

RADIO AGE

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RADIO CORPORATION OF AMERICA
ELECTRONICS FOR LIVING

Radio Age

RESEARCH • MANUFACTURING • COMMUNICATIONS
BROADCASTING • TELEVISION

JANUARY 1957



COVER

A scene from Moussorgsky's "Boris Godounov," starring Boris Christoff, was one of the highlights of "Festival of Music," color Spectacular on NBC's "Producers' Showcase"

NOTICE

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RADIO CORPORATION OF AMERICA

RCA Building, New York 20, N. Y.

DAVID SARNOFF, *Chairman of the Board*
JOHN Q. CANNON, *Secretary*

FRANK M. FOLSOM, *President*
ERNEST B. GORIN, *Treasurer*



Color television sets in production at the RCA Victor plant in Bloomington, Indiana.

RCA Sales Again Top Billion-Dollar Mark

Sarnoff, in Year-End Statement, Puts Total at \$1,125,000,000 for 1956

With Net Profit After Taxes Estimated at \$40,000,000

FOR 1956, business volume of the Radio Corporation of America totaled approximately \$1,125,000,000 — an increase of about six percent over 1955 and a figure exceeding the billion-dollar mark for the second time in RCA's 37-year history — Brig. General David Sarnoff, Chairman of the Board of RCA, announced in a year-end statement.

"While final figures for the year are not yet available, and are subject to final audit," said General Sarnoff, "it is estimated that profit, before Federal Income Taxes, will be about eighty million dollars. Net profit after taxes is estimated to be about forty million dollars. After preferred dividends, this is equal to approximately \$2.60 per common share. This compares with \$3.16 a share earned in 1955.

"The decrease in profit in 1956 was caused mainly by higher costs of labor and materials and the lower prices at which black-and-white TV sets and tubes were sold in a highly competitive market."

General Sarnoff said dividends to stockholders declared for 1956 amounted to \$23,981,000 (preferred, \$3,153,000; common, \$20,828,000). This amounts to \$1.50 per common share. The number of common shares outstanding is 13,850,000. RCA employment totaled 83,000 persons, and of that number 8,000 are employed overseas.

He said Government business accounted for 20 percent of the total and the current backlog of Government orders is approximately \$325,000,000. During 1956, RCA spent nearly \$60,000,000 on improvements and expansion of facilities, he asserted.

Color Television

General Sarnoff recalled that throughout the year under review, many statements have been made publicly about the status of color television in the United States.

"Some of these," he said, "were made by well-intentioned people interested in the progress of a new art and the promise of a new industry. Others were made by those whose objective is to retard the progress of color television in order to serve their short-term purposes. In every pioneering industry there are those

who prefer to see the other fellow undertake the risks of initial investments and do the spade work while they watch and wait. Sometimes they even try to impede the progress of the pioneer.

"For RCA, which has pioneered in world-wide radio communications, in radio broadcasting, in black-and-white television, in electronics and compatible color, such man-made roadblocks do not represent a new experience! We recall, for example, that when RCA pioneered and established black-and-white TV, there were those in the industry who labelled us as 'Tele-visionaries' and the head of one company asserted publicly that 'television is economically so unsound that it will never succeed.' As late as 1946, an officer of the same company testified before the Federal Communications Commission, 'We are not making and do not plan to make any black-and-white receivers.'

Answer to Critics

"But several years later, after RCA had demonstrated, beyond peradventure, the great success of TV and that the public embraced it eagerly, these same folks jumped on the bandwagon.

"History often repeats itself, and I suspect that the same pattern will emerge in color TV as did in black-and-white TV. Today, we hear arguments in some quarters that it will be years before color can reach the stage of profitable operations, etc. Moreover, some other irresponsible statements have been made that in its efforts to establish and promote color television as a regular service to the public, RCA has, this year, poured untold millions of dollars into this undertaking.

"Although it is unusual for a private corporation engaged in a highly competitive enterprise to disclose figures relating to a new segment of its business," said General Sarnoff, "I feel, nevertheless, that the interests of RCA stockholders, and the industry generally, would be constructively served if the record of the actual facts of the situation were made public. Accordingly, here is the record, and here are the facts.

"RCA introduced, for the first time, simplified large-screen 21-inch compatible color TV receivers for the fall of 1955. During the remaining few months of



RCA Victor's Mark III high fidelity instrument features AM-FM radio, 4-speed record changer in luxurious cabinet.

that year, a small quantity of these sets was produced and sold; the major portion was sold in 1956. To date we have sold and delivered 102,000 of these 21-inch color sets. During this period we also sold and delivered color picture tubes, color components and equipment. The total factory billing price of all these color sales amounted to approximately \$58,000,000.

"After accounting for this year's costs of color developments and improvements, the extra costs of training personnel, of advertising and promotion campaigns involved in launching a new product and service, and the costs of providing color programs on the air, the net loss (after Federal taxes) of all RCA color activities for 1956 amounted to approximately \$6,900,000. This is certainly a reasonable expenditure to lay the foundation for a business that promises substantial profits in the near future.

"Such 'starting up' expenditures are inescapable for anyone who would pioneer and lead the way in a new field. The first year's efforts to tool up and mass produce automobiles, or black-and-white television sets, and bring them to the market also entailed losses. But the subsequent years produced handsome profits that more than made up for the earlier losses. Moreover, a position of leadership was established in the industry for the organization that pioneered.

"In color television, as in black-and-white, there

was the additional requirement to provide programs on the air before sales of receiving sets could be made, and the need to build up a reasonable circulation before advertising sponsors could be attracted to the new medium.

Color TV Outlook

"As we enter 1957," continued General Sarnoff, "the question is — What will the New Year bring? I believe that it will bring increased color television — more color programs will be broadcast and more people will buy color sets for their homes. Also, color television will expand in many fields of usefulness in addition to broadcasting; for example, medical, industrial and educational TV as well as for closed-circuit theatre-TV, sales presentations, and inter-department store shopping.

"The year 1957 will witness acceleration on all fronts of color TV as a new dimension in entertainment, education, news and sports, as well as advertising and merchandising. And because of the progress we achieved in 1956, it seems reasonable to expect that some other manufacturers will follow us and enter the color TV field before long. Competition in color programs and in sales of color sets will stimulate sponsorship and accelerate growth of the industry.

"RCA's goal for color television in 1957 is to produce and sell 250,000 color sets, to double the number of color programs on the air, to attract sponsors to the new and productive medium, and to encourage others in the industry to enter the field.

"Barring unforeseen circumstances, we expect on this volume to earn, during the second half of 1957, a modest profit on the color sets and color tubes we sell. Thereafter, profits from operations in all branches of color TV should be substantial.

"RCA is firmly convinced that color television will provide a greater and more interesting service to the public, a profitable business for broadcasters, manufacturers, distributors and dealers, and a rewarding medium for advertisers. The future of television is in color."

National Broadcasting Company

General Sarnoff noted that the National Broadcasting Company, which was organized in 1926 as a service of RCA, observed its Thirtieth Anniversary in 1956. He continued:

"Its avowed purpose was 'to provide the best programs available for broadcasting in the United States,' and the hope was expressed that every event of national importance might be broadcast throughout the nation. The NBC has steadily adhered to that premise both in radio and television. Eight national political campaigns



RCA Wayfarer portable TV has convenient side tuning.

have been broadcast by the radio network and five have been on TV. The second inauguration of President Eisenhower on January 20, 1957, will be broadcast on a world-wide basis.

"Measured by the quality of its programs and financial results, NBC made its thirtieth year the greatest year in its history."

Research Achievements

In looking ahead to 1957, it is helpful to consider what transpired in research and engineering in 1956, General Sarnoff said. He pointed out that for instance RCA scientists, on October 1, 1956, demonstrated the following new developments and several unique applications including:

A magnetic tape recorder for both color and black-and-white TV for broadcast use.

A home "Hear-and-See" magnetic tape player which plays television programs, or phonograph records which are recorded on magnetic tape, so that they can be seen as well as heard through standard television receivers.

A room cooled or heated by electronic panels, operating in complete silence and with no moving parts.

An electronic amplifier of light which amplifies by up to 1,000 times the brightness of projected light; and an application of it in the form of an amplifying fluoroscope for industrial X-ray use.

"In time," said General Sarnoff, "these developments will find their way to the market place. They will serve the public, benefit industry and open immense fields for

further exploration and invention. RCA engineers and merchandisers are studying the commercial aspects of these inventions, all of which hold great promise."

Electronics For Defense, Home, Industry

General Sarnoff said that during 1956 RCA undertook various new electronic projects related to guided missile weapon systems, electronic controls for jet aircraft, fire-control systems, airborne communications and air traffic control.

He listed the following results of RCA's continued research and engineering: Weather radar for commercial airlines and smaller planes, transistors, electronic computers, stereophonic sound, increased popularity of high fidelity phonograph records, expanded traffic over RCA's global radiotelegraph network and extension of TEX, RCA's international customer-to-customer teleprinter exchange service.

In summing up RCA's objectives, General Sarnoff declared: "RCA is engaged in the fullest possible development of electronics as a science, art and industry. We are dedicated to continued pioneering and research, and to the engineering and production of instruments and systems of quality, dependability and usefulness. RCA strives to contribute in every possible way to the national security of the United States, to the progress of industry generally, to the advance and improvement of services to the public, and to the pre-eminence of this country in international communications.

"There is the most vigorous competition in all fields of the Corporation's activities and this is a healthy sign of the promise of the art and industry in which we are engaged. RCA's objective is to meet the competition successfully, to earn a reasonable return on its investment, to safeguard the interests of its employees and stockholders and to fulfill its responsibilities to the nation and the public."



RCA Victor all-transistor portable radio.

Folsom Sees Opportunities to Increase Business

CHANGING SALES and distribution patterns in American marketing — strongly apparent in 1956 in the highly competitive radio-television and electronics industry — will continue into 1957 and will represent a major factor in providing opportunities to increase business volume, Frank M. Folsom, President of the Radio Corporation of America, declared in a year-end statement.

"The shift in selling, largely at the dealers' level, features greater concentration on brand-name merchandise to build business and create new customers," said Mr. Folsom. "The question — 'What's in a name?' — is being answered convincingly and repeatedly by increased sales volumes of well known brands, distinguished for quality, dependability and service.

"The American public's faith in brand name products and in advertising will remain firm and unshakable just as long as they stand the test of experience, that they are as good as we say they are. Quality and value — these are the cornerstones upon which brand name products firmly rest. The brand name products we manufacture today have a heritage that in most instances goes beyond our own span of years. As manufacturers we are entrusted with the responsibility of maintaining and advancing that product heritage.

Industry's Sales At All-Time High

"These trends had a marked effect on merchandising in 1956 — a business year in which sales volume for the electronics industry as a whole established an all-time record of more than \$11.3 billion."



Mr. Folsom said that "steadily and progressively, color TV is taking hold." He added:

"We continuously note increased interest in color on the part of the public, dealers, competitive manufacturers, broadcasters and sponsors. Color television sales are on the increase in many of our markets. More and more dealers are enthusiastically and aggressively behind color as one of the newest, most promising items to be sold.

"Color quality is excellent. Owners of color sets are highly pleased with their purchase and with the increasing amount of color programming. An extensive survey of color TV set owners confirms this fact."

