RADIO CORPORATION OF AMERICA
RCA BUILDING, 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

BOARD OF DIRECTORS
JAMES G. HARBORD, Chairman
Cornelius N. Bliss  John Hays Hammond, Jr.
Arthur E. Braun  Edward W. Harden
Bertram Cutler  Edward F. McGrady
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Gano Dunn  Edward J. Nally

DAVID SARNOFF

OFFICERS
DAVID SARNOFF, President

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General Counsel  of Patent Department

George S. de Sousa  Edward F. McGrady
Vice-President and  Vice-President in Charge of
Treasurer  Labor Relations

Frank E. Mullen  Frank W. Wozencraft
Vice-President in Charge of  General Solicitor
Advertising and Publicity

Henry A. Sullivan  Lewis MacConnach
Controller  Secretary

TRANSFER AGENT
The Corporation Trust Company, New York, N. Y.

REGISTRARS
Preferred Stocks, The Chase National Bank of the City of
New York, New York, N. Y.
Common Stock, New York Trust Company, New York, N. Y.

Printed in U.S.A.
TWENTIETH

ANNUAL REPORT

of

Radio Corporation
of America

for the

Year Ended

December 31, 1939

Radio Corporation of America
RCA Building • 30 Rockefeller Plaza • New York, N.Y.
To the Stockholders of
Radio Corporation of America:

IN 1939 Radio Corporation of America completed its twentieth year of operation. Organized in 1919 primarily as a wireless telegraph company, it has expanded its activities to all fields of radio, and its products and services are known and used throughout the world.

This report covers the operations of the Corporation and its wholly owned companies for the year 1939.

Operations of all RCA companies were on a profitable basis.

Consolidated gross income was $110,494,398, an increase of $10,526,288 over the preceding year.

Consolidated net profit was $8,082,811, an increase of $670,739 over the preceding year.

All dividends on the Preferred stocks were paid, and a dividend of 20 cents per share was declared on the Common stock. These dividends totalled $5,992,009.

Bank loans were reduced during the year from $8,000,000 to $4,000,000, and the rate of interest from 2½% to 1½%.

Harmonious labor relations were maintained throughout the year.

On April 30, 1939, RCA inaugurated the first public service of television in the United States.

The results of operations for the year 1939, when compared with the previous year, show an increase in gross income of 10%, an increase in net profit of 9%, and an increase in the number of persons employed of 15%.

The finances of the Corporation are briefly discussed on the following pages, and the Consolidated Statement of Income and Earned Surplus and the Consolidated Balance Sheet, together with the certificate of the independent public accountants, appear on pages 7 to 11. The summary on page 12 shows the sources and distribution of the Corporation's 1939 consolidated gross income. A review of the Corporation's operations for the year 1939 follows the financial statements; and a summary of its twenty years of progress begins on page 19.
FINANCIAL REVIEW

CONSOLIDATED INCOME FOR 1939

**Gross Income:** Total gross income from all sources amounted to $110,494,398, compared with $99,968,110 in 1938, an increase of $10,526,288.

**Cost of Operations:** Total cost of operations for the year was $96,567,423 compared with $86,576,979 in 1938, an increase of $9,990,444. This reflects the increased volume of business, and includes the cost of goods sold, the cost of operating the broadcasting, television, and communication services, and the cost of research, development, advertising, selling and administration.

**Net Income:** Net income, before deductions for interest, depreciation, amortization of patents, and Federal income taxes, was $13,926,975, an increase of $535,845 over 1938.

**Deductions from Net Income:** Deductions from net income for interest, depreciation, amortization of patents, and Federal income taxes, totalled $5,844,164. Of this total, Federal income taxes amounted to $2,066,700.

**Taxes:** Social Security, State, local and other taxes (included in cost of operations) amounted to $2,722,549, which, added to Federal Income Taxes mentioned above, made a total of $4,789,249 for taxes paid or accrued for the year, equivalent to 34.5 cents per share on the outstanding Common stock.

In addition to the above taxes, Federal excise taxes on radio products sold, and on radio messages transmitted, amounted to $1,462,836.

**Net Profit:** After all the foregoing deductions, net profit for the year amounted to $8,082,811, an increase of $670,739, or 9% over the previous year.

After providing for annual dividends on Preferred stocks, the earnings applicable to the Common stock were equivalent to 35 cents per share, compared with 30.2 cents per share for the previous year.
DIVIDENDS AND SURPLUS

Dividends: Regular dividends amounting to $3,221,217.09 were paid to holders of First Preferred and "B" Preferred stocks.

A dividend of 20 cents a share, amounting to $2,770,791.60, was declared on November 24, 1939, and paid on January 16, 1940 to holders of record as of December 8, 1939, of 13,853,958 shares of Common stock outstanding.

These dividends on Preferred and Common stocks totalled $5,992,008.69.

Surplus: After providing for all dividends and other deductions from the surplus account, the total earned surplus at December 31, 1939 amounted to $20,531,335, an increase of $1,469,831 over the surplus at the end of 1938.

CONSOLIDATED BALANCE SHEET

Working Capital: During the year, $4,000,000 was used to reduce notes payable to banks, leaving cash on hand and in banks at December 31, 1939, in the amount of $13,440,164 compared with $16,877,396 at the end of 1938.

Working capital (the excess of current assets over current liabilities) at December 31, 1939 amounted to $25,746,265, compared with $28,672,064 at the close of 1938.

Notes and accounts receivable (less reserves) at the year-end amounted to $16,181,298, compared with $14,249,190 at the close of the previous year.

Year-end inventories were $14,737,488 (valued at the lower of cost or market), compared with $10,805,338 at the close of 1938. The increase was due to an increased volume of business, and the necessity, in view of the disturbed conditions of world markets, of providing for future needs in raw materials.

