits of mankind. Today, we can but plan and visualize that which we will do tomorrow. Just as surely as research is important and necessary in the prosecution of the war, so will the present increased program of research be important and necessary when converted to new objectives in the working out of the peace.

Radio, in the past, has been a means of transmitting speech and other intelligence from point-to-

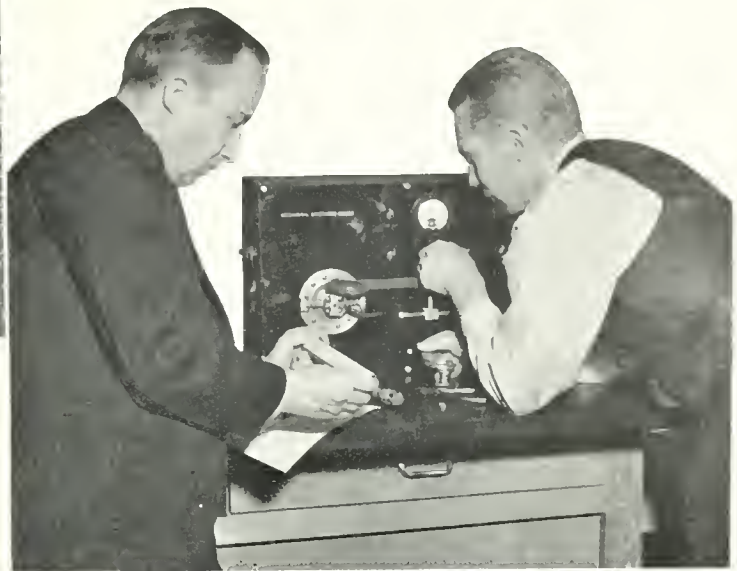
point or broadcast. As a means of control and of navigation, its uses have been restricted. Just before the war research in very short waves (radio) was pointing the way to many specialized uses. After this war, the practical applications of these results will expand quickly to all means of transportation and movement. Aeroplanes, ships and ground vehicles will "see" in all weather conditions and tracks for their movements will be "rails and channels" of radio. Planes, ships, motor vehicles, etc., may come and go in safety without regard to weather, obstacles or possibility of collision — radio and electronics, through their broad realm of application, will make this possible.

Electronics will rapidly assume new roles—some now clearly known and others scarcely visualized. We will count and compute by electronic methods. We will see by visible and invisible light; through electronics, things near at hand or far away, things possible to view by eye and things impossible to view directly, or by any means known in the past, will be made visible to man. The electron microscope is an example of the power and promise of electronics. Just as the electron microscope opened new frontiers in fields

F. E. GRESWOLD, J. J. MC NEILL, AND L. MAC CLASKEY WORK AT THE DRAFTING TABLE TO SOLVE A LABORATORY LAYOUT PROBLEM.



AS MISS E. C. FOWLER (BACKGROUND) ASSEMBLES SPECIAL TUBE STRUCTURES, E. W. HEROLD AND MISS J. V. TRUSKA DISCUSS A TUBE CONSTRUCTION PROBLEM.



USING A NEWLY DEVELOPED DEVICE KNOWN AS A MECHANICAL IMPEDANCE BRIDGE, DR. H. F. OLSON AND A. M. WIGGINS TEST AN ELECTRO-MAGNETIC MECHANISM.

of medicine, biology and industrial research, so will electronics open many doors in the future. We shall measure, control and process better through the use of electronic methods in the home, the laboratory and the factory. The future will be studded with a myriad of electronic jewels.

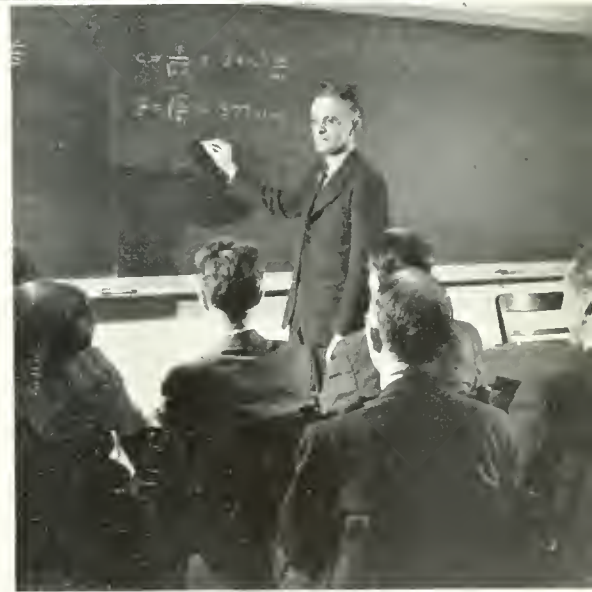
Radio tubes to generate power at radio frequencies have been used mainly at sources for radiating signals through space. Power for manufacturing processes has been reserved for the low alternating currents. Research has shown, and industry now realizes, that alternating current at radio frequencies has unique advantages for many services and performs in many ways not attainable by older methods. Thus, generators of radio frequency will take their places in the factory, in the field and even in the home, to heat and to effect various reactions and changes. Such uses will shortly place much more radio-type power in industry than in all radio communication and broadcasting.

We entered the war with broadcasting at the ultra-high frequency channels and television taking their first steps along the road to public service. These, television particu-

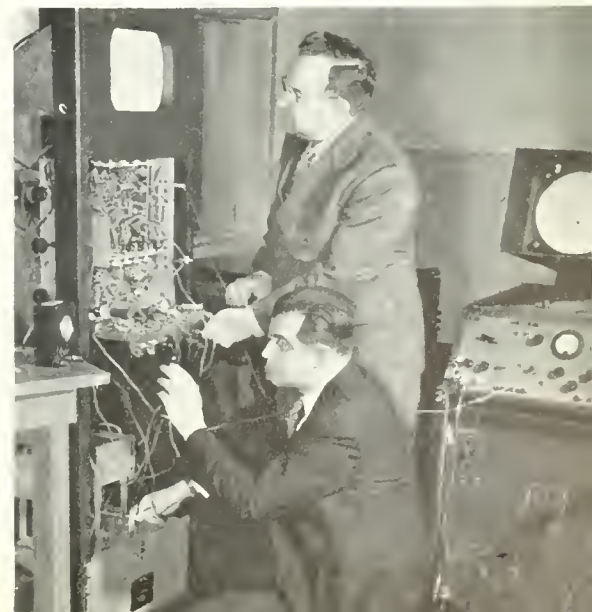
larly, are needed in the post-war period to spur on and to sustain progress and employment. The knowledge gained through years of television research was most helpful in other fields of development for instruments of war; therefore, it is to be expected that war-work will indirectly add to television knowledge and techniques. Because of this, we will be able more readily to add sight to sound, as a radio service.

Thus, while we are driving forward with our war-work, we do have our thoughts on the day ahead, when the war clouds will roll away and we can again undertake the work of our desires. We are conscious of the potentialities of the products and services to come from the researches, now inactive, which will be prime objectives "tomorrow." We dream of the contributions that will be made in the fields of science, culture and just ordinary living, convinced that radio, electronics and acoustics will have an important part. These, and others, are the things that will take form in our research workshop after the war.

Men of science, doing research, like to think of the results of their work as benefits, as progress, as



SCIENTISTS GO TO SCHOOL, TOO. DR. W. D. HERSHBERGER REVIEWS MAXWELL'S EQUATIONS FOR ENGINEERS WORKING WITH WAVE GUIDES AND OTHER TECHNIQUES.

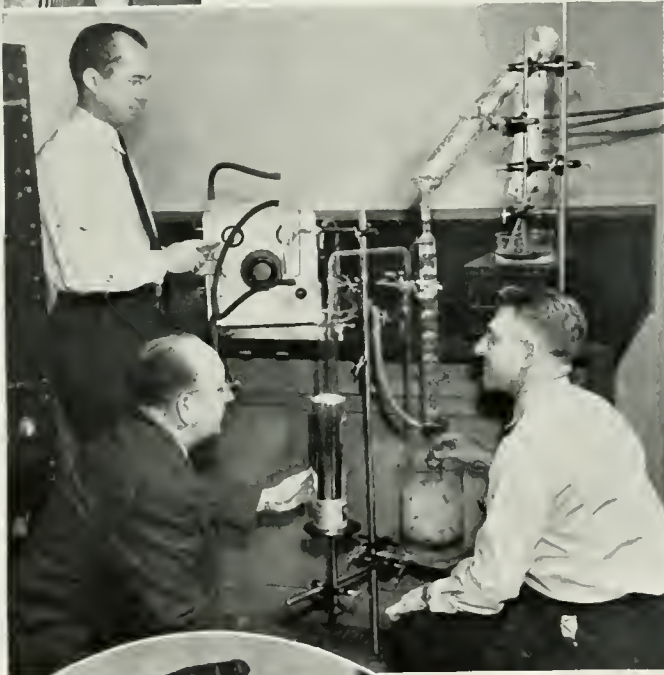


CIRCUITS RESEMBLING THOSE USED IN TELEVISION EQUIPMENT BEING TESTED BY R. D. KELL AND T. L. GOTTIER.



H. G. GREIG (SEATED) AND C. J. YOUNG TEST ELECTRO-CHEMICALLY PRODUCED COLORS FOR USE WITH RADIO FACSIMILE EQUIPMENT AT PRINCETON.

THIS INVOLVED-LOOKING EQUIPMENT IS BEING SET UP BY H. W. LEVERENZ, DR. G. H. BROWN, AND C. N. HOYLER TO UTILIZE RADIO-FREQUENCY POWER IN INDUSTRIAL CHEMICAL PROCESSES.



FROM THIS HIGH-TEMPERATURE FURNACE USED IN METALLURGICAL INVESTIGATIONS OF RADIO CIRCUIT COMPONENTS, C. WENTWORTH AND W. L. CARLSON PREPARE TO REMOVE A TEST SAMPLE.

WITH SLIDE-RULE AND REFERENCE BOOK, INSTEAD OF TUBES AND CIRCUITS, R. S. HOLMES AND DR. I. WOLFF PLAN AN ATTACK ON A RADIO PROBLEM.



things of permanent value to health, to living, to work, to entertainment. Research means change—and to change, without setting in motion sequences of unfavorable results and reactions, requires profound thinking and planning. We realize, during time of war, that all has not been well. For one thing, scientific research for several decades has moved along with ever increasing speed but the sociological aspects have lagged and, as a result, the impacts of new advances and resulting changes have not always been beneficial. We are now in the stage of this war where our thoughts are clearing and where we see the road more certainly. We are at the stage where some are thinking of post-war plans and actions. Research and the changes brought about by research should loom large in this thinking.

We in RCA have much to contribute. We have much of promise to offer to our generation and to pass on to future generations. Research has grown stronger during stress of war. Research can and will continue strong along the road to peace and in the time of peace to follow. The United States and the world need strong scientific research, and a dynamic determination is required to see that the results are applied to the benefit of peoples everywhere. This is both a promise for research and a challenge to research. Now is the time to begin the thinking that will lead to plans and actions for the future.

Women In War Jobs

RCA VICTOR, WITH PURDUE UNIVERSITY COOPERATING, TO TRAIN GIRL TECHNICIANS AS NEED FOR WOMEN WORKERS GROWS



By F. H. Kirkpatrick

*Personnel Planning and Research,
RCA Victor Division*

THAT "infinite variety" of which the poet sang concerning women is being demonstrated anew in a rather startling way by the experience of war production industries in the employment of women at work they have never done before. This hiring has been going on apace for the last year. Up to a short time ago it was on a more or less limited basis, created by the growing man-power shortage. Now the Government tells us that even more woman-power must be employed and that by the end of 1943 we shall have 18,000,000 women in jobs in all industries.

Anticipating this, the RCA Victor Division some months ago initiated a carefully planned, comprehensive program to expand its already considerable force of women workers. While this stepping-up of the proportion of women workers grows out of the war situation, the employment of women represents no change in company policy. In the Harrison plant, for instance, women made up 69 percent of all employees as long ago as 1937. Plans for the employment and training of additional women workers, then, relate to their use in increasing proportions throughout all plants, and in job classifications entirely new to women. These plans

are now in full swing at all six plants of the company: Camden, Harrison, N. J., Lancaster, Penn., Bloomington and Indianapolis, Indiana, and Hollywood, Calif., with variations to fit the different conditions at each plant.

Perhaps our most ambitious program is now in the course of organization. This program is designed to supply us with a force of trained women radio technicians and is being carried out in cooperation with Purdue University in Indiana. The plan calls for a group of eighty girls, between the ages of 18 and 22, to study at Purdue with the curriculum "custom-built" for RCA.

The intensive program at Purdue provides for two terms of twenty-two weeks each. There will be forty hours a week of classroom work or supervised study. At the completion of the course, the girls will be qualified for immediate assignment in our plants for quality control work and as Engineering Aides. The girls will be selected from our own plants and from colleges and universities. Considered employees-in-training, they will be paid a salary while attending school in addition to having their university expenses paid.

Unsuspected Skills

The training activities in operation at our plants, though only in its early stages, have turned up abundant evidence that there were many things industry didn't know about women. One of these things is that they have a world of heretofore unsuspected skills, constituting a storehouse of producing power on which we have hardly started to draw. Among these skills are the ability to do exacting tasks, such as working to very close tolerances. With their delicate sense of touch and supple wrists, they also assemble tiny parts with infinite care, undismayed by the monotony of the work. These characteristics are of



MISS FRANCES R. WHITNEY, WHO HAS JOINED RCA VICTOR DIVISION AS CONSULTANT AND ADVISOR ON THE PERSONNEL PLANNING AND RESEARCH STAFF.

primary importance now, when the nation is at war and must put forth the maximum of its energies to win in the shortest possible space of time. But another discovery has been made of even greater importance in the long run, not only to women, but to the national welfare. This is that women can contribute a great deal to industry in supervisory capacities hitherto denied them, as well as in ideas to improve manufacturing techniques.

The career woman, in other words, is no longer to be monopolized by the professions. There is a place for her in the shops as well as in the offices of industry. There is no limiting "top" to the responsible job open to her. In RCA Victor, as a matter of fact, she is being encouraged in this direction by a systematic upgrading process. Every woman employee is eligible for aptitude tests and personnel analysis. If this shows she might do better at something other than her present job, she is given intensive special training and put to work at the new task.