Phonographs, Records and Radios

The phonograph record business, Mr. Folsom said, is "on the ascendancy," with strong indications that its growth will continue. He listed four main factors responsible for this: (1) more families are seeking home entertainment; (2) the teen-age population, comprising millions of record fans, is rising sharply; (3) more "Victrola" phonographs are being sold as the "45" record-player, the three-speed line and high fidelity (hi-fi) continue to boom; (4) retail outlets for records are expanding. He reported that RCA Victor's record sales for 1956 increased sharply over 1955, with the increases scored in every classification of music.

Mr. Folsom said sales and profits of RCA Victor radios, "Victrola" phonographs and tape recorders made a marked gain in 1956.

"The expanding use of transistors in radio sets provides a base for continued interest on the part of the consumer for the purchase of new radios," he said. "RCA Victor's introduction of high-performance, low-cost, transistor radios provides for a depth of penetration in the market never before possible. In 1956, RCA Victor more than doubled the number of high fidelity instruments sold during 1955. Our sights are set on 1957 for a similar increase. In addition, the tape recorder field represents a new and growing business."

Relative to the future, Mr. Folsom said: "Based upon an analysis of basic economic indicators, the RCA Economic Planning Department forecasts the economic outlook for 1957 as favorable, assuming, of course, that the United States will not become involved in war."

RCA color TV brings a new dimension of entertainment into the home, and reaction has been highly favorable.

The NBC Story: 30 Years of Network Service



Scene from "The Barretts of Wimpole Street," starring Katharine Cornell and Anthony Quayle, shows elaborate setup required for one of NBC's color television productions.

THE NATIONAL BROADCASTING COMPANY celebrated its 30th anniversary as a radio network at a convention of affiliates at the Americana Hotel, Bal Harbour, Miami Beach, Florida, the week of December 10. Both radio and television affiliates participated, for in the intervening years, beginning in 1939, NBC also introduced television to America.

NBC's inaugural radio program November 15, 1926 originated from New York, Chicago and Independence, Kansas. It was carried by twenty-five stations, the most that had taken part in a simultaneous program up to that time. The stations extended along the Atlantic seaboard from Portland, Maine, to Washington, D. C., and as far West as Kansas City.

Today NBC operates from coast to coast and beyond to Canada, Cuba, and Hawaii, with a radio network of 188 affiliates and a television network of 207 affiliates.

The opening program was a first in broadcasting in more ways than one. It marked the first remote pickups from multiple points. The late Dr. Walter Damrosch conducted the New York Symphony Orchestra, and with other stars, appeared from the old Waldorf-Astoria, New York. Mary Garden sang from Chicago and the late Will Rogers chatted from his dressing room at Independence, Kansas.

Among the other stars in that first show were pianist Harold Bauer, conductor Cesare Soderò, Edwin Franko Goldman with his band, and Ben Bernie, B. A. Rolfe, and Vincent Lopez with their orchestras.

While individual stations from the end of 1920 had provided some forms of radio shows, mainly with local talent, it was not until the appearance of the network that an important share of the nation could tune in on the big stars.

When They Started

As the years went by a parade of artists from other media started into radio, and later into television. Al Jolson made his first NBC broadcast on Jan. 4, 1928. Rudy Vallee began his NBC career a year later, and Amos 'n Andy (Charles Correll and Freeman Gosden) moved from local to network radio. Fred Allen's first radio appearance was in 1930. Two years later, Ed Wynn, Jack Benny, Jack Pearl and Groucho Marx had gone on the network either as regulars or guests. Another year and Bob Hope was a network guest for the first time. Eddie Cantor's first NBC appearance goes back to 1926.

Fibber McGee and Molly (Jim and Marian Jordan) began their long network career in 1935. Edgar Bergen



General Sarnoff introduced TV to the public on April 30, 1939, in historic pickup at New York World's Fair.

and his dummy Charlie McCarthy were introduced to the NBC audience in 1937, and the late John Barrymore appeared in a series of Shakespearean plays in that year, too.

In 1948, Milton Berle headed the group of stars attracted by the bright lights and prospects of television, and quickly won the title of "Mr. Television." Television soon began developing other stars, many of whom it could call exclusively its own. At the same time, TV was incorporating into its schedule the best of the radio features. Programs like "Dragnet," "People Are Funny," and "Your Hit Parade" gained greater popularity than ever through the new medium.

From the day of its inaugural broadcast, NBC has sought to adhere to a policy of presenting "the best programs available for broadcasting in the United States." The network has been consistent in covering entertainment, news, education and politics, among other topics. At the same time, through its capacity as a significant national advertising medium, it has enabled its affiliates to carry programs that would be economically, if not physically, impossible for the individual station to provide on its own.

Political Conventions Since 1928

In politics it has broadcast in detail every Republican and Democratic convention since 1928, with television making its first appearance in 1940 at the Republican convention in Philadelphia. The network also has consistently reported returns of every national election since its 1926 formation. As an essential part of its political

service, NBC from the beginning has made its facilities available to the various parties for campaign purposes, with television playing an ever-increasing role as the size of its audience grew.

Significant from the beginning was the radio concentration on educational features such as the "Music Appreciation Hour" for younger listeners which Dr. Damrosch conducted. It began Oct. 26, 1928. The music hour was preceded on Oct. 2 of that year by the first NBC relay of "The National Farm and Home Hour," still a regular radio feature. The latter program is in its 29th year.

Actually NBC's oldest program is "The National Radio Pulpit," which started on the network June 3, 1928, after having been broadcast locally in New York since May 6, 1923. Another long-running religious feature still on the air is "The Catholic Hour," which opened March 2, 1930. "Eternal Light," representing the Jewish faith, is in its fourteenth year.

In the first NBC decade it became sharply apparent that network radio was offering an important means of providing close contact between the people and their government. For instance, President Roosevelt was heard on NBC twenty times in his first nine months in office. He made his first "Fireside Chat" on March 12, 1933, eight days after taking office. His inauguration was the second to be carried by NBC, the network having described the inauguration of President Hoover in 1929.

First Inauguration on TV

The first telecast of an inauguration was President Truman's on Jan. 20, 1949, to fifteen stations in the East and Midwest. Four years later, when President Eisenhower took office, television was available coast to coast.

World War II had brought many changes in the coverage of news and special events. Listening posts were set up on each coast to serve as an "ear" for foreign shortwave broadcasts. First word of the German invasion of Russia was an official Berlin short-wave announcement.

NBC correspondents located in all parts of the world provided eyewitness word pictures of such events as the Japanese bombing of Manila in 1941, the coming of American troops to Sicily in 1943 and the landing on the beaches of Normandy, France, in 1944.

Perfected during the war was the portable tape recorder, since greatly refined. It has been a boon both to the newsgatherer and to the general broadcaster.

In the field of sports, NBC carried ringside descriptions of such famous battles as the Dempsey-Tunney "long count" fight in Chicago, Sept. 22, 1927, and the Louis-Schmeling fight from New York in 1938. Now

there is boxing every Friday night on both radio and television.

College football, including the annual Army-Navy game beginning in 1934, has been a regular fall radio feature, expanding into television as that medium added sight to the announcer's voice.

Televised World Series baseball has been on the air annually since the memorable first viewing of the New York Yankees-Brooklyn Dodgers games in 1947. The first year only four stations in the East could be hooked together, compared to the coast-to-coast array of the present day.

In the Forefront in Music

From the beginning NBC has been in the music forefront. There was that early outstanding concert series known as the "Atwater Kent Auditions." The Boston Symphony was heard on the NBC Network first in 1927.

The network was the first to conduct regular broadcasts from the stage of the Metropolitan Opera House in New York, beginning in 1931. By 1937 it had an orchestra of its own — the NBC Symphony — formed especially for broadcasting.

Brig. General David Sarnoff, who was responsible for the creation of NBC and whose keen sense of music appreciation was the inspiration behind the orchestra, persuaded the noted conductor, Arturo Toscanini, to return to America from retirement in 1937 to conduct again as maestro of the NBC Symphony. Toscanini held that post through the season of 1954, when he retired at the age of 87. The noted conductor also appeared before the TV cameras on numerous occasions — the first on March 20, 1947.

Growth of Color TV

Living color, television's newest and brightest coast-to-coast dress, has set another milestone in the 30-year history of the National Broadcasting Company.

Just as in black-and-white television, NBC has pioneered the production of color programs since the "introductory year" of 1953. Today it carries approximately 55 hours a month in special and regular shows. That total ultimately will be increased until the bulk of live programs are in color. Recently announced was a \$3,500,000 expansion program of coast-to-coast color facilities for the 1957-58 season.

As the new year began, 134 of NBC's 207 television affiliates were ready to carry network color, twenty more than a year ago. Of these, thirty were able to originate live shows in color.



Fred Allen was a radio favorite in the 1930's and 1940's on NBC.



Fanny Brice made Baby Snuggles famous on NBC radio network.



Maestro Toscanini began conducting NBC Symphony in 1937.



Jim and Marian Jordan, better known as Fibber McGee and Molly, were a radio favorite on NBC.



Comedian Eddie Cantor's first NBC appearance was in the year 1926.



Milton Berle was first major entertainer to head his own TV show.

TV Teaching Gets A Helping Hand

THE first live programming ever produced expressly for educational television stations on a national basis will be provided by the National Broadcasting Company beginning in March.

The network will furnish specialized educational programs to all of the nation's non-commercial educational stations. The programs will be produced in the NBC studios and furnished live to the educational stations over network lines.

The programming service will be provided at no charge to the stations. NBC has committed more than \$300,000 for programs, production facilities and personnel in connection with the project. The Educational Television and Radio Center at Ann Arbor, Mich., which has received funds from the Ford Foundation, is supplying the local loops to connect the educational stations with the NBC network lines and is consulting closely with NBC on the design of the programs.

The plan was announced December 13 by Robert W. Sarnoff, President of NBC, at the network's 30th Anniversary Convention in Miami Beach, Florida. In other highlights of his convention address, Mr. Sarnoff hailed color television as the "booster charge for our fourth decade," drew a hopeful picture of future network radio operations, and warned that television as a communications service will decline if the current flood of feature and syndicated film programs leads to displacement of network programs and starts a trend that results in curtailing networks' access to the air.

On NBC's educational TV plans, Mr. Sarnoff said: "These programs will be telecast during an afternoon time period which does not conflict with our regular schedule. They will also be kinescoped for repeat broadcast or subsequent classroom use, thus creating an important and enduring educational television library."

Conducted By Experts

The programs will consist of three half-hour presentations each week, with instruction in mathematics, the humanities and government. The project will extend through twenty-six weeks in 1957, beginning in March for thirteen weeks, and resuming in October for another thirteen-week period. The three program series will be conducted by experts in the fields. James R. Newman, author and editor of "The World of Mathematics," already has agreed to supervise the mathematics course.

Twenty-two non-commercial educational stations are now on the air, and it is possible that this number may be increased to twenty-six by March. The stations fall into two broad classifications — the community-type stations and those run by a single educational institution. In the first group, the general direction is provided by a board representing the various educational and cultural interests of the community. The Pittsburgh and St. Louis stations are of this kind. The second type of educational station is exemplified by those managed and directed by the University of Illinois, Ohio State University and Michigan State University. Alabama has a state-wide network administered by a state commission, with production centers at the university, Alabama Polytechnic and the Birmingham area public schools. North Carolina has a single station with programs fed in from several institutions.

