JULY 1954

RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

NEW TV SETS

Radar installation on Mt. Parnassus.

"The RCA man was here," said Apollo

Electronics has come to Mt. Parnassus. Capping the heights of this legendary retreat of Greek Gods, Muses and Nymphs, is *radar*—installed under the supervision of RCA field engineers.

And it's no myth, but very real evidence of how American enterprise is contributing to the defense of the free world.

To help in the important Mutual Defense Assistance program, RCA's Government Service Department has mustered corps of hundreds of engineers and technicians to train our own military in the installation and service of electronic equipment abroad—and to teach the science of electronics to friendly nations all over the globe.

Radar, Loran, Guided Missile systems—and a host of other electronic devices—are now in efficient operation from the Aleutians to the Dardanelles to the South China Sea. By shoring up the military establishments of the free world, these installations have become ramparts of defense—deterrents against aggression.

Building! Teaching! Training! No wonder "the RCA man was here" has become an expression of gratitude with free peoples, everywhere.

RCA pioneered and developed compatible color television

RCA®

RADIO CORPORATION OF AMERICA

World leader in radio—first in television

VOLUME 13 NUMBER 3

Radio Age

ARCH • MANUFACTURING • COMMUNICATIONS
BROADCASTING • TELEVISION

JULY 1954

COVER

Five models in the new line of RCA Victor TV sets, including a receiver mounted on a matching swivel base for convenient viewing. (Story on Page 12).

NOTICE

When requesting a change in mailing address please include the code letters and numbers which appear with the stencilled address on the envelope.

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

DAVID SARNOFF, *Chairman of the Board*
JOHN Q. CANNON, *Secretary*
FRANK M. FOLSOM, *President*
ERNEST B. GORIN, *Treasurer*

COLOR TELEVISION: A battery of RCA color cameras in an NBC studio.

Youth's Vital and Promising World

Sarnoff in Commencement Address at University of Southern California Says Problems and Perils are Part of the Price of "Monumental Achievements"

"A REMARKABLY vital and promising world" has been built by the parents and grandparents of today's youth, Brig. General David Sarnoff, Chairman of the Board of RCA, told the graduating class of the University of Southern California, Los Angeles, in commencement exercises on June 12. During the ceremonies, General Sarnoff received the honorary degree of Doctor of Laws.

"The conventional pattern of a commencement address, I am aware, requires the orator to apologize for the sins and failures of his own generation—then to congratulate the graduates on their chance to clean up the mess being handed to them," he said. "This shows proper humility and flatters the youthful audience.

"I beg leave to break with the pattern. I cannor in good conscience admit that we have made a mess of things. On the contrary, I believe that your parents and grandparents, which is to say roughly my generation, have built a remarkably vital and promising world.

"It is a world that holds plenty of problems and perils, but these are always part of the price of monumental achievements. Our failures, and they are many, for the most part spring from our successes. They reflect the growing pains of an extraordinary period in human history. Considering the handicaps under which we worked, perhaps you will agree that we have not done too badly."

"The unique and fateful fact about the last fifty years is the dizzy speed with which a multitude of shattering changes have come upon us," he said. "Hardly had mankind gotten over the shock of one tremendous discovery when it was staggered by another and usually bigger one. Small wonder, therefore, that we have been bewildered and a little scared. The terrific acceleration of life has subjected us to immense strains, which at times seemed almost intolerable. We are most acutely conscious of this just now in our reactions to atomic energy.

Mature Technologically, Adolescent Spiritually

"The inability of man as a social and economic creature to keep step with his science—that is the crux of his dilemma today. He is mature technologically while still an adolescent spiritually. Physical distances have shrunk, but the distances between the hearts of man and of nations are wide as ever. This is the primary challenge that awaits you in the world beyond this campus; by this your generation and those that follow will be judged.

"Our choice—more exactly, your choice—is between accepting the challenge or allowing yourself to be crushed by it. You can grovel in terror before the mighty forces released by science, even as savage man groveled before lightning. Or you can face those forces boldly and harness them to your purposes, just as electricity has been harnessed for mankind. That choice is what makes this a time for courage and for leadership."

Progress in Fifty Years

Making what he called a "haphazard inventory of the Twentieth Century," General Sarnoff said that "never before has man's environment been so radically and rapidly modified."

"In comparison with 1954, man at the beginning of the present century was deaf, dumb, blind and earth-bound. He could not speak, hear or see beyond the horizon, or navigate through the air.

"Since then, radio has extended our sense of hearing and carried our voice clear around the globe. Radar has plucked echoes from the moon. Television has projected our sense of sight across continents and soon it will span the oceans as well. Only recently the glorious panoply of full color has been added to this extended vision."

Advances in transportation by ground and air, in chemistry, medicine and agricultural techniques, and in the discovery and development of atomic energy, have made of the Twentieth Century a period "when the worlds of the poet and the scientist have intersected, when the boundaries between the visionary and the practical have been blurred," General Sarnoff said.

"My point is not that these wonders have transpired during my generation and have become part and parcel of our daily experience," he added. "It is that they have come like an avalanche, in so short a time. To understand the world you inherit, you should consider not only the number of these changes, but their tempo —the unexampled speed with which they came."

Following presentation of the honorary degree by President Fred D. Fagg, Jr., of the University of Southern California, right, General Sarnoff is congratulated by Asa C. Vall, President of the Pacific Mutual Life Insurance Co. and President of the University's Board of Trustees, who had presented him as a candidate for the degree.

While mankind is adjusting itself to a changing environment, it is well to recall that victories on the cultural and moral levels have been won during the past half-century despite the "torrential downpour of inventions and discoveries," he said.

"They are spelled out in more widespread education, in easier access to the products of genius in all the arts, in society's vastly larger concern for the old, the widowed, the helpless. The same decades that saw the birth of television and the splitting of the atom also saw a great improvement in race relations and the enactment of vital social legislation.

More Equitable Sharing

"Along with the assembly line has also come the rise of trade unions and a more equitable sharing of the fruits of labor. Though consumption of goods per person has risen two and a half times in these fifty years, the average work week has been reduced by one-third from fifty-eight to forty hours. At the same time, the possibilities for worth-while and enjoyable use of these new margins of leisure have been immeasurably enlarged.

"No, we have no excuse for defeatism in the face of science. We have no warrant for despair. The job ahead is to assimilate the scientific progress, to turn every potential for human benefit into a living reality."

General Sarnoff expressed a fear that "obsessive emphasis on security" in recent years has obscured older and more real values. He suggested that the meaning of ambition and of struggle may have to be relearned, adding:

"Whatever course you have chosen for yourself, it will not be a chore but an adventure if you bring to it a sense of the glory of striving—if your sights are set far above the merely secure and mediocre. In one's personal life, as in world affairs, appeasement can be the shortest road to failure.

Larger Problems Must Be Solved

"Neither personal success nor wealth can any longer provide a guarantee of safety for the individual. They mean little unless the larger problems affecting the community and the nation are solved. To meet the demands of these times, each of you must be prepared to make contributions to society even at what may seem a personal sacrifice.

"The time when government could be left exclusively to professional politicians is past, never to return. For government has become almost co-extensive with life itself. Directly or indirectly you will be called upon to help carry its burdens. To be only a critic on the sidelines is not enough."

The world today, General Sarnoff said, calls for readiness to cultivate and defend the birthright of freedom in the face of a menace to our civilization by a "strong and fanatic" enemy.

"We cannot banish dangers, but we can banish fears," he cautioned. "We must not demean life by standing in awe of death. I do not doubt that we shall win in the deepening struggle between liberty and enslavement; that we can emerge better and stronger from the contest. Indeed, we could lose only by default —and you must see to it that we do not default. American hatred of war is too obvious to need proving. But weakness or fear will surely not avert it.

"America and the world need your fresh energies, the fire and the zeal of youth, no less than the experience of your elders. The hazards of the world I have tried to sketch for you, including its new weapons and newly released forces, put a premium on intelligence. They have made it evident that we need, as a nation, not only more 'man power' but more 'mind power.' Universities like this one represent the prime reservoirs of that 'mind power.'

"You have been bred—and that is the greatest asset of all—by a nation which has given the world an unmarched example of idealism," General Sarnoff said. "Those whom we have liberated from oppression have been free to go their own way. America has responded always and generously to calls for help. Though it has not sought the role, America today stands as the main bulwark of Judeo-Christian civilization. Surely we who are children of this great country must strive to measure up to the splendors of its history and its destiny.

"Let us not lose the sense of the awe and mystery of life. Our very triumphs in penetrating nature have disclosed our mortal limitations. The more we learn, the more remains to be learned. Science, far from making us arrogant, teaches us to be humble. In this universe of endless wonders, the most wondrous is the human mind capable of delving so deep, and the human heart aware of depths we can never plumb."

Electronics and Law Enforcement

Delivering the commencement address at the FBI National Academy in Washington on June 11, General Sarnoff outlined many new uses for television, radio and electronics to aid police in law enforcement.

"Today's graduates have at their disposal a whole spectrum of scientific tools for their trade of which only the most imaginative of the first graduates of the Academy ever dreamed," he said. "By the same token, graduates five or ten years hence will enjoy scientific aids to law enforcement unavailable today."