As a consequence of this, many girls who were doing clerical and stenographic work in the offices a



MISS HELEN BIRCHER (RIGHT), EMPLOYMENT MANAGER AT RCA VICTOR'S HARRISON, N. J., PLANT, INTERVIEWS WOMAN JOB APPLICANT.



MISS MAXINE JACKSON (LEFT) CONDUCTS "VESTIBULE TRAINING" AT RCA'S BLOOMINGTON, IND., PLANT; MISS KAY JOHNSON, ONCE ON THE ASSEMBLY LINE, NOW IS AN INSTRUCTOR FOR GIRL WORKERS AT CAMDEN, N. J.

few months ago are now doing machine operating, sorting, checking or inspection work in the shops. Many others who were operators have become supervisors, forewomen or group leaders. It is likely that this trend will go on in many other directions.

One girl who has recently completed the advanced plant course in radio theory and production looks forward to using that training as a background for radio engineering. She was hired as a repair operator, and after seven months' experience, became a group leader. An assistant foreman in a division engaged in the final assembly of important war equipment is a girl who completed successfully, in the same plant, both the elementary and advanced radio courses.

In a number of instances, women such as these are directing the work of men, and doing it so diplomatically and so well that there has been no resentment. Conversely, many women have been taken from shop benches and machines into research, engineering, educational and personnel work.

In this process, RCA Victor has set up natural ability and personal efficiency as the "selecting screen." At the Bloomington plant, 20-year-old Maxine E. Jackson is conducting "vestibule" training classes in the plant's educational program directed by E. H. Cooper. She came to RCA Victor fresh from high school in 1940, was made an inspector four months later, a group leader in another four months, and was advanced to her present post in

1942. Another woman without formal college training—Miss Helen Bircher—is Employment Manager at the RCA Victor Harrison plant; she started as a factory worker. The Employment Manager at Bloomington also is a woman, Miss Mary Frances Roll. She is a graduate of Indiana University and has taken extension courses in personnel work.

Self-made Women

The foregoing shows that a college education is not absolutely essential in the new world of achievement opening up for women. But this is not to imply that collegiate training has lost any of its unquestioned value. The Senior Interviewer at the RCA Victor Lancaster plant, Miss Mary Margaret Rupp, has done outstanding work in the world of music and education, with post-graduate courses to her credit at Duke and Syracuse Universities. She introduced music courses to the public schools of Pennsylvania, had much to do with the National Youth Administration in the same State and was an interviewer for the United States Employment Service before joining RCA Victor. The Senior Interviewers at Indianapolis are all girls and they come from such universities as Butler, Purdue, Indiana, and Columbia.

These instances are cited not because they are outstanding, but for the reason that the women referred

to sought out for themselves the initial employment with the company leading to their present posts. Insofar as these posts are concerned, they are literally, "self-made women." The point is that the company has now organized procedure to find, employ and train women with equal, but heretofore latent, aptitudes. It is to be naturally expected, therefore, that the next year should show a large increase in the number of "career" women in the RCA Victor Division, and in the importance of their work.

As more and more men leave the company for the armed services, supervisory positions will of necessity become vacant. On the basis of British experience, the company will make no mistake in replacing men with women in first-line supervisory positions. Such women must, of course, be selected on the basis of their technical qualifications and their capacity for leadership. They must have demonstrated both of these qualities as RCA employees.

If RCA Victor consistently uses appropriate tools in the selection and placement of its employees, women with a variety of aptitudes and capacities will be available, as needed, for a variety of jobs. Job analysis is one of the most important of these tools. All jobs must be analyzed by persons competent to describe them in detail, if the qualifications of individuals are to be fitted to the requirements of the

job. In order to match the two, the personal specifications setting forth the duties of the job must be as complete as the job analysis.

No matter how carefully women are selected, we may fail to make maximum use of them unless we remember two other points. Men and women differ not only in muscular strength, but also in emotional and social attitudes. Women also differ from men in that they have had less industrial experience than men, and have, therefore, a lack of mechanical familiarity—not necessarily less mechanical ability than men. The supervisor who recognizes and allows for the natural characteristics of women, at the same time carefully observing the quality of their job performance, is the one who will find his increased force of women employees most valuable.

As evidence of the company's definite interest in using woman-power most effectively, Miss Frances R. Whitney has been added to the staff of the Division of Personnel Planning and Research. Her definite responsibility will be that of serving as consultant and advisor to plant managers, personnel directors and others on personnel relations, skill utilization and training methods for women. Miss Whitney has had a rich experience in employment, training, and research fields. She is a graduate of Mount Holyoke.

It might be noted that in the eleven-month period ending late last year, prior to the full-swing inauguration of the present educational program, the number of women employees at all RCA Victor plants increased from approximate-

ly 10,000 to more than 13,500. That increase came about through routine methods of employment: help wanted ads, the United States Employment Service, recommendations by present employees and similarly obvious channels.

Now the intensive training courses are being supplied by a well-planned employment department search for available women, reaching out among high school graduates, the Y.W.C.A., women's clubs, churches and related organizations. Assuming an increasing shortage of man-power, it is more than likely that the rate of employment of women workers also will increase.

Vestibule Training Used

More than two-thirds of all the employees at the Harrison plant are women, and, since they are particularly fitted for the work of radio tube making performed there, that percentage may also be expected to increase. It was at Harrison, incidentally, that RCA Victor first instituted "vestibule training." As the name implies, this is designed to point the applicant to many doors of opportunity and to shorten the time between initial employment and full productive capacity. Though statistics are not yet available, there is plenty of evidence that a tremendous savings of time already has been made, and this will increase with experience. Vestibule training is also being used at the Bloomington plant.

Some industrialists have been apprehensive—and many still may be—that the presence of women in the shops would reduce the efficiency of

the male workers, either by distracting their attention or stirring up resentment. The experience of RCA Victor has been directly to the contrary, when the women are properly placed. A woman at a task she likes adds to her initial patriotic enthusiasm a power of concentration that in many instances acts as an incentive to the men. This spirit of patriotism also is a potential inspirational force. A man working in the same shop as a woman with sons and perhaps grandsons in the services, or a boy friend in the Marines, is not likely to feel like taking it easy.

There are certain other contributions women workers make as operators in the shops, other than their output. As a rule their benches are likely to be cleaner, and more neat and orderly, than those occupied by men. This makes for higher efficiency, because it helps reduce lost motion in looking for tools and parts which are not in their proper places.

That women, by and large, have less physical strength than men is a recognized fact. It has been found, however, that engineering adjustments made to offset this factor have at times made possible an increase in production by male employees engaged on similar operations. Such adjustments have also reduced accident rates, thus proving of double benefit to the department's production record.

All in all, women in industry are more than measuring up to their job standards; they are even setting new high standards in spirit, skill and efficiency. RCA Victor welcomes them.



ALL THROUGH THE RCA VICTOR ORGANIZATION, AS MORE MEN ENTER THE ARMED SERVICES, WOMEN ARE BEING GIVEN NEW RESPONSIBILITIES. MISS LUCY GRACICK (LEFT) SUPERVISES A GROUP OF TWENTY GIRLS AT CAMDEN; MISS MARY FRANCES ROLL (CENTER) IS EMPLOYMENT MANAGER AT BLOOMINGTON, AND MISS MARY M. RUPP IS SENIOR INTERVIEWER AT LANCASTER, PENN.

Adventure On The Air

BLUE NETWORK ADOPTS CODE OF PROGRAM STANDARDS FOR CHILDREN—BROADCASTS ARE POPULAR IN AMERICAN HOMES



By H. B. Summers

Manager, Public Service Division,
Blue Network Company

THE modern "Children's Hour," daily diet of juvenile adventure broadcasts, has become a popular institution in thousands of American homes.

In the minds of the listening layman, adventure serials are a certainty for better or worse. To those experienced in radio programming, who have nursed these series through their adolescent years, they are an institution representing constructive entertainment.

In building its adventure programs, the Blue Network, which carries a heavy schedule of children's serials, has tried to find an acceptable balance between wholesome stimulation and instruction.

Working with the knowledge that adventure stories in themselves are not frowned upon by educators for the juvenile mind, the Blue has eliminated the recognized evils from its children's serials and has adopted a workable code of program standards.

Education, as such, we have found is resented by the child who expects entertainment and thrills in his radio dialing. Adventure, however, peppered with interesting facts, constructive ideas, and educational suggestions, is a sugar-

coated pill for which American children cry.

"Jack Armstrong—All American Boy," for instance, shows the advantage of a knowledge of science and mathematics as well as giving the young listener a role to play in his nation's war effort. Through the "Write a Fighter Corps," youngsters are urged to write to a relative or acquaintance in the armed forces.

"Hop Harrigan," aviation kid show, highlights the importance of many courses now being taught in school to prepare the child for a career in aviation. The popular masked rider of the airwaves, "The Lone Ranger," invites his listeners to join the Lone Ranger Victory Corps which is dedicated to Victory, Responsibility, Citizenship, Safety and Health.

Again, the "Jack Armstrong" program retains a world-famed child psychologist to check every script of the series, to make sure of its healthful influence on young minds.

War Angles Developed

"Captain Midnight" emphasizes the importance of flying and naval activities.

"The Sea Hound," truly adventurous series, endeavors to teach the language, geography, and the customs of South America. In some schools, teachers are using the serial as required listening.

"Terry and the Pirates" has its locale in wartime China and both the setting and characterization are pointed toward increasing our understanding of Chinese life and deepening our sympathy with China's present struggle. Factual information used in the series is obtained from Government news agencies both of this country and of China.

Latest adventure series to join the Blue lineup of children's pro-



JANICE GILBERT ENCOUNTERS ALL KINDS OF ADVENTURE IN THE BLUE NETWORK SERIES, "THE SEA HOUND."

grams, "Dick Tracy" is teaching youngsters the dangers of black markets. The world famous detective, featured as the "hunter of evil men," is showing, through adventure episodes, that crime never pays.

Since Pearl Harbor, children's programs have been tuned to the war effort. Today's children are interested in the war news. They read newspaper headlines and hear the war discussed at the dinner table. They know our enemies are the Japanese and Germans and they know, better than a great many adults, the heroic exploits of members of the Army, Navy, Marine and Air Corps.

Almost all our children's serials deal with some phase of the war. Program builders have realized that herein lies a wonderful opportunity to do a good job of education and morale-building. The Blue is in daily contact with the public relations offices of the Army, the Navy, and the Office of the Coordinator of Inter-American affairs.

These offices know the great majority of children's programs stress the war and are sympathetic with this additional way to build up among the youth of America respect and admiration for the Amer-



CHESTER STRATTON PLAYS THE TITLE ROLE IN "HOP HARRIGAN," A SERIES ABOUT A YOUNG U. S. AVIATOR, WHO GETS IN MANY DIFFICULT SITUATIONS.

ican way of life and confidence in our fighting forces.

Obviously, in our over-all picture of children's programs, all stories must reflect respect for law and order, good morals and clean living, the importance of fair play and honorable behavior.

The modern "Children's Hour" has grown up during the past decade. Today's programs differ sharply from the type of children's thriller which first began the adventure trend. Sloppy writing and inadequate research on children's programs belong to the past and sponsors themselves were the first to recognize and correct the condition.

We know most boys and girls are voracious listeners to radio, listening during their leisure time an average of three or four hours a day. Particularly in the case of young children, radio listening is a very intense activity with the youngster following the adventures of his favorite hero or heroine with rapt attention.

Educators and students of broadcasting agree that radio is one of the strongest influences in shaping the thoughts and attitudes and the entire personalities of boys and girls of school age.

The Blue Network is fully aware of the influence exerted by radio on

children. Naturally, the network's Program Department takes every care to insure that programs are not over-stimulating to young children, and that nothing is broadcast which might have a harmful effect upon young listeners.

Because of its particular obligations to its juvenile audience, the Blue reserves the right of meticulous supervision over all programs appealing to children. Certain policies, in addition to those applicable to all programs, have been established to govern the acceptance of these children's shows.

Ban on Supernatural

In order that children will not be emotionally upset, no program or episode may end with an incident which will create in their minds morbid suspense, or hysteria. Dramatic action may not be over-accentuated through gunplay or other methods of violence. In general, children are more credulous than adults, therefore use of the supernatural or of superstition likely to arouse fear is not permitted.

Torture or horror of any kind may not be portrayed or suggested. Vulgarity and language of rough character is not acceptable and sound effects intended to anticipate or stimulate any of these prohibitions may not be used.

These taboos, however, are only part of the story. Following the premise that children listen to programs and are influenced by what they hear, the Blue does not stop at the restriction of negative or harmful suggestions in its adventure serials.

The Blue Network works on the policy of using its programs for boys and girls as a means of giving information, creating understandings and developing desirable attitudes. A large number of our programs, therefore, are directly planned to serve an education purpose, without the child being aware of the design. We are building our adventure programs with the idea of giving the listener a broader knowledge and of creating wholesome attitudes through the guise of entertainment.

CHARLES FLYNN AND SARAJANE WELLS, CAST IN THE "JACK ARMSTRONG" SERIES, CONTINUALLY MATCH THEIR YOUNG WITS AGAINST NAZI AGENTS.



Old Tubes Made New

RCA VICTOR ENGINEERS REBUILD TRANSMITTER POWER TUBES
TO AID BROADCASTERS DURING REPLACEMENT SHORTAGE



By L. W. Teegarden

*Manager, Tube and Equipment Dept.,
RCA Victor Division*

EARLY in 1942, studies made by the radio industry indicated that 60 to 70 per cent of the nation's broadcast stations might be driven off the air unless renewal tubes were made available to them. Helping to keep broadcast stations on the air in the face of a threat of silence for lack of replacement tubes is the part played by RCA Victor Division engineers.

The tube and equipment department met the emergency on two fronts. The first front was devoted to obtaining from amateur operators, already silenced by the war, the power tubes no longer in use. The second front tackled the problem of salvaging the larger types of power tubes through a rebuilding program.

Salvage Larger Types

In a program to obtain the maximum life of tubes still in service, an advertising campaign was directed to broadcasters.