Twenty-five Hours A Week

The educational TV stations operate an average of more than twenty-five hours weekly, with some of them broadcasting as much as fifty hours a week. Broadly speaking, their programs are of two kinds: those planned for in-school use, and those designed for general education of a less formal nature.

The educational stations have a potential audience



NBC President Robert W. Sarnoff speaking at Miami Beach where he announced the new educational TV plan.



Station KETC in St. Louis, one of the pioneers in educational television, will be among the twenty-two stations to receive NBC programming aid. The programs will be conducted by experts, including James R. Newman (left), editor of "The World of Mathematics."

when our project terminates at the end of 1957, its values and lessons can be carried forward in ways that will help enrich the whole future of education by television.

"Every citizen has a stake in the success with which these educational stations carry out their mission. The drastic national shortage of teachers and classrooms lends a special urgency to their efforts to build themselves into a major educational force. Those of us who live in television and who seek its full development in every area in society have a particular sympathy for the difficult problems of financing and programming which the educational stations face. In my judgment, we also have an interest going beyond that of the average citizen to lend such support as we can in solving these problems."

Approval From Educators

Leaders in education were quick to voice their approval of the NBC plan.

Dr. Grayson Kirk, President of Columbia University, said: "In formulating and carrying through this project, the National Broadcasting Company earns the gratitude of all who are devoted to the field of education."

Dr. H. K. Newburn, President of the Educational Television and Radio Center at Ann Arbor, Michigan: "We feel that this cooperative arrangement not only is an expression of your faith in the practical educational uses of the television medium, but it is in a real sense an indication of your broad interest in the educational welfare of the American people."

Dr. Herman Wells, President, University of Indiana: "I believe that the National Broadcasting Company's pioneering plan to supply live programs to the nation's educational television stations is one of the boldest and most important forward steps yet taken by television on behalf of our schools and colleges. I salute NBC for this fine public service."

Dr. Carroll V. Newsom, President, New York University: "The National Broadcasting Company's plan is an important step. I congratulate the National Broadcasting Company for its concern and interest in education via television."

Educational stations now on the air are in Alabama (Munford, Birmingham and Andalusia); California (San Francisco); Colorado (Denver); Florida (Miami); Illinois (Chicago and Urbana); Massachusetts (Boston); Michigan (Detroit and East Lansing); Missouri (St. Louis); Nebraska (Lincoln); North Carolina (Chapel Hill); Ohio (Cincinnati and Columbus); Oklahoma (Norman); Pennsylvania (Pittsburgh); Tennessee (Memphis); Texas (Houston); Washington (Seattle) and Wisconsin (Madison).

of about 43,000,000, which is larger than the regularly enrolled school population of the United States.

In addition to the twenty-two educational stations, more than a hundred colleges, universities and school systems are using closed-circuit television in their classrooms to teach everything from Milton to Marriage. Many of these closed-circuit systems have been supplied by RCA. One of the largest will be furnished for the University of Georgia's \$2,500,000 Center for Continuing Education, now in the final construction stage on the Athens, Georgia, campus. The new center will serve as a hub of adult education for the entire Southeast as well as for the State of Georgia. From its RCA-equipped television broadcast studio, the Center will also operate a non-commercial television station of the kind that will be aided under the new NBC programming plan.

"We see our twenty-six-week project as a demonstration operation," Mr. Sarnoff said. "We believe that

For Barnstorming Opera: 'Hearty Approval'

WHEN THE CURTAIN came down on the NBC Opera Company's performance in Newark, New Jersey, one night last month, the capacity crowd applauded enthusiastically. It was a rousing finale for the Company's first barnstorming tour to bring top-flight "opera in English" to cities and towns that had never seen it before.

The troupe of ninety-five singers, musicians and staff members covered more than 10,000 miles to stage fifty-four performances in forty-seven cities. There were thirty-five showings of Puccini's "Madame Butterfly," the tragic story of the beautiful Japanese girl and the American Naval Officer, and nineteen performances of Mozart's "Marriage of Figaro," the satiric comedy that epitomizes the 18th Century's light-hearted classic approach.

The Opera Company's reception was overwhelmingly favorable — in large cities like Atlanta and New Orleans and in small towns like Pittsburgh, Kansas, and Lake Charles, Louisiana. In South Bend, Indiana, floats lined the streets, bands played and the townsfolk turned out in crowds reminiscent of a homecoming celebration for a victorious Notre Dame football team.

The music critics, too, were lavish in their praise

Adelaide Bishop, Phyllis Curtin, and Ralph Herbert in scene from NBC Opera Company's "Marriage of Figaro."



of the Opera Company. "A smartly mounted, carefully cast production," The New Orleans *Times Picayune* called the NBC group's "Madame Butterfly." "The attention and the applause of the huge audience indicated hearty approval." The *Fort Worth Press* hailed the performance as "one of the highest professional caliber, beautifully staged, lighted and costumed, with colorful, stylized settings." The *Waterloo (Iowa) Courier* described it as a "magnificent performance." In Norfolk, Virginia, The *Ledger-Dispatch* said the NBC Opera Company demonstrated convincingly "that opera in English can be successful. The well matched and expert company achieved a real ensemble performance in which the English translation by Edward Eager was a particularly happy one."

"Operatic Missionary Job"

The NBC Company's objective of bringing opera to the grass roots was lauded by the critics as "a crusade of major proportions," and "a highly commendable operatic missionary job."

Bookings for next season's tour already are under way. Both of the operas in the first tour will be repeated, and a third — Verdi's "La Traviata" — will be added to the repertoire.

The producer was Samuel Chotzinoff, and the music and artistic director was Peter Herman Adler. Mr. Adler himself staged "The Marriage of Figaro," and Bill Butler staged "Madame Butterfly." Conducting honors were shared by Mr. Adler and Herbert Grossman.

Commenting on the tour, Mr. Chotzinoff said:

"When we set out on our eight-week tour of forty-seven cities, we did so with the idea that 'opera in English' was what the American public wanted and would enjoy. We felt that doing these operas in a theatrically effective way with casts of fine singers who also could act and who looked their parts, was going to bring us great success. And we are gratified that this turned out to be completely true.

"The audience laughed uproariously at the comic lines in 'Figaro' and was moved to tears by the pathos of 'Madame Butterfly.' The old idea that opera is a wedding of the arts including music, drama and decor was given living validity by our opera company. And the thousands who came to see us showed their appreciation with tumultuous applause."

Medical TV—Just What the Doctor Ordered

THE INCREASINGLY important role of television in the field of medicine is pointed up by two recent developments. One is a new application of closed-circuit TV that provides immediate comparative data of chemical activity within live normal and cancer cells. The other is the start of commercial production of the first compatible color TV camera system designed specifically for medical use.

Closed-circuit TV is one of the most dramatic of a whole host of marvelous mechanisms of electronics that are fashioning a better world for medicine. In this new era of medical electronics, conventional instruments like the stethoscope—traditional badge of the physician for more than a century—seem likely to give way eventually to diagnostic robots with years of medical skill built right in. Electronics has already provided the electron microscope, X-ray systems, the television microscope, infrared and ultrasonic equipment, and an imposing array of measuring devices such as electronic particle counters, radiation meters and electrocardiographs.

Over the years, RCA scientists and engineers have led the way in adapting electronics to the special needs of medicine, and the two new television developments are the latest of a long line of medical devices.

Television for Cell Research

The new TV technique for use in cell research was made possible by a developmental RCA ultraviolet-sensitive TV camera tube. It is now undergoing experimental examination at the National Institutes of Health, Bethesda, Maryland. The RCA ultraviolet TV system is being used with a high-power microscope and an electronic oscilloscope to obtain direct observations and oscillographic measurements of the metabolism of living cells, according to Dr. George Z. Williams, Chief of the NIH Clinical Pathology Department, and Research Pathologist of the National Cancer Institute of the NIH.

The successful application of ultraviolet television to medical microscopy and oscillographic spectroscopy, Dr. Williams said, gives promise of new speed and facility in the analysis of cells and tissue. The system introduces numerous advances in cell research:

(1) For the first time, it enables researchers to observe and take motion pictures, simultaneously, of chemical activity within living cells.

(2) It makes possible microscopic study and analy-

sis of hundreds of living cells in only a fraction of the time formerly required.

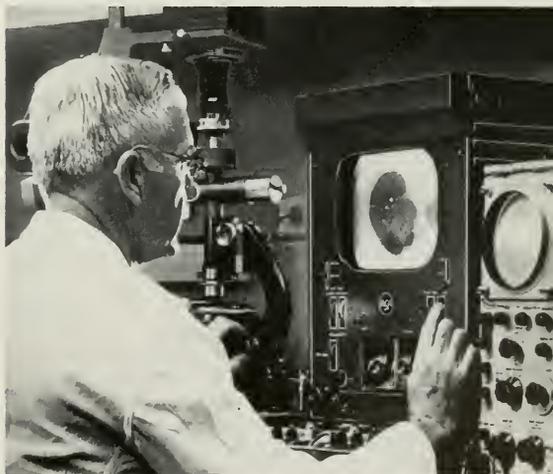
(3) It makes possible direct observation and rapid, accurate measurement and identification of certain chemical changes within the cells.

The ultraviolet television system uses a standard RCA black-and-white TV camera, a type widely used throughout the television broadcast industry. The camera's standard monochrome Vidicon tube has been replaced with the experimental RCA ultraviolet-sensitive Vidicon camera tube. The pickup tube and its circuitry were developed originally at RCA's David Sarnoff Research Center by A. D. Cope and L. E. Flory, under the supervision of Dr. V. K. Zworykin, and furnished to Dr. Williams for the cell-research program at NIH.

The National Institutes of Health is the principal research arm of the United States Public Health Service. It embraces seven research institutes, each devoted to specific medical studies, and a Clinical Center which provides patient care for the various institutes.

"The RCA ultraviolet closed-circuit TV system," Dr. Williams said, "makes it possible to obtain quick and accurate measurements of ultraviolet absorption in

Dr. George Z. Williams examines specimen on monitor of RCA TV system which provides comparative data of chemical activity in live normal and cancer cells.





E. C. Tracy and J. H. Roe examine the four-lens turret of RCA's first color TV camera designed for medical use.

healthy and abnormal cells. The ultraviolet TV camera tube sees more than the eye can discern when living cells are illuminated with visible light. The direct oscillographic analysis and record of any part of the object-image provides immediate comparative data."

Dr. Williams pointed out that previously, the study and observation of ultraviolet-treated specimens represented a long and laborious process due to the lack of a practical medium for direct observation. The ultraviolet TV camera tube developed by RCA makes practical "seeing" ultraviolet pictures by television.

The overall ultraviolet equipment chain, devised by Dr. Williams, includes an ultraviolet light source, a high-power microscope, the RCA broadcast TV camera with ultraviolet camera tube, a monitor, an oscilloscope, and various motion picture cameras for filming images on both the TV monitor and the oscilloscope.

