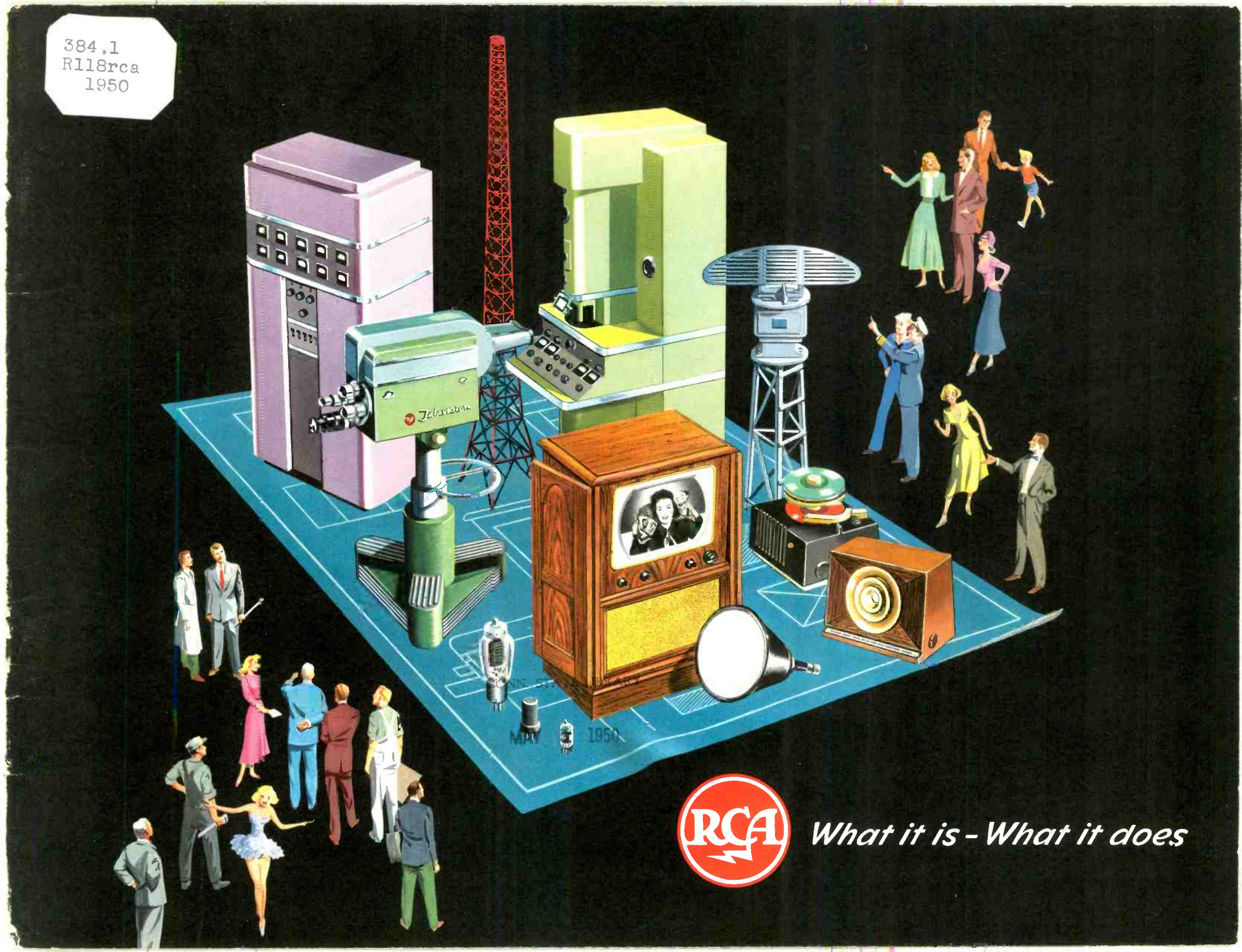

RCA

What it is - What it does

WHAT IT IS — WHAT IT DOES . . . *answers to questions often asked*

CONTENTS

Published by the Department of Information

RADIO CORPORATION OF AMERICA

RCA BUILDING, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

RCA Building, Radio City, New York, headquarters of the Radio Corporation of America and the National Broadcasting Company.

Foreword

THE year 1950 marks the 31st anniversary of the Radio Corporation of America, with its radio and television resources and facilities dedicated to the service of the Nation and its people.

When RCA was formed in 1919, it began operations with 457 employees. Today, it employs 43,140. For more than a quarter of a century, the skill of RCA workers has kept pace with the challenge of science and the commercial progress of radio and television. The research of its scientists provides a constant flow of technical knowledge to expand and to strengthen radio and electronics as a bulwark of scientific preparedness and national security.

Throughout the world, RCA is a symbol of radio progress. It has spun an international communications system around the earth, linking more than sixty countries. It gave America its first nationwide radio networks, and led in the development of worldwide broadcasting. The voice of the United States has been put within listening range of every person on earth. Through radio broadcasting and television, RCA provides facilities and services that entertain and inform people everywhere, in every walk of life.

In industry, hundreds of new types of electron tubes have been developed to lift man's burdens, enhance his safety and add to his pleasures. The phonograph has been electronized. Short waves and microwaves have been harnessed for new services that emphasize America's pre-eminence in radio. Dedicated to pioneering in every phase of radio, as a science, art and industry, RCA has served the Nation in peace and in war.

RCA scientists created the all-electronic system of television in both black-and-white and color. They created Ultrafax, shoran and teleran. They led in pioneering radar, loran, radio relay stations, FM (frequency modulation), radio-heat, and the electron microscope.

The RCA monogram is a mark of quality and superior craftsmanship. It is a symbol of the Radio Age, of the "know-how" gained from thirty years of scientific research and engineering.

Behind all RCA products and services stands RCA Laboratories, one of the world's foremost centers of radio and electronic research. The new ideas developed in these Laboratories continually lead to new discoveries and inventions. They advance radio and electronics for increased utility in the home, on the highways, on the seas, on the airlanes, and in industry.

The results derived from extensive experience and engineering knowledge, supported by vision, optimism and long-range planning, amply justify the millions of dollars which RCA has invested in scientific research. Charted by actual service, television is bringing new pleasures in entertainment, education, and information to an audience of ever-increasing millions. The great accomplishments of this new art – which is radio born anew – have justified RCA's years of pioneering to bring television into the service of the American home.

As a science, radio has limitless horizons. The search for new knowledge is unending. Backed by the visions of its scientists, the talent of its engineers, the confidence of its stockholders, and the ability of its management and employees, the Radio Corporation of America – in this, its Thirty-first Year – stands upon the threshold of a greater future—*World Leader in Radio and Recorded Music—First in Television.*

RCA

Board of Directors

DAVID SARNOFF
Chairman of the Board

FRANK M. FOLSOM
President

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GEORGE L. HARRISON

CHARLES B. JOLLIFFE

HARRY C. INGLES

WHAT IT IS – WHAT IT DOES

What is "RCA"?

The letters "RCA" are the initials of Radio Corporation of America, the parent of: RCA Victor Division, National Broadcasting Company, Inc., RCA Laboratories Division, RCA Communications, Inc., Radiomarine Corporation of America, RCA International Division, RCA Institutes, Inc., RCA Service Company, Inc., and RCA Victor Distributing Corp.

What led to the formation of RCA?

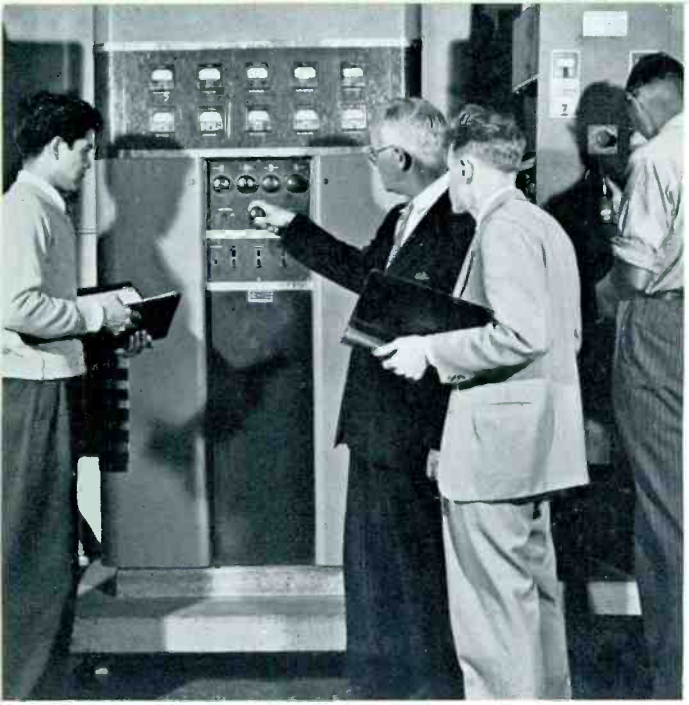
Prior to and during the first World War, the United States depended largely upon foreign-owned cables and wireless stations for communication with many important parts of the globe. Great Britain was the communications center of the world. The war revealed to Americans that radio offered a new and competitive 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 of RCA 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 skyscraper in Rockefeller Center, popularly known as "Radio City".



Students at RCA Institutes receive laboratory instruction in the operation and maintenance of a radio transmitter.

RCA scientist operates a tiny television camera made possible by a newly-developed diminutive pickup tube, the Vidicon.

Television chassis move rapidly along the subassembly production line at RCA Victor's Indianapolis, Indiana, plant.

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.

What are the industrial activities of RCA?

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

Is RCA engaged in electronics?

Yes; RCA has pioneered in the science of electronics, and its laboratories are a foremost center of radio-electronic research, the key of which is the radio or electron tube. The RCA Victor Division, one of the world's leading manufacturers of electron tubes, makes a wide variety of electronic apparatus.

Does RCA have a centralized display of its products and services?

Yes; the RCA Exhibition Hall at 36 West 49th Street, New York, displays the latest RCA radios and Victrola radio-phonographs, television receivers, electron tubes, electron microscope,

phonograph records and marine radio equipment. In addition, animated exhibits explain the operation of domestic broadcast networks and of world-wide radiotelegraph circuits. Admission to the RCA Exhibition Hall is free.

How many people are employed by RCA and its subsidiaries?

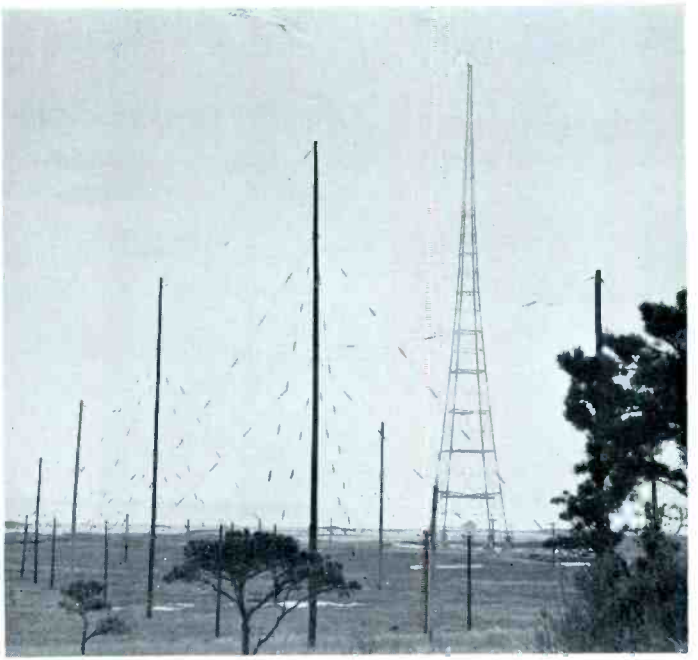
On March 1, 1950, RCA and associated companies had 43,140 employees.

What are RCA's personnel and labor policies?

The management recognizes that the loyal cooperation of employees is of basic importance to the success and progress of RCA. The Company maintains, in all of its units, competent personnel administration, and a wide variety of educational training, social, and recreational facilities is provided. Employment is on the basis of merit and efficiency as determined by such factors as character, dependability, skill, intelligence, and physical fitness. It is the Company 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 plants are located or operations are carried on. In instances where employees choose to bargain collectively, the employing company deals willingly and frankly with their authorized representatives. At present, there are in force a number of contracts between the various companies and 45 separate bargaining agencies. Of these, all but 9 independent unions are affiliated with the A. F. of L., or C.I.O.

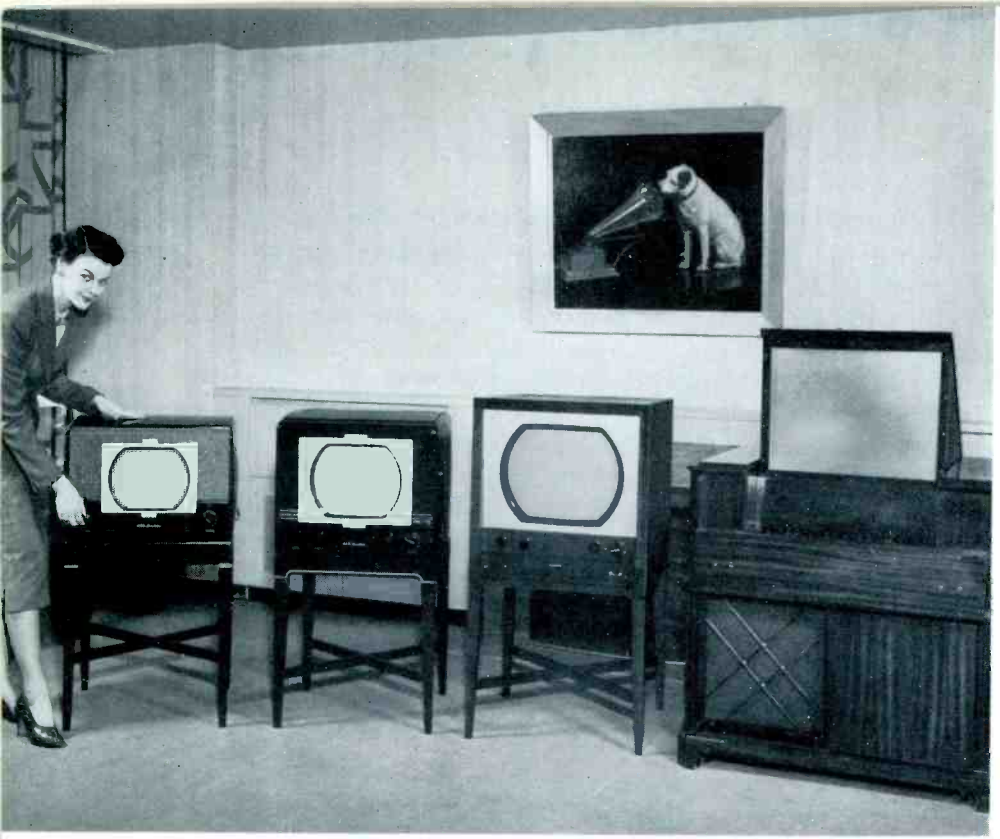
Edward F. McGrady, who for four years had been Assistant

International programs to and from United States radio broadcast stations pass through this console at Radio Central, New York City.



Transmitting antennas for long and short waves are located at RCA's marine station, Chatham, Massachusetts.

Studio audience watches a musical program as it is broadcast simultaneously over NBC's radio and television networks.



