

RADIO AGE

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RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION



VOLUME 10 NUMBER 2

JANUARY 1951

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RADIO CORPORATION OF AMERICA
RCA Building, New York 20, N. Y.

DAVID SARNOFF, *Chairman of the Board*
LEWIS MACCONNACH, *Secretary*

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

Radio Age is published quarterly by the Department of Information,
Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N. Y.

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Services of RCA are:

RCA Laboratories Division

RCA Victor Division

RCA Communications, Inc.

Radio Marine Corporation of America

Radio Broadcast Company, Inc.

RCA Institutes Inc.

RCA Service Company Inc.

RCA International Division

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COVER

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- Services of RCA are:
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 - RCA Victor Division
 - RCA Communications, Inc.
 - RCA Marine Corporation of America
 - RCA National Broadcasting Company, Inc.
 - RCA Institutes, Inc.
 - RCA Service Company, Inc.
 - RCA International Division



RADIO CITY'S 3,000-SEAT CENTER THEATRE HAS BEEN ACQUIRED BY NBC TO KEEP PACE WITH TELEVISION'S GROWTH.

Radio and Television in 1950

Chairman of RCA Board in Year-End Statement Declares America is Fortunate at This Time of National Emergency to have Television Reaching 40 Million Citizens, Supplementing Radio's Vast Audience for Purposes of Unity — He Lists Advances of Electronic Fields in 1950 and Describes Year as Biggest in RCA History.

By David Sarnoff.

*Chairman of the Board,
Radio Corporation of America*

THE year 1950 was the biggest in the history of the Radio Corporation of America. Gross income, profits, dividends to stockholders were larger than ever before and employment increased substantially.

Television in performance and growth during 1950 reached proportions that qualify it as one of America's most promising industries. Years of research, engineering and planning were brought to fruition. As a result the signpost on the road of progress is marked TELEVISION—in both black-and-white and color.

There are about 10,000,000 television sets in the United States and 107 television stations. No new industry ever grew so fast in so short a time. While there are still vast areas of the country served only by sound broadcasting, the appeal of television is so powerful that those who remain out of its range eagerly await its arrival.

The sale of television sets throughout the year contributed to industrial progress and to the pleasures which American families in ever increasing numbers are enjoying.

The rate of television's growth, however, has been slowed by a nation-wide "freeze" put upon the construction of additional television stations. In the public interest it is hoped that the "freeze" will be thawed in 1951 so that television can reach every city, town, farm and school and satisfy the public demand for this new and important service. Hundreds of new television stations await the signal to go on the air.

Television accounted for approximately 75 per cent of RCA's total gross income in 1950. Vision and



DAVID SARNOFF

planning, plus confidence in the service that television could render, enabled RCA to maintain leadership in television. No other organization has contributed as much to the creation or more to the advancement of the new science and art as a service to the American people and an important tool for industry.

Dividends to RCA Stockholders

At the December meeting of the Board of Directors a regular dividend of 50 cents per share, and an extra dividend of 25 cents per share were declared on the outstanding shares of Common Stock, payable on December 26, 1950 to holders of record of such stock at the close of business December 8, 1950.

A dividend of 87½ cents per share was also declared on the RCA First Preferred Stock for the period from October 1 to December 31, 1950, payable on January 2, 1951 to holders of record of such stock at the close of business December 21, 1950.

Previous payments on the Common Stock during 1950 were 50 cents on January 23, 1950 (which dividend was declared on December

2, 1949), and an extra dividend of 25 cents paid on May 29, 1950.

With payment of these declarations the total of dividends disbursed by RCA during 1950 will amount to \$23,938,800, consisting of \$3,152,800 on the Preferred Stock, and \$20,786,000 on the Common Stock.

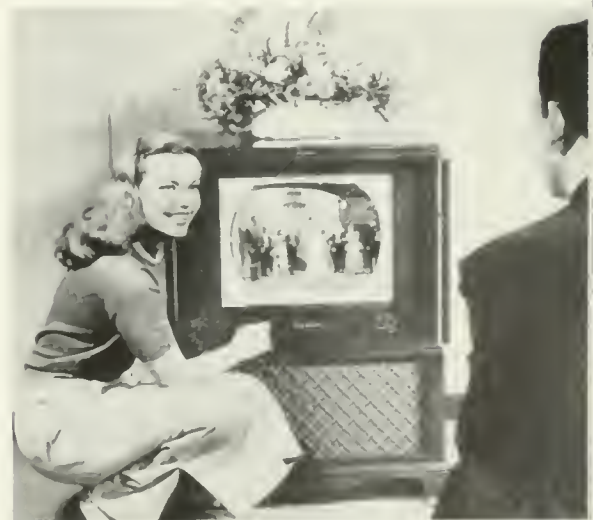
Color Television

Color television in 1950 was a revelation and a provocation. As a rainbow arches across the sky after a storm, so television in color broke through one of the greatest tempests of controversy and conflicting opinions.

As creator and leading proponent of a compatible all-electronic color television system, RCA fought to assure its development and approval over the outmoded incompatible mechanical scanning apparatus.

The Federal Communications Commission closed its public hearings in May, and in October adopted an incompatible system as the standard for commercial color television

"... THE SIGNPOST ON THE ROAD OF PROGRESS IS MARKED *Television* — IN BOTH BLACK-AND-WHITE AND COLOR."





WHAT THE TELEVISION CAMERA SEES, ANTENNAS ON THE SKYLINE PICK UP FOR RECEPTION IN THE HOME.



despite the fact that eminent scientists and virtually all of the radio-television industry warned against such a move. The Commission set November 20 as the date when commercial operations were to begin.

Acting in the public interest, RCA carried the case to Court and on November 16 the United States District Court in Chicago issued a temporary restraining order which deferred the establishment of commercial color television until further order of the Court. RCA maintained that the outlawing of its compatible electronic system was indefensible and contrary to the public interest. It pointed out that the FCC Order was "arbitrary and capricious" and unsupported by substantial evidence; that it would bring irreparable injury to the television industry and to the public.

When the RCA compatible system is used, the present owner of a black-and-white receiver does not need an adapter, nor any change whatever, in his present set to receive color programs in black-and-white. If it is desired to see the programs in color, a converter can be used.

With an incompatible color system, present set owners would not see any picture unless they installed adapters. Even if an adapter for color reception is installed, the black-and-white picture is degraded

from 200,000 to 80,000 picture elements.

It would cost the public approximately \$500,000,000 to adapt the 10 million existing sets to an incompatible system. With the RCA compatible system this unnecessary tax upon the public is avoided.

RCA is a staunch advocate of color television, realizing its great advantages and potentialities, as well as its psychological effect. That is why RCA has so aggressively pursued every possible phase in all-electronic television development. It has spent millions of dollars in research and engineering in backing its faith in an all-electronic system.

Historically significant was RCA's introduction of the first all-electronic tri-color tube. Upon the face of this tube appear clear television pictures in full color and unlimited in size. It eliminates the mechanical whirling disk. Demonstrated publicly for the first time in March, 1950, this tri-color tube was heralded as an electronic miracle of the age.

RCA Improvements Acclaimed

Eight major improvements in the development of the RCA compatible, all-electronic color television system were featured in a series of progress demonstrations beginning on December 5, 1950, before leaders of the radio-television industry and

representatives of the press in Washington, D. C. The improvements were widely acclaimed.

Further revealing the effectiveness of planning and confidence in a new invention is the "45" Victrola-phonograph. It was introduced by RCA in the Spring of 1949 and, as is sometimes the case, it was immediately confronted with opposition from those who would cling to the old rather than accept the new. But the "45", one of the finest musical instruments ever developed and a revolutionary change in the phonograph, steadily proved its worth. Today it leads the field. It has greatly extended the musical pleasures of millions of people and has met all tests of competition. Its magnificent quality has in every respect successfully overcome the early opposition. Now, the 45-rpm records are widely available. Equipment which will play the 45-rpm is produced by 75 different companies. Music lovers are applauding the clear tones of the small plastic disks as played on the fastest, simplest automatic player ever developed.

Since March, 1950, RCA Victor has produced and sold a steadily increasing volume of 33 $\frac{1}{3}$ -rpm long play records of improved quality and tonal fidelity. These records supplement the complete line of recordings on 45 and 78-rpm disks in keeping with the Company's policy

to make available to the public RCA Victor's unsurpassed library of music in the three phonograph speeds.

Foundations of Progress

The Radio Corporation of America, founded upon the bedrock of science and upon service to the Nation and its people, continually plans for the future. In all of its operations the Corporation is mindful of its responsibility to stockholders and employees, to the public and to industry.

RCA Laboratories at Princeton, N. J., is one of the world's great centers of research in radio, television and electronics. From there have come many of the major advances in the art, including the latest triumph—the tri-color television tube. Such research gives solidarity to RCA's future growth.

Radio and television broadcasters do not enjoy the freedom of other industries. Before they broadcast on the air, they must necessarily obtain licenses from the Federal Communications Commission. Radio, in its advance, has passed through many trials and tribulations, and now television is passing through similar experiences. Unsound policies and actions, whether by a Government commission, or a commercial company, can be injurious to stockholders, to employees, to the industry and to the public generally. The adoption of incompatible standards and the controversy that raged throughout 1950 in regard to color television are examples of the dangers that can arise from unrealistic governmental decisions.

Because of the uncertainties of the international situation and the great importance of having America fully prepared for any emergency, the radio and television industry, like other industries, is faced in 1951 with restrictions on normal expansion.

The Radio Corporation of America has pledged to the President of the United States its fullest cooperation in the national effort to resist aggression and to help preserve world peace. RCA is "at the ready" with all of its resources, facilities and manpower to do its

part in helping the Nation to emerge from the crisis into a new era of peace and prosperity.

Major Achievements in 1950

1. Development of the RCA tri-color television picture tube, an essential element of any practical color television system.

2. Improvement and simplification of the RCA compatible all-electronic color television system.

3. Extension of television network program service to Florida and westward to Nebraska.

4. Development by RCA Laboratories of the electronic analogue computer, which shows great promise in contributing to the Nation's air power by speeding up the design of guided missiles and airplanes.

5. The enthusiastic public acceptance of the RCA Victor "45" Victrola phonograph, high-quality vinyl plastic disks, and the quickest record changer ever devised; also extension of RCA Victor's record catalog to include improved long play 33 $\frac{1}{3}$ -rpm wide tonal range recordings.

6. Erection of 200-foot multiple antenna designed by RCA, atop the Empire State Building, New York, enabling five television stations to operate simultaneously from one location. It simplifies the directive setting of home antennas, thereby improving reception in the metropolitan area.

RCA Opens Branch Office in New U.N. Building

Opening of a branch office in the new United Nations building on East 42nd Street, New York, by RCA Communications, Inc., was announced on January 9 by H. C. Ingles, President.

In anticipation of the message traffic from UN government representatives and press correspondents, the RCA branch has been equipped with modern machines which can handle as many as 58,000 outbound words in each eight-hour period of the day. Direct lines connect the new branch with RCA's Central Radio Office in lower Manhattan where direct telegraph channels speed messages to and from more than 60 foreign countries within a few minutes.

RCA currently maintains branches for the UN staff at Lake Success and Flushing Meadows, where on days of peak activity any one press association may send out as many as 10,000 words a day. Since many of the UN news stories are written in foreign languages, RCA employs highly skilled operators to assure the utmost accuracy.

Special telegraph facilities inaugurated at the new building will serve the press and UN officials who have moved their headquarters into the partially completed offices. The third floor of the building contains offices for part of the UN press division.

THE SALE OF TELEVISION SETS CONTRIBUTES TO THE PLEASURES WHICH AMERICAN FAMILIES IN EVER INCREASING NUMBERS ARE ENJOYING.



Television—An Audience of Forty Million Americans

By Frank M. Folsom,

*President,
Radio Corporation of America.*

TELEVISION'S popularity in 1950 mounted with such expanding vigor that by year-end this new art and industry had outdistanced the progress of all of its previous years combined. As 1951 bowed in, the New York metropolitan area alone had more than 2,000,000 sets with an estimated viewing audience of 8,000,000 men, women and children.

Within two years—from January, 1949, to this January—television receiver circulation had increased twelve times. This means that across the Nation today, television brings its magic charm into 10,000,000 homes to entertain and inform an audience of approximately 40,000,000 Americans.

During 1950, the public backed its appreciation of this new broadcasting service by spending a billion and a half dollars for sets—an amount exceeding by more than 100 per cent its purchases in 1949, television's third and best postwar year. To meet these demands, television manufacturers expanded facilities wherever possible and stepped up production schedules to such an extent that in a single month more sets were made available to the public than during the entire year of 1948.