Total current assets at the end of 1939 amounted to $44,358,951, compared with $41,931,924 at the end of the previous year.

Total current liabilities were $18,612,686, compared with $13,259,860 at the close of 1938.

At the end of 1939, the ratio of current assets to current liabilities was 2.4 to 1.
Foreign Investments: The net assets of foreign subsidiaries amount to $5,193,463, and represent 7.6% of the consolidated total net assets of the Corporation. Most of these foreign assets are held by subsidiaries operating in Canada and Central and South America. Further information concerning foreign subsidiaries appears in the General Notes at the foot of page 7, and on page 10.

Radio-Keith-Orpheum: The reorganization proceedings of the Radio-Keith-Orpheum Corporation, which have been pending for several years, were terminated during January, 1940. As a result of this reorganization, this Corporation's investment in RKO, in place of the securities shown on the balance sheet, is now represented by the following securities of the reorganized company: 44,757 shares of $100 par value 6 percent convertible preferred stock (annual dividends of $268,542 are cumulative after February 1, 1940), 316,328 shares of common stock, and 555,254 option warrants. Each warrant entitles (but does not obligate) RCA during the next ten years to buy one share of RKO common stock at $15 per share, or, during the next five years, to buy one-half share at $10 per share.

Fixed Assets: Capital additions and improvements during the year in plant facilities and equipment for manufacturing, broadcasting and communications, including additions to the patent capital account, amounted to $4,609,486, compared with $4,176,102 during 1938.

After allowing for the year's depreciation and capital additions, total fixed assets were $39,901,407, compared with $39,118,647 for the previous year, an increase of $782,760 for the year.

STOCKHOLDERS AND EMPLOYEES

Stockholders: There were approximately 244,000 holders of all classes of RCA stock at December 31, 1939. The Directors appreciate the helpful suggestions and cooperative assistance which the stockholders have rendered in furthering the sale and use of RCA products and services.
Employees: During 1939 the monthly average number of employees of the Corporation and its companies was 20,716, compared with 18,046 during 1938, an increase of 2,670. At the year-end the total was 22,913, compared with 19,177 at the end of 1938, an increase of 3,736 employees.

The Directors gratefully acknowledge the loyalty and cooperation of all employees, who have contributed in such large measure to the continued progress of the Corporation.

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Radio in all its branches represents a national asset, both in times of peace and of emergency. Radio services are vital to our national defense and commerce. During the past year, RCA has continued to render valuable service to many branches of the government—in the fields of communications, broadcasting, manufacturing, engineering, and research.

The progress made by the Radio Corporation of America cannot be measured alone by increases in its income and profits. There must also be taken into account the strengthened position of the Corporation in the industry, the increase in the number of workers it employs, and the constant technical advances it is making in research and pioneering to improve existing services, to create new services, and to increase the scope of the radio art and industry and its usefulness to the public.

FOR THE BOARD OF DIRECTORS:
JAMES G. HARBORD, Chairman,
DAVID SARNOFF, President.

New York, N. Y., March 2, 1940.
RADIO CORPORATION OF AMERICA
AND SUBSIDIARY COMPANIES

CONSOLIDATED STATEMENT OF INCOME AND EARNED SURPLUS
FOR THE YEAR ENDED DECEMBER 31, 1939

GROSS INCOME:
From Operations ......................... $109,844,443.85
Other Income, including Interest and Dividends from Investments .............. 649,954.37

TOTAL GROSS INCOME FROM ALL SOURCES ..................................... $110,494,398.22

Less: Cost of Goods Sold, General Operating, Development, Selling and Administrative Expenses .......................................................... 96,567,423.23

NET INCOME FOR THE YEAR (before Interest, Depreciation, Amortization of Patents and Federal Income Tax) .................. $ 13,926,974.99

Deduct:
Interest ..................................... $ 116,844.16
Depreciation .................................. 3,010,619.84
Amortization of Patents (Note 1) .......... 650,000.00
Provision for Federal Income Tax .......... 2,066,700.00

TOTAL DEDUCTIONS ........................................ 5,844,164.00

NET PROFIT FOR THE YEAR, TRANSFERRED TO EARNED SURPLUS .......... $ 8,082,810.99

EARNED SURPLUS AT DECEMBER 31, 1938 ........................................... $19,061,504.10

Less:
Adjustment of royalties payable in respect of prior years (less credit for Federal Income Tax thereon) .......... $ 600,000.00
Excess of cost over Stated Value of 330 Shares of “B” Preferred purchased and retired .................................................. 20,971.26

Deduct:
Dividends—
On Convertible First Preferred ............. $ 3,152,895.84
On “B” Preferred ................................ 68,321.25
On Common .................................... 2,770,791.60

TOTAL DIVIDENDS ........................................ 5,992,008.69

EARNED SURPLUS AT DECEMBER 31, 1939 ........................................... $20,531,335.14

Note 1: This covers proper amortization of all patents acquired since December 31, 1928, all acquired previously having been reserved for out of Surplus prior to that date.