RCA Victor television receivers — left to right: table models with 10-inch, 12½-inch and 16-inch direct-view tubes, and the projection-type console.

Secretary of Labor, in 1938 became RCA's Vice President in charge of Labor Relations and a member of the Board of Directors.

Who owns Radio Corporation of America?

Ownership of RCA is widely distributed among approximately 199,340 stockholders, in every state of the Union. No stockholder of record holds as much as 3% of the total outstanding voting securities of the Corporation. Less than 5% of the stock is held by foreign stockholders.

Dramatic moments in television programs are intensified by showing two scenes on the picture screen.

What is RCA's capital stock?

There are two classes of RCA stock:

	Shares Outstanding
$3.50 Cumulative First Preferred	900,824
Common	13,881,016

Do RCA stocks pay dividends?

Quarterly dividends have been paid regularly on the Preferred stock. In 1949 these dividends amounted to $3,152,800. On the Common stock, dividends have been paid annually at the rate of 20 cents per share for ten years, from 1937 through 1946. The dividend declared December 5, 1947 and paid January 27, 1948 was increased to 30 cents per share, and on December 3, 1948, was increased to 50 cents per share. The Common stock dividend, amounting to $6,928,604 was declared on December 2, 1949, and together with the dividend paid on Preferred stock on January 23, 1950, amounted to $10,081,404.

During the ten-year period, 1940 through 1949, dividends paid to stockholders amounted in total to $69,164,112 or 49.8% of net profits (after taxes) earned during this period. Of this amount $31,752,243 was paid to Preferred stockholders and $37,411,869 to Common stockholders.

What was RCA's volume of business in 1949?

The Consolidated Gross Income of Radio Corporation of America and its domestic subsidiaries for the year 1949 was $397,259,020.

WHERE IT CAME FROM

RCA*	$308,202,199	77.6
NBC	72,866,510	18.3
RCA Communications and Radiomarine	19,997,079	5.0
Less Inter-Company Transactions	*3,806,768*	*.9*
Total	$397,259,020	100.

WHERE IT WENT

Cost of Raw Materials, Supplies, Program Talent, Rent, Sales and Advertising; Payments to Affiliated Broadcasting Stations; Research, Administration, and Other Operating Expenses	$212,831,688	53.6
Wages and Salaries to Employees	128,048,338	32.2
Depreciation and Amortization.	8,451,891	2.1
Interest	1,093,077	.3
Taxes	21,689,747	5.5
Dividends to Stockholders	10,081,404	2.5
Carried to Surplus	15,062,875	3.8
Total	$397,259,020	100.

* Including the operations of RCA Victor Division, RCA Laboratories Division, RCA International Division and domestic subsidiaries other than the three subsidiary companies listed here.

Italic figures denote decrease.

What is RCA's record of earnings for the past 10 years?

The earnings of Radio Corporation of America and its domestic subsidiaries during the ten-year period from 1940 to 1949 inclusive, were as follows:

YEAR	GROSS INCOME	NET PROFIT BEFORE FEDERAL INCOME TAXES	FEDERAL INCOME TAXES	NET PROFIT AFTER FEDERAL INCOME TAXES*	PERCENTAGE OF GROSS INCOME		EARNINGS PER SHARE ON COMMON STOCK
					PROFIT BEFORE TAXES %	PROFIT AFTER TAXES %	
1940	$128,491,611	$13,364,656	$ 4,251,500	$ 9,113,156	10.4	7.1	$ .425
1941	158,695,722	26,566,316	16,373,600	10,192,716	16.7	6.4	.502
1942	197,024,056	28,077,287	19,074,850	9,002,437	14.3	4.6	.417
1943	294,535,362	36,316,452	26,124,000	10,192,452	12.3	3.5	.505
1944	326,421,913	40,211,191	29,947,900	10,263,291	12.3	3.1	.512
1945	279,503,615	30,484,068	19,167,000	11,317,068	10.9	4.0	.588
1946	236,980,770	14,346,353	3,361,300	10,985,053	6.1	4.6	.564
1947	314,023,572	29,481,557	10,712,000	18,769,557	9.4	6.0	1.125
1948	357,617,231	41,071,047	17,049,000	24,022,047	11.5	6.7	1.503
1949	397,259,020	41,927,279	16,783,000	25,144,279	10.6	6.3	1.584
ANNUAL AVERAGE	$269,055,287	$30,184,621	$16,284,415	$13,900,206	11.2	5.2	$ .773

* The figures for 1945, 1946 and 1947 are after charges to the reserve for post-war reconversion expense, and those for 1945 and 1946 are after adjustments for tax credits, all as set forth in the financial statements for those years. For 1940, the figures include foreign subsidiaries.

What are the working capital and net worth of RCA?

RCA's working capital (the excess of current assets over current liabilities) at December 31, 1949, amounted to $96,552,769. The total assets, liabilities and capital of Radio Corporation of America and its domestic subsidiaries, as shown by its consolidated balance sheet on December 31, 1949, were as follows:

ASSETS

Current Assets	
Cash and Government Securities	$ 55,517,381
Notes and Accounts Receivable (less reserves)	43,695,932
Inventories	51,007,885
Prepaid Insurance, Rent, Taxes, etc.	4,610,252
Total Current Assets	$154,831,450
Investments in Foreign Companies	$ 4,931,308
Plant and Equipment (less reserves)	$ 76,464,981
Patents (less reserve)	$ 5,387,961
Other Assets	$ 2,657,889
Total Assets	$244,273,589

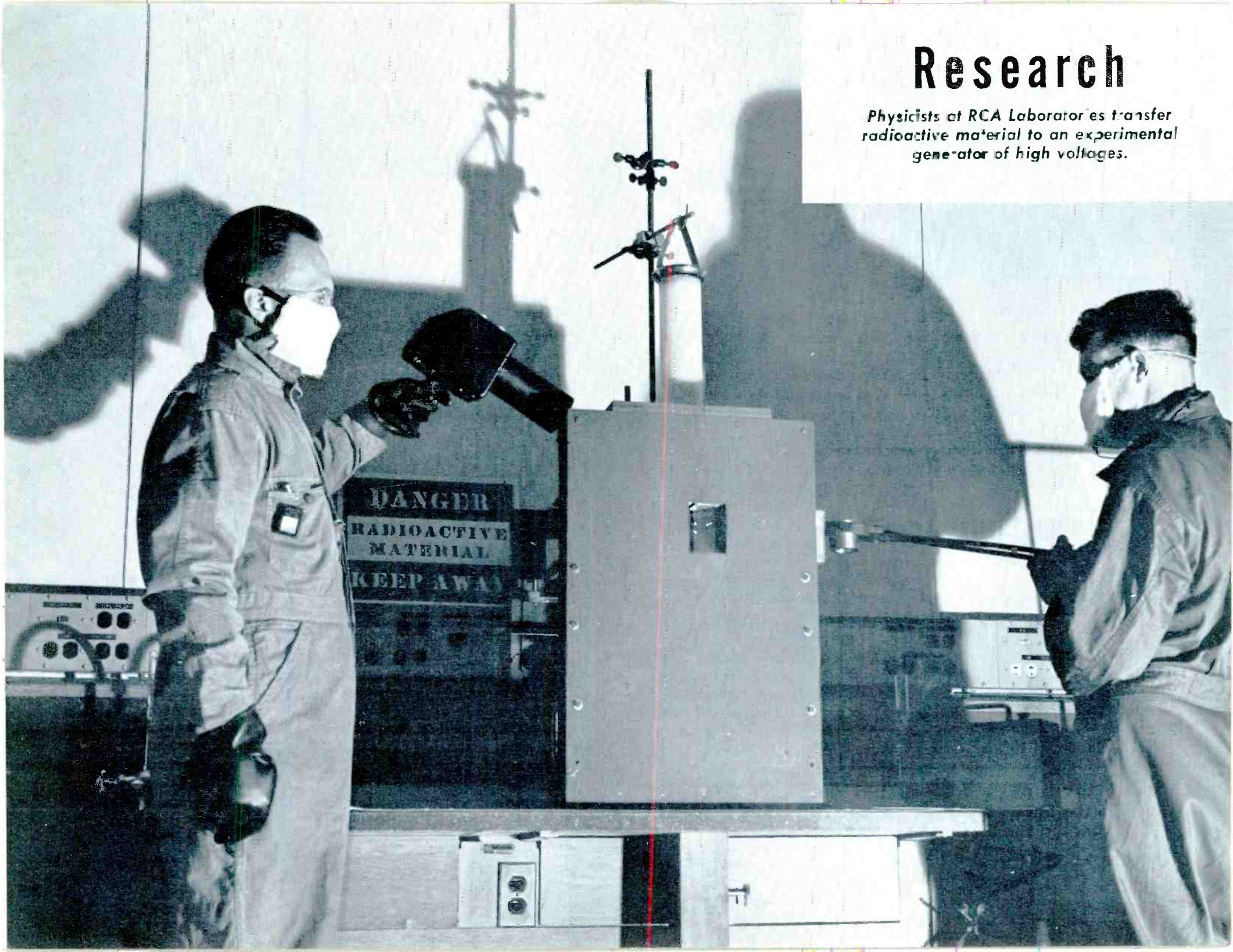
LIABILITIES AND CAPITAL

Current Liabilities		
Accounts Payable and Accruals		$ 42,708,311
Provision for Federal Income Taxes (less U. S. Tax Notes $15,800,000)		7,853,566
Dividends Payable		7,716,804
Total Current Liabilities		$ 58,278,681
Long Term Loans Payable		
3% Promissory Notes due 1970-1974		$ 40,000,000
Reserve for Contingencies		$ 3,654,780
Net Worth consisted of		
Capital Stock, at a stated value of	$ 42,336,473	
Capital Surplus	5,441,301	
Earned Surplus	94,562,354	
Total Net Worth		$142,340,128
Total Liabilities and Capital		$244,273,589

NOTE: The Assets, Liabilities and Capital, as tabulated on this page, are merely a summary of the Consolidated Balance Sheet of RCA on December 31, 1949. For complete facts and figures, please refer to the Annual Report of Radio Corporation of America for the year 1949.

Research

Physicists at RCA Laboratories transfer radioactive material to an experimental generator of high voltages.



DR. C. B. JOLLIFFE,
Executive Vice President
in Charge of
RCA Laboratories Division

Research

What is the policy of RCA toward scientific research?

Radio Corporation of America has always recognized that research is a true guarantee of continued progress and a bulwark of national security. Consequently, since the formation of RCA, research has been a major activity. Research is centered in RCA Laboratories Division. The main laboratories are in Princeton, N. J., with others in New York; Newark, N. J.; Riverhead and Rocky Point, New York; Chicago, and Washington, D. C. As befitting one of the foremost centers of radio and electronic research in the world, the search for knowledge at RCA Laboratories is continuous.

What is the purpose of RCA Laboratories?

The primary aim of RCA Laboratories is to increase the usefulness of radio and electronics to the Nation, to the public and to industry. Scientific investigations conducted by RCA are directed toward gaining new knowledge, toward improvement in methods and devices for every branch of radio, electronics and their production and operation processes, and toward the creation of new products and services.

While developing projects, speedily applicable to commercial needs, and conducting research to provide a constant flow of new technical knowledge, RCA continues close cooperation with the military services of the United States, conducting specific research to help guarantee the scientific and technological preparedness and security of the Nation.

Work on projects for the armed forces and other Government agencies is carried on in a separate building, where maximum security can be maintained at all times.

Is RCA research confined to radio?

Modern radio is closely allied with many branches of science such as electronics and acoustics and, as radio progresses, new sciences are continually being brought within its horizon. RCA has extended its research into many fields such as optics, chemicophysics, and nucleonics. Studies which have resulted from this work, or as by-products of radio and television research, include research in fluorescent and phosphorescent materials, the electron microscope, plastics and the application of radio-frequency heating to industrial processes.

Are research and engineering activities of RCA limited to RCA Laboratories?

As a logical adjunct to research, each company and division of RCA has its own engineering department to assist in the solution of engineering problems, to conduct applicable product engineering and to exercise immediate engineering supervision over technical operations. These engineering departments include staffs at the National Broadcasting Company headquarters in Radio City, as well as at each NBC-owned broadcasting station, at each plant of the RCA Victor Division, at RCA Communications, Radiomarine Corporation of America, and RCA International Division. In addition, the staff of RCA Service Company and the faculty of RCA Institutes consist almost entirely of engineering personnel.

Does RCA publish information concerning the results of its research and engineering?

Scientists and engineers of RCA are active contributors to leading technical journals, and also present technical papers at

engineering meetings throughout the country. In addition, RCA Laboratories Division publishes for the Corporation the quarterly technical journal, *RCA Review,* as well as various technical and engineering books, indexes and pamphlets.

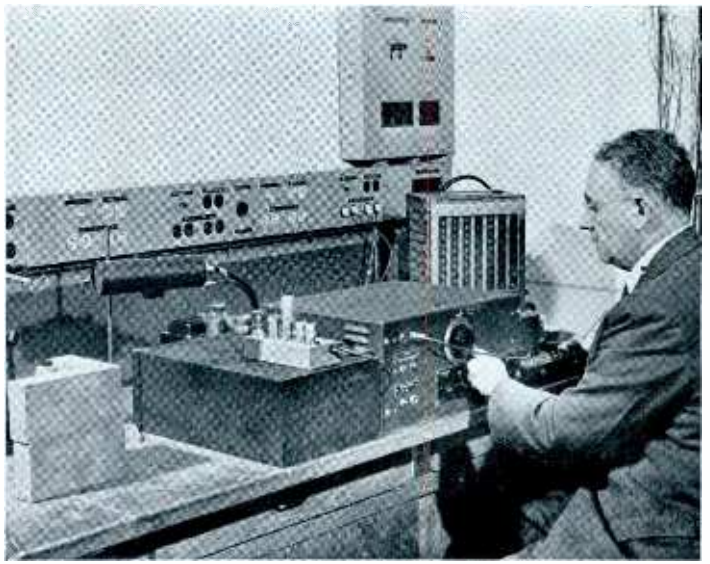
Does RCA make its inventions and patents available to other manufacturers?

RCA makes available to competitive manufacturers in radio and related fields its inventions and patents by means of patent licenses at moderate royalty rates. By this means the accomplishments of RCA scientists are promptly made available to serve the government and the public in the most efficient manner. To assist its licensees, RCA Laboratories Division maintains 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. In addition to several completely equipped laboratories, the Industry Service Laboratory maintains a mobile field laboratory which provides test and measuring equipment that can be employed under all conditions in any location, for studies in relation to television, frequency modulation, facsimile and standard broadcasting.

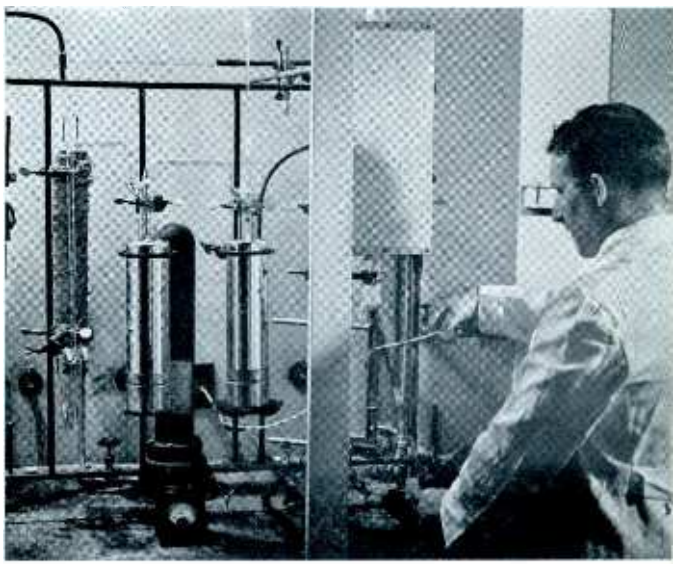
What are some of the outstanding developments of RCA research?