He recalled the contributions of radio services to this work, pointing out that there is a total of 100,000 police vehicles now equipped with two-way radio apparatus and that major turnpikes are provided instantaneous communications along the route by means of microwave radio systems.

"Eventually, we may be sure," General Sarnoff said, "these expressways will be interconnected not only by radio but by television. It is only a matter of time, moreover, before a coast-to-coast radio-television network will transmit teletype messages, weather reports, photographs, fingerprints and other documents. Law enforcement will have at its disposal an all-seeing eye that scans the country at a glance."

Among the electronic devices now in use by police, or of great potential use in police work, General Sarnoff mentioned these:

Radar, which "will be increasingly an arm of the police forces;"

Radiophoto, by which "photographs or fingerprints can be flashed around the world within minutes, if necessary;"

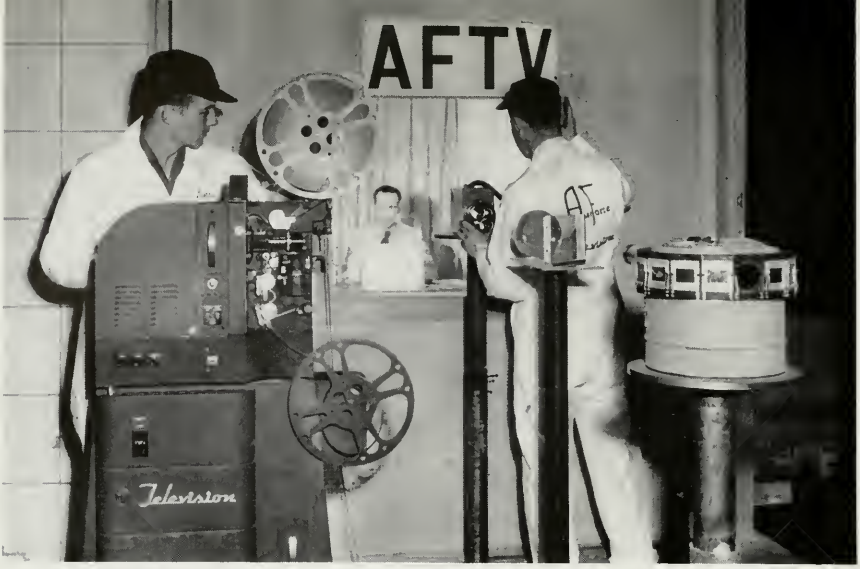
Television, in which RCA recently cooperated with the New York City Police Department in televising a police lineup, and which already is used for surveillance of prisoners, as in the new jail at Houston, Texas;

Electronic detectors, which may be used in prevention of smuggling of weapons or tools to cells;

The transistor, which makes possible miniature radios with which "the patrolman and detective will be as directly and continually in touch with headquarters as are mobile units;"

The electron microscope, used by the FBI as well as by crime detection laboratories in cities like New York and Rio de Janeiro.

In addition, he foresaw just over the horizon a number of new scientific aids to law enforcement, including miniature battery-powered tape recorders, electronic computers, electronic controls that may automatically trigger traffic signals to halt traffic and clear a path for emergency vehicles, and ultra-sonic alarm systems that could be touched off if broken by a person or object passing through the ultra-sonic signal beam.



The Limestone Air Force Base TV station in operation. Staff Sgt. James R. Dean prepares to roll kinescope film recording as Airman Second Class Robert L. Slezak cues announcer in the studio.

The Smallest TV Station in the World

THE world's smallest television station was officially previewed on June 30 at the U. S. Air Force base at Limestone, Me., from which Uncle Sam's airmen fly the world's largest bombers.

Colonel Bertram C. Harrison, Commander, 42d Bombardment Wing, hailed the "Tom Thumb" TV setup as a "truly significant experiment that we hope will be used as a pattern to bring television to U. S. military personnel stationed at isolated bases around the world."

The tiny, low-powered station has approximately one five-thousandths the wattage of the nation's largest commercial stations. With its maximum coverage range of only three miles, the Air Force station provides ten hours of major network programs daily for more than 15,000 persons living at this 10,000-acre installation only a few miles from the Canadian border.

Conceived by General Curtis E. LeMay, Commander, Strategic Air Command, as an entertainment medium for personnel at isolated bases, the station was built by the Radio Corporation of America after General LeMay sought assistance from Brig. General David Sarnoff, Chairman of the Board of RCA.

The tiny new television station was dedicated at ceremonies which took place at a giant "open house" at the base on the Fourth of July. It was estimated that more than 50,000 persons were on hand to inspect non-security portions of the mammoth base and to catch glimpses of the latest type planes in the nation's air defense armada.

Built and Installed at Cost

Equipment for the miniature 8-watt station, which transmits programs over a three mile radius, was designed, built and erected at cost by RCA. A grant of $34,000 from the SAC welfare fund paid for the equipment and its installation.

"The lessons learned by our engineers in simplifying and miniaturizing television equipment to be used by our Armed Forces enabled us to design and construct this miniature station," Francis H. Engel, Assistant to the Vice-President and General Manager, Engineering Products Division of RCA, said in describing the station.

"The same principles we used in building lightweight, efficient and easy-to-operate television equipment for airplanes and other military uses were applied here. Consequently, less than three months after General LeMay proposed his idea to General Sarnoff, the station was in operation."

Studios and transmitter facilities are housed in a "television shack" — ten by thirteen feet in area — atop the four-story base hospital. A lieutenant and six enlisted men comprise the engineering and program staff. On the air for approximately six months on an experimental basis, the station telecasts kinescope recordings of top network programs from the major broadcasting systems. It also provides three daily "live" newscasts and twice-daily "weather man" programs. Regularly scheduled "flying safety" programs are carried as well as religious telecasts produced by Air Force chaplains and their staffs.

Air Force Morale TV Policy

Colonel Harrison estimated at "more than 1,000" the number of television receivers in use in living and recreation quarters at the base. Stating Air Force policy on the operation of morale TV stations, he declared:

"We will operate television stations only in areas where it is not possible to receive TV programs from commercial outlets. We do not intend to compete with private industry. It is our purpose — and our sole purpose — to provide television service to our people only when and where they cannot get it from privately owned stations."

Recounting the nearly two decades of television use by the Armed Forces, Mr. Engel said that General Sarnoff first assigned RCA engineers and scientists to developing television for the Armed Forces in 1934.

"Long before World War II ended, radio-controlled airplanes with RCA television cameras in their noses had been tested against targets in the South Pacific," he related. "German objectives along the English Channel also felt the devastating impact of similar electronic-controlled, television-guided weapons. World War II saw many successful uses of airborne television in patrol work. Pictures transmitted from high-flying aircraft were relayed scores of miles to receivers installed at land bases and aboard ships.

"Since V-J Day, military television — like its civilian counterpart — has made amazing strides. TV has been used to get close-up pictures of radioactive clouds unleashed by nuclear explosions. Television has guided pilotless drone aircraft to communist targets during the fighting in Korea. Even now, we — and by 'we' I mean RCA in partnership with the Armed Forces — we are developing new and important uses of television and electronics to safeguard national security."

Staff Sgt. Tam B. Legan is staff announcer. Here he presents a newscast from the tiny studio.

Staff Sgt. Charles McDonald scans the teletype in preparation for the hourly broadcast of AP news.

Vidicon Camera Used

Mr. Engel explained how RCA engineers had adapted much existing equipment used in commercial television stations to provide the nucleus of the Limestone installation. The tiny Vidicon camera used to pick up both live and filmed programs is the size of a cigar box and has found widespread applications in industry, as well as commercial television.

"It is significant, I believe, that here at Limestone Air Force Base — the home of the world's largest bombers and the world's smallest television station — the value of morale TV has been proved," Mr. Engel stated.

Limestone AFB's television station presented its first program last Christmas Day. Equipment installation set some kind of a record since the first shipment did not arrive until December 21. The compact transmitter — the most vital piece of equipment — was flown in on December 23. RCA engineers and Air Force technicians worked around the clock to meet the Christmas target date.

The Limestone Air Force Base was selected as the initial site because it is isolated enough to present morale problems, but still near enough to sources of supply — equipment and program material — to insure a continuous flow of necessities.

One of Northernmost Bases

One of the northernmost outposts of the United States defense system, the base is located at the northeastern tip of Maine, 200 miles northeast of Bangor, Me., and 16 hours by rail from Boston, Mass.

Limestone is the headquarters of the 42d Heavy Bombardment Wing, which operates B-36 "intercontinental" bombers capable of flying nuclear explosives non-stop to any point in the world. The base also is capable of servicing all latest-type aircraft, including jet fighters and bombers. A feature of the base is a cement hangar capable of housing two giant 10-engine B-36's in addition to various facilities especially designed for defense against atomic attack on the United States.

Construction of the Limestone Air Force Base was started in the winter of 1946-47, and it continues today. Unlike many Air Force installations which formerly served the Army and were designed for ground force needs, Limestone AFB was planned from the beginning as an Air Force base. Thus training, flight line, barracks and headquarters facilities have carried the Air Force stamp from the moment they left the drawing board.

The end product—an interested TV audience in an enlisted man's home at the Limestone base.