One of these advertisements, addressed directly to amateurs, suggested that they sell their idle transmitting tubes to their nearest RCA tube distributors thus making them available to commercial broadcasters. This was followed by a

broadcasting trade advertisement suggesting that stations contact RCA tube distributors regarding the availability of such tubes.

As a consequence of this campaign, hundreds of tubes owned by amateurs began to pour into the hands of RCA distributors and became available for broadcasters. Some had never been used. But, in a spirit of patriotism, their "ham" owners brought them in to RCA distributors as a contribution to the war effort. A number of operators wrote directly to the company describing what tubes they had for sale. A list of these offerings was sent to RCA tube distributors and broadcast stations.

Meanwhile, RCA engineers were attacking the problem of salvaging larger types of tubes, which use substantial quantities of critical materials, through rebuilding. The rebuilding program does not justify itself in times of peace, when materials now critical are plentiful and relatively cheap. It calls for complete dismantling of tubes returned by the broadcasters after the tubes were worn out electrically but not mechanically. The usable parts of such tubes, together with small amounts of necessary new material, were then put through the company's regular manufacturing processes of assembly, aging and testing.

All of that sounds simple, but what it called for was a reversal of the assembly line procedure, in taking the old tubes apart, and the development of new techniques in rebuilding them. It was a reclamation program that could not be conducted on an individual basis. In other words, it called for a pooling of old tubes. In the rebuilding process the parts of each single tube lost its identity. The one the broadcaster got back might contain parts from any others.

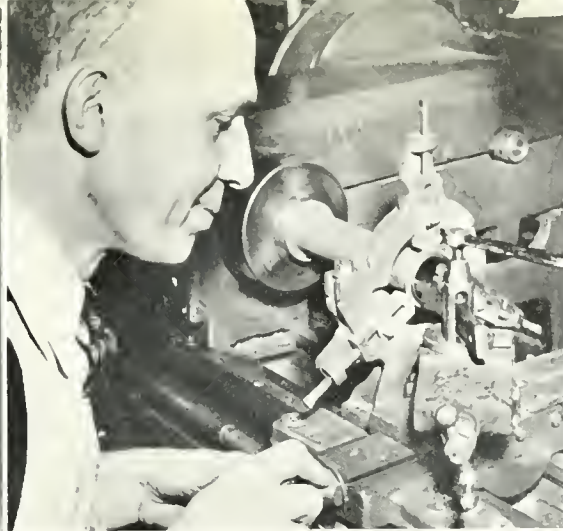


THE FIRST STEP IN REBUILDING AN IN-OPERATIVE POWER TUBE IS TO CUT OPEN THE GLASS BULB, AS SHOWN HERE.

One of the most difficult parts of the job, of course, was getting the materials. Speed was essential, but the work could not be hurried. As a first step, for example, the broadcasting station had to obtain a preference rating to accompany the return of an old tube and his order for a rebuilt one. Since radio tubes contain quantities of copper, tungsten, molybdenum, nickel and other metals now obtainable only on WPB priorities, all orders were contingent on the amount of material thus obtainable. After all these problems had been solved, the tubes had to be tested to make certain that they would stand up under actual service. These tubes were tested over a period of months in RCA services to insure that rebuilt tubes would give good service.

Keep Stations On Air

All of this took time, but patience and skill triumphed and, early last Fall, RCA Victor was able to notify broadcasting stations that it was ready to help keep them on the air with rebuilt tubes of types listed. It might be noted here that in many instances the station sending in its order was reduced to a single spare tube before the failure that made the order necessary. If the rebuilt tube had not been available and the



INSTALLING THE GRID STRUCTURE OVER THE FILAMENT (LEFT) IS A PART OF THE TUBE REBUILDING PROCESS; THEN COMES THE PREPARATION OF THE COPPER ANODE TO WHICH THE GLASS BULB IS TO BE SEALED (CENTER), AND THE ACTUAL SEALING (RIGHT) OF BULB AND ANODE.

spare failed, the station would have been silenced. In that event, since these were all relatively large stations, hundreds of thousands of American homes would have been deprived of their daily radio programs.

Rebuilding is still available and will no doubt continue to be of service in keeping the airplanes open for the duration. Every time a large tube is rebuilt it puts that much more critical material into the stockpile for use in the manufacture of new tubes, both transmitting and receiving, for military needs.



THIS GIRL OPERATOR INSERTS THE REBUILT MOUNT, OR INTERNAL STRUCTURE, INTO THE BULB-ANODE ASSEMBLY.

LOWER RIGHT—HELD IN A LATHE, THE MOUNT IS SEALED IN THE BULB-ANODE ASSEMBLY AS ONE OF THE FINAL OPERATIONS IN REBUILDING A TUBE.

BOTTOM — THE JOB OF REBUILDING THEM COMPLETED, A GROUP OF TUBES ARE MADE READY FOR PACKING AND SHIPPING TO BROADCASTING STATIONS.



Radio Adds to Story of Religion

WITH LARGE PART OF WORLD AFFECTED BY WAR, AMERICAN RELIGIOUS BROADCASTS BECOME A CHIEF MEANS OF UPHOLDING FREEDOM OF WORSHIP IN MANY COUNTRIES



By Dr. Max Jordan

*Director of Religious Broadcasts,
National Broadcasting Company*

TO GUGLIELMO MARCONI the Father of Radio, religion meant a great deal. It is well known—and Orrin E. Dunlap, Jr., has told us quite a bit about it in his Marconi biography, which remains the best and most complete ever written—that the Senator took a strong personal interest in the affairs of his church. He was as deeply religious a man as other great scientists, such as Pasteur, Volta, Ampère, and Galvani. As a matter of fact, it was due to his initiative that the Vatican built its own radio station under Marconi's personal supervision.

It is not generally known, however, that it was while visiting the celebrated sanctuary of Oropa, not far from Milan, in 1894, that the great inventor had the first intuition of the possibility of communicating between distant points without means of conducting wires.

Marconi was then just 20 years old and had been engaged in physical experiments under the guidance of Professor Vincenzo La Rosa of Biella, near Oropa. One late afternoon, while walking through the fields around the sanctuary, he suddenly felt that he was the man

destined to discover the means of transmitting messages through space. He said nothing about it at the moment, but in the evening, in walking from the sanctuary towards the city, he said to a friend who was with him, the poet Giuseppe de Abate:

"Up there when I was at the Chapel del Paradiso, a sudden wonderful idea struck me while I looked across the distant plain. You will see what I mean later on."

Now, at the Porta Regia of the sanctuary, a tablet has been inaugurated bearing this inscription:

"From the cloisters of the mountain of Oropa, Guglielmo Marconi drew the inspiration of his great discovery—May wireless telegraphy under the auspices of Mary pacify men in Christ."

Today, we know that Marconi's discovery has indeed greatly contributed toward a better understanding and good will among men. The history of the "Pulpit of the Air" has not yet been written, but when it is it will add a striking chapter to the story of all religion.

Instrument of Religion

Since its foundation, NBC has been guided by a simple policy in matters of religion. Realizing that the sale of time for religious programs might result in according a disproportionate representation to those individuals or groups who happened to command the largest purse, the company has never "commercialized" religion. Also, being aware of the fact that no broadcaster can attempt to serve individually all of the many religious groups, or wisely single out by its own choice any individuals to represent the various faiths, NBC has always depended upon responsible organizations representing the

three dominant religious groups in America, namely the Protestant, the Catholic and the Jewish, to suggest speakers and prepare programs. And finally, the company has striven to build its religious programs so that they would interpret religion at its highest, avoiding controversy and conveying the message of faith to all the listeners in such elevating terms that all would realize their responsibility to the organized church and to society.

Adhering to these principles, NBC has been able to contribute its share toward making religion an ever-growing force in American life. The experience in all these years has proved that radio is one of the most highly effective instruments of religious teaching. Millions of people listen every Sunday, and in addition there are countless successful weekday programs based on religious gatherings, festivals and music. The result of all these endeavors was well summed up some time ago by Dr. Harry Emerson Fosdick when he said that radio has furnished religion an opportunity such as has never existed before.

That these religious broadcasts presented by NBC in cooperation with the nation's outstanding Protestant, Catholic and Jewish organizations leave lasting impressions among listeners of all faiths is shown by the many letters received. They testify that the audience is drawing spiritual inspiration and confidence from the sermons and prayers as well as the church music offered on the air, and gaining strength from these programs to meet the heavy sacrifices of a war against the forces of oppression and intolerance.

Outstanding among the regular religious programs broadcast by NBC are *The Catholic Hour*, produced in cooperation with the Na-

tional Council of Catholic Men; *The National Radio Pulpit*, with Dr. Ralph W. Soekman, pastor of Christ Church in New York as officiating clergyman, presented in cooperation with the Federal Council of the Churches of Christ in America, and *Religion in the News* by Dr. Walter W. Van Kirk, Secretary of the Federal Council's Department of International Justice and Good Will. During the Summer season, this latter program is replaced by the popular series *The Art of Living*, with Dr. Norman Vincent Peale as the speaker. Likewise, Dr. Frederick K. Stamm conducts a special summer series entitled *Highlights of the Bible* under the auspices of the National Radio Pulpit.

NBC's all-faith Sunday hymn feature, *We Believe*, is dedicated to all listeners who, now more than ever, whatever their creed, turn to God in these times of trial and tribulation. This program, which is broadcast Sundays at 1:30 p.m. EWT, is truly a contribution to the spiritual morale of the American people. In designing the series, NBC consulted religious leaders of all faiths, including the Federal Council of the Churches of Christ in America, the National Council of Catholic Men, the United Jewish Laymen's Committee and the Synagogue Council of America.

The listeners response to *We Believe* has been most enthusiastic. Letters have come from all parts of the country expressing warm appreciation and telling of the spiritual benefits drawn from this program.

The oldest radio pulpit of all times is the aforementioned *National Radio Pulpit*, which is heard every Sunday at 10:00 a.m. EWT. On May 23, 1943, it will observe its twentieth anniversary on the air. The *National Radio Pulpit* began with the late Dr. S. Parkes Cadman, celebrated Brooklyn pastor, over station WEAJ and when the network of the National Broadcasting Company was formed, WEAJ was the key station for the production of this program. During its entire history, the *National Radio Pulpit* has had the unanimous backing and cooperation of city, county and state councils of the churches in the United States and the major denominations of the Protestant faith through the Federal Council of Churches of Christ in America. The *National Radio Pulpit* has always upheld tolerance in the many Sundays it has been on the air, in the interest of the entire nation.

A short time ago the *National Radio Pulpit* inaugurated a policy of urging its listeners to attend their respective churches. An



DR. WALTER W. VAN KIRK CONDUCTS THE PROGRAM "RELIGION IN THE NEWS" ON THE NBC NETWORK EVERY SATURDAY.

agreement was reached with the Federal Council of Churches whereby the program on Sunday mornings would be introduced with appropriate chimes followed by a brief announcement calling upon its listeners to go to church.

When the late Dr. Cadman appeared on the *National Radio Pulpit* he declared that he was speaking "in the common interest for the people of every race and creed from the forests of Maine to the orange groves of California, and from the reaches of the Northwest Territory to the Everglades." Records show that the people of this land welcomed the program and to this day make it their business to listen in every Sunday. To the shut-ins and the sick it has been a special comfort. During 1942, a total of 384,000 copies of radio sermons was distributed in response to audience-mail requests received by the Federal Council, these coming from forty-eight States, Canada, England, Australia, South Africa, India, the Canal Zone and various Latin American countries. In the same year, the Federal Council's Department of National Religious Radio received an average of 7,392 letters weekly.

Equally popular is *The Catholic Hour*, which went on the air for the first time on March 2, 1930, and is heard every Sunday at 6:00 p.m., EWT. Starting with a hookup of twenty-two stations, the program is now heard over stations situated in

THE PAULIST CHORISTERS ARE FEATURED DURING "THE CATHOLIC HOUR" BROADCASTS BY THE NATIONAL BROADCASTING COMPANY ON SUNDAYS.



forty States, the District of Columbia and Hawaii, including one short wave station broadcasting to the entire world. These outlets vary in number from seventy-seven to 107 and are all affiliated with the National Broadcasting Company. The National Council of Catholic Men, under whose guidance the series is presented, arranges the schedule of speakers and music, and handles the tremendous volume of audience mail—about 16,000 letters a month, averaged throughout the year.

When the late Cardinal Hayes appeared on the inaugural program of *The Catholic Hour* he said: "The purpose of the National Catholic Hour is not to triumph or to boast; not to attack or to blame; but to serve. . . . With good will, with kindness and with Christ-like sympathy for all, this work is inaugurated. . . . this work of dedication voices, therefore, the hope that this Hour may serve to make known, to explain with the charity of Christ, our faith, which we love even as we love Christ Himself. . . ."

Subjects discussed on *The Catholic Hour* are usually doctrinal, moral, or historical and the priest-speakers are chosen from many sections of the United States. The music is provided by the Paulist Choir in New York. The current speaker is the Rt. Rev. Monsignor Fulton J. Sheen who has won for himself a unique place in religious radio. During his last three series alone, this speaker received 642,227 pieces of audience mail.

NBC's interest in the activities of the Jewish religion has been no less active. Having been instru-

mental in the establishment of the weekly series of the *Message of Israel*, which is now carried by the Blue Network, at that time a part of NBC, the Company is not only devoting a good deal of time to traditional Hebrew chant in its weekly *We Believe* program, but also is trying to "cover" all the major events in the life of the Hebrew congregations of America such as Rosh Hashonah, Yom Kippur and Shabuoth. A special broadcast was recently devoted to the *United Jewish Appeal* for Refugees, Overseas Needs and Palestine, and again this year a Passover program is scheduled under the auspices of the Synagogue Council of America, which last year sponsored the *Festival of Freedom* program with Rabbi Israel Goldstein, Judge Irvin Lehman and Sam Jaffee, noted star of stage and screen, as the speakers.

"Radio" In Talmud

All these broadcasts devoted to the Jewish faith are indeed memorable events when we remember Rabbi David de Sola Pool's statement that some 1500 years ago it was written into the Talmud that the sound of "radio" goes from one end of the earth to the other. The word radio stood for the spirit of rainfall, and yet the meaning of this writer in the dim past has assumed a truly modern significance now that wireless waves constantly span the globe.