RCA pioneering research has been responsible for many of the outstanding contributions in radio and electronics. High on the list of developments is all-electronic, high-definition black-and-white television, which has rapidly become a major broadcasting service. Of equally great significance was the development by RCA Laboratories of an all-electronic, high-definition, fully compatible color television system. This system maintains the standards established for black-and-white television and would not make obsolete the millions of black-and-white receivers now in use.

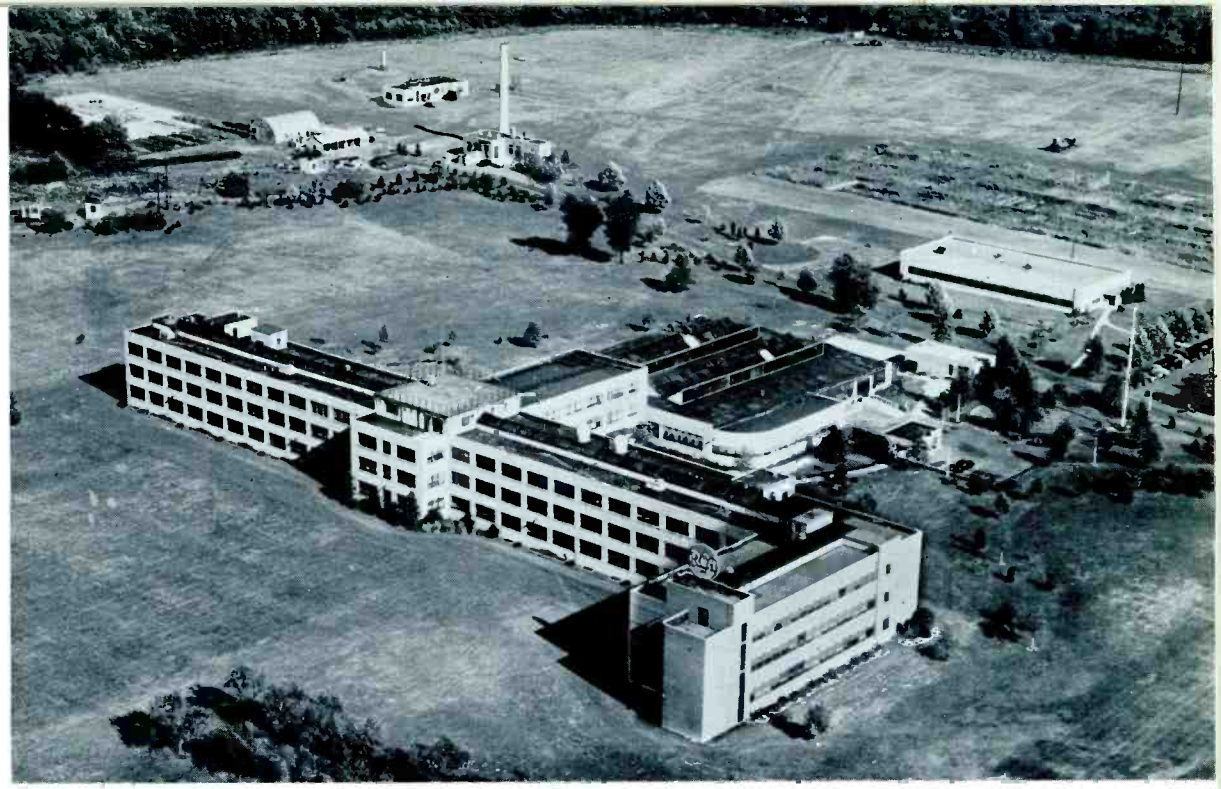
Tonal characteristics of loud speakers are checked and charted by this device.



Heart of this scintillation counter is the new RCA multiplier phototube.



Purifying the rare element germanium for use in research on radio components.



Quality of materials used in RCA products is checked by sensitive testing instruments.

Right: Aerial view of RCA Laboratories, Princeton, New Jersey.

Another achievement in the field of television is an industrial system which combines excellent performance with simplicity and compactness. It employs a new, diminutive pickup tube—the Vidicon—in a camera no larger than a 16-millimeter personal movie camera.

Pursuing original investigations in ultra-high frequencies, new applications have been made in the spectrum of microwaves, including uses in television, radar, and in automatic radio-relay stations.

A new transmitter circuit permits multiple operation of transmitter tubes at ultra-high frequencies, thus simplifying the problem of generating higher power for services above 500 megacycles.

To reduce interference between television stations operating on the same channel, a system of synchronizing carrier frequencies of the stations was devised. Later it was found that by "offsetting", or separating the carrier frequencies of the interfering stations by a certain percentage of the scanning frequency, satisfactory results could be obtained.

Research in the field of microwaves has led to a new method of frequency stabilization using radio absorption effects on certain gases. The stabilization obtained at microwave frequencies compares favorably with that provided by the use of quartz crystals on lower frequencies.

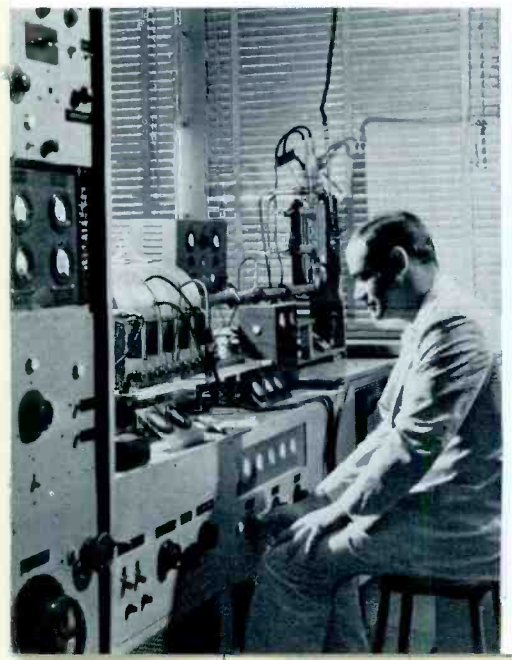
Research in television, which led into the realm of electron optics, has brought numerous outstanding developments, including the RCA electron microscope, an instrument that enables the human eye to see deeply into the world of the infinitesimal. Recent research in this field has been concentrated on specimen-handling techniques which, when combined with a specially-developed lens, make it possible to follow some of the structural changes occurring in growing bacteria.

A method of preparing for micrography consecutive slices of tissue, each four-millionths of an inch thick, was developed by Laboratories' physicists in co-operation with medical scientists of Sloan-Kettering Institute. This technique is expected to increase significantly the importance of the electron microscope in cancer research.

Greater versatility for the electron microscope has been attained by the development of an intermediate electronic lens, which permits magnification by the instrument to be varied over a much wider range than heretofore had been possible without changing components.

Many types of vacuum tubes have been created for myriad uses in radio and industry. The new supersensitive pickup tube, or "eye", for the television camera – the image orthicon – permits the televising of scenes even when illumination is provided only by a single candle.

Testing a high-power transmitting tube designed for ultra-high frequencies.



Behind a protective shield an RCA scientist watches a radioactive generator in operation.

A new multiplier phototube has been developed which enhances the performance of the scintillation counter in the detection of radioactivity. The tube multiplies a million times the signals received as flashes from a fluorescent crystal under bombardment, and the counter can distinguish between radioactive particles striking the crystal less than one 100-millionth of a second apart.

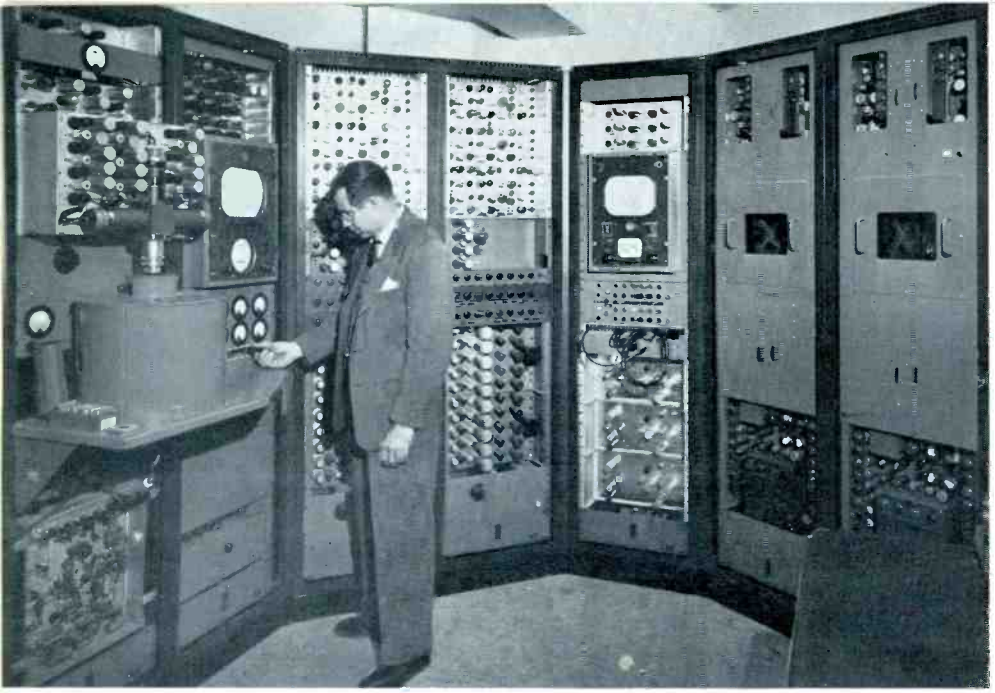
A trigger-grid thyratron tube that holds great promise as a control mechanism for alternating currents of high voltages and which operates in exceedingly brief time intervals is another product of RCA research.

Explorations in radio have pointed the way to useful developments applicable to other fields. For example, early work in the realm of microwaves led to development of various radar devices including the RCA altimeters which were widely used in aircraft during the war. Many types of special tubes also were developed for wartime radar applications. Research is progressing toward the adaptation of some of these tubes to peacetime uses such as television in the ultra-high-frequency ranges.

Research in the field of amplifier tubes has resulted in the successful combination of the highly efficient electron multiplier with the conventional cathode-and-grid tube structures to provide a new type of tube which probably will find extensive application in the near future.

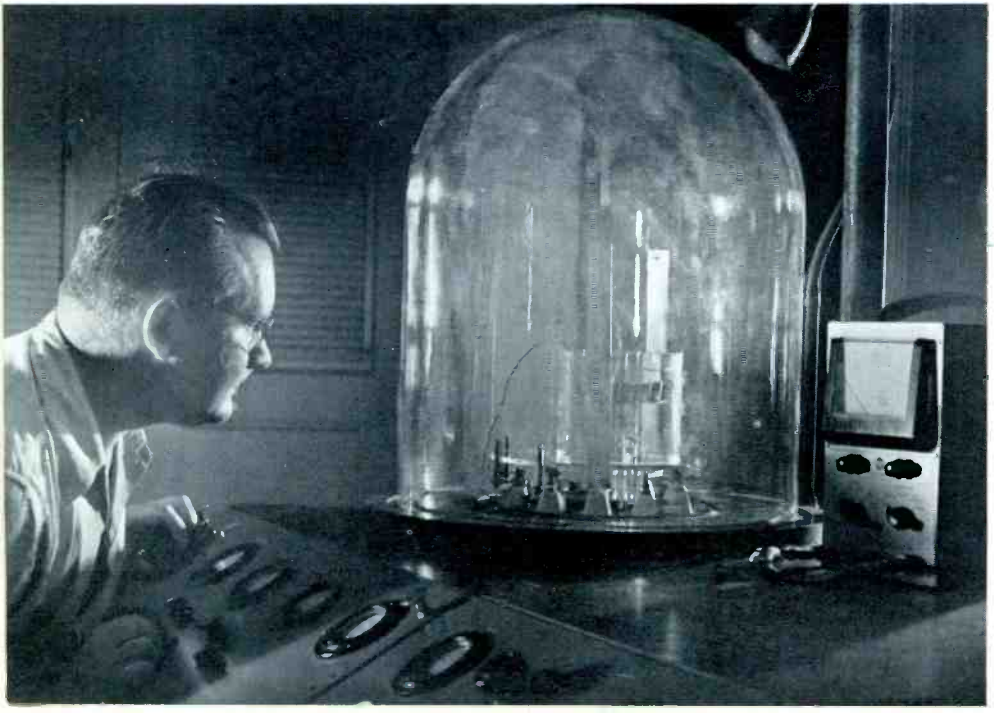
Electrical signals that exist for periods as brief as a billionth of a second now may be "stored" for as long as a minute by the Graphechon, a visual "memory" tube. A recently developed storage oscilloscope, employing this tube and a television kinescope, is envisaged as a valuable tool in research and industry for the observation of electrical phenomena which until now required photographing before they could be examined.

Efforts in television research to find a way of eliminating reflections from glass, led to RCA's chemical process for making low-reflection glass and the Magicote process that greatly increases the efficiency of lenses. Extensive investigations in the field of



Control units of RCA all-electronic, high-definition, compatible color television system as installed at NBC station WNBW in Washington, D.C.

Conducting an electronic research experiment in the evaporation of metals inside a vacuum chamber at RCA Laboratories.



radiothermics — the application of heat generated by high-frequency radio waves — have led to numerous developments such as the electronic sewing machine.

In the field of antenna research, a new antenna for home television receivers has been developed which will receive from either of two directions, controllable at the receiver location. This antenna efficiently covers the complete range of 12 television channels. Research in slot-type transmitting antennas has shown that this type of antenna can be used to advantage at the television frequencies as well as at the ultra-high frequencies.

An FM circuit, called a "ratio detector", has been developed by RCA. It aids in counteracting interference and its use reveals superior merit over circuits previously used for FM reception, particularly in low-priced receivers.

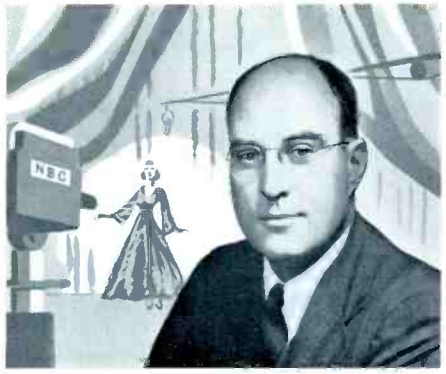
Research in the field of electronic counters has made available a commercial counter capable of measuring time in units as small as one-millionth of a second. A special electronic counter chronograph, capable of measuring time in units as small as one ten-millionth of a second, has been developed for the government.

Combining the elements of television and facsimile with the latest techniques in radio relaying and high-speed photography, a new communication system known as Ultrafax has been developed which is capable of transmitting written or printed messages and documents and receiving them in recorded form at the rate of a million words a minute.

