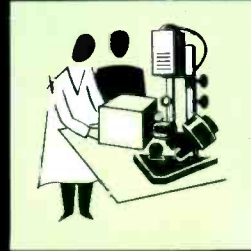
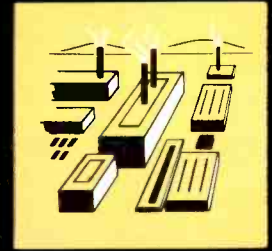


384.1  
R118rca  
1954

1954



RESEARCH



MANUFACTURING



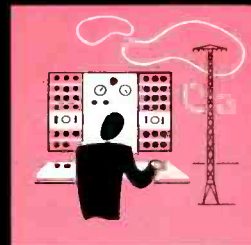
RADIO



TELEVISION



what it is - what it does



COMMUNICATIONS



MARINE RADIO



TECHNICAL TRAINING



FOREIGN TRADE



# RADIO CORPORATION OF AMERICA

## Board of Directors

WALTER A. BUCK	HARRY C. HAGERTY	MRS. DOUGLAS HORTON	EDWARD F. McGRADY
JOHN T. CAHILL	JOHN HAYS HAMMOND, JR.	HARRY C. INGLES	WILLIAM E. ROBINSON
FRANK M. FOLSOM	GEORGE L. HARRISON	CHARLES B. JOLLIFFE	DAVID SARNOFF

## Officers

### Chairman of the Board

DAVID SARNOFF

### President

FRANK M. FOLSOM

### Executive Vice-Presidents

JOSEPH B. ELLIOTT	E. W. ENGSTROM	CHARLES M. ODORIZZI	L. W. TEEGARDEN
	W. WALTER WATTS		

### Vice-Presidents

E. C. ANDERSON	JOHN S. CARTER	CHARLES B. JOLLIFFE	ROBERT A. SEIDEL
HENRY G. BAKER	CONWAY P. COE	HAROLD R. MAAG	FRANK SLEETER
PAUL A. BARKMEIER	ORRIN E. DUNLAP, JR.	RICHARD T. ORTH	THEODORE A. SMITH
MEADE BRUNET	E. DORSEY FOSTER	EMANUEL SACKS	EDWARD M. TUFT
WALTER A. BUCK	VINCENT dePAUL GOUBEAU	DOMINIC F. SCHMIT	ROBERT L. WERNER
	V. K. ZWORYKIN		

### Controller

WALTER S. HOLMES, JR.

### Vice-President & Treasurer

ERNEST B. GORIN

### Secretary

JOHN Q. CANNON

### General Counsel

CAHILL, GORDON, REINDEL & OHL

### Transfer Agents

THE CORPORATION TRUST COMPANY, NEW YORK 5, N. Y.  
THE FIRST NATIONAL BANK OF CHICAGO, CHICAGO 90, ILL.

### Registrars

#### Preferred Stock:

THE CHASE NATIONAL BANK OF THE CITY OF NEW YORK, NEW YORK 15, N. Y.  
CITY NATIONAL BANK AND TRUST COMPANY OF CHICAGO, CHICAGO 90, ILL.

#### Common Stock:

THE NEW YORK TRUST COMPANY, NEW YORK 15, N. Y.  
CITY NATIONAL BANK AND TRUST COMPANY OF CHICAGO, CHICAGO 90, ILL.

## C O N T E N T S

RCA Board of Directors	2
Foreword	3
Radio Corporation of America	5
Research	10
Broadcasting	17
Consumer Products	28
Electronic Products	34
Sales and Service Subsidiaries	42
International	47
Communications	50
Pioneering in Radio	54
RCA-NBC Firsts in Television	59



**WHAT IT IS - WHAT IT DOES**  
answers to questions often asked

Published by the Department of Information

**R A D I O C O R P O R A T I O N O F A M E R I C A**  
RCA BUILDING, 30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

CONN. STATE LIBRARY Copyright 1954, Radio Corporation of America

JUN 1 1954



David Sarnoff  
*Chairman of the Board*



Frank M. Folsom  
*President*



John T. Cahill



George L. Harrison



Edward F. McGrady



Harry C. Hagerty



Walter A. Buck



Mrs. Douglas Horton



John Hays Hammond, Jr.



William E. Robinson



Charles B. Jolliffe



Harry C. Ingles

**R C A B O A R D O F D I R E C T O R S**

## F O R E W O R D

The idea for the origination of this booklet was born in the White House in the autumn of 1941 while Brig. General David Sarnoff was visiting with President Franklin D. Roosevelt.

During their conversation, the President asked a number of questions about RCA, and it occurred to the General that since the President was so interested in the answers to the various questions, there was a need for a booklet that would provide the answers to others who might also be interested.

From year to year since that date a new edition of "RCA—What It Is and What It Does" in a question-and-answer format has been published to keep pace with the changing times and growth of RCA.

The story begins in 1919 when the Radio Corporation of America was formed. Its research laboratory then was in a small tent on Long Island and the Corporation's employees totaled only 485. There was no radio broadcasting to the home, no television, no talking movies, no radio-phonographs, no long-play records, and there were no such products as magnetic tape recorders, transistors, or electron microscopes, no radar or atomic batteries.

This is a timely story as well as a history, because from year to year the story changes and new achievements are added. The old ones are recorded as historic milestones. Each year adds new names, new faces, new inventions, new products and services, and questions related to the past give way to new ones linked with the present and the future.

Since "RCA—What It Is and What It Does" was conceived in 1941, the gross income of RCA has increased from \$158,695,722 in that year to \$853,054,000 in 1953, an increase of 437%.

In the same period the number of RCA employees increased from 30,000 to 65,000.

When the first issue of this booklet was published the majority of questions related to radio. Television was just "opening its eyes." Today there are more than 28 million television receivers in the United States and 375 stations broadcasting TV programs. This phenomenal growth of a new industry has been achieved since the end of World War II.

Time tests and time judges that which is to transfer in whole or in part from the present into the future. With the passing of the years some instruments are improved to remain in service while others become obsolete, relegated to the museums that depict man's ingenious efforts to pioneer and to advance on the trails of science and industry. That is the American way. And because "RCA" is dedicated to pioneering and research, that symbol continually gains in stature and remains ever-new.

Thirty-five years — 1919 to 1954 — have added distinction to "RCA" as a trademark in American enterprise born of leadership in radio, television, electronics and world-wide communications. "R-C-A" flashed in huge electric letters atop Radio City is an emblem emblazoned by scientific and industrial achievements which signify leadership, dependability and quality.



*President*

RADIO CORPORATION OF AMERICA







## WHAT IT IS — WHAT IT DOES

**What is "RCA"?** The letters "RCA" are the initials of Radio Corporation of America which includes: RCA Laboratories, National Broadcasting Company, Inc., RCA Victor Home Instrument Division, RCA Victor Record Division, RCA Victor Home Appliance Division, RCA Estate Appliance Corporation, RCA Engineering Products Division, RCA Tube Division, Radiomarine Corporation of America, RCA Service Company, Inc., RCA Victor Distributing Corp., RCA Institutes, Inc., RCA International Division and RCA Communications, Inc.

**What led to the formation of RCA?**

Prior to and during the first World War, the United States depended largely upon foreign-

owned cables and wireless stations for communications with many important parts of the globe. Great Britain was the communications center of the world. The war revealed to Americans that radio offered a new and competitive system, an opportunity to win pre-eminence for the United States in radio communication.

Subsequently, RCA was formed as a result of suggestions by officers of the United States Navy. Arrangements were made to acquire the assets of the Marconi Wireless Telegraph Company of America. A charter was granted RCA under the corporation laws of the State of Delaware on October 17, 1919. The business and property of the American Marconi Company were acquired by RCA on November 20, 1919. On December 1,



1919, RCA began business as an all-American organization. Its charter provides that no person shall be eligible for election as a Director or officer of the Corporation who is not at the time of such election a citizen of the United States. The charter also specifies that the Corporation may, by contract or otherwise, permit such participation in the administration of its affairs by the Government of the United States as the Board of Directors deems advisable. A clause in the charter provides that at least 80% of the RCA stock outstanding shall be held by citizens of the United States.

The first Chairman of the Board was Owen D. Young; the first President, Edward J. Nally; David Sarnoff was Commercial Manager.

***Where are the RCA executive offices?***

Headquarters of Radio Corporation of America are in the RCA Building, 30 Rockefeller Plaza, New York City. This building is the tallest in Rockefeller Center, popularly known as "Radio City."

***What is the nature of RCA's business, as outlined in its original charter?*** To send and receive signals, messages and communications; to create, install and operate a system of communication which may be international; to improve and prosecute the art and business of electric communication; to radiate, receive and utilize electromagnetic waves; to create, manufacture and sell goods and merchandise, and to hold and own patents, patent rights, copyrights and other real and personal property of every description.

***How did RCA enter the manufacturing business?*** When Radio Corporation of America was formed in 1919, its primary activities consisted of international and marine radio communications. Shortly thereafter, radio broadcasting began and RCA initiated the sale of radio products manufac-

tured by General Electric Company and Westinghouse Electric & Manufacturing Company. The rapid development of this new industry made it necessary for RCA so to organize its business in 1929 that it could combine manufacture and sales under a unified management.

To obtain manufacturing facilities, RCA in 1929 acquired the Victor Talking Machine Company — a company whose beginning dates back to 1898. In the latter part of 1934, the various units engaged in the manufacture and sale of RCA products were unified as the RCA Manufacturing Company. On December 31, 1942, this company was merged into Radio Corporation of America as the RCA Victor Division.

To keep pace with the continued growth of RCA's business, the Corporation realigned its organizational structure early in 1954. All manufacturing activities, including those conducted by the RCA Victor Division and other units of RCA, were combined into two separate categories, namely: consumer products and electronic products. In addition to manufacturing activities, the sales and service subsidiaries of RCA were also grouped for more efficient operation.

***What are the industrial activities of RCA?***

Radio Corporation of America is one of the world's foremost radio-electronic organizations. Through its various divisions and wholly-owned subsidiaries, it is engaged in numerous phases of radio, television and electronics: research and engineering, design and development, manufacturing, domestic and foreign sales, communications, broadcasting, technical training and servicing.

***To what extent is RCA engaged in electronics?*** RCA has pioneered in the science of electronics since its formation 34 years ago. Its laboratories today are a foremost center of radio-electronic research.



**Does RCA have a centralized display of its products and services?** Yes; the RCA Exhibition Hall at 40 West 49th Street, New York. The Hall, free to the public, is open daily and Sundays from 11 a.m. to 9 p.m. Other exhibits of RCA products are at the Corporation's manufacturing plant in Camden, N. J., and at the Chicago Museum of Science and Industry.

**How many people are employed by RCA and its subsidiaries?** On December 31, 1953, RCA and its subsidiaries had 65,000 employees.

**What are RCA's personnel and labor policies?** The management recognizes that the loyal cooperation of its employees is important to the success and progress of RCA. The company maintains competent personnel administration in all units including facilities for recreational and personal development. Candidates for employment are selected on the basis of ability, without regard to race, creed, color or national origin. Promotion is on the basis of merit and efficiency. It is RCA's policy to pay as high wages, under as favorable hours and working conditions in similar classes of work, as those prevailing in the areas in which the company's operations are conducted. Where employees choose to bargain collectively, the company deals willingly and frankly with their authorized representatives. At present, there are in force contracts between various divisions, subsidiaries or companies of RCA and 72 separate bargaining agencies. Of these, all but 9 are affiliated with the A. F. of L., or C. I. O.

**Who owns RCA?** Ownership of RCA is widely distributed among approximately 177,000 stockholders, in every state of the Union. No stockholder of record holds as much as 4% of the total outstanding voting securities of the Corporation. Less than 5% of the stock is held by foreign stockholders.

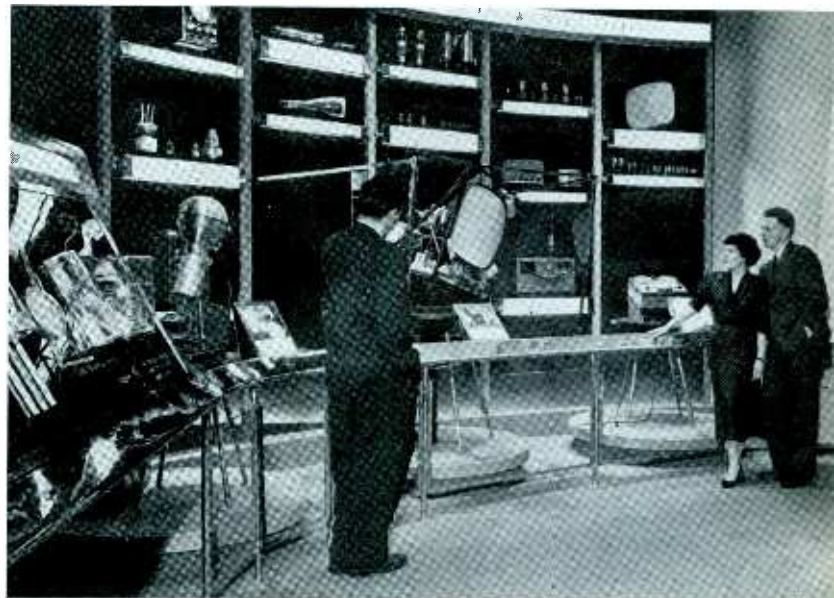
**What is RCA's capital stock?** There are two classes of RCA stock:

	Shares Outstanding
\$3.50 Cumulative First Preferred . . . . .	900,824
Common . . . . .	14,031,016

**Do RCA stocks pay dividends?** Quarterly dividends, at the rate of \$3.50 per share per annum have been paid regularly on the First Preferred Stock since it was issued in 1936. In 1953, these dividends amounted to \$3,153,000.

Dividends totaling \$104,106,000 have been paid on the Common stock since 1937, including \$16,810,000 for the year 1953. The 1953 Common stock dividend represents \$1.20 per share, including 20 cents extra, compared with \$1.00 per share in each of the three preceding years.

A new policy has been adopted, as announced on December 4, 1953, placing Common stock dividends on a quarterly basis. It is the intention of the Directors to declare such dividends payable in May, August, November and February, provided future earnings justify the action.



Product display at RCA Exhibition Hall, New York.

# RESULTS AT A GLANCE

## WHERE IT CAME FROM

<i>A summary of products and services sold during the year</i>	1953		1952	
	AMOUNT	%	AMOUNT	%
RCA — Includes RCA Victor, RCA Laboratories, RCA International Division and domestic subsidiaries other than those listed here	\$645 117 000	75.6	\$507 354 000	73.1
National Broadcasting Company	176 052 000	20.6	162 521 000	23.4
RCA Communications	17 939 000	2.1	17 503 000	2.5
Radiomarine Corporation of America	18 662 000	2.2	11 853 000	1.7
RCA Institutes	960 000	.1	742 000	.1
Less: Inter-company transactions	5 676 000	.6	6 032 000	.8
TOTALS	\$853 054 000	100.0	\$693 941 000	100.0

## WHERE IT WENT

<i>How the sales dollar was applied during the year</i>	1953		1952	
	AMOUNT	%	AMOUNT	%
Materials and services bought from others	\$456 331 000	53.5	\$358 604 000	51.6
Wages and salaries	281 769 000	33.0	233 848 000	33.7
Pensions, social security taxes, insurance and other benefits	18 470 000	2.2	15 112 000	2.2
Depreciation and patent amortization	15 174 000	1.8	12 238 000	1.8
Interest on borrowed money	4 631 000	.5	3 161 000	.4
Taxes on income and property	41 657 000	4.9	38 653 000	5.6
Dividends declared for year	19 963 000	2.3	17 011 000	2.5
First quarter 1954 dividends declared in 1953	4 290 000	.5	—	
Reinvested in the business	10 769 000	1.3	15 314 000	2.2
TOTALS	\$853 054 000	100.0	\$693 941 000	100.0

# CONSOLIDATED FINANCIAL POSITION

## ASSETS

	<u>Dec. 31, 1953</u>	<u>Dec. 31, 1952</u>
<b>CURRENT ASSETS:</b>		
Cash	\$ 57 876 177	\$ 62 086 563
U. S. Government securities, at cost	50 844 144	56 142 951
Receivables, less reserves	124 270 741	86 836 283
Inventories, at lower of cost or market	108 179 915	90 382 339
Prepaid expenses	8 563 984	8 919 164
<b>TOTAL CURRENT ASSETS</b>	<u>349 734 961</u>	<u>304 367 300</u>
<b>INVESTMENTS IN WHOLLY-OWNED FOREIGN SUBSIDIARIES</b>	3 905 125	3 649 127
<b>OTHER INVESTMENTS, AT COST, LESS RESERVES, 1953 \$2,065,298, 1952 \$2,346,812</b>	1 503 665	2 346 749
<b>PLANT AND EQUIPMENT, AT COST</b>	226 617 673	198 498 299
<i>Less: Accumulated depreciation</i>	92 436 155	83 054 488
	<u>134 181 518</u>	<u>115 443 811</u>
<b>PATENTS AND PATENT RIGHTS</b>	10 795 636	11 950 877
<i>Less: Accumulated amortization</i>	8 770 364	9 339 885
	<u>2 025 272</u>	<u>2 610 992</u>
<b>DEFERRED CHARGES</b>	2 274 189	3 834 072
<b>TOTAL ASSETS</b>	<u>\$493 624 730</u>	<u>\$432 252 051</u>

## LIABILITIES AND STOCKHOLDERS' EQUITY

	<u>Dec. 31, 1953</u>	<u>Dec. 31, 1952</u>
<b>CURRENT LIABILITIES:</b>		
Accounts payable and accruals	\$104 897 559	\$ 88 688 622
Federal income and excess profits taxes, less U. S. Government securities, 1953 \$38,375,000, 1952 \$32,770,000	8 016 761	9 602 402
Dividends payable on preferred stock	1 576 476	788 238
Dividends payable on common stock	6 303 600	—
<b>TOTAL CURRENT LIABILITIES</b>	<u>120 794 396</u>	<u>99 079 262</u>
<b>PROMISSORY NOTES, DUE 1970-1977</b>	150 000 000	130 000 000
<b>DEFERRED INCOME ON INSTALMENT CONTRACTS RECEIVABLE</b>	7 111 347	885 424
<b>STOCKHOLDERS' EQUITY:</b>		
\$3.50 Cumulative First Preferred Stock, no par, shares authorized 920,300, outstanding 900,824 (preference on involuntary liquidation \$100 per share or a total of \$90,082,400), at a stated value of	14 574 441	14 574 441
Common Stock, no par, shares authorized 18,500,000, outstanding 1953 14,031,016 shares, 1952 13,881,016 shares at a stated value of	28 062 032	27 762 032
Capital surplus	9 014 203	6 651 703
Reinvested earnings	164 068 311	153 299 189
<b>TOTAL STOCKHOLDERS' EQUITY</b>	<u>215 718 987</u>	<u>202 287 365</u>
<b>TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY</b>	<u>\$493 624 730</u>	<u>\$432 252 051</u>

*For more complete financial data, refer to the 1953 Annual Report of Radio Corporation of America.*





DR. E. W. ENGSTROM  
Executive Vice President  
RCA Laboratories

A world center of electronics research.

## RESEARCH

### *What is the purpose of RCA Laboratories?*

The primary aim of RCA Laboratories, the principal research organization of RCA, is to increase the usefulness of radio, television and electronics to the Nation, to the public and to industry. RCA scientists and research engineers work to improve methods, devices, production and operation in every branch of electronics and to create the ideas that bring about the development of new products and services. At the same time, RCA Laboratories engage in fundamental research, with the belief that all contributions to knowledge eventually are of practical worth though this may not be evident at the outset, and that, in the long run, fundamental discoveries are of the greatest value.

### *What is the role of research in RCA?*

Recognizing that research is a guarantee of progress and a bulwark of national defense, RCA has supported an active and growing research organization since its first group made radio studies in 1919 at Riverhead, N.Y. For many years the operating units of RCA conducted research on their own particular problems. Today, a large part of the Corporation's scientific work is performed by the RCA Laboratories, the main laboratory of which is the David Sarnoff Research Center, Princeton, N.J. Other laboratories are located in New York City; Newark, N.J.; Riverhead and Rocky Point, L. I., N.Y.; Chicago, Ill.; Hollywood, Calif., and Washington, D.C.



***Is RCA research confined to radio and television?*** As the usefulness of modern radio has grown, so has the scope of scientific exploration on which it is based. Early RCA research in the radio field eased the development of modern television; similarly, RCA's pioneering in black-and-white television nourished development of compatible color television. Today the radio-television field is interwoven with the sciences of physics, acoustics, optics, chemistry and nucleonics. This blending of several sciences into electronics has led teams of RCA scientists to such developments as the electron microscope, electronic computers and automatic industrial equipment. It has encouraged basic studies of luminescent and phosphorescent materials and of the electronic behavior of solid materials like germanium, the work-horse of the tiny transistor.

***Are research and engineering limited to RCA Laboratories?*** To link the laboratory with direct service to the public, subsidiaries and divisions of RCA have their own engineering departments. These staffs supervise technical operations and solve specific engineering problems peculiar to the division's function. Such staffs work at the National Broadcasting Company headquarters in Radio City and at each NBC-owned broadcasting station; at each plant of RCA's manufacturing divisions; at RCA Communications, Inc.; Radiomarine Corporation of America, and RCA International Division. In addition, the majority of the staffs of RCA Service Company and the faculty of RCA Institutes are engineers.

***Does RCA publish its research results?***

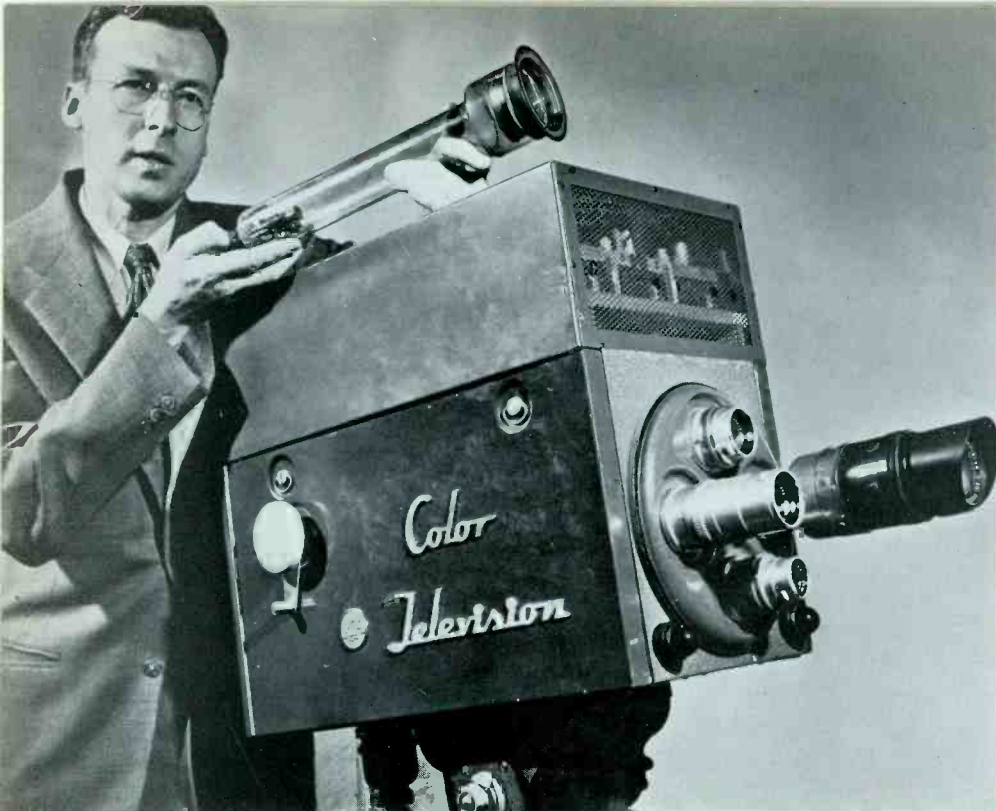
Many of the more than 2,500 scientists and engineers of RCA are active contributors to scientific and technical organizations and their publications. In a typical year, RCA Laboratories' authors alone presented 133 papers at scientific meetings and 86 of their papers were published in more than 20

different technical and semi-technical journals, magazines and books. RCA Laboratories publish for the Corporation the quarterly technical journal, *RCA Review*, as well as numerous technical and engineering books and pamphlets.