Various programs are also planned by NBC from time to time in cooperation with the National Conference of Christians and Jews. This year, NBC carried a program in connection with Religious Book Week sponsored by the National Conference. Dr. Henry Noble MacCracken, President of Vassar College, Mrs. Roger W. Straus and Francis J. Sheed talked about present-day Protestant, Jewish and Catholic literature.

However, NBC has not confined itself merely to a national task in promoting audience interest in religious topics. The company has

also been a real pioneer in worldwide religious broadcasting. The Christmas Day broadcast from the Roman Catacombs of St. Domitilla in 1937 is a case in point.

To those who were present in the chamber fifty feet beneath the soil of the Eternal City, this broadcast remains an unforgettable experience. The soft glow of flickering candles revealed a scene of classical splendor. Austere Roman pillars supporting the vaulted roof, ancient inscriptions in Latin and Greek carved on the walls and floor, symbolic religious emblems traced upon the marble slabs of the altar and on the primitive oil-lamps, stone coffins richly adorned with sculptured biblical figures—indeed it was an inspiring setting for a Christmas broadcast, fittingly carrying the listeners back to an age which, like our own, had its freedom of worship challenged by brutal tyrants.

Quite different in character though hardly less interesting was NBC's broadcast of the Oberammergau Passion Play. It was not the easiest thing in the world to secure permission for this exploit. The whole world sends pilgrims once in ten years to this charming Bavarian mountain village, whose folk think of their Passion Play as an act of religious veneration. Would not the radio introduce a hostile new note? Fortunately everything could be arranged, and one bright day a great radio motor-van, carrying all the necessary equipment, arrived in Oberammergau. There was no end of excitement. The village children were bursting with curiosity, suppressed and otherwise, and even their elders watched developments with an eagle eye. Broadcasting time finally came and the program which encompassed the basic scenes of the Play from the stage itself was a complete success.

Possibly a third program may be adduced to demonstrate the wealth of material that has been offered. Remembering that the whole world loves *Silent Night*, *Holy Night*, NBC thought of bringing this beautiful folk song by air straight from its Austrian birthplace. Accordingly, we investigated Hallein, a sleepy little town not far from



DR. RALPH W. SOCKMAN OCCUPIES THE "NATIONAL RADIO PULPIT," BROADCAST ON SUNDAYS BY NBC.

Salzburg which is proud of the fact that Franz Gruber, the village school teacher, composed the melody for his little church choir some hundred years ago. The roofs were covered with deep white snow, and wreaths of chimney smoke fluttered up towards the winter stars. If ever Santa Claus should have felt at home anywhere, it was in Hallein on that Christmas morning. The grandson of Franz Gruber sang the strains of *Stille Nacht* in the original version to the accompaniment of his ancestor's own guitar, which incidentally had also been used for the original performance, as the church organ happened to be out of order that night; and afterwards the village children took up the melody with real enthusiasm. Then, to make this a memorable Yuletide program, we sent the radio man round the world to bring the same tune from Buenos Aires, Hawaii and New York, showing what different interpretations it had been subjected to at all four corners of the earth. Finally we concluded at Salzburg, where the Cathedral mixed choir took up the entrancing theme with a majestic accompaniment from the great organ.

Many other instances could be referred to in order to show that radio has really opened up new vistas full of inspiration in the religious field. NBC's, for instance, was the "scoop" in 1933 when we made the bells of the Church of the Holy Nativity in Bethlehem ring around the globe on Christmas Eve. To NBC was likewise due the initiative in happier pre-war days for relaying to American listeners the great choirs of the synagogues of Amsterdam and Warsaw. Even more memorable, perhaps, was the broadcast from the Jewish Cemetery and the Ghetto in Prague, spots now defiled which enshrine amidst a great modern city unforgettable mementos of the Hebraic past in which tragedy and glory are so frequently blended.

That in brief is the story of religion in radio as far as NBC can tell it. I wish I could refer at this point to all that has been done by leaders in the field of religious radio abroad, particularly by the British and the Canadian Broadcasting Corporations, and by the

many fellow broadcasters in this country whose contributions could hardly be enumerated within the compass of a brief article. Perhaps my readers will not take it amiss, however, if I add a word about some problems which arise in religious broadcasting.

Every deep faith has a certain "exclusiveness"—that is, a body of convictions and dogmas which sets it off from other faiths. Sometimes the cleavage is sharp and deep. Yet, there are also beliefs shared in common, or attitudes characteristic of every believer. Naturally, radio must seek to find these last. It cannot debate about religious matters, or bring antagonisms to the fore. To do so would mean getting entangled in a conflict which could not possibly be mitigated on the air.

Appeal Is Universal

Yet it is often felt that this restriction to a few "ethical" themes and to the exercise of the irenic spirit weakens the expression of religious conviction. Does not radio tend to make all faiths "look the same?" I do not believe this is necessarily true. After all, the church does not live by broadcasting alone. It has the whole of the rest of life inside which to deepen its conception of the human and the Divine. Radio is just one of its op-

portunities—not by any means its only opportunity. Surely it can be utilized to bring home to all men, regardless of differences in belief, those things that make the whole world kin.

When we remember that Americans listen to the radio many hours a day, while the average person spends not more than one hour per week attending church, we may well appreciate the immense amount of good that can be accomplished by radio in the field of religion. These are times of stress when we need more than ever the strength and comfort which only a true faith in God can give. On the airplanes of this country the gospel of Light and Charity and the message of Tolerance and Brotherhood among men is being broadcast to the millions without any shackles being imposed by self-appointed arbitrary rulers. It is the tradition of freedom which helps our people to reap such benefits from a medium which originally was conceived as merely technical in its scope. Today we know that Marconi's inspiration was of deep significance. With a large part of the world covered by darkness, physical as well as spiritual, radio has become the chief instrumentality in upholding that most fundamental of all human freedoms—the freedom of worship.

DR. MAX JORDAN (RIGHT) AT THE MICROPHONE COVERING FOR NBC'S AMERICAN LISTENERS THE VATICAN CITY CONCLAVE WHEN PIUS XII WAS ELECTED IN 1938.





FROM SUCH OPERATING STATIONS AS THESE IN R. C. A. COMMUNICATIONS, INC.'S, NEW YORK HEADQUARTERS, THIS COUNTRY IS IN INSTANTANEOUS RADIO-TELEGRAPHIC COMMUNICATION WITH ALL PARTS OF THE WORLD.

reported that the scheme was probably workable. Accordingly, experts of that Company and the Western Electric Company undertook the development of the necessary apparatus. Radical improvements were made by them upon the first suggested idea; special apparatus was constructed; a ship was equipped and put to sea; connection was made with an Atlantic cable and *messages were intercepted, and a clear, legible record of them was obtained.* All of this was accomplished *without producing any disturbance whatever in the working of the cable.* It was clearly demonstrated that cable tapping could be accomplished in this manner, and that cable tapping so accomplished could not be detected by any possible means at the shore ends of the cable."

Exit "cable secrecy!" It was simple then, and it would be even simpler today, for the electronic art has advanced tremendously in twenty-four years. We would be unimaginative indeed if we believed that Germany, thorough in all other phases of espionage, would neglect so simple, so important, so inviting a task as cable-tapping.

Cables Cut in 1918

During the last war, Germany had no trouble in locating and cutting cables connecting the United States with Europe and South America. The account given below is from the log of a German submarine officer whose ship, the *U-151*, was assigned to the task of cable-cutting as an incidental task during a program of mine-laying and torpedoing:

"Our next assignment was to cut the cables off New York harbor. We cruised leisurely up the coast, arriving off Fire Island just after sundown. The morning of May 28, 1918 was fair, with a gentle west wind and calm sea. . . . We could

Communications Secrecy

DIFFICULTY ENEMY WOULD HAVE IN DUPLICATING OUR EQUIPMENT AND FOLLOWING SIGNALS GIVES RADIOTELEGRAPHY RELATIVE SECURITY



By Ray Hutchens

R.C.A. Communications, Inc.

(Editor's Note: "How long, because of unreasonable trust in cable secrecy, must we continue to play into the hands of the Axis?" asks Editor Ray Hutchens of R. C. A. Communications, Inc.'s magazine 'Relay.' Throwing new light on an old argument, Editor Hutchens contributes the following interesting discussion of the relative secrecy of cablegrams and radiograms.")

THE following excerpt, from the Chief Signal Officer's report to the Secretary of War after the first World War, is taken from the November 16, 1920 issue of *Telegraph & Telephone Age*, journal of the American communications industry. It explodes the false "inherent-secrecy-of-submarine-cable" theory:

"Up to the time of making this study it had been generally assumed that it would be impracticable to tap an ocean cable without producing an electrical disturbance at the ends which would undoubtedly result in discovery.

"After a careful inquiry into the matter, Colonel Carty [the late Colonel John J. Carty, former vice president of the AT&T] reached the conclusion that it might be possible to tap successfully, and without discovery, an ocean cable, by employing some recent electrical discoveries. He devised a tentative scheme which was submitted to the engineers of the American Telegraph and Telephone Company, who

see the beach, and the houses. . . . We dropped our cable-cutting shears attached to a grapnel overboard, attached to a long wire rope. Back and forth we cruised, trolling not for fish, but for any of the cables we might run across. The thrill was almost as great as fishing for bluefish." (From pp. 32-3, *German Subs in Yankee Waters*, by Henry J. James, Gotham House, 1940.)

The actual damage to the cables cut by the *U-151*, the author of the book says, was "relatively negligible" because *only two* were cut: the Commercial Cable Company's #4 Canso cable—Nova Scotia to New York—and another, owned by the All-America Cable Company, running from New York to Colon!

A cable can be cut, and its repair is difficult. A radiotelegraph circuit may be "jammed," but it cannot be put out of commission permanently. Jamming could bring reprisals to affect enemy circuits, and this is one reason why radiotelegraph facilities are comparatively secure.

A cable is not safe merely because it lies on the bed of an ocean. Proof is given in the Chief Signal Officer's report referred to above:

Urges Radiotelegraphy

"It was concluded that complete severance of cable communication by the enemy was not impossible."

In the same report Colonel Edgar Russell, who later was to become Brigadier General and Chief Signal Officer, is quoted from a memorandum dated August 15, 1917:

"From my own experience in cable engineering I am satisfied that it would be entirely practicable for the enemy to cut some or all of the cables whenever he considers it important enough to do so."

Five days later he wrote to the Commander-in-Chief of the American Expeditionary Forces:

"There is no question of the grave situation in which we may find ourselves as a result of extensive cable cutting which, in the belief of all the cable authorities we have consulted, may be easily effected by the enemy. The enormous importance of immediate provision of reliable and extensive trans-

Atlantic radiotelegraph service is therefore evident."

Thank Heaven that RCA heeded this warning, and provided emergency radio telegraph capacity which stands ready for use at any time!

Confirmation of the work of the *U-151* is also found in the report of the Chief Signal Officer:

"Information furnished by the Navy concerning the enemy's intentions seemed to be well founded, for while the German submarines were operating on the Atlantic coast of the United States, two submarine cables were cut about 100 miles from New York, one a cable from New York to Canso, Nova Scotia, which stopped working at 12:35 p. m. on May 28, the other a cable from New York to Colon which began to fail at 3:30 p. m. on May 28th and went out of commission entirely at 9:30 p. m."

If an enemy interceptor is ordered to copy radiotelegraph signals between two Allied points, he soon learns he cannot do it with portable equipment. When he attempts to follow the daily shifts of a single circuit, he must obtain complete tuning equipment for as many wavelengths as the total in use at both ends; he must, since he cannot personally operate on several wavelengths, monitor and record all stations continuously. He must also be near supplies and maintenance materials—which means he is in a disadvantageous location, for Allied antennas are aimed at each other, not at him.

From his records, he must duplicate whatever printer, multiplex, or coding devices are in use, and learn to distinguish between one type of signal—or combination of signals—and all the rest, and he also must follow the changes in them quickly. This work, even with receivers of the highest order, must necessarily be done with an inferior signal.

Radiotelegraph circuits are engineered over their ether routes as well as in the terminal offices. Everything in a modern radiotelegraph company, after years of practical operation with all types of equipment, is there because it helps to maintain maximum efficiency in propagation between two desired points on the earth's surface. Every phase of operation—switching tech-

nique, signal transcription, clerical work, novel apparatus—is combined for the fastest, most accurate signal transmission over the desired path.

If, having better equipment—a premise conceded only for the sake of discussion—the enemy interceptor is able to receive, record, and translate all our transmissions, on all our circuits, in both directions, he still cannot duplicate one of the most important factors: the engineering and operating technique of a communications company which for more than two decades, has been schooling itself by accomplishment day and night, seven days a week.

Speed of communication is a military advantage. Enemy delay is also an important secrecy factor.

One message route from New York to Cairo, Egypt, is via cable to London. From London, it is retransmitted, by cable or radio, to its final destination.

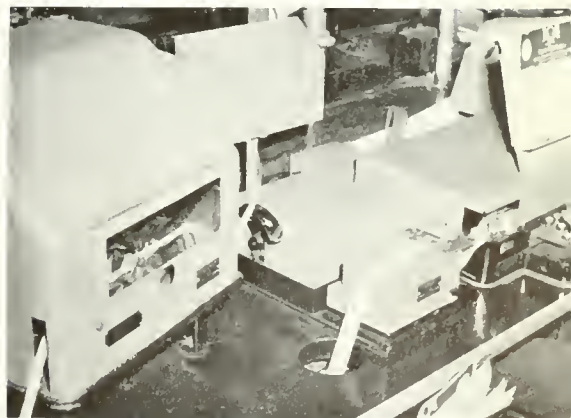
Radio's Advantages

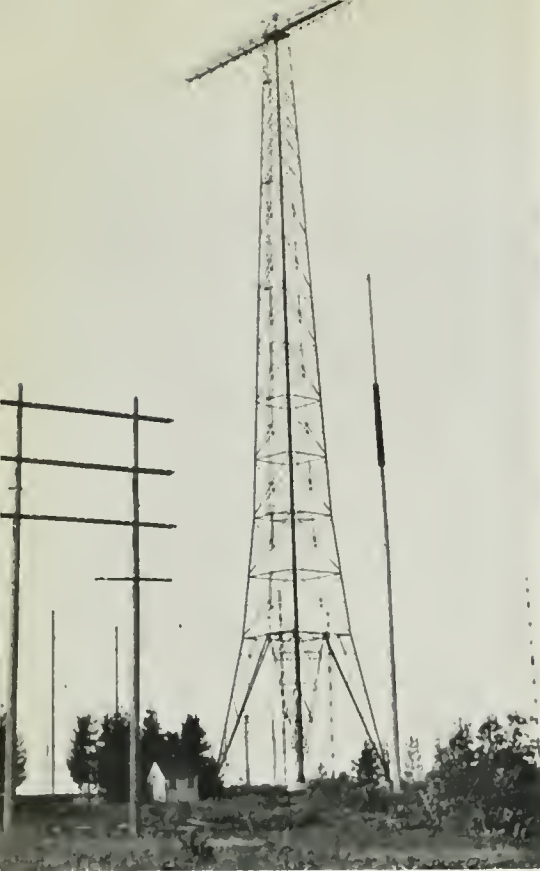
By radio, the message would go directly from New York to Cairo.