General Note: The operations of foreign subsidiary companies, following the practice of prior years, have been included in the consolidated statement of income and are converted into dollars at the prevailing monthly exchange export rates. The net income so included amounted to $272,858.71 after charging thereto provision for exchange adjustments to reduce net current assets of such subsidiaries to the prevailing exchange export rates at December 31, 1939.
### RADIO CORPORATION OF AMERICA

#### CONSOLIDATED BALANCE SHEET

**ASSETS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CURRENT ASSETS</strong></td>
<td></td>
</tr>
<tr>
<td>Cash in Banks and on Hand</td>
<td>$13,440,164.26</td>
</tr>
<tr>
<td>Notes and Accounts Receivable (less Reserves of $1,649,771.40)</td>
<td>16,181,298.16</td>
</tr>
<tr>
<td>Inventories (at the lower of Cost or Market)</td>
<td>14,737,488.29</td>
</tr>
<tr>
<td><strong>TOTAL CURRENT ASSETS</strong></td>
<td><strong>$44,358,950.71</strong></td>
</tr>
<tr>
<td><strong>NOTES AND ACCOUNTS RECEIVABLE MATURING AFTER 1940 (less Reserve of $55,000)</strong></td>
<td>378,132.90</td>
</tr>
<tr>
<td><strong>INVESTMENTS</strong></td>
<td></td>
</tr>
<tr>
<td>Radio-Keith-Orpheum Corporation (Note 1)</td>
<td>$6,614,434.75</td>
</tr>
<tr>
<td>Sundry Investments in and Advances to Associated and Other Companies, at Cost (less Reserve of $3,874,563.32)</td>
<td>275,004.00</td>
</tr>
<tr>
<td><strong>TOTAL INVESTMENTS</strong></td>
<td><strong>6,889,438.75</strong></td>
</tr>
<tr>
<td><strong>FIXED ASSETS</strong></td>
<td></td>
</tr>
<tr>
<td>Factories, Radio Communication and Broadcasting Stations, Warehouses, Service Shops, Offices, etc.—Land, Buildings and Equipment, at Cost</td>
<td>$82,884,051.88</td>
</tr>
<tr>
<td>Less: Reserve for Depreciation and write-down of Fixed Assets</td>
<td>51,435,907.56</td>
</tr>
<tr>
<td><strong>TOTAL FIXED ASSETS</strong></td>
<td><strong>39,901,144.32</strong></td>
</tr>
<tr>
<td><strong>DEFERRED CHARGES</strong></td>
<td></td>
</tr>
<tr>
<td>Development—Television Field Test</td>
<td>$806,947.03</td>
</tr>
<tr>
<td>Taxes, Insurance—Paid in Advance, etc.</td>
<td>1,405,102.88</td>
</tr>
<tr>
<td><strong>TOTAL DEFERRED CHARGES</strong></td>
<td><strong>2,212,049.91</strong></td>
</tr>
<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td><strong>$93,739,979.64</strong></td>
</tr>
</tbody>
</table>

**NOTE 1:** This investment, stated at cost, is represented by 555,254-1/10 shares of Common Stock and $4,485,550.21 of Ten-Year Debentures. The indicated market value thereof, based on closing New York Stock Exchange prices at December 31, 1939, was $2,970,484.35. In January 1940, upon termination of the proceedings under Section 77-B, Act of June 7, 1934, these securities became exchangeable for the following securities of the reorganized company: 44,757 shares of $100 par value 6% Convertible Preferred Stock (dividends cumulative from February 1, 1940), 316,328 shares of $1 par value Common Stock and 555,254 Option Warrants.
AND SUBSIDIARY COMPANIES
AT DECEMBER 31, 1939

LIABILITIES AND CAPITAL

CURRENT LIABILITIES:
Accounts Payable and Accruals ......................... $15,841,894.09
Common Dividend Payable (Paid Jan. 16, 1940) 2,770,791.60
TOTAL CURRENT LIABILITIES ........................ $18,612,685.69

OTHER LIABILITIES:
Notes Payable to Banks, due April 8, 1941 ................ 4,000,000.00

RESERVE FOR CONTINGENCIES (after net increase of
$124,840.75 during the year) ........................... 2,532,024.40

GENERAL RESERVE (unchanged during the year) ............ 5,441,300.79

CAPITAL STOCK:
$3.50 Cumulative Convertible First Preferred,
No Par Value—
Authorized— 920,300 shares
Issued — 900,844.8 shares
at a stated value of ................................. $14,574,441.45
(Preference on involuntary liquidation $100
per share or an aggregate of $90,084,480)

“B” Preferred Cumulative $5 Dividend,
No Par Value—
Authorized — 16,193 shares
Issued — 13,363 shares
at a stated value of ................................. 286,160.17
(Preference on involuntary liquidation $100
per share or an aggregate of $1,336,300)

Common, No Par Value—
Authorized— 18,500,000 shares
Issued — 13,881,016 shares (Note 2)
at a stated value of ................................. 27,762,032.00

TOTAL CAPITAL STOCK ................................. 42,622,633.62

EARNED SURPLUS ........................................ 20,531,335.14

TOTAL LIABILITIES AND CAPITAL ....................... $93,739,979.64

NOTE 2: The common shares shown above as issued include 27,048 shares reserved
for issue to stockholders of predecessor company.

See General Note on page 10 regarding foreign assets.
General Note with Reference to Consolidated Balance Sheet on pages 8 and 9.

Foreign subsidiary companies are, following the practice of prior years, included in the consolidated accounts. Net current assets are converted at the prevailing exchange export rates at December 31, 1939, and fixed assets at the rates prevailing when expenditures were made. A summary of the net assets of foreign subsidiaries, included in the consolidated balance sheet is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Canada, Central and South America</th>
<th>Other countries principally England and Australia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 257,103.35</td>
<td>$ 44,036.34</td>
<td>$ 301,139.69</td>
</tr>
<tr>
<td>Other Current Assets, net of current liabilities</td>
<td>2,788,001.02</td>
<td>445,466.18</td>
<td>3,233,467.20</td>
</tr>
<tr>
<td>Fixed Assets</td>
<td>1,520,452.97</td>
<td>15,747.83</td>
<td>1,536,200.80</td>
</tr>
<tr>
<td>Other Assets and Deferred Charges</td>
<td>116,188.86</td>
<td>6,466.12</td>
<td>122,654.98</td>
</tr>
</tbody>
</table>

The earned surplus of these subsidiaries (after reserve for exchange adjustments) is included in consolidated earned surplus, and amounts to $45,599.97.