***Does RCA make its inventions and patents available to other manufacturers?*** RCA makes available to competitive manufacturers of radio and other apparatus its inventions and patents by means of patent licenses at moderate royalty rates. In this way, the accomplishments of RCA scientists and engineers are promptly made available to serve the government and the public in the most efficient manner. To assist its licensees, RCA Laboratories maintain an Industry Service Laboratory through which licensees are kept informed of new technical developments, advised how best to apply them, and given assistance in the solution of technical problems.

***What is RCA's role in color television?***

RCA pioneered and developed compatible color television. The RCA compatible color television system, which operates on the signal standards approved on December 17, 1953 by the Federal Communications Commission, is the fruit of hundreds of man-years of inventive research and development. RCA scientists were engaged in studies basically related to color television as far back as the 1920's. More recently, RCA technical teams have refined color transmitters and receivers as well as color cameras, color studio equipment etc., so that today pioneering is resulting in rapid establishment of the RCA color television system as a new, nationwide service. RCA's investment in research and development in black-and-white television amounted to more than \$50,000,000. Building on this, RCA has invested \$30,000,000 to bring compatible color television from the laboratory to the home.



Experimental RCA color TV camera employing single camera tube.



15- and 19-inch tri-color picture tubes.

**What is the significance of the RCA tri-color tube?** A major research accomplishment, the RCA tri-color picture tube (kinescope) was first demonstrated in 1950. It is now in mass production as the heart of color television receivers for the home presentation of color images in their natural hues and brilliance. Numerous types of tri-color kinescopes have been made and tested in RCA Laboratories to assure that the most practical type will be offered to the public.

**Is RCA's color TV research completed?**

Though the signal standards for color television are now fixed, there is no ceiling on progress that can be attained in refining the equipment, — cameras, kinescopes, receivers, — that employs the standard color signal. Reenforced by their fund of knowledge, RCA scientists are developing new techniques in color pick-up equipment; they are devising ways of constructing larger, brighter color kinescopes, and they are streamlining the apparatus that broadcasters need to transmit color programs.

**What is TV magnetic tape recording?**

It is a new method of recording television pictures

on magnetic tape, similar in some respects to tape recording of sound. After several years of research in this field, RCA demonstrated for the first time magnetic tape recording of television programs in both color and black-and-white on December 1, 1953. At the demonstration a color television program was recorded on a strip of magnetically coated, plastic tape and then "played back" through color TV receivers.

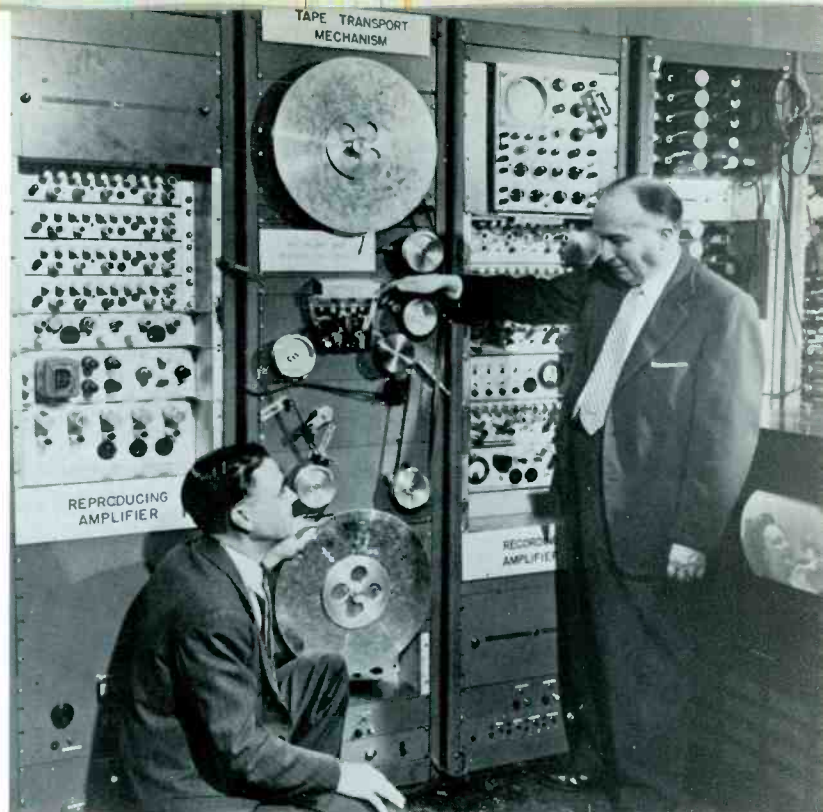
The new method, hailed as the first major step into an era of "electronic photography," has several advantages over ordinary film techniques. Magnetic tape requires no chemical processing and pictures can be viewed the instant they are taken. An unlimited number of copies of magnetic tape recordings can be made quickly. In addition, tapes can be preserved indefinitely, or if desired can be "wiped off" and reused again and again.

**What is electronics of solids?** Electronics of solids relates to the action and control of electrons in solid matter, as contrasted to the flow and control of electrons in vacuum tubes. Like the elec-





Miniature radio receiver made possible by transistors.



Equipment for recording TV programs on magnetic tape.

iron tube, electronically active solids—phosphors, photoconductive materials and semi-conductors as used in transistors—have already expanded into a diversity of applications. Mindful of further potentialities in this field, RCA scientists are conducting extensive studies in solid-state physics.

**What is a transistor?** A transistor is an electronic valve, like a tube, which can amplify, detect, oscillate and perform other control jobs in electronic circuits. In its present form, the transistor consists of a small crystal of a semi-conductor such as germanium or silicon imbedded in a plastic shell about the size of a kernel of corn.

The transistor has no heated filament, requires no warm-up period and uses very little power. Further, it is rugged and has a long operating life. These qualities together with its small size offer great opportunities for the miniaturization and simplification of many types of electronic equipment. A large portion of RCA's research activities is directed toward bringing the transistor into greater usefulness.

Laboratory tests indicate that transistors can do

many of the things (but by no means all) that tubes do in present-day equipment and that they can perform some tasks beyond the scope of tubes.

**What does the transistor promise for radio and television?** As a maker of hundreds of products based on the efficient control of electrons, RCA is concentrating on speeding the establishment of the transistor as a mass-produced, low-cost and versatile electronic valve. RCA already has several basic types of transistors in production and more varieties are being developed in the laboratories. To dramatize the transistor's potentialities, RCA has built and demonstrated more than thirty experimental models of electronic apparatus using transistors. Among these transistorized items are broadcast radio receivers that fit in a pocket, a portable single-channel television receiver, an automobile radio with simplified power supply, and a number of audio devices such as microphones, portable public address systems, phonograph amplifiers and audio amplifiers that need no transformers. In all these devices the use of transistors allows compact design and greatly reduced power

supply in contrast to similar items built with tubes. In the long run, transistors may take over many of the tube's simpler functions and, perhaps more important, enable the devising of new kinds of equipment heretofore impossible because of economic or technical obstacles. Present RCA research is directed towards extending the temperature and frequency range of transistors, thus assuring their widest application in the years to come.

***Why are solids important in electronics?***

The transistor, with its ability to control electrons in a solid substance, is symbolic of a major trend in electronics research — the study of the physics and chemistry of crystalline materials and how electrons behave in them. This approach, for example, has made possible the making of effective phosphors for the screens of black-and-white and color television picture tubes. It has led to new magnetic materials for radio circuits and for electronic computers, and to photoconductive ma-

terials such as those employed in the Vidicon tube of RCA industrial television equipment. It has provided new understanding of how electrons behave in the heated cathodes of electron tubes, thus increasing their efficiency.

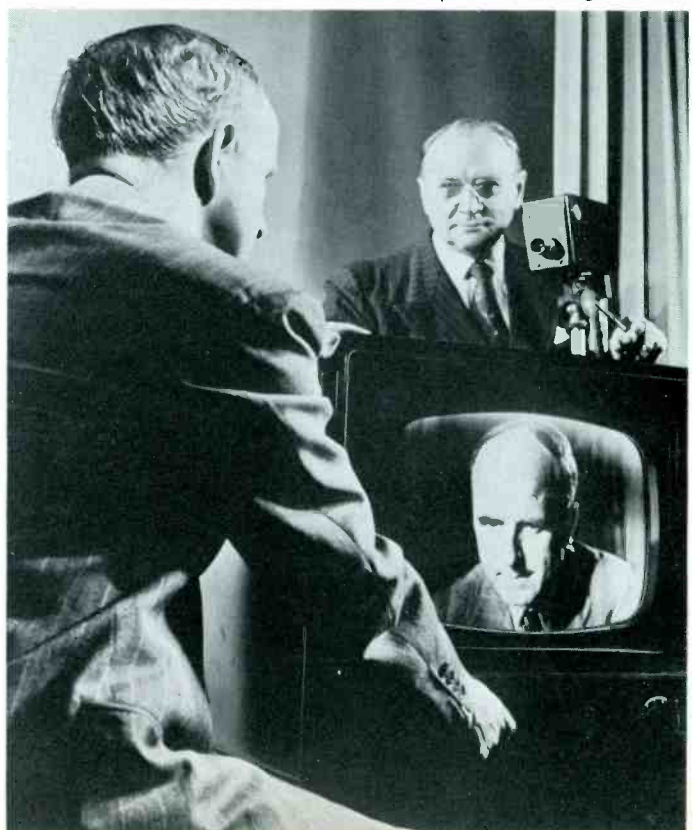
***What is the RCA Atomic Battery?*** RCA's Atomic Battery, announced and demonstrated on January 26, 1954, provides only a millionth of a watt of power from a tiny radioactive source, but it represents a reasonably efficient conversion of radioactivity to electricity useable in powering electronic equipment and, as such, promises to open up a major peacetime application of atomic energy.

The RCA Atomic Battery is powered by a minute quantity of strontium-90, a long-life radioactive isotope obtained as a by-product of atomic reactor operation. For a given amount of radioactive material, its output of electric current far exceeds previous results in attempts to generate electricity

General Sarnoff demonstrates RCA Atomic Battery.



Small television camera operates through TV set.





from atomic energy. This major advance has been achieved by coupling the battery's radioactive source to a transistor-like wafer, which instantaneously releases some 200,000 electrons for each electron (beta particle) it receives from the radioactive material. For some time, research on atomic batteries will be directed towards providing a suitable source for transistorized electronic equipment. With much further research and a plentiful, inexpensive supply of suitable radioactive materials, a situation which does not yet exist, it may be possible to build atomic batteries lasting for decades, with considerably greater power output.

***Does RCA explore new applications of television?*** RCA engineering is world famous for its technical contributions to broadcast television in black-and-white and color. At the same time, it has developed equipment that is rapidly enlarging the non-entertainment, utilitarian potential of television. Particularly adaptable to such employ-

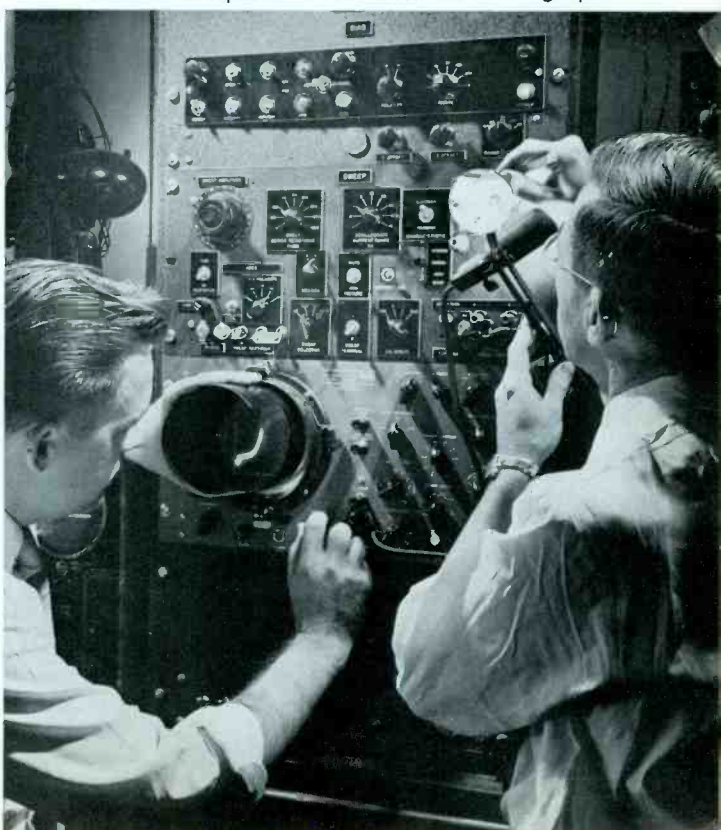
ment of television techniques is the diminutive television pick-up tube, the Vidicon. Invented by RCA scientists, it harnesses still another aspect of the electronically active solid materials, photoconductivity, a phenomena in which the flow of current in a material varies according to the intensity of the light falling on it. As the eye of industrial television equipment, the Vidicon is already extending human sight in factories, classrooms, laboratories, stores, and as an aid to law enforcement.

A recent RCA development enables attaching a Vidicon television camera to a standard television receiver thus further simplifying and reducing the cost of closed-circuit television installations. One of the most recent of applications of the versatile Vidicon has been in RCA's Sanguinometer, a combination of television camera, microscope and computer that counts red blood cells with considerably greater speed than by laborious manual techniques.

The "Sanguinometer" enables rapid counting of blood cells.

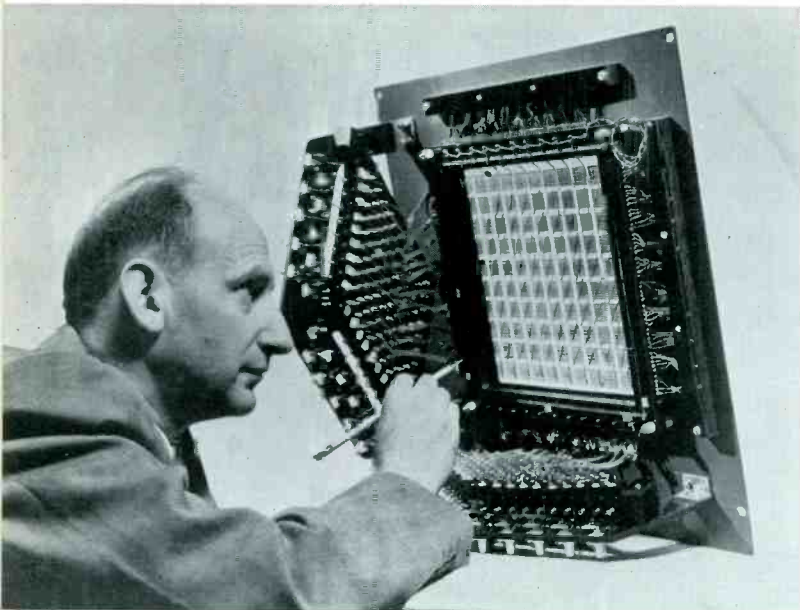


Transistor experiments checked on oscillograph.



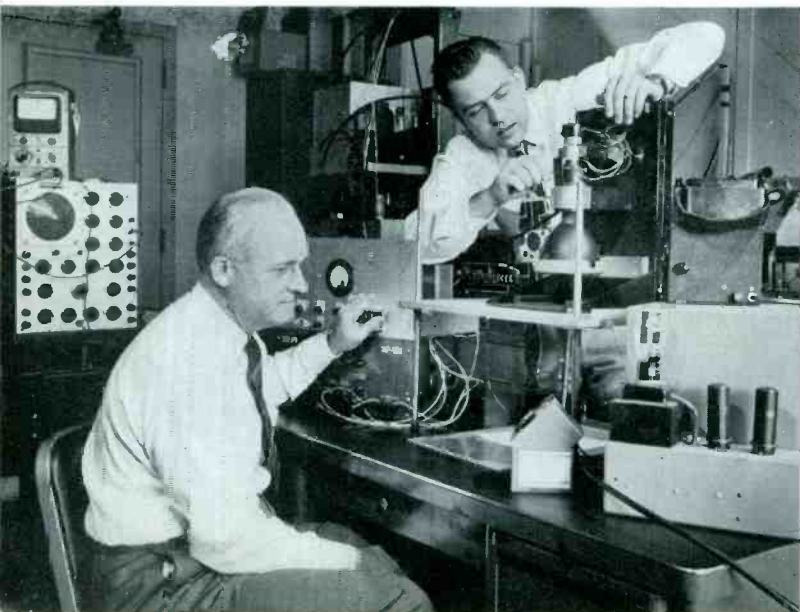


This instrument insures precise placement of tube elements.



Mercury device promises to solve intricate scientific problems.

Laboratory equipment used in tests of powder printing process.



*What are some of the other outstanding developments of RCA research?* Research in television led into the field of electron optics and helped development of the RCA electron microscope, which permits examination of substances far beyond the power of light microscopes. Working with a number of leading medical and biological institutions, RCA physicists are broadening the uses of the electron microscope both in scientific research and for clinical applications in medicine. Among the most recent of many milestones achieved by the electron microscope in its relatively short history, has been its use in the isolation and observation of the polio virus. In another advance, research workers have studied for the first time the inner structure of bacteria showing how they divide in reproduction.

The diverse possibilities of electronics in the future have been illustrated by a current RCA study of electronic systems that might reduce highway disasters and relieve drivers of fatigue on modern highways. In a laboratory experiment, a model car has been equipped to drive itself along a prescribed route.

RCA's research in acoustics has for years set a high standard in methods and equipment for the reproduction of sound in radios, phonographs, television equipment and motion picture theaters. Acoustical studies also include ways of absorbing undesirable sounds. As a supplement to mechanical sound absorption methods, which are effective only at the higher audio frequencies, RCA scientists have discovered an electronic technique for absorbing sounds, particularly at the low frequencies. In an experimental device, a microphone picks up a sound wave, which is electronically processed in an amplifier and instantaneously put out through an adjacent loudspeaker in such a way that it cancels out much of the incoming sound.





Toscanini directing the NBC Symphony Orchestra.



SYLVESTER L. WEAVER, JR.  
*President*  
*National Broadcasting Company, Inc.*

## B R O A D C A S T I N G

### TELEVISION

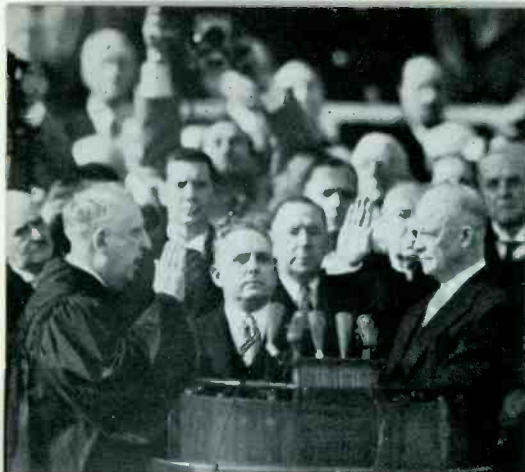
**What television stations does NBC own and operate?** NBC owns and operates television stations WNBT in New York, WNBW in Washington, D.C., WNBQ in Chicago, WNBK in Cleveland and KNBH in Los Angeles.

**How many television sets are in the United States?** As of April 1, 1954, there were 29,300,000 television sets installed in the United States.

**How many TV stations are operating?** As of April 1, 1954, there were 380 television stations in operation throughout the United States, of which 131 were ultra-high-frequency (UHF) stations.

**Does NBC telecast programs in color as well as black and white?** Yes; NBC has pioneered in experimental color television broadcasts since 1941. Also, on December 17, 1953, within minutes after the Federal Communications Commission approved standards for compatible color television, NBC was the first network to go on the air with a color TV signal under the new FCC regulations. In the following 15 days, NBC presented four major programs in color. The extent of NBC's color television broadcasts has been increased continuously since the start of 1954.

**How long and to what extent has NBC operated television as a service to the public?** Since 1939, pioneering of the National Broadcast-



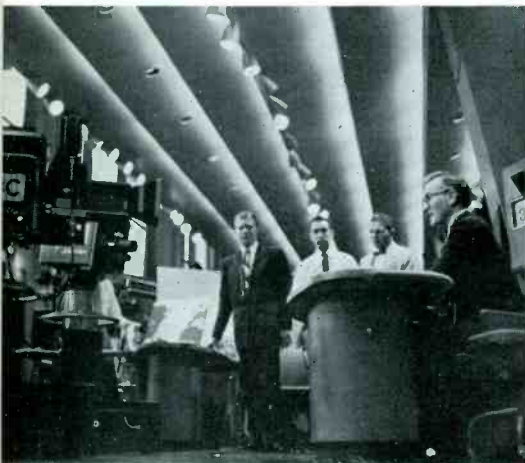
Millions watched Inauguration on NBC.



Coronation of Queen Elizabeth II.



News cast with John Cameron Swayze.



News comes to life on "Today."



"American Forum of the Air"



"March of Medicine"

ing Company has brought to the public an era of new entertainment, information, news and education made possible through the video medium.

Limited in its expansion during the years of World War II, television experienced a rebirth in 1946, and by 1950 had become a truly major service.

By April 1954, NBC was supplying visual programs to a network of 170 stations, of which 125 were interconnected by microwave relay and coaxial cable, the remainder being serviced by kinescope recordings and films. The network's television programs are now available to more than half of all the homes in the United States.

**What types of programs are telecast by NBC?** NBC provides television audiences with outstanding comedy, variety, and dramatic pro-

grams in addition to the many other special shows of cultural and educational interest.

During 1953, for example, the network broadcast television events ranging from the inauguration of President Dwight D. Eisenhower in January to the traditional Times Square celebration on New Year's Eve. NBC audiences witnessed such historic happenings as the coronation of Queen Elizabeth II; the Panmunjom truce talks; the Korean Armistice; the return of American prisoners of war in "Operation Big Switch;" the burial of Stalin; the Midwest drought; the earthquakes in Greece; the New York waterfront strike; the Big Three conference in Bermuda; sessions of the United Nations; and atomic experiments.

To observe its eighth anniversary of pioneering in the field of news films for television, NBC-TV presented a one-hour documentary, "Assignment:





A dance scene from "Excursion."



Maurice Evans starred in "Hamlet."



