

# Sarnoff Looks Ahead

RCA PRESIDENT SEES NEW ELECTRON TUBES OPENING UNLIMITED OPPORTUNITIES—RADIO INDUSTRY NOW BREAKING ALL RECORDS

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RADIO activity in research, engineering, communication and manufacturing during 1943 may be summed up in one objective—win the war! Although wartime secrecy imposes limitations, the end of the year affords appropriate opportunity to gauge radio's vital role in the world today, and to measure the significance of wartime developments as they may fit into the pattern of the future.

Strongly fortified by the ingenuity and skill of American research and industrial enterprise, radio has entered its third year of war in the service of the United States. Years of suspense—a year of defense and a year of offense—have gone into history. As 1944 begins, the United States is on the road to Victory. A year of intensified offensive, such as the world has never known, is ahead. Only time can tell, however, whether 1944 is to be the year of decision—the year of unconditional surrender of the forces which have wrought destruction and tragedy upon the world.

## Radio's Role Great

Radio's great role in global warfare is coordination achieved through lightning-like communication, regardless of distances, natural barriers or the enemy. The application of radio-electronics to detecting, ranging and navigation is being greatly extended with miraculous results. Thus, the future of radio is an ever-increasing circle

within whose orbit new peacetime services are being evolved through wartime research and engineering. As keys to the microwave spectrum, more powerful electron tubes are opening the domain of tiny wavelengths, which possess unlimited possibilities in radio and its related fields of electronics, television, radiothermics, supersonics and electron microscopy.

Today, science marches with the victorious armies. It sails with the fleets and flies with the air armadas. The totalitarian powers intent upon conquest, invaded country after country, and perverted inventions of science to warfare. They have failed.

Today, on the wings of the airplane, Victory soars. On the waves of radio, Freedom sends its heartening message around the world. Science triumphant has given winged Victory indomitable power. There is no direct clue, however, to reveal how long and difficult the march to final Victory will be. Until the goal is reached, there must be no letdown in the all-out effort to win the war.

The American radio industry is breaking all records in production and communication. As the New Year unfolds, the "ether" pulses with new vigor. Micro-waves accomplish new wonders. Daily, 400,000 radio-electron tubes are manufactured. Every hour of the day and night, all America is informed by up-to-the-minute broadcasts on the progress of the war. At the same time, short-wave broadcasters are reaching every land throughout the world regardless of enemy restrictions. Tons and tons of apparatus are sent into combat every week. Miles and miles of transoceanic radiotelegraph circuits are vibrant with urgent dispatches,



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news and communiques. Messages are flashed by automatic high-speed machines at the rate of 600 words a minute.

Latest estimates reveal that radio production in the United States is up to \$250,000,000 a month against \$30,000,000 a month a year ago—all for the armed services. The equipment is the finest and most efficient in the world. America's radio-electronic scientists and engineers have far surpassed Germany's much vaunted super-men of science.