A new light-weight microphone developed by RCA has come into wide use in the sound motion picture studios of Hollywood where its mechanical and electrical characteristics make it superior to previous designs for mobile studio use. Highly-directional stationary microphones, which may replace the movable boom-type devices in television studios, were developed. The effect of moving microphones is obtained by mixing and fading the output of several units of this type.

Broadcasting

Maestro Arturo Toscanini leads the NBC Symphony Orchestra in a concert broadcast from Radio City.



JOSEPH H. McCONNELL,
President,
National Broadcasting Company

Broadcasting

How did the idea of broadcasting to the public originate?

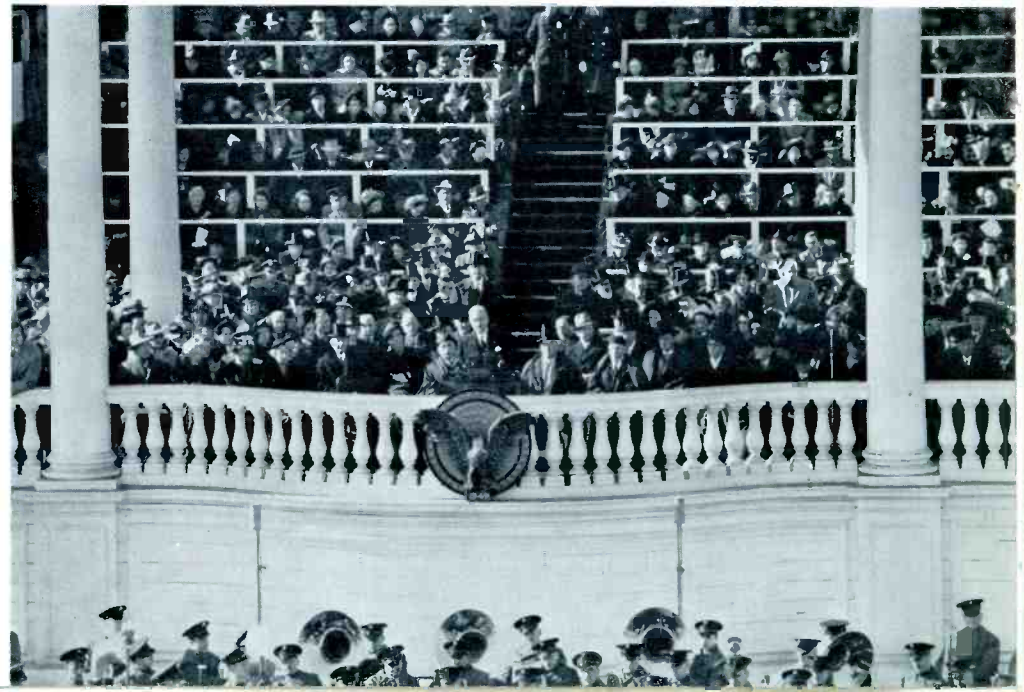
David Sarnoff was the first man to propose that programs be broadcast over the air for public consumption. In 1916, when he was Assistant Traffic Manager of the Marconi Wireless Telegraph Company of America, Mr. Sarnoff suggested the manufacture of "radio music boxes" so that purchasers could enjoy "concerts, lectures, music, recitals, etc." His memorandum to E. J. Nally, Vice President and General Manager of the 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 of 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.

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 2, 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.

Inauguration ceremony of President Truman on February 20, 1949 was carried to the entire nation by radio and was viewed by ten million persons on television receivers.



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."

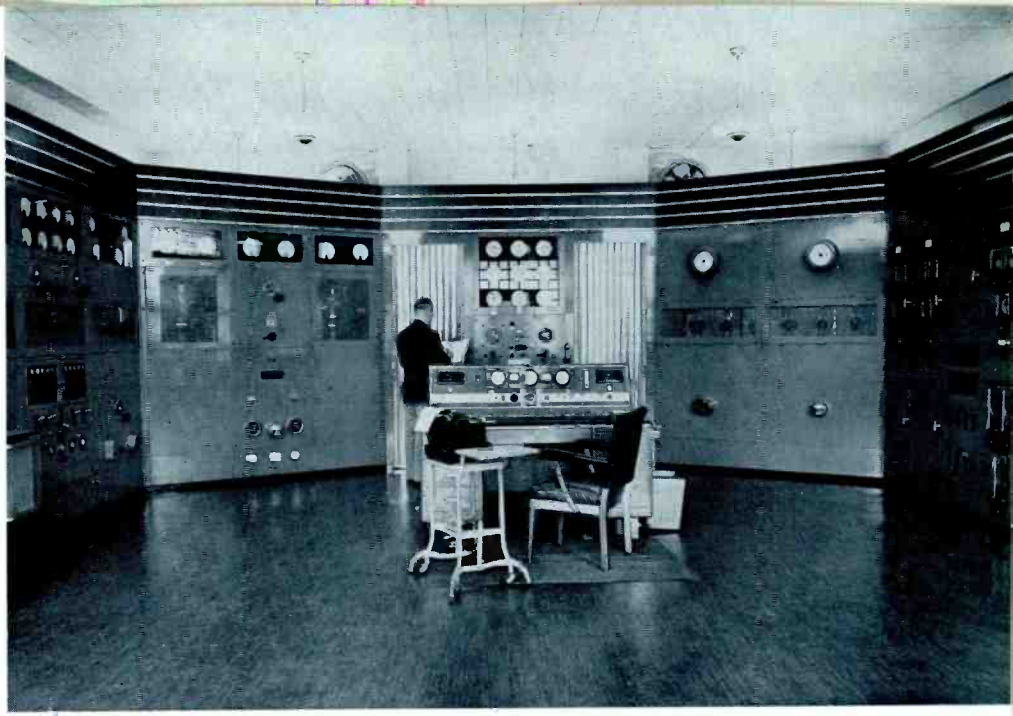
RCA's first regularly operated broadcasting station, WDY in Roselle Park, N. J., was licensed September 19, 1921 and went on the air December 14 of that year to provide programs to the New York metropolitan area. Use of this station was discontinued in February, 1922, when RCA entered into an arrangement 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 up-to-date 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.

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, WEAF (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.

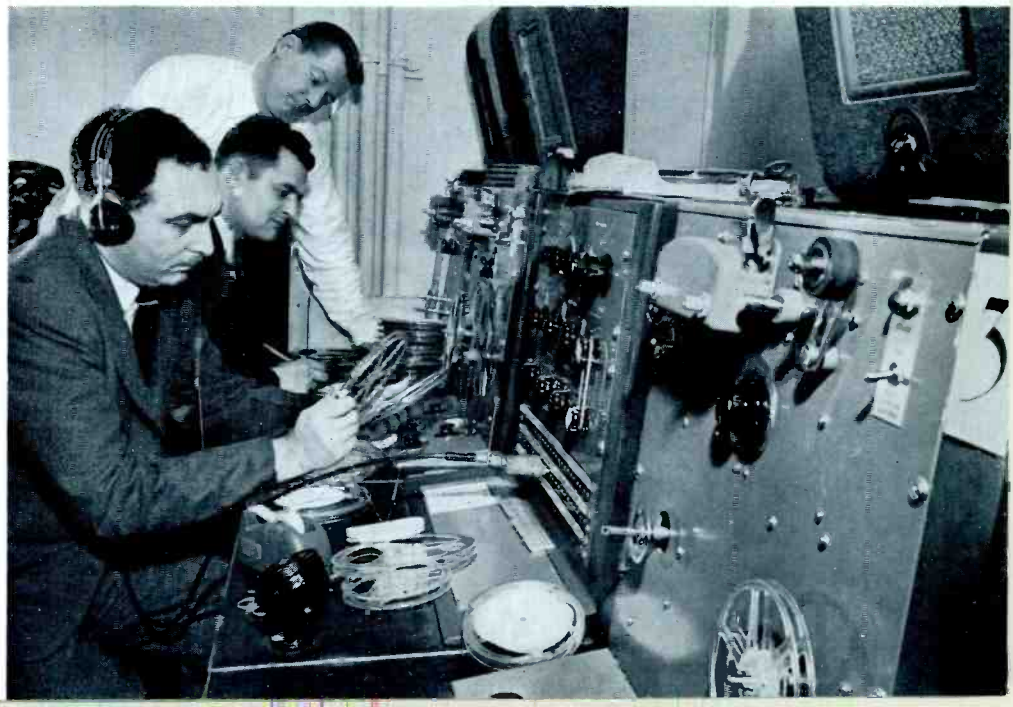
Where are NBC studios located?

The National Broadcasting Company's main offices and studios are located in the RCA Building, Radio City, New York. NBC



Transmitter panels and control desk at NBC's key station WNBC at Port Washington, N.Y.

Tape-recorded radio programs are run through these machines at NBC for inspection and editing.



also has offices and studios in Washington, Cleveland, Chicago, Denver, Hollywood, and San Francisco.

Did NBC have a coast-to-coast network when it started?

No; there was no coast-to-coast network until January 1, 1927, when the first transcontinental 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 network?

The NBC radio network now comprises more than 180 stations. Six of these are owned by the Company: WNBC, New York; WRC, Washington; WTAM, Cleveland; WMAQ, Chicago; KOA, Denver; KNBC (formerly KPO), San Francisco.

How is the NBC network interconnected?

The network consists of over 16,000 miles of leased telephone circuits especially engineered for the transmission of broadcast programs. These circuits are available for NBC use for 24 hours a day and they are used for periods varying from 16 to 18 hours a day in different parts of the country. In addition to these circuits, temporary facilities are purchased on a per-occasion basis, primarily for program transmission of pickups outside NBC studios.

What is the seating capacity of NBC studios in Radio City?

The seating capacity of all NBC studios in Radio City exceeds 3,000. The largest broadcasting studio in the world, 8H, alone seats more than 1,100 persons. Radio's continuous growth and the demands of television have made it necessary to secure supplementary studio space in New York locations outside of Radio City.

How may tickets be obtained for admission to broadcast programs?

By writing at least two weeks in advance to the Guest Relations Division of NBC. Cards of admission, if available, will be supplied.

What proportion of NBC programs is sponsored by advertisers?

Approximately half of the total program hours of the NBC network are commercially sponsored. The remaining half are filled with non-commercial programs, that is, programs for which NBC and its affiliated stations supply time, facilities and frequently program content, without remuneration.

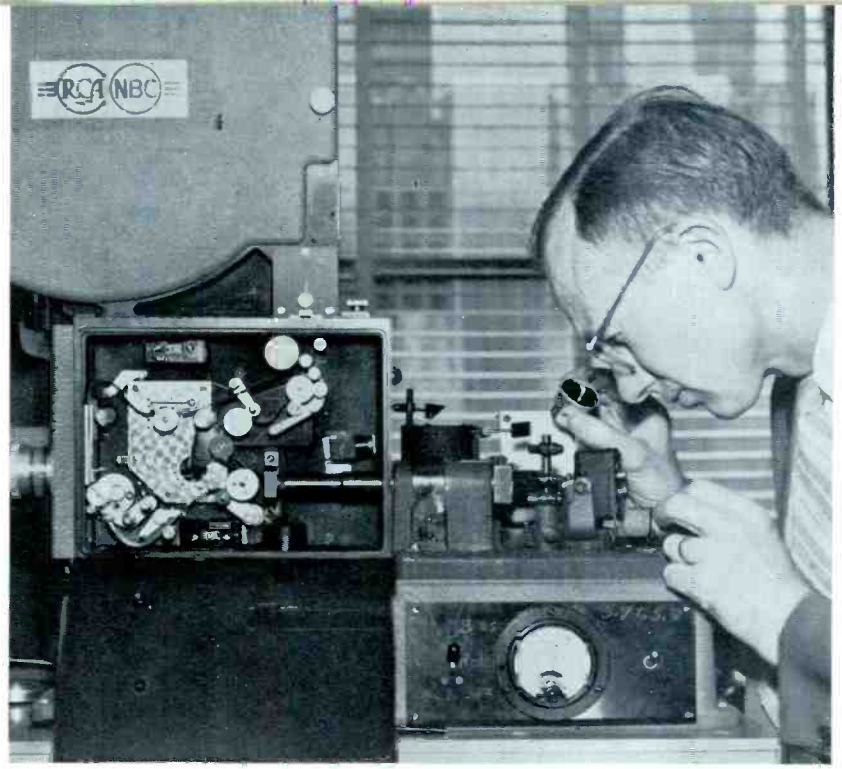
How should an idea for a radio script or program be presented for consideration?

NBC welcomes new ideas for radio programs as well as constructive criticism intended to improve programs already on the air. All program ideas must be submitted in writing to the Program Department and must be accompanied by a signed release form which is readily obtainable from the Program Department. They will not be accepted orally. Ideas for programs, as well as specific scripts, are given prompt consideration by the Script Division.

Does the NBC network conduct auditions to find new talent?

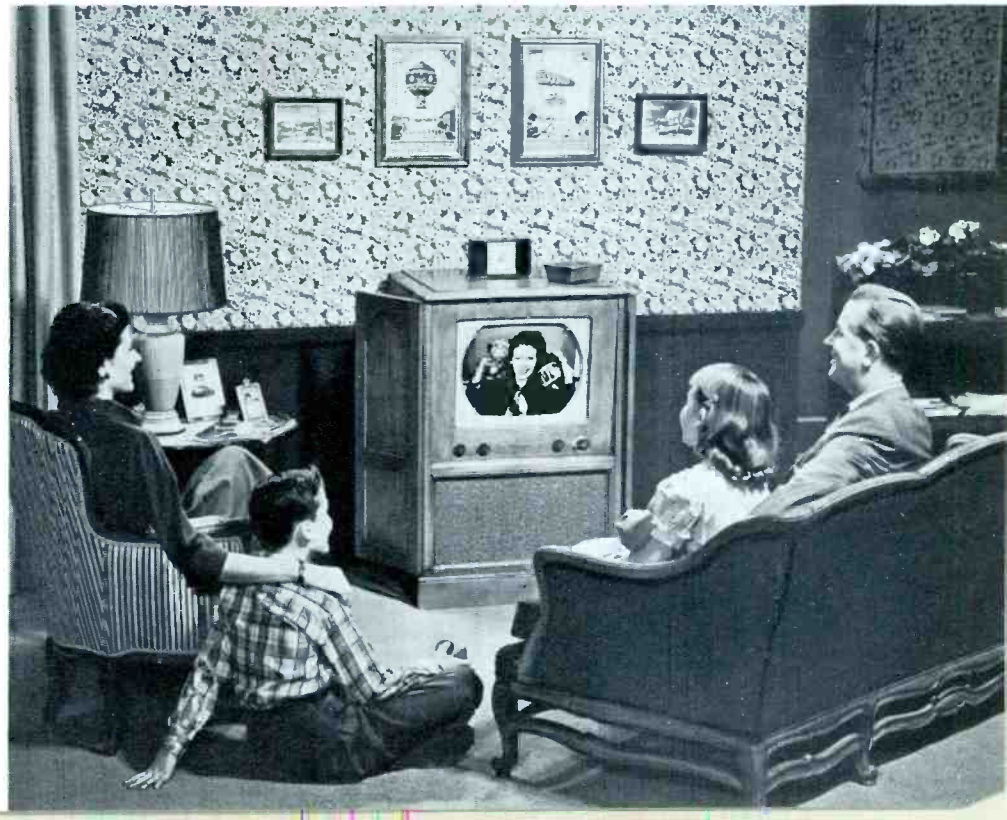
NBC has an extensive system of auditions set up for the express purpose of getting a proper appraisal on talent. The audition system is open to anyone who applies. A specialist in drama and another in music first conduct interviews with applicants, then hear auditions of those with proper background and experience. Those who are approved in the preliminary audition are heard by dramatic and musical producers; they are placed on a list which is made available to advertising agencies and given full consideration in casting NBC programs.