"Amahl and the Night Visitors"



Football classics covered by NBC-TV.



Jack Webb (left) on "Dragnet."



Francis Horwich of "Ding Dong School."

Tomorrow," in August of 1953. This program described the work of NBC's world-wide news organization which reports events for the "Camel News Caravan" and "Today," NBC's early morning news and special feature program.

The public was given an opportunity to evaluate major issues confronting this generation by such enlightening television programs as "Meet the Press," "American Forum of the Air" and "Youth Wants to Know." A series of progress reports on the nation's health problems, entitled "The March of Medicine," was produced on NBC-TV by Smith, Kline and French Laboratories in cooperation with the American Medical Association.

NBC's pre-eminence in the field of classical music was again demonstrated by memorable television performances of the NBC Opera Theatre. These operas in English included "The Marriage" by

Martini, "Sister Angelica" by Puccini, and "Der Rosenkavalier" by Strauss. "Carmen" and "Amahl and the Night Visitors" were telecast in color.

In dramatic programming, NBC-TV climaxed 1953 by presenting Robert E. Sherwood's first original play for television, "The Backbone of America." This full hour program was the first in a series of nine video dramas to be written by the Pulitzer Prize winner exclusively for NBC.

Maurice Evans, noted Shakespearean actor, made his television debut on NBC in a two-hour production of "Hamlet."

Among NBC's current television programs in the field of public service for the younger generation are: "Ding Dong School," for children of pre-school age; "Youth Wants to Know," in which authorities in various fields are questioned by teen-agers; and "Mr. Wizard."

Leading all other networks in sports coverage, NBC telecast the World Series, NCAA football games, the All-Star baseball game, the Gillette boxing bouts, the World Heavyweight Championship bout between Rocky Marciano and Joe Walcott, the Rose Bowl and Cotton Bowl Games, the National Tennis Championships and 10 top Eastern horse racing events.

In March, 1954, NBC introduced a new daytime television program, called "Home," which was created for the millions of women viewers. This new idea in programming, designed as a television service magazine, features such subjects as fashion, cooking, child care, shopping news, interiors, gardens and home economics.

***How many persons are required to produce a television program?*** The number of "behind-the-scenes" persons helping to produce a television program varies considerably, but for one of NBC's top variety shows, such as "Your Show of Shows," it exceeds 200.

***Are any programs transmitted simultaneously over radio and television networks?*** Several NBC programs are simulcast over the company's radio and television networks. Programs broadcast on television and heard at the same time or rebroadcast at another time on radio include "The Voice of Firestone," "American Forum of the Air," "Youth Wants To Know," "Meet the Press," and "Groucho Marx—You Bet Your Life."

Several NBC series have distinct radio and television presentations at different times. These include "The Big Story," "Dragnet," "The Roy Rogers Show," and "Howdy Doody."

***Does NBC make filmed television programs available?*** Yes; the NBC Film Division, which

was established as one of the company's three major operating Divisions in March, 1953, syndicates (or leases) TV film programs to local TV stations and to local or regional advertisers throughout the world.

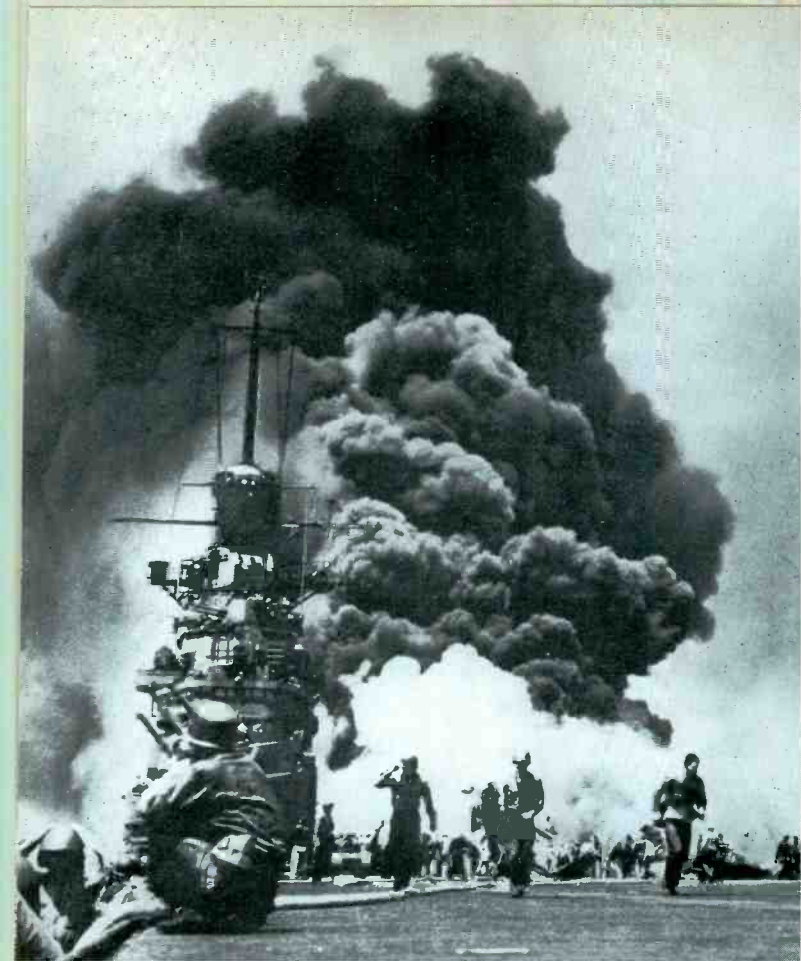
Currently offered by the NBC Film Division are programs which ran originally on the NBC television network and programs produced especially for syndication: among the former are "Victory at Sea," "Badge 714" (formerly "Dragnet"), "Captured" (formerly "Gangbusters") and "The Visitor" (formerly "The Doctor"). The NBC Film Division also syndicates "The Life of Riley" in cities not covered by the network sponsor. Among the programs filmed especially for syndication are "Dangerous Assignment," "Hopalong Cassidy," "Paragon Playhouse" (formerly "Douglas Fairbanks Presents,"), "Inner Sanctum," "The Lilli Palmer Show," "Watch the World" and a daily and weekly news-film program. The Division also syndicates 26 feature films, none of which were previously shown on television.

More than 1,100 sales of NBC Film Division properties were made during its first year of operation. Markets ranged in size from Panama City, Fla. (2,000 TV homes) to New York City (3,715,000 TV homes).

During 1952-53, the Film Division provided the Armed Forces with kinescope prints of over 5,700 major NBC-TV network programs, amounting to 6,000,000 feet of film. These shows, with commercials deleted, include "Your Show of Shows," "Colgate Comedy Hour," the "Milton Berle Show," the "Dinah Shore Show," "Mr. Peepers," and "Your Hit Parade."

***Has NBC expanded its production facilities to pace the growth of television?*** Yes, during 1953, NBC greatly expanded its production facilities to keep pace with the growing medium. A new TV coordinating studio was completed in





A dramatic scene from film series "Victory at Sea."



Lawrence Spivak is host on "Meet the Press."

Arlene Francis stars on NBC's new "Home" show for women.



Guest vocalist Roberta Peters on "Voice of Firestone."





New York, making it possible for the network to perform switching and monitoring operations previously considered extremely difficult. The studio, known as 5-H, permits the integration of pickups from as many as 10 different points into one program.

All television transmitters of NBC-owned-and-operated stations are now operating on the maximum power permitted by FCC regulations, or will soon do so.

NBC constructed a number of "Jiffy Developers," portable film processing machines which enabled NBC News to prepare film for the projectors within eleven minutes after shooting. These machines aided NBC in scoring a long series of "exclusives" and firsts in news coverage.

***What are NBC's plans for color television?***

Conversion of NBC's program schedule for color television broadcasts is progressing rapidly. As part of this plan, each regular network program will be telecast in color at least once during 1954.

In this way, each show's creative group will work with NBC's color corps to acquire experience in the techniques of color staging, lighting, make-up, costuming and camera work. NBC also has conducted a color television indoctrination course for its own personnel and that of affiliated stations.

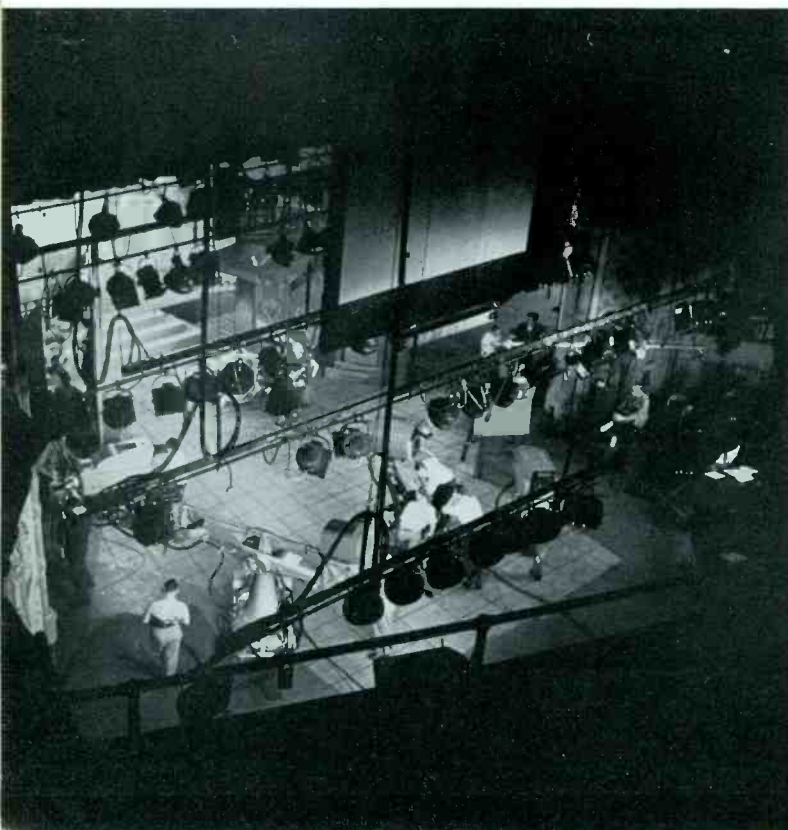
***Does NBC have special studios for colorcasting programs?***

Yes; NBC's Colonial Theatre in New York City, the world's first fully equipped color TV studio, is being operated virtually on a seven-day-a-week basis. In addition to the Colonial Theatre, NBC has in New York another color studio, a color film studio and a color mobile unit for outside pickups. Plans have been made to convert studio facilities in Burbank, Calif., and Brooklyn, N.Y., for color programs. Other NBC-owned stations, in Washington, D.C., Cleveland, Ohio, and Chicago, Ill., are in the process of being equipped for origination of color broadcasts.

***How many NBC affiliates intend to broadcast color programs?***

By April, 1954, the five

Color television studio at Colonial Theatre in New York.



"Carmen" was televised for the first time in color by NBC.





NBC-owned stations and 64 affiliated stations had announced their intentions of picking up and broadcasting color shows from the NBC network. Many other affiliated stations are expected to be prepared for color by the end of the year.

**What types of shows have been telecast in color by NBC?** Many popular NBC operatic, musical, educational, dramatic and comedy programs have been produced in color. These include the opera "Carmen," "Amahl and the Night Visitors," "Camel News Caravan," "Zoo Parade," "Meet the Press," "Kraft Television Theatre," "Armstrong Circle Theatre," "Kukla, Fran and Ollie," "Mr. Peepers," "Colgate Comedy Hour," "Your Show of Shows," "Dinah Shore Show," and "Your Hit Parade."

On New Year's Day, 1954, the Tournament of Roses Parade at Pasadena, Calif., was telecast in color coast-to-coast by NBC over 21 network stations then equipped to transmit a color signal.

This event marked the first use of NBC's new mobile color TV unit and was the first broadcast of a network color program by a coast-to-coast series of stations.

**Have steps been taken to inform advertisers on color television techniques?** Yes; since the fall of 1953, NBC has been conducting a series of color clinics to familiarize personnel of advertising agencies with the techniques of color programming and broadcasting. At these clinics, art directors and other creative personnel from advertising agencies work with NBC producing teams at the Colonial Theatre on the preparation of typical commercials. The commercials are viewed by agency representatives on RCA color receivers.

**When did NBC begin its experimental broadcasts in color TV?** On February 21, 1941, NBC transmitted its first color television pictures in motion over experimental station W2XBS in New York using mechanical methods.

Mobile color TV unit is used for outdoor colorcasts.



NBC televised the Tournament of Roses Parade in color.





Madame Pandit and commentator Henry Cassidy discuss "NBC Lecture Hall" broadcast.

## RADIO

*How did the idea of broadcasting to the public originate?* David Sarnoff was the first man to propose that programs be broadcast over the air for public consumption. In 1916, when he was Assistant Traffic Manager of the Marconi Wireless Telegraph Company of America, Sarnoff suggested the manufacture of "radio music boxes" so that purchasers could enjoy "concerts, lectures, music, recitals, etc." His memorandum to the late E. J. Nally, who was Vice President and General Manager of that Company, said: "I have in mind a plan of development which would make radio a household utility in the same sense as a piano or a phonograph. The idea is to bring music into the house by wireless . . . For example, a radio telephone transmitter having a range of say 25 to 50 miles can be installed at a fixed point where instrumental or vocal music or both are produced . . .

The receiver can be designed in the form of a simple 'radio music box' and arranged for several different wave lengths, which should be changeable with the throwing of a single switch or pressing a single button . . . The same principle can be extended to numerous other fields—as for example—receiving lectures at home which can be made perfectly audible; also events of national importance can be simultaneously announced and received. This proposition would be especially interesting to farmers and others living in outlying districts removed from cities. By the purchase of a 'radio music box' they could enjoy concerts, lectures, music, recitals, etc., which may be going on in the nearest city within their radius . . . Should this plan materialize, it would seem reasonable to expect sales of 1,000,000 'radio music boxes' within a period of three years."



Demonstration of the practical value of the Sarnoff plan was delayed by World War I. However, on November 2, 1920, when the Westinghouse station, KDKA, Pittsburgh, broadcast the Harding-Cox election returns, the "radio music box" became a reality. The approximately 115,000,000 radio sets now in use attest to the impressive growth of this medium.

***When did RCA enter the broadcasting field?***

The first broadcast program presented by RCA was the Dempsey-Carpentier heavyweight championship boxing match in Jersey City on July 12, 1921. Major J. Andrew White telephoned a blow-by-blow description from the stadium to a station in Hoboken which RCA had installed especially for this occasion. White's words were typed as they came over the phone and were read over the air by J. O. Smith to an estimated 200,000 listeners. Commenting on this event a few weeks later, the RCA magazine, *World Wide Wireless*, stated: "In the future, it is proposed to employ the radiophone to report all events of national and international importance, such as elections and big sporting events. Indeed, we are living in the age of miracles and the day is not far off when almost every home will be equipped with its own wireless telephone receiver."

RCA's first regularly operated broadcasting station, WDY in Roselle Park, N.J., was licensed September 19, 1921, and went on the air December 14 of that year to provide programs to the New York metropolitan area. Use of this station was discontinued in February, 1922, when RCA entered into an arrangement with Westinghouse Electric & Manufacturing Company for the operation of Station WJZ at Newark. RCA acquired full ownership of this station in the spring of 1923, and studios were installed in Aeolian Hall, New York. The Company also constructed Station WRC in Washington, D. C., which went on the air August 1, 1923.



"Oscar" presentations were broadcast by NBC radio and TV.



"One Man's Family" — a radio favorite for over two decades.

Peter Donald acts as emcee for NBC's "Can You Top This."







"The Eternal Light" is one of NBC's religious programs.



Wanda Landowska has appeared on NBC.

**When was the National Broadcasting Company formed?** The National Broadcasting Company was established by RCA in the fall of 1926. It was NBC's announced purpose "to provide the best programs available" to the five million American homes then equipped with radio receivers. NBC's inaugural network program, on November 15, 1926, was broadcast by 24 stations in 21 cities extending from the eastern seaboard as far west as Kansas City. Initially, NBC owned one station, WEAJ (now WNBC), New York, which it had purchased from the American Telephone & Telegraph Company. It also operated the two RCA stations, WJZ and WRC, acquiring ownership of these stations from the parent company in 1931.

**Where are NBC studios located?** NBC's main offices and studios are located in the RCA Building, Radio City, New York. NBC also has offices and studios in Washington, Cleveland, Chicago, Hollywood and San Francisco.

**May the public visit NBC studios?** Yes; NBC is pleased to have the public take its guided

tour throughout the Radio City studios in New York. Paying a nominal fee, 500,000 persons took this tour in 1953.

**Did NBC radio have a coast-to-coast network when it started?** There was no coast-to-coast network until January 1, 1927, when the first transcontinental radio network was arranged by NBC to broadcast a football game from the Rose Bowl at Pasadena, California.

**How many stations are affiliated with the NBC radio network?** As of April, 1954, the NBC radio network comprised 211 stations. Five of these are owned and operated by the Company: WNBC, New York; WRC, Washington; WTAM, Cleveland; WMAQ, Chicago; KNBC, San Francisco. These stations broadcast all programs simultaneously over standard (AM) and FM (frequency modulation) facilities.

**What are the NBC radio network interconnections?** The NBC radio network consists of 14,860 miles of leased telephone circuits especially engineered for the transmission of broadcast programs.



Conducting radio interview in an Alabama coal mine.



Jimmy Stewart reads script for radio show.

**How may tickets be obtained for admission to broadcast programs?** By writing at least two weeks in advance to the Guest Relations Department of NBC. Cards of admission, if available, will be supplied.

**How should an idea for a radio or television script or program be presented for consideration?** NBC welcomes new ideas for programs but they cannot be accepted orally. The ideas must be expanded as fully as possible and submitted in writing to the Story Division and must be accompanied by a signed idea-release form which is readily obtainable from the Story Division.

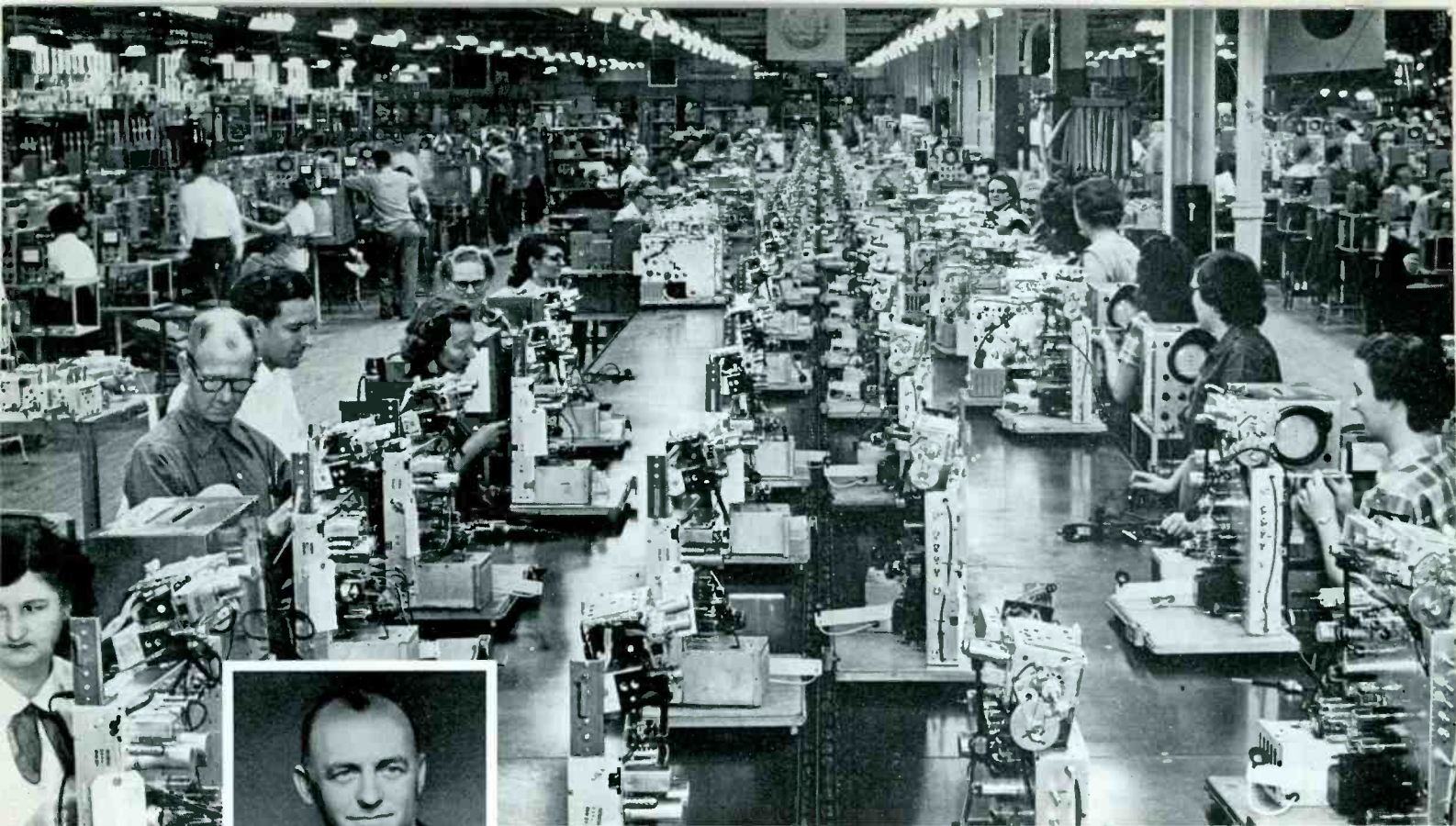
**Where does NBC get its news?** From NBC's accredited reporters and cameramen on all world news fronts and from Associated Press, United Press and International News Service, which give 24-hour service to the NBC News Room. NBC maintains news bureaus in principal American cities and in foreign capitals including London, Paris, Berlin, Rome, Cairo, Tokyo, and Korea. Each correspondent is equipped with a tape recorder to bring on-the-spot recordings from news

sources direct to the radio audience. NBC has more than 200 special film and other correspondents in the United States and abroad and has special arrangements for exchange of news film with agencies in Great Britain, France, the Scandinavian lands, Switzerland, Holland, and Belgium.

**How many NBC programs originate overseas?** Annually, almost 4,000 pickups and programs are originated in foreign lands and broadcast over the NBC networks. Throughout the year, the NBC staff of news analysts, commentators, and reporters regularly broadcast first-hand reports from strategic locations all over the globe.

**When was the first overseas program broadcast in the United States?** On March 12, 1925, station WJZ, New York, then owned by RCA, broadcast the chimes of Big Ben atop Parliament House in London. The signals were picked up by the RCA station at Belfast, Maine, from a British broadcast on the 1600-meter waveband originating in Chelmsford, England, and were relayed by short-wave to New York.





TV sets on assembly line at Bloomington, Ind.



JOSEPH B. ELLIOTT  
Executive Vice President  
Consumer Products

## CONSUMER PRODUCTS

*What are RCA's activities in the field of consumer products?* RCA designs, develops, manufactures and merchandises consumer products including radio and television receivers, "Victrola"® phonographs, phonograph records, air conditioners, gas and electric ranges.

These activities are conducted by the RCA Victor Home Instrument Division, the RCA Victor Record Division, the RCA Victor Home Appliance Division which includes the RCA Estate Appliance Corporation.