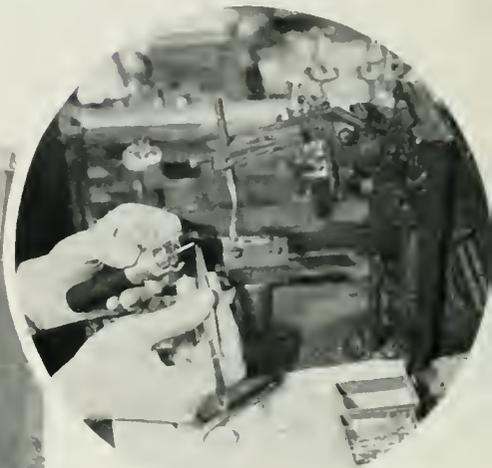
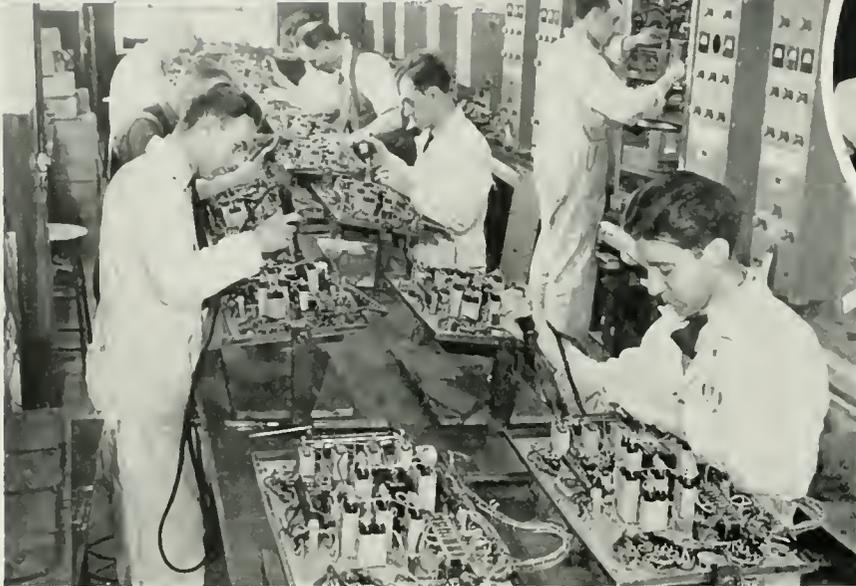
## Praises Workers' Record

From every theatre of battle, come reports of the outstanding performance of American radio. This speaks high praise for the workers on the production front, who are achieving an unparalleled industrial record. Their patriotic spirit and skill on the assembly lines supplement the courage, initiative and fighting spirit of the men who take radio into battle. A radio flash from a walkie-talkie in a foxhole, or from a handie-talkie on a beachhead, may well be the signal of victory. A radio flash from the cockpit of a fighter plane, or from a rubber liferaft, may turn the tide of a battle, or save the lives of struggling men. Radio's record for 1943 attests the triumphs of the deft fingers that make radio tubes, of the hand that manipulates a



RESULTS OF WAR-TIME RESEARCH IN RCA LABORATORIES POINT TO NEW PEACE-TIME RADIO SERVICES. HERE, EXPERIMENTAL TUBE PARTS ARE BEING REMOVED FROM A HYDROGEN FURNACE.

THE SCENE BELOW IS FROM AN RCA PRODUCTION LINE, WHICH IS CONTRIBUTING TO THE RECORD-BREAKING VOLUME OF RADIO EQUIPMENT BEING SUPPLIED THE ARMED FORCES.



DELICATE FEMININE FINGERS PERFORM INTRICATE TUBE ASSEMBLY JOB (BELOW) IN RCA VICTOR PLANT. THE RADIO INDUSTRY IS PRODUCING ELECTRONIC TUBES AT THE RATE OF 400,000 A DAY.

soldering iron on the assembly line, or the skill of the tester who declares the completed apparatus ready to enter the fight.

In fulfilling its unprecedented wartime responsibilities, radio has taken its place among the great industries of America, offering employment to hundreds of thousands of workers. Since the war began in Europe, RCA employees have increased from 23,000 to more than 40,000. Another 6,000 employees are enrolled as officers and enlisted men in the military services. Many of them are in the front-line of communications — they strengthen, maintain and operate the life-line of Victory.

It is a tremendous task to supply radio instruments and installations to our army of 8,000,000 men aligned on a global front; to meet the needs of our allies for radio, and to install radio apparatus in thousands of aircraft, warships, trans-

ports, tanks and mechanized units as well as in all airfields and outposts. This task is intensified by new and exacting specifications of war, ruled by all sorts of conditions related to topography, seas, weather, climate, and altitude. Radio apparatus, subject to constant movement, rough handling and assault in the field, on the seas and in the air, must be rugged to be dependable. Our fighting men know and appreciate that the radio research men, engineers and production workers have succeeded in meeting the demands of war. Their craftsmanship keeps faith with science as well as with the Army, Navy and Air Corps.