If the cable between New York and London were tapped, a cablegram from New York to Cairo *would be in enemy hands before the addressee received it!*

The wide frequency channels of radiotelegraphy allow the design engineer freedom in his choice of control equipment. Since some secrecy systems depend upon a sacrifice of frequency-band width, they

THIS HIGH-SPEED RCAC PRINTER PREPARES MESSAGES FOR AUTOMATIC TRANSMISSION BY RADIOTELEGRAPHY ACROSS CONTINENTS AND SEAS.





DIRECTIONAL AND NON-DIRECTIONAL ANTENNA ARRANGEMENTS COVER THE LANDSCAPE AT RCAC'S LONG ISLAND, NEW YORK, RADIO TERMINALS.

marine-cable paths are charted and well-known.

The feeling still persists in some quarters that cable transmissions are secret. Despite the fact that the findings of the last war proved the only thing secret about cablegrams is their interception, conservative diplomats order that their confidential messages be sent by cable.

Our enemies (who, incidentally, send all *their* confidential messages between Rome, Berlin, and Tokio by radio!), knowing of this reliance, have good reason not to disturb the many vulnerable points of the Allied cable system. Why should they, for the sake of a partial and temporary disruption of our communications, give up their opportunity for interception of the most important messages the world has ever known?

Could Carry Full Load

In the opinion of many communications men, the cables remain intact simply because our enemies do not choose to cut them. They know that modern radiotelegraph equipment could carry the full load of traffic between England and America, and that it could then be handled with greater speed and with a more complex mechanical encipherment.

It is interesting to note, that Japanese submarines, although they infest the Pacific, have not cut the cable between San Francisco and Honolulu. In the Pacific, as in the Atlantic, our present paralleling radiotelegraph facilities probably help to protect the cables. We may never learn what information we are losing through them, but, after the war, how bitter it will be if we find we would have been better off if we had *cut our own submarine cables!*

Today, after many pioneering struggles, America leads the world in aviation and radio. These two new sciences, more than any others, shall shorten and win the war. Let us give our best to speed the day.

Meanwhile, why cannot our radiotelegraph facilities be used to their greatest advantage in the interest of the United Nations? How long, because of unreasonable trust in cable secrecy, must we continue to play into the hands of the Axis?

operate better, and faster, in a wide radio channel.

Because of the physical and electrical characteristics of a long, insulated conductor, the frequency band of a cable is necessarily narrow, and the equipment which is attached to its ends must be designed primarily to favor this weakness.

The impenetrability of any coded message may be increased by novel control equipment while it is in transit.

Radio, however, offers opportunities for additional secrecy which the cables cannot: wavelengths may be changed, and there is usually a choice of transmitter locations by those in charge of the operating offices. Prearranged schedules to change these facilities can be used to complicate, frustrate, or delay interception.

Only radiotelegraphy has these advantages. A cable station is fixed at the ends of a cable, and sub-

Tribute to Soldiers

TO THE EMPLOYEES OF
THE RADIO CORPORATION
OF AMERICA

NEW YORK NY—

APRIL 4 AM 10:12

ARMY DAY WILL NOT BE CELEBRATED THIS YEAR WITH THE USUAL MILITARY CEREMONIES AND PARADES. AMERICANS EVERYWHERE ARE TOO BUSY FIGHTING AND WORKING TO PAUSE, EVEN FOR A FEW MOMENTS. BUT THE OCCASION REMAINS A TRIBUTE TO THE SOLDIERS OF AMERICA. ON THIS ARMY DAY YOU WHO HAVE DONE YOUR FULL DUTY ON THE PRODUCTION LINE SHARE THAT TRIBUTE WITH AMERICAN FIGHTING MEN. OUR SOLDIERS ARE ON THE OFFENSIVE OVER EUROPE, IN NORTH AFRICA AND IN THE PACIFIC. WITH YOUR CONTINUED SUPPORT THE ARMY WILL KEEP THAT OFFENSIVE ROLLING UNTIL VICTORY REWARDS OUR EFFORTS—

PATTERSON
UNDER SECRETARY
OF WAR.

Educators Praise Radio

The old copybooks are gone and the radio receiver is now a standard piece of classroom equipment, according to Dr. Belmont Farley, co-ordinator of radio activities for the National Education Association. Dr. Farley was addressing 400 teachers and students gathered Sunday, February 28, in NBC's Radio City Studios at dedicatory ceremonies for the first courses based on radio programs to be accepted by New York City's Board of Superintendents for teacher in-service training.



PAUL WHITEMAN SIGNS BLUE NETWORK CONTRACT. WITH HIM ARE PHILLIPS CARLIN, VICE PRESIDENT, (CENTER) AND MARK WOODS, PRESIDENT OF THE BLUE.

PAUL WHITEMAN JOINS BLUE

Dean of Modern American Music, Named Music Director of Network, to Supervise Planning of Programs, Discover and Develop New Talent

IT IS hard to believe that in the space of a swift quarter-century, the history of music could be re-written, and a new era, an era symbolic of all that young America stands for, would be enscribed on the blackboard of time by one man above all others.

Today, standing at the threshold of a new career which will offer him even greater fields than he and his fellow trail-blazers ever hoped to explore, is Paul Whiteman, dean of modern American music, who recently was named music director of the coast-to-coast BLUE Network.

In taking on his new role as a BLUE radio executive, Whiteman will keep his weather eye peeled for new talent, and once discovered, it will be developed as were the others. He will act in a supervisory capacity for the planning of musical programs, and cooperate in the production of new programs for potential commercial sponsors.

"Pops," as he is known affectionately to all in the music world, would be the last to agree that the part he played in the renaissance of

American music was a major one.

He will offer you such names as Bix Beiderbecke, Gene Goldkette, Louis Armstrong, King Oliver, Jellyroll Morton, Johnny Dodds, Joe Venut and the original Dixieland Band, and all the other immortal stylists, as the men who dreamed jazz into existence.

He will insist that theirs was the greatest contributions to the swing-over from the accepted, stilted one-two-three step style, so deeply ingrained in American music to the high, wide and handsome forerunner of the boogie-woogie beat.

Which is true, to a certain extent. But it took one man—Paul Whiteman—to corral the unruly notes, to curb the irresponsible Dixielanders and to correlate all their native ingenuity into an understandable form which was to become a definite and dignified pattern in the over-all musical picture.

Whiteman, unlike other dreamers of the early days when growing pains were beginning to presage the coming revolution, kept his head, and tightened a strong noose around the unruliness, which was

breaking out like a plague of musical measles.

By every force of circumstances and heredity, Whiteman was destined to be the man for the job, since he was armed with a thorough musical background. For one thing, his father, Wilberforce James Whiteman, had been supervisor of music for the Denver, Colo., public school system for fifty years. Whiteman pere was the organizer of school orchestras. Mrs. Whiteman had been a fine coloratura, who frequently made appearances with a singing group.

It was natural, then, that out of this old-line musical menage should come the new leadership, and the future King of Jazz. Not that young Paul hadn't had his share of the long-haired schooling. He had, but it breezed over his sturdy frame, leaving only enough of its influence to form the framework of a style which, in due time, was to become the basis of the original Whiteman rhythmic metre.

In whipping his first band into shape to open at the Alexandria Hotel in Los Angeles, Whiteman had more to do than just to wield a baton. He had to convince his boys that there must be a ceiling for the hitherto untrammelled high notes—letting them shoot off into the air and fall where they may in the accepted jazz tradition was not the thing to do any more.

Jazz, as it was being accepted in those days, was going to take off its rompers and put on long pants, not to mention a top hat and silk tails, protests to the contrary, if Whiteman had anything to say about it.

With his debut on the Coast, he found all his pleas and complaints for a chance to prove his point fully justified, for the clients called loud and clear for "that sensational new Whiteman band." Thus was launched the new era of American music. Through Whiteman, it acquired a symphonic dressing which was to assure him, and all who were to follow in his footsteps, a fair share of immortality.

As Whiteman kept pacing the new trend in music, quietly installing subtle melodic changes as the need for them arose, there came upon the scene another trail-blazer in whom Paul found a sincere kin-

ship. He was George Gershwin.

Gershwin, too, was charged with a dream—to carve into concrete realization a new expression of the American way of life. As this great new work was being moulded and re-moulded by Gershwin, Whiteman stood by and encouraged the young composer.

When "Rhapsody In Blue" was introduced by Whiteman before a distinguished and highly critical audience in Carnegie Hall, it won for Gershwin lasting fame, and for Whiteman, a new crown: that of "Dean of Modern American Music." Since then, "Rhapsody In Blue" has been identified as Whiteman's musical signature.

There were others for whom Whiteman envisaged great things—Bing Crosby, Morton Downey, Ferde Grofe, Helen Jepson, Mildred Bailey, Jane Froman, Ramona, the Dorseys, and a host of others now in the spotlight of fame. All served their apprenticeship with Whiteman.

Whiteman's talents run to other

fields as well as music. He owns and manages a 700-acre farm in Rosemont, N. J., with 350 acres for cultivating barley, wheat, corn and alfalfa. He also has large herds of Aberdeen Angus cattle, Hampshire hogs and walking horses. Incidentally, that's the name of his farm—"Walking Horse."

Paul certainly has no objection to being called a gentleman, but never a gentleman farmer, for he has made a business of farming for the past five years, and a profitable business it has turned out to be. In his own little community, Farmer Whiteman bears quite a reputation, and he takes just as much pride in it as he does in his \$5,000,000 musical library with its thousands of special Whiteman arrangements.

Sincerity in every endeavor has been a Whiteman trademark through the years. As musical director of the BLUE, he hopes to make that same trademark a national one, wherever music can be heard and appreciated.

RCA PRODUCTION FEAT

54 Ships Sail on Time as Result of Workers' Efforts at Camden

A PRODUCTION feat which made it possible for fifty-four ships to sail on time from seventeen different American ports came to light when naval officials recently authorized the RCA Victor Division of the Radio Corporation of America to make public certain facts relating to a rush order for vital radio equipment.

Where the ships were going, what they carried and whether they were warships or merchantmen are military secrets. All that may be said is that they were awaiting radio equipment not to be described until they have helped win the war, and that they were scheduled to leave around the first of the year. To make that possible a new record in high speed production was established at RCA Victor's Camden, N. J., plant.

This became necessary because shortages of essential materials developed after the initial order had been placed. Suppliers of parts made from these materials delivered some of the units. Then the materials bottleneck cropped up, and precious time flew by while Government officials and company executives sought to crack it.

Unexpectedly the break came on December 29. On that date, RCA Victor was notified that a first shipment of the badly wanted parts would arrive sometime on the afternoon of the following day. The company was also asked to break all previous production time records in getting out the shipment.

As a consequence all was in readiness in the shops at two o'clock the next afternoon—December 30—when the parts began to arrive. By three o'clock the job was rolling. The equipment was highly complicated, requiring skillful and delicate handling. Deliveries—for the ships—began on December 31. The final units to complete the order left the plant on January 4. A lot of tired workers went home to sleep, happy in the knowledge that the ships of America's life line to its fighting fronts were sailing—on time.

SIGN TOSCANINI, STOKOWSKI

ARTURO TOSCANINI and Leopold Stokowski will again conduct the NBC Symphony Orchestra during the 1943-44 season, according to an announcement March 23 by Niles Trammell, president of the National Broadcasting Company, who disclosed that the 24-week Winter series will be equally divided by the two world-renowned symphony directors.

The new season, starting October 31, will mark the seventh year of the NBC Symphony and will represent Maestro Toscanini's sixth full season with the orchestra that was organized for his return from semi-retirement in 1937. For Stokowski, it will be the third consecutive season on the NBC podium.

"Music is a major heading in the public service broadcasting performances today," said Mr. Trammell. "In wartime, it is more important than ever, playing a vital part in the nation's morale, in ad-

dition to filling its customary cultural and entertainment roles.

"Continuing under the inspiring leadership of Toscanini and Stokowski, the NBC Symphony is assured of maintaining the high standards to which listeners have become accustomed through six years of broadcasting, concert and recording achievement."

The 1943-44 season will continue to utilize the established Sunday afternoon hour, 5:00 to 6:00 p.m., EWT, which, on the basis of listener response this season, has proved to be the most popular listening time in the orchestra's six years of existence.

Toscanini will conduct the first six concerts, October 31 through December 5; Stokowski will direct 12 consecutive programs, December 12 through February 27, and Toscanini will return for his additional six broadcasts on March 5, concluding the season April 9.



RADIOMARINE RECEIVES "M" PENNANT. LEFT TO RIGHT HUGH A. SAUL, I. F. BYRNES, CHARLES J. PANNILL, AND REAR ADMIRAL H. L. VICKERY.

DAKAR CIRCUIT OPENS

RCAC Extends Direct Radiotelegraph Service to West African Key Port

EXTENDING direct radio communication service to another sector important in United Nations war strategy, a radiotelegraph circuit between New York and the West African key port of Dakar was opened March 10 by R.C.A. Communications, Inc.

Formerly, telegraphic messages between the United States and French West Africa were routed by way of London. With this direct radio circuit in operation, message traffic moves much faster and cheaper, since RCAC negotiated a 15 per cent reduction in the rate.