RCA's consumer products are distributed through 68 wholesalers and approximately 45,000 retail outlets in the continental United States.

*Where are RCA's consumer products manufacturing plants located and what do they make?* *California:* Hollywood — recording studio and custom record pressing. *Indiana:* Bloomington — television receivers. Indianapolis — television receivers and phonograph records. Monticello — television cabinets. *New Jersey:* Rockaway — phonograph records. *New York:* New York — record pressing and recording studio. *Ohio:* Cambridge — record players and television receiver parts. Hamilton — gas and electric ranges. *Pennsylvania:* Canonsburg — radio receivers and "Victrola" phonographs.

*How did the RCA Victor dog trademark originate?* As one of the most famous trade-



marks in advertising history, the painting by Francis Barraud, entitled "His Master's Voice," is familiar to millions of people throughout the world wherever RCA's consumer products are sold. The dog in this picture was a real dog, a fox terrier named "Nipper," who belonged to the artist. The picture was painted by Barraud in England in 1899. The Victor Talking Machine Company acquired rights to the painting, and this trademark now identifies "Victrola" phonographs, RCA Victor records, RCA Victor radios, television receivers, and other consumer products.

## **RCA VICTOR HOME INSTRUMENT DIVISION**

***What types of home instruments are manufactured by RCA?*** The RCA Victor Home Instrument Division makes black-and-white and color television sets, radio receivers, and "Victrola" phonographs. Black-and-white television sets are available in a wide variety of styles, finishes, and screen sizes. The "Victrola" phonograph line includes various 45-rpm and 3-speed models, as well as the superb High Fidelity instruments. In the radio line, table models, clock-radios and portables are more attractively styled than ever before. Combination instruments with radio, phonograph and television also are manufactured.

***Can ultra-high frequency (UHF) television stations be received by RCA Victor sets?*** Yes; since early 1953, all RCA Victor television receivers are available either for VHF (very high frequency) reception only or with combination UHF-VHF tuners. These VHF sets and earlier models may be equipped by installing UHF-VHF tuners, or by adding any one of several UHF selectors.

***Is color television ready for the public?***

On December 17, 1953, the Federal Communica-

tions Commission approved the standards for *compatible* color television which had been presented to it by RCA, NBC and others. RCA and other manufacturers are currently producing compatible color television receivers.

***How soon will color television receivers be available?*** Although small quantities of RCA Victor compatible color television receivers are scheduled for marketing in 1954, substantial production is not expected until 1955. The first color sets manufactured by RCA have a picture size comparable to the 14-inch black-and-white screen.

***What is meant by "compatible color television receivers"?*** Compatible color television was pioneered and developed by RCA. On December 17, 1953, the Federal Communications Commission approved standards used by the RCA color television system. This system permits owners of black-and-white sets to receive color telecasts in black and white, without making any changes on their present receivers. Without compatibility, the millions of existing black-and-white receivers would be completely "blind" to color telecasts.

***Does a color set receive black-and-white programs as well as color telecasts?*** Yes; a color set receives black-and-white telecasts in black-and-white pictures. Only programs transmitted in color are received in color.

***How much do color television receivers cost?*** The price for the first color television sets is \$1,000. But as production techniques improve and advances in design are worked out, substantial price reductions are anticipated.

***Why is a color television set more expensive than a black-and-white receiver?*** Color sets have many more parts and require more man-



Color slides are used to test color set performance.

RCA's color TV sets are highest in quality and beauty.



hours of labor to build. The color receiver functions as a black-and-white set; it also receives color broadcast signals and "translates" them into color pictures. The tri-color picture tube, a vital part of the color set, is much more complicated than the black-and-white picture tube. This complex tube adds substantially to the cost of a color television set.

***Is it possible to see color telecasts in color on a black-and-white receiver?*** No; reception of pictures *in color* on a black-and-white receiver is impossible. Although the telecast may be in color, it can be received on a black-and-white set, but in black-and-white only.

***Is a black-and-white set still a good investment?*** Yes; more than a million dollars is spent every twenty-four hours in providing the American public with top television programs. The value of black-and-white sets has never been greater; 21-inch RCA Victor television sets are at their lowest price in history.

***Has television resulted in decreased public interest in radio?*** Although the popularity of television caused a temporary decline of public interest in radio, sales of radio sets are increasing. In 1953, for example, radio sales showed an increase of 30 per cent over the previous year. Statistics further indicate that 20 million homes now have an "extra" radio.

***What are the advantages of the new RCA Victor high-fidelity "Victrola" phonographs?*** High-fidelity "Victrola" phonographs, used with RCA Victor high-fidelity records, bring a new reality in music, approximating the original performance with amazing realism. These instruments contain the high-fidelity "Golden Throat" tone system, "Olson-design" curvilinear loudspeaker, specially constructed acoustical chamber,



powerful new amplifier and a high-quality 3-speed record changer. The high-fidelity phonographs are offered in both table and console models. Companion speakers with matching cabinets are also available.

## **RCA VICTOR RECORD DIVISION**

*What is RCA's position in the record industry?* Known around the world as "First in Recorded Music," RCA's traditional leadership in the record industry has been maintained through an unswerving insistence upon the highest standards of quality, unexcelled repertoire and incomparable performances by "The World's Greatest Artists". Major recent contributing factors to this continued leadership were the enormous success enjoyed by "45 Extended Play" records, and enthusiastic consumer acceptance of high fidelity reproduction and "New Orthophonic" high fidelity recordings.

*How has RCA contributed to the high fidelity record field?* One of the most far reaching events in the record industry during 1953 was the great consumer interest shown in high fidelity records and instruments. Since 1949 (date of the advent of recording by tape), RCA has been making complete range high fidelity recordings.

As a result of this program, RCA was able in 1953 to merchandise with marked success the largest selection and widest variety of high fidelity recordings in the world, including every kind of music from popular to classical . . . from Perry Como to Arturo Toscanini. These discs result from the use of special microphones and the most advanced studio acoustics which produce a brilliant, highly defined sound with maximum separation between instrumental choirs, and exceptional clarity and fidelity on solo instruments.

*What are the advantages of the RCA Victor 45-rpm system?* The RCA Victor 45-rpm phonograph system has become firmly established as a superior method of reproducing recorded music. Acceptance has been so wide-spread that virtually all manufacturers in the industry are now making and selling 45-rpm records.

The record player is simple, compact, trigger-fast in action and relatively trouble-free. Records are small (7-inch diameter), made of non-breakable vinyl plastic, wearing up to 10 times longer than shellac records. Storage problems are negligible since 150 45-rpm records can be placed in one foot of book-shelf space. The "45" allows the listener freedom in choice and order of playing the shorter works which comprise 90 per cent of all recorded music.

AM-FM table radios in production at Canonsburg, Pa.





**What are the advantages of the new record speeds?** Introduction of the new record speeds, 45-rpm and 33 $\frac{1}{3}$ -rpm, after World War II had a stimulating effect on the whole field of recording. Far from inhibiting consumer sales, the new speeds created an unprecedented interest in records.

The advantages of each of the new speeds have been fully recognized. Certain musical compositions, because of their length, are more suitable for recording on 45-rpm or "45 EP" than on Long Play. Complete classical works are ideally suited to the longer playing records. This flexibility allows individual compositions to be recorded and merchandised in the speed for which they are best suited.

**What are the advantages of "45 Extended Play" records?** Utilizing greater playing surface, the "45 EP" record plays up to eight minutes per side, thus increasing not only the musical content of each record, but the value received. They make possible the recording of shorter classical

works on a single record side, and reduce by half the number of records previously required in an album of popular music. Identical in size to 45-rpm records which operate on any standard 45-rpm or 3-speed turntable, the "45 Extended Play" record is an outstanding RCA "first" and a distinct contribution to the industry.

**What types of entertainment are available on records made by RCA?** In addition to popular and classical selections, RCA Victor recorded repertoire includes children's songs and stories, country and Western hits and international music.

**What new record products has RCA introduced?** Early in 1954, "X" records and Groove records made their appearance on dealer counters throughout the country. They are competitively priced and conform to the highest standards of quality. Repertoire for "X" records is confined

Technician checks master record with a microscope.



High-fidelity phonographs give music new realism.



almost exclusively to popular hits of the day, while music released on Groove records is entirely in the blues and rhythm category. "Camden" records, a new line of low-cost, high-quality recordings also went on sale in leading stores throughout the country late in 1953. "Camden" records, produced by the RCA custom record activities, offers great music from the RCA Victor vaults. Each of these three new record products bear the legend "A Product of the Radio Corporation of America."

***Are custom-made records available through RCA?*** Custom record activities of the RCA Victor Record Division include a complete service for the production of every type of custom-made record, such as radio transcriptions, spot commercials, professional sales training, educational and slide-film recordings, and brand-label phonograph records.

***Does RCA provide transcribed radio and television programs?*** Through its Recorded Program Services, RCA is one of the leading producers and distributors of transcribed programs for radio broadcasting, to which hundreds of stations in and outside of the United States subscribe.

The RCA Thesaurus library service offers radio programming of every musical category for station broadcast and local, regional or national sponsorship. It consists of a basic library of approximately 5,000 selections; a monthly release of new selections; a weekly script service; special holiday features; production aids; promotional aids and library fixtures.

The syndicated radio catalog of Recorded Program Services includes 26 fully recorded radio programs, ranging from 5 to 30 minutes and from situation comedy through drama, mystery, music and commentary.

The Program Service also distributes television film libraries and syndicated TV programs.

***Are recording facilities available through RCA?*** Yes; RCA maintains five recording studios throughout the United States. Three are disc recording studios in Chicago, Hollywood and New York, and two are film recording studios in Hollywood and New York.

## **RCA VICTOR HOME APPLIANCE DIVISION**

***What models of RCA room air conditioners are available?*** RCA room air conditioners, made in nine models, are of window and console types, compact and expertly engineered for quality construction and smooth operation. They give peak performance in their ability to ventilate, circulate, dehumidify and filter out dust, dirt, and pollen.

***Where can RCA room air conditioners be purchased?*** RCA room air conditioners for the home and office are available from more than 9,000 authorized dealers. RCA Service Company contracts are available for installation and maintenance.

***Does RCA make gas and electric ranges?*** Yes; acquisition of the Estate Stove Company in 1952 brought gas and electric ranges and space heaters into the growing family of outstanding RCA products. The new subsidiary is known as the RCA Estate Appliance Corporation. RCA Estate ranges are sold through RCA dealers from coast-to-coast.

***Where is the RCA Estate Appliance Corporation located?*** RCA Estate is located at Hamilton, Ohio, and is one of the oldest manufacturers of gas and electric ranges in the appliance industry. Since the introduction of its first range in 1886, Estate has always been highly regarded for its reputation of quality products.





**W. WALTER WATTS**  
Executive Vice President  
Electronic Products

Transistors being assembled on glass table.

## ELECTRONIC PRODUCTS

**What are RCA's activities in the field of electronic products?** RCA designs, develops, manufactures and merchandises electronic products for industry, science and government — including broadcast, communications, theatre and industrial equipment; receiving tubes and transistors, cathode-ray and power tubes; electronic components, equipment and parts; marine radio communications equipment and electronic navigational devices.

These activities are conducted by the RCA Engineering Products Division, the RCA Tube Division and the Radiomarine Corporation of America.

**Where are RCA's electronic products manu-**

**facturing plants located, and what do they make?** *California:* Los Angeles — government communication equipment. *Indiana:* Indianapolis — receiving tubes. Marion — kinescope tubes and luminescent powder. *Michigan:* Detroit — motion picture projectors. *New Jersey:* Camden — government and communications equipment; broadcasting, theatre, sound and industrial equipment; television apparatus. Harrison and Woodbridge — receiving tubes. Moorestown — special government apparatus. *New York:* New York — marine radio communications equipment and electronic navigational devices. *Ohio:* Cincinnati — miniature tubes. Findlay — electronic component parts. *Pennsylvania:* Lancaster — kinescopes, power tubes, television camera and special purpose tubes.

## **RCA ENGINEERING PRODUCTS DIVISION**

***What products are manufactured by RCA for industry?*** RCA manufactures a large number of electronic products for industrial use. Many modern industrial plants throughout the nation are using RCA equipment to produce new products, to perform manufacturing operations better, more safely and at less cost. Beverage inspection machines, industrial television, metal detectors, automatic counters, nuclear radiation detection equipment, time- and fire-signal generators, electron tubes and test-measuring equipment are just a few of the RCA electronic products which are serving American industrial plants.

***Does RCA supply equipment for AM and FM broadcasting stations?*** RCA manufactures a complete line of AM and FM broadcasting equipment, including transmitters, antennas, test apparatus, microphones, monitoring units, loudspeakers, studio turntables, disc and tape recorders.

***What progress has been made by RCA in the ultra-high frequency field?*** After 20 years of research, RCA was first to transmit UHF television programs on a regular schedule from its experimental station near Bridgeport, Conn. This station was used as the proving ground for the television industry. During 1952, RCA installed in Portland, Oregon, the first commercial UHF station to go on the air. This was followed by many additional UHF stations in different parts of the country during 1953.

***Is RCA manufacturing color television broadcasting equipment?*** Yes; RCA is supplying television stations with a full line of transmitting and studio equipment for broadcasting TV programs in color. RCA equipment includes studio cameras, transmitters, color film and slide equipment as well as monitoring and test equipment.

***What other equipment does RCA make for radio and television stations?*** RCA manufactures a complete line of equipment for television as well as radio broadcasting stations. Associated apparatus includes television cameras, antennas, microwave relays, film-recording and film-reproduction equipment, and test equipment for servicing.

### ***What is RCA motion picture sound?***

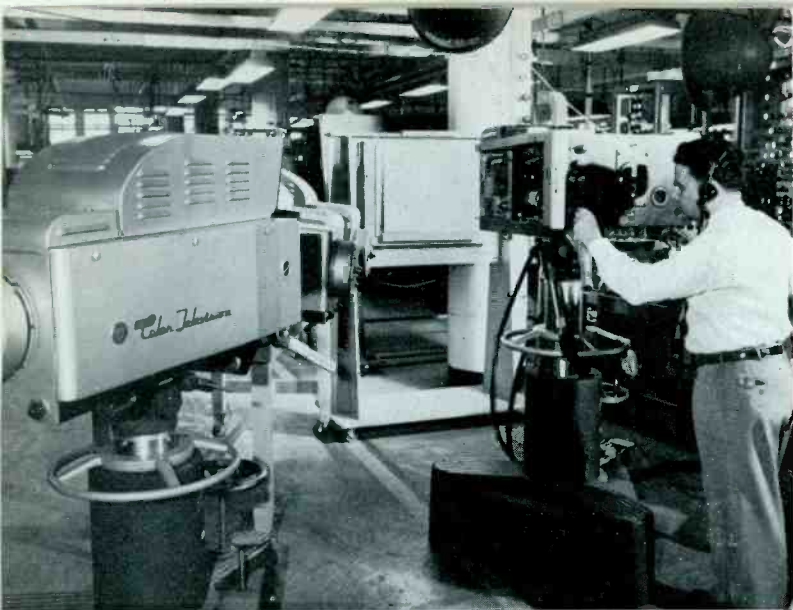
The sound portion of motion pictures is recorded in the studio at the time the picture is made, and reproduced in the theatre from the sound track which parallels the pictures on the film. Many fundamental improvements in sound-on-film, both in recording and reproducing, have been pioneered by RCA engineers. The Academy of Motion Picture Arts and Sciences has recognized a number of them by awarding them the famous "Oscar."

***Is recording equipment available through RCA?*** Yes; professional disc, film and magnetic tape recording equipment is manufactured by RCA for use in motion picture recording and radio broadcasting studios.

***Does RCA make a tape recorder for home use?*** Yes; RCA entered the home tape recorder field in 1953 by introducing a portable push-button instrument. The instruments, as well as a complete line of accessories, are marketed through RCA consumer products distributors and dealers.

***Does RCA manufacture sound-film motion picture projectors and equipment?*** Yes; RCA makes sound-film motion picture projectors for both 35mm and 16mm film. The 35mm RCA projector is accepted as the finest available to the motion picture industry. It is used in many theatres in the United States and foreign countries. RCA's line of 16mm sound projectors, introduced





RCA color television cameras undergo final tests.



Assembling loudspeakers for high-fidelity systems.

Portable RCA tape recorder for home use.



to meet the growing use of sound films in education, commerce and industry, consists of portable machines of one- and two-case types. They provide professional-quality pictures and sound. An adaptation of the 16mm machine was introduced by RCA for operation with television equipment for televising films.

RCA provides equipment for recording sound magnetically on film and also for recording television programs on film from the face of kinescope tubes for re-broadcasting.

**What progress is being made by RCA in theatre-type television?** The first permanent installations of RCA large-screen theatre television were made in 1949 in two theatres in Brooklyn and Boston. The first theatre-television network broadcast was in 1951 when the Louis-Savold fight was televised for theatre audiences in nine cities.

At the start of 1954 more than eighty theatres were operating RCA theatre television equipment. Large-screen television also is being used successfully in conventions, sales meetings and similar gatherings.

**What equipment does RCA make in the sound distribution field?** Another major product manufacturing line is that of sound-distribution systems. This equipment provides methods for the broadcast of music, radio programs, paging calls, announcements, etc., from central or remote locations in industrial plants, churches, hospitals, schools and public buildings. RCA also has a complete line of office intercommunication systems.

**Does RCA make television receiver installations in hotels and motels?** Latest to recognize the tremendous appeal of television are hotels, and motels, now buying this "entertainment" for guests. Over 300 leading hotels, including such

famous names as Schine, Sheraton, and Statler, have installed RCA television.

**What is the new RCA "Antenaplex" equipment?** RCA developed the "Antenaplex"® system, which is a central antenna system for all-channel television reception. It provides program reception in large apartment houses, hotels, hospitals, department stores and similar locations where many receivers are in operation in the same building. This equipment eliminates the need for individual roof antennas for each receiver in the building.

**Who uses RCA two-way radio communication equipment?** RCA two-way radio communication systems are employed by police, forestry and fire departments, public utilities, oil, construction and transportation companies. They also are used widely by industrial and taxicab fleets.

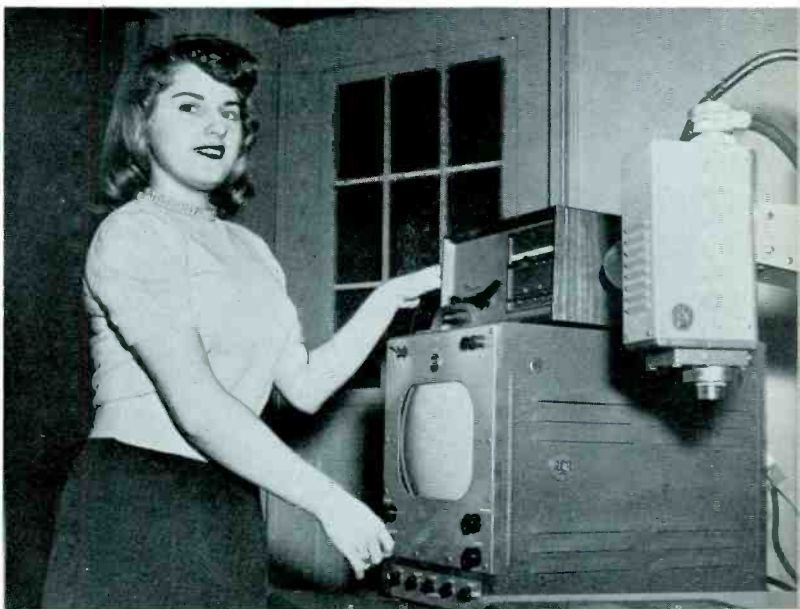
**Does RCA manufacture microwave radio relay equipment?** Yes; RCA microwave radio equipment provides one of the most economical and effective means of point-to-point communications over long distances.

Many types of information can be transmitted simultaneously over the microwave system. These include multiple voice channels, teletype, telegraph, telemetering, facsimile and other signaling information. RCA microwave equipment on the Pennsylvania and New Jersey Turnpikes, for instance, handles all communications including policing, administration, teletype and maintenance.

**How widely is the RCA electron microscope being used?** More than 400 RCA electron microscopes now are being used by leading manufacturers, government bureaus, foundations, hospitals, college laboratories, and other important centers of research throughout the world. Magni-



Inspector checks circuits of small "TV Eye" camera.



Industrial TV system transmits banking information.

RCA's first 50-kilowatt VHF television transmitter.





fications of 100,000 diameters and upwards have been achieved; for example, a single tuberculosis germ can be enlarged to the size of a saucer. RCA is the principal supplier of this remarkable scientific tool to research, medical and industrial users.

***What products and services does RCA sell to schools and colleges?*** RCA offers a wider range of audio-visual equipment for schools and colleges than any other manufacturer. It includes school sound systems, 16mm sound film motion picture projectors, tape recorders, electron microscopes, electron tubes, scientific test and measuring equipment, radio and television receivers, phonographs, and record libraries. RCA also provides an advisory service to educational institutions in the selection and use of RCA Audio-Visual aids.

***What RCA instruments are available to the aviation industry?*** RCA long has been engaged in the development of aviation equipment for the U. S. Air Force and Bureau of Aeronautics, as well as for commercial airlines and private planes. RCA manufactures a line of aircraft transmitters and receivers, as well as supplementary equipment. Utilizing radar principles, RCA has developed two forms of highly accurate altimeters, widely used by the Army, Navy, and commercial airlines. RCA also produces large quantities of loran units, equipment using radio signals from base stations to provide navigators with positions at long range.

***Does RCA manufacture equipment for the Armed Forces?*** RCA, as one of the country's leading suppliers of equipment to the government, is engaged in the design, development and manufacture of many electronic products for all branches of the Armed Forces.

These products include especially designed navi-

gation and communication equipment, walkie-talkies, mobile television transmitters, radar and complex electronic control devices for gun fire and guided missiles. An example of these control devices is the analogue computer, an ingenious electronic calculator used by the United States Navy for testing and studying guided missiles. This device solves in a matter of minutes mathematical problems which by manual methods require hours and often weeks and months to solve.

***How are engineering products marketed?***

Electronic equipment for theatres, schools, and other users of motion picture, sound distribution and associated products are sold through several hundred RCA distributors and dealers throughout the United States. Broadcast, two-way radio, microwave and a number of industrial products are sold direct to customers by RCA field sales representatives.

## **RCA TUBE DIVISION**

***What electron tubes does RCA manufacture?***

RCA makes a complete line of electron tubes, from the smallest subminiature to the largest power type, for use in the entertainment and communications field as well as in industrial and military applications. Tubes manufactured for television range from camera pickup tubes to picture tubes, including RCA tri-color picture tubes, heart of RCA's all-electronic compatible color TV system.