There is included among the assets shown on the Consolidated Balance Sheet amounts payable in U. S. Dollars, due to domestic companies from foreign customers and governments, of approximately $3,600,000 against which, it is believed, adequate reserves have been provided and on which normal collections continue to be received.
To the Stockholders of
Radio Corporation of America:

We have examined the consolidated balance sheet of RADIO CORPORATION OF AMERICA AND SUBSIDIARY COMPANIES as of December 31, 1939, and the consolidated statement of income and earned surplus for the year 1939, have reviewed the system of internal control and the accounting procedures of the Companies and, without making a detailed audit of the transactions, have examined or tested accounting records of the Companies and other supporting evidence, by methods and to the extent we deemed appropriate. Following the practice of prior years the Companies’ methods of taking inventory were reviewed and approved by us; we satisfied ourselves as to prices and computations and made substantial physical tests of quantities at the various locations. For certain foreign subsidiaries, whose assets amount to 3.3% of the total assets, we have accepted and incorporated in the consolidated statements, after a review sufficient to satisfy ourselves as to the accounting principles followed, the audited accounts prepared by their public accountants as of November 30, 1939.

In our opinion, the accompanying consolidated balance sheet and related statement of consolidated income and earned surplus present fairly the consolidated position of the Companies at December 31, 1939, and the results of their consolidated operations for the year 1939, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

New York, N. Y.,
February 26, 1940.

[Signature]
THE CONSOLIDATED GROSS INCOME OF RCA
FOR THE YEAR 1939 WAS $110,494,398

WHERE IT CAME FROM

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>$ 56,065,201</td>
<td>50.7</td>
</tr>
<tr>
<td>Broadcasting</td>
<td>40,707,032</td>
<td>36.9</td>
</tr>
<tr>
<td>Communications</td>
<td>8,731,502</td>
<td>7.9</td>
</tr>
<tr>
<td>All Other Sources</td>
<td>4,990,663</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$110,494,398</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

WHERE IT WENT

<table>
<thead>
<tr>
<th>Expense</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Raw Materials, Supplies, Sustaining Program Talent, Rent, Sales and Advertising; Payments to Associated Broadcasting Stations; Research, Administration, and Other Operating Expenses</td>
<td>$ 57,753,632</td>
<td>52.3</td>
</tr>
<tr>
<td>Wages and Salaries to More Than 20,000 Employees</td>
<td>36,091,242</td>
<td>32.7</td>
</tr>
<tr>
<td>Depreciation and Interest</td>
<td>3,777,464</td>
<td>3.4</td>
</tr>
<tr>
<td>Taxes</td>
<td>4,789,249</td>
<td>4.3</td>
</tr>
<tr>
<td>Dividends to Stockholders</td>
<td>5,992,009</td>
<td>5.4</td>
</tr>
<tr>
<td>Carried to Surplus</td>
<td>2,090,802</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$110,494,398</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The above figures show the sources and distribution of the consolidated income for 1939 of Radio Corporation of America and its wholly owned companies.
REVIEW OF RCA OPERATIONS FOR 1939

DURING the year, Radio Corporation of America enlarged the scope and usefulness of all its services to the public and strengthened its position in every field of radio. The diversified products and services of the Company enjoyed an increasing public recognition and demand. The pioneering research and the development work carried on by RCA Laboratories again advanced the leadership of RCA.

In all its branches, radio is a highly competitive industry.

The people of the United States are served by a broadcasting industry made up of more than eight hundred local broadcasting stations. More than four hundred of these local stations are served by national and regional networks. These network facilities provide a competing and varied program service to the entire nation. The American system of broadcasting not only helps to maintain our essential democratic freedoms, but also provides American listeners with the finest and most varied programs available anywhere in the world.

Radio communication companies compete not only with one another, but with the cable companies, for international telegraph business.

In radio receivers, the public is given a wide latitude of choice—in models, styles, and prices—by a large number of competing manufacturers. In 1939, in spite of higher costs, the radio manufacturing industry passed along to the public the results of technical advances, in terms of greater values and lower prices than ever before.

More radio sets are now in use in the United States than in all the rest of the world combined. With some 45,000,000 receivers in American homes and automobiles, radio is more than ever an integral part of our national life.

Broadcasting

The year 1939 was marked by extraordinary achievements in the public service of broadcasting.

The war, and its threat to the neutrality of the Western Hemisphere, put the American system of free and private enterprise in radio to the test. American broadcasting met that test, and impartially presented the facts to its listeners at home and throughout the world. To foreign listeners, American short-wave broadcasts were almost the only factual and uncensored source of radio news.

The broadcasting service of RCA, the National Broadcasting Company, led all American broadcasting organizations in the completeness and promptness with which it covered important European events of 1939.
NBC reaches practically all American radio homes through its two nationwide networks — the Red and the Blue. At the year-end, NBC networks served a total of 181 local stations, of which ten are owned by the company and 171 are owned by others. NBC also serves a worldwide foreign audience by short wave, through its International Division.

An increase in the volume of business handled by NBC, by which the nation’s advertisers stimulated the distribution of their products, enabled the company to carry on an expanded service in all fields of broadcasting. In conformity with its policy of providing the highest type of programs, NBC, for the third successive year, presented the concerts of the NBC Symphony Orchestra, under the direction of Maestro Arturo Toscanini and other noted conductors. For the ninth consecutive season NBC presented the Saturday afternoon performances of grand opera from the stage of the Metropolitan Opera House in New York. Dr. Walter Damrosch, dean of American conductors, continued his direction of the NBC Music Appreciation Hour for the twelfth successive year.