The new service is operated in cooperation with the Administration of Posts, Telegraph & Telephone of French West Africa. Other RCAC direct radiotelegraph circuits with African terminals link New York and Monrovia, Liberia; Leopoldville, Belgian Congo; Brazzaville, French Equatorial Africa, and Cairo, Egypt. A radiophoto circuit also operates between New York and Cairo.

A direct radiotelegraph circuit between New York and Quito, Ecuador, is being tested by RCAC preliminary to the start of regular commercial operations. Until now, Ecuador, where a complete cable monopoly has existed, has been the only South American country closed to radiotelegraphic communication.

The Government of Ecuador is cooperating with RCAC in setting up this new radio service. With the addition of Quito, sixteen Latin American nations will be linked with this country by RCAC direct radiotelegraph circuits.

The radio equipment for the Quito station was designed and built by the RCA Victor Division of Radio Corporation of America.

Miss Dorothy Kirsten, soprano of opera and radio, sang "America" and "The Star Spangled Banner." The ceremonies were broadcast by WJZ, Key Station of the Blue Network.

RADIOMARINE AWARDED "M"

U. S. Maritime Commission's Pennant, Victory Fleet Flag, and Merit Badges for Employees Won for War Production Record

AWARDING the U. S. Maritime Commission "M" pennant, Victory Fleet Flag and Maritime merit badges to employees of Radiomarine Corporation of America, Rear Admiral Howard L. Vickery, U.S.N., Vice Chairman of the U. S. Maritime Commission, on March 8 praised the workers for on-time delivery of vast amounts of radio equipment for the Merchant Marine despite innumerable difficulties in procurement of materials.

"You have been providing the merchant marine of your nation with eyes, ears, and a voice—three requisites to successful conduct of wartime operations for our merchant vessels," Admiral Vickery said. "Apparatus and equipment which have been designed and produced in your plant are making a substantial contribution toward a United Nations victory. Often you have been ahead of schedule. It never has been a case of too little and too late."

Arthur M. Tode, Honorary President of the Propeller Club of the United States, served as chairman of the presentation ceremonies. R.

J. Baker, Secretary-Treasurer of the American Merchant Marine Institute, Inc., one of the honor guests, spoke briefly.

Acceptance of the "M" Pennant and the Victory Fleet Flag by Radiomarine was acknowledged by I. F. Byrnes, Chief Engineer, and Hugh A. Saul, Production Superintendent.

Following the raising of the pennant and the flag by the Color Guard of the Fort Hamilton Memorial Post, American Legion, Admiral Vickery presented the Maritime Merit Badges. They were accepted by a plant committee composed of Victoria Zimanski, representing the General Office; Gordon C. Hopkins, Engineering Department; W. H. Courtney, Maintenance, Repair and Inspection Department; Leon J. Bilyk, Shipping Department, and Ralph Angelillo, Shop.

A scroll, bearing the signatures of all Radiomarine employees to a pledge not to falter in their work until Victory is won, was presented to the Maritime Commission by Chester O. Harris, an employee.



PILOT OFFICER GEORGE BEURLING, CANADA'S AIR ACE, PRESENTS MERIT PINS TO FORMER FELLOW WORKERS IN RCA PLANT AT MONTREAL.

HERO LAUDS RCA WORKERS

Pilot Officer Beurling, Former Employee in Montreal Plant, Returns as Canada's Ace Air Fighter, Presents Merit Pins to Production Winners

MONTREAL, Canada.—It was a highly dramatic moment when the smiling young hero of Malta, limping slightly, but with a look of happy anticipation on his face climbed out of an Air Force car and came in the RCA Victor plant here recently to visit again with his former fellow workers. George Beurling, modest and unassuming, of the Fourth Floor Assembly, had returned, still modest, still unassuming . . . but now he was Pilot Officer Beurling, Distinguished Service Order, Distinguished Flying Cross, and Distinguished Flying Medal and Bar.

Addressing 115 topflight Production Boosters, after he had presented them with the first of the Merit Award Pins which their outstanding efforts had won them, P O Beurling said:

"Radio keeps us flying . . . it keeps flyers on their course, and takes them to the target . . . and it brings them back. It has been said that this is an all-out war . . . that means each individual, no matter what your war job, must give his best. You people in radio, knowing your importance, especially to flyers, sailors and soldiers, can be assured that we appreciate your contribution. You share

equally in the victory which we SHALL win!"

At his own request, and despite his still healing wound which necessitated his return to the hospital, P O Beurling insisted upon being taken through the plant where he could say "Hello" personally to everyone. Guards chaired him through the whole factory.

At 21, P O Beurling is Canada's outstanding war ace. His total bag of enemy planes, up to the time he was sent home to recuperate, was 29. On one morning alone, while helping in the defense of Malta, island hot-spot of the Mediterranean, he brought down four German and Italian fighters and was given credit for one "probable" victory. He was in the air over Malta many times, before being shot down last October, when the odds against him were as much as twenty to one.

Beurling credits most of his success to his development of "deflection shooting," that is, firing at an enemy plane from an angle. This type of shooting takes into consideration not only the angles of both planes in a combat, but also their air speeds and the distance that separates them. He believes that if he had not developed it his air

PURCHASE AGREEMENT

RCA Victor Announces Plan for Post-war Delivery of Theater Equipment

THE first plan within the industry designed to meet the post-war demand for theater and sound projection equipment has been announced by the Radio Corporation of America.

Known as the "Purchase Priority Plan," it offers to forward-looking exhibitors the opportunity to apply now for post-war deliveries of RCA sound and other theater equipment the manufacture of which has been halted by the war.

In brief, the plan provides, first, a preferred position for a theater owner on the "priority purchase" list; and second, a method of building up an interest-bearing cash reserve for the theater owner to apply against his post-war purchases.

Explaining the need for this plan, Homer B. Snook, manager of the Theater Equipment Division of RCA Victor said:

"When the war ends, hundreds—perhaps thousands—of theater exhibitors will need new equipment badly. Also, population shifts have caused demands for many new theaters—and therefore much new equipment. All this adds up to a big initial post-war demand, one which may exceed the supply for as long as two years. The RCA Purchase-Priority Plan enables a theater owner to earmark equipment for his post-war needs and at the same time build up an interest bearing reserve to help pay for it."

When the company is able to resume normal manufacture and deliveries, the theater operator can convert his "priority purchase agreement" into a standard form of order or contract at prices and at terms then in effect, and apply his advance deposit and interest as a down payment. The time allowed to negotiate such a conversion will be announced by RCA Victor and will be based largely upon its production outlook at the time.

score would be 6 instead of 29. He is the author of a book on the subject, which the British Air Ministry has published for the use of Royal Air Force pilots.

NAME LABORATORIES GROUPS

Sarnoff Appoints Advisory and Planning Committees to Work With RCA Laboratories—Functions Are Outlined in General Order

LOOKING toward the fullest coordination between research and operations and to the planning of future developments in radio-electronics, David Sarnoff, President, Radio Corporation of America, in a general order issued March 18 named two important committees—Advisory and Planning—for RCA Laboratories at Princeton, N. J.

Said Mr. Sarnoff:

"When the plans were announced for the erection of RCA Laboratories at Princeton it was stated that certain committees would be organized. Since the initial portions of the Princeton project are now substantially completed and in operation, the following committees are hereby appointed:

"ADVISORY COMMITTEE: David Sarnoff, Chairman; R. R. Beal, Gano Dunn, DeWitt Millhauser, C. J. Pannill, O. S. Schairer, Robert Shannon, G. K. Throckmorton, Niles Trammell, W. A. Winterbottom and Mark Woods.

"The purposes of this Committee are to give the management of RCA Laboratories the direction and advice of directors and executives of the other RCA divisions and Companies, and to provide a medium for informing such directors and executives of the products of the Laboratories to the end that prompt and advantageous public use may be made of them.

"This Committee will meet from time to time upon call of the Chairman in the Laboratories at Princeton.

"PLANNING COMMITTEE: O. S. Schairer, Chairman; Engineering—R. R. Beal, Group Chairman; H. H. Beverage, I. F. Byrnes, E. W. Engstrom, H. G. Grover, O. B. Hanson, C. B. Jolliffe, C. W. Latimer, A. F. Van Dyck; Commercial—E. C. Anderson, Group Chairman; H. C. Bonfig, F. R. Deakins, L. de Bottari, H. Heath, E. Kobak, F. E. Mullen, J. G. MacKenty.

"The functions of this Committee will be to consider, and to plan for, the future development of the radio, electronic and kindred arts and industries, and to provide a medium for coordinating the research, development, engineering and commercial planning of all branches of the RCA organization. It will deal with such subjects as television, frequency modulation, facsimile, extremely high frequencies, radio relays, and all other new systems, services and products.

"This Committee will meet in the Laboratories at Princeton on the first Tuesday of alternate months beginning Tuesday, April 6, 1943."

NEW RCA SUBSIDIARY

Service Company Organized for More Efficient Handling of Installations

A SEPARATE subsidiary, RCA Service Company, Inc., for the more efficient handling of the technical servicing and installation activities of the RCA Victor Division of the Radio Corporation of America, has been formed.

Edward C. Cahill, manager of RCA Victor's sound equipment activities, is president of the new company; he will also retain his other responsibilities with the RCA Victor Division. W. L. Jones, former manager of RCA Victor's Service and Installation Division, is vice president and general manager of the new company. There are no changes in either the managerial or technical staff of the RCA Victor service organization, which is now incorporated in its entirety within the new company.

RCA Service Company, Inc., will continue to devote a major part of its activities to the installation and

servicing of vital radio and sound equipment for our armed forces wherever they may be, and in all parts of the world.

Twelve district service offices are maintained in Hollywood, San Francisco, Dallas, Kansas City, Atlanta, Pittsburgh, Cleveland, Chicago, New York, Boston, Philadelphia, and Scranton. From these offices a highly trained technical staff installs and services theater sound reproducing equipment, broadcast station equipment, and other RCA radio and sound equipment for industrial plants, schools, churches, hospitals, and the home.

The new Company will also continue to conduct its training school for technicians in Philadelphia for the U. S. Signal Corps.

The BLUE Network devoted 122 hours and 59 minutes to the war effort in March, 1943. Of the total amount of time, 93 hours and 56 minutes was sustaining, contributed by the BLUE, and 28 hours and 53 minutes, commercial contributed by the BLUE's sponsors.

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MISS FLORENCE ROTHSCHILD, ONE OF THE NEW NAVY "WHIPS," INSPECTS RADIO EQUIPMENT IN THE RCA VICTOR DIVISION'S PLANT AT CAMDEN.

NAVY "WHIPS" AT RCA VICTOR

*New Unit of Women Workers at Camden Plant Serves as Inspectors
50 Girls Release Like Number of Men for Other Essential Jobs*

ADD the "Whips" to the list of women's groups who are giving their best to the war effort—on the production line.

This new unit recently came to light at the RCA Victor Division plant of the Radio Corporation of America at Camden, N. J., where a force of about fifty girls and women are now performing production work for the Navy and thereby releasing a like number of men for other essential duty.

Official insignia of these girls is U.S.N.I.S.—United States Naval Inspection Service. But the girls have tagged themselves, and are being called by their co-workers, the Whips. They are authorized to wear a snappy light navy blue uniform that keeps them reminded of their big responsibility on the job. Their's is the job of inspecting all

types of naval radio, sound and electronic equipment after it has passed through the hands of RCA's inspectors. They see their jobs as "whipping" out defects so that this equipment will give top performance in action.

The girls are the first graduates of a vocational training program in Philadelphia instituted by the Federal Government in cooperation with the State and city school systems to make womanpower available in war plants requiring technical skills.

"We made it clear to all the applicants at the outset," said Commander J. F. Bates, U. S. N., Chief Naval Inspector at RCA Victor, "that they were taking over work that had been done by male inspectors. We told them that though they were civilians hired for an eight-

hour day they would be expected in emergency to live up to Navy traditions and get the work out.

"The fact that our force of women inspectors has been rapidly increased and is still being expanded is eloquent evidence that they have met and accepted these conditions. On occasion the girls have worked until late hours at night, and with unabated enthusiasm. At much of the tedious, painstaking inspection work they have proved more apt, and have learned more quickly, than men. We had seldom put a man on inspection alone in less than six months. Some of these trained and skillful women learn to do the work in two months."

Ages of the women naval inspectors at RCA Victor range from a couple of 17-year-olds to grandmothers of 50-plus. Typical are youthful Mrs. Ida Coppinger, tall, blonde and comely; Miss Florence Rothschild, a petite brunette; and red-headed Miss Mary Gilbert. Mrs. Coppinger was Secretary for the Boston Symphony Orchestra when her husband went into the Army. He was assigned to Camp Dix, so she came to Philadelphia to be near him and get into war work.

"I chose working for the Navy when I heard of this special course," said Mrs. Coppinger, who lives at 2221 Delancey Street, Philadelphia. "Besides, I always liked Navy blue. Also—as we say in the Navy—somebody has to taxi the Army across. I'm doing the best I can. Everytime I stamp the Navy anchor on a piece of radio equipment I kiss it goodbye and tell it to go do its work."

Mrs. Coppinger's father was an electrical contractor. As a child, she had some hard-boiled training digging around in old houses and helping him to sneak wires through conduits, but she knew nothing about radio until she took the special course.

Miss Rothschild didn't even know anything about electricity. She had never handled a tool in her life. Her former occupation was teaching in a private school in New York, and she spent her Summer months as Secretary of the Berkshire Music Festival. Her home now is at 5810 Whitby Avenue, Philadelphia.

Hair-do's and complexion creams, permanents and other mysteries of the beauty shop constituted the working background of Miss Gilbert, who lives at 141 Garvin Boulevard, Camden. She is tremendously interested in the work, but says the biggest thrill she gets out of her job is when naval officers spot the insignia on her overcoat and give her a courtesy salute.

"I've even been saluted by Commanders," laughs Miss Gilbert. "You'll never know what a thrill that is."

At their work the women use micrometers, calipers, scribers to test tightness of soldered connections, a dentist's mirror to get a look at vital points not visible from outside the apparatus, screw drivers and other tools. They must also handle blue prints, and most of them have taken special courses for this. Most of them also are studying now on their own time in one or more of the RCA Victor special classes.

An unexpected but warmly welcomed by-product of the introduction of women naval inspectresses in the shops has been the effect on the production line morale. According to Harry LeRoy, RCA Victor's Camden Works Manager, the enthusiasm of the girl inspectors is contagious. It has acted as a challenge to the craftsmanship of the male workers.