Thomas F. Joyce, right, President of Raymond Rosen and Co., Inc., of Philadelphia, receives an inscribed, gold-plated 45-rpm phonograph from Joseph B. Elliott, Executive Vice-President, Consumer Products, RCA, in recognition of the Rosen organization's achievements in sales contest sponsored recently by RCA. Looking on at left is Raymond W. Saxon, now General Sales Manager, RCA Victor Television Division.

Five Years of Success for the "45"

REVITALIZED by the 45-rpm recording system introduced by RCA five years ago, the phonograph-record industry has been lifted to new high levels with more than 200 million "45" records sold, Frank M. Folsom, President of the Radio Corporation of America, said on June 29 in a statement marking the fifth anniversary of the "45."

He said that 13 million homes now have turntables capable of playing "45s," and estimated that within another five years the "45" will account for more than 75 per cent of the total record volume.

"The '45' records now represent more than 50 per cent of all single records sold," said Mr. Folsom. "The older 78-rpm records are obsolete. So quickly did the '45' gain popularity that by the end of its first year, the sale of '45' records represented 10 per cent of all record sales, and this percentage has steadily increased from year to year. In 1949, when RCA introduced the '45' system, record industry sales totaled $160 million. This year, because of the interest the system has generated for all types of records, the sales volume for the industry should be greater than $225 million — and the quarter-billion dollar figure is only a matter of time.

"The '45' system has won recognition from every quarter, even from those who were its severest critics, and it has given the American public recorded entertainment of matchless tonal quality and more music for less money. Today all major record and phonograph manufacturers are producing discs and record-players utilizing the '45' system, yet five years ago great furor was created by what was proclaimed as 'the battle of speeds.' In 1949, those who would have clung to the old and thus deterred progress by not adopting the '45' must now realize that their lack of vision and faith threatened to keep their own business at low levels and prevent the public from enjoying the many advantages of the '45' system.

Fastest, Simplest Record Changer

"We have made available to the public RCA Victor's unsurpassed library of the world's greatest artists and music on '45' records, as well as on 33⅓-rpm (long-play) records. And we have provided the fastest and simplest record changer ever developed, designed for the finest possible music reproduction. The results have been extremely satisfactory and dramatically show the value of recognizing the merits of an invention and American ingenuity in creating new electronic instruments that keep the art of music in step with scientific progress."

Indicative of the continued growth of the "45" system, Mr. Folsom revealed that beginning July 1, RCA Victor will ship only "45" popular records to more than 2,000 radio stations throughout the country, replacing the shipment of 78-rpm records for broadcast use. He pointed out that this is another signpost of listener acceptance of the "45" system and represents a logical follow-up to the conversion that already has taken place in automatic music machines.

The "Listener's Digest"

"The '45' system has become the standard for virtually all new popular records," Mr. Folsom declared. "It also has created new and expanding interests in the field of classical music.

"In this connection, RCA Victor has produced a truly monumental new record album to commemorate the fifth anniversary of the '45' system. It is the 'Listener's Digest,' which, in one album, brings condensed versions of twelve great musical masterpieces. These records feature the world's greatest recording artists playing selections by seven renowned composers.

"More than thirteen months of intense effort was expended in preparing the 'Listener's Digest'. The original uncondensed recordings are five hours, fifty minutes, seventeen seconds in length. The 'Listener's Digest' album runs two hours, thirty-five minutes and sixteen seconds. It is a masterpiece destined to interest millions of people in music of the masters."

Mr. Folsom explained that in order to implement the distribution of the "Listener's Digest," RCA is offering the new album as part of a package which includes a 45-rpm "Victrola" phonograph and a 42-page Musical Enjoyment Guide.

"We are convinced," he said, "that the 'Listener's Digest' will please parents who will find this new concept in records a perfect and inexpensive way to introduce their children to fine music. It also will be ideally suited to adults who want to become better acquainted with great music. Schools, too, are expected to make extensive use of this new approach to musical education and enjoyment.

"Success of previous RCA Victor albums — such as the 'Heart of the Symphony,' 'Heart of the Piano Concerto,' and 'Heart of the Ballet' — has proved that the general public will buy great music, even if they are somewhat unfamiliar with it, when the music is presented in an exciting manner. This is done with the 'Listener's Digest' as it has never been done before in the history of recording."

Greatest Advance in 50 Years

Observing that the recording industry has kept technological pace with developments in electronics, Mr. Folsom appraised the "45" system as "the greatest advance in fifty years of recorded music." It is, he added, a new standard of musical enjoyment in the "Victrola" field — a standard that highlights and reflects the industry's search for quality and perfection in music reproduction. The small, unbreakable, vinyl plastic, wafer-thin records, Mr. Folsom said, have revolutionized many aspects of the "Victrola"-phonograph industry, including the merchandising of records.

Mr. Folsom paid tribute to merchandisers for the outstanding role they have played in making the 45-rpm system a part of the American home entertainment scene. He cited Raymond Rosen and Company, Inc., RCA Victor distributor in the Philadelphia area, as an outstanding example of a firm which has successfully merchandised the 45-rpm system. He said that in five years the Raymond Rosen organization has sold more than 3,500,000 45-rpm discs and nearly 195,000 45-rpm "Victrola" phonographs.

Recalling the advertisement in March of 1949, announcing RCA's development of the "45," which stated

Keeping a close eye on quality in the making of 45-rpm records—here the first master pressing is tested at the RCA Indianapolis plant.

that "the '45' is here to stay and destined to lead all other types of recorded music," Mr. Folsom added:

"That prediction has come true as we knew it would because of the determination and concerted efforts of scientists, artists and businessmen in calling the public's attention to the 45-system. We were confident that once the public was exposed to the '45' success would be assured because it represented progress in artistic fulfillment as well as simplicity, convenience and economy."

Developments Continue

The "45" system, Mr. Folsom pointed out, is not "static," and because of its relationship with the unlimited possibilities inherent in electronics, it can continually adapt itself to new advances. For example, RCA Victor's "New Orthophonic" high fidelity records represent the latest improvements in recorded sound. He cited the successful introduction in November, 1952, of the "Extended Play" — or EP — 45-rpm record as another important milestone in the progress of the system. The EP record, he said, won immediate acceptance, and at the end of its first year, more than 10 million discs had been sold, providing the consumer "more music for less money."

"Introduction of the EP record," continued Mr. Folsom, "was an important milestone in recorded entertainment because it permitted the development of new repertoire such as combining four hit tunes on one record. It has also enabled us to introduce new concepts in recorded entertainment like the new series which combines famous operatic arias sung in their original language by Metropolitan Opera artists with especially written adaptations in English."

Development of the "45s", Mr. Folsom pointed out, marked the first time a player and a record were designed as a matching unit. This brought about three distinct advantages, including:

1. A distortion-free, seven inch disc of optimum quality which can be conveniently packaged in small storage space.
2. A trigger-sharp, silently-working changer mechanism which eliminated both record damage and the need for adjusting the changer to discs of various sizes.
3. The most compact "Victrola" in the history of the industry offering the finest in quality reproduction.

"The 45-rpm system opened up new and untapped markets for the merchandising of the 'Victrola' and phonograph records," Mr. Folsom said. "The 45-rpm's compact size made possible the expansion of customer self-service in stores and resulted in the trend toward super-market sales. Planned in terms of small homes and apartments where bookshelves would serve as storage cabinets, the new 'Victrola' and record found its way into many homes where conservation of space was essential."

He said that the unbreakable discs also offered:

1. Eye-attracting window and counter display material for record dealers.
2. A handy, compact portable unit for music enthusiasts while traveling or for students and campus living.
3. A sturdy, nursery-sized product for the kiddies' disc market.

"The '45' system revitalized the entire record industry," Mr. Folsom said. "It has rendered a continuing service to the consumer and the artist because it so faithfully reproduces music and sound. Because of the contribution it has made in increasing the confidence of the consumer in the lasting value of recorded music, the record industry is today on the threshold of its greatest period of opportunity and prosperity."

The 200 millionth 45-rpm record gets a joyful inspection from artists Perry Como and Roberta Peters, and RCA Victor Record Division sales manager Larry Kanaga.

RCA Introduces Its New Line of Home Instruments

Elliott Calls for an Active Merchandising Effort and Realistic View of Industry's Prospects; Emphasizes Role of Second TV Set in Home

RCA Victor will introduce in July a new line of television receivers designed to provide "the greatest values in the company's history," Henry G. Baker, Vice-President and General Manager of the RCA Victor Television Division, announced in mid-June. The line will include 20 basic models in three picture tube sizes —one 17-inch, thirteen 21-inch and six 24-inch receivers —with suggested retail prices ranging from $159.95 to $500.

With the announcement came disclosure by Jack M. Williams, Advertising and Sales Promotion Manager of the television division and the RCA Victor Radio and "Victrola" Phonograph Division, that sale of the new TV sets and the new radio and "Victrola" phonograph lines will be supported by the largest advertising campaign in RCA Victor history.

A few days earlier, Joseph B. Elliott, Executive Vice-President, Consumer Products, RCA, outlined what he called a realistic attitude toward the prospects and problems facing the radio-television industry—a position that lies between the "feast of an optimist and the famine of a pessimist." Speaking to a convention of the National Association of Electrical Distributors at Atlantic City, N. J., Mr. Elliott said:

"Today's business climate in the electronics field calls for level-headed thinking and action. It calls for work—and hard work—with the belief that the reward will be large. It calls for recognized brand merchandise of outstanding values and for a desire on the part of salesmen to demonstrate and establish these values firmly in the mind of the consumer."