The National Farm and Home Hour completed its eleventh year of continuous service to American agriculture. America’s Town Meeting of the Air, in its fifth year, was again the leading radio forum of the nation.

Many representative organizations, government officials, and other leaders of American thought broadcast to the public over the NBC networks.

The complete coverage of news, religion, government, education, agriculture, labor, music, plays, and public forums, represented by these free public service programs, gives to NBC the distinction of leadership in the broadcasting industry, and serves to maintain the public interest in radio. NBC provides a substantially greater number and a wider variety of free public service programs than are supplied by any other broadcasting organization in the United States.

Again in 1939, NBC networks broadcast the great majority of the most popular programs, as determined by independent surveys and program popularity polls conducted by leading newspapers, trade journals, and research organizations.

The International Division of NBC continued its development of short-wave program service to Central and South America and Europe, through Stations WRCA and WNBI, on frequencies of 9670 kc. and 17,780 kc., respectively. These international programs for the first time were made available to advertisers, to promote international goodwill and the commerce of the United States. Short-wave programs from the United States now enjoy preference among Latin American listeners, because of their entertainment value and freedom from censorship. NBC short-wave international programs are on the air 16 hours a day.
From 9 A.M. to 4 P.M. they are directed to Europe, in the English, Spanish, Portuguese, Italian, German and French languages. From 4 P.M. until 1 A.M. they are directed to Latin America, in Spanish, Portuguese, and English.

Two important factors indicate that 1940 should be a year of increased public interest in broadcasting. One is the international situation. The other is the presidential campaign in the United States.

**Manufacturing**

The RCA Manufacturing Company did an increased volume of business in the manufacture and sale of all types of radio and sound equipment. An attractive line of radio receivers, phonographs, and radio-phonographs enabled this company to realize a substantial share of the industry's total sales in all price classes. The company continued to hold a leading position in the radio tube field, with a substantial increase in the sale of metal tubes.

The upward trend of public demand for recorded music was substantially accelerated in 1939. RCA research has contributed vital improvements to records and record-players; radio broadcasting and all forms of advertising and promotion have greatly stimulated their sale.

Several new types of radio transmitters were developed and marketed for aviation, police, television, and other radio services for operation on ultra-high frequencies.

New analyzing and testing equipment was introduced for use in radio service work, and apparatus was produced for use in various industrial fields. In the field of commercial sound, the RCA Manufacturing Company produced and sold various new types of recorders, power amplifiers, and loudspeakers and sound systems for schools and auditoriums. RCA built and sold the principal sound equipment used at both the New York and San Francisco World's Fairs.

There were important new developments in standard-size motion picture Photophone equipment. A new 16-millimeter sound motion picture projector for home, school, and other non-theatrical use was placed on the market.

Among the new RCA tubes introduced in 1939 were Kinescopes and amplifier tubes for television, tubes for amateur use, and photo-electric tubes.

RCA Manufacturing Company entered the general field of toys and novelties during 1939 by making available a "sound effects" kit, and an electronic kit with which a variety of interesting experiments can be performed.

**Communications**

RCA's radio communication services, vital to national defense and commerce, maintained direct service with 45 countries, and between 12 cities of the United States. In 1914 such radio service was nonexistent, and this country's international communications were dependent upon cable facilities, which were to a large
extent controlled by other nations. Since no censorship by intervening countries is possible in radio, today's facilities guarantee the freedom of communication lanes for a direct flow of international messages to and from the United States.

R.C.A. Communications, Inc., handles a substantial share of all communication business between the United States and foreign countries. The outbreak of war in Europe brought to this company an increase in traffic during the last four months of 1939. Through its facilities also, daily broadcasts from the war zone by trained observers were brought to America, and heard throughout the country over national networks. Radio photographs from Europe and South America, received via R.C.A. Communications, have appeared practically daily in American newspapers.

The Radiomarine Corporation of America is one of the world's foremost marine services, and plays an important part in the continuing efforts to increase safety of life at sea. This company maintains 15 coastal stations, and has more than 1,000 American ships under contract for radio service. During 1939 Radiomarine received orders from about 85% of American ship owners for new radio telegraph transmitters to replace spark equipment, in accordance with international agreement.

During the year this company made available a new and improved type of radio direction finder and various types of radio telephone equipment for use on craft of all sizes, from harbor craft and pleasure boats to ocean liners. The new radio telephone equipment proved of immediate interest to tug-boat companies.

**Technical Training**

R.C.A. Institutes, Inc., maintains completely equipped schools in New York and Chicago for all phases of technical training in radio and electronics. During 1939 these schools had the largest enrollment in their history. At the year-end, more than 1,000 students were enrolled. Extensive additions were made to laboratory equipment, and television was added to courses of instruction.

**Research and Patents**

During 1939 the major emphasis of the advanced work of RCA Laboratories was upon developments in the ultra-high frequency field. Out of these investigations have come entirely new types of vacuum tubes for producing power, and for amplifying and detecting radio signals, over the vast new range of frequencies extending from 30,000 to 1,000,000 kilocycles. These higher frequencies are useful in nearly all fields of radio communication—telegraphy, telephony, sound broadcasting, facsimile, television, and marine, aviation, and police services.

Research in frequency modulation has been in continuous progress in the RCA Laboratories for more than twelve years. To solve technical problems peculiar to ultra-high frequencies, the RCA Laboratories have
drawn upon these years of research in methods of modulating radio waves. RCA engineers are engaged in experiments to determine the most desirable method of modulating ultra-high frequencies for each class of radio service.