In operation, the ultraviolet light source is focused on the specimen under the microscope. The RCA camera is mounted so that it "peers" through the eyepiece of the microscope. Sensitive to ultraviolet, it "sees" and transmits to the monitor an image of the cell and the action and reaction of its ultraviolet-absorbing chemicals, both those normal to the cell and those induced artificially or by disease.

Color TV Camera System

First units of the new color television camera system have been earmarked for the Walter Reed Army Medical Center, Washington, D. C.; Smith, Kline & French Laboratories, a Philadelphia pharmaceutical firm;

and the University of Michigan Medical School at Ann Arbor. Other orders are being accepted for delivery in the spring.

"The RCA medical TV camera has been recognized as an electronic development of major significance to medical research and education," said E. C. Tracy, Manager, RCA Broadcast and Television Equipment Department. "It makes available to the medical and educational instructor an important new classroom aid which combines the immediacy of television, the realism and detail of compatible color, and the quality performance of broadcast equipment with its own specially developed features for maximum flexibility and economy."

The medical camera is designed around three Vidicon camera tubes and special electronic circuitry which makes possible televising surgical procedures in full-color detail under normal operating-room lighting. It measures only 26 by 15 by 14 inches, weighs less than 200 pounds and, to eliminate interference with surgery or demonstrations, is designed for permanent installation in an overhead fixture which supports both camera and surgical lamp.

Mr. Tracy said that the new design approach in the medical camera provides users with numerous operating and performance advantages. It permits long periods of exposure to a single scene without danger of image burn-in, and virtually eliminates "halo" or overloading effects caused by reflections from polished instruments or wet tissue.

A Variety of Uses

Television has numerous uses in the medical field. In addition to its value in diagnosis and consultation — a use laden with rich potentialities for the future — TV may be put to work supervising an entire hospital ward from a central point. In clinics, interesting cases can be brought instantly to the attention of a large group of trained onlookers. Biopsies and autopsies can be presented to medical students.

As an educational tool, TV is invaluable in preparing the doctors of tomorrow — both physicians and dentists — to give more expert care. Dr. Albert E. Furstenberg, Dean of the University of Michigan Medical School, summed up the educational value of television like this: "The application of closed-circuit color TV to surgical instruction enables large numbers of students to 'stand' at the surgeon's shoulder, to see what he sees, to observe each precise movement of hands, fingers, and surgical instruments. In essence, color television equips the Medical School with a medium of inestimable value for providing surgical and clinical information immediately and with complete detail to large groups of students."

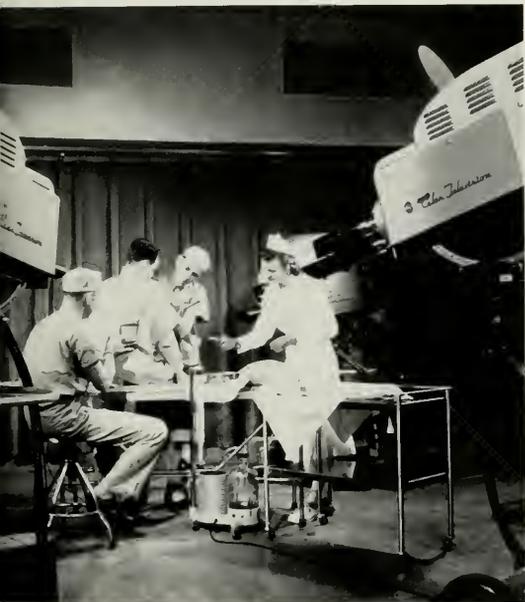
Not long ago at Philadelphia's famed Willis Eye Hospital, a specialist performed an intricate operation involving the planting of a plastic lens in the eye of a patient. In the narrow confines of the operating room, only one man at a time could have watched from nearby. But television gave a close-up view to some 300 ophthalmologists.

"Only through the eye of the camera," says the Journal of the American Medical Association, "can hundreds of persons be brought to within a few feet or inches of interesting visual material."

Early Medical TV Experiments

RCA's interest in medical television goes back to February, 1947, when it televised a "blue baby" operation at Baltimore's Johns Hopkins Hospital for more than 300 surgeons, internes and nurses in various viewing rooms in the hospital. Later the same year, RCA sent the first televised pictures of surgery through the air from the operating room of a New York hospital to receivers set up in the Waldorf-Astoria Hotel for a meeting of the American College of Surgeons. Since those experiments, RCA specialists have put on more than fifty medical television demonstrations throughout the United States and in Latin America and Europe.

RCA Victor color television cameras at the famed Walter Reed Army Medical Center in Washington, D. C.



Besides, RCA equipment — including a fully outfitted mobile television studio — has been used extensively by the pharmaceutical firm of Smith, Kline & French in its own surgical and clinical demonstrations before medical gatherings.

Advantages of Color

The early demonstrations were in black-and-white television, but in 1955, RCA introduced a compatible color TV system for medical use. Doctors agreed that the addition of color to medical television lent realism and authenticity to human tissue and areas of infection, and gave a sense of three-dimensional presentation valuable in revealing the extent and depth of lesions and incisions.

On January 19, 1955, color television of governmental-approved standards was used for the first time as a means of inter-city consultation and diagnosis. In the hush of a Philadelphia hospital, a patient lay on the operating table. The surgeon had made his incision and was awaiting a confirmation of the diagnosis by consulting specialists. Even though the consultants were more than a hundred miles away, the surgeon got his confirmation almost instantly — through the use of color television.

RCA cameras focused first on the patient, then on a magnified piece of tissue that had just been removed. More than 150 doctors examined the specimen on large-size color television receivers in Baltimore and Washington. A pathologist in Baltimore spoke up and his remarks were carried to doctors in the other two cities over the closed-circuit system. The diagnosis was discussed and confirmed, and the operation completed.

"It was like bringing 150 specialists right into the operating room," said one doctor.

Color System at Walter Reed

The most extensive color television system ever designed for hospital use is the one for the Walter Reed Army Medical Center. The system includes three separate and complete color broadcasting studios and thirty large-screen monitors. It will be used for medical instruction, research and consultation.

With this color TV system, it is possible for an operation at Walter Reed to be viewed by a specialist two blocks away at the Armed Forces Institute of Pathology, central laboratory for the Army, Navy and Air Force. If the removed tissue requires pathological examination, it can be sent by pneumatic tube to the laboratory. Then, while the surgeon watches on his TV monitor, the pathologist can prepare the specimen for slide projection and hold a two-way picture and voice consultation with the surgeon.



1. Immediately before a launching, skilled technicians check every piece of gear to make sure it is in perfect condition.



2. From the moment a missile like the Snark, shown here, is fired, its flight is recorded by optical and electronic devices.

Tracking Long-Range Missiles

DEVELOPMENT of long-range missiles has become a top priority item in our national defense program, and has focused sharp attention on Patrick Air Force Base on the east coast of central Florida. There the giant "birds" like the Snark, Navaho, Redstone and Bomarc are tested under the supervision of the Air Research and Development Command. From a scrub-covered launching area on Cape Canaveral, the missiles are fired out over the Atlantic Ocean. They are "tracked" by camera, radar, telemetry and other means along the range of islands shown on the map below, a range that will eventually be in full operation for 5,000 miles from Florida to lonely Ascension Island.

The RCA Service Company, under sub-contract to Pan American World Airways, Inc., has responsibility for the all-important technical aspects of range operations. RCA experts plan, engineer, install, maintain and operate the electronic and optical equipment used for tracking.

A single missile flight may produce as much as 50,000 feet of photographic film and more than 100,000 feet of magnetic and punched tape. Electronic devices inside the

missile itself, known as telemetry devices, radio to the ground vital information about performance. On some missile flights, telemetry alone has furnished more than 400 separate pieces of information. The data recorded by the various electronic and photographic devices cover every aspect of the missile's performance—speed, altitude at various stages, rate of climb, fuel consumption, and other factors.

Once a test flight has been completed, this vast bulk of data is processed by mathematicians and machines. The end product is a Flight Test Report of fifty to 100 pages telling how well the missile's guidance system, engine and other equipment functioned. This report is turned over to the missile manufacturer. Engineers analyze it and decide what changes to make in the missile's design.

The techniques developed for gathering and processing missile test data will be used in the Vanguard Project to track the earth satellite when it is launched from Cape Canaveral some time after next July 1. Pictures on this and the opposite page show step-by-step the various aspects of the tracking operation.





3. Missile's takeoff is recorded by as many as 75 special cameras, like this Fairchild Analyzer aimed by binocular sights.



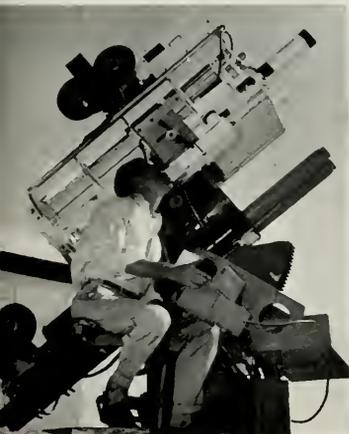
4. Huge radars at launching site begin tracking the missile, then as it moves down-range each station in turn takes over.



5. Electronic devices inside the missile send back critical data which are picked up by telemetry antennas like this one.



6. Information is sent to Operations Room where officer can destroy missile electronically if it veers off course.



As missile soars down-range, it is followed by high-speed, long focal-length cameras like this tracking telescope mount.



8. Each of the down-range stations, like Eleuthera here, is a technical outpost manned by an average of 80 technicians.



9. Data from down-range and launch area are rushed to Laboratory for processing and inclusion in Flight Test Report.

U. S. Air Force Photo



The United States pavilion at the International Trade Fair at Stockholm, Sweden, where RCA Victor closed-circuit television (right) was one of the main attractions.

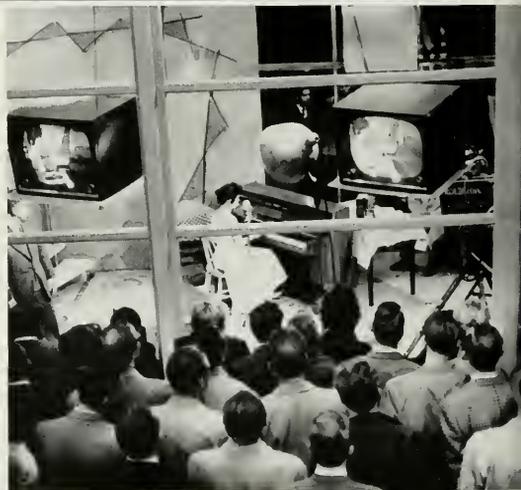
Off to the Fair

AT DAMASCUS' International Trade Fair, Syrian exhibitors had a complaint: visitors were staying away from their booths in droves. Then RCA technicians lent a sympathetic ear and some television equipment. They hooked up TV sets at strategic points around the exhibition area. Immediately the crowds grew so large that exhibitors had to call for police help to maintain orderly lines.

"RCA stole the show," enthused one local exhibitor.

The incident is typical of the drawing power of RCA displays at International Trade Fairs from Stockholm to Bangkok during the fall and early winter. At these fairs, the United States showed its wares and its way of life to millions of peoples overseas in a determined bid to build world trade and good will. In addition to television, RCA demonstrated radios, tape recorders and high fidelity phonograph equipment.