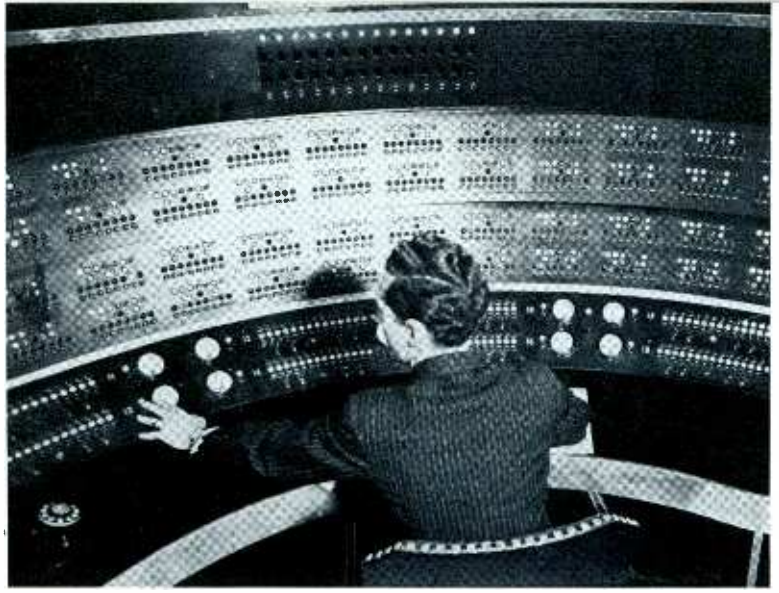
Right: An NBC engineer checks the filming of a television program as recorded from images on the screen of a kinescope picture tube.



A program director issues instructions to radio artists from his post in the studio control room.

Right: Television has taken its place as the "Theatre of the Home," providing a variety of programs for viewers of all ages.





The master control board in Radio City with its myriad switches and flashing lights is the nerve center of the NBC network.

Scene from "We, the People", one of the programs transmitted simultaneously over NBC's radio and television networks.

How does one arrange for an audition?

Application should be made to the Production Division of the Program Department. This applies to actors, announcers, and vocalists. All instrumentalists are considered by the Music Division of the Program Department.

Where does NBC get its news?

From NBC's accredited reporters on all world news fronts and from Associated Press, United Press and International News Service teletype machines which give 24-hour service to the NBC News Room. NBC maintains offices and news bureaus or correspondents in principal American cities and in London, Paris, Berlin, Rome, Ankara, Belgrade, Helsinki, Stockholm, Manila, Honolulu, Tokyo, Batavia, Rio de Janeiro, Buenos Aires, and other foreign capitals.

How many NBC programs originate overseas?

Annually nearly 3,000 pickups and programs are originated in foreign lands and broadcast over the NBC network. Throughout the year, the NBC staff of news analysts, commentators, and reporters regularly broadcast up-to-the-minute, 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, RCA's station WJZ, New York, 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.

Is the National Broadcasting Company active in frequency modulation (FM) broadcasting?

Yes; NBC owns and operates FM stations in New York, Washington, Cleveland, Chicago, Denver, and San Francisco, where all programs are broadcast simultaneously over both standard (AM) and FM facilities. More than 90 affiliated stations operate FM stations.

Television

Image orthicon cameras focus on an artist performing in an NBC television studio.

Television

Does NBC operate television as a service to the public?

Yes; since 1939, NBC's leadership has brought the public into an era of new entertainment, information, news and education.

Early in 1948, NBC revealed to the public the greatest means of mass communication in the world — network television. At that time, NBC's Television Network consisted of four stations. In the early part of 1950, NBC's total was 59 stations — 28 joined in the East and Midwest networks to bring programs simultaneously to viewers from New York to St. Louis. Thirty-one more stations aired NBC network programs by means of kinescope recordings.

At the beginning of 1948, there were only 170,000 television receiving sets in the country. Two years later, there were approximately 4,000,000 sets in operation; by the end of 1950 it is expected that the number will increase to 7,000,000.

It is estimated that at least 10,000,000 viewers watched the inauguration of President Truman — more than all who saw, in person, the 31 presidents from Washington to Roosevelt take the oath of office.

What types of programs are telecast by NBC?

Those who have had television in their homes for the past year will remember the thrills of such special program highlights as the presidential inaugural, a telecast by NBC in cooperation with the U. S. Army Air Force in simulated air reconnaissance missions, and Maestro Toscanini conducting the NBC Symphony.

Throughout each week, NBC television offers infinite variety from Milton Berle and Bob Smith, to drama hits on "Kraft Television Theater", "Chevrolet on Broadway", "Colgate Theater", and "Philco Television Theater"; to musical stars such as Roberta Quinlan and Perry Como; to the arts and sciences as represented by "The Nature of Things" and "Meet the Press"; to juvenile favorites like "Howdy Doody" and "Kukla, Fran and Ollie"; to sports and "The Camel News Caravan".

Variety shows featuring leading entertainers continue to attract the largest television audiences; here is seen Milton Berle and sustaining cast.

What does TV mean to industry?

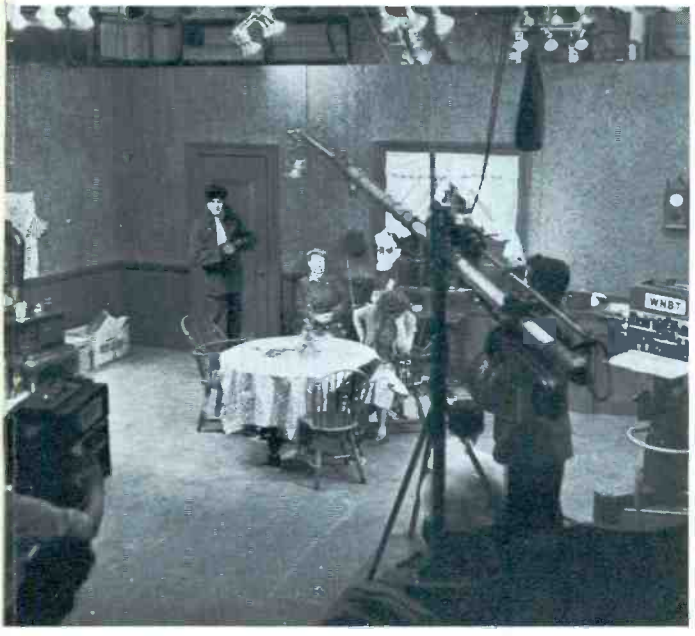
The fantastic growth of TV has lifted radio and television to a three billion-dollar-a-year industry — one which may be one of the nation's top enterprises by 1953.

It means, also, that NBC has led in the economic advances of the new medium, as shown by the use of its facilities by nearly four times as many advertisers as the next network.

Juvenile viewers applaud the appearance of child performers on television programs.

"Kukla, Fran and Ollie", telecast five days a week, appeals to viewers of all ages.

Drum-majorettes go through their formations before a battery of television cameras.



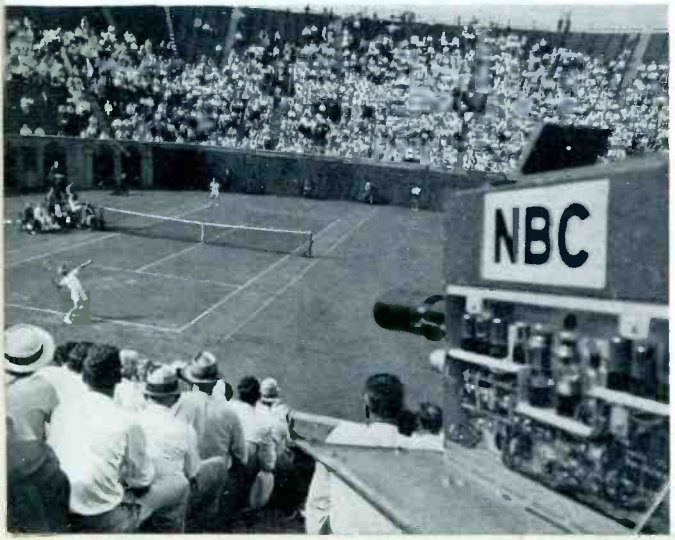
Television versions of well-known stage plays with Broadway actors are among the most popular video offerings.

Mobile units make it possible to bring television programs to the main transmitter from remote sports stadia and scenes of news events.

Movement of cameras and the performance of actors are directed from this television control room at NBC.

Realism is added to the locales of programs by creating background scenes through the use of rear-projection techniques.

Television joins with newsreels in covering an important news event in Washington.



Television has proved successful in bringing important sports features of all kinds into the home.

Advertisers are aware of the experience of Texaco, whose NBC television program series is drawing an almost unbelievable sponsor identification and the highest rating ever received in either radio or television. Advertisers also know that Hooper surveys in New York show NBC with the largest average evening audiences. In the same way that advertising has built the wide range of radio's broadcasting schedule, it will make possible an increasing wealth of fine programs on television.

Television holds high promise to be the most effective of all advertising media. It will afford unlimited opportunities to the commercial sponsor to present sales, service and public relations messages in a manner informative, interesting, and entertaining.

What television stations does NBC own and operate?

NBC owns and operates five television stations: WNBT, New York; WNBW, Washington, D.C.; WNBQ, Chicago; WNBK, Cleveland, and KNBH, Hollywood.

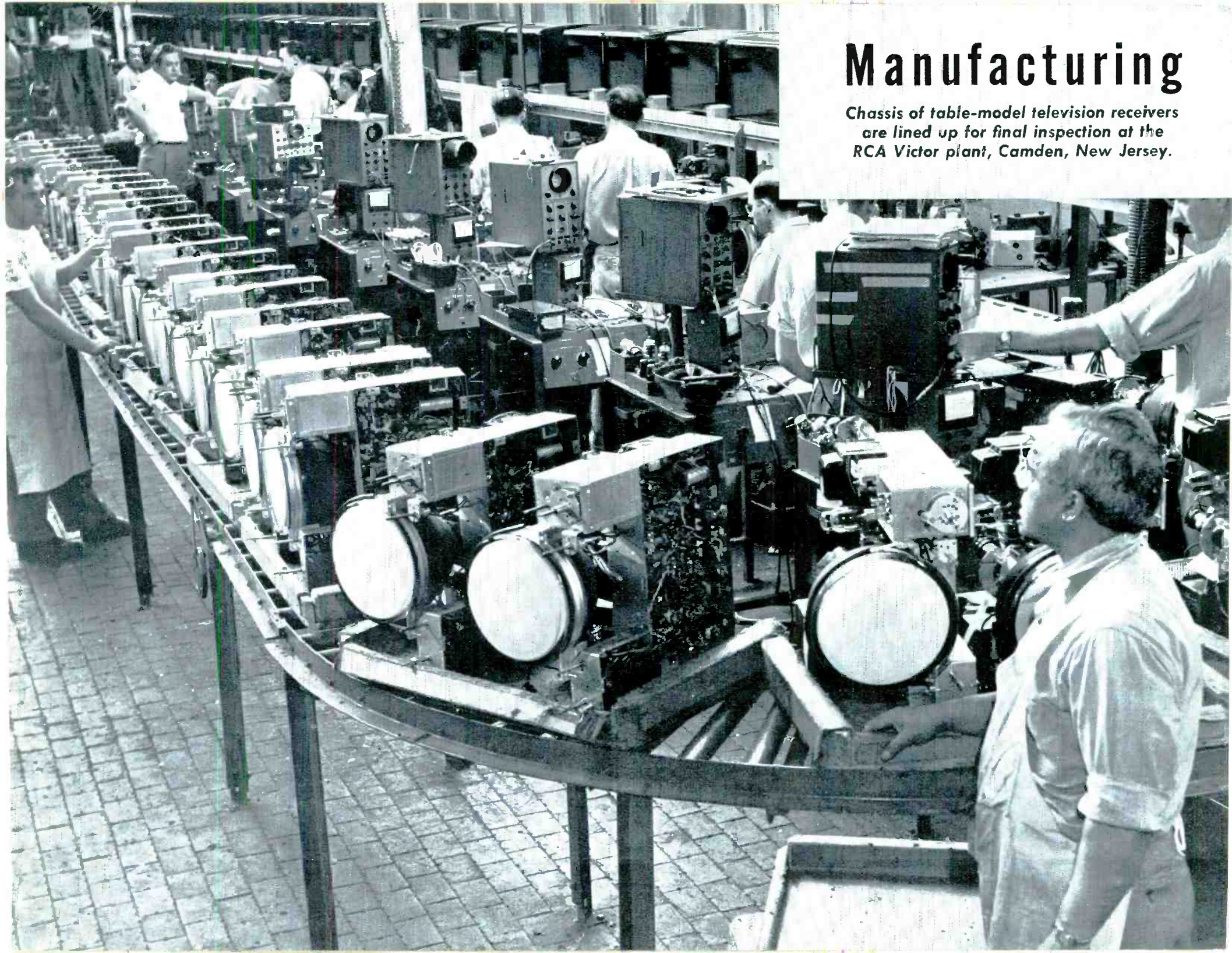
W2XBS, predecessor of WNBT and the first NBC station to go on the air, inaugurated a regular program service to the public on April 30, 1939. Station WNBT began commercial operation on July 1, 1941; WNBW went on the air in June, 1947; WNBQ and WNBK began transmissions the latter part of 1948, and KNBH went into regular operation early in 1949.

Are any programs transmitted simultaneously over radio and television networks?

Yes; several NBC programs are simulcast over the radio and television networks of the Company. Simulcasts have included: "Voice of Firestone", "We, the People", "The Horn and Hardart Children's Hour" (locally, in the New York area), and occasional NBC Symphony programs. Several NBC series have separate radio and television presentation at different times. These include: "The Big Story", "Break the Bank", "The Aldrich Family", "One Man's Family" and "Chesterfield Supper Club".

Manufacturing

Chassis of table-model television receivers are lined up for final inspection at the RCA Victor plant, Camden, New Jersey.



J. G. WILSON,
Executive Vice President
in Charge of
RCA Victor Division

Manufacturing

When was RCA Victor, the manufacturing division of RCA, organized?

When Radio Corporation of America was formed in 1919, its primary activities were in the fields of international and marine radio communications. Shortly thereafter, radio broadcasting began and RCA initiated the sale of radio products manufactured 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 acquired the Victor Talking Machine Company—a company which had been in operation since 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.

Where are RCA Victor manufacturing plants located?

RCA Victor Division plants are located in Camden and Harrison, New Jersey; Indianapolis, Bloomington, Monticello, and Marion, Indiana; Canonsburg and Lancaster, Pennsylvania; Detroit, Michigan; Pulaski, Virginia; Hollywood, California; and New York City.

How did the RCA Victor dog trademark originate?

As one of the most famous trademarks in advertising history, the painting by Francis Barraud, entitled "His Master's Voice", is familiar to millions of people throughout the world wherever RCA Victor 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. The Victor Talking Machine Company acquired rights to the painting, and this trademark, which now identifies Victrola-phonographs, RCA Victor records, RCA Victor radios, television receivers, electron tubes, and other home products, has become one of the best known symbols of dependable quality in the world.