The phenomenal development of radio is due to extensive scientific research and invention, in which RCA has pioneered and led. Modern radio apparatus embodies more patented inventions than almost any other article of commerce. RCA is the owner of many inventions relating to radio. It also has licenses to use many additional radio inventions owned by others. It places these inventions in public use through its own services and products, and it also grants licenses to competing manufacturers, who pay royalties to RCA for the use of its inventions and patent rights.

The extensive rights to use radio inventions that are employed by RCA and its many licensees have promoted the orderly and rapid development of a great new industry and the creation of much new employment for both labor and capital.

**Television**

The outstanding radio development of the year 1939 was the introduction by Radio Corporation of America of the first public service of television in the United States. Upon the opening day of the New York World’s Fair—April 30, 1939—RCA’s broadcasting service, the National Broadcasting Company, inaugurated in the New York Metropolitan area the nation’s first regular television program service. At the same time, the RCA Manufacturing Company began the sale of television receivers in this area.

Since that date, NBC has maintained a regular schedule of television programs—drama, fashion and variety shows, round table discussions, demonstrations of art, music and domestic science, sports events of all kinds, and motion pictures.

The quality of television images broadcast by NBC has shown steady improvement in brilliance and clarity. A new type of Iconoscope or pick-up tube—the “Orthicon”—was developed by RCA Laboratories and tested with great success by NBC. This type of Iconoscope, far more sensitive than any heretofore employed, and requiring less brilliant light on the subjects televised, will be available to all television stations during the present year. Similarly, the latest types of television transmitters developed by RCA are available to all stations, through the RCA Manufacturing Company. RCA has licensed competing manufacturers, in consideration of royalty payments, to make and sell such transmitters, as well as television receivers.

Two important new television developments are now technically ready for public service.

One is a system of television radio relays, different from any other system so far devised, which offsets the distance limitations of ultra-short waves. This new RCA system makes
possible the establishment of intercity television networks comparable to the wire networks of sound broadcasting. This development makes it feasible to set up a radio relay system for television linking New York City, for example, with Washington, D. C., and with Boston, Mass., and other intermediate cities.

Such a network would bring television programs within reach of approximately 20,000,000 persons, or, roughly, one-sixth of the nation's population. Programs could originate, as well as be received, in any city which is part of the system.

The new RCA television relay system is a marked advance in the development of radio transmission, because of the success achieved in dealing with the wide frequency channels necessitated by television. It makes use of specially designed automatic relay stations operating on frequencies many times higher than those used by regular television broadcasting stations.

Each relay station in the new system contains both receiving and transmitting devices, mounted on a 100-foot steel tower. The system employs highly directional, or beam-like, transmission, and RCA frequency modulation developments. The radiated power required for operation of each station is less than 10 watts. The distance between relay points averages some 30 miles, and each relay station operates automatically and unattended.

The other new television development is the improved projection of large screen television images, of a size and clarity suitable for theatre presentation. Large screen television will permit the showing of current events and other programs to large audiences. The relay system described above offers a practical means for distributing television programs to theatres, whether in a single locality or in the several cities of a television network.

**World's Fairs**

RCA products and services, including interesting demonstrations of television and facsimile, were shown to millions of visitors at the RCA exhibit buildings at the New York World's Fair and the Golden Gate International Exposition at San Francisco.

RCA will reopen its building at the New York World's Fair in May, 1940, and a cordial invitation is extended to all RCA stockholders and employees to visit the exhibit this year.
TWENTY YEARS OF RCA PROGRESS
1919-1939

THE year 1939 marked the twentieth anniversary of the formation of Radio Corporation of America.

The following summary of some of the important events in RCA history is a condensed record of significant developments in the radio industry during the past two decades.

1919

Radio Corporation of America organized, in order to insure ownership in the United States of this country's international radio communication facilities. Owen D. Young was Chairman of the Board; Edward J. Nally, President; and David Sarnoff, Commercial Manager.

Marconi Wireless Telegraph Company of America assets and business taken over by RCA.

First successful effort to end the patent deadlock which existed in the United States, thereby enabling radio to go forward. This was finally accomplished by cross-license agreements made between RCA and other owners of important patents in the radio field.

1920

Commercial long distance radio telegraph communication between the United States and foreign countries inaugurated by RCA. International radio telegraph communication services established between the United States and Great Britain, Hawaii, Japan, Norway, Germany, and France. These international communications have been steadily expanded, and the system now consists of direct circuits with 45 foreign countries, and between 12 cities of the United States.

1921

Vacuum tubes for operation from storage batteries, the first tubes bearing the RCA trademark, were manufactured. Vacuum tubes for dry cell batteries were developed.

RCA's first broadcast station, WDY, opened at Aldene, N. J.

International radio telegraph transmitting station established at Rocky Point, L. I., N. Y. and receiving station at Riverhead, L. I. (These stations continue to be RCA's main stations for transoceanic communication.) RCA established direct control of Rocky Point and Riverhead stations from its central operating office in New York City, obviating double handling of messages.

First commercial marine vacuum tube transmitting apparatus installed in the RCA station at Marion, Mass.

Medical advice without charge for the benefit of persons ill or injured on ships at sea first offered by RCA through cooperation of U. S. Public Health Service and Seamen's Church Institute of New York.
1922

High powered vacuum tube transmitters successfully employed in transoceanic communication.

RCA set up nation-wide distribution system and began merchandising of radio broadcast receiving sets and tubes for home use.

Began conversion of spark transmitting apparatus on ships to vacuum tube operation, and equipped ships with vacuum tube detectors and amplifiers, thereby greatly increasing the range of marine communications.

1923

Major General James G. Harbord elected President of RCA.

Broadcast stations WJZ and WJY in New York, and WRC in Washington opened by RCA.

RCA inaugurated a high power, long distance press service to ships at sea, available to vessels over a radius of 4,000 miles.

Frequency control of transmitters by means of quartz crystals employed by RCA.