But television was indisputably the major attraction, especially the "See-Yourself-On-TV" feature. Astrakhan-hatted hillmen, nomadic tribesmen in billowing bur-nooses, natives in the traditional tarboosh — adults and children alike — would wave and grin in delight as they watched themselves on the monitor screens. At Salonika, Greece, doting parents would station their



offspring in front of monitors and then line up for their turn at the camera where they would wave to the youngsters. The children, thinking they were on a two-way hook-up, would wave back excitedly before the TV receivers.

At one fair, television was used as a traffic control device. During fashion shows when the crowd got too large, the show's operators would turn on the closed-circuit TV to draw away some of the people.

Often the throngs around the RCA booths were so large that the demonstrators had to resort to a ruse. They would turn off the equipment and pretend to be

closing up for the day, only to start again once the crowd had dispersed. In Afghanistan, the monarch, Mohammed Zahir Shah, appeared on the first telecast in his nation's history — a closed-circuit hook-up from the United States pavilion to 8,000 of his subjects.

"Exchange Program" In Thailand

At the fair in Bangkok, Thailand, an "exchange program" was set up. The RCA-equipped Government station — Thai TV — would pipe its regular programs into the twenty receiving sets scattered throughout the American pavilion. In return, the closed-circuit programs from the fair — featuring Benny Goodman's orchestra and explanations of the various American exhibits — were sent out over Thai TV.

Tape recorders also proved to be big drawing cards at the fairs. In Damascus, RCA crews hit upon an appealing gimmick for demonstrating the equipment. They would pre-record a message in Arabic. Then, selecting a volunteer from the audience, they would hand him an English version of the message to read. After he had stumbled through it in halting English, the RCA men would re-wind the tape to the Arabic section and play it back to the amazement of the volunteer and the amusement of the crowd.

Expressing appreciation for RCA's participation in the program, William R. Traum, Deputy Director of the Commerce Department's Office of International Trade Fairs, said: "In providing the initial grant from his emergency fund for the trade fair program, President Eisenhower referred to it as 'seed money' to stimulate the presentation of American industrial exhibits overseas and to help counteract propaganda against free enterprise. The response of the American industrial community has been most gratifying."

Praise For RCA's Representatives

Reaction of the fairs' managers was universally favorable. Typical was a letter to the RCA International Division from W. Bradlee Smith, manager of the United States Government exhibition at the Salonika Fair.

"[The RCA representatives] did an outstanding job in setting up the closed-circuit RCA television show," said Mr. Smith. "They supervised the unpacking and arranging of the exhibit and under some adverse conditions of electric power got their sets operating beautifully. At no time did we have a breakdown; at no time was the television off; and when it is realized that the fair ran continuously eight hours a day for twenty-five days, I think this is an outstanding accomplishment."

The RCA exhibits at the fairs were handled by the RCA International Division and the RCA Victor Community Relations Department.



Robert Gold (left) and Walter Lawrence at monitor of RCA "See-Yourself-On-TV" installation at Salonika.



Above, natives examine with interest RCA equipment at the International Trade Fair at Kabul, Afghanistan. Below, crowds at the fair in Damascus, Syria, watch a closed-circuit television program on RCA receivers.



ELECTRONICS for greater safety . . .



An airline pilot in the Far East remarked: "In this part of the world, we would rather lose an engine than our Weather Radar."

A steelworker in West Virginia commented: "With industrial TV, we can *see* even where we can't *look*."

A freighter captain in New York said: "I'd rather sail for \$200 a month less pay than sail without electronic equipment."

These terse comments dramatically underline the growing importance of electronics to greater safety. Today electronic devices are adding startling new dimensions to man's senses and abilities, relieving him of scores of dangerous jobs, and providing him with vital communication lifelines—on land, on sea and in the air.

Safety On Land Through Electronics

At the Strip Steel Hot Mill of the Weirton Steel Company division of National Steel Corporation in West Virginia, flashing lights warned of trouble. In a huge reheating furnace, where the temperature approached a searing 2,000 degrees, a slab of steel had moved past the uniform heating area so that its edge overhung the hearth, resulting in what steelmen call a "cold edge." When the slab started through the rolling process, it skewed, causing a cobble that brought the mechanism to a grinding halt.

The trouble was that the operator controlling the movement of slabs into the furnace could not actually see them, for no human could withstand the furnace's scalding heat. He had to work by signal which sometimes came too late. The "cold edges" meant aggravating delays, and in extreme cases, a costly roll might be broken.

Now the perplexing problem of "cold edges" has been solved by a new wonder tool of electronics known as closed-circuit television or industrial television — ITV for short. An RCA TV camera, encased in a metal box with a built-in air conditioning system, peers into the blinding glare of the furnace. It is connected by closed circuit to a monitor 150 feet away in the furnace's control booth, dubbed the "pusher's pulpit."

When the front slab in the furnace has reached the required heat for rolling, the operator opens the door

at the rear of the furnace by remote control. The raising of the door starts the TV camera. As a cold slab is pushed into the rear of the furnace, the heated slab at the front is forced into the discharge chute and the next slab in line moves forward. Thanks to television, the operator can safely position this slab so its edge will not overhang the hearth. He can do the entire job safely and efficiently from the comfort of the control booth.

Industrial television is only one example of how the wizardry of electronics is vastly enhancing personal safety, efficiency and economy in industry and on the highway. Electronics' increasing importance to industry may be judged from the fact that industrial concerns are now spending about \$700,000,000 a year for electronic equipment, nearly three times as much as they spent in 1948. Estimates are that this figure will double in the next five years under the sharp spur of automation, which depends largely upon electronics as its intricate nerve center and sensory system.

Three RCA TV monitors guide operator of giant shear at the Lukens Steel Company plant in Coatesville, Pa.



In the packaged goods and bottled beverage industries, "Inspected by Electronics" has become sharply synonymous with purity and safety. Surveys show that metal particles like chewing gum foil and hairpins account for well over half the contamination of packaged products. To catch such particles, RCA has five different types of electronic metal detectors, all working on the same general principles. The packaged product is moved through an inspection opening where it is scanned by a high frequency electromagnetic field. In other words, radio waves travel through the package to search out metallic specks. Whenever any are found, an alarm system is set off.

Today, in addition to its widespread use in confectionery plants, the metal detector has become standard equipment in the drug, tobacco, chemical, lumber, mining, rubber, textile, plastics, and food processing industries.

150 Bottles A Minute

Just as the electronic metal detector safeguards packaged goods, the RCA automatic beverage inspection machine provides assurance that bottled beer and soft drinks will be free from such foreign particles as a wisp of cellophane or a tiny bristle. The inspection machine's multiple electronic "eyes" scan up to 150 bottle a minute — about four times as many as human inspectors. A defective bottle is automatically shunted aside, while the approved ones move along the conveyor belt for labeling and packaging.

Fully as important as inspection in the promotion of safety is prompt and dependable communications. In the Army, electronic eyes and ears are providing the vital link between headquarters and front line. There is scarcely any industry that could not furnish examples of the value of radio communications as a safety device. Electric utility companies depend on radio for restoring service knocked out by storm. The oil and gas industry relies on it. So do the construction, transportation and mining industries, to say nothing of public safety agencies like fire and police. On the ribbon-like super-highways of today, a comprehensive communications system is essential to safety and service.

Russell S. Deetz, who as Project Manager is responsible for over-all operation of the new Ohio Turnpike, puts it this way: "Effective communications is the most important single factor in the operation of a facility of this size. It helps us integrate all the patron services, and permits us to maintain administrative control of all the Turnpike's functions."

Nerve center of the Ohio Turnpike system is in Berea, on the outskirts of Cleveland. From there a network of Very High Frequency (VHF) and microwave



Newsweek Photo (Ed Wergeles)

The *S. S. United States*, world's most modern ocean liner, is outfitted from bridge to lifeboats with RCA radio communications equipment. Operator (right) sits at console in the passenger liner's radio operations room.



radio stretches in both directions along the 241-mile highway, connecting police cars, service trucks, toll stations, maintenance areas and administrative vehicles with the Turnpike Headquarters.

Through this vast communications network, a round-the-clock check-up is available on road conditions, fog and sudden emergencies. The New Jersey and Pennsylvania Turnpikes, like the Ohio Turnpike, use RCA microwave and mobile radio equipment.

Safety In Marine Navigation

On our seaways as well as our highways, electronics is insuring greater safety and comfort.

Out of the fog loomed a giant ocean liner, threading the white-becked Narrows and gliding into New York Harbor. Faint streamers of smoke trailed from her two red, white and blue stacks as she moved up the Hudson River under gray, drizzling skies.

Four-and-a-half days out of Le Havre, France, the *S. S. United States*, first lady of the seas and the world's fastest, most modern ocean liner, was keeping her rendezvous with the tugs. Neither the fog nor the storm she had passed through at sea had delayed her crossing. Equipped with the latest electronic aids to

navigation and communications, the *United States* had once again defied the challenge of the weather and the hazards of the sea.

From bridge to lifeboats, the superliner is outfitted with RCA radio communications equipment. This equipment includes radiotelephone, radiotelegraph, and high, intermediate and low frequency transmitters and receivers which link the *United States* with other ships and with the principal cities of the world. Each of its staterooms has a telephone which can be connected to the ship-shore communications system. Two of its twenty-four aluminum lifeboats carry rugged, battery powered radio transmitters and receivers for use in case of emergency.

The loran (long range navigation) system, which determines the *United States'* position from radio signals broadcast by synchronized transmitting stations, is an RCA product. So are the radio direction finder, which fixes the ship's position during fog and storm when other means may be impractical, and the distress alarm system, ever alert to the emergency signals of other ships. For the recreation of her 2,000 passengers, the liner has two permanent theatres, furnished with RCA motion picture projection and sound reproduction equipment.

The *United States* is the latest in the flotilla of luxury liners outfitted with RCA equipment. The roster includes her running mate, the *America*, the American Export Line's *Independence* and *Constitution*,

In the radio room of the aircraft carrier *Saratoga*, operators work with RCA communications receivers.

U. S. Navy Photo



and the Holland-America Line's *Nieuw Amsterdam*, to mention but a few.

However, passenger ships are not the only vessels affected by the quiet revolution in navigation and communications at sea in the decade since the U. S. Navy took the wraps off its super-secret war-time equipment. Freighters, tankers, fishing trawlers, even the sturdy little tugs that churn up thin white wakes in the harbor — all have benefited by the maritime magic of electronics.

Electronics In The Navy

The Navy's growing dependence on electronics is indicated by the fact that where a typical pre-World War II destroyer used about sixty vacuum tubes, today's destroyer uses some 3,200 such tubes. Electronics has become a vital factor in communications for assuring cohesion and mobility, and in navigation for promoting accuracy and safety.

Today specialized RCA receivers, for picking up messages from shore stations and from ships, are an integral part of the communications system aboard Navy vessels like the supercarriers *Forrestal* and *Saratoga*, the missile cruisers *Boston* and *Canberra*, the atomic submarine *Nautilus* and others. Hub of the Navy's vast communications network is the RCA-built transmitter at Jim Creek in the state of Washington which gives orders to all the Navy's scattered ships and submarines.

RCA's pioneering work in radar, loran and sonar is making possible safer voyages for the entire fleet. At the same time, its continuing research program is developing improved electronic devices for the Navy.