Sees Demand for Second TV Set

Predicting that the public will be in a more receptive mood for television sales during the last quarter of the year, Mr. Elliott added:

"More and more it becomes evident that the day of the second TV receiver is with us. It will soon be a must that in a mixed household of adults and children one screen will not be enough. The football game will hold adult attention for 150 minutes, but most of the youngsters will keep on demanding their Westerns at the same time. Through persistent and productive merchandising and promotion, we can see that peace is maintained in the family circle."

The New Orthophonic High Fidelity "Victrola" Low-Boy phonograph, with 3-speed automotic record changer.

The 21-inch Pickford, with vertical tuning controls and two powerful 8-inch speakers behind slanted grille.

The Wister, 21-inch swivel-based console model whose upper portion can be turned to face different positions.

The new RCA television line announced subsequent to Mr. Elliott's speech was described by Mr. Baker as representing a positive course of action by RCA to maintain its television sales leadership in the changed market conditions of today. These four significant factors were involved in planning the line, he said:

1. An analysis of the market situation indicated that added values were desirable to maintain volume sales. Engineering, styling and design developments which had been in the planning stages were therefore accelerated to become available for the new line.

2. The analysis also indicated the desirability of planning the strongest merchandising program in the history of the company. To carry this out, all operations connected with the manufacture and sale of television receivers were separated from those of the radio and phonograph business. The new organization, the RCA Victor Television Division, will now concentrate its efforts solely on the television receiver line.

3. The increased activity in color television anticipated this fall called for greater consumer values in black-and-white sets to maintain a high level of sales. The new line reflects RCA's optimistic outlook for healthy black-and-white business ahead.

4. Consideration was also given the desirability of providing additional dealer incentive for selling up to higher priced models. As planned, the incorporation of special features, particularly the visible ones, makes possible easy, logical step-up from model to model, or from group to group. If these features are utilized fully by the dealer, Mr. Baker predicted, it will result in increased dollar volume and profits.

Features of the New Line

Engineering highlights of the new line include newly designed chassis incorporating circuit improvements, and a new high-speed UHF (ultra-high frequency) continuously variable tuner resulting in pin-point station selection and picture improvement in fringe areas.

Describing development of the new VHF-UHF tuner as an important contribution to the extension of UHF broadcasting service, Mr. Baker said that RCA Victor will continue to manufacture UHF-equipped receivers in sufficient quantities to satisfy consumer requirements. He remarked that almost 28 per cent of TV receivers produced by RCA this year were equipped with UHF tuners at the factory.

The new RCA Victor line consists of two series of models — the Super and the De Luxe — covering the 17-, 21- and 24-inch receivers. To re-enter the 17-inch field actively, Mr. Baker said, RCA Victor will offer for the first time a set at $159.95. Incorporating a newly designed chassis, this model (the Trent) is expected to find important application as a second set in TV homes. To promote this use, a "Roll-Around" stand with wheels will be available.

RCA Victor's basic plan to offer greater values in its new line also is indicated in a new group of swivel consolettes in the 21-inch Super series. This receiver is mounted on a matching swivel base so that the screen can be rotated to provide maximum convenience in set location and viewing angle. Named the Wister, it will be available in grained limed oak finish at $229.95. As a specialty, it will also be offered in decorator finishes of grained charcoal oak and grained natural walnut, both listed at $325.

The Eye that Sees One 10-Millionth of an Inch

A NEW type of electron microscope, twice as powerful as any now in use, will go to work this summer to help science probe more deeply than ever before into the nature of cancer.

The first of the new instruments, developed and built by RCA, made its public debut on May 11 at the United Nations, New York, in ceremonies at which it was turned over to the world-renowned Karolinska Institute of Stockholm, Sweden. The institute, one of the world's leading centers of research in cell structure, already has made extensive use of earlier RCA electron microscopes. It is receiving the powerful new instrument under a grant from the Rockefeller Foundation.

With the new microscope, scientists will be able to study particles smaller than one 10-millionth of an inch in diameter. Photographs taken by automatic cameras built into the slender pylon that houses the electron source and the lenses may be enlarged consistently up to 200,000 times the size of the specimen—a scale at which an ordinary dime would measure more than two miles across. By comparison, the previous type of electron microscope, with which the polio virus was first observed, normally provides useful photographic enlargements only up to 100,000 times, although far greater enlargements have been achieved by a relative handful of highly skilled microscopists.

Oscar Thorsing, right, Swedish delegate to the U. N., listens as T. A. Smith, Vice-President in Charge, RCA Engineering Products Division, explains operation of the new electron microscope.

Accepted by U. N. Delegate

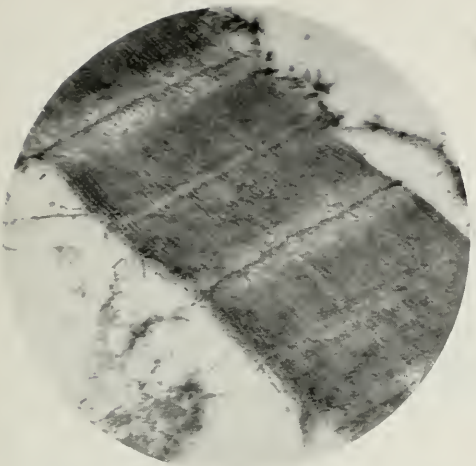
At the United Nations ceremony, the powerful microscope was accepted for the Karolinska Institute by Oscar Thorsing, Permanent Delegate to the U.N. from Sweden. Theodore A. Smith, Vice-President in Charge, RCA Engineering Products Division, presented the instrument to Mr. Thorsing, observing that its introduction coincided with the 15th anniversary of the development of the first electron microscope, produced by RCA in 1939 and since employed in nearly every branch of scientific and industrial research.

"We confidently believe that the many new features of this advanced instrument will pave the way to new knowledge to serve mankind everywhere," Mr. Smith said.

Mr. Thorsing, accepting the microscope, read a letter from Dr. Fritiof S. Sjostrand, head of the Karolinska Institute, in which the Swedish scientist described the electron microscope as one of "the most important technical instruments" in medical and biological research. Their use, he said, has helped to give scientists a fuller knowledge of the "most fundamental character of the life process."

Dr. Sjostrand indicated in his letter that the powerful new microscope will first be put to work to widen the scope of information about the construction of normal cells in order to shed greater light on the nature of those which develop abnormally, as in cancer.

"This work is now on foot and our earlier conceptions of the cell structure have already had to be greatly modified," he wrote. "Only when sufficient observations have been made regarding normal cells, e.g., cells of the



First micrograph made with the new microscope shows minute section of muscle fiber magnified 100,000 times.

nervous system, of the sense organs and the glands, can the study of pathologically transformed cells, such as the cancer cells, be expected to produce reliable results. There is hope that the analyses by electron microscopes will lead to discoveries which may cast light over the character of the cancerous process and thereby provide a clue to the understanding of the cancer disease."

Differs From Earlier Models

In appearance, the new microscope differs radically from earlier types. Two desk-type working surfaces, each backed by a sloping control panel, flank a slender 7½-foot vacuum column that forms the heart of the instrument. The desk and control panel units are joined to the column at a slight forward angle to place all controls within reach of the operator, seated on a chair in the center.

Built in the column at desk level is a viewing chamber equipped with windows on three sides to permit several persons to see the enlarged specimens at the same time. Magnification up to 30,000 times is obtained on the direct viewing screen, while enlargement up to 200,000 or more times is achieved from photographs taken by automatic plate and roll film cameras housed in the column.

The new microscope operates on the same principles as its less powerful predecessors. A concentrated beam of electrons, originating from an electron gun, is directed through the specimen to be observed. As the electrons pass through the specimen, they are affected in varying degrees according to the density and composition of its various parts. When the beam emerges from the far side, it bears the pattern or "image" of the specimen, which is then magnified by powerful magnetic lenses that act upon electron beams very much as glass lenses act upon light. The pattern finally is projected upon the viewing screen.

The ordinary optical microscope, using light to form the image of the specimen, is limited in its range by the wave-length of visible light. Objects appreciably smaller than this wave-length fail to interrupt or reflect the light in any visible fashion. The electron beam, however, has a wave-length only one 100-thousandth as great as that of visible light, with the result that it is interrupted or reflected by far smaller particles. When RCA first introduced the electron microscope, the immediate effect was to multiply by fifty times the range of human vision into the world of infinitely small organisms and particles—and the new microscope has now doubled that range.