1924

RCA made pioneer experimental transmission of radio photographs across the Atlantic.

Marketed the first radio receiver for use with a standard phonograph to provide a combination radio-phonograph.

Established direct radio telegraph service with South America, employing short waves.

Superheterodyne receiving set introduced for broadcast reception.

Broadcasting first used in national political campaign. Republican and Democratic conventions were broadcast.

RCA commenced payment of dividends to its Preferred stockholders.

1925

First international broadcasting program received from England via RCA and rebroadcast to American audiences through WJZ.

High power broadcasting station WJZ, replacing WJZ transmitter in New York, erected at Bound Brook, N. J.

RCA marketed radio broadcast receiving sets with battery eliminators, affording complete AC (lighting circuit) operation.

Dynamic loud speaker introduced.

Apparatus introduced for recording and reproducing phonograph records electrically.

Ships equipped with RCA radio direction finders.

1926

National Broadcasting Company organized to provide national program service, available to broadcasting stations throughout the country.

NBC Advisory Council established, representing education, religion, labor, agriculture, and industry, to guide the company's public policies.

NBC's official opening program broadcast November 15.

First NBC ("Red") network organized with WEAF, New York, as key station.
RCA, through the application of short waves to marine communication, maintained direct contact with a ship around the world.

RCA inaugurated commercial facsimile (radiophoto) service between New York and London.

1927
Second NBC ("Blue") network organized with WJZ, New York, as key station, to provide additional independent stations with national programs, and to give the public a choice of national programs.

Alternating current receivers utilizing AC tubes introduced.

Sound-on-film talking motion pictures successfully demonstrated.

Radiomarine Corporation of America organized to operate in marine communication field.

1928
RCA introduced improved types of superheterodyne radio broadcast receivers with automatic volume control, using dynamic speakers and AC tubes.

Marketed broadcast transmitters up to 50 kw. capacity.

Began experimental television transmissions with mechanical system employing 48 lines per picture.

Diversity system for short wave international radio telegraph reception given extensive commercial applications.

Centralized radio distributing system introduced to give multiple outlets for radio reception in schools, apartment houses, hotels, etc.

1929
R.C.A. Communications, Inc., organized to carry on RCA's international radio communication services.

Screen grid tubes made available by RCA to the radio industry and the public.

Demonstration of an all-electronic television receiver using a special cathode-ray tube called the Kinescope.

Victor Talking Machine Company acquired by RCA.

1930
Major General James G. Harbord, President since 1923, elected Chairman of the Board; David Sarnoff, Vice-President since 1922, elected President of Radio Corporation of America.

Research, engineering, manufacturing and sales operations were consolidated. Through this unification RCA became the manufacturer of the products it sold to the public, and also the sole owner of NBC and other subsidiaries.

RCA License Laboratory established to render technical service to licensees.

Radiomarine Corporation of America demonstrated use of radio facsimile transmission for sending pictures and printed messages to ships at sea.

1931
RCA began a field test, continuing through 1932, of a television system employing mechanical scanning at transmitter, and cathode ray reproduction in receiver. Ultra-high
frequencies were employed for transmission. Picture frequency 24 frames a second and definition 120 lines to the picture.

Demonstration of electrical types of musical instruments, using radio vacuum tubes and loudspeakers.

R.C.A. Communications, Inc., and Western Union Telegraph Company effected a service arrangement, providing for collection and distribution of RCA radiograms by Western Union local offices throughout the United States.

Ultra-high frequency radio telephone developed and installed by RCA to link land-line systems of the Hawaiian Islands in an inter-island telephone service.

Transpacific telephone service connected Hawaiian Islands with United States mainland.

Introduced radio system for emergency use on life-boats.

RCA introduced to the motion picture field a system of noiseless recording, and a low-cost sound picture reproducer for direct AC operation.

1932

The General Electric Company and the Westinghouse Electric and Manufacturing Company, which held more than one-half of the stock of the Radio Corporation of America, disposed of their holdings by distribution to their own stockholders, and their representatives retired from the Board of Directors of the RCA. The stock of RCA is now owned by nearly a quarter of a million stockholders.

The ribbon type high fidelity microphone, for pick-up of broadcast programs as well as the recording of sound motion pictures and phonograph records, was announced.

Automatic typewriter adapted by R.C.A. Communications, Inc., for radio transmission.

Self-contained, portable, ultra-high frequency radio telephone and telegraph transmitter of knapsack dimensions developed for broadcast pick-ups.

Automatic repeater or relay station for ultra-high frequencies successfully operated.

Multiplex operation of a single transmitter, providing several separate telegraph channels simultaneously over one radio circuit.

1933

RCA developed small "acorn tube" for ultra-high frequency use.

Field test of first all-electronic system of television. This employed the Iconoscope, or electric eye of television, for scanning. Picture definition was increased to 240 lines, with a picture frequency of 24 frames a second.

Television programs first successfully relayed by radio, pictures being transmitted from New York City to Camden, N. J., with one intermediate radio relay—a total distance of about 90 miles.

Improved mobile short wave transmitter, capable of maintaining constant two-way communication, was developed by NBC.
Improved short wave relay apparatus for broadcasts from aircraft and similar uses introduced.

RCA moved its headquarters to Radio City, New York, and NBC opened world's largest broadcasting studios in RCA Building.

1934

RCA introduced multiple-band receivers for direct home reception of international programs.

RCA Laboratories employed 3,000 megacycle frequencies (10 centimeter waves) to communicate a distance of 20 miles.

New "inductor" type microphones were introduced for improved pickup of outdoor broadcasting programs.

R.C.A. Communications, Inc., established its inter-city radio telegraph service in United States.

1935

Radiomarine developed an automatic "SOS" alarm for use on vessels not having an operator constantly on watch.