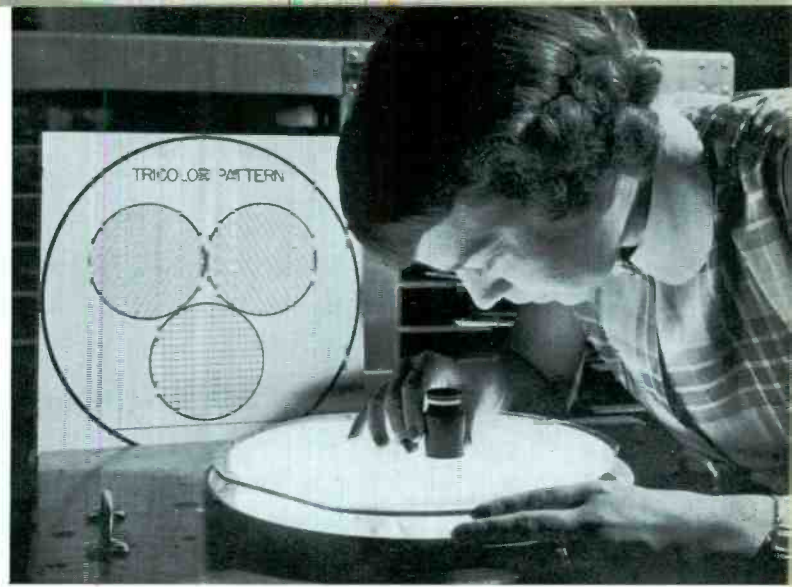
RCA's precision methods for mass production have contributed to television's rapid growth by making available to the industry low-cost picture tubes, thereby bringing about moderate-price receivers.

***Is RCA manufacturing tri-color tubes?***

The RCA tri-color picture tube is another of the



Tri-color tubes tested at Lancaster, Pa., plant.



Examining screen structure of tri-color tube.



Electron tubes are subjected to exacting tests.

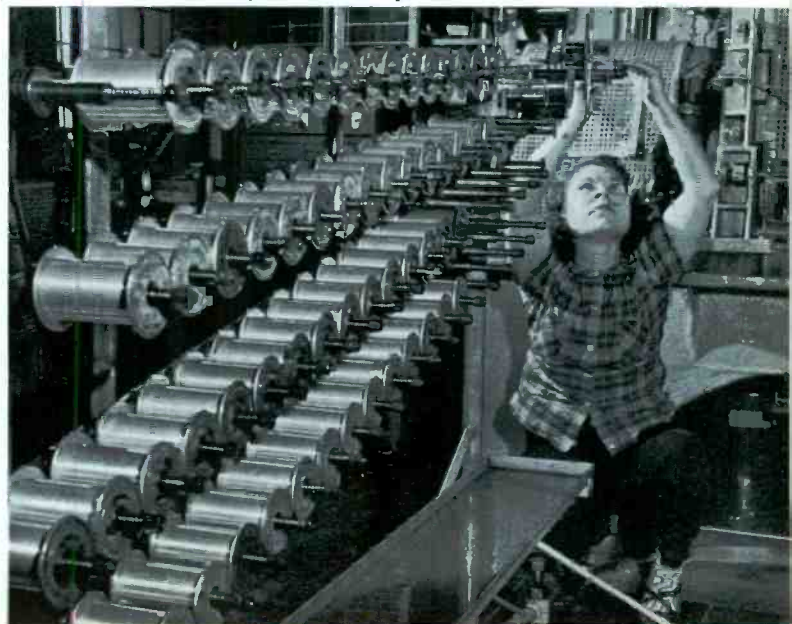


Assembly of components for use in RCA tubes.

Technician makes careful check of RCA transistors.



This complex machine produces grids for tubes.





pioneering "firsts" of RCA engineering. RCA's plant at Lancaster, Pa., has been converted for the production of these color tubes.

While the company produced many laboratory versions of the tri-color tube during the years of research and field tests, the first commercial tube was placed on the market December 30, 1953. It was made available to all manufacturers of color TV receivers and broadcast equipment.

The tube contains three electronic "guns" which fire a stream of electrons through a mask containing nearly 200,000 microscopic holes onto the viewing screen of the kinescope. The screen is treated with about 600,000 tiny dots of red, green and blue phosphors, arranged precisely in nearly 200,000 triangular groups. As the electron beams scan the screen, the picture is reproduced in color.

***Does RCA make transistors?*** Early in 1953, RCA crystallized more than four years of research and development with the introduction of four commercial types of transistors intended for a wide range of uses in hearing aids, communications equipment, and industrial electronic equipment such as computers, counters, and control devices.

***Does RCA manufacture electronic components?*** RCA makes a variety of components that are widely used by the electronic industry in the manufacture of new equipment and by the servicing industry in maintenance of television and radio receivers. These products include ferrites, transformers, speakers, and specialized television components which are built to original RCA designs as well as to customer specifications.

RCA markets a complete line of dry batteries for portable and farm-home radios, flashlights, industrial equipment and other electronic applications.

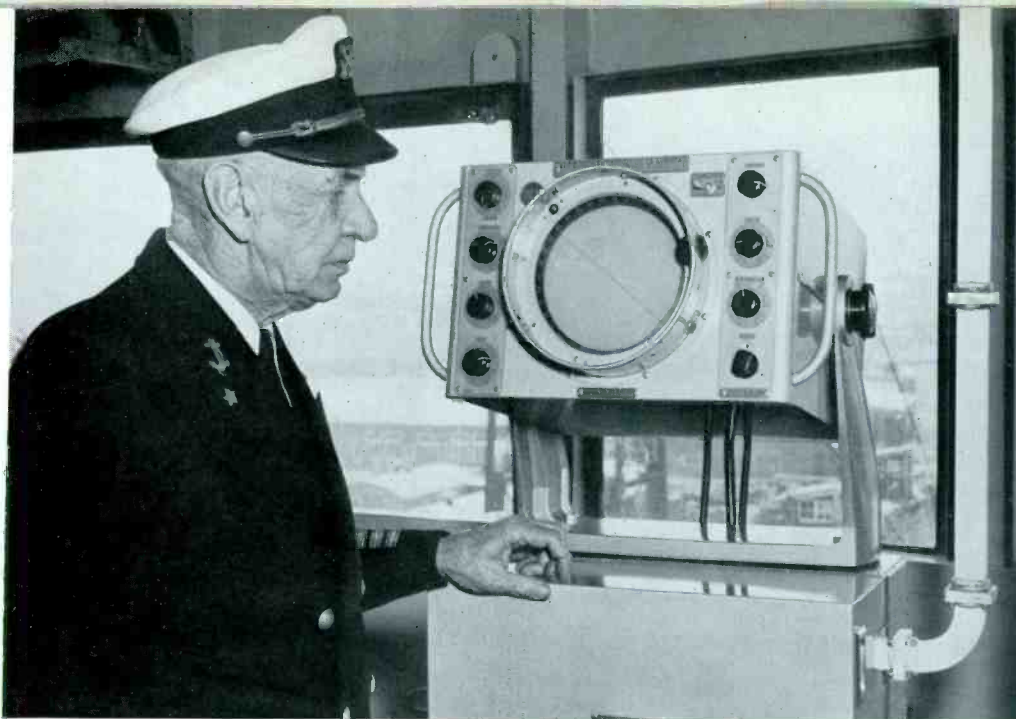
RCA test equipment is widely used by service

technicians in the maintenance of radio and television receivers and industrial equipment.

***How are products of the Tube Division marketed?*** The RCA Tube Division is responsible for the sale of RCA tubes, TV components, radio and TV service parts, tube parts, tube making machinery, test equipment and batteries. It sells in four major markets: to electronic equipment manufacturers who incorporate RCA products in the items they produce; to authorized Tube Division distributors who service the renewal needs of radio and TV dealers, servicemen, broadcast stations, industrial users and the general public; to U. S. Government agencies for maintenance of electronic equipment; and to other manufacturers of electron tubes.

## **RADIOMARINE CORPORATION OF AMERICA**

***What is the function of the Radiomarine Corporation of America?*** Radiomarine develops, produces and sells marine radio communications equipment, electronic navigational devices as well as other specialized electronic apparatus. Among the various aids to navigation manufactured are shipboard radars, loran receivers, radiotelephone and radiotelegraph transmitters and receivers, automatic radio alarms, and radio direction finders. Radiomarine also develops and manufactures special electronic equipment for the Armed Forces. Radiomarine's communications facilities include the operation of a radiotelegraph and radiotelephone communications system for contact with ships in all parts of the world as well as the maintenance, repair and installation of marine radio communications equipment and electronic navigational devices.



Captain consults Radiomarine radar unit aboard his ship.



Portable radio transmitter-receiver for lifeboats.

***When was Radiomarine organized?*** Marine radio communications has been a service of RCA since its founding in 1919. As this business expanded, the Radiomarine Corporation of America was formed on December 31, 1927, as a wholly-owned subsidiary of RCA.

***Does Radiomarine operate branch offices outside of New York?*** Radiomarine has sales offices and service offices located in all principal seaports and on inland rivers and lakes of the United States.

***What is Radiomarine's role in the manufacture of equipment for the Armed Forces?***

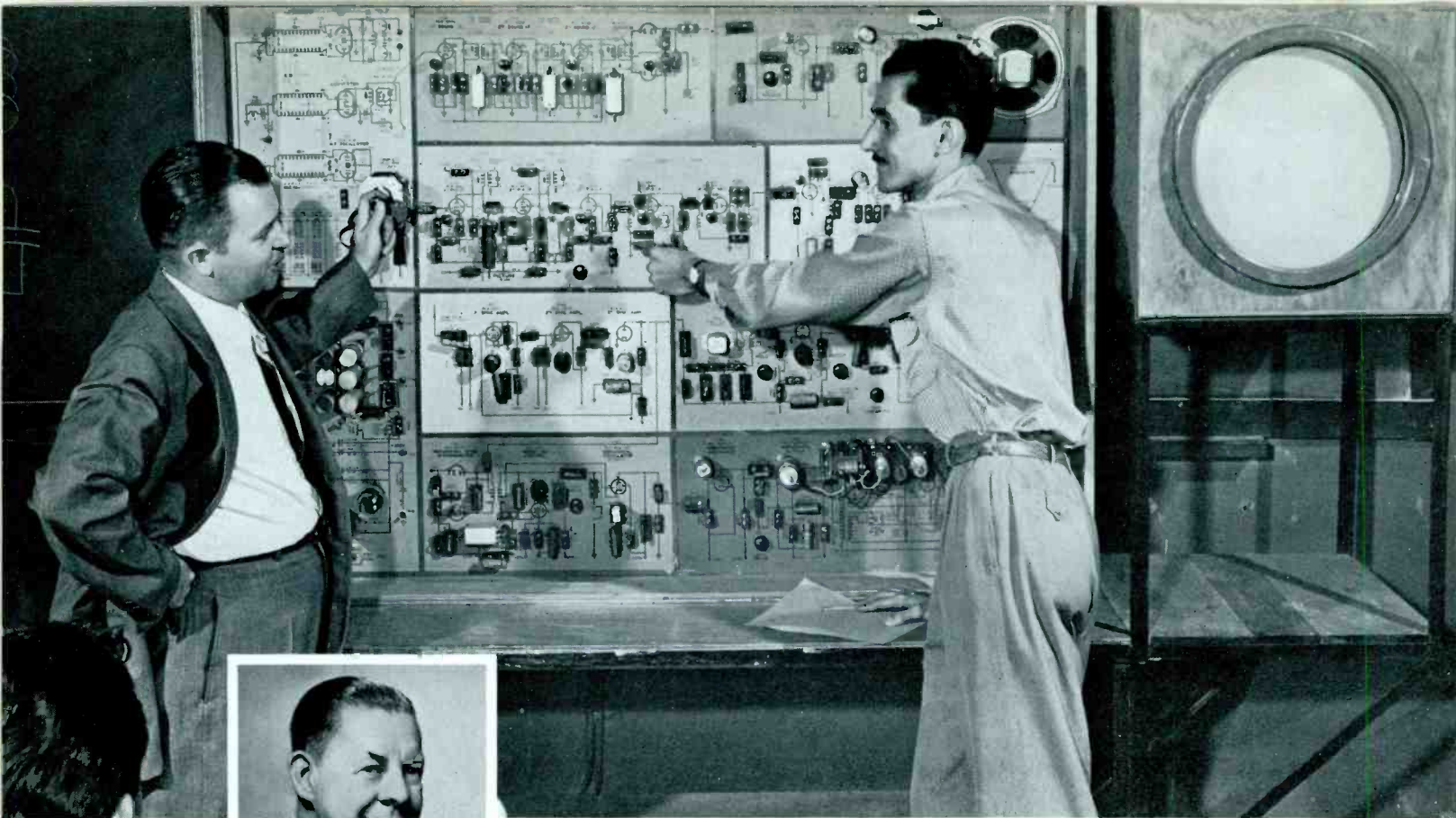
Radiomarine engineers have developed and designed high-quality marine radio and electronic equipment for our Armed Forces. Such items as radar, electronic navigational devices and other specialized electronic equipment have been manufactured specifically for the United States Army, Navy, Air Force and Coast Guard.

***What is the function of Radiomarine's communication service?*** Radiomarine is engaged

in commercial shore-to-ship, ship-to-shore and ship-to-ship radiotelegraph and radiotelephone communication, maintaining coast stations on the Atlantic, Pacific and Gulf Coasts, the Great Lakes, the Mississippi and Ohio Rivers and their tributaries. There is radiotelephone and radiotelegraph service at Buffalo, and radiotelephone service at St. Louis, and Pittsburgh. This nationwide network of coast stations handles radiograms, government weather reports, press bulletins and free medical advice for the benefit of sick and injured persons on vessels not carrying doctors. Radiomarine's "Gift-by-Radio" and plane-to-shore services are also available. Messages are received by coast stations and relayed to their destinations. Radiomarine provides as a part of its communication function maintenance, repair and installation service to more than 2,500 ships on all types of marine radio communications equipment and electronic navigational devices.

***Where may radiograms be filed for ships at sea?*** Radiograms to ships may be filed at any RCA Communications, Inc., or Western Union office. They should be marked "Via RCA".





TV circuit instruction at RCA Institutes.



ROBERT A. SEIDEL  
*Vice President*  
*Sales and Service Subsidiaries*

## SALES AND SERVICE SUBSIDIARIES

### *What are RCA's sales and service subsidiaries and what are the activities of each?*

The sales and service subsidiaries of RCA are: the RCA Service Company, Inc., which installs, maintains and services RCA consumer and technical products; the RCA Victor Distributing Corp., which distributes products made by RCA and other companies; and RCA Institutes, Inc., which trains students in the technical phases of radio, television and electronics.

### **RCA SERVICE COMPANY, INC.**

#### *What is the RCA Service Company, Inc.?*

The RCA Service Company, Inc., is a nationwide

organization of technical specialists devoted to the installation, maintenance and servicing of electronic products and equipment. It operates in technical and industrial fields, but its principal manifestation to the public is in connection with home television receivers.

The Company is divided into three major service groups — Consumer Products, Technical Products and Government.

The Consumer Product Service activities began in 1939. The responsibility of offering factory service to every RCA Victor television owner was delegated to the RCA Service Company. Factory service branches now are located in every major television area in the United States and in Hawaii.

Technical bulletins and manuals are made available to all television technicians, and lecture clinics have been attended by about 76,000 technicians, dealers and other servicing agencies.

***What is the RCA Factory Service Contract?***

The RCA Factory Service Contract is available to RCA Victor television owners only. A variety of service and maintenance contracts are available to meet the customer's specific requirements, in addition to a full coverage plan giving complete parts and tube protection and unlimited service as needed.

***Can non-contract owners obtain TV service?***

Yes; branches in virtually all television markets and thousands of factory trained technicians make RCA Factory Service available on a time and parts-plus basis.

***What provisions are made for the installation and servicing of RCA air conditioners?***

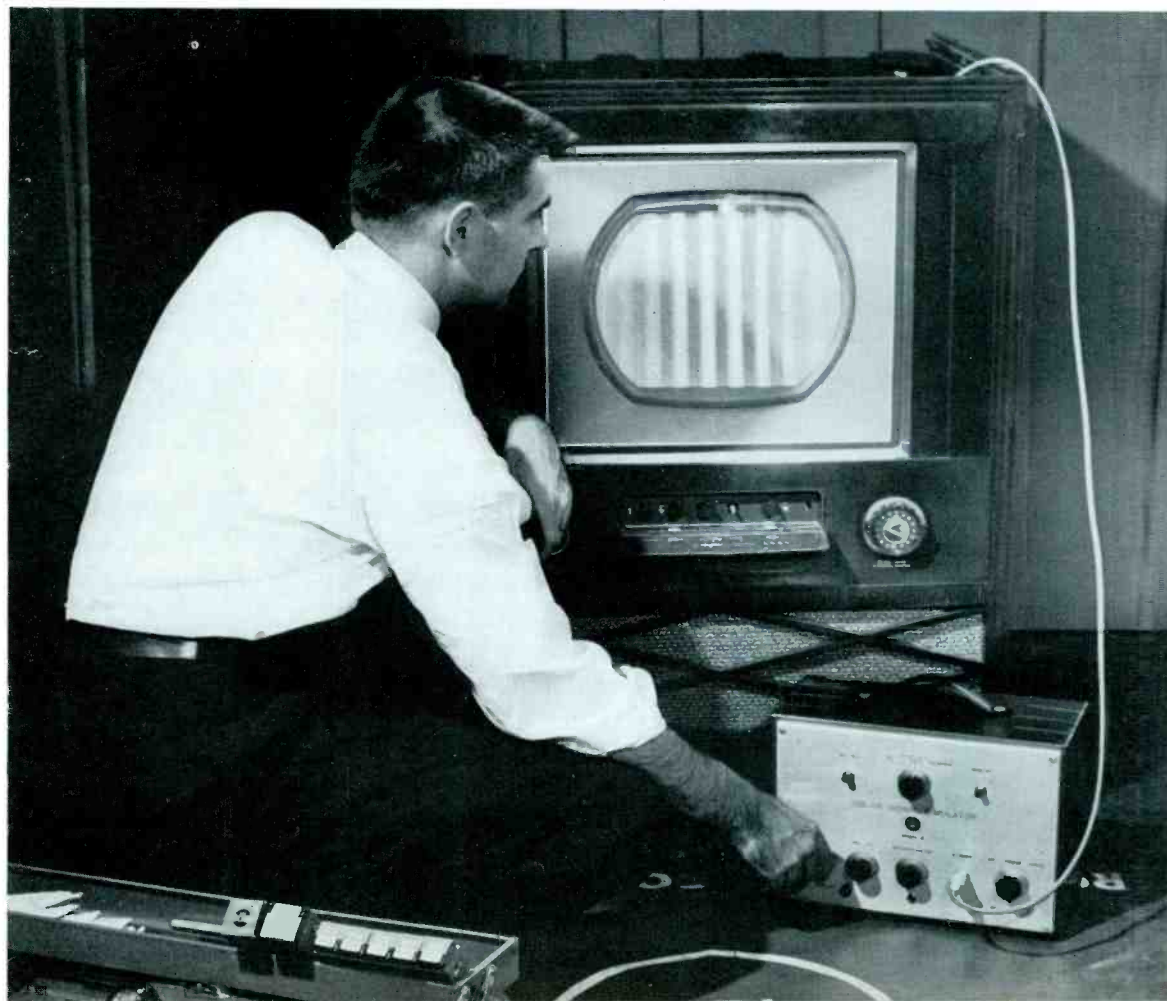
A Factory Service Contract covering installation and service of any RCA air conditioner can be purchased at any RCA Service Company factory branch.

***What is the Technical Products Service?***

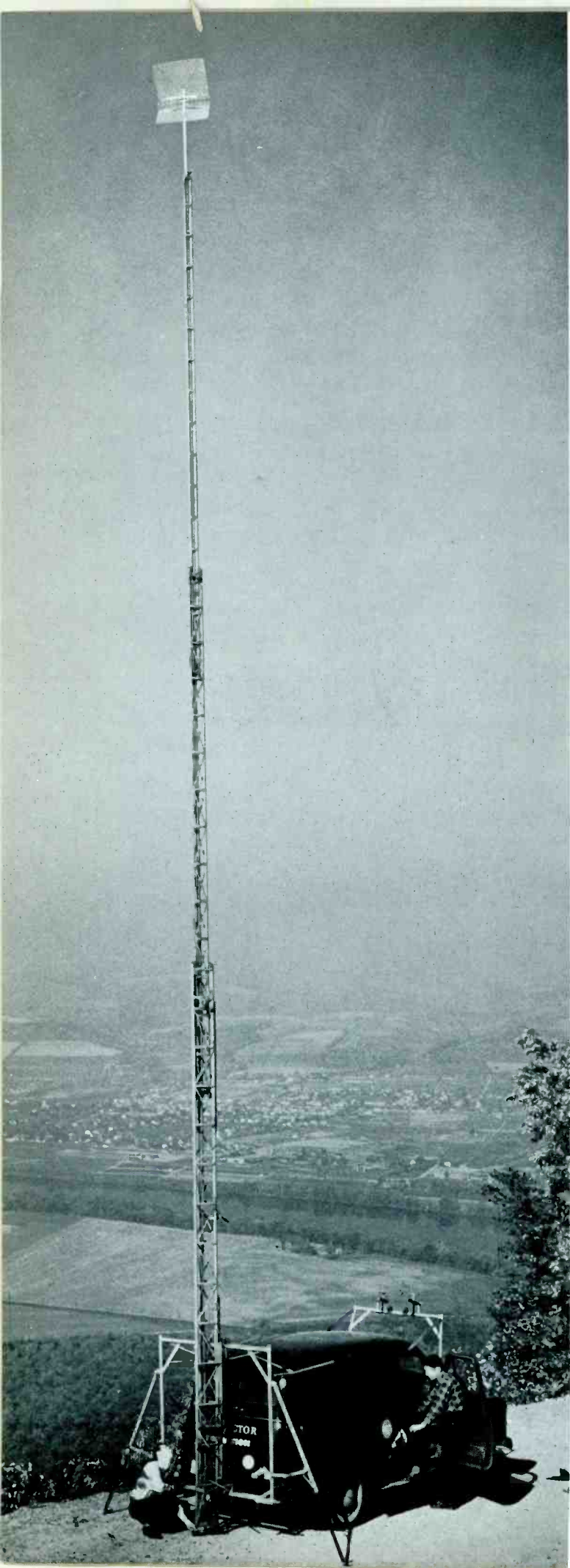
The Technical Products Service provides installation, service, preventive maintenance, and parts and tube replacement plans to motion picture exhibitors, industrial and scientific electronics equipment users, and to the broadcast industry.

Since the beginning of "talkies", the RCA Service Company has contributed greatly to modern advances in this field, such as "CinemaScope," 3-D and stereophonic sound. RCA Service also is firmly established in the field of theatre television.

Color signal simulator, designed by Service Company, is used to align color TV sets.







Service Company technician installs UHF-TV antenna.

Facilities of the industrial products service are available to users of RCA electron microscopes, beverage and ampule inspection machines, metal detectors, sound systems, radio frequency generators, industrial television and television film projectors and to AM, FM and television broadcasters.

***What services are performed for the Government?*** The Government Service activity of the RCA Service Company, Inc., has hundreds of field engineers with the Air Force, Navy and Army to assist and instruct U.S. personnel at home and abroad in the installation, operation and maintenance of radio-electronic military equipments produced by RCA and others. These RCA field engineers accompany our Armed Forces to the battle-front, on the sea, in the air.

In addition to field engineering, Government Service prepares electronics training devices and technical publications including training manuals, equipment instruction books, and installation plans.