Theatre television, with giant projections of special events on screens of motion picture houses, began to spread across the country in 1950. Installations of RCA Victor's new system were made in a number of cities, including New York, Boston, Washington, Chicago and Los Angeles. This was believed to form the pioneering basis for an independent theatre television network which would supplement regular film fare with special offerings to attract the public. By year-end one large theatre chain was planning for installations in 71 theatres



FRANK M. FOLSOM

from Yuma, Arizona, to San Francisco.

RCA Victor's 1950 line of home television receivers led the market in popularity. Eighteen models were offered, including three with 12½-inch picture tubes, eleven with 16-inch tubes and four with 19-inch tubes. During the year, nearly 70

per cent of the total RCA Victor production was devoted to sets with 16-inch tubes, the overwhelming choice.

Television Operations Expanded

The greatly enlarged television audience spurred broadcasters to superlative efforts in extending networks and improving programs. For instance, when the present construction plans of the National Broadcasting Company are completed, NBC's investment in television will be between \$35,000,000 and \$40,000,000. Plans call for the acquisition of more top talent and the start of morning network programming as the number of sponsors increases.

NBC's commanding lead in all phases of television broadcasting is expected to increase as 1951 progresses. The plan is to provide entertainment of such quality and variety that increasing numbers of set owners will be attracted to the NBC network. At the same time, efforts will be made to provide the finest cultural and informational programs.

A TELEVISION TRUCK IS SWUNG ABOARD A FREIGHTER DESTINED FOR SOUTH AMERICA WHERE THE MOBILE UNIT WILL AID IN EXTENDING THE APPEAL AND VARIETY OF TELEVISION PROGRAMS.



Among the mammoth tasks of expansion completed by NBC in 1950 was the building of a line-up of talent for programs that could be produced at the rate of a hundred a week. Other tasks included the leasing and transforming of the world-famous Center and Hudson Theatres, in New York, and conversion of three large radio broadcasting studios into suitable locales for the production of the great new television shows.

Expansion of TV Outside U. S.

Television's success in the United States caused progressive groups in a number of countries to begin in 1950 an active participation in the new art. During the year, two television stations were opened in Havana, Cuba, one each in Mexico City and Sao Paulo, Brazil, and plans for a Canadian station were being studied. A third Cuban transmitter is expected to go on the air early in 1951. All of these stations are or will be RCA-equipped throughout.

Special demonstrations were conducted during the latter part of the year by E. R. Squibb & Sons, in cooperation with RCA, in four Latin American countries to show television's usefulness in surgical and medical training. More than 16,000 members of medical groups in Cuba, Peru, Colombia, and the Dominican Republic witnessed the demonstrations.

In December, presentation of the Nobel awards by King Gustaf VI in Stockholm, Sweden, was televised for the overflow audience by an RCA Victor television crew which flew across the Atlantic with pickup equipment and receivers at the invitation of the Nobel Foundation. After the historic telecast, demonstrations of American television were conducted for Swedish doctors, scientists and government officials.

Expansion of television outside of our borders is of tremendous significance, for it brings closer the day when there can be an exchange of programs, of ideas and culture, to improve understanding between the nations of this hemisphere and strengthen relationships on which peace and progress depend.

Radio broadcasting continued throughout 1950 to render an in-

valuable service to the public. During the first half of the year, radio averaged 35,000,000 listeners every evening of the week in America. Its potential audience of families having sets in their homes comprised 95 per cent of the population.

The year 1950 was one of the most productive in the history of the record industry, and the outlook for 1951 is highly favorable. One of the principal factors in the remarkable up-swing of record sales is RCA Victor's revolutionary 45-rpm record system with its small, unbreakable discs and the fastest record changer ever devised.

"45" Sets New Standard

So great has been the American public's acceptance of the "45's" that today—less than two years after introduction—this system has set a new standard of musical enjoyment in the phonograph field. By the end of 1950, the retail sales of the industry reached an annual going rate in dollar value of \$40,000,000.

Paralleling this success, RCA Victor's new and improved, non-breakable long-playing record (33 $\frac{1}{3}$ rpm) is rapidly becoming the favorite of music lovers who prefer certain classical selections played without interruption. These records, together with "45's" and 78-

rpm discs, provide the public with an unsurpassed library of the world's greatest artists and music. RCA Victor's 1950 line of home instruments included console combination models playing records of all three speeds.

Outstanding Scientific Achievements

Scientists and engineers at RCA Laboratories continued in 1950 to extend the usefulness of the radio-electronic arts for the benefit of the Nation and the public. Among their outstanding scientific achievements was development, in cooperation with the U. S. Navy, of the world's largest and most accurate analogue computer, an electronic "brain" to evaluate the performance of guided missiles, ships, airplanes and submarines for better protection of American cities.

Designated "Project Typhoon," the computer is expected to save American taxpayers a billion dollars by solving problems that ordinarily would require the expenditure of valuable instruments and apparatus.

Another scientific achievement in 1950 was development by RCA engineers of a portable model of the electron microscope, less complex to operate and only 30 inches high. This instrument, capable of magnifications far greater than that of

(Continued on page 17)

FASHION SHOWS ARE AN IMPORTANT CONTRIBUTION TO THE GROWING DEMAND FOR DAYTIME TELECASTS DIRECTED ESPECIALLY TO WOMEN VIEWERS.



[RADIO AGE 7]

RCA Color Television Acclaimed

Demonstrations of Compatible, All-Electronic System in Washington Enthusiastically Praised by Leaders of Industry and Representatives of the Press.

SUCCESSFUL demonstrations of the RCA compatible, all-electronic color television system held in Washington, D.C., during the first two weeks of December were viewed and enthusiastically acclaimed by more than 2500 leaders of the radio-television industry and representatives of the press.

The consensus among the industry leaders was that major strides had been made in the RCA color system, bringing its quality to a level of general public acceptance. Performance of RCA's new tri-color picture tube won high praise. The television industry was represented by manufacturers, broadcasters, engineers, distributors and dealers. Favorable comment on the improvements of the system was also made by several members of the House Interstate and Foreign Commerce Committee who attended the demonstrations.

Some of the comments from in-

dividuals and publications are quoted below:

Convincing proof that the Federal Communications Commission's October decision on color television was premature has just been provided by the Radio Corporation of America. — WASHINGTON EVENING STAR

Last week's demonstration of the improved color system of the RCA materially changes the whole outlook on the dispute over video in natural hues. . . . And unless all accepted criteria have suddenly become faulty, the RCA appears to have a decided advantage over the long pull. — THE NEW YORK TIMES

RCA showed an excellent color picture, striking progress. . . . Thus, RCA has won important victory in a field where it counts most — color performance. — TELEVISION DIGEST

Last week RCA demonstrated the improvements it has made in its compatible all-electronic television

system during the past six months. They were, we think, significant. —

BROADCASTING MAGAZINE

As 1950 closed . . . compatible all-electronic color-TV met and vanquished every indictment which the FCC had earlier charged against it. — O. H. CALDWELL, EDITOR OF TELETECH

The pictures were excellent. I was very much impressed by the enormous improvement. — ROBERT SPRAGUE, PRESIDENT, RADIO-TELEVISION MANUFACTURERS ASSOCIATION.

The following comments of competitors in the industry were published in Television Digest:

This is a big improvement. There is no flicker, the brightness is satisfactory, and the color is better than CBS's. — DR. ALLEN DUMONT

This is great. The important thing is that we've got the right system. This is it. — DR. W. R. G. BAKER, GENERAL ELECTRIC

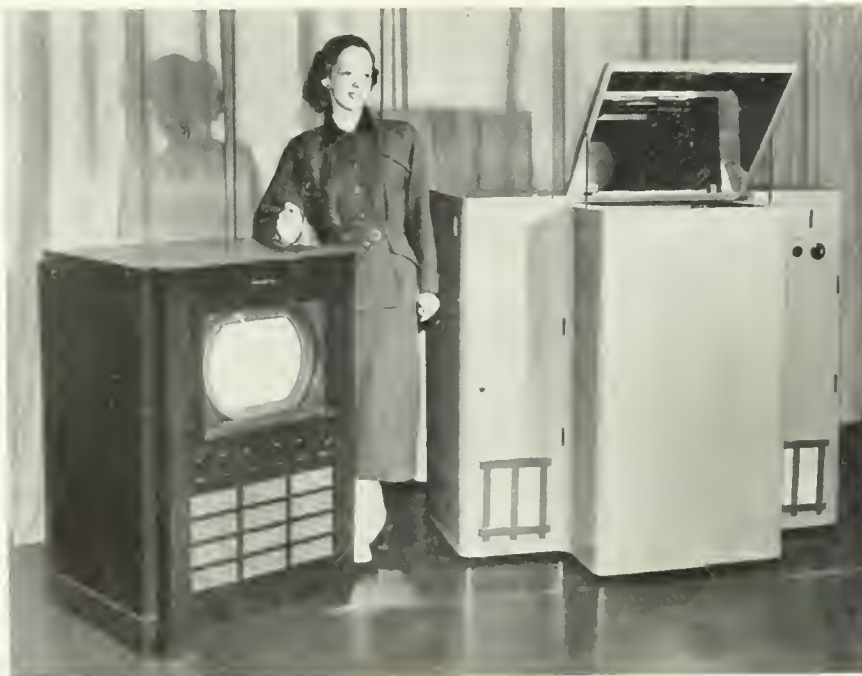
Every technical obstacle has been overcome. — DAVID SMITH, PHILCO

This is fine. There's no question about having compatibility now. — ROSS SIRAGUSA, ADMIRAL

Still further refinement of the system, with emphasis on the development of a larger tri-color picture tube, will be pressed, according to Dr. C. B. Jolliffe, Executive Vice President in Charge of RCA Laboratories.

"I believe we have successfully proved our recent marked progress in color television," Dr. Jolliffe said. "Even more important, our all-electronic system is always growing in the research sense and even further improvements are not only possible but are certain."

Dr. Jolliffe pointed out that the major advances demonstrated were improved color fidelity, improved picture texture, simpler receiver circuits and increased picture



LATEST DEVELOPMENTAL COLOR TELEVISION RECEIVER (LEFT) COMPARED WITH EARLIER MODEL COLOR TV SET DEMONSTRATED IN OCTOBER, 1949.



RCA COLOR TELEVISION CAMERA FOCUSES ON A MODEL AND MANNEQUIN IN A DEMONSTRATION OF THE VALUE OF COLOR IN TELEVISION FASHIONS.



IN THIS COLOR TV CONTROL ROOM OF NBC STATION WNBW, WASHINGTON, D. C., OUTGOING SIGNALS ARE CONTROLLED AND MONITORED.

COLOR TV RECEIVER, EQUIPPED WITH THE NEW RCA TRI-COLOR PICTURE TUBE WHICH HAS APPROXIMATELY 600,000 PHOSPHOR DOTS ON ITS "SCREEN".

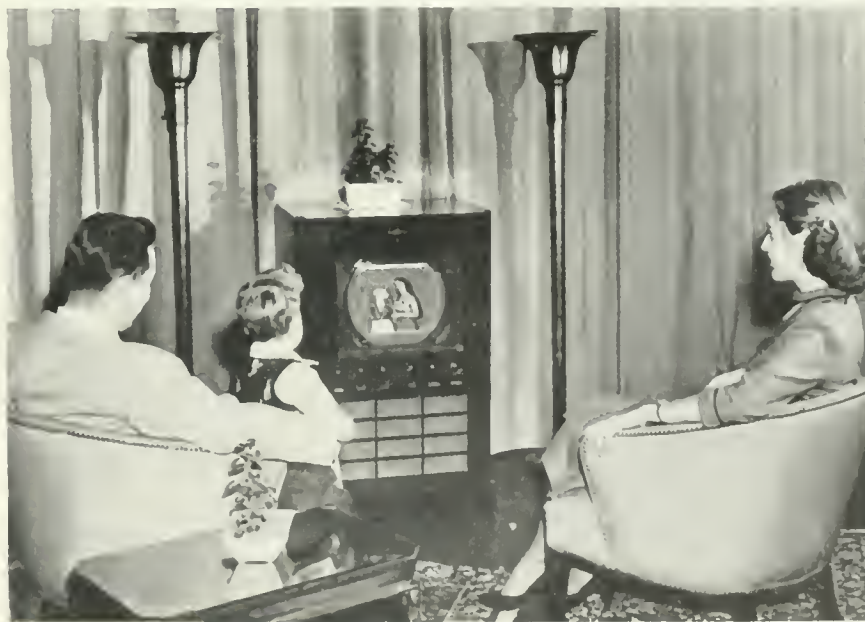
brightness. New red and blue phosphors were used on the tri-color tubes and higher definition of color pictures was achieved by increasing the number of color dots on the tri-color tube from 351,000 to approximately 600,000.