Until recent years, marine equipment was designed primarily for large commercial and Navy ships. It was bulky and expensive. Then RCA engineers pioneered in adapting electronic gear to the needs of the small-boat owner. They put the emphasis on compact design, smart styling, and simplified operating controls. Today a wide range of electronic equipment is making pleasure craft navigation easier and safer for the 25,000,000 men, women and children who follow the call of the sea in their own time and in their own way — every way from a gleaming outboard to a glassed and glossy luxury yacht.

Safety In Air Navigation

Electronic devices are adding new dimensions of safety, speed and comfort to air transportation.

Through darkening, cloud-swept Western skies, the big airliner droned on toward its destination. Suddenly, the glowering clouds closed in and rain blotted out Captain George Henderson's view of the land below and the ominous peaks ahead. But a glance at the plane's radarscope brought reassurance. Across the tele-



United Air Lines Photo

United Air Lines is one of the fifteen major commercial airlines now using RCA's Weather Radar equipment.

vision-like screen passed a series of queer configurations that conveyed to trained eyes a succession of heartening sign-posts along the route.

The radar beams "saw through" the squall to detect, many miles ahead, the turbulent core of the thunder-head whose violent updrafts and downdrafts can mean uncomfortable — and sometimes dangerous — moments in air travel. With this advance warning of the storm center, Captain Henderson flew skillfully through the trouble area. The result: a safer, smoother flight and arrival at his destination on schedule.

This plane bore the red, white and blue insignia of United Air Lines, but it might have belonged to any one of fifteen airlines that now use RCA AVQ-10 Radar. Airlines relying on RCA's Weather Radar, besides United, are American, Continental, Trans World, Pan American, Swissair, Air-India, Iberia, British Overseas (BOAC), Air France, Sabena, Cubana, Union Aeromarine de Transport (French), Cia. Mexicana de Aviacion, and Qantas Empire Airways (Australian).

Weather radar is a good example of how the sciences of electronics and aeronautics have joined to create modern aviation. In the impressive cockpit of the modern airliner are more than 400 dials, scopes, levers, switches, buzzers, warning lights and other electronic and mechanical marvels. Virtually every move of the plane is determined by electronics.

For example, electronic communications (radio) provide pilots with runway, departure and flight instructions. Electronic controls are the heart of many func-

tioning parts of the airliner. In the air, pilots follow radio tracks. Position and altitude are generally determined by electronics. Weather radar permits selection of safe paths through or around storm areas; ground search radar aids in air traffic control. Two-way radio keeps pilots in contact with ground control stations throughout flight and provides landing instructions.

Thus is electronics vital in air navigation, in communications, and in traffic control, and RCA has made and is continuing to make significant contributions in all three areas.

In military aviation, electronics is playing a critically important role. General Carl Spaatz, former Air Force Chief of Staff, has said that in any future war "superior electronics would be decisive." Some measure of the Air Force's reliance on electronics may be seen from the fact that roughly one-third the cost of a modern all-weather jet fighter plane goes into electronic gear.

Today, RCA is working closely with the Air Force and the Navy on projects designed to promote greater safety — both for the men who fly the planes and for the millions of Americans who look to air power as our first line of defense.

Defense Projects

RCA's defense projects are, for the most part, shrouded in secrecy. But an indication of their vast scope and diversity may be gained from a few examples. RCA is developing and producing land-based tactical launching and guidance systems for the "Talos" guided missile, a surface-to-air defense weapon for use against enemy aircraft. RCA has developed and is producing a compact lightweight electronic fire-control radar for the world's fastest combar plane, the new F-104 Starfighter jet. RCA operates the hundreds of electronic and optical instruments used to track guided missiles at the Air Force Missile Test Center at Patrick Air Force Base on the east-central coast of Florida.

The importance of electronics was aptly summed up by Maj. General Thomas P. Gerry of the Air Force in these words: "There is no aspect of operation or control of modern aircraft that does not depend in large measure on electronics. Without electronics, we could not achieve the high performance required of our combat aircraft."

Electronics' contributions to greater safety are discussed more fully in two booklets recently published by RCA — "Safety In Marine Navigation," and "Safety In Air Navigation." These booklets may be obtained by writing to the Department of Information, Radio Corporation of America, 30 Rockefeller Plaza, New York 20, New York.



Miss Betty Duval, Manager, RCA Training, directing a class for supervisory personnel at office in Camden.

ONE OF THE most significant post-war trends in the American labor force has been the notable increase of women workers. Fifty per cent more women are at work now than were employed fifteen years ago. The current total is 21,000,000, which means that one out of every three persons employed in this country is a woman.

The Feminine Touch In RCA

In RCA the percentage of women workers is even higher than the national average — about 40 per cent. Of RCA's 75,000 U. S. employees, 30,500 are women. They hold positions of importance in training, personnel sales, accounting, radio and television program production, research, engineering and many other fields. They work as managers, supervisors, coordinators, and executive secretaries. One woman — Mrs. Douglas Horton — serves as a member of the Board of Directors of both RCA and NBC.

Four women are assistant officers of the Corporation, serving as Assistant Secretaries of our facilities in Camden and Harrison, New Jersey, and in New York City. Another woman is manager of RCA's training activities, while still another has an important job in the sales branch of the RCA Victor Television Division. Both these women have won the RCA Victor Award of Merit, the company's highest honor for salaried employees.

Twenty-nine women engineers work in RCA's var-



Women production workers, like these assembling parts for high fidelity instruments at the Canonsburg, Pennsylvania, plant of RCA, play an important role in the company's manufacturing setup.



Miss Jeannette McEwen, a tube design engineer, in Harrison, N.J.



Mrs. Kathryn Cole, manager of NBC's Information Department.



Miss Margaret E. Stevenson, an Assistant Secretary of RCA.



Mrs. Edith Mayaud, a junior engineer in the Lancaster plant.



Miss Doris Ann, Supervisor of TV Religious Broadcasts for NBC.



Miss Ann Hathaway, a tube design engineer at Harrison, N. J.

ious laboratories. One of them, a graduate of Massachusetts Institute of Technology and holder of several patents, is an engineering leader in the advanced development of color television picture tube design at our Lancaster, Pennsylvania, plant.

At RCA's Woodbridge, New Jersey, plant, a woman is Manager of Special Tube Production Engineering, supervising a group who work on thirty-five tube types each month. In the Tube Division's Chemical and Physical Laboratory, a woman engineer is in charge of a team working on new analytical procedures for materials being developed for future use in receiving tubes.

Women represent a substantial proportion of RCA's manufacturing workers, the workers who turn out television sets, radios, phonographs, records, electron tubes and other products for the home and for industry. Women's finger dexterity and patience have given them access to many new jobs in electronic manufacturing. Application of these skills has been dramatically demonstrated in the manufacture of new products like the

tiny transistor that performs many functions of the electron tube.

In the broadcasting end of the business, too, women have found many satisfying careers. NBC employs more than 1,500 women, of whom 215 hold positions of substantial responsibility. They are engaged as supervisors of radio sales service, religious broadcasts and talks, costume design, religious television programs and literary rights. Women manage NBC's Information Department, General Office Services, and Sales Traffic activities. Women also work as producers, staff writers, public relations coordinators, cost accountants and coordinators of public service programs.

Working wives hold important positions in many branches of RCA. A few years ago, when a girl married, everybody took it for granted that she would give up her job. But today the girl who announces she is being married is asked, more often than not: "Are you planning a trip or will you be in the office on Monday?"

New Member in the 'Golden Disc Club'



Elvis Presley has sold 11 million single records.

THESE DAYS you can get into an argument about Elvis Presley almost at the drop of a phonograph record. But there is little room for argument on one point: as a record salesman, the guitar-thumping Tennessean has already won a high place for himself among the best-selling RCA Victor artists of all-time.

In the past year, the singer who switched from driving a truck to driving teen-agers crazy, has sold 11,000,000 single records — more than anyone else has ever done in a comparable period. In addition, he has sold better than 2,000,000 albums.

In his first year in the big-time, Elvis has made the "Golden Disc Club" — the record industry's All-America Team — with four titles that have sold more than a million copies each. "Don't Be Cruel," with "Hound Dog" on the flip-side, topped the list with 3,200,000 copies, "Love Me Tender" sold 2,300,000, "Heartbreak Hotel" 1,600,000, and "I Want You, I Need You, I Love You" 1,200,000. The phenomenal success of Presley's pressings has old-timers talking about him in the same breath with best-selling artists of the past.

Altogether, RCA Victor and its predecessor, the Victor Talking Machine Company, have produced sixty "golden discs" with sales of a million or more. The first one was recorded by Enrico Caruso just fifty years ago — "Vesti la giubba." He followed that up with "O sole mio" which also hit the magic million mark.

In 1920, Paul Whiteman, the "King of Jazz," recorded a lilting tune called "Whispering" which became the first pop-record to sell a million copies.

In the fast-moving, free-spending days of 1928, everybody was singing, humming or whistling "Ramona." Gene Austin recorded the number and it soared over the million mark in just a few months. After "Ramona," there were nine lean years, years in which radio threatened to put the phonograph out of business entirely. Eventually, though, it was radio that became the No. 1 showcase for records and actually revitalized the phonograph industry.

This trend began taking shape in 1937 when radio stations from coast to coast started playing a swinging instrumental by Tommy Dorsey and his orchestra, "Marie." It was Dorsey's first golden record. A year later, he recorded "Boogie Woogie," a tune that has since sold nearly 4,500,000 copies, an all-time record for an instrumental. RCA had three other golden records in 1938 — "Beer Barrel Polka" by Will Glahe, "Jalousie" by Arthur Fiedler conducting the Boston Pops Orchestra, and Artie Shaw's "Begin The Beguine."

Four By Glenn Miller

The years immediately before Pearl Harbor saw the rise of a great new name on the American musical scene, the name of Glenn Miller. Between 1939 and 1941, he put four numbers on the all-time best-seller list — "In The Mood," "Sunrise Serenade," "Tuxedo Junction," and "Chattanooga Choo Choo."

The post-war years have been dominated by vocalists. In fact, between 1946 and 1955 not a single instrumental disc reached the million mark. Two of the leading vocalists have been Perry Como and Eddie Fisher. Como's first million-copy record was "Prisoner of Love," and he later scored with "Don't Let The Stars Get In Your Eyes," and "Hot Diggity." Fisher made the all-time list with "Anytime" and "I Need You Now."

Up until 1953, Victor's golden records had been awarded only to soloists or instrumental groups. But the Ames Brothers changed the pattern with "You, You, You," and repeated their success with "Naughty Lady From Shady Lane." Last year, with Como's "Hot Diggity," Kay Starr's "Rock And Roll Waltz," and the four Presley discs, RCA had more records in the magic million class than ever before in a single year.

Lawrence W. Kanaga, Vice President and General Manager of the RCA Victor Record Division, summed up the situation like this:

"The Presley story isn't the kind that is repeated too often. But when it is repeated, we only hope it happens at RCA Victor."

Miniature Memory For Computers

THE ELECTRONIC MEMORY, a key element in modern commercial and military computers, has been reduced to unprecedented compactness and simplicity by RCA Laboratories with the development of a novel printed plate magnetic storage unit that can tuck away 256 bits of computer information in a thin wafer less than an inch square.