"Naval inspection of radio and electronic equipment," said Mr. LeRoy, "is always, necessarily, rigid. No one would say that the women inspectors are tougher than the men, but there is no denying that they have keen eyes and unlimited initiative, and they're plenty tough. No skilled workman taking pride in his craft likes to have rejects,

but it irks him a lot more if his work is turned back by a woman.

"As a consequence, we've found a spirit of friendly competition developing in every shop in which the Navy has placed women inspectors. The fact that most of these women could earn more money in their former professions or careers is known to the workmen, though the women don't boast about it. They are making sincere, earnest and patriotic sacrifices to get the war over as soon as possible. This example cannot help but inspire the men to put the same spirit into their work."

All the women in the group were required to take tough civil service examinations. There was a rigid weeding out process, and only those with high ratings and unusual ability were accepted. Minimum educational requirement is a high school education, but most of the women are college graduates, and all of them are thoroughly imbued with the Navy spirit.

The course for Navy women inspectors runs 408 hours on a schedule of eight hours per day, six days per week, no holidays and plenty of homework.

The first fourteen graduates, trained specifically for inspection work at the RCA Victor plant, were sent over on an experimental basis by the U.S.N.I.S. The results were so highly regarded, both by Navy officials and RCA management, that succeeding graduates were immediately placed with the company.

With the training program a practical success, it is being extended to other war plants throughout the country making naval radio and electronic equipment, according to the office of the Inspector of Naval Material of the Fourth Naval District, Philadelphia.

New Television Course

English-made films, explaining the mechanism of the enemy's newest explosive types of incendiary bombs and demonstrating effective means of extinguishing the lethal shells, are being used in NBC's revised Air Raid Warden's course,

televised every Monday at 4:00 p.m., and again at 7:30 p.m., over Station WNBT.

Since February, 1942, when the first Air Warden lessons were televised, more than 250,000 wardens have attended the lectures through the medium of television sets installed in New York's eighty-two police precinct stations. Completion of the course is mandatory for warden-candidates.



FIRST RADIOPHOTO TRANSMISSION FROM STOCKHOLM WAS THIS PICTURE OF DIRECTOR GENERAL OF SWEDISH TELEGRAPHS H. STERKY.

RADIOPHOTO SERVICE

New Circuit Opened By RCAC Links Stockholm, Sweden, With N. Y. City

ESTABLISHING radiophoto service between this country and a neutral European nation for the first time since the outbreak of war, a new circuit linking Stockholm, Sweden, and New York was opened February 22 by R.C.A. Communications, Inc.

Opening of the 3,976-mile New York-Stockholm circuit enables RCAC quickly to service photographs and other graphic material to and from all sides of the European war theater. With Stockholm in the North, other RCAC radiophoto circuits link the United States with London in the West, Moscow in the East, and Cairo in the South.

The Stockholm service, which was under test in cooperation with the Swedish Telegraph Administration for several months, brings to seven the number of radiophoto circuits operated by RCAC between the United States and various sections of the world. There is a New York-Buenos Aires service and, in addition, RCAC's San Francisco terminal receives radiophotos from Melbourne and Honolulu. Transmission of a picture over any of the circuits requires only six to ten minutes.



LIEUT. FOLLETT BRADLEY, NOW A MAJOR GENERAL, AND LIEUT. HENRY A. ARNOLD, NOW A FULL GENERAL, IN THE AIRPLANE FROM WHICH LIEUTENANT BRADLEY SENT THE ARMY'S FIRST MILITARY RADIO MESSAGE ON NOVEMBER 2, 1912, AT FORT RILEY, KANSAS. RIGHT—MAJ. GENERAL BRADLEY, AS HE APPEARS TODAY.



RADIO WINS HIGH TRIBUTE

Maj. Gen. Follett Bradley, Sender of First Military Radio Message from Plane in Flight, Hails Advances In Aviation Communication

ONE of the greatest tributes ever paid to radio, particularly the part it is playing in today's global warfare, recently came from Maj. Gen. Follett Bradley, the man who sent the first military radio message from an airplane in flight.

Speaking during the February 7 world-wide broadcast of "The Army Hour" by the National Broadcasting Company, General Bradley, who is now Air Inspector of the U. S. Army Air Forces, said:

"A little more than thirty years ago—on the second of November, 1912, to be exact—I sent a radio message from an airplane. That was the first military radio message ever sent from an airplane in flight. I was a First Lieutenant then, and my pilot was another Lieutenant by the name of Henry H. Arnold—now Lieutenant General Henry H. Ar-

nold (later named a full General), Commanding General of the Army Air Forces. And down on the ground at the receiving station was still another Lieutenant, Joe Mauborgne. Major General Mauborgne was retired a year and a half ago as Chief Signal Officer of the Army.

"We had arranged this test, the three of us, to demonstrate that artillery fire could be accurately controlled from an airplane in flight, and the test was eminently successful, although we had no way of receiving messages in the plane. We merely flew over the receiving station and they waved back at us to let us know they'd heard us. As I sat there, on practically nothing at all—the plane was an old Wright 'B' Pusher, and we sat out in the open air with two propellers buzzing at our necks, and we had no

parachutes or safety belts, either—as I sat there, tapping a key strapped on my leg. I am sure that I had no inkling whatever of the tremendous gains that were to be made in the coming thirty years in aerial communications. Neither, I am sure had my companions.

"I have watched aerial communications grow up along with the other developments in aviation, and I think I can say truthfully that I have seen miracles come to pass. I went to Russia and certain other places last year. On that trip we had American radio operators aboard, we had Russians, and we had Chinese. And I discovered that the science of radio communications is indeed a universal language—a language that speaks to men of all races equally.

"Today's global warfare could not be carried on without the magic of communications—and the intensive operations of aerial warfare would amount to aimless guerilla fighting without our highly developed communications system.

"We are able to talk from continent to continent, we guide our fighters, our bombers, our transports over uncharted skies with an ease and skill that we who sent that first radio message from a plane would have gasped at that day thirty years ago.

"The men who operate our communications systems deserve all the credit that can be heaped upon them—they are the men who guide our planes out into unknown parts, and who send, receive and transcribe the messages that bring them safely back.

"I am a pilot myself, and I know a pilot's responsibilities and his job. I have sat beside navigators, bombardiers, engineers, in flight and marvelled at their skill. But each and every one of them knows that the magic hand that keeps them all flying—them and their plane—and that brings them home again, is the hand at the radio key.

"There have been mighty changes since that day, and it is a good and useful thing that the changes have come—for now we have not only the best fighting equipment in the world, but the best communications equipment and the best men to use it."



MRS. HELEN WORTH LOVE (LEFT), JAMES DAUGHERTY, AND MISS MARY H. DAVIS, WHO WON CERTIFICATES OF INDIVIDUAL PRODUCTION MERIT FROM THE WPB FOR THEIR OUTSTANDING SUGGESTIONS TO SPEED THE WAR EFFORT.

WPB HONORS RCA WORKERS

Nineteen Employees of RCA Victor Division Win Certificates and Letters of Honorable Mention for Individual War Production Merit

FOR individual production merit in the war effort, nineteen employees of the RCA Victor Division were among the 157 workers in the nation to win War Production Board awards in March. The awards were made by the WPB through forty-four Labor-Management Committees in as many plants.

RCA Victor, for the second time since the WPB inaugurated its system of civilian awards last September, led all other companies in the total number of honors received. Of the nine women who shared in the list of awards, three are employed at RCA Victor's Harrison, N. J., plant. Moreover, two of these three women won Certificates of Individual Production Merit.

RCA Victor's winners of Certificates are:

Mrs. Helen Worth Love, Harrison plant, whose suggestion for rearranging a terminal board assembly on radio tubes will save 19,400 hours of labor.

Miss Mary H. Davis, Harrison plant, who made two suggestions on tube production which will save 2,050 hours of direct labor and \$1,400 in materials.

James Dougherty, Jr., Camden plant, who designed a pair of pliers with a simple adjustable screw that

solved a baffling problem of rejections in switch wafers.

Letters of Honorable Mention were received by the following RCA Victor employees:

M. D. and R. K. Harrison, special ratio board for testing transformers, RCA Victor Division, Radio Corporation of America, Camden, N. J.

R. D. Hughes and Charles Thiel, RCA, Camden (now at RCA Laboratories, Princeton, N. J.), suggested an improved feed through bushing in by-pass filter capacitors.

William Goble, RCA Victor Division, Radio Corporation of America, Harrison, N. J., two suggestions on radio tube operations.

Peter Janis, engineer, RCA, Harrison, redesigned a tube.

Harold Lipschultz and Fay Stariski, RCA, Harrison, changed the welding operation on a cathode.

Harris B. Kort, RCA, Harrison, devised an electrical method of forming tungsten filament leads for a specific type of power tube.

Daniel Battstone, RCA, Harrison, suggested elimination of unnecessary wing micas in certain magic eye receiving tubes.

George Van Wagoner, foreman, RCA, Harrison (two suggestions), adapted a single row fixture to a

double row for spraying filaments, and designed a new multiple welder.

Thomas H. Briggs, chief engineer, RCA, Harrison, suggested change in the flashing operation on getters, which formerly was a hand operation.

Thomas H. Schelling, coordinator of work simplification in the power tubes at RCA, Harrison, an improved testing device for shorts in tube mounts.

Robert B. DeLong, process engineer, RCA Victor, Harrison, suggested an improved method of treating ingots.

R. A. Jacobus, engineer, RCA Victor, Harrison, suggested a changeover from trolley to sealex exhaust on certain special-purpose radio tubes.

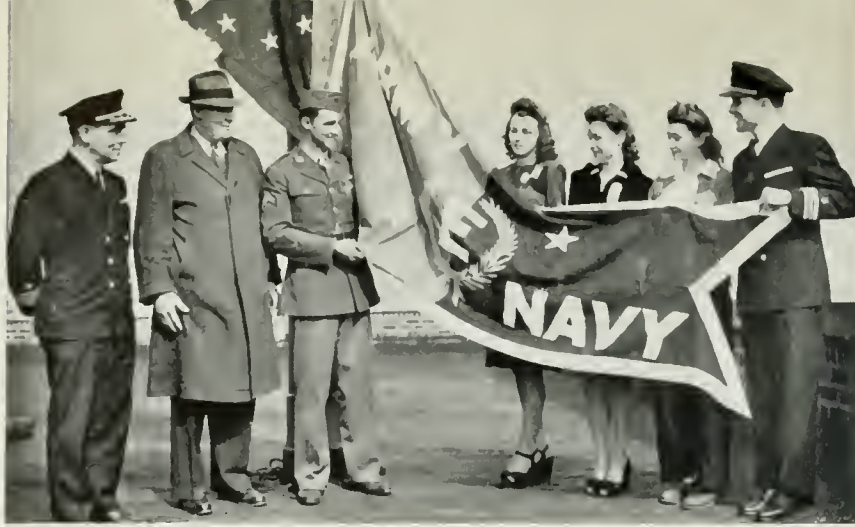
Dorothy L. Sanderson, work simplifier, RCA, Harrison, developed a new mounting procedure for a high-production metal tube.

All told, RCA Victor workers have now won a total of 49 honors out of the grand total of 389 issued by the War Production Board. These include 14 certificates of individual production merit, 34 honorable mentions and one citation—the latter being the highest possible honor.

Dogs Guard Plants



AS PROTECTION AGAINST POSSIBLE SABOTEURS AND INTRUDERS, RCA VICTOR DIVISION AT CAMDEN, N. J., EMPLOYS HIGHLY TRAINED DOGS TO AUGMENT THE STAFF OF 100 PLANT PROTECTION GUARDS.



TWO WAR HEROES, CORP. NICHOLAS LASTOHKIEN AND LIEUT. COM. MORGAN SLAYTON, HELP RCA VICTOR WORKERS RAISE THEIR NEWLY AWARDED TWO-STAR ARMY-NAVY "E" FLAG AT CAMDEN. AT THE LEFT ARE COMMANDER J. F. BATES AND GILES FRAZIER.

2 RCA PLANTS WIN "E" STARS

Camden Gets Second, Harrison First Star Added to Army-Navy Emblems for Continued Splendid Achievement in Outstanding Production

WITH the presentation of a two-star Army-Navy "E" flag as advance incentive, the RCA Victor Division's joint labor-management War Production Drive Committee in the Camden plant has launched its fourth "Beat the Promise" production drive.

Early in April, workers at the Harrison plant of RCA Victor were notified that they had been awarded the first star to be added to their Army-Navy "E" flag, which was

presented last September.

In a letter addressed "To the Men and Women of the Harrison Works," Robert P. Patterson, Under Secretary of War, said:

"You have continued to maintain the high standard that you set for yourselves and which won you distinction more than six months ago. You may well be proud of your achievement."

The Camden campaign opened on the celebration of Washington's

Birthday. "Let's Get It Over—Beat YOUR Promise" is the rallying cry of the drive designed to step up the output of vital radio, sound and electronic equipment. This slogan is emblazoned throughout the plant on posters, handbills and house publications. The plant-wide sound system likewise drives it home.

One of the highlights of the Washington Birthday program was the raising of the two-star "E" flag over the plant, following its presentation by Commander J. F. Bates, resident Naval inspector at the plant. The award was accepted for the employees by Arnold Weber, manager of the special apparatus division and chairman of the plant's joint labor-management committee, and Giles Frazier, vice president of Local 103, UERMWA, and vice chairman of the Committee.

In announcing the award earlier, Admiral C. C. Bloch, USN (Ret.), chairman of the Navy Board for Production Awards, said:

"I congratulate each and every one of the employees (of the RCA Victor Camden plant) upon their continued splendid achievement in outstanding production. This award is difficult to win in the first instance, and the requirements for renewal are equally exacting. By winning this additional honor, you have all demonstrated a solid determination to supply our fighting forces with the materials they must have to bring this war to a successful conclusion."



NBC Aids Red Cross

William S. Hedges (seated) NBC vice president, discusses with Mrs. August Belmont (right), Red Cross Council head, and Dorothy Stickney and Howard Lindsay, dramatic stars, script suggestions for the popular current broadcast series, "That They Might Live." The series is successfully promoting the Red Cross nation-wide campaign for nurses, nurses aides, and home nursing students to serve in the war emergency.