He emphasized that at no time during the 24 individual 20-minute demonstrations was it necessary to retune the receivers.

Three Color Sets Demonstrated

The demonstrations showed in operation three of the latest RCA color receivers as well as two black-and-white sets experimentally converted for color reception. Standard black-and-white sets were operated simultaneously to feature the system's compatibility, that is, the ability of the black-and-white sets to receive color signals in black-and-white without changes in the sets. The receivers were demonstrated in the National Broadcasting Company radio studios in the Trans-Lux Building in midtown Washington.

The color program for each



demonstration originated in the NBC television studios in the Wardman Park Hotel, two miles away.

The color transmitting studio equipment was operated from 8 A.M. to 5 P.M. by the regular staff of WNBW-NBC television engineers during the demonstrations.

The same equipment, with certain refinements, has been in operation since January 9, 1950, for testing, demonstrations, or programs. With the conclusion of the series of demonstrations on December 15, the RCA color signal had been on the air in Washington for a total of 1200 hours.

New Electronic Computer Aids U. S. Air Defense

"Project Typhoon" Solves the Complex Design Problems of Guided Missiles in a Few Seconds.



A PHYSICIST AT RCA LABORATORIES TIMES THE ACTION OF A MODEL USED TO SIMULATE THE BEHAVIOUR OF A GUIDED MISSILE UNDER FLIGHT CONDITIONS AS DETERMINED BY THE ANALOGUE COMPUTER DEVELOPED AT THE LABORATORIES.

THE largest and most accurate electronic analogue computer ever built to evaluate the performance of guided missiles, ships, airplanes, submarines and aid in the air protection of American cities today was shown in operation publicly for the first time at a joint Navy Special Devices Center-Radio Corporation of America demonstration at Princeton, N. J., on November 21.

"Designated 'Project Typhoon', the new electronic computer is expected to save many millions of dollars in the design of guided missiles and also solve many riddles encountered in the air defense of our cities," said Dr. C. B. Jolliffe, Executive Vice President in Charge of RCA Laboratories Division. "Complex simulated problems of a complete guided missile system, which other computers are too small or too inaccurate to handle effectively, can be solved by Typhoon. This will enable the design of equip-

ment with a minimum of experiments that would require expensive apparatus, such as missiles, airplanes and ships."

Dr. Jolliffe predicted that the RCA electronic analogue computer will play a significant role in military science of the future. Very often the construction of an experimental guided missile may cost more than \$100,000, he pointed out, and unless its characteristics are properly checked in advance by accurate computing techniques, actual launchings may be failures resulting in the loss of instruments and apparatus. With Typhoon, he added, any missile problem can be solved over and over, with the characteristics varied each time until the desired results are obtained. Thus, by avoiding costly trial and error tests, the new computer can, with a high degree of accuracy, assure scientists how a proposed missile will react under actual flight conditions.

The new analogue calculator employs approximately 4,000 electron tubes, several miles of intricate wiring and a new set of super-accurate components, exact to better than one part in 25,000. Under contract with the Special Devices Center of the Office of Naval Research, engineers of RCA Laboratories designed and built the instrument for use by the Navy Bureau of Aeronautics. Three years of research and development work directed by Arthur W. Vance, Head of the Electronic Computer Section of RCA Laboratories, preceded actual construction of the computer.

Simulated Problem Solved

During the demonstration, the computed was shown solving a simulated air defense problem wherein a high-speed bomber was successfully attacked by a radar-controlled, supersonic rocket-propelled guided missile. The missile was guided with deadly accuracy to the target.

All information necessary to solve the problem was introduced to the machine by means of more than 100 dials and a portion of 6,000 plug-in switchboard connections, mounted on the tall panel sections of the computer. Different dial positions and plug connections represented such characteristics as aerodynamics of the missile, loss of weight due to fuel consumption, and radar signals which follow the missile and target. Other adjustments accounted for the autopilot or gyro stabilizers of the missile, the path and velocity of the target, and the main guidance system to be used for directing the missile toward the target in the most effective manner.

An instant after the computer was put into operation by the throwing of a switch at the main control console, electrical impulses flowed through Typhoon's thousands of electron tubes and wires. Within

the device, electrical currents and voltages began representing physical things such as distance, velocity and force. Circuits started functioning according to predetermined equations.

While the instrument was engaged in its electronic thinking process, the paths of both the high-speed bomber and the rocket-propelled guided missile were traced respectively by red and green pens on two large plotting boards. From these charts, which provided a permanent record of the test flight, skilled technicians were able to determine the exact position of the missile at any given time.

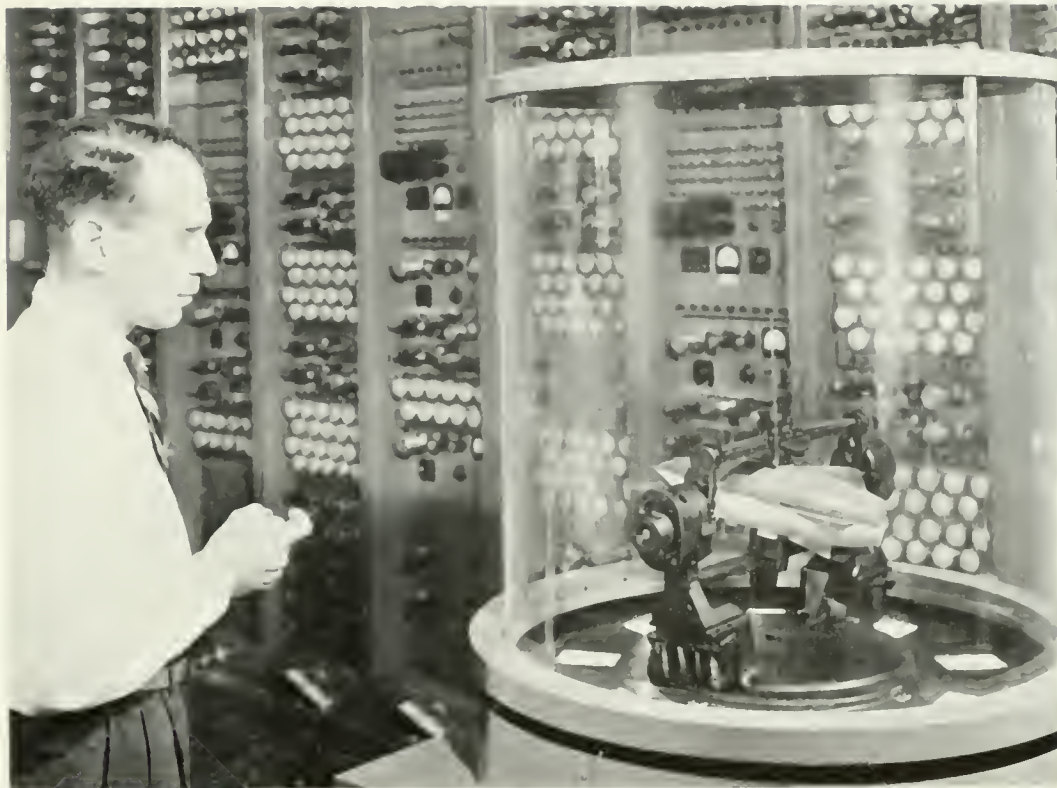
Missile and Target Simulated

A three-dimension visual representation of the "dog fight" as it progressed was provided for spectators by an auxiliary device, called the trajectory model, in which two suspended fluorescent balls traveled the identical course of the missile and target. At the same time, a small scale missile model, 12 inches long and $3\frac{1}{2}$ inches in diameter, revolved about on a rotating mechanism to simulate performance of the anti-aircraft missile under test. As the model received control signals or instructions from the computer describing how best to hit the target without wasting too much time or fuel, its three sets of fins were deflected as the corresponding fins of a missile would be deflected in actual flight.

While the solution proceeded, 12 recording voltmeters drew curves on paper rolls indicating the positions of the fins, acceleration, velocity, and rate of spin of the missile, as well as the remaining distance between missile and target. Six sets of flashing neon lights on the panels of the computer displayed numbers representing the rates of spin, and the sidewise and forward velocities of the missile.

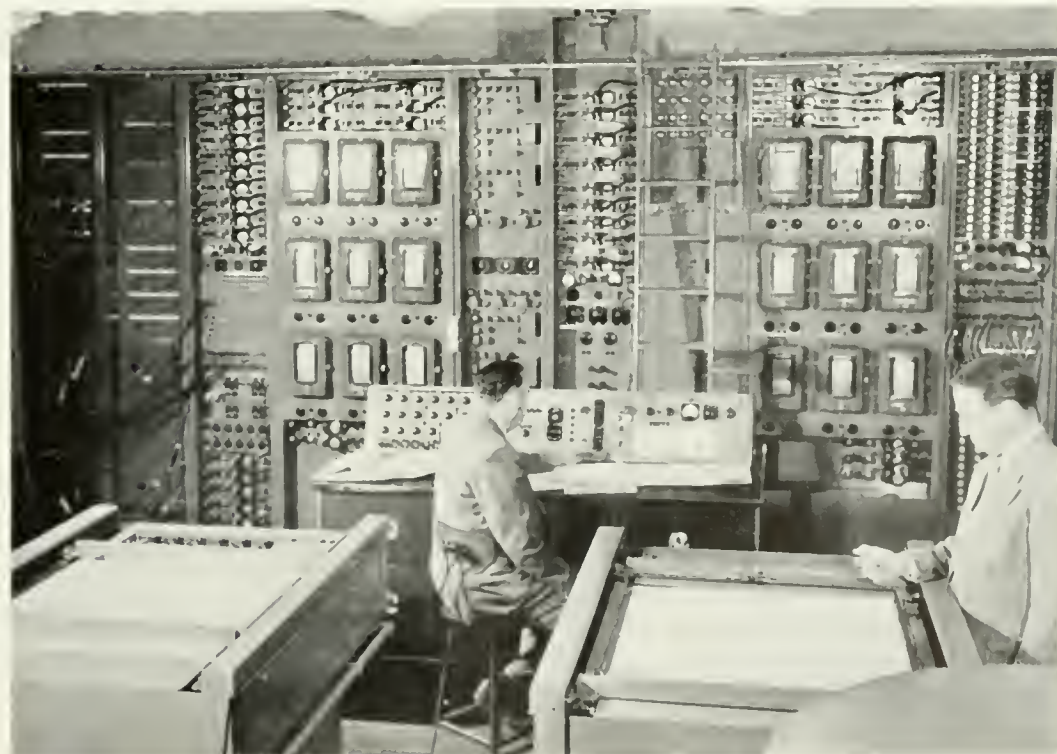
After only 60 seconds of operation, the computer automatically stopped and the solution was examined. RCA engineers then took the complete answers and explained what factors were right or wrong.

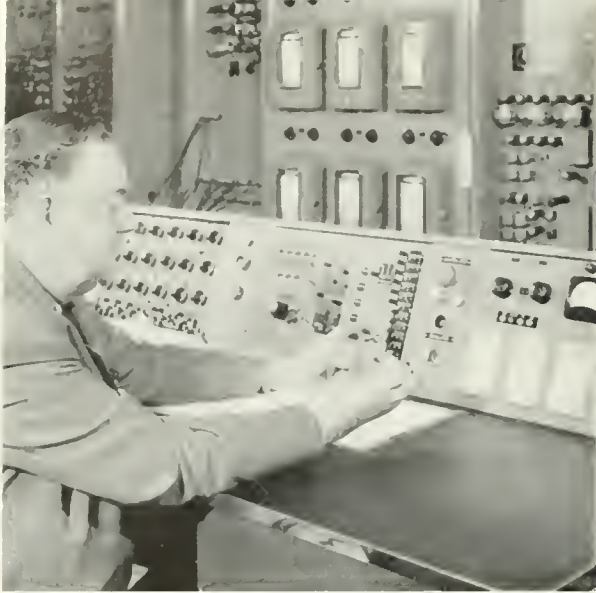
Solution of the problem involved 250 additions, 67 multiplications,



BEHIND THE SMALL SCALE MODEL OF A MISSILE ARE SOME OF THE NUMEROUS PANELS CONTAINING THOUSANDS OF TUBES REQUIRED FOR THE OPERATION OF THE ANALOGUE COMPUTER.

IN THE CENTER REAR IS THE MAIN CONTROL DESK OF "PROJECT TYPHOON" WITH THE TWO PLOTTING TABLES, ON WHICH THE PATHS OF MISSILE AND TARGET ARE TRACED, IN THE FOREGROUND.