Improved Features Listed

Dr. Robert G. Picard, Manager of Scientific Instruments Engineering, RCA Engineering Products Division, who designed the new instrument, told the U.N. audience that the basic objective of the new design was to make operation so simple that people without specialized training can operate it successfully. The improved features that have contributed to this objective are:

1. Push button control of practically all operations, including photography;

2. A 30 per cent increase in resolving power—the ability to distinguish separate particles clearly at the outer limits of magnification;

3. Provision of controls that allow the operator to correct astigmatism easily while watching the image—a process that has involved much time and manipulation in previous models;

4. A new power supply, producing either 50,000 or 100,000 volts, and giving the electrons higher energy to penetrate thick specimens;

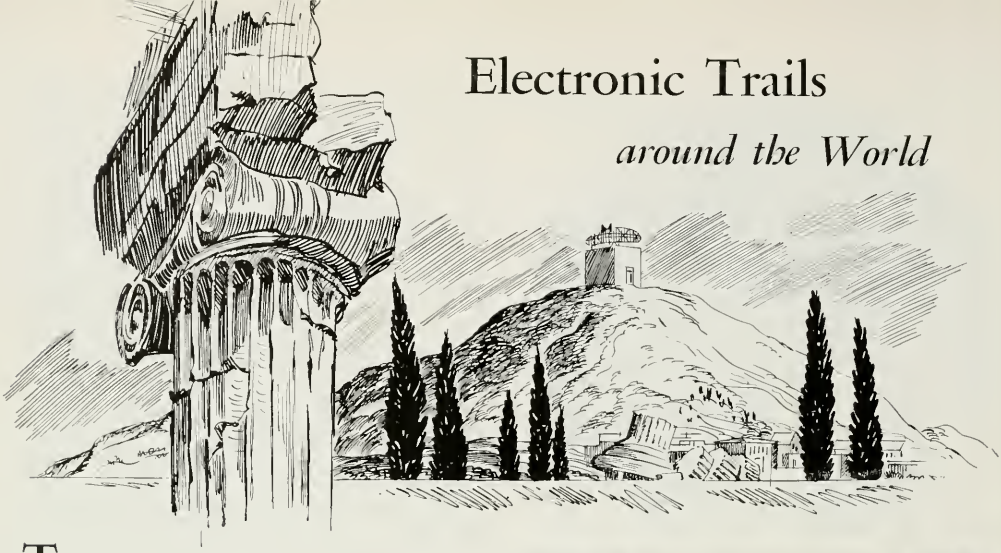
5. Stability in the electron gun, described by Dr. Picard as "an achievement which turned out to be the most difficult single engineering development in the new instrument."

When it is installed at the Karolinska Institute, the new instrument will be the eighth RCA electron microscope in use in Sweden. Others of the new type are being built on order.

More than 500 of the earlier electron microscopes already are in use on scientific and industrial research projects in the United States and 29 foreign countries.

Electronic Trails

around the World



THE Greek mountain of Parnassus, in legend the spiritual retreat of Apollo, the Muses, and the Corycian nymphs, is crowned today by a parabolic radar antenna of American make and design. The antenna rotates on a rectangular block of white marble which might, and by all poetic standards should, have come from Apollo's 3000-year-old temple on the southern flank of Parnassus.

The temple, its foundation still standing, formed the heart of the Delphic precinct. Delphi was, figuratively speaking, home territory for the Muses, those female divinities who presided over science, poetry, and art. Their science, presumably, did not embrace radar; but some unknown Greek workmen, schooled in mythology, possibly saw a link between the two. In any event, the radar apparatus was joined to a chunk of marble once exposed to the oracular winds and volcanic gases that carried messages from the Muses.

The workmen might have reasoned that radar, like the Muses, opened a door to the unknown.

"I couldn't swear," says P. B. ("Pincky") Reed, Vice-President in Charge of the Radio Corporation of America's Government Service Department, "that the marble came from the old ruins. But that's what one of my Greek hosts told me. It wouldn't surprise me a bit if it did."

An Electronic Trail

Few things, indeed, would surprise Mr. Reed in the way of history, legend, or local custom. He has traveled well over 100,000 miles in the last three years. In one month alone, he logged 30,000 air miles hopping from New York to Alaska to Japan to Korea to Formosa to the Philippines to Guam to Hawaii and, finally, to California.

P. B. Reed, enjoying a rare pause on his global beat, inspects the Parthenon with a Greek guide.

Mr. Reed has a passing acquaintance with Ionic columns, Buddhist temples, Arctic shelters and Formosan cutlery. He acquired it simply by pursuing an electronic equipment trail around the globe. Wherever the American military establishment harnesses the electron, Mr. Reed can be counted upon, sooner or later, to pop up.

And if Mr. Reed isn't around, the odds are that one or more of his team of over 1,000 skilled electronic technicians is. They work with the armed services in 22 foreign countries, in the United States and in U. S. possessions. They train military technicians on the installation and service of radar, loran, shoran, two-way radio, guided missiles systems, microwave equipment, and the host of other RCA electronic devices in use by the Army, Navy and Air Force.

As a twin occupation, and at the behest of the Government's Mutual Defense Assistance Program, they teach. They teach the science of electronics and its specific military applications to Turks, Italians, Yugoslavs, Icelanders or whomever else the MDAP might designate. In this sense, they are de facto diplomatic representatives.

A New Language

Most of these electronic emissaries, working out of RCA Government Service Department headquarters on the shores of the Delaware River in Gloucester, N. J., are graduate engineers. They go abroad for a minimum one-year hitch. By the time they return, they are often skilled linguists and the possessors of fine photographic albums.

"One of the boys was just back from Italy," Mr. Reed recalls. "He didn't speak Italian when he went, but he certainly did when he returned. The trouble was, it was electronic Italian. He'd been lecturing to Italian technicians, and he had a beautiful electronic vocabulary. He was fretting about how he was going to use it here."

The electronic technicians are a relatively new breed of Americans abroad. They are an offspring of World War II when the armed services and American industry began adapting a vast array of electronic products to military use. The technician was put in uniform, attached to the staff of local commanders in different theaters, and charged with the responsibility of equipment maintenance, installation and technical instruction. He moved as close to the front as his equipment did. Next to the war correspondent, he probably witnessed more combat than any other American civilian.

Industry's Answer

The cold peace of the late Forties, and then Korea, saw the service expand. America's policy of communist containment hinged on military bases from the Aleutians to the Dardanelles to the South China Sea — and on shoring up the military establishments of allied nations. In both cases, electronic equipment was essential to the proper defensive posture. Civilian technicians who could train military personnel, who could fly anywhere, anytime, on emergency missions, who could serve as a direct information channel from industry on new equipment developments; they were the obvious, and most economical, answer to the military's needs.

So the RCA Service Company, formed originally to install and service radio and television sets, created the Government Service Department as a civilian adjunct of the armed services. The bulk of its men rotate around Zone of the Interior bases, but over 250 technicians are now stationed abroad and the foreign service is growing like ragweed. New teams are being shaped up at the present time for Far Eastern nations. And a special flying squad of 40 engineers has been set up to trouble-shoot on worldwide basis.

The foreign service is controlled by Thomas G. Whitney, who is field operations manager in Mr. Reed's department. In the security-conscious headquarters at Gloucester, his office resembles a military command post — except that Mr. Whitney dresses in the quiet grays of a banker. A wall-size map opposite his desk is punctured with colored pins, each representing an individual or a team of servicemen. The phone on his desk gives him quick contact with cities such as Frankfurt, Weisbaden and Tokyo.

This could be any of numerous airports where Mr. Reed has waited between planes: Rhein-Main, Fronkfurt, Germany.

Business in Rome with Italian officers and two RCA technicians—Mr. Reed, center, John Basse and Harry Mills, right.

Another day, another country. A Portuguese Boy Scout talks with Mr. Reed during a ferry crossing at Lisbon.

"Speed and mobility are important in this business," Mr. Whitney explains. "When the armed services want a job done, they want it done fast. It's up to us to get hold of the right man and move him where he's needed. If we can't locate the man ourselves, we don't hesitate to ask our Embassies or military headquarters abroad to assist us. They're very helpful that way.

"For example, the Air Force recently wanted a special microwave survey made for a two-way radio installation at Fontainebleau in France. The man with the best technical background for the job happened to be in Tokyo. We got hold of him out there by telephone via Signal Corps headquarters. He hopped a plane and had his survey under way within a week in France.

The Flying Forty

"As a matter of fact, this type of thing is becoming so widespread that RCA's Engineering Products Division — which builds electronic equipment for the services — decided to help us with a flying Squad of Forty based in Camden, N. J. It's a mobile engineering reserve, each member ready to take off for Tibet or Tunisia just about as quickly as a local repairman can leave his shop to handle a job in your home."

Most of the technicians, according to Mr. Whitney, have a sound electronics background before they're selected by RCA. They're given a fine-tooth security investigation and then assembled at Gloucester for a five-to-six week refresher and indoctrination course.

"In addition to the government security check, we do a pretty thorough screening job on our own," Mr. Whitney explains. "We look for fellows with tact, good personalities and stable backgrounds. We don't want the type of man who will go to India and make public wisecracks about cows. In other words, we try to get men who will be a credit to the country and to RCA when they're abroad."

Tank obstacles in central Germany form a background for Mr. Reed and Ed Johnston, former RCA Service Company supervisor for the U. S. Armed Forces in Europe and now at the U. S. Air Force Airways and Air Communications Service in Washington.

Some of the foreign work is so highly classified, according to Mr. Whitney, that "we don't even know what many of our boys are working on." Once they report to the local commander, they are, in effect, on his staff.

"In this connection, we tell them pretty frankly about the hazards they might run. A few of our men have had tight squeezes in the past, and they might in the future. In the Korean War, one of our technicians stayed with his equipment in Seoul until the rear guard evacuated just minutes before the North Koreans entered. Another was in Teheran during the Mossadegh coup. He had to get out with the British oil men and he had a close shave in doing it."