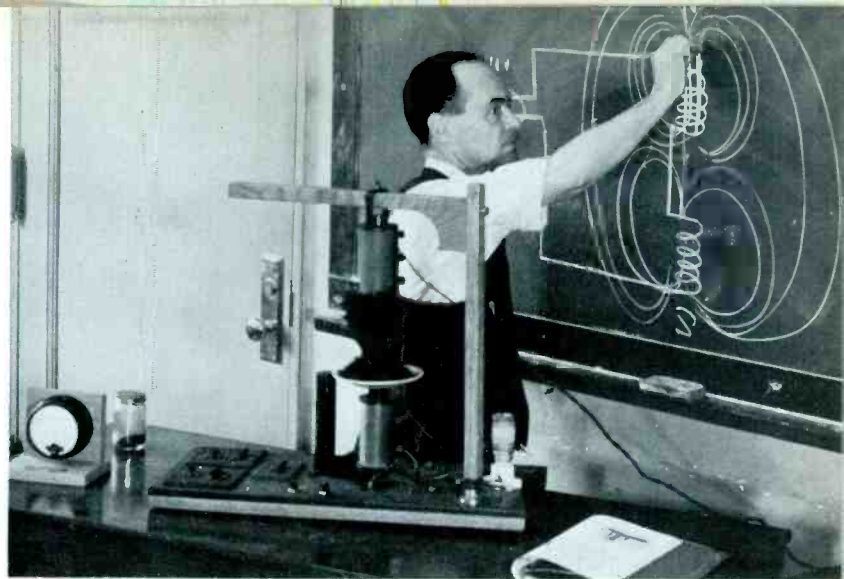
Many special projects, such as the operation of an Army Ordnance Quality Control Laboratory and an Air Force Guided Missile Test Range have been successfully undertaken by this activity of the RCA Service Company, Inc.

***What steps have been taken to train technicians for servicing color TV sets?*** Training

Antenna atop service truck tests TV signal strength.



Students in radio laboratory of RCA Institutes.



Instructor explains problem in radio physics.

clinics are being conducted throughout the country to instruct RCA Service Company personnel, independent servicemen, and station technicians in the new art of color television. In addition, the Service Company has prepared a comprehensive textbook on color television for service technicians and engineers.

### **RCA VICTOR DISTRIBUTING CORP.**

#### ***What is the RCA Victor Distributing Corp.?***

The RCA Victor Distributing Corp., is responsible for the distribution of RCA and other products through dealers served by branches in Chicago, Ill.; Davenport, Iowa; Detroit, Mich.; Buffalo, N.Y.; Kansas City, Kan. During 1953, the Corporation established warehouses in Wichita, Kan., Springfield, Mo., and Rockford, Ill., better to serve these fast growing television areas.

### **RCA INSTITUTES, INC.**

***What is RCA Institutes, Inc.?*** RCA Institutes is one of the oldest technical schools in the United States. It comprises a Technical Institute, which offers an Advanced Technology Course at collegiate level, and a Vocational School which offers courses in Radio and Television Broadcasting, Radio and Television Servicing, Advanced Tele-

vision Servicing, Radiotelegraph Operating and instruction in the Morse Code.

#### ***What instruction does RCA Institutes offer in television?***

All the courses, except the Operating Course, include instruction in TV. The design, operation and maintenance of the complete TV system are covered in the Advanced Technology Course. Maintenance and operation of the complete TV system are taught in the Broadcasting Course. The installation and repair of TV receivers are included in the Servicing Course.

Students enrolled in courses dealing with television also receive instruction covering the basic principles for color television transmission and reception. Special emphasis is given to new color TV equipment being developed.

#### ***How is the school year at RCA Institutes divided?***

Classes are in session for 49 weeks each year, closing only the three weeks preceding Labor Day. New terms start approximately the first day of March, June, September and December. New students may enroll at the beginning of any term.

#### ***Does RCA Institutes conduct evening classes?***

Yes; evening classes are conducted in all courses. Evening courses are three times as long as corresponding day courses because of the smaller number of class hours per week.



**What are the qualifications for entering RCA Institutes as a student?** Some high school education is necessary for all courses. Candidates for the Advanced Technology Course must be high school graduates. The minimum entrance age is seventeen. All courses are open to the general public and any man or woman with the proper educational background may enroll.

**How may detailed information about the RCA Institutes resident courses be obtained?** Write for a catalog or call at the school from 9 a.m. to 8 p.m. on school days (Monday through Friday), at 350 West 4th Street, New York City.

**Does RCA Institutes offer any home study or correspondence course?** Yes; it offers a thorough course in Television Receiver Servicing, written and administered by qualified teachers and technicians. Behind this course is the RCA background of TV design, manufacture and customer service and the knowledge gained in applying this course to the training of several thousand technicians.

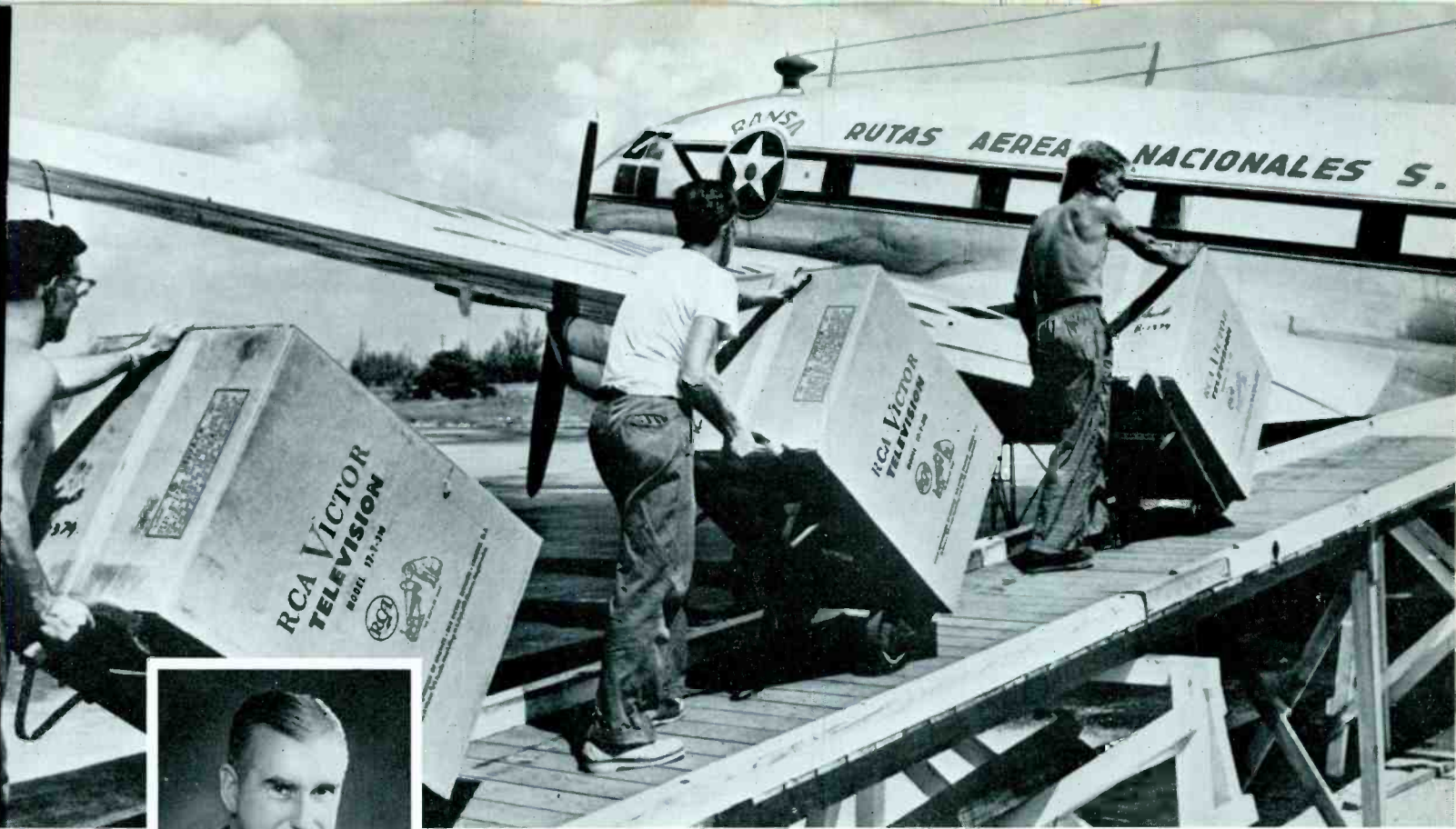
A color television home study course is available to technicians with experience in servicing black-and-white TV receivers. This course covers all phases in the principles and servicing of color television receivers. Descriptive bulletins available on request.

**Does RCA Institutes maintain a Job Placement Service?** Yes; to assist students in obtaining satisfactory positions, RCA Institutes maintains an active placement service. Practically all of its students who desire employment are placed in suitable jobs upon graduating. The principal fields of employment are in testing and design work with radio-electronic manufacturers; as technicians in broadcasting stations, or as technicians with radio and television service companies.

**Are courses at RCA Institutes sponsored by the Veterans Administration?** Yes; any qualified veteran may apply for admission.

A new student enrolls for technical courses at RCA Institutes.





RCA TV sets being shipped to South America by plane.



**MEADE BRUNET**  
 Vice President of RCA  
 and Managing Director  
 RCA International Division

## I N T E R N A T I O N A L

**How does RCA conduct its international business?** RCA's international business is conducted through RCA International Division. Operating through more than 200 major distributors and eleven associated companies, the Division sells RCA products in all markets of the world open to trade. Headquarters for RCA International Division are in the RCA Building, 30 Rockefeller Plaza, New York.

**In what countries does RCA have associated companies?** The associated companies of RCA for which RCA International Division provides management counsel are: RCA Victor Argentina, S.A., in Buenos Aires; RCA Photophone of Australia Proprietary Ltd., in Sydney; RCA Victor

Radio S.A., in Rio de Janeiro, Brazil; RCA Victor Company, Ltd., in Montreal, Canada; Corporacion de Radio de Chile, S.A., in Santiago; American Radio Television (Hellas), S.A., in Athens, Greece; RCA Photophone Ltd., in London, England; Photophone Equipments, Ltd., in Bombay, India; Radio e Televisione Italiana, S.p.A. in Rome, Italy; RCA Victor Mexicana, S.A. de C.V., in Mexico, D.F., and Industria Electronica, S.A., in Madrid, Spain.

**Is RCA increasing its overseas operation?**

RCA is developing more business in many areas around the world. In England, the RCA associated company is manufacturing sonar equipment for the NATO governments. The company in Canada





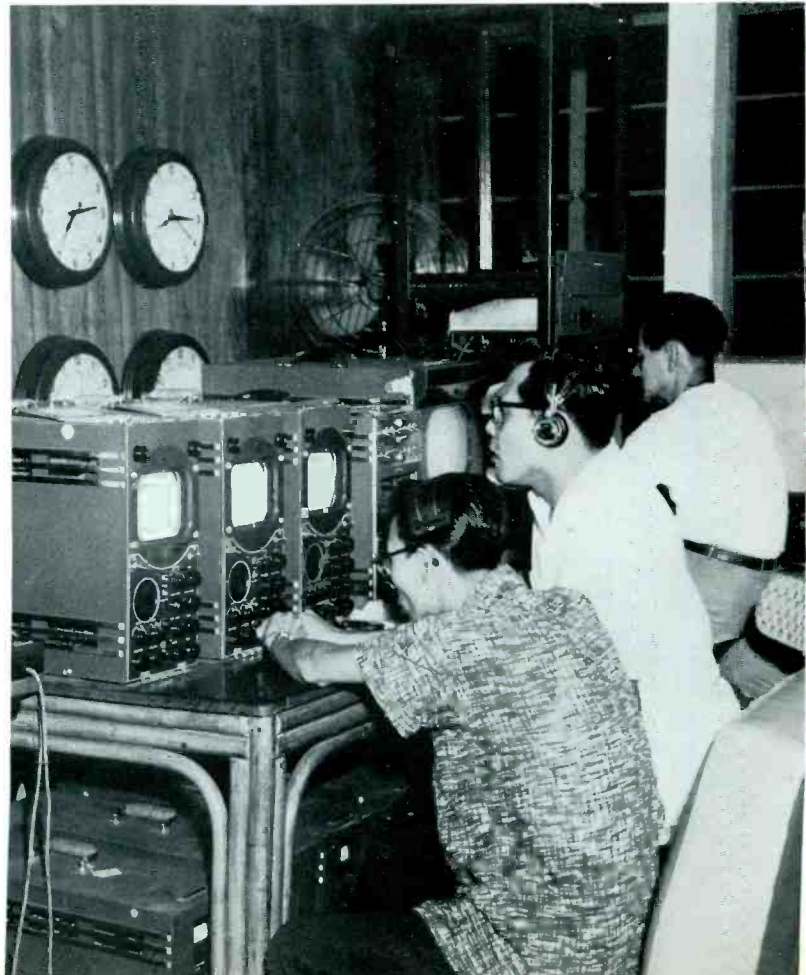
Switzerland uses RCA radar to guard lake frontiers.



This Japanese TV station employs RCA equipment.



Showroom of RCA products in Caracas, Venezuela.



First TV station in Philippines is RCA-equipped.

is assisting in the expansion of television, microwave radio and other forms of communications. New RCA Canadian factories are in operation at Prescott and Smiths Falls, Ontario, for the manufacture of consumer products and radio equipment for utilities, government and industry.

In Italy, RCA's associated company is producing phonograph records, using the first double-press facilities in Europe, with radio-television sets and other electronic products scheduled for early production.

The new factory of the Spanish company has been completed for the manufacture of RCA products.

***What products and services are handled by RCA's associated companies?*** TV sets are made or assembled in RCA factories in Argentina, Brazil, Canada and Mexico. The companies in Argentina, Brazil, Canada, Chile and Greece manufacture and distribute records, radio receivers — including automobile radios in Canada — some broadcast transmitters and special communications apparatus. Plastic products are made in the Argentine factory.

In Argentina, Brazil and Mexico, the RCA companies distribute motion picture equipment, sound products as well as transmitting and communications products manufactured in the United States.

The Australian, English and Indian companies handle distribution of RCA motion picture and sound equipment, and some other products. They install and service equipment in theatres and supply technical service to the motion picture studios and to their film recording licensees.

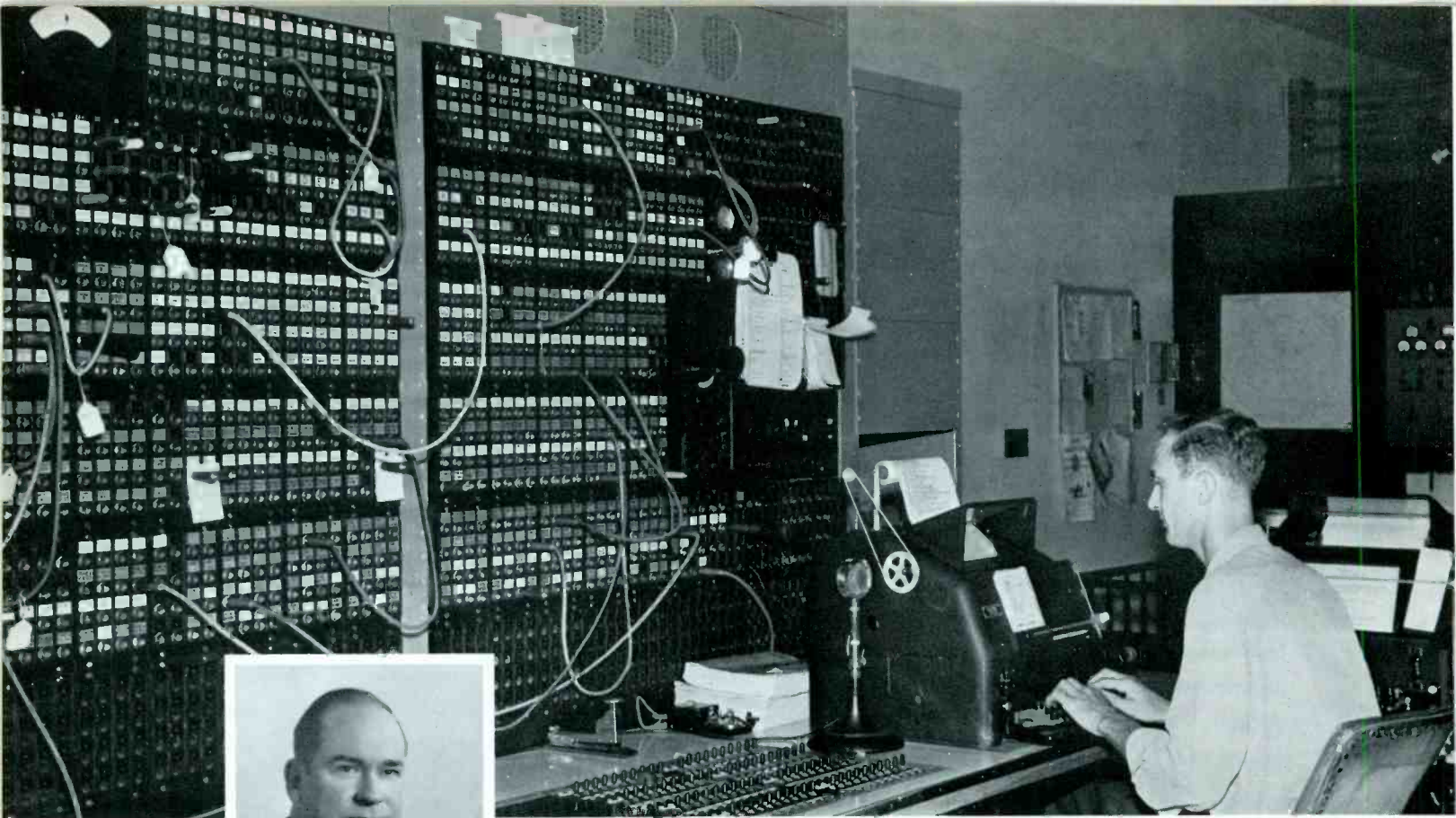
***What products does RCA export from the U.S.A.?*** RCA International sells all products

manufactured by RCA, wherever export, import and exchange regulations allow. The products sold range from miniature tubes, supplied to distributors and manufacturers, to complete communications networks supplied to governments, 16mm projectors to mining camps and school systems, and marine radio installations for entire whaling fleets. RCA International also sells a line of refrigerators and deep-freeze units, RCA air conditioners and ranges and handles export sales for a number of other companies whose products include industrial power equipment, aircraft navigation and airport control equipment and appliances such as washers, toasters, vacuum cleaners and heaters.

***What part is RCA playing in international television?*** As of early 1954, twenty-seven RCA-equipped television stations were on the air or scheduled to go into operation outside of the continental U.S.A. These are in Brazil, Canada, Cuba, Dominican Republic, Hawaii, Italy, Japan, Mexico, Philippine Islands, Puerto Rico, Thailand and Venezuela. RCA TV cameras and other equipment have been sold to Argentina, Chile and Sweden. The possibility of an international TV network is being accelerated by the growing acceptance of U.S. technical standards.

***What is the trend in radio communications abroad?*** Extensive communications projects have been engineered by RCA in many countries. Installed by RCA technicians, working in close cooperation with engineers of each country, these installations are located in Belgian Congo, Burma, Canada, Colombia, Cuba, Dominican Republic, Indonesia, Pakistan, Venezuela and elsewhere. The projects include broadcasting, microwave and other communications systems for Army, Navy, railroads, mining and other industries.





THOMPSON H. MITCHELL  
*President*  
RCA Communications, Inc.

Control console at Riverhead, N.Y., station.

## COMMUNICATIONS

***What is RCA Communications, Inc.?*** One of the first activities of Radio Corporation of America was the establishment of a worldwide radiotelegraph system to provide the United States with an adequate and independent international communications service. This system has been expanded and improved continuously throughout the years since the founding of RCA in 1919. By 1929, its growth warranted its organization as a separate company — RCA Communications, Inc. — wholly-owned by Radio Corporation of America and engaged primarily in international radiotelegraph (radiogram) communications as a service to the public.

***What is the extent of RCA's radiotelegraph service?*** RCA Communications operates modern radiotelegraph circuits terminating in the principal cities of 67 countries throughout the world.

***How does one send a radiogram?*** In the cities of New York, Washington, D. C., and San Francisco, messages may be sent most efficiently through one of the many traffic offices conveniently maintained by RCA in business districts. At these offices, messages are processed promptly and sent overseas by radiotelegraph with the speed of light. Many of the better hotels and travel agencies in these "gate-way" cities are authorized RCA agents. In other U. S. cities the local telegraph offices of

the Western Union Company accept and deliver RCA radiograms. However, when messages are filed with Western Union — to insure RCA service — the free routing indicator, "Via RCA," must be written after the city of destination, as follows:

London (England) Via RCA

**Where are RCA's main transmitting and receiving stations?** RCA's main transmitters on the East Coast are located at Rocky Point, N.Y., and are linked directly with New York and operated by remote control from the company's Central Radio Office at 66 Broad Street. The main receiving station is at Riverhead, sixteen miles from Rocky Point. Incoming signals received at River-

head pass automatically to the Central Radio Office in New York.

The main transpacific office of RCA is at 135 Market St., San Francisco, and transmitting and receiving stations are located respectively at Bolinas and Point Reyes, California. Similar RCA installations are in Honolulu, Guam, Ciudad Trujillo (Dominican Republic), Port-au-Prince (Haiti), San Juan (Puerto Rico), Havana (Cuba Transatlantic Radio Corporation), and Tangier. Stations in New York, San Francisco, Honolulu, Manila and Tangier comprise a trunkline belt of RCA semi-automatic relay points for transmissions around the world.

Operators place and monitor TEX teleprinter messages to foreign cities.





*What other communications services are operated by RCA?* RCA offers radiophoto service for handling pictorial and other information not easily converted to telegraph message form. Provided the type is at least typewriter size, any black-and-white material is suitable for radiophoto transmission.

Radiophoto circuits are operated between either New York or San Francisco and more than 30 foreign countries.

TEX service, RCA's Overseas Teleprinter Exchange, is a new development in international radiotelegraph service which provides direct connections between teleprinters in New York City and Washington, D. C., and the Netherlands, Great Britain, France, Spain, Luxembourg, Western Germany, Denmark, Belgium, Switzerland, Sweden, Finland, Norway, and the Belgian Congo.