A CLOSE-UP VIEW OF THE CONSOLE FROM WHICH THE ENTIRE OPERATIONS OF THE ELECTRONIC ANALOGUE COMPUTER CAN BE CONTROLLED.

30 integrations, and 20 aerodynamic functions, all carried on simultaneously with continuously variable factors. A mathematician and an

assistant would require 6 months to compute a single solution for the minimum number of points required to give an approximate answer. Typhoon gave the continuous solution, for an infinite number of points, in less than 60 seconds.

It was pointed out by Mr. Vance that Typhoon is an extremely versatile instrument. Shortly before the start of the demonstration a complex problem was being solved by the computer. A few hours later, all necessary adjustments had been completed in order to determine the solution for the test problem. On equally short notice, Typhoon may be switched from one problem to another. This feature is a valuable aid to design engineers who require speedy verification of plans before going ahead with construction work.

The heart of Typhoon is a new type of electronic multiplier which consists of a hybrid between ana-

logue and digital apparatus. Basically, an analogue device may be compared to the operation of a slide rule, and a digital one is similar in function to an adding machine. By blending these two techniques in more complex forms, Typhoon achieves a combination of flexibility and accuracy unobtainable by either of the systems alone. Each of the more than 600 electric relays in the computer's multipliers operate in 1/10,000 of a second.

A staff of nine engineers and mathematicians as well as six technical assistants are required to operate the computer when it is solving complex guided missile problems. To keep the sensitive instrument free of climatic influences, Typhoon is housed in a special air-conditioned room at RCA Laboratories which has a constant temperature of 75° Fahrenheit and a relative humidity of not more than 50 per cent.

"Tex" Service Extended To Customers in Denmark

Denmark has become the third European country to be linked with New York and Washington, D. C., in RCA's overseas customer-to-customer radio teleprinter exchange service. Previous TEX circuits opened by RCA provide direct teleprinter connections between customers in the two American cities and those in the Netherlands and Western Germany.

"Public acceptance of the TEX service is paving the way for a much wider application of this important means of direct communication," said H. C. Ingles, President of RCA Communications, Inc., which developed and operates the new service. "We are pleased to extend the service to Denmark, and we expect to expand it to other countries in the near future."

The two-way RCA teleprinter connections, are billed on a time basis, rather than the usual telegraph word rate and provide greater economies than transatlantic telephones, with the added advantage of fully recorded messages.



BRIG. GENERAL DAVID SARNOFF, CHAIRMAN OF THE BOARD, RADIO CORPORATION OF AMERICA, AND GENERAL GEORGE C. MARSHALL, RED CROSS PRESIDENT, DISCUSS THE 1951 AMERICAN RED CROSS FUND CAMPAIGN WHICH GENERAL SARNOFF WILL DIRECT AS CHAIRMAN.

Urges Public be Given Chance to Select Color TV System

RCA Executive Asserts FCC Decision Puts Ceiling on Scientific Development.

THE right of the American public to determine "by its ballot in the marketplace" which color television system it prefers was urged by Robert A. Seidel, Vice President of the Radio Corporation of America, in an address before the National Retail Dry Goods Association in New York on January 11.

If RCA is permitted to offer its system to the public, NBC will begin broadcasting good color television programs in good commercial time, "not just experimental broadcasts at odd hours," he told the nation's retailers.

Declaring that the right of the public "to pick and choose" is inherent in American freedom, Mr. Seidel said the recent FCC decision favoring a spinning-disk, non-compatible color television system "is exactly the same" as if, in the early days of the automobile industry, some government bureau had standardized the Stanley Steamer to the exclusion of gasoline motors.

"In effect," he said, "the FCC order tells the public: 'This is the type of color television we prefer, and it's the only type you're going to be given an opportunity to buy.' We have the unprecedented situation of a Government Agency actually placing a ceiling on scientific development."

Public Should be the Judge

All RCA asks, he continued, is that the public be given a chance to judge for itself.

"That's how everything good was developed in this country," Mr. Seidel declared. "Everybody who had a product in which he had confidence could bring it to the marketplace. There it was placed side-by-side with competing products, and the people voted on which they thought was better. They voted with their dollars, instead of ballots. The product they liked best was the one they bought. The others went off the market.

Asserting that RCA is ready to stake its resources, its dollars, and its reputation, "both as broadcasters and as set manufacturers," on its compatible, all-electronic color system, he expressed confidence that the public, if allowed to judge, "will make the right choice, as they always have".

Faults of FCC-Approved System

Mr. Seidel pointed out that the system approved by the FCC produces images composed of only 83,000 individual picture elements, as compared to the 200,000 elements constituting, present black-and-white images, resulting in degraded picture quality. He also pointed out that present set owners would not be able to receive color broadcasts even in black-and-white without the wholly unnecessary investment of large amounts in adapters or converters.

Estimating that it would cost the public one billion dollars to convert the 10,000,000 television receivers now in use so as to receive programs broadcast with the mechanical color system, he said:

"Compatibility is a fundamental requirement of any good broadcasting system, and is the responsibility of the people developing the system, and not of the people who bought black-and-white sets in good faith.

"Even though current national developments may retard or completely stop its progress," he said, "color television will ultimately have an important bearing on the promotional activities of every manufacturer and every retailer, and its effect will be felt in every household in America."

Color Will Benefit All

Everybody wants color television, including manufacturers, Mr. Seidel declared, because good color television will benefit the manufacturers and distributors of television receiving equipment, as well as the

broadcasting stations and the American public. RCA has put sound planning and intensive effort into the perfection of color television, he said, and has invested several million dollars in it.

Mechanical Method Discarded

More than twenty years ago, he recalled, RCA started experimenting with a system similar to the one recently approved by the FCC, but later abandoned it because of its limitations. Convinced that its own interest and that of the public demanded the harder course of developing an all-electronic color system, the company undertook research leading to the single tri-color tube compatible system demonstrated successfully in Washington last month.

When the receivers seen in Washington are engineered to a point where they can be put on a production line, Mr. Seidel promised, "they will produce a color picture adequate to meet the demands of the most exacting customer."

"Regardless of what system or systems are finally approved," he said, "color television is going to assume its place gradually and naturally over a period of years. For a long time to come, black-and-white television must remain the backbone of the industry. Sponsors of television programs are going to stick to black-and-white until a good audience has been built for color. NBC and other television broadcasters are improving and expanding their black-and-white television service day by day, and they will continue to do so. And every day, the public is buying, and will continue to buy, more and more black-and-white receivers, regardless of all the talk about color."

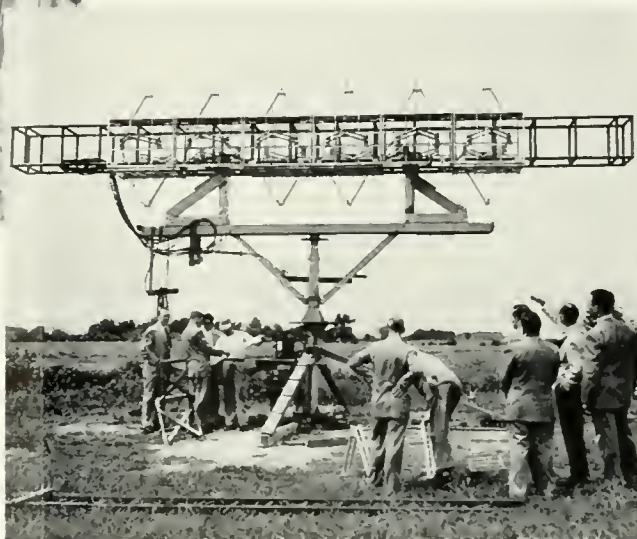
Third TV Station for Cuba

The third television station built by the Radio Corporation of America for operation in Havana has been shipped to Cuba. The new station will be operated by Telenews Company, Alonso, S. A. Its President is Manuel Alonso, owner of the Cuban firm, *Noticiario Nacional*, producers of newsreels and documentary films. Mr. Alonso hopes to have the Telenews station on the air early in 1951.

Erecting New TV Antenna

Flanked on either side
of WNBT and WJZ-
has reached the 130

Workmen with torch and sledge prepare to dismantle the old antenna mast which supported WNBT's TV radiator.



RCA engineers, working at a field laboratory near Camden, N.J., conduct tests on a model of the Empire State antenna.



Steelwork for the 217-foot tower is raised from ground level to the top through one of the building's elevator shafts.

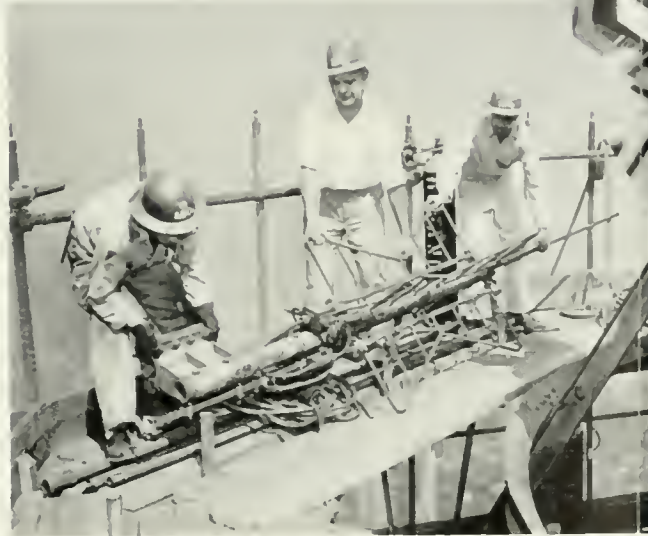


Temporary antenna is assembled and raised on support alongside the main mast.

for the New York Area

orary antennas
er, in this view,
n 80 feet to go.

Looking down from the dizzy height of the steel lattice-work which will support five TV and three FM antennas.



Working on a narrow staging 1300 feet above the street riggers prepare to set up a super-gain TV antenna.

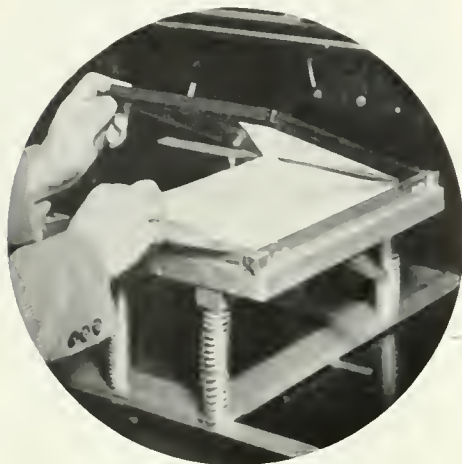


Workmen attach transmission cables to a temporary antenna which WNBT has been using while the new tower is going up



Intrepid riggers hail the completion of the lofty structure by raising a flag on the tower's peak, 1500 feet above the street.

RIGHT: PRINTED MATERIAL TRANSMITTED BY RCA FACSIMILE EMERGES FROM THE RECEIVING CONSOLE AT THE RATE OF 15 LINEAR INCHES A MINUTE. BELOW: COPY TO BE TRANSMITTED BY FACSIMILE IS PLACED ON THE "COPY BED" AND AUTOMATICALLY MOVED FORWARD LINE BY LINE UNDER A FLYING SPOT SCANNING BEAM.



Fast, Long-Distance Facsimile

Test Model, Installed at Oak Ridge, Speeds Library Service for Research Laboratories at Atomic Energy Plant.

A TEST model of a new high-speed, long-distance facsimile system, developed by RCA Laboratories, Princeton, N. J., under contract with the Atomic Energy Commission, has been installed at the Oak Ridge National Laboratory for providing full reference library service to outlying research laboratories.

The new system incorporates several innovations in the field of facsimile reproduction. The reader-transmitter will scan printed copy or drawings on flat surfaces such as book pages and will make direct enlargements of material in small type by any ratio up to 4 to 1. The copy bed can handle individual sheets or books up to 3 inches thick. The signal is transmitted over an ordinary telephone line and the recorder will reproduce clear, highly legible black-on-white copy at a speed of 15 linear inches or 120 square inches per minute.

Operational tests to be started at Oak Ridge immediately will indicate to what extent existing library services at the Laboratory can be expanded without greatly increasing the outlay for new books and particularly scarce and expensive sets of bound scientific periodicals. The system will also prevent possible contamination of books and

journals in laboratories using radioactive materials.

At the present time at Oak Ridge more than a score of separate research and production facilities scattered over a wide area require library services. If the new facsimile service proves useful, it may be possible to consolidate many of these library services into larger, more adequate units.