What types of home instruments are manufactured by RCA Victor?

RCA Victor makes a wide variety of home television and radio receivers, and Victrola phonographs, to meet every need. Direct-view television receivers include 10-inch, 12½-inch and 16-inch sizes, in both table and console models. The recently introduced 45-rpm phonograph is available in a variety of models, singly and in combination with radio, television and other phonograph speeds. Console combinations include models to play all three types of records—45, conventional 78, and long-playing 33⅓. They employ two separate playing mechanisms—one for 45, and the other for 78 and 33⅓—to take fullest advantage of the unique features of each system.

Where can RCA Victor home instruments, records and other products be purchased?

RCA Victor home instruments and records are sold through approximately 30,000 dealers in the continental United States. These outlets also carry RCA electron tubes and other RCA products. Dealers handling RCA Victor television receivers are limited to those areas in which stations are located. The number

of television dealers is increasing as new stations go on the air and customer needs expand.

What is the status of the new RCA Victor 45-rpm phonograph system?

It is by far the fastest-growing phonograph system on the market. Hundreds of thousands of 45-rpm players are in use. As an indication of the public's appreciation of its advantages, thousands of new record players are being sold every week, and sales of 45-rpm records are at the rate of 30 million per year. As of January, 1950, ten record manufacturers, in addition to RCA Victor, were manufacturing 45-rpm records, or had announced their intention to make them early in 1950.

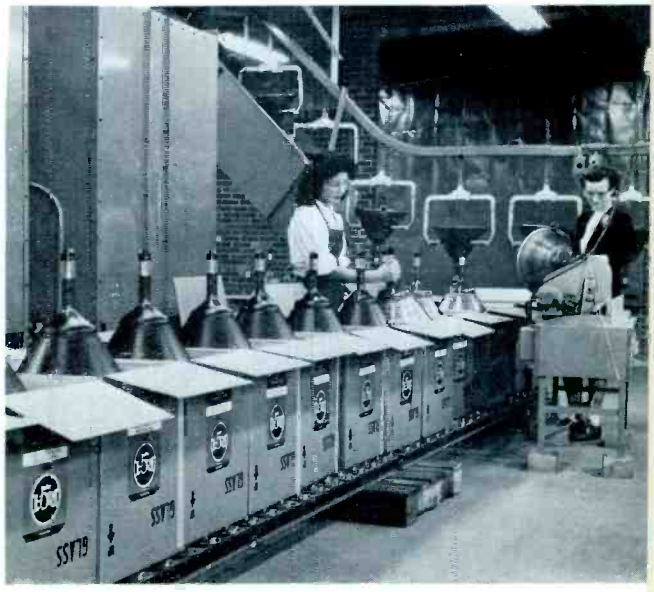
What are the advantages of the 45-rpm system?

The record player is simple, compact, relatively trouble-free. It is the lowest-priced automatic record changer ever manufac-

The RCA Victor 45-rpm automatic record player, features the fastest phonograph record-changing mechanism ever devised.

At this section of the Camden, N. J., assembly line, television chassis with 12½-inch tubes are inserted in their cabinets.

Two-way radio communications system installed for the Brooklyn, N. Y., police department uses RCA equipment.



Workers at the Marion, Indiana, plant pack RCA's new 16-inch metal-cone television picture tubes for shipment.

The RCA Exhibition Hall in Radio City, New York, is a "World's Fair" of the latest radio, television and electronic instruments.

tured by RCA Victor. It is also trigger-fast in action—the world's fastest changer. Records are small (7-inch diameter), yet they play as long as conventional 78-rpm discs. They are made of non-breakable vinyl plastic, wearing up to ten times longer than shellac records. Storage is no longer a problem, since the 7-inch wafer-thin discs can be placed on ordinary bookshelves, 150 to the foot. Best of all, 45-rpm records provide the finest quality of music yet achieved. The quality of music is not only higher as such—it is also completely distortion-free, a feature achieved by recording only in the "quality zone", that portion of a record where distortion is not a problem. In contrast to long-playing records, "45" allows the listeners complete freedom in the choice and order of playing the shorter works (under 5 minutes) which comprise 90 per cent of all recorded music.

Does RCA Victor also manufacture long-play records?

Yes; early in 1950 RCA Victor announced that it would again issue long-play (33⅓-rpm) records, thus bringing the great artists in the RCA Victor catalog to those who prefer suitable works in the long-playing form. It was also announced that through an exclusive process these records would be the finest of their type obtainable.

What does RCA consider "the phonograph system of the future"?

Based on past experience, as well as on the overwhelming acceptance of "45", RCA Victor believes this will be the system preferred by the great majority of music lovers; and further, that it will eventually replace "78" as the standard system. RCA Victor also expects that "33⅓" will continue as a supplementary service for those desiring the long-play feature.

What types of RCA Victor records will be available in each of the three record speeds now in use?

Seventy-eight rpm (conventional)—RCA Victor will continue to make available its huge catalog of 78 recordings as long as the demand exists; 45-rpm—the 45 catalog now comprising more than 2,000 selections will continue to be expanded as rapidly as possible, both by the addition of older titles, and by the in-

Skilled women operators at the Marion, Indiana, factory fuse glass neck sections to the metal cones of 16-inch television picture tubes.

Operator furnishes music to factory employees through this RCA sound distribution system console.

clusion of all new releases in every category of music; 33⅓ rpm (long playing)—selected works suitable to the long-playing form (symphonic, operatic, etc.) will be issued at frequent intervals. Note that these selections also will be available on 45- and 78-rpm records.

What kinds of television tubes does RCA manufacture?

RCA makes a complete line of television tubes, from image orthicon camera tubes to kinescope picture tubes for your home television receiver. They are manufactured at four different plants. The ultra-modern factory at Lancaster, Pennsylvania produces several types. Unique, precision methods for mass-producing kinescope picture tubes at this plant have contributed to television's rapid progress by making low-cost tubes available to the industry, which in turn have resulted in moderate-priced receivers. Various types of RCA television tubes also are manufactured at Harrison, N.J.; Indianapolis and Marion, Indiana.

What is the RCA Television Owner Contract?

The RCA Victor "Television Owner Contract", available for 90-day and one-year periods, makes available to RCA Victor television set owners an installation and maintenance service administered by the RCA Service Company, Inc., enabling set owners to obtain the finest performance from their instruments. The contracts provide for complete installation, parts replacement, customer instruction and maintenance for the period of the contract, all for a nominal fee. RCA television service is also available on a per-call basis.

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 that of the 1949 World Series baseball games, with Chicago, Milwaukee, and Scranton being added to the Boston and Brooklyn installations. A great future for the telecasting of important events direct to motion-picture audiences is envisioned as a result of these pioneering installations.

Does RCA also manufacture television station equipment?

Yes; RCA manufactures a complete line of equipment for television as well as radio broadcasting stations. At the beginning of 1950, almost 70% of the operating television transmitters were of RCA manufacture. Associated apparatus includes television cameras, antennas, microwave relays, film-recording and film-reproduction equipment, and test equipment for servicing. RCA's image-orthicon camera is ultra-sensitive, virtually eliminating the need for intense studio illumination.

Does RCA supply equipment for AM and FM broadcast stations?

RCA manufactures a complete line of AM and FM broadcasting equipment, including transmitters, antennas, test equipment, microphones, monitoring units, loudspeakers, studio turntables, disc and tape recorders and other types of broadcasting studio apparatus.

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, high-frequency heating equipment, automatic counters, time and fire signal generators and test-measuring equipment are just a few of the RCA electronic products which are serving American industrial plants.

Does RCA manufacture sound-film motion picture projectors and equipment?

Yes; RCA makes sound-film motion picture projectors for both 35-mm and 16-mm film. The 35-mm Brenkert 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 16-mm sound projectors, introduced 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 profession-quality pictures and sound. An adaptation of the 16-mm machine was introduced by RCA for operation with television equipment for televising films.

RCA also provides equipment for recording television programs on film from the face of kinescope tubes for re-broadcasting. RCA also makes many other commercial theatre products, including drive-in theatre equipment.

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. More than 2,000 RCA systems are in use now, including many units in new Veteran hospitals. The flexibility of the systems makes them valuable in the operation of many types of installations.

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".

Are recording facilities and equipment available through RCA?

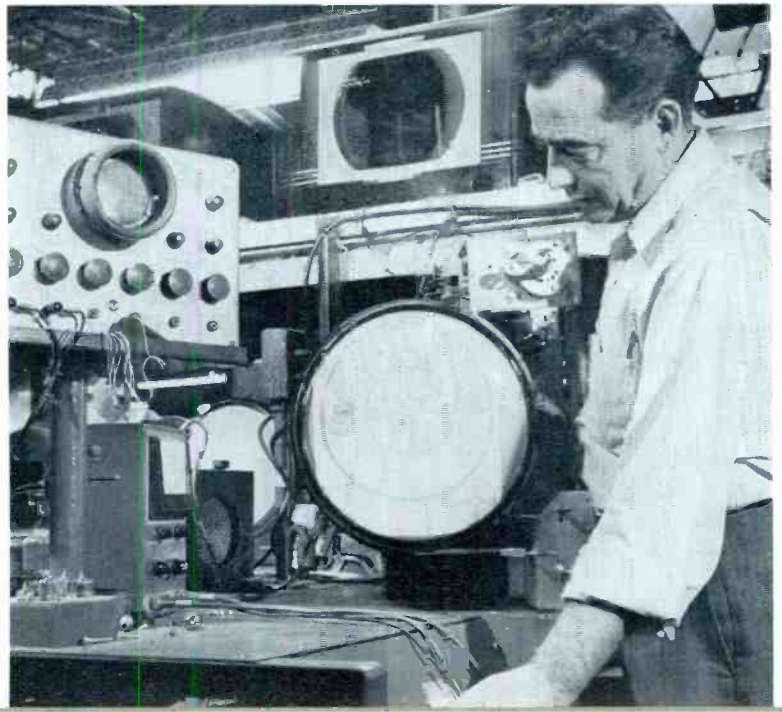
RCA Victor maintains seven recording studios throughout the United States. Five are disc recording studios in Chicago, Hollywood and New York, and two are film recording studios in Hollywood and New York. Professional disc and film recording equipment is manufactured for use in motion picture, recording and radio broadcasting studios.

How widely is the RCA electron microscope being used?

More than 300 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. This amazing scientific instrument extends man's seeing power many times beyond the range

At Indianapolis, 45-rpm turntables are assembled and checked as they move along the production line.

Before completed television receivers pass inspection, their chassis and kinescopes are tested with a signal representing each of the 12 TV channels.



of light microscopes. Magnifications 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 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 commercial airlines and private planes. Utilizing radar principles, RCA has developed two forms of highly-accurate altimeters, both of which are widely used by the Army, Navy, and commercial airlines. These altimeters enable planes to fly safely through overcast, making use of prevailing winds.

RCA also produces large quantities of loran units, a system using radio signals from a base station to provide navigators with positions at long range. Teleran is another RCA development for the Air Force. This is a system which combines radar and television, giving the pilot a "picture" of terrain, landmarks and weather conditions. RCA manufactures a full line of aircraft transmitters and receivers, as well as supplementary equipment.

What is the new RCA Antenaplex Equipment?

With television expanding so rapidly throughout the country and the number of home and commercial receivers increasing daily, RCA was quick to realize the complexities involved in program reception in large apartment houses, hotels, hospitals, department stores and similar locations where many receivers are in operation in the same building. RCA developed television Antenaplex equipment, which is a central receiving system for all-channel television reception. This equipment eliminates the need for individual roof antennas for each receiver in the building. Many Antenaplex system installations already have been made in hotels and apartment houses. FM and AM reception also is available on the Antenaplex system.

The original 16-inch metal-cone kinescope picture tube is compared with its successor which is approximately six inches shorter.

Table-model radios, featuring an 8-inch console-type loudspeaker, near completion on a Bloomington, Indiana, conveyor belt.

What is the RCA Service Company, Inc.?

The RCA Service Company, Inc., is a nation-wide organization of technical specialists devoted to the correct installation, maintenance and servicing of RCA products and equipment. It operates in technical and industrial fields, but its principal manifestation to the public is in connection with home television receivers. This service is offered to owners of RCA Victor television instruments by way of a "Television Owner Contract", covering installation, service and guarantee of parts for a specified period; as well as through requests for individual service calls. To assure adequate service to its television customers, the RCA Service Company employs more than 4,000 people and maintains some 2,500 service vehicles operating out of 90 service branches.

What is an electron tube?

The electron tube was known as a radio tube until its uses expanded far beyond radio. It is a highly flexible device which liberates and controls the flow of electrons within a glass or metal envelope. It has given man infinitely greater control of electrical and mechanical devices and has opened vast new fields in the science of electronics. RCA tube developments have spearheaded many major advances in the field of radio and electronics. The heart of all radio and electronic apparatus is the electron tube, and RCA is the fountainhead of modern tube development.

What products does RCA Victor offer for schools and colleges?

RCA Victor offers a wider range of audio-visual equipment for schools and colleges than any other manufacturer. This equipment is extensively used with great success by educators and school administrators. It includes school sound systems, 16-mm sound film motion picture projectors, recording equipment, electron microscopes, electron tubes, scientific test and measuring equipment, FM and AM radio receivers, television receivers, phonographs, record libraries, and transcription players.

Communications

RCA branch offices provide modern facilities for rapidly processing overseas Radiograms.

HARRY C. INGLES,
President,
RCA Communications, Inc.

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. As American in concept as the Constitution and adaptable like it in meeting the needs of a fast-growing nation, this system has been expanded and improved continuously throughout the years since the founding of RCA in 1919. Its growth by 1929 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 more than 75 direct radiotelegraph circuits terminating in the principal cities of the countries listed below:

Argentina
Australia
Austria
Belgian Congo
Belgium
Bermuda
Brazil
Bulgaria
Canada
Chile
China
Colombia
Cuba
Czechoslovakia
Dominican Republic
Ecuador
Egypt
Finland
France
French West Africa
Germany
Great Britain
Greece
Greenland
Guatemala
Haiti
Hawaii
Holland
Iceland
Indo-China
Indonesia
Iran
Italy
Japan
Korea
Lebanon
Liberia
Macao
Martinique
Mexico
Netherlands, W. I.
New Caledonia
New Zealand
Norway
Okinawa
Pakistan
Panama
Philippines
Poland
Portugal
Puerto Rico
Rhodes, Island of
St. Pierre-Miquelon
Spain
Surinam
Sweden
Switzerland
Tahiti
Tangier
Thailand
Turkey
U. S. S. R.
Union of So. Africa
Venezuela
Yugoslavia

RCA also provides service of superior quality to countries other than those listed here by carefully planning the routing of its worldwide traffic in a way that takes fullest advantage of the best available connecting facilities.

Messages destined for overseas are perforated on tape by this machine in an RCA Branch Office.

Checking incoming Radiograms before delivery to their destination in this country.

Where are RCA's main transmitting and receiving stations?

RCA's main transmitters on the east coast are situated at Rocky Point, N. Y. The main receiving station is at Riverhead, sixteen miles away. Supplementary transmitting stations are at New Brunswick and Tuckerton, N. J. All are linked directly with New York and are operated by remote control from the Company's Central Radio Office at 66 Broad Street. Incoming signals received at Riverhead pass automatically to the Central Radio Office.