The Old Appeal

Despite the hazards, Mr. Whitney says, many of the technicians take to life abroad. Some stay four or five years. Some, of course, follow the established G. I. custom of falling in love and marrying foreign women.

"I guess a half-dozen of our men from the Far East, for example, have married Japanese women. Some have returned to the States with their wives and are working for us here. That's fine as far as we're concerned."

There is a less glamorous side of the Government Service Department but one that is in every sense as vital as foreign service. A large staff, under Mr. Reed's direction, devotes itself to the preparation of technical manuals, equipment diagrams and digests of new information for government use. This material flows into the armed services in a steady stream. It keeps technicians in step with industrial electronic activities.

Then, too, there is the domestic service, larger in scope than the foreign. The home staffers work at air bases, Signal Corps installations, Naval electronic centers. They also give technical instruction, and they also work with highly classified experimental equipment. A typical example is the Air Force Missile Test Center at Cocoa, Fla., where one of Mr. Reed's groups has just tackled the job of maintaining and analyzing electronic guidance apparatus for the latest in Air Force missiles.

To maintain organizational unity, Mr. Reed twice a year brings in his top foreign technicians—his field managers as he calls them—for a meeting at Camden and Gloucester. Many of them come half-way around the world as casually as a Kiwanian would go from New York to Philadelphia for a Golden Rule session.

Like Mr. Reed, they are wedded to the idea that theirs is a world-wide business, and that time and distance are minor obstacles to accomplishment in this electronic age.

The Maestro Retires

A small, white-haired man walked slowly off the stage in Carnegie Hall, New York, last April 4, his head bowed. It was Arturo Toscanini leaving for the last time after his farewell appearance with the NBC Symphony Orchestra.

Toscanini at 87 had decided to retire. He revealed the decision in a letter written to Brig. General David Sarnoff, Chairman of the Board of RCA, the man who founded the NBC Symphony 17 years ago as an instrument for the incomparable talents of the veteran conductor. At the end of the final concert, neither the orchestra itself nor the cheering audience in the hall knew that this was Toscanini's farewell — which was the way he wanted it. He left as he had always worked, simply and modestly.

The first Toscanini concert with the NBC Symphony took place on Christmas night, 1937. Except for one year when he was on leave (1941-42) and conducted only five Treasury concerts for Bond sales, he was regular conductor of the orchestra up to the end of the season just completed. His broadcast concerts with this group, according to music critics, were among the most exciting musical events in America.

During World War II, Toscanini directed the orchestra in many other War Bond concerts, raising large sums of money. He also conducted for the Red Cross. And although he had refused a quarter-million dollar offer to make a single film for Hollywood, he worked free for the United States government in making the film "Hymn of Nations" in 1944.

In 1950, at the age of 83, he took the NBC Symphony on a coast-to-coast tour of the United States, covering 20 cities in personal appearances before thousands who previously had enjoyed his music only over the air or through recordings.

33 Years of Recordings

Even in retirement from his 17-year association with NBC, Toscanini has left a rich musical heritage in the form of symphonic and operatic recordings made over the past 33 years — and others, already recorded by RCA Victor but not yet processed for distribution, are yet to come.

His recordings of the Beethoven Ninth Symphony, "Missa Solemnis" and "The Pines of Rome" and "The Fountains of Rome" were RCA Victors' sales leaders among all albums during February. The Beethoven Ninth, which has sold more than 140,000 albums since its 1952 release, has been the company's leading Red Seal album for the past two years.

Arturo Toscanini

Best-Selling Compositions

The variety of Toscanini's musical interests and appeal is illustrated by his best-selling recordings since 1921 — besides the compositions of Beethoven and Brahms, they have included the "Skaters' Waltz" and the "Grand Canyon Suite." The most popular of the Toscanini recordings was his collaboration with Vladimir Horowitz on the Tchaikovsky First Piano Concerto, of which 350,000 albums have been bought up to the present time.

His recorded versions of the operas "La Boheme," "La Traviata" and "Otello" have been hailed as definitive by the leading music critics, and the repertoire of opera is to be increased by the "Falstaff" and "Masked Ball" albums which RCA Victor hopes to release this fall.

An RCA research team ot Rocky Point, L. I., uses this system to photograph the face of the sun. Sun's rays (1) strike clock-driven mirror which reflects them (2) directly at stationory mirror. The image then is directed (3) at six-inch telescope lens, which passes it in magnified form (4) along 40-foot pipe to camera plote holder in structure at rear.

They Explore the Face of the Sun

CONTEMPLATION of the sun, a pursuit of curious men since history began, is the task at RCA's Rocky Point, L. I., laboratories, of a physicist and two engineers who are confident that their venture into astronomy is harvesting down-to-earth knowledge of how radio waves behave.

With a simple telescope, the working elements of which are at the ends of a 40-foot section of glazed tile pipe, the Rocky Point solar research team has been taking a remarkable series of photographs which enable them to look at details of the sun's surface that have never been studied before.

Dr. William A. Miller, who has developed a deep aversion to clouds in the three years he has headed this unique sun-watching program, is convinced that the Rocky Point telescope, and the techniques that the tanned trio have mastered in using it, are already complementing the work of the world's great solar observatories.

At the same time, he is optimistic that their research can lead to more precise and simpler methods of predicting the solar-caused disturbances that play such havoc with long-distance radio communications.

Dr. William A. Miller examines clock-driven mirror with which the sun is tracked for the improvised telescope.

A Century-Long Quest

Over the past hundred years, astronomers, physicists, chemists and radio engineers have devised a number ot ingenious ways of figuring out what is happening on the sun.

These scientists, for example, can split a sunbeam in a spectroscope's prism and learn of the sun's chemistry

Or they can apply theories of atomic and nuclear physics to mysteries of the solar furnace, an approach that has explained much in recent years. By charting the relationships between changes seen on the sun, such as sunspots, and unusual behavior of radio signals, other clues have been made available.

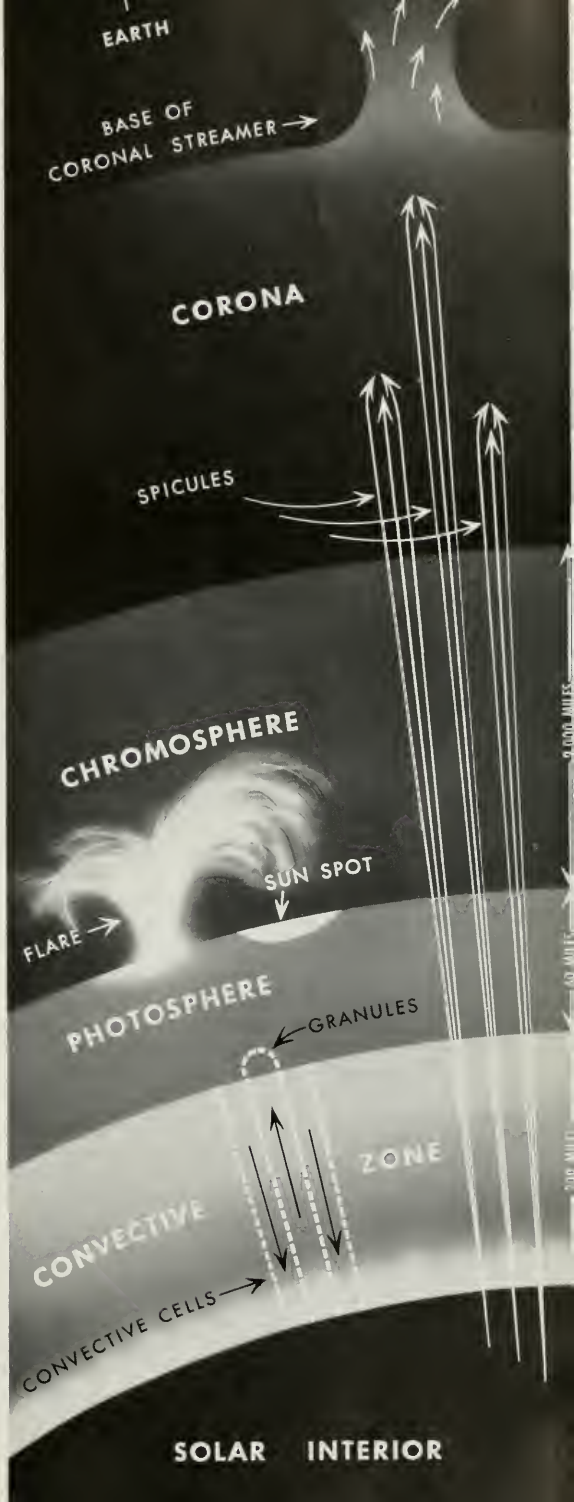
Among the most fruitful investigations have been those in which the sun's rim is photographed during an eclipse, producing spectacular and informative pictures of violent solar activity. With optically simulated eclipses (coronagraphs), astronomers have taken many more silhouettes of the sun's outer atmosphere.

A neglected approach, however, is examination of the sun "full-face," instead of in profile, and photographing sections of its surface in great detail. It is to this technique that the Rocky Point group is devoting so much of its effort.

"Head-on" examination of the sun's surface, though not new, is a method virtually dormant for seventy years. In the 1870's the famous French astronomer, Pierre Jules Cesar Janssen, took such pictures and was able to show, for the first time, the granular, cooked-cereal texture of the solar surface. Janssen's classic photographs have appeared in standard texts over the years as the best of their kind. But they were, in many ways, ahead of their time and raised as many astronomical questions as they answered.