The transmitter is located at the central library at the X-10 site while the only operating recorder is located 8 miles away at the Y-12 site. On the initial test of the system a research chemist at Y-12 requested the complete text of a 2-page article to which he had found a reference in *Chemical Abstracts*. The bound periodical was located in the X-10 library stacks, placed in the transmitter, and a facsimile copy was delivered at Y-12 within 4½ minutes after the request was made.

Flying Spot Scans Copy

A cathode ray flying-spot scanner at the sending unit is the most important innovation. The five-inch cathode ray tube directs a tiny spot of light through a focusing lens to "read" the copy in a thin line from left to right. The reflected light

from the copy is picked up by a bank of four photomultiplier tubes which convert the varying light impulses into normal electrical facsimile signals.

The copy bed automatically moves the copy forward under the flying-spot cathode ray tube. The length of the scanning line on the copy can be adjusted from 2-1/16 to 8½ inches by simply turning a knob. This automatically adjusts the lens to maintain the proper focus and the same adjustment changes the speed of the copy bed to maintain the correct scale.

The receiver, or recorder, also incorporates several new mechanical and chemical features to simplify operation and to supply a permanent print of the transmitted material. The electrolytic process used in recording eliminates photo developing and printing and avoids the mess, clogging and corrosion of previous electrolytic methods. The paper is moistened no more than is absolutely necessary, and as it passes out of the machine it is completely dried. Ultraviolet light fixes the chemicals so that neither the printing nor the background will fade. The clogging and corrosive action of the chemical solution is eliminated by keeping separate the

(Continued on page 28)



STATE DEPARTMENT'S NEW STUDIO-ON-WHEELS RECEIVES OFFICIAL SEND-OFF UNDER FLAGS OF THE UNITED NATIONS IN ROCKEFELLER PLAZA, NEW YORK.

Television—An Audience of Forty Million Americans

(Continued from page 7)

conventional light microscopes, is expected to appeal particularly to colleges, hospitals and industrial laboratories.

A new and highly effective television system that extends human sight far beyond normal limits for benefits to science, industry and education was disclosed and demonstrated in 1950 by RCA. The apparatus, portable and easy to operate, can be used for nonbroadcast industrial televising. The system is based on a remarkably sensitive pickup tube, known as the vidicon, which is expected to be the forerunner of smaller electronic "eyes."

A test model of a new high-speed, long-distance facsimile system, developed by RCA Laboratories, under contract with the Atomic Energy Commission, was installed at the Oak Ridge National Laboratory to provide full reference library service to outlying research laboratories.

In the field of international communications, RCA proceeded with success in extending use of its automatic tape relay method of transmission and advanced mechanization for greater speed and accuracy in handling overseas radiotelegraph traffic. During the year, RCA Communications introduced a new two-way, customer-to-customer teleprinter exchange service, known as TEX, and extended this service for operations from New York and Washington to the Netherlands and Western Germany.

Radiomarine Corporation of America, another service of RCA, in 1950 produced shipboard radar, loran, radiotelephones and other navigational aids and communications devices in quantities exceeding those of 1949.

A record number—957—of students were graduated from RCA Institutes in 1950. Reflecting the increasing importance of the courses in radio, electronics and television virtually all of the graduates found jobs immediately with industry. Veterans of World War II accounted for 60 per cent of the 1950 enrollment.

Radio Studio on Wheels

Van Built by RCA for Voice of America Broadcasts, Contains Complete Shortwave Transmitter and Recording Units.

A STREAMLINED radio studio-on-wheels, built by the Radio Corporation of America with the best types of shortwave transmitting and recording facilities, has been delivered to State Department representatives for use on roving assignments for "Voice of America" broadcasts.

Delivery was made by the RCA International Division at a ceremony under the flags of the nations in Rockefeller Plaza, Radio City, New York. Receiving the mobile unit on behalf of the "Voice of America," Foy D. Kohler, Chief of the International Broadcasting Division of the State Department, declared:

"This unit is a tribute to American industry as a whole and to the American radio industry in particular. With it the Department of State of the U. S. A. can better take to the road for its material.

"This studio-on-wheels will bring our roving microphones to the very spots that best tell America's story to listeners overseas: its homes, factories, fairs, sports events, its research centers, musical groups, schools. This beautiful motor vehicle, so typical of America itself, will help us get closer to America

and thus the better to tell our story."

In response, Meade Brunet, a Vice President of RCA and Managing Director of the RCA International Division, said: "We are glad to be the instrument of the radio industry which has helped the 'Voice of America' in its great task of world enlightenment."

The mobile unit, a shapely, enclosed blue and white truck, was designed by "Voice of America" engineers and is RCA-equipped throughout. It contains a complete radio studio, transmitter, control room, recording apparatus, intercommunication system. With its own power supply, the unit can broadcast programs directly from outlying locations.

Commentaries, interviews and musical programs can be conducted from a sound-proof studio; a control room in the center of the mobile unit contains all the equipment necessary for broadcasting and receiving programs. Besides two disc-recording machines and two magnetic tape recorders, a low-powered shortwave transmitter relays programs back to the main studios of the "Voice of America," whence they are re-transmitted overseas.

Alert Receiver Gives Warning With the Speed of Light

Simple Instrument, Now Proposed for Use in Nation's Defense Plans, Proved Itself in 1949 Test.

DANGER of sudden attack on the United States brings to the fore the urgent need for adequate defense not only to ward off the attack itself, but to minimize loss of life and property. Of vital importance, therefore, is a system of warning that can cover wide areas with the greatest possible speed and dependability.

Radio communications provide the basis for such a system. As fleet as light, radio signals travel at 186,000 miles a second; they can carry virtually any type of information; they can be reliable to a point of perfection. The problem is to establish radio signalling networks in tactical defense areas—networks that can link civil defense control centers directly with all forces needed for immediate action when the alarm goes out.

General requirements of a suitable warning system are these: (a) that it communicate almost instantly over distances of several hundred miles at least; (b) that it be selective in reaching any one of several areas, or reach simultane-

ously all areas in danger; (c) that it be selective in reaching any one group in an area, or all groups in an area; (d) that it be simple and dependable; (e) that it be low in initial cost of equipment and inexpensive to maintain; (f) that it be susceptible to national standardization; (g) that it be capable of easily coordinated operation in civil defense plans.

When notice of a coming air raid reaches a Defense Control Center, it is essential that the warning be relayed at once to all proper authorities, as well as to all key defense personnel within the danger zone. These groups may include governors of states, mayors, law enforcement and fire officials, hospital and public works directors, transportation supervisors and civilian defense block wardens. The alert, to be effective, has to be complete.

Alerting Method Developed

Recognizing the need for a satisfactory civilian warning method, the Radio Corporation of America began research in this direction almost a year before the Japanese surprise assault on Pearl Harbor on December 7, 1941, alerted the Na-

tion to the danger of sneak attacks from distant enemies.

Research had progressed to such an extent that by mid-summer, 1941, RCA staged a demonstration in which it revealed publicly for the first time the ability of the RCA Alert Receiver to serve as a means of defense warning. Participating as National Director of Civil Defense, the late Mayor F. H. LaGuardia of New York described the device as "of the greatest possible value to our national defense."

New Instrument Introduced

Brigadier General David Sarnoff, then President of RCA, briefly introduced the new instrument and discussed its usefulness with the Mayor, while a nation-wide audience, tuned into a network of the National Broadcasting Company, listened to the description of this new service to the public which had come out of RCA Laboratories.

The initial demonstration took place in the Administration Building at LaGuardia Airport. It consisted of a three-point hookup. Word that "enemy planes" had been sighted was relayed by telephone by Army officers at Mitchell Field to a Civilian Defense Officer in an NBC studio at Radio City. Immediately, this officer pressed a button that sent a robot, or sub-audible, signal riding over the station's waves. Within a second or two, the impulses turned on the Mayor's RCA Alert Receiver at the Airport. Lights glowed and a bell on the receiver rang to notify him that the

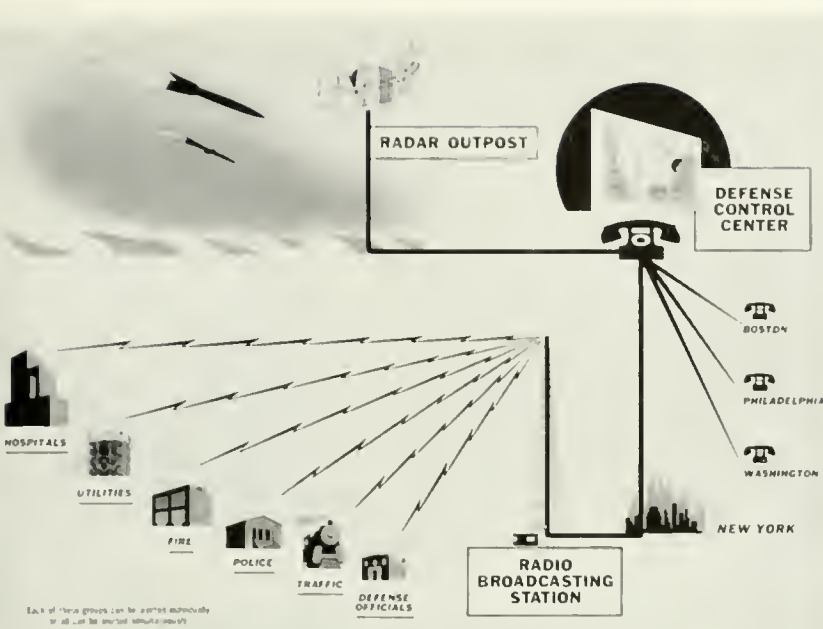


ALERTING APPARATUS AT TRANSMITTER IS COMPACT AND SIMPLE TO OPERATE.

[18 RADIO AGE]

FOUR EXPERIMENTAL MODELS OF THE RCA ALERT RECEIVER ARE SHOWN BY ARTHUR F. VAN DYCK (RIGHT) OF RCA LABORATORIES.





THIS DIAGRAM SHOWS HOW EACH DEFENSE GROUP CAN BE ALERTED INDIVIDUALLY OR ALL GROUPS IN CONCERT THROUGH THE USE OF RCA ALERT RECEIVERS INSTALLED AT STRATEGIC LOCATIONS.

network was ready from coast-to-coast to broadcast any message he might have as National Director of Civilian Defense.

With the end of the global conflict, interest in the Alert Receiver subsided. But less than four years after the "cold war" had made the international situation so critical that, once again, civilian and military forces began discussing defense plans, and the receiver made another appearance. On September 5, 1949, civil defense forces participating in "Operation Lookout" were called to action in New England by this ingenious alert method.

As more than a hundred Air National Guard pilots "raided" the East Coast from Maine to Delaware, a signal was sent from a command post of the Continental Air Command in New Hampshire to station WFEA, Manchester, N. H. There it was transmitted as an inaudible tone to station WBZ, Boston, and by that station to an RCA Alert Receiver in the air raid warning center of Montpelier, Vt. This signal, which arrived only a few seconds after its original transmission, warned the defense staff that the raid was in progress.

In an earlier stage of Operation

Lookout, which was conducted under the Continental Air Command, the warning signal originated at a command post on Long Island. Passing over private wire to the transmitter of NBC's station WNBC at Port Washington, Long Island, the signal was added as an inaudible tone to the station program beams. It was received by an RCA Alert Receiver at Station WGBI, Scranton, Pa., and retransmitted to civil defense headquarters in that city.

Signal Warns Defense Staff

These demonstrations revealed the ability of the RCA alert system to work effectively over distances of several hundred miles and to provide defense authorities with the specific degree of emergency.

The RCA Alert Receiver transforms existing radio broadcasting facilities into a warning system of unsurpassed speed and scope. Through its use, entire communities, regions, or the Nation itself can be alerted within the space of a few seconds.

The instrument, about the size of a portable radio set, turns on automatically when it receives a special inaudible signal from a broadcast-

ing station, rings a bell, turns on a red or yellow light according to the kind of alert being sent out, and a white light when the all clear signal is flashed.

The receiver is simply constructed, and its tubes require such negligible power that it can be operated twenty-four hours a day over long periods of time at low cost. It can use batteries or electric current.

The device may be fixed-tuned to any one broadcasting station. It is then receptive to the inaudible signal from that transmitter. A self-contained loudspeaker remains silent until the special signal is received.

Signal Operates Relay

When this signal arrives, it energizes an electric relay which clicks the loudspeaker into the circuit to reproduce the transmissions from the broadcasting station.

Simultaneously, the bell rings. This is to insure the summoning of the listener in the event that the alert occurs at night. The bell, if desired, may be located at a distance from the receiver, so that the listener, although in a different part of the building, will not miss the call.

Lights atop the instrument can carry the color signal denoting the type of alarm. For instance, colors that might be specified are: yellow, indicating preliminary warning of possible attack; red, indicating attack imminent, and white, announcing the all-clear.