The main transpacific office of RCA is at 28 Geary St., San Francisco, and transmitting and receiving stations are situated respectively at Bolinas and Point Reyes, Calif. Similar RCA installations are in Honolulu, Manila, 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 trunk-line belt of RCA semi-automatic relay points for transmissions around 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 "gateway" 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, the free routing indicator "Via RCA" must be written after the city of destination, as follows

John Jones
13 London Terrace
London (England) *Via RCA*

What other communication 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 the cities indicated in the following countries:

Argentina, Buenos Aires
Australia, Melbourne
Austria, Linz
Bermuda, Hamilton
Ceylon, Colombo — Via London
China, Shanghai
Czechoslovakia, Prague — Via Paris
Denmark, Copenhagen — Via Stockholm
Egypt, Cairo
France, Paris
Germany, Frankfurt
Great Britain, London
Greece, Athens
Hawaiian Islands, Honolulu
India, Bombay — Via London
Italy, Rome
Korea, Seoul
New Zealand, Wellington
Philippine Islands, Manila
Portugal, Lisbon
Straits Settlement, Singapore — Via London (westbound only)
Sweden, Stockholm
Switzerland, Berne
Transjordania, Amman — Via London (westbound only)
Union of South Africa, Capetown
Durban, Via Capetown
Johannesburg, Via Capetown
U. S. S. R., Moscow

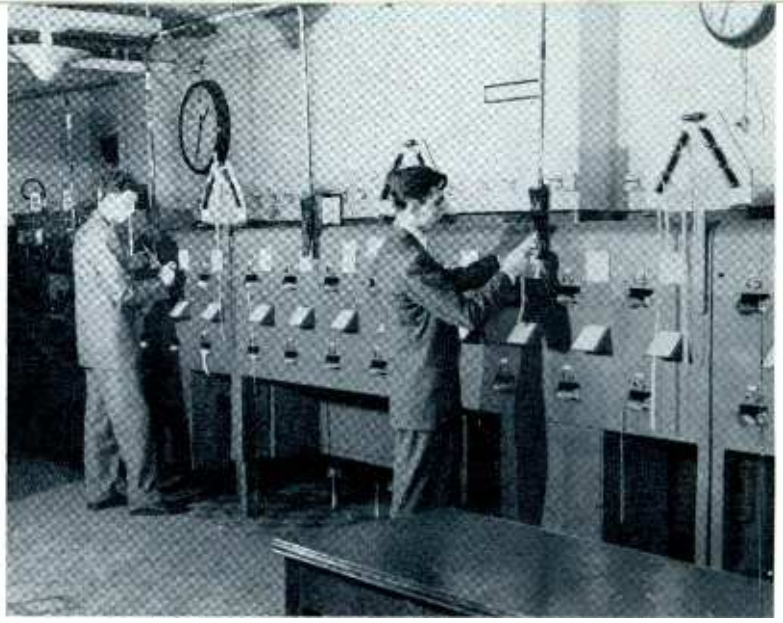
RCA also maintains a Frequency Measuring Service which is performed at the Riverhead and Point Reyes receiving stations. Upon request, measurements are made to ascertain whether or not transmitters are broadcasting on allotted frequencies. The service is performed singly or at specified intervals, and is available to operators of all types of radio transmitters.

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 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. Scheduled Press Transmission Service enables press associations and news centers to make use of RCA facilities on a time basis and reach a number of destinations simultaneously. 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 circuits originated for 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 international 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



Tapes carrying messages filed at Branch Offices pass through these consoles before going to RCA transmitting stations.

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.

The success of RCA's moderization program is demonstrated by the fact that today it is possible to deliver a radiogram originating in New York to correspondents in such far-off places as Stockholm, Paris, and Buenos Aires within five or ten minutes. Under the older Morse system the average elapsed time was much greater.

Marine Radio

Radiomarine small-craft radar is installed aboard a commercial tug operating in New York waters.

T. P. WYNKOOP,
President,
Radiomarine Corporation
of America

Marine Radio

What is the Radiomarine Corporation of America?

Radiomarine, a service of RCA, offers the general public an efficient long-range radiotelegraph communication system which maintains contact with vessels in all parts of the world. It also is engaged in the development, production and servicing of marine radio communication equipment and electronic navigational devices. Many American and foreign flag merchant ships, as well as thousands of work boats and pleasure craft, are equipped with Radiomarine apparatus. It produces modern shipboard radar, loran receivers, radiotelegraph transmitters and receivers, automatic radio alarms, radio direction finders, lifeboat radios, radiotelephones and specialized electronic equipment. Radiomarine engineers have contributed much to the development and design of high-quality marine radio and electronic apparatus.

When was Radiomarine Corporation of America organized?

Marine radio communication 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, entirely devoted to marine radio activities.

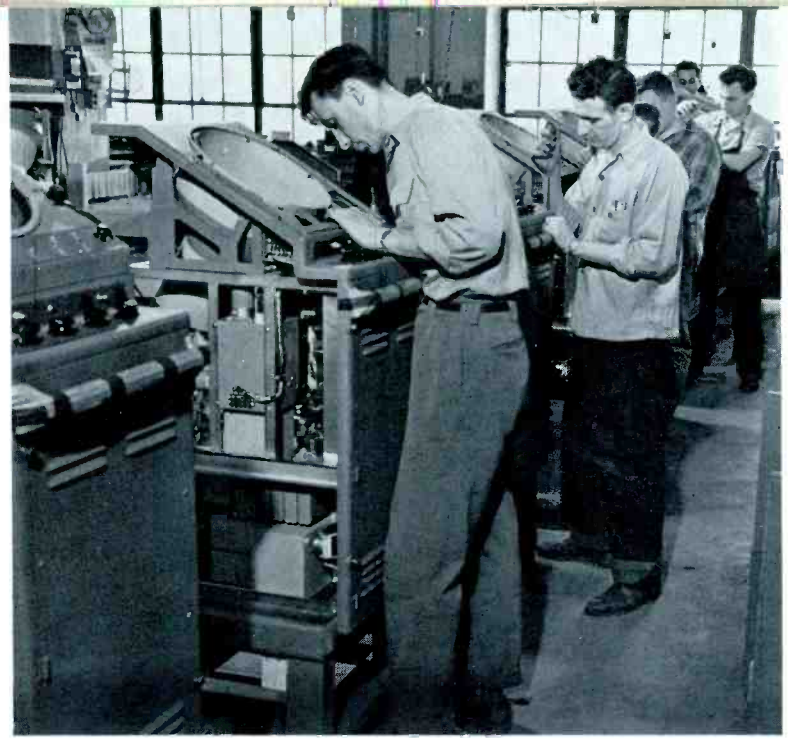
Does Radiomarine operate branch offices outside of New York City?

Radiomarine has 30 service depots and offices located in principal seaports of the United States. Many of these service stations have been established for more than 25 years. They render a competent maintenance, repair and inspection service on all types of radiotelegraph, radiotelephone and marine electronic apparatus, including radar and loran. These offices serve the Atlantic, Pacific, and Gulf areas as well as the Mississippi River and Great Lakes. Service is also available in foreign ports.

Small-craft radiotelephone and radio direction finders are also sold and serviced through a chain of authorized Radiomarine dealers.

New 500-watt radiotelegraph console designed by Radiomarine for installation aboard luxury liners.

Small-craft radio direction finder with broadcast band auxiliary serves as an accurate navigational aid or a source of entertainment.



Workmen at Radiomarine headquarters, New York, assemble merchant-ship radar units and test completed models for technical perfection.

What is the extent of Radiomarine coastal station service?

Radiomarine is engaged in commercial shore-to-ship, ship-to-shore and ship-to-ship radiotelegraph communication, maintaining 11 coastal stations and two affiliated stations on the Atlantic, Pacific and Gulf Coasts, the Mississippi River, and the Great Lakes. This service includes radiotelephone at Buffalo and St. Louis; the handling of radiograms via all stations; weather reports for the Government; press bulletins and transmission of free medical advice for the benefit of sick and injured personnel on vessels which do not carry a doctor. Radiomarine's Gifts-by-Radio service, available to passengers and ships' personnel, enables them to have flowers, candy, fruit or magazine subscriptions delivered to any address in the continental United States. The overall charge for the service is the value of the gift selected plus the usual rate for the gift service radiogram, which includes a personal message of greeting to accompany the delivered order. Passengers aboard aircraft are able to send RCA radiograms to persons ashore by means of a new global plane-to-shore communications system. Transmissions are received by Radiomarine coastal stations and relayed to their proper destinations.

Where may radiograms be filed for ships at sea?

Radiograms to ships on every sea may be filed at any RCA Communications or Western Union office. They should be marked "Via RCA".

How much does it cost to send a radiogram to a ship?

If the radiogram is to be sent to an American ship the usual charge via any of the coastal stations is 21 cents a word including address and signature; the rate to a foreign vessel is usually 26 cents a word. From inland states the charge is slightly higher.

GEORGE L. VAN DEUSEN,
President,
RCA Institutes, Inc.

Technical Training

What is RCA Institutes, Inc.?

RCA Institutes is a technical training school which offers comprehensive courses in radio and television. These courses include: Radio Servicing – prepares the day student in nine months for servicing radio, television, and FM receivers; Radio Operating – trains the day student in nine months for station operations in marine, mobile, and point-to-point communication service; Radio Broadcasting – instructs the day student in 18 months for the operation and maintenance of all types of radio receivers and transmitters, and provides station operating experience in television, broadcasting and other communications services; Advanced Technology – provides the day student in 27 months with a thorough engineering knowledge of the radio industry, with practical and complete training in specialized branches. All courses include laboratory experience.

How is the school year at RCA Institutes divided?

Classes are in session for 50 weeks each year, closing only for two weeks preceding Labor Day. New terms start approximately the first of March, June, September, and December.

Does RCA Institutes conduct evening classes?

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

Students at RCA Institutes receive instruction in the adjustment and repair of record changers.

What instruction does RCA Institutes offer in television?

Instruction in television receiver maintenance, adjustment and operation is given in the Radio Servicing Course, and television transmitter maintenance and operation are included in the Radio Broadcasting Course. The design, maintenance and operation of a complete television system are covered in the Advanced Technology Course.

What are the qualifications for a student to enter RCA Institutes?

Some high school education is necessary for all courses. Candidates for the Advanced Technology Course must be high school graduates. Those who lack sufficient high school work may qualify by taking the Institute's preparatory term which includes high school algebra, geometry and physics, The courses at RCA Institutes are open to men and women, 17 years of age and older.

How may detailed information about the courses be obtained?

Write for a catalog, or visit the school from 9 a.m. to 8 p.m. on school days (Monday through Friday). Completely equipped classrooms and laboratories at 350 West 4th St., New York City, are open to visitors.

International

Signs on rooftop and street kiosk, in this scene from Athens, Greece, are constant reminders of RCA products and services available in this ancient city.

MEADE BRUNET,
a Vice President of RCA, and Managing Director, RCA International Division

International

How does RCA conduct its international business?

RCA's international business is conducted through RCA International Division. Operating through more than 130 major distributors, field representatives and associated companies, the Division sells RCA products in all markets of the world open to trade. Headquarters for RCA International Division are at 745 Fifth Avenue, New York.

What are RCA's associated companies in other countries?

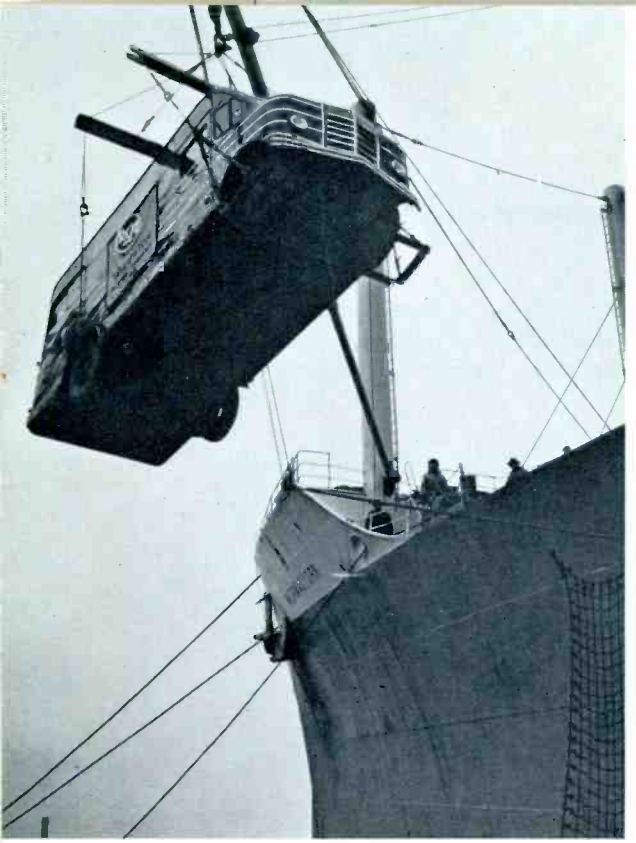
The associated companies for which RCA International Division provides management counsel are: RCA Victor Argentina, S. A., in Buenos Aires; RCA Photophone of Australia, Proprietary Ltd., in Sydney; RCA Victor Radio, S. A., in Rio de Janeiro, Brazil; RCA Victor Company, Ltd., in Montreal, Canada; Corporacion de Radio de Chile, S. A., in Santiago; RCA Victor Company of China, in Shanghai; RCA Photophone, Ltd., in London, England; Photophone Equipments, Ltd., in Bombay, India; RCA Victor Mexicana, S. A., de C. V., in Mexico, D. F.

What products and services are handled by RCA's associated companies?

Argentina, Canada and Chile manufacture phonograph records, wooden cabinets, radio receivers, some broadcast transmitters, special communications apparatus for both transmitting and receiving, and sound apparatus. Plastic products are also made in the Argentine factory. The Montreal factory manufactures television receivers for Canadian cities that can receive American programs.

Brazil's new streamlined factory in São Paulo has been completed and is now producing phonograph records and radio receivers. A new building in Rio de Janeiro completely houses all activities there: offices, laboratories, recording studios and warehouses. The Brazilian company is also the distributing organization for RCA apparatus and sound products manufactured in the U.S.A. and other countries. The Mexican company manufactures radio receivers and phonograph records, and distributes motion picture equipment, sound products and transmitting and communications products manufactured in the United States.

A finish-line banner announces use of RCA Sound systems along a Portugal race-course.



A television mobile unit is hoisted aboard a freighter bound for a television network organization in São Paulo, Brazil.

Dealers meet in Mexico City to learn about RCA's 45-rpm record system and the most modern types of television equipment.

Bombay's leading theatre is one of many in India featuring RCA's film projection and sound reproducing systems.

The Australian, Indian and English 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.

Does RCA export products from this country?

Yes; RCA sells abroad all products manufactured by RCA, wherever import licenses, permits and exchange restrictions allow. The products sold range from minature tubes supplied to agents, distributors and manufacturers, to complete communications networks supplied to governments, and marine radio installations for commercial fleets. RCA International also sells a line of refrigerators and deep-freeze units, and handles export sales for a number of other companies whose products include industrial power equipment, aircraft navigation and airport control equipment, and such appliance lines as electric air circulators, washers, ironers, toasters, vacuum cleaners and heaters.

What part is RCA playing in bringing television to countries abroad?

During 1950, three RCA-equipped television stations are expected to be in operation outside of the U.S.A. These will be located in São Paulo, Brazil; Havana, Cuba; and Mexico City, D. F.