Smooth Air Aids Observation

Speculating on the hiatus of detailed "full-face" solar photography since Janssen's time, Dr. Miller points out that most modern solar observatories have been perched at higher and higher altitudes to take advantage of the increased transparency of the earth's atmosphere. Though these mountaintop sites give many occasions of good viewing of the sun's outer atmosphere — the corona and chromosphere — they are usually the worst possible locations for seeing the solar disc in great detail. The sun heats the air around the mountain, violent updrafts form and the sun's image dances in an optical instrument.



In profile at various levels of the sun's atmosphere are some of the phenomena the Rocky Point group are observing in full-face studies of the solar disc (see photo on page 22). The photosphere is the layer visible to the eye; outer zones are more rarified. Both the eruptive flare and jet-like spicules are believed to be near the start of different chains of events that often disrupt long-distance radio communications on earth. Also under scrutiny are granules, which give sun's face a cooked-cereal texture in photographs.

Rocky Point, on the other hand, turns out to be one of the world's best spots for what Dr. Miller terms "optical tranquility." The flat terrain of Long Island usually allows a smooth flow of air, carried by the prevailing southerly winds, across the Rocky Point area and into Connecticut before turbulence and thunderstorms develop. Contrary to expectations, the frequent Long Island haze does not normally interfere with their solar photographs and is viewed by the Rocky Point group as a good omen indicating the atmosphere above them is quiet.

Getting their best results in the late spring, summer and early fall, the team has had over the past two years an average of 75 days when they made pictures whose detail was limited only by the resolving power of their 6-inch telescopic lens. (Janssen, it is interesting to note took only 25 to 30 comparable shots in a decade.) Twice as many additional days a year are suitable for taking valuable, if not perfect, pictures of the sun.

"Give us just two minutes' break in the clouds, and we'll get a shot," says Dr. Miller.

May Aid Radio Prediction

As their pictures pile up, the team sees emerge a definite pattern of details that may well form the basis of a valuable radio prediction service.

Radio engineers have realized for some time that long-range high-frequency communication is feasible because of layers of ionized gas lying in thick spherical shells around the earth's surface. The layers of the ionosphere (a zone lying 50 to 300 miles above us) act as mirrors reflecting radio waves back to the earth's surface.

If these layers were fixed in altitude and constant in their electrical reflecting properties, there would be no problem. But this is hardly the case. To circumvent the vagaries of the ionosphere, radio stations must constantly change frequencies or reroute circuits.

Fortunately, some of the variations in the ionosphere can be anticipated. Seasonal changes and nocturnal changes, for example, have been well charted simply by observing actual radio circuits year after year. But most of the changes are more elusive. Some appear to be completely random. Others may recur more or less regularly, but with unpredictable intensity. Dr. Miller's group is particularly anxious to pin down the latter disruptions because they cause the most distress.

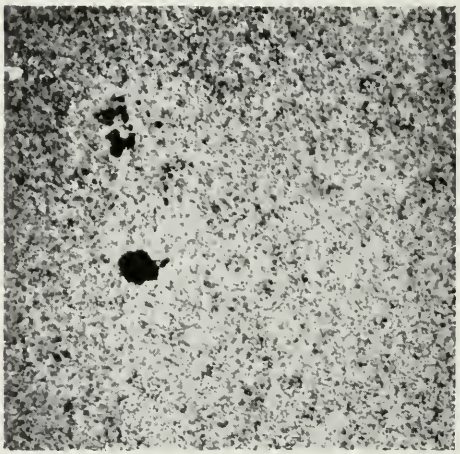
How the Sun Affects Ionosphere

As Dr. Miller explains it, there are two ways in which the sun can influence the ionosphere. First, by direct electromagnetic radiation — X-rays or ultraviolet rays — which travels at the speed of light from the sun to the ionosphere in 8 minutes. Such bursts of radiation from the sun appear to be the cause of sudden and often complete radio fadeouts called Dellinger fades. Fortunately, these last for only 20 or 30 minutes and never more than two or three hours.

The second way the sun is believed to alter the ionosphere is by sending out actual streams of ionized particles. Such solar bombardments travel more slowly than radiation, taking perhaps two or three days to make the 93 million-mile journey. They are considered a likely cause of the so-called great magnetic storms. These rare but violent disturbances, which may not be felt for years at a time, can knock out radio communications for days and can so disrupt the earth's magnetic field as to cripple wire and cable communications as well.

That both radiation and beams of particles can be agents of ionospheric caprices is evidenced by the fact that radiation as felt in a Dellinger fade is disruptive only on the sunny half of the earth. A great magnetic storm, on the other hand, will be felt simultaneously on the light and dark hemispheres, suggesting that the earth is passing through a great shower of particles which have been rapidly dispersed throughout the ionosphere by the earth's magnetic field.

Astronomers are fairly well agreed that both these types of disturbance spring from the same phenomenon — solar flares. These sudden, short-lived brightenings of small regions of the sun's surface are usually seen in the neighborhood of sunspots. Flares are often noticed at



Minute section of the sun's face, showing granular texture of the solar surface. Large black areas are sunspots: the tiny black dots are believed to be "spicules" — jets of heated material rising from interior of the sun.

the time of a Dellinger fade and they appear to project enough radiation to account for this phenomenon on the earth.

When great magnetic storms occur they follow by two or three days a Dellinger fade, which would suggest that they are the result of a properly directed beam of particles spewed out by the same flare that produced radiation for the Dellinger fade. In addition, both of these ionospheric upsets are more frequent during the peak years of the 23-year sunspot cycle, which is also the time of the greatest number of observed flares.

Another Cause Is Sought

It would simplify the propagation expert's life if the solar flare could be named the villain of all radio communication breakdown, not just the Dellinger fades and great magnetic storms. Unhappily, the flare, according to most theories, can be assigned only a relatively minor role. Flares are short-lived and erratic, while the ionospheric disturbances that yet elude full explanation — the somewhat regular ones known as M-region disturbances — appear to be caused by something that lives for many months on the sun, reappearing several times in rough synchronization with the sun's 27-day rotational period.

Gaining support from experts is the hypothesis that the sun's outer atmosphere, the corona, has at all times a number of invisible long arms that sweep out millions of miles into space. Some of these coronal streamers would be aimed, as it were, to intercept the earth in its orbit. Unlike the flare-caused beams of particles, coronal streamers would be semi-permanent projections of the corona, lasting for several cycles of the sun's 27-day rotational period. The Rocky Point trio is working with other solar observers to check the validity of this theory.

A goal of Dr. Miller's current studies is to establish beyond a doubt what it is on the sun's surface that can build up the corona to such an extent that a streamer will be cast out into space. The Rocky Point photographs are, as he puts it, "not in disagreement with modern theories of the corona and the formation of streamers."

The detailed "full-face" photographs do not reveal the whispy streamers themselves but they do show a generous sprinkling of black dots which have never been "isolated" before. These dots, Dr. Miller explains, are probably a bird's-eye view of solar spicules, a short-lived but common activity of the sun first discovered, on the sun's rim, only 14 years ago. They may well be long narrow jets of heated material from the interior of the sun that pop right through the sun's surface, spewing new matter up into the corona.

The research team lines up sun's image on screen before exposing film in the camera plate halder. Left to right are A. B. Maulton, Ralph E. Franklin, and Dr. Miller.

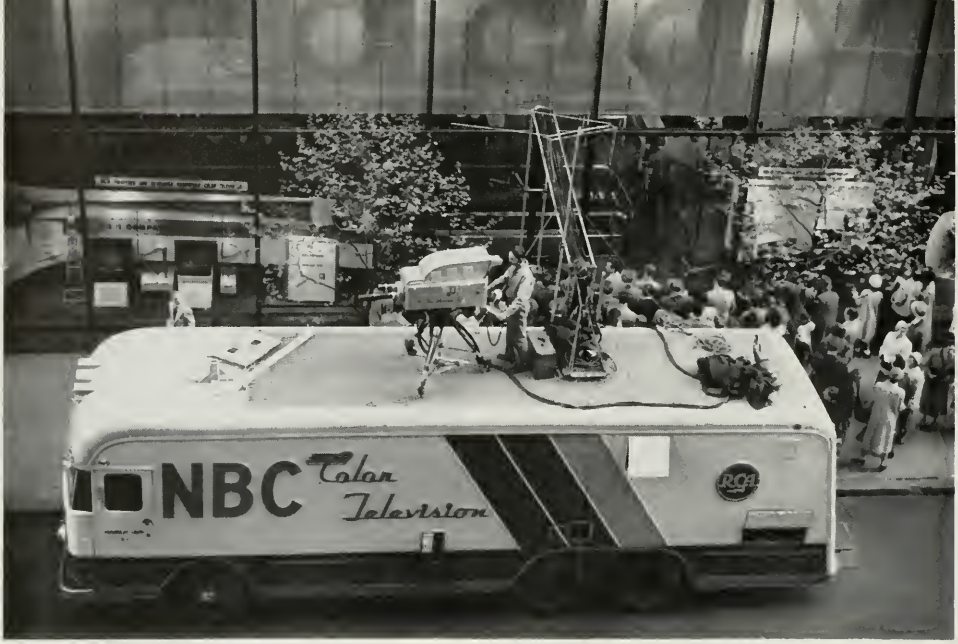
How Streamers May Be Born

Normally, the theory goes, spicules reinforce the corona at a steady rate. But when an above-average number of spicules are clustered in a particular region on the sun, and if, at the same time, there are "favorable" distortions of the sun's magnetic field in that area, the corona bulges and a streamer is born.