At the transmitting station, the apparatus is very simple. It consists merely of a vacuum tube oscillator which generates the inaudible sound frequencies—one for each of the desired actions to be performed.

The signal generating unit is connected to the broadcast transmitter like a microphone. In fact the control room operator plugs the oscillator device into the microphone circuit. When a button is pressed it releases the "On" sub-audible signal, which turns on all of the Alert Receivers equipped to be activated by it.

Engineers stress the fact that

(Continued on page 28)

Design for Television

Illusion is an Important Part of the New Medium but Only Through Realism Can TV Achieve Its Proper Role in Society.



TELEVISION HAS PROVED ITS WORTH IN BRINGING FINE MUSIC AND GREAT SINGING FROM THE CONCERT STAGE TO THE HOME.



THE TELEVISION SCREEN EXPOSES THE VIEWER TO WORLD EVENTS AND THE PEOPLE RESPONSIBLE FOR THEM.



EVERYTHING we do in television is an influence on those who are watching and listening to us. For that reason we in television are all public relations people. Not only do we recognize the social effect of what we will be sending into the home but we rejoice in it.

The contribution that television can make in communications to the understanding of the various facets of life, the various peoples of the world, is tremendous. We can show what they do and what their strengths and weaknesses are, their ambitions and aspirations. The whole mosaic of factors surrounding modern life can be made understandable when known to people through television. Because essentially television is a medium of reality.

We use television, of course, for illusion and we use it greatly for entertainment. But essentially in revealing people as they really are without the formalism of convention and manners, in revealing events as they really happen, in making one present at history as it is born, in all the myriad phases of television and the peculiar quality of miracles that television has, the wonderful spontaneity, the wonderful contemporaneity of television—all means that this medium of communication is going to make the people of this world understand each other better, like each other more, or at least know each other well enough to find procedures and means of getting along with each other without open warfare and open clash.

The general impact of the entire television medium will serve the people even without much thought or care. By this I mean that all networks and all stations covering as they will under the private enterprise system all possible forms of diversion and entertainment, all possible forms of special group interests and their satisfaction through special programs will in general offer such a wealth of exposure to so many different things



By Sylvester L. Weaver, Jr.

*Vice President in Charge of Television,
National Broadcasting Company*

that the overall accumulative effect will be to broaden the cultural horizons and broaden the interests of our people, broaden their understandings, add to their knowledge and in general activate many of the latent traits which they have within them.

Pattern Will be Established

It is not, however, NBC's purpose merely to take part in this gradual amelioration of our society through the basic power of this great communication instrument in the living room. It is our intention rather to base an approach upon the things that we learned from two decades or more of showmanship in the living room with the radio set. It is our intention to set up a pattern that will accelerate all of the good things that television has within it.

One thing that we certainly do not intend to do is to take television and to have a small, lost department called "Cultural Events" or "Educational and Public Affairs" or something of that sort, and try to have a rearguard retreating action against the pressure of the small but articulate cultural groups of this country. Rather, we will conduct our social responsibility from the highest offices.

What we can do in public affairs and news coverage we will do. What we can do in the general use of our medium through high circulation.

gh voltage programming, by including in relatively short doses things in which the people have no particular interest in the hopes of gradually creating special interest. These people, will be done on a planned level. Let me be specific. The opera will on occasions get large audiences. Nonetheless it is more likely that even larger audiences will result from such happenings as the Metropolitan Opera stars, Robert Merrill and Margherita Piazza performing in operatic vignettes on Your Show of Shows on Saturday nights. When we put opera on, we are catering to the wishes of a special group relatively small in numbers. But simultaneously and more important we are broadening and increasing the size of that group by presenting opera attractively in vignette form to people who would not now watch in longer form. Some of them will become opera lovers.

The same thing can be said for the ballet and the efforts in the great entertainment shows to include ballet.

Fine music and great singing from the concert stage can be handled in similar style.

NBC to Join in Social Advance

NBC, to recapitulate first in a general way, will be part and parcel of the great social advances that television will bring about through the exposure through television to the world and all the people in it of importance, a knowledge of our times and exposure to cultural influences by all families with sets. Secondly, NBC through its public service and public events coverage, through its news, will do a great job in advancing the special cause of news information. Then, NBC through high voltage, high circulation attractions will reach the all-set circulation and when that all-set circulation is available, we will give the audience exposure to cultural and informational experiences of plan.

And finally, we wish to replace the radio experience that we had with a marginal time operation appealing to special interests with a new device which I am unveiling today for the first time.

This plan has the working title "Operation Frontal Lobes". As you can see, it is a cultural plan, and it is, in my opinion, the most intriguing possibility that has ever happened in the communication field as far as marrying the practicalities of a network operation and its high circulation necessity with the need to do a great job for all the people.

To Create Reporting Style

First, the shows NBC wants America to see: the operas in English, the NBC Symphony, the Masterpiece Playhouse. Certainly we want to offer Sadler's Wells Ballet next year in peak time. Then in addition to music and drama of the finest, we want to create a new kind of reporting for the American people. We want to present the issues of our times to the people with enough showmanship so that most of the people will watch the shows.

Americans believe in self advancement. We in advertising know how to get visibility for ideas and acceptance for ideas. We can get visibility and acceptance of the idea that important issues and people of our times should be watched on television. We can build shows and an acceptance of shows for the all-set circulation, even though the subject matter is not immediately appealing.

For instance, the issues of our times certainly include the great problem of the individual and his rights and the group or state and its rights. Whether we have Bertrand Russell and his book "Authority and the Individual", or whether we dramatize the life of an average man to show the large limitations on his freedom brought about by the development of our industrial society,—or whether we create a whole new approach to this creative challenge,—we have an opportunity and an inspiration to make people understand the times in which they live, so that they may make more intelligent decisions in the years of decision through which we are passing. We could get Dartmouth College, for instance, to develop a show based on its Great Issues course. Or we could make the issue of a future economic system of

private enterprise or socialism, surely one of the greatest questions of the century. We could present that issue by debates between selected American and English intellectual, business, and political leaders.

We could do a show on the changing credo of the American nation, showing what we as a people believed a century ago and today, and why those beliefs have changed. We could face up to and report on the tide of nihilism that constitutes one of the obvious shaping forces of our era. Everywhere we look we can find subjects that should be explored and exposed to our people, because our people, you and I and the man next door, are going to need all the intelligence and knowledge possible to solve our problems.

Television has Impact

America's future cannot be decided on the information given us at Mother's knee, unless Mother gave us information open to proof, and capable of demonstrating its social usefulness in today's world. Of all the forces that can move in on lethargy and prejudice, television has the impact, the power, and the fascination to make adult subjects worthy of mass circulation. Obviously, the selection of subjects and the handling of subjects must stem from the central core of material that might be called the area of agreement among most American groups. We plan to explore and expose—not propagandise.

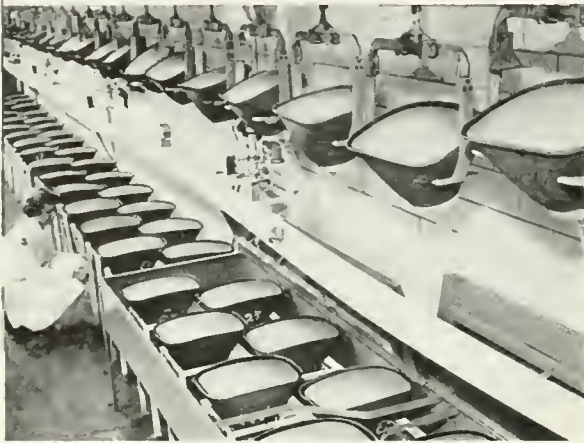
These great shows of cultural or
(Continued on page 28)

"EVERYTHING WE DO IN TELEVISION IS AN INFLUENCE ON THOSE WHO ARE WATCHING AND LISTENING TO US."

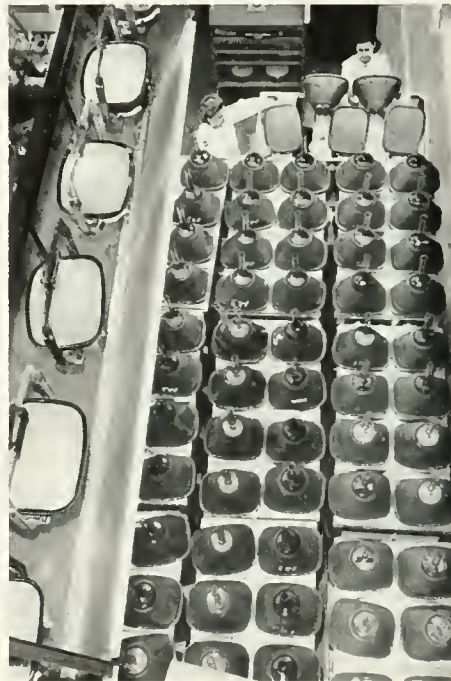


Manufacturing the RCA 17-inch Rectangular TV Picture Tube

at the RCA Plant in Lancaster, Pa.



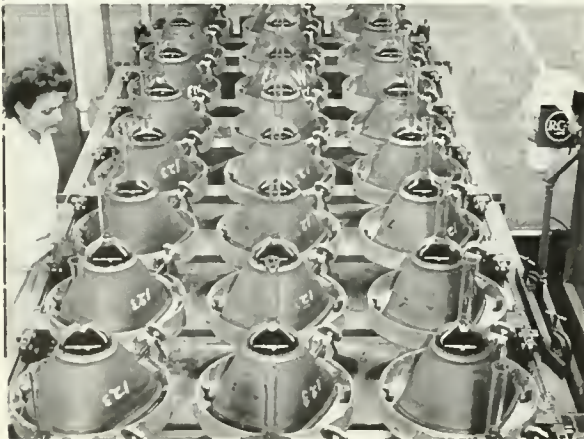
Fluorescent screen surfaces of television picture tubes are quick-dried in the special racks shown in foreground.



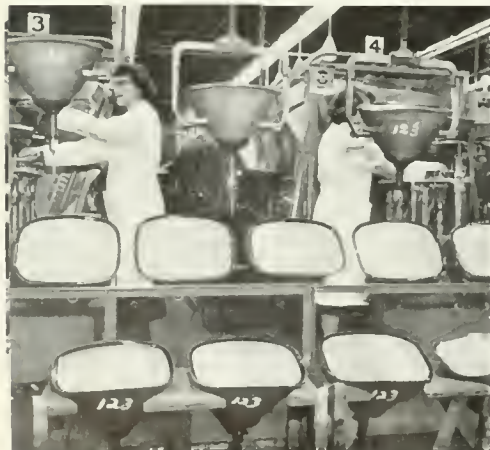
An elevated conveyor transports the 17-inch rectangular tubes from one process to another.



Tubes are cleared of air by pumps which create the vacuum required for television kinescopes.



Tubes move slowly on this travelling belt while the fluorescent powder becomes a flawless surface on the glass face-plate.



After air is removed, tubes are passed through an oven to expel gases from the metal shells.



Workers place the tubes on a conveyor belt leading to the next process in mass production.



The tubes move slowly through an oven where the fluorescent screen surface is baked.

Servicing Military Equipment

A Technicians Help Keep Armed Forces' Electronic Devices in Order on Land, in Air and Aboard Ships.

WHEREVER the sun shines—on the battlefields of Korea, an Air Force base on Guam, on a battleship in the South Pacific—shines on an RCA Service Company field engineer, a specially-trained civilian technician using know-how to help keep the armed forces' electronic equipment top working order.

These men are the backbone of the Company's recently established Government Service Division. Numbering in the hundreds, these highly qualified technicians are on duty today with U. S. Army, Navy, and Air Force units the world over, in 17 different foreign countries, on islands in the Atlantic and the Pacific, and at military bases throughout the United States.

Their basic assignment is to install, maintain, and repair electronic equipment of all types and make, and to instruct military personnel in operation, installation and repair procedures. Such equipment runs the gamut from standard teletype, radio, and aircraft communication systems to highly complex radar, sonar, and electronic bombing equipment. Whenever such equipment is used by the military, RCA Service Company personnel will be found, doing the work that has to be done to keep the equipment on the beam.

The Government Service Division represents a pool of electronic



By P. B. Reed

*Vice President in Charge of
Government Service Division,
RCA Service Company*

specialists, ready and waiting to rush on short order to any part of the globe where the servicing of military communications equipment is required, whether it be the army post nearest the Gloucester, N.J., headquarters of the RCA Service Company, or in Pusan, Korea. While the division itself is relatively new, it is the outgrowth of an activity that dates back to World War II. During their preparation for the war, the armed forces discovered that they had insufficient trained technicians to properly install and maintain the deluge of new and complex electronic equipment pouring from the laboratories and production lines of American industry. In response

to Government requests for factory servicing, the RCA Service Company, among others, provided the pool of technicians to fill the gap.