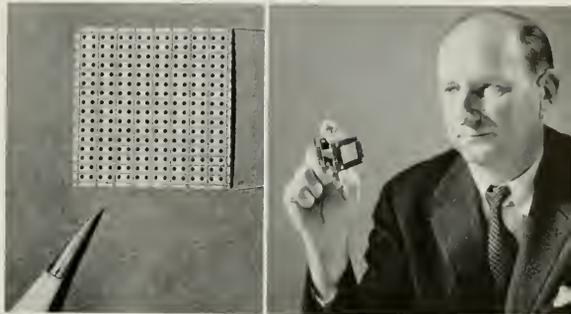
Linked in series to form a large-capacity memory system, the tiny plates will enable computers to store electronically more than a million bits of information in a space about the size of a shoebox, and to recall the bits in a few millionths of a second in any desired order, combination, or quantity.

The fruit of a continuing research program that led to the earlier development of the RCA magnetic core memory used in many present-day computers, the new "aperture plate" memory was devised by a research group under the direction of Dr. Jan A. Rajchman, research scientist at RCA's David Sarnoff Research Center. In appearance, the tiny plate is something entirely new in electronics. Perforated with neat rows of minute holes, it resembles a diminutive punch-board.

Dr. Rajchman points out that the new memory, unlike the earlier magnetic core system, lends itself to extremely simple production techniques. The tiny plates are made of an RCA-developed ferromagnetic material, a ceramic-like substance that can be molded in any desired shape or size and hardened by heating. They are produced with essential circuitry already incorporated by means of a printing technique similar to that used in making printed electronic circuits for radio and television sets. The fabrication technique, developed by Chandler Wentworth of the RCA Laboratories technical staff, has been used to produce thousands of the plates during the research program.

Operates in Two-Unit Code

Dr. Rajchman explains that the aperture plate memory, like its magnetic core predecessor, depends for its operation on the fact that computer language can be expressed entirely in terms of "0" and "1", used in various combinations to represent any words, numbers, or symbols. As an example, one such coding system expresses 0 as 0000, the number 1 as 0001, 2 as 0010, 3 as 0011, 4 as 0100, and so on up to 9, which would be expressed as 1001.



This tiny perforated plate (left) is the heart of a new electronic memory system, developed by Dr. Jan A. Rajchman (right) of the David Sarnoff Research Center.

"When we translate into a language that employs only two symbols, it is possible to design a memory system in which each of the elements can be switched electrically to represent one or the other of the two values," says Dr. Rajchman. "In the aperture plate, one of the values is represented by a flow of magnetism, or magnetic flux, in one direction around a hole in the plate while the other value is represented by a magnetic flux in the opposite direction. The values can be changed as desired simply by applying to the right spot an electrical signal strong enough to reverse the direction of the magnetic flux."

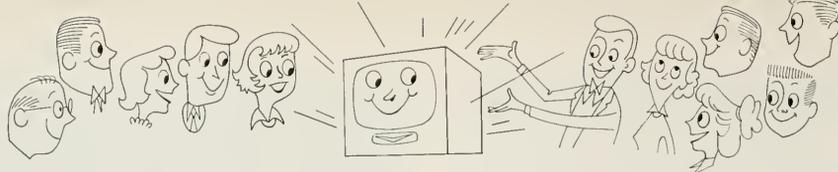
The circuits of the memory are so arranged that each of the holes in each plate can be reached individually for putting in or reading out information.

Prospects For The Future

Looking ahead to the application of the new aperture plate system and the further development of magnetic memories, Dr. Rajchman says:

"The development of these plates has now reached a stage which opens possibilities of memories of very large capacities. Because this arrangement requires much less driving power than previous systems, it promises also to reduce and simplify the associated electronic circuits. Furthermore, it makes possible very compact memories of relatively small capacity.

"Three years ago, it was predicted that micro-second memories with capacities reckoned in millions of bits would be available at a relatively low cost in a distant future. We believe that the aperture plate is now ready to usher in this era. But the demand for larger and faster memories is incessant, and we may look forward to the development of still newer techniques in the future, making possible the storage and instant selective readout of billions of bits."



Applause for Color Television

Recent unfavorable stories in the press about color television have brought sharp retorts from appliance distributors and dealers, as well as from the general public. A selection of their comments follows:

C. G. Deason, Jr., Deason Radio Company, San Antonio, Texas: "Having enjoyed a very successful business in electronics for twenty-nine years, I feel sure that I am able to speak up and tell a true story about color TV. We have done an outstanding job in our territory and with no more service problems than on black-and-white. Any man, woman or child with average intelligence can learn to operate a color TV set if given the proper instructions. I think RCA Victor has opened up a new field of entertainment."

Rudolph Valas, Valas Stores, Inc., Denver, Colorado: "Our experience indicates that the RCA color sets require even fewer services than black-and-white sets of any make. It is interesting to note that the greatest amount of effort to discourage color sales is being made by manufacturers who have no color sets in production or are now just beginning."

Ward E. Terry, Ward Terry & Company, Denver, Colorado: "[Unfavorable stories on color TV] seem to be based on statements made by competitors of RCA who have been left at the starting point in the development of color television. These same companies let RCA pioneer black-and-white television and then climbed on the bandwagon at a late date because they were forced into it. It would be very much the same as if you asked a member of the Communist party what he thought of democracy; he would tell you it just doesn't work."

H. B. Price, Jr., Price's Inc., Norfolk, Virginia: "Just recently I visited the RCA color tube plant in Lancaster, Pennsylvania. As one retailer who was very dubious about the status of color, I am now convinced that color is here; that it is dependable, and that many strides have been made in developing the present circuitry and tube that are being used by RCA. It's going to take a lot of money and know-how on the part of any manufacturer to catch up with RCA, and I think it behooves them either to get in the business or admit they are not capable of it and let color progress in the

normal, healthy economic manner that any new product of its fabulous performance should enjoy."

J. E. Cleworth, West Michigan Electric Company, Benton Harbor, Michigan: "Sales have increased sharply every month of 1956, with a backlog of orders building up. This in itself proves that dealers handling color television are confident in the future of it. The buying public today is ready and able to buy color sets, and is proving it by increased sales at the dealer level."

Earl I. Rounkles, Hutchinson, Kansas: "We have owned our color set, which is a 21-inch model, for over one year. Mrs. Rounkles tunes it as well as any TV set we have ever owned. The color is just beautiful. Our set has not had any service and it is played continually. We certainly enjoy the color TV programs."

W. A. Clark, Belleville, Illinois: "The color reception is excellent and a real pleasure to watch, making you wish all shows were in color. The black-and-white reception is also excellent, well above the average of all sets in our neighborhood. You could not ask for a clearer, better picture. I have two boys, one seven and one twelve years old, as well as my wife and I. None of us is an engineer, yet any one of us can tune the set satisfactorily."

Mrs. Sam Drew Winter, Ferguson, Missouri: "How many times have those who are behind the times said, 'It's no good' because they do not have it? I recall many said four-wheel brakes were 'no good.' The same was said about V-8 engines and about the first TV sets. The color we get on our set is like we have on the color pictures we take with our camera."

W. E. Johnson, Johnson Bros., Baltimore, Maryland: "Color TV sets represent about 30 per cent of our total television volume in instruments — and more in dollars. We can show you a sale of three consecutive color sets to a lady so enthused that she bought sets for the homes of her son and daughter. We can show you several more customers who bought a second color set for their own 'second' set use. We can show you photographs of crowds of people in our stores who came to see color TV, to ask about it, to exclaim over its beauty and to buy."



This ultra-modern RCA distribution center in Los Angeles is largest facility of its kind in California.

New Distribution Center on the West Coast

THE RCA VICTOR DISTRIBUTING CORPORATION recently opened in Los Angeles a \$1,400,000 distribution center, the largest facility of its kind in California. The new center is designed to provide faster, more efficient service for the nearly 2,000 RCA Victor and RCA Whirlpool dealers in the Los Angeles area, and for the thousands of customers they serve.

The new distribution center is a one-story building of modern design, situated on a seven-and-a-half-acre landscaped lot in the Telegraph Road-Washington Boulevard industrial district. The building, accommodating offices, three large display rooms and a warehouse, contains 3,500,000 cubic feet of storage space, enough for 50,000 television sets.

The main display room will exhibit the latest RCA television sets, radios, phonographs, and other products. A hi-fi listening room and a color TV room connect with the main display area.

Principal speaker at the opening ceremonies on October 25 was Frank M. Folsom, President of RCA. He said the new center was "a tangible indication" of RCA's faith in the future growth of California.

"We of RCA are so confident of the growth possibilities here," Mr. Folsom said, "that we have nearly tripled the size of our facilities in California in the last ten years. During the same period, we have increased our investment by more than 300 per cent, our employees by 300 per cent and our payroll by 500 per cent.

"In 1946, there were 195 electronic manufacturing

firms in the Los Angeles metropolitan area. Today, there are 460 companies in this area that are concerned primarily with turning out electronic products or components. During the same period, the dollar volume rose from \$425-million annually to a 1956 total which I understand will exceed one billion dollars. This means that the Los Angeles area alone accounts for nearly 10 per cent of the nation's electronics production.

Rise of 60% Foreseen

"Looking to the future, our surveys show that the growth of electronics will continue to be more rapid than most other industries. Ten years from now, we expect to see total volume reach more than \$18-billion. That would represent a growth of 60 per cent and should put electronics well up among the top five manufacturing industries in this country. The electronics industry in California can certainly be expected to keep pace with this nation-wide growth."

As a feature of the opening ceremonies, an experimental solar battery developed at RCA's David Sarnoff Research Center at Princeton, New Jersey, was used to break a ribbon stretched across the entrance of the new building.

The Los Angeles center is one of ten operated by the RCA Victor Distributing Corp., which handles the distribution of RCA Victor and other products through dealers served by its various branches. Last month the Corporation awarded contracts for a new office-warehouse in Davenport, Iowa.

Answer to Anti-Trust Suit

THE RADIO CORPORATION OF AMERICA and the National Broadcasting Company have issued the following statement relative to the civil anti-trust suit filed in federal court in Philadelphia by the Anti-Trust Division in December:

"This suit results from a jurisdictional dispute between two agencies of government, in which RCA and NBC have been caught in the middle. The NBC-Westinghouse exchange of stations in Philadelphia and Cleveland, with which the action deals, was approved by the Federal Communications Commission in December, 1955, after a thorough study of all the facts. On the basis of this study, the FCC decided that the exchange was in the public interest.

"Contrary to the claim made by the Anti-Trust Division in this suit, not only was Westinghouse not coerced by RCA and NBC to make the transfer but Westinghouse in fact sent a letter to the FCC urging approval of the transfer as being in the public interest."

Letter to the Commission

The letter, signed jointly by the Chairman of the Board of Westinghouse Broadcasting Company, Inc., and the Chairman of the Board of the National Broadcasting Company, was sent on November 10, 1955, to George C. McConnaughey, Chairman, Federal Communications Commission. It said:

Dear Chairman McConnaughey:

Attached are the replies of our respective companies to the points raised by the Commission in its letter of October 17, 1955, describing the proposed exchange of the Westinghouse stations in Philadelphia for the NBC stations in Cleveland and answering the other questions raised by the Commission.