Pioneering in Radio . . .

some RCA 'Firsts' in the Radio World

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

•

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

•

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

•

Short waves applied in 1924 to RCA transatlantic communication featuring vacuum tubes rated at 20 kilowatts.

•

First radiophoto transmitted by RCA across the Atlantic was of Charles Evans Hughes, sent on July 6, 1924, from New York to London where it was radioed back across the sea and recorded in New York.

•

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

•

Broadcasting transmitters of RCA participated in 24 station hook-up for Coolidge inaugural in 1925, 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's station WJZ, March 1925.

•

Radio facsimile messages, maps and pictures sent by RCA radiophoto system on May 7, 1925, from New York to Honolulu.

•

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

•

National Broadcasting Company organized as a service of RCA on September 9, 1926, to conduct nationwide network broadcasting.

•

World series baseball games broadcast for the first time by WJZ in October 1926.

•

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

•

Radio receiving sets and tubes designed for complete alternating current operation, introduced by RCA for home use in 1927.

•

Radiomarine Corporation of America—a service of RCA—was organized on December 31, 1927, to operate in the marine communication field.

•

The diversity reception system, which contributes to the stability and reliability of short-wave communication, was introduced by RCA in 1928.

•

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

•

RCA inaugurated an international program transmission service as a regular operation in 1931.

•

New noiseless system of sound recording introduced to the motion picture industry by RCA in 1931.

•

RCA perfected, in 1931, the velocity microphone, which became the standard of world-wide broadcasting stations; in 1934 it introduced the unidirectional microphone, used widely in film and phonograph recording as well as broadcasting and television.

•

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

•

Automatic ultra-short-wave radio stations, designed to relay television pictures and other forms of radio communication from city to city, were first demonstrated by RCA in 1932.

•

RCA, at the Navy's request, began development work on sonar, an underwater sound system, in 1934, following considerable inde-

pendent 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.

•

Electron multiplier tube, developed by RCA Laboratories, demonstrated in 1935, multiplies amplification hundreds of thousands of times within a single tube.

•

Automatic SOS alarm for use on vessels not having a radio operator on constant watch, introduced by RCA in 1935.

•

First ultra-high-frequency automatic relay circuit opened by RCA in 1936, between New York and Philadelphia, transmits simultaneously facsimile and multiple radiotelegraph messages.

•

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

•

A radio altimeter embodying radar principles was developed by RCA in 1937 during research on collision prevention apparatus.

•

Receivers for recording radio-broadcast newspapers and other graphic material in the home were demonstrated by RCA in February, 1938, before the National Association of Broadcasters.

•

Dr. V. K. Zworykin of RCA Laboratories, in December 1939, at the annual meeting of the American Association for the Advancement of Science, announced that he and his associates were working on the development of an electron microscope; in April 1940 he announced the completion of the instrument which has attained magnifications of more than 100,000 diameters.

•

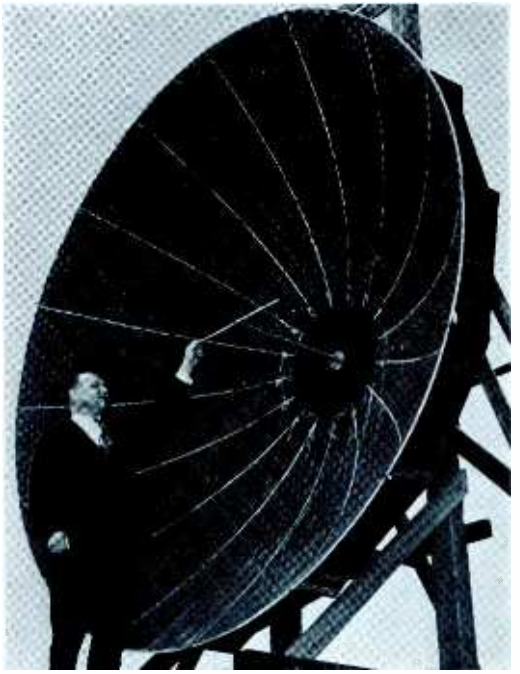
NBC station W2XWG, the first FM station established in New York by any network broadcaster, began operation on January 11, 1940.

•

Utilizing the space-saving advantages of its miniature tubes, RCA introduced the pocket-size "personal" radio receiver in 1940.

•

Large parabolic antenna, developed by RCA for microwave radio relay between New York and Philadelphia.



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, 1941, for possible use in civilian defense.

•

Ground broken on August 8, 1941, 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, 1941.

•

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, 1941.

•

Advanced types of miniature tubes, were introduced by RCA beginning in 1942. These small tubes were developed to meet the demands of wartime military equipment but their use in peacetime is expected to make possible smaller radio and television receivers and more effective hearing aids.

•

The electron micro-analyzer growing out of research on the electron microscope, was a new scientific development at RCA Laboratories in 1943. This instrument makes possible the determination of the atomic composition of sub-microscopic particles of matter.

•

First direct radiophoto circuit between Australia and United States opened by RCA (March 20, 1942); between New York and Cairo (June 24, 1942); New York and Stockholm (February 22, 1943); New York and Berne (September 21, 1943); direct radiotelegraph circuits between New York and Dakar

(March 10, 1943); between New York and Naples (February 1, 1944). For the New York-Italy circuit, RCA set up the first American owned-and-operated commercial station on the continent of Europe.

•

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, 1944.

•

Development of necessary tube and transmitter to provide, for the first time, five kilowatts of output power at 300 megacycles for a television transmitting or relay station was announced by RCA in October, 1944.

•

Special equipment to measure the muzzle velocity of projectiles was developed by RCA Laboratories in 1944.

•

Electronic counters developed at RCA Laboratories have many military and peacetime applications.

RCA International Division was formed February 5, 1945, "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 radio direction finder signals was announced by Radiomarine Corporation of America, April 3, 1945.

•

After eleven years of research, RCA introduced a non-breakable high-fidelity phonograph record which was demonstrated to the press on August 30, 1945.

•

Two radio-relay systems, developed by RCA Laboratories in collaboration with the Camp Cole Ground Signal Agency, which provide as many as eight channels on a single carrier, were demonstrated October 1, 1945, by the U. S. Signal Corps.

•

A new FM radio circuit, called the Ratio Detector, invented by Stuart W. Seeley, manager of RCA Industry Service Laboratory, was revealed at a meeting of the Institute of Radio Engineers, October 3, 1945.

•

First link in an automatic microwave relay system, using equipment developed by RCA, was announced jointly by The Western Union Telegraph Company and RCA on October 22, 1945. With radio beams working in both directions between terminals, the system provides 270 multiplex circuits.

•

A new system of air navigation, proposed by RCA, based on wartime developments in radar and television and known as "teleran", was described before a technical symposium in New York City on December 8, 1945.

•

Shoran, a precision radar system developed by RCA as an aid to blind bombing in war, was revealed on January 22, 1946, to have widespread peacetime applications as a "yard-stick" for world-mapping of uncharted areas. So precise is shoran that it can measure distances up to 250 miles with almost pinpoint accuracy.

•

Development of an improved projection kinescope or picture tube with a gain of about 50% in light efficiency, obtained by coating the back of the tube's luminous surface with a layer of metal 2- to 8-millionths of an inch thick, was revealed by RCA research engineers at a meeting of the Institute of Radio Engineers on January 24, 1946.

•

Army headquarters, on April 21, 1946, 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. Car drivers equipped with image-tube binoculars could speed along roads in total blackouts as if in daylight.

•

The "Pocket Ear", developed in 1946 by NBC, is a miniature 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 "talk-back" free from the trailing wires inherent in former systems.

•

A new electron tube with a "memory", developed by RCA Laboratories for use in calculating machine that will solve complex mathematical problems with lightning-like speed, revealed to I.R.E. on March 4, 1947.

•

A method of making river navigation charts using a mosaic of photographs of radar images taken from the scope of Radiomarine's 3.2-centimeter radar equipment was revealed by the U. S. Army Corps of Engineers, Ohio River Division, on June 4, 1947.

•

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, 1947 and demonstrated to the public for the first time, October 21, 1948 at the Library of Congress, Washington, D. C. Called "Ultrafax", the new system is a development of RCA Laboratories and the Eastman Kodak Company.

•

New methods of highly accurate microwave frequency control for transmitter circuits, based on the effects of radio on certain gases were described by Hershberger and Norton of RCA Laboratories, in March, 1948.

•

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, 1948. Weighing only 1/16th of an ounce, the new tube is so sensitive that it can measure the vibrations made by a fly landing on a board.

•

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 to the New York Electrical Society, Oct. 26, 1948.

•

An entirely new system for the reproduction of recorded music in the home, based on a vinylite record 6⅞ inches in diameter and a fast-changing record player operating at 45 r.p.m., was announced January 11, 1949, by RCA Victor Division. The combination of record and record-player provides completely distortion-free music of unprecedented brilliance and clarity of tone.

•

A new highly-directional stationary microphone for use in television studios was announced to the Audio Engineering Society on October 25, 1949. By mixing and fading the output of the various fixed units the effect of several mobile boom-type microphones is achieved.

•

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, 1949.

•

A new visual memory tube, the Graphechon, which can reproduce for as long as a minute traces or other electrical signals occurring in as short an interval as a billionth of a second, was announced to the Institute of Radio Engineers on March 10, 1949. An associated device, a storage oscilloscope, was revealed to the same organization on November 2, 1949.

•

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, 1949.

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A new photo-multiplier tube six times more sensitive than its predecessor was revealed by RCA on November 21, 1949.

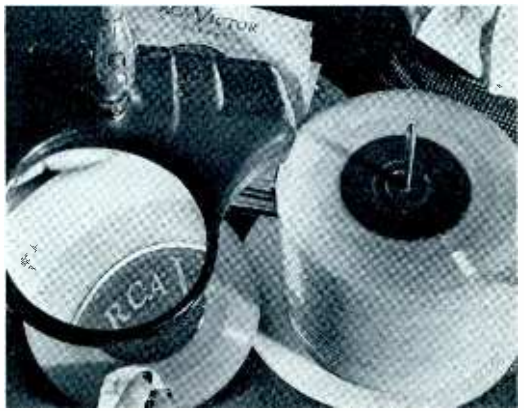
•

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

•

A pocket-size superheterodyne radio receiver, smaller than any previously designed with a loud speaker was disclosed by RCA Laboratories engineers at a meeting of the I.R.E. *(March 9)*

New system for reproduction of recorded music, based on 6⅞-inch records and a fast-changing record player, introduced by RCA in 1949.



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 electronic "eye". *(December 29)*

1929

Dr. V. K. Zworykin demonstrated an all-electronic television receiver using the kinescope, or picture tube, which he developed. *(November 18)*

1930

Television on 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

First television demonstrations for RCA officials and sales engineers. *(January 11)*

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

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

1936

Television outdoor pickups demonstrated by RCA at Camden, N. J., on 6-meter wave across 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)*

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 was 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)*

Portable television equipment demonstrated to FCC by RCA, supplemented with motor truck mobile stations. *(December 1)*

1940

RCA demonstrated to the FCC, at Camden, N. J., a television receiver producing images in color by electronic and optical means employing no moving mechanism. *(February 6)*

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

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

President Franklin D. Roosevelt speaking at opening of New York World's Fair in 1939, was first Chief Executive to be televised.

Television program broadcast from NBC station, New York, received on *USS President Roosevelt* while 250 miles at sea on return voyage from Bermuda. *(May 14)*

Coaxial cable used for first time in television program service by NBC in televising Republican National Convention at Philadelphia and transmitting scenes over New York station. *(June 21)*

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

Election returns telecast for the first time as RCA-NBC showed teletypes of press associations reporting the news, as well as commentators at the microphone. *(November 5)*

1941

Demonstrating television progress to the FCC, RCA exhibited the projection-type home television 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 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 television studio. *(February 20)*

RCA-NBC made successful tests with first projection-type color television 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)*

1943

NBC televised major sports and other events at Madison Square Garden for wounded servicemen in television-equipped hospitals in the New York area. *(October 25)*

1944

NBC announced plans for nationwide television network to be completed possibly by 1950. *(March 1)*

1945

RCA demonstrated projection-type television home receiver featuring screen approximately 18 by 24 inches. *(March 15)*

Supersensitive RCA image orthicon tube was introduced as solution to major problems in illumination of television programs and outdoor pickups. *(October 25)*

Greatly improved black-and-white television pictures and color television in three dimensions featuring live talent were demonstrated by RCA at Princeton, N. J. The color system was mechanical; the black-and-white, all-electronic. *(December 31)*

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

Post-war television receivers introduced by RCA Victor. *(September 17)*

Color television pictures on 15- by 20-inch screen produced by all-electronic means were demonstrated publicly for the first time by Radio Corporation of America at RCA Laboratories, Princeton, N. J. A simple radio-frequency converter was announced that enables black-and-white receivers to reproduce in monochrome the programs of color television stations operating on high frequencies. This will make it possible to introduce all-electronic color without causing obsolescence of black-and-white television receivers. *(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 Victor from operating room in New York hospital to television receivers viewed by members of the American College of Surgeons at the Waldorf-Astoria Hotel, presaging television as "medical lecture hall" of future. *(Sept. 7 to Sept. 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 championship prize-fight in Madison Square Garden, New York. *(December 5)*

1948

Trinity Church service telecast for the first time. It was the first program of its kind to be televised in New York from interior of a church during religious service. *(February 22)*

NBC Symphony Orchestra with Maestro Arturo Toscanini conducting an all-Wagnerian broadcast concert, telecast for the 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)*

Telecasts of Republican and Democratic National Conventions at Philadelphia enabled more people to eyewitness the events than the total of all who attended presidential nominating conventions in the past 100 years. *(June and 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)*

The first split-screen television image, in which two pictures from different originating points appeared side-by-side on the same kinescope picture tube, was displayed by NBC during Television Broadcasters Association Clinic in New York. *(December 8)*

First practical method of reducing co-channel interference of television stations by synchronizing their carrier waves was put into regular use between WNBT, New York, and WNBW, Washington, D. C. The control system was developed at RCA Laboratories. *(December 16)*

1949

Newly developed direct-view metal-cone television picture tube, 16 inches in diameter, disclosed by RCA Victor Division. *(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 and viewed by an audience estimated at 10,000,000. *(January 20)* Improved reception of television stations operating on the same frequency was achieved by a new system, developed at RCA Laboratories, of offsetting one or more of the conflicting carrier frequencies. *(June)*

Large-screen theatre television was successfully introduced on a commercial basis with the signing of a contract between Fabian Theatres, Inc., and RCA for the first permanent installation of instantaneous, 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 black-and-white. *(August 25)*

RCA introduced a new 16-inch metal-cone television picture tube approximately six inches shorter than its predecessor, making possible the design of smaller television receiver cabinets. *(October 21)*

A new television receiver developed by RCA International in conjunction with the RCA Victor Division to operate on power supplies of various frequencies was demonstrated in Milan, Italy. *(October)*

The RCA television Antenaplex System—multiple-outlet master device which offers solution of TV antenna problems for apartment houses, hotels, stores, schools, hospitals and office buildings—was made commercially available. *(November)*

1950

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

A new system of industrial television, simpler, more compact and less costly was demonstrated before the Institute of Radio Engineers. 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 the FCC at Washington, D. C.; one tube utilized a single electron gun, the other three electron guns, one for each primary color. *(March 23)*

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