Today, we are still providing this service. Our procedure is simple. We respond to military requests for technicians, no matter in what part of the world they originate, by dispatching the required technicians via plane or boat.

Third of Staff on Overseas Duty

While the number and specific pin-point locations of these technicians are matters of military security, it can be revealed that the RCA Service Company today has more men in the field on Government service than it had during the peak of its World War II activities. Actually, one out of every three of the Government Service Division's hundreds of technicians is now on duty overseas.

While overseas duty is assigned on a volunteer basis, there is no telling in advance where any one technician will eventually land. Some are lucky and draw choice assignments in large European cities or at well-established military bases. Others wind up at lonely island outposts.

The overseas assignments generally call for one year of duty, and the men are classified as civilian personnel attached to military units. They serve under military regulations and pretty much share the living conditions of the units with which they are associated. Our men provide the technical advice and assistance. The military provides the equipment and the



ONE OF RCA'S BATTLEFRONT TECHNICIANS HOLDS A CARBINE — ESSENTIAL ITEM FOR KOREAN DUTY.



FIELD ENGINEERS BOARD A TROOP TRAIN IN KOREA TO SET UP OPERATIONS AT AN ADVANCED BASE.



VETERAN RCA SERVICEMAN SURVEYS THE PUSAN SCENE WITH PICTURESQUE NATIVES.

necessary replacement parts and tubes.

With the outbreak of the shooting war in Korea, we were called upon to provide the military with a vital part of its needs within a few weeks—radar and communications experts for Air Force squadrons to be multiplied, for naval ships to be recommissioned or held in commission, and for new or expanding Army units. In addition, new continental air defense nets and overseas military aid programs needed high-grade servicemen and instructors right away.

Trained Men Ready for Duty

We were ready: we had a pool of topnotch engineers specializing in the required subjects—radar, sonar and intercommunications—to draw on for the start of the new Government Service Division. From experience, these fellows knew the exacting nature of military needs and specifications.

At the outbreak of the Korean war, the men were portioned off among key naval shipyards throughout the U. S. (teaching and servicing radar, sonar, and homing beacon equipment) and among most of the bases of the Airways & Air Communications System (AACS).

Now, with the multibillion-dollar defense program beginning to hit its stride, the best technicians available still are being recruited into RCA government service. The call is still out, with the company taking want-ad space in a dozen trade journals, and recruiting officers combing the country. Our procurement machinery is well organized, with the itinerary of trained interviewers geared to a schedule of spot newspaper advertising in major cities throughout the United States. Applicants are carefully screened and tested. Only one in ten is found to possess the high degree of training and skill required to qualify for these positions which are so essential to the national defense. Selected applicants are brought to Gloucester, where, with technicians and engineers who have transferred from other divisions of RCA, they receive intensive indoctrination and refresher training.

[24 RADIO AGE]

The United States is very much in the buildup state of rearmament. Requirements will change from week to week. Shifts in tactical and strategic plans of the armed forces are inevitable. Service contracts, already keeping us busy, will continue to rise—and sharply, after the first of the year.

RCA Service Company engineers began working side by side with the armed forces ten years ago, and have built up a tradition of distinguished service for our men to live up to today.

Among those who helped establish that tradition by serving their country and their Company with distinction during the World War II were Ed Tracy, now of Engineering Products, who was handed a War Production Board Citation of Merit by President Roosevelt for an improvement in airborne radar testing and Frank Hartwick, mobile communications, Los Angeles, who received a commendation for extraordinary diligence and devotion to duty under difficult and hazardous conditions from Navy Secretary James Forrestal.

Engineers Receive Navy Awards

Also from the Navy came Certificates of Merit for William J. Zaun, now head of the RCA Service Company's Quality Division; and Paul Melroy, Government Division Contract Negotiations manager. The chief of the Bureau of Ships wrote Zaun: "This award

is made for your outstanding accomplishment in supervising the electronic field engineers of the Service Company." Melroy received a similar citation for sonar work.

Navy BuShips expressed appreciation for the field engineers as a group, working under difficult circumstances and in hazardous locations in their stations at strategic points in a far-flung battle front, pointing out that it was not necessary to name one individual above another. Also from the bureau came special recognition for the men who conducted the instruction courses on MAR-UHF equipment for trainees at Navy Yard at Pearl Harbor and in the U. S.

Hundreds of engineers were deployed over the world under contracts with the Navy, Army, Signal Corps, Coast Guard, War Shipping Administration, Red Cross, and O.S.S. In France, Italy, and at home, our engineers instructed airmen in operation and maintenance of radar, tail warning, and precision shoran equipment. In England, they modified airborne altimeters for low-level flying.

In France, Belgium, Italy, they supervised tape facsimile operations in tanks and armored cars for liaison and casualty reports. Based at Casablanca, Gibraltar and Oran, RCA engineers installed and maintained shipborne radar, gunfire control, battle announcement radio, and sonar equipment. At

(Continued on page 28)

DR. VLADIMIR K. ZWORYKIN, (LEFT), VICE PRESIDENT AND TECHNICAL CONSULTANT, RCA LABORATORIES, RECEIVES THE 1950 PROGRESS MEDAL, HIGHEST AWARD OF THE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS, FROM EARL I. SPONABLE, PRESIDENT OF THE SOCIETY.





REBUILT STUDIO 8-H IN RADIO CITY HAS 300,000 CUBIC FEET OF SPACE AND CAN ACCOMMODATE SIX TELEVISION CAMERAS IN OPERATION.

Famous Studio Rebuilt for TV

NBC has Invested over \$1,000,000 in Converting 8-H into the World's Most Modern and Best Equipped Television Studio.

THE National Broadcasting Company's renowned Radio City Studio 8-H, caught up in the deep of the times, has had its face lifted for television.

Representing an investment of over \$1,000,000, 8-H has been reconverted into the most modern, the most versatile and the largest television studio in the world.

A swarm of engineers, production men, technicians, and workmen in a little over three and a half months have descended on 8-H, ripped it apart from wall to wall and converted it into a glistening studio which can do more things than any other studio in the country.

Studio 8-H now looks out on the coaxial cables with a spanking new lease, including:

1. The most modern and most extensive lighting system in the world, incorporating all the lighting requirements ever needed in any other studio;

2. A platform or "island" hanging from the ceiling from which spotlights and television cameras will operate;

3. Six television cameras operating on the floor;

4. Three control rooms — the most modern and most workable control rooms ever built for a television operation;

5. A completely-equipped stage for theatre-type presentations, using no elevation;

6. A stage which can be completely "struck" in an hour and a half to make the whole studio available for dramatic presentations;

7. Fifteen separate dressing rooms;

8. The most modern make-up room in television;

9. An over-all size of 300,000 cubic feet, making it the largest single unit of television studio production space in the country;

10. A series of new special-effects, especially constructed for this studio;

11. The largest rear projection screen ever used in television.

From the standpoint of lighting, no studio of any kind has ever been so completely nor so extensively equipped as 8-H. The lighting sys-

tem incorporates everything ever needed in any television studio, whether for a stage or dramatic-type presentation. Each lighting unit can be adjusted at any height from five to 27 feet.

Remote-Control Light System

The ceiling of 8-H is literally paved with lights. More than 1,000 individual lamps, ranging in wattage from 100 to 5,000, have been installed in 8-H and every individual light is remotely controllable from the control room. Such a system has never been used before in any kind of studio.

The control rooms, the most modern and workable in television, also are located on the ninth floor. They comprise a lighting control room where the dimmers and circuits are housed; a video control room, and the audio control room. The latter two are separated by a glass curtain which can be opened or closed, depending upon whether the two rooms are to be connected or separated for any individual show.

To afford every modern convenience the producer, director and technical director will sit in the video control room, supplied with eight viewing monitors.

The directorial staff will face nine monitors, including one for each of the six cameras, one preview monitor, one on-the-air monitor and a ninth for possible outside or film transmissions.

Most Modern TV Control Room

The audio control room also is the most modern in TV. Located there are one master console and three sub-masters for intricate controlling and switching of microphone booms, microphones and other audio effects. Each of the secondary consoles is equipped with red, white and green lights to indicate to the engineer the control which has been switched on.

An innovation which is part of 8-H is the placement of a camera just off the ceiling. The special platform or "island" suspended from the studio's ceiling will support spotlights and special lighting effects for stage-type presentations. In addition, a television camera will be stationed there for high shots

(Continued on page 28)

TV Extends Microscope's Range

Color-Sensitized TV Camera Tubes Make Possible Study of Cell Structures Beyond Scope of Human Eye — Technique Demonstrated by Scientists of Princeton University and RCA Laboratories.

SIGNIFICANT extension of the range, power and versatility of the light microscope by use of special electronic eyes of the television camera, instead of the human eye, was demonstrated by scientists of Princeton University and the RCA Laboratories Division in Princeton, N. J., on January 9.

The new technique of televised microscopy, since it enables the interchanging of television camera tubes made sensitive to specific wave lengths of light, gives considerably sharper contrast than heretofore available, according to Dr. A. K. Parpart, chairman of the Princeton Department of Biology. Dr. Parpart has tested the experimental RCA industrial television equipment in biological research since last April.

The television-microscope combination, Dr. Parpart said, also has the advantages of making possible (1) the study of many components of living cells normally visible only after killing and staining and (2) the direct observation of motion of, and within, these cells at high magnifications. Even without the specially sensitized tubes a high degree of contrast enhancement can be obtained by means of the variable light level controls on the television receiver screen.

Used in Classroom Demonstrations

Though the RCA televised microscopy equipment has been used primarily for research at Princeton, Dr. Parpart said that it had proved convenient for showing specimens to several persons simultaneously in a conference group. It has also been used successfully in large classroom demonstrations by Dr. Harry Fulbright, former Princeton physics professor, in two otherwise difficult microscopic demonstrations — the Millikan oil drop experiment and the demonstration of Brownian motion in smoke particles.

Adaptation of the RCA industrial television system for microscope



DR. A. K. PARPART (LEFT) AND L. E. FLORY DEMONSTRATE THE TELEVISION-MICROSCOPE COMBINATION WHICH PERMITS DIRECT OBSERVATION OF LIVING CELLS.

work was done by L. E. Flory and J. M. Morgan, of the RCA Laboratories research staff. The equipment was made available to Princeton University by RCA Laboratories. Dr. V. K. Zworykin, Vice President and Technical Consultant of RCA Laboratories, directed the development of the RCA industrial television system.

The experimental installation consists of a laboratory microscope mounted beneath an RCA industrial television camera, which is no larger than a personal 16-mm motion picture camera. The televised microscopic scene is transmitted by cable to a standard receiver-monitor placed nearby.

At the heart of the industrial television camera is a remarkably small and sensitive pickup tube — the Vidicon. For microscopy, the Vidicon can be sensitized with materials which make it receptive to a particular narrow band of wave lengths. For the model used by Dr. Parpart, a red-sensitive tube and a

violet-sensitive tube have been provided. RCA research engineers are developing tubes which may extend the range of the microscope's vision into the infra-red and ultra-violet regions. The microscope can also be equipped with a binocular viewer and a second television camera so that two selective tubes scan the microscopic scene at the same time.

With the red or violet tube, Dr. Parpart explained, it is possible to select a narrow wave length band for study of a particular cellular material whose light absorption characteristics lie in that band. The degree of contrast between various chemical components within the cell, he said, is much superior to that previously gained by the tedious method of photographing the specimen through color filters. In fact, he added, some granules in living cells have been brought out this way for the first time.

Many biological specimens, such as granules of certain red blood cells, can at present be studied only

er they have been stained, he said. With televised microscopy, an appropriate tube will make the specimen stand out clearly without staining, he said, explaining that staining often either kills a specimen or, in some instances, a specimen must be killed before it will absorb the stain.

Dr. Parpart pointed out that the new technique enabled examination of either slow or rapid motion of material under a microscope at magnifications which formerly could have been "watched" only by motion picture photography. This method offered no effective way of monitoring what the camera was filming and required such an intense light source that living material was either killed or injured, he said. With the low light levels needed for televising the microscopic scene, living material can be examined for many hours without damage.

Large Projections Possible

Dr. Flory said that enlargement of the image up to 15 to 20 times through the television system made ease of viewing and made the equipment particularly adaptable for classroom or conference use.

Even larger enlargements are feasible by projection of the image onto a screen, he said.