All-metal tubes for service in home receivers and other applications marketed.

RCA Laboratories demonstrated "electron image tube," for use in biological and physical microscopic research, as well as in astronomy and other fields.

Electron multiplier tube demonstrated, making possible amplification of the order of millions of times within a single small device.

1936

RCA reorganized its capital structure, and improved the position of its Common stockholders by clearing up all accruals of preferred dividends and by substantially reducing the annual preferred dividend requirements ahead of the Common stock.

RCA Laboratories began high-definition all-electronic television field tests, 343 lines per picture and 30 frames per second.

RCA introduced a new method of recording for sound motion pictures, employing ultra-violet instead of visible light.

The first ultra-high frequency automatic relay circuit was opened by R.C.A. Communications, Inc., between New York and Philadelphia. This circuit permitted simultaneous transmission of one facsimile and multiple telegraph messages.

R.C.A. Communications, Inc., introduced a 200 kw. short wave radio-telegraph transmitter.

1937

The NBC Symphony Orchestra, the first full-size symphony orchestra devoted exclusively to radio broadcasting, was organized, and gave its first performance on the air on November 2 under direction of Maestro Arturo Toscanini.

NBC extended its international short wave broadcasting service, placing it upon a regular schedule of 16 hours per day, with programs in six different languages.

RCA television was increased in definition from 343 to 441 lines to the picture, providing practical standard for public service.

RCA mobile equipment for television pick-up developed.

In addition to paying regular preferred dividends, RCA paid the first dividend to its Common stockholders. This dividend was 20 cents per share on 13,853,415 shares of Common stock outstanding. The total of these preferred and common dividends amounted to $6,005,160.

1938

Field tests made of RCA radio broadcast facsimile system.

Television transmitters of various powers designed, and offered commercially.

First motorized television pick-up unit put into operation by NBC.

A "pick-me-up" portable battery receiving set marketed.

NBC brought to radio listeners throughout the world the first news of the entry of German troops into Austria, and of the signing of the Munich Pact.

Announcement made, October 20, that public television program service would be inaugurated, and receiving sets sold, in New York area in April, 1939.

RCA paid its regular preferred dividends, and a dividend of 20 cents per share on its Common stock. The total of these dividends amounted to $5,993,467.

1939

NBC inaugurated the first regular public television program service in the United States by televising the opening ceremonies of the New York World's Fair, April 30, 1939.

RCA marketed four models of television receivers for use in the home.

NBC broadcast first news of signing of German Russian pact (August 23), text of German rejection of British terms, and news of sinking of "Athenia" (September 3), first broadcast from Montevideo describing arrival of "Graf Spee" (December 14), and eyewitness description of its sinking (December 17).

R.C.A. Communications, Inc., improved system of transmitting "Radiophotos" between the United States and England, affording increased speed of transmission and picture clarity.

RCA maintained comprehensive exhibits at New York and San Francisco World's Fairs, showing virtually every application of radio, including television.

RCA Laboratories demonstrated ultra-high frequency television relay system, with automatic relay stations.

On October 17, RCA's twentieth anniversary, television signals were received from New York in a plane of the United Air Lines 20,000 feet above Washington, D. C., at a distance of 200 miles.

RCA paid its regular preferred dividends, and declared a dividend of 20 cents per share on its Common stock, which was paid January 16, 1940. The total of these dividends was $5,992,009.
THE products and services of the Radio Corporation of America are provided by the following divisions and wholly owned companies:

RCA MANUFACTURING COMPANY, INC.

RCA Victor Radio Receivers
Radio Tubes
Broadcasting Transmitters and Studio Equipment
Television Receivers, Transmitters, and Studio Equipment
Equipment for Radio Communication and Facsimile Systems
Aircraft and Airport Radio Equipment
Radio Laboratory and Test Equipment
Equipment and technical services for the U. S. Government

Phonographs and Radio-Phonograph Combinations
RCA Victor and Bluebird Records
Photophone Sound Equipment for Motion Picture Studios and Theatres
Public Address Systems
Sound Systems for Educational and Industrial Uses
16 mm. Motion Picture Projectors for Educational and Home Use
Radio Equipment for Amateur Operators

NATIONAL BROADCASTING COMPANY, INC.

National “Red” Network
International Broadcasting Service
Artists’ Service

National “Blue” Network
Television Program Service
Recorded Program Service

R.C.A. COMMUNICATIONS, INC.

International Radio Telegraph Service between United States and 45 Countries
International Radio Program Transmission

Domestic Radio Telegraph Service between 12 leading cities in the United States
International Radiophoto Transmission

RADIOMARINE CORPORATION OF AMERICA

Radio Telegraph Service between Ships and Shore
Radio Direction Finders

Marine Radio Telegraph and Telephone Transmitting and Receiving Equipment
Automatic Radio Alarms

R.C.A. INSTITUTES, INC.

Technical Instruction in New York and Chicago, in Radio, Television, and Electronics

Publication of Scientific Papers on Radio and Television subjects, through RCA Institutes Technical Press

RCA LABORATORIES AND PATENT DEPARTMENT

Research and Advanced Development in Radio, Television, Electronics, and Recording and Reproduction of Sound

Administration of Patents and License Agreements. Laboratory and Technical Service to Licensees.

To send a radiogram from any city in this country to any point outside the United States, between cities served by the RCA inter-city service, or to a ship at sea, it is necessary only to mark the message “Via RCA,” and to file it at any office of R. C. A. Communications or Western Union.

For information concerning RCA products, address the RCA Manufacturing Company, Inc., Camden, New Jersey. For information concerning RCA services, address Department of Information, Radio Corporation of America, RCA Building, 30 Rockefeller Plaza, New York, N. Y.