The decision to make this exchange was arrived at after careful consideration of all factors at the highest management level of both companies. It has the approval of our respective Boards of Directors and the approval of the Boards of Directors of our respective parent companies.

The companies, therefore, entered into the agreement satisfied that the exchange is a fair one, that its consummation will serve the best interests of both companies, and that it is consistent with the public interest.

We jointly urge the Commission to approve this exchange at an early date.

The statement by RCA and NBC went on to say:

"It was on the basis of this representation by Westinghouse as well as the other material before it that the FCC approved the transfer now challenged by the Anti-Trust Division.

"The FCC is specifically authorized by Congress to pass upon such station transfers, and NBC acted in accordance with its decision. Now another branch of government — the Anti-Trust Division — is trying to undo the action of the Federal Communications Commission.

"If American businesses are to be hauled into court by the Anti-Trust Division because they act in conformance with the rulings of an authorized government agency, then indeed confusion will be compounded by confusion. We are confident that this dispute between government agencies will not result in RCA and NBC being penalized for scrupulously following the procedures established by law."

TV Tape 'On the Air'

THE FIRST "on-the-air" public demonstration of RCA's new video magnetic tape has heralded a new era of television in which all programs, whether in black-and-white or in color, can be recorded for later viewing.

The demonstration, a two-and-a-half-minute, tape-recorded segment featuring singer Dorothy Collins, was colorcast coast-to-coast by NBC on the "Jonathan Winters Show" October 23.

Under the RCA system, a television program is recorded on magnetic tape in much the same manner that sound is recorded on tape. The video magnetic tape can be replayed immediately, without the chemical processing required in the use of films.

In introducing the system to the viewers, Mr. Winters showed a section of the video tape and said, "For the first time in history you are going to see a color television picture transmitted from a piece of tape just like this. It is called video magnetic tape. On it is recorded both sound and picture — with the picture in full compatible color, as well as black-and-white."

The principle of video magnetic tape recording was first demonstrated in color by RCA under laboratory conditions on Dec. 1, 1953, at the David Sarnoff Research Center, Princeton, N. J. On May 12, 1955, the system was employed in a closed-circuit transmission from New York to St. Paul. NBC has been field-testing the system.

Television Awards to NBC

ROBERT W. SARNOFF, President of the National Broadcasting Company, has received a special Sylvania Television Award for his "outstanding contribution to music on television," with special reference to his launching of the "NBC Opera Theatre."

Altogether, NBC won twelve of the twenty-three network awards presented December 6 at the annual Sylvania awards dinner in the Hotel Plaza, New York.

The "Kaiser Aluminum Hour," the weekly dramatic program which went on the air in the fall of 1955, was selected as the "outstanding new series." Other award-winning NBC personalities and programs were:

"A Night to Remember" on the "Kraft Television Theatre" on March 28, winning two awards as the "outstanding television adaptation" and the "outstanding production."

Joan Lorring in "The Corn is Green" on the "Hallmark Hall of Fame" telecast of January 8, for the "outstanding performance by a supporting actress."

The "Ernie Kovacs Show" as the "outstanding comedy show."

The "NBC Opera Theatre" as the "outstanding serious musical series."

"The Bachelor" on the Sunday Spectacular of July 15, as the "outstanding light musical production."

The "Kraft Television Theatre" as the "outstanding dramatic series."

"Project 20" as the "outstanding documentary series."

"The Long Way Home" on "Robert Montgomery Presents the Schick Television Theatre" March 28, as the "outstanding human interest program."

The "NBC Matinee Theatre" as the "outstanding network daytime show."

In addition, NBC won a special Sylvania citation for its coverage of the national political conventions.

Edison Award for "Wide Wide World"

Another prize-winning NBC program is "Wide Wide World" which received the Thomas Alva Edison Foundation Award on December 3 as "the television program best portraying America." In presenting the award, Charles Edison, former Governor of New Jersey and Honorary President of the foundation, said: "Wide Wide World" is doing what television does best, by taking its audience on visits, via live cameras, to places and events of topical interest and historical significance throughout the United States."

Five NBC programs received *Look* Television Awards, presented annually by *Look Magazine* and determined in a nationwide poll of TV critics and editors. They were:

"Caesar's Hour," starring Sid Caesar — "For superior humor and originality in the presentation of straight comedy."

"Perry Como Show" — "For the musical series which best demonstrated variety, originality and excellence."

The second colorcast of "Peter Pan," starring Mary Martin on "Producers' Showcase" — "For the best individual show, including Spectaculars, concerts, operas, tributes, ballets and musical plays."

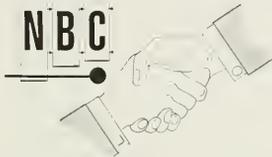
"Project 20" — "For the most interesting and best special program or special TV coverage appearing on a one-time or occasional basis."

"NCAA Football" — "For the most informative sports analysis or effective on-the-spot coverage."

The "NBC Matinee Theatre," selected as the outstanding network daytime show, featured such presentations as Louisa May Alcott's "Little Women" with Judith Braun as Jo, Irene Hervey as Mother March, Alexander Lockwood as Papa March, and Ariana Ulmer as Meg.



RCA news in brief



Congratulations . . .

Congratulatory messages from President Eisenhower, former President Herbert Hoover and Sir Winston Churchill headed a long list of anniversary wires and cables received by NBC. Mr. Eisenhower said: "Congratulations to the National Broadcasting Company on the occasion of its 30th Anniversary. Over the past 30 years your company has contributed to the strength and pleasure of the national community by stretching an efficient and responsible network of radio stations across the land. Linking us with major cities around the world, you have widened the markets of commerce and increased an effective range of artists and information. I wish you continuing success as you serve the best interests of the listening public."



Most Powerful . . .

The nation's first million-watt ultra high frequency (UHF) television station — WBRE-TV, Wilkes-Barre, Pennsylvania — is putting in complete RCA live and film color-TV camera systems. The installation will make WBRE-TV the world's most powerful broadcast station with facilities for originating live local color TV shows.

Tiny Light Cell . . .

A tiny light-sensitive electronic device that may be used to guide missiles by sunlight, spot the flashes of distant artillery, or enable blind telephone operators to find plug-in positions on a switchboard has been developed at the David Sarnoff Research Center, Princeton, New Jersey. A novel type of photocell no larger than the eraser on a lead pencil, the device is able to sense with a high degree of accuracy both the direction and intensity of a source of light. It can do many things that in the past have taken four separate conventional photo-cells.

Drive-In Theatres . . .

"Impac," the non-breakable, chip-proof, colorfast casing material used on RCA Victor portable radios, is now going into drive-in theatres. It is being used on in-car speakers to meet the need for an instrument capable of holding its shape, color and overall appearance despite weather abuse and wear-and-tear of drive-in theatre operations. RCA will continue selling its "Starlight" speaker with die-cast aluminum casing, too.



Shaw's 'Saint Joan' . . .

A recording of George Bernard Shaw's "Saint Joan," done by the Cambridge Drama Festival's original cast, has been released by RCA Victor. The recording is the complete reading of the Shaw play as performed at the Phoenix Theatre in New York, with Siobhan McKenna in the starring role.



Boating Equipment . . .

New RCA "Radiomarine" equipment for pleasure boats and small commercial ships goes on display this month at the National Motor Boat Show in New York City. The new line includes a series of specially designed radiotelephone antennas and a six-channel VHF radiotelephone for large pleasure craft. Other features are a new direction finder with a special "sense" switch that enables users to determine more quickly whether bearing is correct, and electronic fish finders for both commercial fishermen and pleasure boat owners.



Awards For Radar Men . . .

RCA has set up proficiency awards for the Air Force's radar controllers, those ground-based specialists who keep a constant radar eye on the skies and advise intercept pilots on the location and movement of targets. The first RCA trophies were awarded to men scoring highest achievement in a weapons and gunnery meet recently at Vincent Air Force Base, Arizona. The trophies will be given each year. They are named in memory of Brig. General Clinton D. Vincent who was the second youngest general in Air Force history, receiving his star at the age of 29.

New careers for engineers, now that

Color TV is here!

RCA's pioneering in this exciting medium means unlimited opportunities for you in every phase from laboratory to TV studio

Now, more than ever, new engineering skills and techniques are needed in the television industry — to keep abreast of the tremendous strides being made in Color TV. RCA — world leader in electronics — invites young engineers to investigate these challenging opportunities. Only with RCA will you find a scientific climate particularly suited to the needs of young engineers. Your knowledge and imagination will be given full rein. Rewards are many.

Your talents are needed in research — in TV receiver design — in network operations — even "backstage" at TV studios. The experience and knowledge you gain can take you anywhere!

WHERE TO, MR. ENGINEER?

RCA offers careers in TV and allied fields — in research, development, design and manufacturing—for engineers with Bachelor or advanced degrees in E.E., M.E. or Physics. Join the RCA family. For full information write to: Mr. Robert Haklisch, Manager, College Relations, Radio Corporation of America, Camden 2, New Jersey.



Like 2 sets in 1—get Color and black-and-white shows, too! It's RCA Victor Compatible Color TV. See the great Color shows in "Living Color"—regular shows in crisp, clear black-and-white. With Big Color, you see everything.



Big-as-life 21-inch picture tube — overall diameter. Actually 254 square inches of viewable picture area. And every inch a masterpiece of "Living Color." Here are the most natural tones you've ever seen—on a big-as-life screen!



Color every night — right now! Something for everyone! You'll have "two on the aisle" for the best shows ever—drama, comedies, Spectaculars, children's shows, local telecasts. For now 216 TV stations are equipped to telecast Color.



Big Color TV is so easy to tune, even a child can do it! Turn two color knobs and there's your Big Color picture! It's easy, quick, accurate. It's a new thrill when the picture pops onto the screen in glowing "Living Color."



Practical and trouble-free! Service at new low cost! Big Color is dependable Color. And RCA Victor Factory Service is available in most areas (but only to RCA Victor owners). \$39.95 covers installation and service for ninety days.



Color TV is a common-sense investment—costs only a few cents a day. It's sure to become the standard in home entertainment for years to come—you can enjoy Color every night right now! And you can buy on easy budget terms.



Now starts at \$495 — no more than once paid for black-and-white. This is the lowest price for Big Color TV in RCA Victor history! There are 10 stunning Big Color sets to choose from—table, console, lowboys, and consoles, too.



Make sure the Color TV you buy carries this symbol of quality. Because RCA pioneered and developed Compatible Color television, RCA Victor Big Color TV—like RCA Victor black-and-white—is First Choice in TV.



RADIO CORPORATION OF AMERICA
ELECTRONICS FOR LIVING



*Fire control radar tells... / WHERE TO AIM
WHEN TO FIRE!*

All-seeing radar pinpoints the target for these Air Force planes. Whatever armament they carry—guns, rockets or missiles—fire control radar tells them *where* and *when*. It provides the far-sighted vision necessary for modern long-range combat operations.

Today's modern fighter plane is an electronic wonder, with fire control radar-computer systems supplying a continuous

flow of information about target position in terms of range and rate of closing.

RCA is a major supplier of airborne fire control equipment to the Armed Forces.

It has produced, and in several instances developed, these systems for many of the latest aircraft. Some of these are illustrated above.



Defense Electronic Products

RADIO CORPORATION of AMERICA

Camden, N. J.