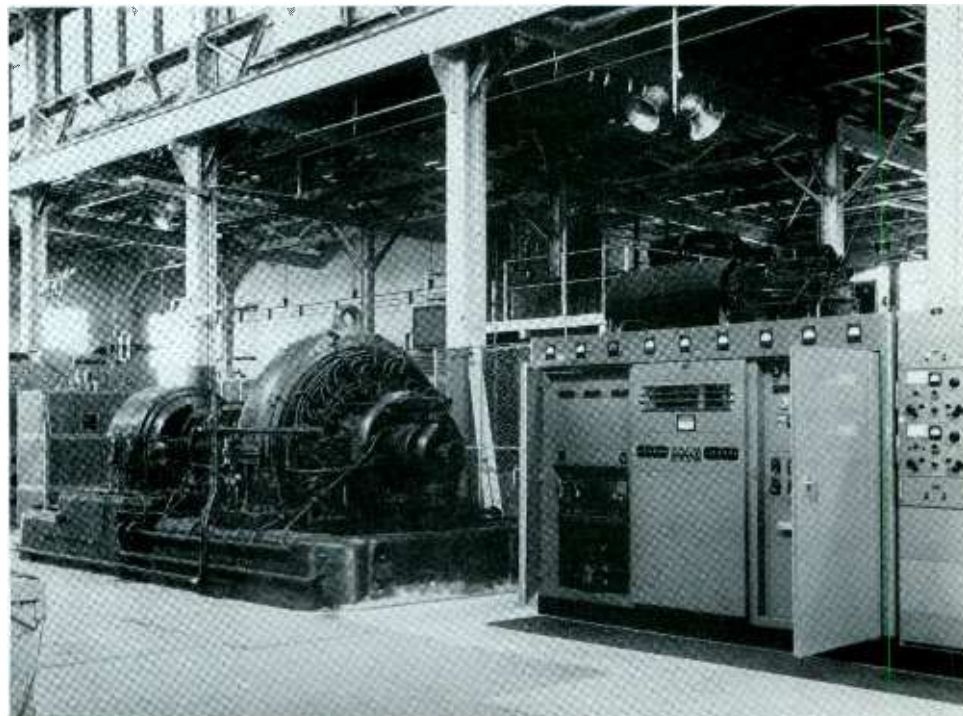
This service enables subscribers of the European Telex System to communicate directly from their offices in Europe to the offices of their associates in New York and Washington. The European Telex System is similar to the American Domestic Teleprinter service, known as TWX. In addition to its transatlantic TEX facilities, RCA also provides Teleprinter Exchange Service between San Francisco, California and Honolulu, T. H.

RCA Program Transmission Service offers facilities for the exchange of broadcast studio and press programs between the United States and foreign points. Through this service, programs originating in foreign studios are received by RCA and are distributed to American broadcasting networks for transmission to the American public. Similarly, American programs are transmitted overseas to foreign broadcasting agencies.

Facilitating a freer exchange of news between the



Technician adjusts receiving equipment.



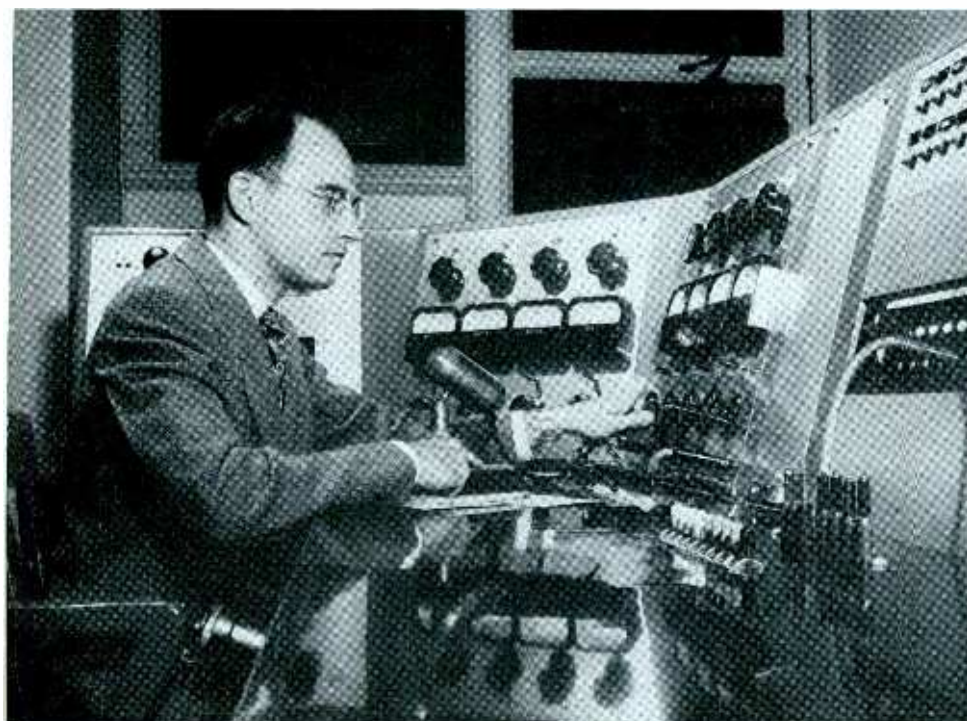
Alexanderson alternator of 1920 and new short-wave transmitter.

United States and other countries, RCA has inaugurated a Volume Press Service by which large quantities of press dispatches may be sent at low word-rates. Special transmissions of press to overseas points are also handled for the State Department. Daily news bulletins are relayed via Tangier to listening posts in Europe and the Near East for the State Department's Information Service. Similar to this service are special channels leased to commercial users — such as the overseas airways — for the conduct of large volumes of overseas message traffic.

***What technical advances have been made recently in the field of international radiotelegraphy?*** Applying new operating techniques and methods developed during and since World War II, RCA Communications, Inc., has pioneered the modernization of radio's interna-

tional services. The answer to greater speed and efficiency in handling increased volumes of traffic is the mechanical processing of messages and world-girdling, automatic radio relays. The advanced system employs time- and motion-saving tape relay operation. Its aim is to achieve maximum speed of service at low unit cost with minimum risk of errors. This is accomplished by eliminating letter-by-letter manual processing except at the point where a message is prepared for original transmission.

Messages are handled through relay points in a tape relay network by a simple physical transfer of message tapes. The original processing can be done at any convenient location — customer's office, branch office, or central office. At the ultimate destination a page printer is substituted for tape reception and the message is received in printed form, ready for delivery.



Foreign broadcasts are received through this control console.



Removing perforated-tape message from machine.



## PIONEERING IN RADIO

**1920** World-wide communication inaugurated by RCA in 1920 was greatly extended in 1921 with the opening of "Radio Central" at Rocky Point, N.Y., featuring the 200-kilowatt Alexanderson alternators.

**1921** Dempsey-Carpentier fight on July 2, broadcast by RCA from Boyle's Thirty Acres in Jersey City as the first heavyweight championship bout on the air.

**1923** High-speed transmitters and automatic receivers installed on ocean liners to handle increased radio traffic.

**1924** Short waves applied to RCA transatlantic communication, featuring tubes rated at 20 kilowatts.

First radiophoto transmitted by RCA across the Atlantic was of Charles Evans Hughes. It was sent from New York to London on July 6, and instantly radioed back across the sea and recorded in New York.

**1925** First rebroadcast from London heard on February 14, through RCA stations WJZ, New York, and WRC, Washington.

RCA broadcasting transmitters participated in 24-station hook-up for Coolidge inaugural, first event of its kind on the air.

Initial international broadcast program transmitted from Chelmsford, England, picked up at Belfast, Maine, and relayed by short wave to New York, for rebroadcast by RCA station, WJZ, March.

Facsimile messages, maps and pictures sent by RCA radiophoto system, May 7, from New York to Honolulu.

**1926** Picturegram of a check sent from London to New York by RCA radiophoto on April 20, was honored and cashed in New York.

National Broadcasting Company organized as a service of RCA on September 9, to conduct nationwide network broadcasting.

World series baseball games broadcast for the first time by WJZ in October.

**1927** Play-by-play description of Rose Bowl football game in Pasadena, Cal., on January 1, broadcast by NBC over coast-to-coast hook-up, was America's first transcontinental network program.

Home radio sets and tubes designed for alternating current operation introduced by RCA.

Radiomarine Corporation of America — a service of RCA — was organized on December 31, to operate in the marine communication field.

**1928** The diversity reception system, which contributes to the stability and reliability of shortwave communication, was introduced by RCA.

RCA successfully demonstrated motion pictures with sound on 16mm film.

**1929** RCA Communications, Inc., organized January 3, to conduct international radiotelegraph service.

**1930** RCA inaugurated an international program transmission service as a regular operation.

**1931** Noiseless system of sound recording introduced to the motion picture industry by RCA.

RCA perfected the velocity microphone, which became the standard of broadcasting stations. In 1934, it introduced the unidirectional microphone, used in film and phonograph recording, and in broadcasting and TV.

**1932** Self-contained, portable very-high-frequency knapsack transmitter built by RCA for use in broadcasts of outdoor events and for military scouts.

Automatic very-short-wave radio stations, designed to relay television pictures and other forms of radio communication from city to city, demonstrated by RCA.

**1934** RCA, at the Navy's request, began development work on sonar, an underwater sound system, following considerable independent research by RCA scientists and engineers. Sonar was credited by the Navy with the destruction of nearly 1,000 enemy submarines during World War II.

**1935** Electron multiplier tube, developed by RCA Laboratories, multiplies amplification hundreds of thousands of times.

Automatic SOS alarm for use on vessels not having a radio operator on constant watch, introduced by RCA.

**1936** First very-high-frequency automatic relay circuit opened by RCA, between New York and Philadelphia, for simultaneous transmission of facsimile and multiple radiotelegraph messages, on frequencies in 90 megacycle region.

**1937** First full-size symphony orchestra organized exclusively for broadcasting introduced by NBC under Maestro Arturo Toscanini, conductor.

A radio altimeter embodying radar principles was developed by RCA during research on collision prevention apparatus.

**1938** Receivers for the home-recording of newspapers and other graphic material transmitted by radio were demonstrated by RCA in February.

**1939** Dr. V. K. Zworykin of RCA Laboratories at annual meeting of the American Association for the Advancement of Science, in December, announced that he and his associates were working on the development of an electron microscope; in April 1940 the instrument was completed. It has attained magnifications of more than 300,000 diameters.

**1940** NBC station W2XWG, first FM station established in New York by any network broadcaster, began operation on January 11.

Utilizing space-saving advantages of miniature tubes, RCA introduced a pocket-size "personal" radio.

**1941** RCA Alert Receiver, turned on and off by a special signal from broadcast transmitter, rings bell, lights electric lamp or blows siren to summon listeners. demonstrated on July 28, for use in civilian defense.

Ground broken on August 8, for new RCA Laboratories at Princeton, N. J., to be one of the foremost centers of radio and electronic research in the world: cornerstone laid on November 15.

RCA electron microscope at the University of Pennsylvania magnified the influenza virus 65,000 times, making possible the first photograph ever taken of the virus, as announced on November 22.

**1942** Advanced types of miniature tubes were introduced by RCA.

**1943** The electron microanalyzer, growing out of research on the electron microscope, was a new development at RCA Laboratories.

**1944** Radio-frequency equipment for the bulk dehydration of penicillin was developed and installed by RCA at the plant of E. R. Squibb & Sons, New Brunswick, N.J., on May 5.

Special equipment to measure the muzzle velocity of projectiles was developed by RCA Laboratories.

**1945** RCA International Division was formed February 5, "to supervise foreign sales and other activities of the Company and its subsidiaries outside the United States."

Capable of operating over distances of 1,000 miles or more, new lifeboat radio equipment that automatically transmits SOS and direction finder signals announced by Radiomarine Corporation of America, April 3.

After eleven years of research, RCA introduced a non-breakable high-fidelity phonograph record which was demonstrated to the press on August 30.

A new FM radio circuit, called the Ratio Detector, invented by Stuart W. Seeley, manager of RCA Industry Service Laboratory, was revealed October 3.

First link in an automatic microwave relay system, using equipment developed by RCA, was announced jointly by Western Union Telegraph Company and RCA on October 22.

A new system of air navigation, proposed by RCA, based on wartime developments in radar and television and known as "Teloran," was described before a technical symposium in New York City on December 8.

**1946** Shoran, a precision-radar system developed by RCA as an aid to blind bombing in war, was revealed on January 22. So precise is Shoran that it can measure distances up to 250 miles over land or water with almost pinpoint accuracy.

Army headquarters, on April 21, revealed use in the Pacific theatre of the sniperscope, an effective night-fighting device which uses an electronic infrared image tube developed by RCA Laboratories in 1930, during television research on the image orthicon. A corresponding combat aid, the snooperscope, was used by the armed forces as an invisible spotlight for reconnaissance and for night signalling.

The "Pocket Ear," developed by NBC, is a miniature





General Sarnoff opens radio station built by RCA for U. S. Navy.

radio receiver, small enough to carry in a coat pocket and conveying sound through a replaceable ear plug. Used for communication between control rooms and studio stages, it provides a means of "talkback" free from the trailing wires inherent in former systems.

**1947** An electron tube with a "memory", developed by RCA for use in calculating machines that will solve complex mathematical problems with lightning-like speed, revealed on March 4.

Development of a revolutionary system of high-speed communications capable of transmitting and receiving written or printed messages and documents at the rate of a million words a minute was disclosed by RCA-NBC on June 23, and demonstrated to the public on October 21, 1948, at the Library of Congress, Washington, D. C. Called "Ultrafax," the system was developed by RCA and the Eastman Kodak Company.

**1948** New method of highly accurate frequency control for transmitter circuits, based on the effects of radio on certain gases announced by RCA in March.

A new electron tube, which acts as a "transducer" in converting mechanical vibrations into electrical pulses that can be studied as audible or visual signals, was announced by RCA, October 20.

A new form of electronic reading aid, which scans individual letters and reproduces their sounds through a loudspeaker, was developed by RCA Laboratories and demonstrated on October 26.

**1949** An entirely new system for the reproduction of recorded music in the home, based on a vinylite record  $6\frac{7}{8}$  inches in diameter and a fast-changing record player operating at 45-rpm, was announced January 11, by RCA.

RCA developed an electronic counter which measures radiations emanating from the hands and feet of personnel engaged in production and research on radioactive materials. First demonstrated on October 31.

A new visual memory tube, the Graphechon, which can store, for as long as a minute, traces or other electrical signals occurring in an interval as short as a billionth of a second, was announced to the Institute of Radio Engineers on March 10. An associated device, a storage oscilloscope, was revealed on November 2.

Development of a new pencil-type triode transmitting tube for use at frequencies up to 3,000 megacycles was announced by RCA on November 15.

A photo-multiplier tube, six times more sensitive than its predecessor, revealed by RCA on November 21.

**1950** Development by RCA of a new transmitting tube capable of delivering 500 kilowatts of radio-frequency power was announced on February 1.

A pocket-size superheterodyne radio receiver, smaller than any previously designed with a loudspeaker, was demonstrated by RCA Laboratories' engineers at a meeting of the I.R.E. on March 9.

For the first time in communications history, direct teleprinter contacts on an international scope were made available to the public on May 15, when RCA inaugurated two-way customer-to-customer overseas radio teleprinter exchange service, called TEX, between New York and Holland. Since then the service has been extended to fourteen foreign countries.

RCA scientists announced on September 15, the development of a compact, high-fidelity unobtrusive pressure microphone called the "Starmaker" for use in radio and television studios.

RCA, on October 26, revealed the "tristimulus photometer," an instrument which enables quick and accurate measurement of color from a direct light source.

An electronic analogue computer designed to evaluate the performance of guided missiles, airplanes, ships and submarines was demonstrated by RCA on November 21. Called "Typhoon," the computer employs approximately 4,000 electron tubes and several miles of wiring. In a few seconds it is able to solve problems that would require months of manual computation.

A new high-speed facsimile system, capable of transmitting copies of books, line drawings and documents, was developed by RCA for the Atomic Energy Commission and installed at the Oak Ridge National Laboratory on December 13.

**1951** On March 21, RCA scientists announced development of a new gas-discharge tube — the Plasmatron — which provides a new means of high-speed control of power and of radio circuit operation.

**1952** Dr. P. T. Smith of the David Sarnoff Research Center described to the I.R.E. on March 5, an experimental model of a triode power tube with an output of 5 kilowatts on ultra-high frequencies.

A machine that automatically uncases milk bottles and washes them at a rate up to 576 bottles a minute was demonstrated by RCA in Chicago on April 17.

A three-speed "Victrola" record player was introduced to the trade on April 21.

First electronic means of achieving color reproduction in the graphic arts was revealed on May 7, as a joint experimental development of RCA and the Interchemical Corporation. Called a Color Correction Machine, the device operates with error limits of only plus or minus 2 per cent.

An electronic viscometer which simplifies many difficult or heretofore impossible measurements of the viscosity of liquids was developed at the David Sarnoff Research Center of RCA, and announced on May 14.

Development of point-contact transistors which can be made to oscillate at frequencies up to 200 megacycles, announced by RCA on June 26.

*S. S. United States* sailed on maiden voyage on July 3, equipped with radiotelephone, radiotelegraph, high-intermediate- and low-frequency transmitters and receivers manufactured by Radiomarine.

A new, longer playing 45-rpm record, called the EP, or Extended Play, was introduced by RCA on July 31. Utilizing a greater playing surface the new record plays up to eight minutes on each side.

First demonstrations showing the scientific progress made toward harnessing the transistor in applications useful to radio, television and industry were held on November 17, at the David Sarnoff Research Center, Princeton, N. J. Transistors were shown operating an experimental portable television receiver, radio sets, loudspeaker systems, miniature transmitters, parts of electronic computers, and other experimental devices.

In December, Radiomarine introduced a Powergraph Position Tracker with dichroic mirror arrangement which fits over radar scope permitting navigator to plot courses of other vessels directly on face of scope.

**1953** Methods of cooling transistors so they can be operated at relatively high power levels were revealed on March 24 by Drs. Armstrong and Jenny of RCA.

A highly sensitive and directional microphone, smaller and less obtrusive than existing designs, was described by RCA scientists at the annual convention of the I.R.E. on March 26. Called a uniaxial microphone, it rejects to a high degree all sounds originating at the sides and rear.

An electronic sound absorber which reduces the sound level by means of an electronic transducing system was described on May 7 to the Acoustical Society of America by Dr. Harry F. Olson and Everett G. May of RCA Laboratories. The sound absorber, consisting of a microphone, amplifier and loudspeaker, could

Dr. V. K. Zworykin and electronically controlled model car.





be used for example, in a factory to reduce low-frequency machine noise near the operator.

The RCA "TV Eye," a relatively inexpensive closed circuit television system, was introduced during May. The system includes a simplified four-pound TV camera and a compact control unit.

The first RCA components for high-fidelity sound reproduction equipment were announced in May, followed during October, by a demonstration of high-fidelity "Victrola" phonographs.

A portable tape recorder for home use was introduced by RCA on June 22. The dual-speed machine, operated by push-button controls, can record up to two hours on a single reel of tape.

Development of experimental point-contact transistors which oscillate at more than 400 megacycles per second was disclosed by RCA on July 7.

Dr. V. K. Zworykin of RCA Laboratories revealed on July 22 that an exploration was being made to apply electronic controls for automobiles of the future. An experimental system provides automatic means for driving a model car along a prescribed route.

Development of a very-high-speed electronic memory device, capable of storing ten-thousand bits of information, was described on August 4 by Dr. Jan A. Rajchman of RCA.

A tiny, experimental radio receiver, using transistors and powered by small flashlight batteries, was developed by scientists at the David Sarnoff Research Center and announced during December. Weighing only a pound, the receiver has an audio output comparable to conventional small portable radios with tubes.

The most powerful military radio transmitter in the world, built by RCA in cooperation with the U. S. Navy, was put into operation by the Navy at Jim Creek Valley, Washington, on November 18. The 1,200,000-watt transmitter provides world-wide communications with naval units on the land, in the air, and on and under the surface of the seas.

**1954** A new method which converts atomic energy into small but usable quantities of electrical energy was demonstrated by RCA for the first time on January 26. Using this method, a thimble-size experimental RCA Atomic Battery operated a transistor to produce audible tones.

A highly sensitive and directional microphone designed by RCA.



These tiny transistors have built-in cooling systems.



## RCA - NBC FIRSTS IN TELEVISION

**1923** Dr. V. K. Zworykin, now Vice President and Technical Consultant of RCA Laboratories, applied for patent on the iconoscope, television's first electronic "eye". (December 29)

**1929** An all-electronic television receiver using the kinescope as the picture tube was demonstrated by Dr. V. K. Zworykin, who developed it. (November 18)

**1930** Television on a 6-by 8-foot screen was shown by RCA at RKO-Proctor's 58th Street Theatre, New York. (January 16)

**1931** Empire State Building, world's loftiest skyscraper, was selected as new site for RCA-NBC television transmitter, W2XBS. (June)

RCA initiated field tests for 120-line, 30-frame television between New York and Harrison, N. J. Signals from station W2XF were transmitted on 44 megacycles. Receiver was all-electronic. A rotating scanning disk was used at the transmitter. (November 16)

W2XBS began regular television and facsimile operations. (December 22)

**1932** NBC began experimenting from W2XBS with live talent. (February 6)

First television demonstration for members of the Federal Radio Commission. (May 7)

**1936** Outdoor television pickups demonstrated by RCA at Camden, N. J., on 6-meter wave over distance of a mile. (April 24)

**1937** RCA announced development of electron projection "gun" making possible television pictures on 8-by 10-foot screen. (May 12)

Completely equipped mobile television vans developed by RCA-NBC appeared on New York streets for first time. (December 12)

**1938** Scenes from Broadway play, "Susan and God," starring Gertrude Lawrence, telecast from NBC studios in Radio City. (June 7)

**1939** RCA and NBC introduced television as a service to the public at opening ceremonies of New York World's Fair, featuring President Roosevelt as first Chief Executive to be seen by television. (April 30)

Improved television "eye", the "orthicon" was introduced by RCA. (June 7)

Major league baseball telecast for the first time by NBC, covering a game between the Brooklyn Dodgers and Cincinnati Reds at Ebbets Field. (August 26)

First college football game — Fordham vs. Waynesburg—televised by NBC in New York. (September 30)

RCA receiver in plane over Washington picked up telecast from NBC station in New York, 200 miles away. (October 17)

**1940** RCA demonstrated to the FCC, at Camden, N. J., a television receiver producing images in color by electronic and optical means, without moving mechanism. (February 6)

New York City televised from the air for the first time from a plane equipped with RCA portable television transmitter. (March 6)

Television pictures on 4½-by 6-foot screen demonstrated by RCA at stockholders' meeting. (May 7)

Coaxial cable used for first time in television program service by NBC in bringing scenes at Republican National Convention in Philadelphia to transmitter in New York. (June 21)

NBC made first test of 507-line pictures. (July 23)

Election returns telecast for the first time as RCA-NBC showed commentators at microphones. (November 5)

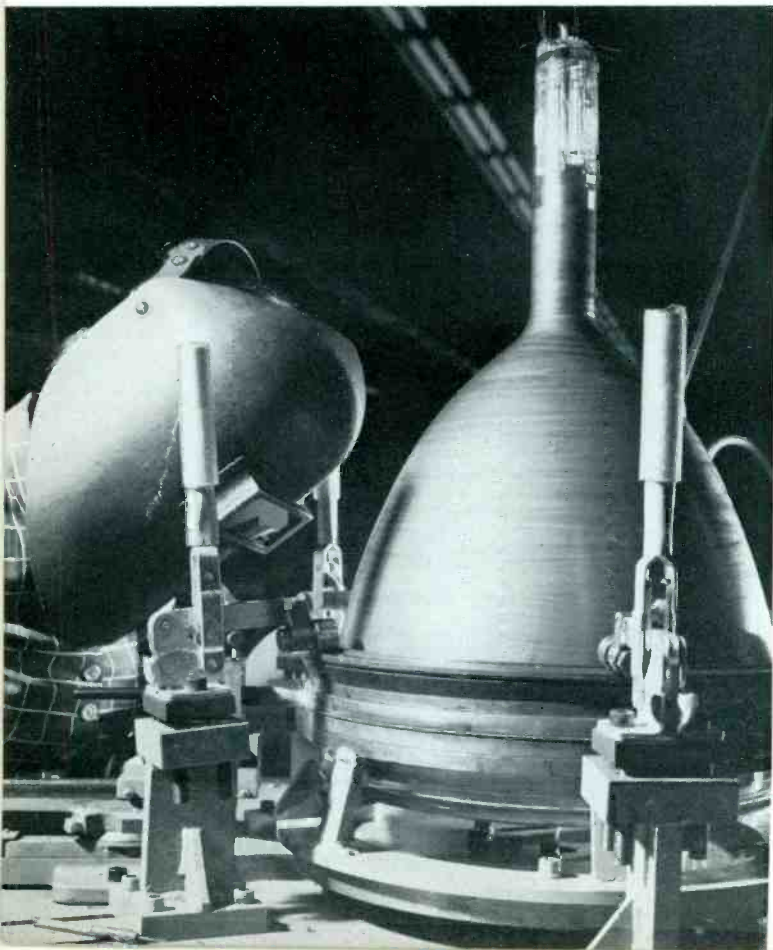
**1941** Demonstrating television progress to the FCC, RCA exhibited a projection-type home receiver featuring a screen 13½ by 18 inches . . . Television pictures including a prize fight from Madison Square Garden and a baseball game at Ebbets Field, Brooklyn, were





NBC-TV covered Inauguration with this mobile unit.