URGES CHARTER FOR BUSINESS

Sarnoff Says Hope of American Prosperity, Security Depends Upon Government Cooperation with Industry, Labor, and Agriculture

IN A PLEA for an American Charter for American business, David Sarnoff, President of the Radio Corporation of America, speaking February 4 at a meeting of the Chamber of Commerce of the State of New York, said that the great hope for American prosperity and security in the post-war period, depends upon Government cooperation with industry, labor and agriculture.

Pointing to the vital importance of science in global warfare, Mr. Sarnoff said that the degree of success in applying wartime developments to a new world in peacetime, will be controlled by social and economic forces over which science has no control.

"The achievements of science and industry hold out for us the promise of a great post-war prosperity," said Mr. Sarnoff, "but only if the individual enterprise of our citizens makes it a prosperity for all our people. Peace for only a segment of the globe and prosperity for only a section of our people will not be enough. Our constant efforts must be to make them universal. Neither industry alone nor labor alone nor agriculture alone can provide prosperity and security for all. But Government, which represents all of us, can, in cooperation with industry, labor and agriculture, help to make the entire nation prosperous and secure.

"The accomplishments of science and industry, expressed through the American competitive system of private enterprise, can be used to create employment for labor and for capital, and to stimulate national prosperity.

"The achievements of science in communication and aviation have wiped out geographical barriers, and have made the world a neighborhood in which no one's welfare can be separate from his neighbor's. When this war to save civilization is ended, there can be no peace for us as a nation unless there is peace in the world as a whole."

Discussing "Post-War Horizons," Mr. Sarnoff said that after all the treasure has been spilled across the battlefronts, enough potential resources will remain to feed, clothe and house the world's population. Looking ahead to the post-war era, he envisaged bread in place of bullets, and farm tractors in place of tanks, while cargo ships will carry products of farm and factory to millions needed by a world at peace.

There is no magic formula for the future, he said, and if global prosperity is the aim, it can be achieved only if global war is followed by global peace.

"Our hope for a future world economy of abundance is founded upon much more than pre-war standards of prosperity," continued Mr. Sarnoff. "It is based upon the promise of industrial science. The old frontiers of the world were frontiers of geography. The new frontiers are those of science. The covered wagon of the present day is the research laboratory.

"Progress in the field of radio and electronics has advanced on the same broad front with progress in other fields of science and industry. It is radio which has made possible a war of speed and mobility on land, at sea and in the air. Radio-electronic sentinels stand watch on shipboard and along the coast. The United States now has fighting forces stationed at more than sixty strategic locations on the world map. Its Navy operates on the Seven Seas. Without instant, reliable radio communication it would be impossible for these wide-spread forces to function as a unified war machine."

Referring to the radio tube as the heart of every radio instrument, Mr. Sarnoff said that science in putting electrons to work in the tubes has greatly extended the usefulness of electronics in industry as well as in communications.

"The versatility of these tubes, and of the devices built around them," he said, "is amazing."

ENDURING PEACE URGED BY GENERAL HARBORD

Warns Against Standing By and Watching Germany and Japan Rearm Again.

PEACE made, when victory at last is won, must be a peace that will endure, Lieut. Gen. J. G. Harbord, Chairman of the Board of Radio Corporation of America, said February 17 at a dinner in his honor, held at the Union League Club. He declared that it must be made impossible for war-seeking leaders in Germany or her satellite countries to make war again.

"We must not once more make the mistake of standing calmly by and watching the re-arming of a Germany where militarism has been a cult since the Roman Era; or a Japan unbroken on 'through ages eternal' as the Japanese so proudly boast," said General Harbord, who was Chief of Staff of the AEF in the first World War, and at the end of the war was in command of the important Services of Supply.

"Our second thought, when peace eventually comes, should strike closer to home," continued General Harbord. "As loyal patriotic Americans we must do everything in our power—to the very limit of our power—to carry into the future our individual initiative, our self-reliance, and our political freedom. These heritages have created the strong stamina of our nation—these heritages have created the constantly increasing pace of its truly marvelous progress. America is made of such stuff!"

Reviewing the advances made in radio communication between the first World War and the present conflict, General Harbord said: "These again are great days for the scientists and engineers in the closely guarded laboratories of America, where new devices are being planned to be forged by industrial plants into the tools of victory.

"When victory is won at last, a great wealth of knowledge and skill and manpower will be ready to be turned from destruction to construction."

RCA Gross Income Rose in 1942

CONSOLIDATED gross income of Radio Corporation of America for the year 1942 was \$197,024,056, compared with \$158,695,722 in 1941, it was stated in the company's twenty-third annual report, released by David Sarnoff on February 27 and mailed to 235,000 stockholders.

The report shows, after all deductions, a net profit of \$9,002,437 for the year 1942, a decrease of \$1,190,279 compared with 1941. After payment of Preferred dividends, earnings applicable to the Common stock were equivalent to 41.7 cents per share, as against 50.2 cents in 1941. Provision for Federal income taxes was \$19,074,850 in 1942, an increase of \$2,701,250 over 1941.

The sources of RCA's 1942 gross income were:

Manufacturing	\$122,595,597	62%
Broadcasting	52,613,910	27%
Communications	14,497,197	7%
All other sources	7,317,352	4%

Total \$197,024,056 100%

Disposition of the year's income was as follows:

Cost of Raw Materials, Supplies, Sustaining Program Talent, Rent, Sales and Advertising;	
Payments to Associated Broadcasting Stations; Research, Administration, and Other Operating Expenses	\$ 92,267,770
Wages and Salaries to Employees	68,129,079
Depreciation and Interest	4,762,157
Taxes	22,862,613
Dividends to Stockholders	5,984,825
Carried to Surplus	3,017,612
Total	\$197,024,056

On December 31, 1942, the report stated, RCA personnel numbered 35,587, an increase of 5,126

RCA'S TEN-YEAR RECORD OF EARNINGS

(The figures shown for all years prior to 1941 include Foreign Subsidiaries)

YEAR	GROSS INCOME	NET PROFIT BEFORE FEDERAL INCOME TAXES	FEDERAL INCOME TAXES	NET PROFIT AFTER FEDERAL INCOME TAXES	EARNINGS PER SHARE ON COMMON STOCK (Based on present capitalization)
1933	\$ 62,333,496	\$ 582,094*	—	\$ 582,094*	—
1934	78,756,994	5,055,114	\$ 805,850	4,249,264	\$.074
1935	89,228,898	6,026,673	899,800	5,126,873	.137
1936	101,186,310	7,293,037	1,137,100	6,155,937	.212
1937	112,639,498	11,142,158	2,117,300	9,024,858	.418
1938	99,968,110	9,095,772	1,683,700	7,412,072	.302
1939	110,494,398	10,149,511	2,066,700	8,082,811	.350
1940	128,491,611	13,364,656	4,251,500	9,113,156	.425
1941	158,695,722	26,566,316	16,373,600	10,192,716	.502
1942	197,024,056	28,077,287	19,074,850	9,002,437	.417

* Loss.

in twelve months. Of this number, 18,746 or 53% were men, and 16,841 or 47% were women. At the year-end, 3730 RCA employees had joined the armed forces of the United States.

With the report to stockholders, announcement was made of the annual meeting to be held on Tuesday, May 4 at 11 A.M. in one of the NBC sixth floor studios.

NBC In Listening Survey

Results of one of the most comprehensive surveys of the radio scene ever conducted have been issued by the National Broadcasting Company. Two brochures, titled "A Tale of 412 Cities," present statistics on the listening habits of radio users in the 412 United States cities having populations of 25,000 or more. The supplementary folder, "A Report from the Nation," extends the survey to the entire country.

To Redeem "B" Stock

The RCA Board of Directors, meeting April 2, voted to redeem on July 1, 1943, all outstanding "B" Preferred Stock of RCA, at \$100 per share and accrued dividends to the redemption date, a total of \$101.25 per share.

The 11,891 shares of "B" Preferred Stock now outstanding are the balance (less than 2 per cent) remaining after the recapitalization plan which went into effect in 1936. After July 1, 1943, the entire capitalization of RCA will consist of 900,824 shares of \$3.50 Cumulative First Preferred Stock and 13,881,016 shares of Common Stock outstanding.

During a typical month of 1942, the National Broadcasting Company devoted an average of more than 5 hours of its own time daily to public service and war effort programs.

Sincerely Yours...

WHEN the enemy struck at our country, American industrialists and business men, not content with their achievements of converting from peacetime to war production, turned the full power of their advertising, not only radio but publication advertising as well, to the gigantic task of bringing the war and its meaning to the American people.

Closely cooperating with the Government, they devoted, with characteristic energy and loyalty, time, money and great talent to the task of crystallizing the nation's thinking, to dispelling confusion and to clarifying the wartime duties of the individual.

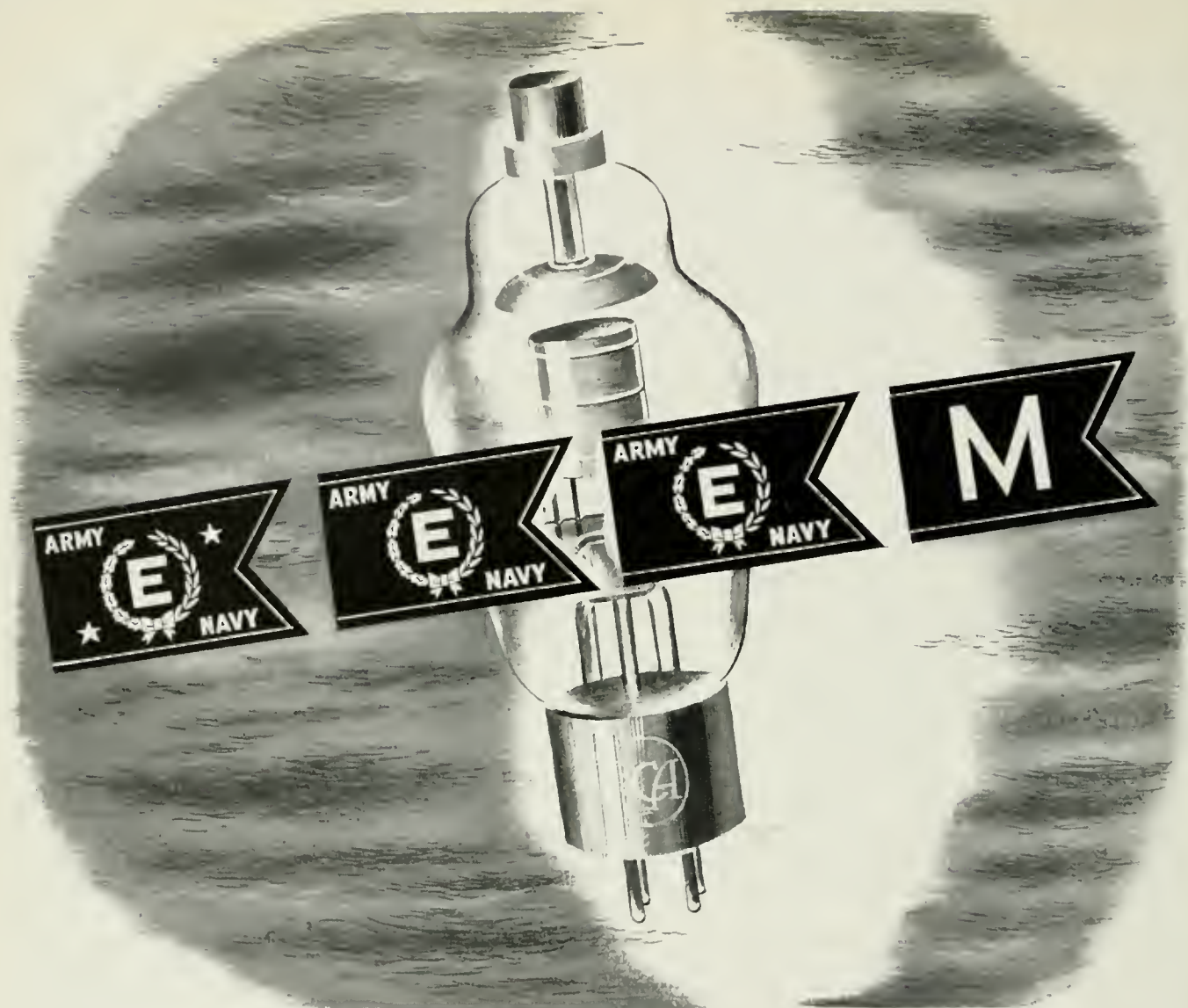
Advertising agencies, too, have utilized all their skill and experience in bringing about the fullest understanding of all the problems of war in a manner which has done much to unite the American people.

It is to these leaders of American industry, to executives, copywriters and artists of American advertising agencies and members of the Advertising Council, that the American people owe a debt of gratitude.

It is their advertising support, their war-effort and entertainment programs, which make possible a broadcasting service without equal in the world—a free radio for a free people.

To these men radio pays tribute—history will write “well done” to their magnificent contributions to the war effort.

• THE NATIONAL BROADCASTING COMPANY •



Battle Flags of Radio...

These are flags of Victory — an Army-Navy "E" with two stars awarded to an RCA Instrument plant—an Army-Navy "E" won by an RCA Tube plant—an Army-Navy "E" and the Maritime Commission "M" pennant awarded to the Radiomarine Corporation of America.

They have been won on a vital battlefield of this war—the battlefield of production. The men and women of the Radio Corporation of America and its services have earned

these four flags by their outstanding achievement in the production of radio-electronic equipment vital to victory.

When victory is won, the skill and war experience of RCA will be turned to the new goals of peace . . . to the task of making the life of our nation richer, safer, more enjoyable, and more productive . . . through new and finer products of radio and electronic research.

★ BUY WAR BONDS EVERY PAYDAY ★



RADIO CORPORATION OF AMERICA

RCA LEADS THE WAY IN RADIO, ELECTRONICS, TELEVISION

The Services of RCA: RCA Laboratories • RCA Victor Division • R.C.A. Communications, Inc. Radiomarine Corporation of America • National Broadcasting Co., Inc. • Blue Network Co., Inc. • RCA Institutes, Inc.