#### *Serve Home Front*

American-built radios have been under fire now for more than two years. Within that period home-

radios in the United States have been used as never before as a source of news and entertainment. A home without a radio is out of tune with the world. Americans everywhere have an ear to the battlefronts. There are 60,000,000 receiving sets; 31,000,000 "radio families"; 900 broadcasting stations; 14 American international short wave transmitters; millions and millions of radio-electron tubes glow in the service of the Nation and its people.

The fact that our civilian radio service is not disrupted during these war years, when all-out efforts and materials are directed to winning the war, is high commendation of the quality of American radios as designed for the home. In this country broadcasting has not been distorted by censorship, nor put under absolute government operation and strait-jacketed by stringent rules on listening. Americans listen to enemy broadcasts without danger of death-penalty or imprisonment. All this liberty in wartime is proof of radio's faithful alliance with Democracy and the Freedoms.

Scientifically, the outstanding developments of 1943, as those of 1941-42, are classified as military secrets. It violates no secret, however, to report that outstanding ad-

vances have been made in the use of radio sound and sight. Nothing in radio is ever new for long, even in peacetime. War, however, changes the old order of things even more rapidly.

New instruments and new services are in the offing for peace. The wartime pace that science is called upon to maintain is breathtaking. Nevertheless, American radio keeps up with it. Our laboratories are creative beehives of activity; our manufacturing plants are arsenals; our communication waves are lifelines. To reconvert them all to peaceful pursuits will present a great challenge to the radio industry. It will be a most promising field for post-war employment and opportunity.

When the war ends American industry must not be without a chart for the future. The post-war era will bring many challenges and problems to test American leadership and enterprise. Few industries compared to radio hold greater opportunity for the solution of problems relating to industrial progress and employment or the maintenance of the American standard of living.

Industry must be prepared to reconvert as quickly as possible from war to peace, yet without the slightest neglect or relaxation in the total war-effort of the present.

Radio as an industry is fortunate to have television as a postwar development of great promise and popular appeal, able to open a new era in service to the public.

### *New Things to Come*

There should be no expectation, however, that when the war ends the air will be transformed overnight to television. It will require from 3 to 6 months to get the machinery in operation to resume the manufacture of civilian broadcast receivers. It may require a year after approval of standards and full authorization of commercialization of television broadcasting by the Federal Communications Commission before television sets are available within the price range from \$200 to \$300. Production of television receivers is not the only task. Television transmitters must be erected. Interesting programs must be planned. Automatic radio relay

stations must be built to link key cities into a network. That is no one-year job.

Alongside of television, "FM," or frequency modulation on ultra-short waves, holds great promise of becoming an added feature in broadcasting. Even now "FM" carries the sound part of television. In both television and "FM," much scientific progress has been made in connection with the application of radio to the war. The home-radio instrument of the future will be a combination television and sound-broadcast receiver incorporating "FM" and a phonograph.

Outside the realm of radio communication, the application of radio-thermies, or radio heating, is finding widely extended use in industry. The use of high-frequency waves for heating is a wartime development of no small achievement. It is accelerating and increasing the efficiency of numerous industrial processes.

The electron microscope, now produced under a high wartime priority rating, will be made available over a vast field of usefulness after the war. It will be compact

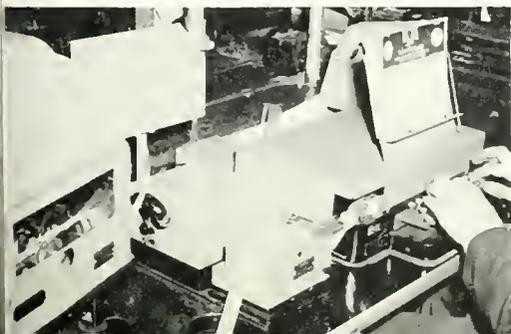
SPECIAL RADIO COMMUNICATION UNITS, DESIGNED BY ENGINEERS OF RADIOMARINE FOR LIFEBOATS, ARE PROTECTING LIVES OF THOUSANDS OF AMERICAN SEAMEN.