Welding rim of tri-color television picture tube.



projected on a 15-by 20-foot screen in the New Yorker Theatre . . . Scenes at Camp Upton, Long Island, were automatically relayed by radio to New York establishing a record as the first remote pickups handled by radio-relay stations. (January 24)

Color television pictures in motion were put on the air by NBC in the first telecast in color by mechanical means from a TV studio. (February 20)

RCA-NBC made successful tests with first projection-type color receiver using mechanical methods. (May 1)

NBC's television station, WNBT, became the first commercially licensed transmitter to go on the air. (July 1)

**1942** First mass education by television was initiated by RCA-NBC in training thousands of air-raid wardens in New York area. (January 23)

**1945** RCA showed projection-type television set with screen 18 by 24 inches. (March 15)

Supersensitive RCA image orthicon tube was introduced for television studio and outdoor pickups. (October 25)

Improved black-and-white television pictures and color television in three dimensions demonstrated by RCA. Color system was mechanical; the black-and-white, all-electronic. (December 13)

**1946** Airborne television, as developed during the war by RCA and NBC in cooperation with U. S. Navy, U. S. Army Air Forces and the National Defense Research Council, was demonstrated at U. S. Naval Air Station, Anacostia, D. C. (March 21)

First world heavyweight championship fight to be seen on television featured Louis-Conn at Yankee Stadium, New York, televised by NBC and transmitted to Washington via coaxial cable. (June 19)

RCA introduced post-war TV sets. (September 17)

Color television pictures on 15-by 20-inch screen, produced by all-electronic means, were demonstrated publicly for the first time by RCA. (October 30)

**1947** Philadelphia audience saw color television pictures produced on 10-foot theatre screen by RCA all-electronic system. (April 30)

First showing of American television in Europe conducted by RCA at Milan (June 9), and at the Vatican where Pope Pius XII was televised. (July 12)

Televised pictures of surgical operations were transmitted through the air for the first time by RCA from operating room in New York hospital and viewed by members of the American College of Surgeons. (Sept. 7-12)

Intensified NBC television activities included the following historic pickups: first telecast from Congress (Jan. 3); first pickup from White House (Oct. 5); first televising of World Series (Sept. 30 to Oct. 6); arrangement with Theatre Guild to telecast dramatic adaptations, starting with St. John Ervine's "John Ferguson;" the Louis-Walcott prizefight in Madison Square Garden, New York. (December 5)

**1948** Trinity Church service telecast as first program of its kind to be televised in New York. (February 22)

NBC Symphony Orchestra with Maestro Arturo Toscanini conducting an all-Wagnerian broadcast concert, simulcast on television for first time. (March 20)

Beethoven's "Ninth Symphony," played by NBC Symphony Orchestra, Maestro Arturo Toscanini conducting, was telecast as well as broadcast; estimated TV audience, 370,000. (April 3)

Republican and Democratic National Conventions at Philadelphia telecast by NBC. (June-July)

Combat maneuvers of the carrier *USS Leyte*, 20 miles off Long Island, were televised by NBC and its east-coast network, reaching an estimated audience of two million. (August 29)

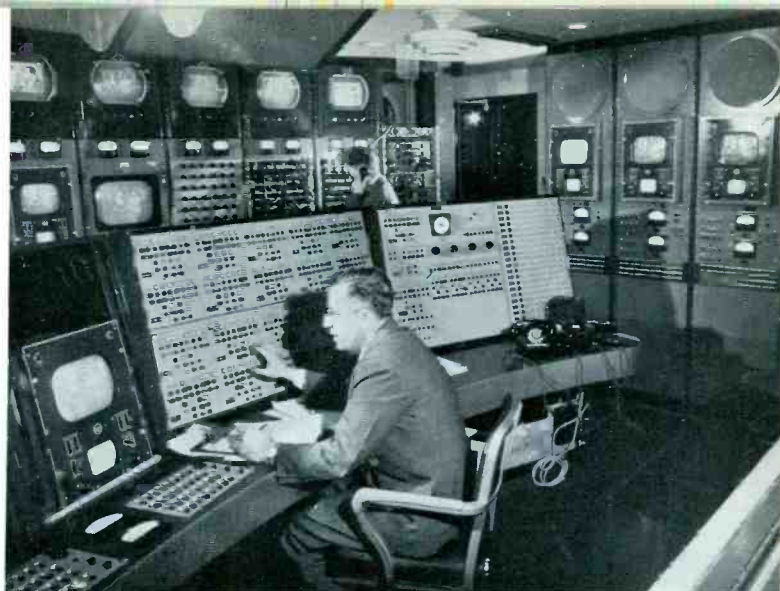
RCA, in cooperation with NBC, instituted simultaneous tests of television program transmissions on 67 and 505 megacycles from station WNBW, Washington, D.C., as part of a continuing study of propagation characteristics of ultra-high-frequency waves. (September)

**1949** Direct-view metal-cone television picture tube, 16 inches in diameter, disclosed by RCA. (January 3)

Scenes at inaugural of President Truman were transmitted from Washington, D. C., over the 15-station NBC television network extending from Boston to St. Louis. (January 20)

Improved reception of television stations assigned to the same channel was achieved by a new system, developed by RCA Laboratories, of offsetting one or more of the conflicting carrier frequencies. (June)

Large-screen theatre television was introduced with the



Television control room of NBC in Washington, D. C.



This machine received Corporation pictures for NBC

Rehearsal of color TV program at Colonial Theatre.





signing of a contract between Fabian Theatres, Inc., and RCA for the first permanent installation of theatre-size TV projection equipment. (July 27)

A new all-electronic, high-definition, fully-compatible color television system was announced by RCA to the Federal Communications Commission. The system maintains the standards of black-and-white service and will not make obsolete receivers now in use, since they can receive RCA color telecasts in high-definition black and white without touching the receiver. (August 25)

The RCA Antenaplex System—multiple-outlet master antenna for apartment houses, hotels and stores—was made commercially available. (November)

NBC's experimental ultra-high-frequency television station, KC2XAK, near Bridgeport, Conn., was placed in operation. (December 30)

**1950** A new system of industrial television, simpler, more compact and less costly, was demonstrated. The system incorporates a diminutive pickup tube, the Vidicon, which operates in a camera no larger than a 16-millimeter movie camera. (March 7)

Color kinescopes (direct-view type) demonstrated by RCA to members of FCC at Washington, D. C.; one tube used a single electron gun; the other, three guns—one for each primary color. (March 23)

RCA-NBC engineers designed, developed and tested a multiple antenna system, first of its kind, to permit five TV stations and three FM stations to operate from atop the Empire State Building in New York. (September)

**1951** Extension of the range, power and versatility of the light microscope by use of industrial television cameras was demonstrated by RCA and Princeton University. (January 9)

A new portable television camera and transmitting station, designed by RCA Laboratories to operate in the field as a one-man back-pack unit, was demonstrated. The back-pack station has its own battery-power supply. (March 22)

A 21-inch direct-view tri-color picture tube, making possible larger color pictures for the home, shown by RCA. (July 9)

RCA-NBC conducted color television field tests simultaneously on VHF and UHF, using, for the first time, standards chosen by the National Television System Committee. (September 7)

Transmission of compatible color television programs was field-tested over coaxial line and radio-relay facilities between New York and Washington, D. C. (September 20)

RCA exhibited a color TV projector which provided color pictures on a 9-by 12-foot theatre screen, at the Colonial Theatre, New York. (October 16)

**1952** Three dimensional television pictures of microscopic specimens were produced by RCA by mounting two industrial television cameras side by side, with the audience viewing images through polarized spectacles. (April 15)

Utilizing RCA equipment, the nation's first commercial UHF station went on the air with regular programs in Portland, Ore., using call letters of KPTV. (October 1)

First commercial model of RCA Vidicon system of closed-circuit industrial television was given practical demonstration in railroad yard operations in Chicago terminal of Baltimore & Ohio Railroad. (September 16)

**1953** A color television camera equipped with a single tri-color tube, instead of three color pick-up tubes, was demonstrated by RCA to the House Committee on Interstate and Foreign Commerce and the FCC. (April 14)

NBC provided American television audiences with the most complete coverage of the coronation of Queen Elizabeth II. The network flashed the first still pictures of the ceremonies nine minutes after they were taken in London and also presented the first films of the royal pageant seen in the United States. (June 2)

RCA-NBC petitioned the FCC to adopt the compatible technical signal specifications used by the RCA color television system as standards for commercial color television. (June 25)

The first publicly announced experimental broadcast in compatible color television of a network program was presented by NBC featuring the "Kukla, Fran and Ollie" production of the opera, "St. George and the Dragon." (August 30)

Compatible color television was demonstrated for the first time in Chicago when NBC staged a showing for the Association of National Advertisers. This inter-city program was transmitted over a closed-circuit from New York. (September 22)

RCA turned over to engineers representing virtually all

television set manufacturers full details of design and performance of RCA's basic color television receiver at a symposium in New York. (October 7)

NBC presented the opera "Carmen" in color, marking the first time an opera had been telecast in color and the first production of a full-hour program in compatible color. (October 31)

A live show from the NBC Colonial Theatre studio in New York was transmitted by RCA compatible color television via radio relay to Burbank, Calif., in the first transcontinental color television demonstration; color film was also transmitted by television for the first time from East to West coast. (November 3)

The "Colgate Comedy Hour" starring Donald O'Connor was presented by NBC as the first sponsored network program in compatible color. (November 22)

Magnetic tape recording of both color and black-and-white television programs was demonstrated for the first time by RCA at its Princeton laboratories. The

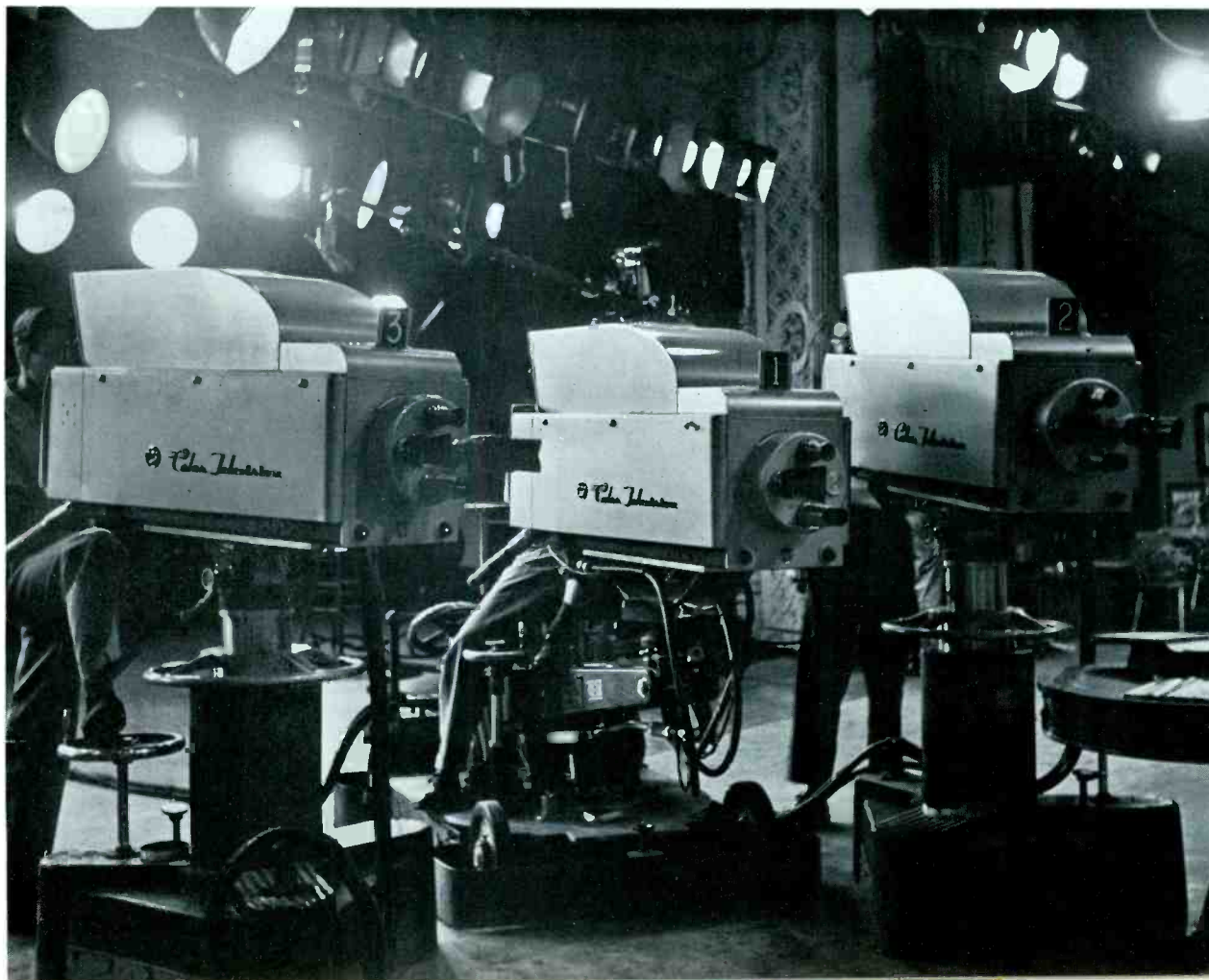
new method was heralded as the first major step into an era of "electronic photography." (December 1)

NBC was first network to go on the air with a color TV signal, within minutes after the F.C.C. approved standards for compatible color television. (December 17)

RCA's 15-inch tri-color picture tube was announced as a commercial product, together with deflecting yokes, transformers and other essential circuit components for color receivers. (December 30)

**1954** The Tournament of Roses Parade at Pasadena, Calif., was telecast in color by 21 stations of NBC's coast-to-coast network. This colorcast marked a series of significant "firsts" in television history including: the first use of NBC's new mobile color TV unit; the first West-to-East transcontinental transmission of color TV; the first West Coast origination of a color program under compatible color standards; and the first broadcast of a network color program by a coast-to-coast series of stations. (January 1)

Color television adds a new dimension to the entertainment arts.







**R A D I O   C O R P O R A T I O N   O F   A M E R I C A**  
**PRODUCTS AND SERVICES**

**RCA CONSUMER PRODUCTS:** . . . . . JOSEPH B. ELLIOTT, *Executive Vice-President*

**RCA VICTOR HOME INSTRUMENT DIVISION** . . . . . H. G. BAKER, *Vice-President and General Manager*  
 Television Receivers, Radios, "Victrola" Phonographs, Magnetic Tape Recorders.

**RCA VICTOR HOME APPLIANCE DIVISION** . . . . . JOSEPH B. ELLIOTT, *Acting Vice-President and General Manager*  
 Air Conditioning.

**RCA ESTATE APPLIANCE CORPORATION** . . . . . CECIL M. DUNN, *President*  
 RCA Estate electric and gas ranges (stoves).

**RCA VICTOR RECORD DIVISION** . . . . . EMANUEL SACKS, *Vice-President and General Manager*  
 Phonograph Records; Custom Records.

**RCA ELECTRONIC PRODUCTS:** . . . . . W. WALTER WATTS, *Executive Vice-President*

**TUBE DIVISION** . . . . . R. T. ORTH, *Vice-President and General Manager*  
 Tubes; Tube Parts; Tube Making Machinery; Radio Batteries.

**ENGINEERING PRODUCTS DIVISION** . . . . . T. A. SMITH, *Vice-President and General Manager*  
 Equipment for sound and television broadcasting, mobile and microwave communications, motion picture recording and reproduction; sound systems, industrial electronics, specially engineered military electronic apparatus.

**RADIOMARINE CORPORATION OF AMERICA** . . . . . THOMAS P. WYNKOOP, *President*  
 Development, production, sale and service of marine communication equipment and electronic devices — Commercial shore-to-ship, ship-to-shore and ship-to-ship radiotelegraph and radiotelephone communications.

**RCA SALES and SERVICE SUBSIDIARIES:** . . . . . ROBERT A. SEIDEL, *Vice-President*

**RCA VICTOR DISTRIBUTING CORP.** . . . . . WALTER M. NORTON, *President*  
 Supervises distribution of RCA products through dealers.

**RCA SERVICE COMPANY, INC.** . . . . . E. C. CAHILL, *President*  
 Operates service branches in all principal television areas, at district and field offices, and assigns technicians under contract with all branches of the Armed Forces throughout the world.

**RCA INSTITUTES, INC.** . . . . . GEORGE F. MAEDEL, *President*  
 Technical instruction in radio, television and electronics.

**RCA LABORATORIES** . . . . . DR. E. W. ENGSTROM, *Executive Vice-President*

Fundamental research in electronics including the physics and chemistry of electronically active solids — Applied research in radio, electronics, acoustics, sound recording and reproduction, television, tubes, and transistors — Laboratory and Technical Service to RCA Licensees.

**NATIONAL BROADCASTING COMPANY, INC.** . . . . . SYLVESTER L. WEAVER, JR., *President*

National Network and Local Standard and FM Broadcasting — Television Film Distribution — National Network and Local Television Broadcasting — National Spot Representation.

**RCA INTERNATIONAL DIVISION** . . . . . MEADE BRUNET, *Vice-President and Managing Director*

Distribution and sale of RCA products abroad; supervision of RCA-associated companies in foreign lands.

**RCA COMMUNICATIONS, INC.** . . . . . THOMPSON H. MITCHELL, *President*

International Radiotelegraph, Radiotelephone, Radiophoto, Program Transmission, Teleprinter Exchange, and Leased Channel Service.



**For general information concerning RCA, its products and services, write:**

Department of Information, Radio Corporation of America,  
RCA Building, 30 Rockefeller Plaza, New York 20, N. Y.

RCA TV RECEIVERS, RADIOS, "VICTROLA" PHONOGRAPHS: RCA Victor Home Instrument Div., Camden, N. J.  
 ELECTRONIC PRODUCTS: Engineering Products Division, Camden, N. J.  
 ELECTRON TUBES AND COMPONENTS: Tube Division, Harrison, N. J.  
 RCA VICTOR RECORDS: RCA Victor Record Division, 630 Fifth Avenue, New York 20, N. Y.  
 AIR CONDITIONERS: RCA Victor Home Appliance Division, Camden, N. J.  
 RANGES: GAS and ELECTRIC: RCA Estate Appliance Corporation, Hamilton, Ohio  
 INSTALLATION AND MAINTENANCE: RCA Service Company, Inc., Camden, N. J.  
 FOREIGN TRADE: RCA International Division, 30 Rockefeller Plaza, New York 20, N. Y.  
 BROADCASTING: National Broadcasting Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y.  
 RESEARCH: RCA Laboratories, David Sarnoff Research Center, Princeton, N. J.  
 INTERNATIONAL COMMUNICATIONS: RCA Communications, Inc., 66 Broad Street, New York 4, N. Y.  
 MARITIME ELECTRONICS: Radiomarine Corp. of America, 75 Varick Street, New York 13, N. Y.  
 TECHNICAL TRAINING: RCA Institutes Inc., 350 West 4th Street, New York 14, N. Y.

**RCA Regional Offices**

Northeastern Region — 2301 John Hancock Bldg., 200 Berkley Street, Boston 16, Mass.  
 Eastern Region — 36 West 49th Street, New York 20, N. Y.  
 Southern Region — 522 Forsyth Bldg., Atlanta 3, Ga.  
 Eastern Central Region — 718 Keith Bldg., Cleveland 15, Ohio  
 Central Region — American Furniture Mart, 666 North Lake Shore Drive, Chicago 11, Ill.  
 West Central Region — 340 Dierks Bldg., Kansas City 6, Mo.  
 Southwestern Region — 1907-11 McKinney Avenue, Dallas 1, Tex.  
 Western Region — RCA Bldg., 1560 N. Vine Street, Hollywood 28, Calif.

**NBC Owned and Operated Stations**

WNBC, WNBC-FM, WNBT — RCA Bldg, 30 Rockefeller Plaza, New York 20, N. Y.  
 WMAQ, WMAQ-FM, WNBO — Merchandise Mart, Chicago 54, Ill.  
 WTAM, WTAM-FM, WNBK — 815 Superior Avenue, Cleveland 14, Ohio  
 KNBH — Sunset Boulevard and Vine Street, Hollywood 28, Calif.  
 KNBC, KNBC-FM — Taylor and O'Farrell Streets, San Francisco 8, Calif.  
 WRC, WRC-FM, WNBW — The Sheraton Park Hotel, Washington, D. C.

**RCA Communications, Inc., District Offices**

New York District — 66 Broad Street, New York 4, N. Y.  
 Washington District — 1812 M Street, N.W., Washington 6, D. C.  
 San Francisco District — 135 Market Street, San Francisco 8, Calif.

**Radiomarine Corporation of America Sales Offices**

Boston 10, Mass., 470 Atlantic Avenue	Mobile 9, Ala., 14 South Water Street
Philadelphia 6, Pa., 5 North Front Street	Houston 21, Tex., 7632 Harrisburg Boulevard
Baltimore 2, Md., 28 South Gay Street	Cleveland 13, Ohio, 3125 Detroit Avenue
Norfolk, Va., 731 Boush Street	St. Louis 2, Mo., 805 North Wharf Street
Miami 36, Fla., 1227 Biscayne Boulevard	San Francisco 3, Calif., 1075 Folsom Street
Savannah, Ga., 39th Street and Ogeechee Road	Wilmington, Calif., 437 North Avalon Blvd.
New Orleans 3, La., 500 St. Peter Street	Seattle 4, Wash., 1008 Western Avenue

**Television and Radio Programs Sponsored by RCA over NBC**

**TELEVISION:** Your Show of Shows — Alternate Saturdays at 9 p.m., EST  
 Dennis Day Show — Monday, 9 p.m., EST  
**RADIO:** Phil Harris-Alice Faye Show — Friday, 9 p.m., EST





R A D I O   C O R P O R A T I O N   O F   A M E R I C A