Commenting on his research with the RCA equipment in a recent letter to Dr. Zworykin, Dr. Parpart stated: "It has been possible to observe certain microscopic particles in cells in active Brownian motion that have not been observed before; it has been possible to expose various egg cells, red cells and plant cells to light of different wave lengths and thus be able to study at a particular wave length, details of cellular structure that are not clear or not observable visually.

"For example, in eggs of the sea urchin, the violet-sensitive tube will pick out the echinochrome granules and exclude yolk and protein granules. The latter granules are well defined under the red-sensitive tube while the echinochrome granules are apparently absent. This ability to see details by selective absorption at narrow wave lengths is a very real advantage."

Dr. Parpart has used the equipment primarily in studies of a wide variety of marine life at the Marine Biological Laboratory, Woods Hole, Mass. Besides its value in other branches of biology, the technique

should be of importance in medicine, chemistry, geology, physics and other fields of research.

The Vidicon tube was developed at RCA Laboratories by Dr. Paul K. Weimer, Stanley V. Fergue and Robert R. Goodrich, under the supervision of Dr. Albert Rose. Research engineers of RCA credited with the development of the overall industrial television system are Richard C. Webb and J. M. Morgan. Special tube faces used in the Vidicon for the new technique of televised microscopy were evolved by A. D. Cope.

Dealers Advised to Prepare for Shortages

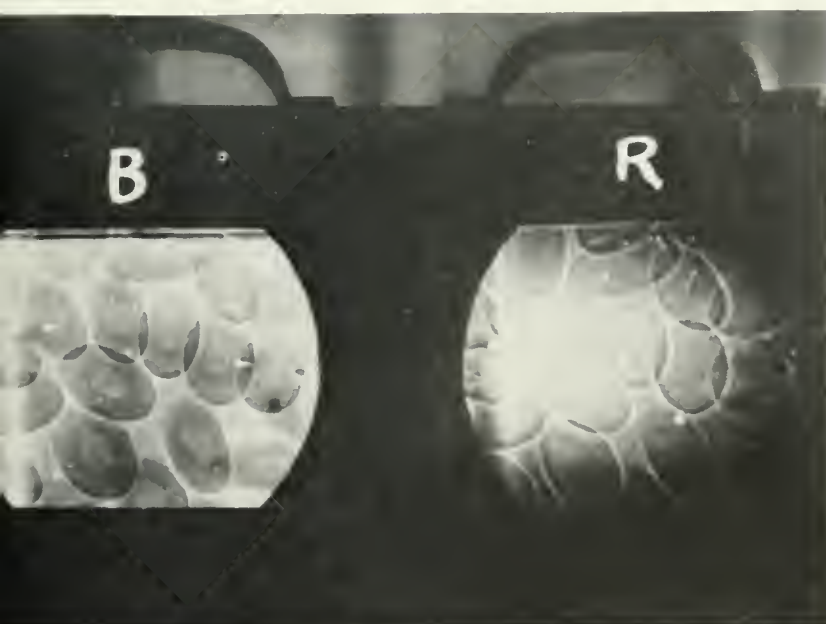
A warning to the nation's radio and appliance retailers that "business as usual" is "out" in 1951, unless conditions change, was sounded by Joseph B. Elliott, Vice President in charge of RCA Victor Consumer Products, in an address before the National Appliance and Radio Dealers Association at the Hotel Stevens in Chicago on January 15.

Urging retailers to prepare for merchandise shortages in the near future, Mr. Elliott declared:

"There is no prospect of business as usual. Manufacturers can't anticipate production beyond the first quarter of the year. We don't know what allotments of key raw materials to expect, because nobody knows from day to day what news the next few hours will bring from the fighting fronts."

Mr. Elliott said that RCA Victor will make every effort to have replacement parts available for servicing and maintaining television sets now in use in homes.

This can only be done, he pointed out, by diverting a portion of whatever materials and components are available from new production to the production of replacements parts. In addition to fulfilling his responsibility for keeping present television sets in operation because of their vital role as a communications medium, he declared, a manufacturer of an established brand-name product must undertake to do this, even at a sacrifice of maximum production, to safeguard brand-name reputation and good will.



PHOTOGRAPHS OF CELL STRUCTURE AS REVEALED ON SCREENS OF CATHODE RAY TUBES SHOWING DEFINITION OF THE MAGNIFIED IMAGES AFTER EXPOSURE TO VIDICON CAMERA TUBES WHICH HAVE BEEN MADE SENSITIVE TO LIGHT FROM THE BLUE (B) AND RED (R) PORTIONS OF THE LIGHT SPECTRUM.

Studio S-H Rebuilt

(Continued from page 25)

and other trick effects which directors may specify.

When the standard stage, with a specially-built proscenium, is put in place it has a depth of 30 feet. It has no elevation, so that the cameras are not restricted to platforms as they are in other types of theatre studios. Forty feet are allowed for the camera action, and behind this will be seats for an audience.

Among the new additions to the studio is a motor-driven "transistor". This is a device to provide transitional effects, such as dream sequences, or to change the mood of a play. Other facilities include a combination hand- and motor-driven crawl for titles and a motor-driven revolving display table, which resembles a "lazy-suzan" in appearance, with different sized disks on which to display objects of varying sizes.

The studio is equipped with the largest rear-projection screen ever used, measuring 15 by 20 feet. It also can use the smaller rear-projection screen of 9 by 12 feet. Both screens employ the newly-developed blue-tint for optimum results in television transmission.

Facsimile

(Continued from page 16)

two components of the solution until applied to the paper.

An intercommunication system set up with the facsimile equipment enables the operators of the transmitter and recorder to discuss the material as it comes over the wire.

The recorder can be operated simply by an on-off switch. Operation of the sending unit, the performance of which is monitored by an oscilloscope on the front panel, is also simple so that nontechnical operators can be trained in less than a day.

The experimental model of the new facsimile system was developed over the past 18 months at the RCA Laboratories Division by Maurice Artzt, Roger Olden, R. H. Fisher and K. J. Magnusson, research engineers under the direction of C. J. Young, section head in radio systems research.

Design for Television

(Continued from page 21)

social significance would be scheduled each week at a different period, the period being pre-empted from the advertiser. The advertiser would lose one show during the 41 week contract, but would still sign for 44 weeks, which would run 45 weeks on the calendar because of the pre-empted time.

The shows would fit the time given to them. For instance, This Is Your Government, might be a show we would do from Washington, with all the remote crews in Washington to handle pick-ups from the Supreme Court, the Senate, the White House, the Fort Knox gold room, et cetera. Such a show could be publicized to all schools and civic groups, and would be shown at 7 to 8, to let the young people watch. A more straightforward do-gooder, like a documentary on safety, for instance, would be done from 5 to 6, for the juvenile audience. An adult show could be set from 10 to 11, and be repeated by kinescope

in the same time to avoid having children see it. A show on mental health or some other subject which could upset youngsters would fit this late night scheduling.

The shows would be sponsored, I hope. This plan might either be offered to our affiliates on a sustaining basis, or we might get present sponsors to pay for the time if we allowed some commercial time before and after the performance. Or, more likely, we can get some major organization to underwrite the time cost, with NBC paying program charges.

By the fall of 1951, then, I would hope that NBC could offer a full network weekly hour show—once a month musical, once a month dramatic, and twice a month of a special nature—a new kind of three dimensional reporting and commenting on our life and times. This would be the major final step in the NBC use of television for social good.

Alert Receiver

(Continued from page 19)

use of the RCA Alert Receiver is as flexible as the highly developed transcontinental broadcast network systems, which permit the hook-up of two stations or hundreds by means of intricate switching arrangements already in service. Furthermore, the Alert does not require even one additional radio frequency allocation for its full use.

Civilian defense organizations usually have many different groups which must be warned, such as hospitals, public works agencies, police and fire departments. It is often desirable to warn some of these groups and not others, particularly in the preliminary stages of an alarm which may not eventuate in an actual attack. An outstanding feature of the RCA Alert Receiver is that signalling can be made selective by groups in any way desired.

The RCA Alert Receiver was developed by Arthur F. Van Dyck, Stuart W. Seeley and H. B. Deal, engineers of RCA Laboratories.

Service for Armed Forces

(Continued from page 24)

Brazzaville and Leopoldville, African headquarters of the Free French and Free Belgian governments, respectively, and in England, they oversaw installation of high-power broadcast transmitters. For the Brazilian Navy at Recife, they put in electronic equipment and held training classes

They went on shakedown cruises and test flights in the Atlantic and Pacific, were stationed at Bermuda and Guantanamo, at Guam and New Guinea, and aboard carriers. Charlie Hobbs, now of the RCA Service Company's technical publications group, for instance, was on the *Enterprise* when a Kamikaze knocked her out of action off the Japanese island, Kyushu. He was servicing night bombing equipment. Merrill Gander, now the Company's chief engineer, was aboard a ferry at Pearl Harbor when the base was attacked on Dec. 7, 1941. He was returning from a job repairing PBY altimeters.

Injunction Sought by RCA-NBC on FCC Color Television Order

Complaint Declares Irreparable Injury will be Caused to Public, Manufacturers and Broadcasters by Standardizing on Incompatible System — FCC Order Called Illegal, Arbitrary and Capricious.

A TEMPORARY injunction to restrain the Federal Communications Commission immediately from enforcing its order for the adoption of incompatible color television standards, pending a hearing for a permanent injunction, was sought in Federal Court on October 17, 1950, by the Radio Corporation of America, National Broadcasting Company and RCA Victor Distributing Corporation, a wholly-owned subsidiary of RCA.

In a complaint filed in United States District Court in Chicago, RCA, NBC and the RCA Victor Distributing Corporation declared that the FCC order of October 10 adopting the color television method promoted by the Columbia Broadcasting System will result in irreparable injury and damage to the public, which has more than two billion dollars invested in television sets, to the nation's television broadcasters with their huge investments, and to the television manufacturing and distributing industry.

The complaint charged that the Order is contrary to the public interest, is arbitrary and capricious, exceeds the legal authority of the Commission and is not supported by the evidence.

"The effect of the Order," said the complaint, "is to authorize the commercial broadcasting of color programs upon CBS standards to the exclusion of the commercial broadcasting of color programs on any other color television standards. Thus, commercial broadcasting in accordance with the RCA system is prohibited, although it, unlike the CBS system, is compatible and can be received on existing receivers without modification and without degradation of picture quality, and which can be broadcast by all television broadcasters without dilution of their audience.

"Although the Commission has no jurisdiction over television set manufacturers, the Commission sought to require that such manufacturers agree with the Commission to build all their black-and-white television receivers according to specifications laid down by the Commission. These specifications required extensive alterations in present production model receivers. The Commission stated to the television set manufacturers that if they did not agree so to build their sets the Commission would forthwith and finally adopt the CBS color system.

"The Order adopting the incompatible CBS color system impairs the advantages of compatibility now possessed by the RCA system. If the Order standardizing upon the CBS color system remains in effect and receivers capable of operating on those standards are sold, the existence of those receivers in the hands of the public will operate as a deterrent to the adoption of the RCA system by the Commission at some future date."

Injury to the public, broadcasters and manufacturers, as a result of the FCC order, was emphasized in the complaint.

"Ten years having elapsed since the adoption of commercial television standards during which the public has invested approximately two billion dollars in television receivers," the complaint stated, "the Commission cannot consistently with its obligation to protect the public interest adopt a color system which is incompatible with the black-and-white system on which more than 30,000,000 of the public depend for their television service.

"The broadcasting of television programs on the CBS standards will deprive broadcasters of the television audience that has been grad-

ually built up over a period of four years, to the irreparable injury of the television broadcast service, and will deprive the existing television audience of a part of the television broadcast service, to the irreparable injury of the public interest."

Declaring that the Order cannot be sustained, the Court was informed that the Commission's staff engineer, who took the most active role throughout the hearing on behalf of the Commission's technical staff and who is in charge of the Commission's laboratory which tested the various color systems, invented a device usable only in the CBS system and applied for a patent thereon.

"On disclosure of this fact," the complaint asserted, "objection by RCA was overruled and the staff engineer continued in the proceedings as theretofore.

"On information and belief the Commission relied on this staff engineer's advice because the majority of the Commission have no engineering training and the decision of the Commission is stated to be based entirely upon engineering considerations.

"Although the engineer fore-swore any financial interest in his device he did have professional prestige and reputation at stake which could be furthered only if the CBS system were adopted. On information and belief he advised the Commission in the absence of the parties and participated in the formulation and preparation of its Reports and the Order herein complained of."

The complaint pointed out that RCA and NBC have a present investment of approximately \$100,000,000 in television. It was not until 1941, however, that the Commission first set standards for commercial operation of black-and-