THESE TOWERS OF WEAF, KEY STATION OF THE NBC NETWORK, SERVE THE HOME FRONT WITH UP-TO-THE-MINUTE NEWS AND ENTERTAINMENT.



HIGH-SPEED MULTIPLEX RADIO-TELEGRAPH PRINTERS AT RCA COMMUNICATIONS TRANSMIT WAR-VITAL MESSAGES ACROSS THE SEAS AT THE RATE OF HUNDREDS OF WORDS A MINUTE.



and portable, and its service will be greatly increased. In addition, RCA Laboratories has succeeded in developing an electron micro-analyzer, which, incorporating an electron microscope, enables atomic identification of the chemical elements comprising submicroscopic particles of matter. For example, if there is iron in the nucleus of a bacterium, the micro-analyzer detects it.

Because of spectacular wartime developments, radio apparatus will be adapted for collision prevention to aircraft, ships, railroads and possibly automobiles. All this will be part of the new service of radio in an era of sight control made possible by the development of electron tubes in the field of microwaves.

### *New Tubes Foreseen*

As new electron tubes always serve as keys to major advances, so in broadcast reception, new and tiny tubes—smaller than acorns—may introduce “personalized” radio.

Small, compact receivers, and even transmitters may be built in a little case that will slip into a pocket. The uses to which such “stations” may be put gives the imagination much to play upon.

All these new developments will not be realized in 1944, but with 1944 as the year of expected decision in the European war, they will date from it, as radio broadcasting dated from 1919.

The new ideas, tools and instruments of progress that emerge from the war may well give us 1960 radio in 1950. War shrinks the lapse of time between invention and its practical use. The merit of a discovery is quickly appraised and harnessed.

While we can see all these signs of progress, we must not lose sight of the losses suffered to the world through the casualties of battle. The boy who fell in the jungles of Guadalcanal, on the sands of Africa, on the road to Rome, who vanished in the Atlantic or Pacific

or parachuted into the realm of missing warriors, may well have carried with him a revolutionary idea. When we review a year of war we wonder what might have been the fate of wireless had war taken the lives of such men as Maxwell, Hertz, Marconi, deForest, Alexander, Armstrong and Zworykin, in their youth.

But the young men, lost to the world and to science in this war, have, in their supreme sacrifice, made it possible for the civilized world to progress; they have contributed far more than invention. They have made future invention possible by the defense of a civilization in which men can think, study, work and achieve for the welfare of mankind under freedom and justice.

We may look forward to 1944 with high hopes, bulwarked by a determination never to break faith with those who have fallen, or with those who are marching with the Stars and Stripes, on the bomb-infested road to Victory.

RADIO-ELECTRONIC DEVICES, SUCH AS THE RIVET DETONATOR (RIGHT), HAVE GREATLY SPEEDED UP PRODUCTION FOR WAR IN NUMEROUS BRANCHES OF INDUSTRY.

TWO TYPES OF THE ELECTRON MICROSCOPE (LOWER LEFT) HAVE BEEN DEVELOPED IN RCA LABORATORIES BY DR. JAMES HILLIER, LEFT, AND V. K. ZWORYKIN. THE LARGER, STANDARD, MODEL IS SERVING WAR-TIME RESEARCH.

LARGE-SCREEN TELEVISION RECEIVERS FOR THE HOME (LOWER RIGHT) HAVE BEEN DEVELOPED EXPERIMENTALLY BY RCA, AND ARE PART OF TELEVISION'S POST-WAR PROMISE.