That the spicules seen as dots in the Rocky Point photographs are the same things seen as long thin spikes in coronagraphs, has been the subject of considerable checking at Rocky Point. Dr. Miller is now optimistic that this correlation can soon be established: the black dots have roughly the same lifetime (3-4 minutes), the same size (5-6000 miles in diameter, miniscule by solar standards) and the same population density as the spicules seen by others in profile photographs.

Riding herd on spicules along with Dr. Miller are A. B. Moulton and Ralph E. Franklin. Both have been engaged in communications and research engineering with RCA for nearly thirty-five years, and both boast years of experience as backyard astronomers.

To help in analysis and interpretation of their pictures, the Rocky Point trio are receiving the assistance of Dr. Walter Orr Roberts, Dr. Joseph N. Rush, and other solar experts of the High Altitude Observatory of Harvard and Colorado Universities, at Climax, Colorado, under a contract with RCA Laboratories. The superlative coronagraphic results obtained at Climax are available for continuing comparison with the "full-face" observations of Rocky Point.



One of the two trucks of NBC's Color Mobile Unit in New York before starting its tour.

NBC Takes to the Road with Color TV

Color television's first studio on wheels—the two-truck Color Mobile Unit of the National Broadcasting Company—focussed its cameras on the famed Busch estate in St. Louis on June 9, beginning a 10-city tour that will take it through the midwestern and eastern United States for a series of outdoor color features for the NBC network.

By the end of June, the NBC color cameras had televised scenes from Milwaukee's Whitnall Park, the color and activity of life on a modern farm near Chicago, and the Ohio Governor's mansion at Columbus. Ahead on the schedule were visits to Cleveland, Washington, Baltimore, Philadelphia, Boston and New York, with a colorful aspect of local life planned for presentation from each city.

The features picked up by the mobile unit are being presented on the "Home" and "Today" shows over the NBC network. In every city where either or both programs are seen, local NBC stations and RCA dealers, as well as one or more leading department stores, have been equipped with RCA color TV sets on which the public is able to view the live pick-ups from the field in their natural color. Thanks to the compatibility of RCA color television, the colorcasts from the mobile unit will be seen in black-and-white on monochrome TV sets.

The Color Mobile Unit, consisting of two trucks of 20 tons capacity each, is the only one of its kind in existence. Designed by NBC engineers under the supervision of O. B. Hanson, former NBC Vice-President and Chief Engineer, recently elected Vice-President, Operations Engineering, RCA, the unit made its network debut last January 1 when it covered the Tournament of Roses parade in Pasadena, California.

NBC Color "Spectaculars"

With the unit on the road for its series of outdoor features, NBC continued preparation for an ambitious schedule of precedent-shattering color "spectaculars" beginning in early autumn. Three distinct series of spectaculars have been planned, each consisting of thirteen 90-minute shows designed to range across the colorful panorama of show business, with participation by the most celebrated stars and directors in existing and original musical comedies, operettas, contemporary and classical drama, circuses, aquacades and ice shows.

Two of the series will be produced by Max Liebman,

producer of "Your Show of Shows," while the third is to be produced by Leland Hayward. Each series will be presented at the rate of one show a month—the Liebman productions scheduled for 10:30 to midnight on Saturdays and 7:30 to 9 p.m. on Sundays, and the Hayward productions from 8 to 9:30 p.m. on Mondays. The first will go on the air from 7:30 to 9 p.m. on Sunday, September 12, featuring film star Betty Hutton in a special musical comedy written for her. This program also will inaugurate color TV broadcasting from the huge new NBC television studio in Brooklyn, N. Y.

New Color Equipment

The step-up in color broadcasting activity is being accompanied by other RCA advances in color equipment engineering and servicing, and in receiver manufacture.

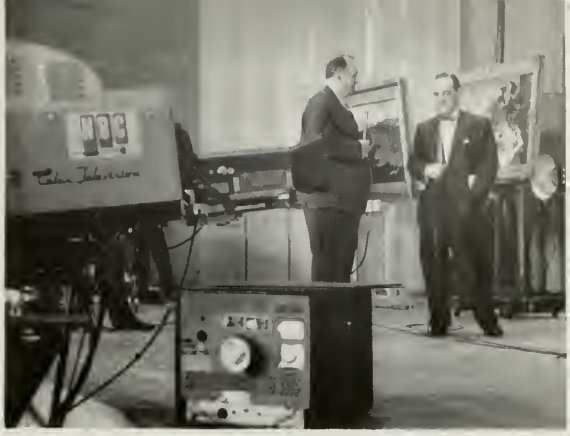
Joseph B. Elliott, Executive Vice-President, Consumer Products, RCA, disclosed on June 10 that RCA Victor color television receivers to be introduced in the fall will employ the new and very latest RCA shadow mask 19-inch tube, using the full area of the tube face and providing larger and brighter color pictures of approximately 205 square inches.

"The new tri-color tube will incorporate a recently developed 3-gun assembly, shorter and with higher efficiency, producing outstanding brilliance and picture quality with increased stability," he said. "The new tube does not require any change whatsoever in the circuitry of the color receiver."

In the field of color equipment, a new "3-V" camera developed by the RCA Engineering Products Division for telecasting color motion pictures made its debut on June 25, when NBC broadcast 35-mm film in color publicly for the first time in television history. Previously only 16-mm film had been shown publicly in color television, and the new development was hailed by the press as a major forward stride in color TV and a vast improvement over all earlier color film presentations.

The new camera employs three RCA Vidicon pickup tubes and a light-splitting optical system comprising two dichroic mirrors placed at angles in front of the projector. The first of the mirrors reflects the blue portions of the projected image to one of the Vidicons, permitting the red and green portions to pass through to the second mirror. The second mirror reflects the red portions to the second Vidicon and allows the green portions to pass through to the third Vidicon. Each of the Vidicon units generates a signal for broadcast representing its own color portion of the original image.

The development of new equipment to speed installation and maintenance of color receivers was announced by E. C. Cahill, President of the RCA Service Company. The equipment features a "color stripe generator" de-



The versatility of color television was demonstrated by NBC during the spring with a colorcast from the Metropoliton Museum of Art.

signed by the Service Company to transmit a video signal that will enable a service technician to determine whether a color TV set installed in a home is actually receiving color signals.

Mr. Cahill said that the system, costing about $500, can be installed easily by TV broadcasting stations already equipped to carry network color programs, and in other stations when they modify equipment to handle color. The test signal transmitted by the equipment consists of a narrow vertical yellow-green bar visible at the edge of the viewing screen on color sets, but practically invisible on the screen of a black-and-white set.

Arias Sung and Acted

Opera lovers long accustomed to listening to words they don't understand can now break through the language barrier by means of RCA Victor's new series of records titled "Arias Sung and Acted."

The unusual twin packaging of the spoken word and song, conceived by George R. Marek, Director of Artists and Repertoire, RCA Victor Record Division, has resulted in a new album of famous arias acted in English by players of the legitimate stage and then sung in their original language by famous stars of the Metropolitan Opera.

The acting and singing versions of the arias are portrayed in the new album by Judith Anderson and Risé Stevens, who are cast as "Carmen," Dennis King and Leonard Warren as "Rigoletto" and "Tonio;" Deborah Kerr and Licia Albanese portraying Mimi from "La Boheme" and Violetta from "La Traviata;" Dennis King and Robert Merrill as the Germont père of "La Traviata," and Geraldine Brooks and Joseph Cotton with Zinka Milanov and Jussi Bjoerling as "Aïda" and "Radamès."

New Daylight Viewing Screen for Radar Can Hold an Image for Minutes

A RADAR viewing screen capable of retaining for several minutes a picture so bright that it can be clearly seen even in brilliant sunlight may result from a new electron picture tube developed by a research team at the David Sarnoff Research Center of RCA at Princeton, N. J.

The tube has been designed as a simple electronic tool for the direct daylight viewing of radar in an airplane cockpit or on the bridge of a ship. Today, airborne or marine radar screens are hooded to prevent daylight from obscuring the relatively dim images that appear, and even under a hood that cuts out all daylight the viewer may have to wait for 2 or 3 minutes before his eyes adapt themselves to the low light level of the radar image.

Fine details of test pattern on the new picture tube are examined by H. O. Haak, of the development team.

A distant cousin of the television kinescope, the new tube was developed by RCA scientists under a United States Army Signal Corps contract. The development team included Dr. Max Knoll, H. O. Hook and Dr. R. P. Stone, all of the Princeton laboratories staff.

Far Brighter than Standard TV Picture

The tube is able to present pictures five to ten times brighter than those on a standard television kinescope, or picture tube, and to retain a half-tone image on the screen for some 30 seconds without any deterioration, or up to several minutes in useable form. In radar scanning reproduction, the viewing duration needs only to be about ten seconds before a new picture is to be displayed.

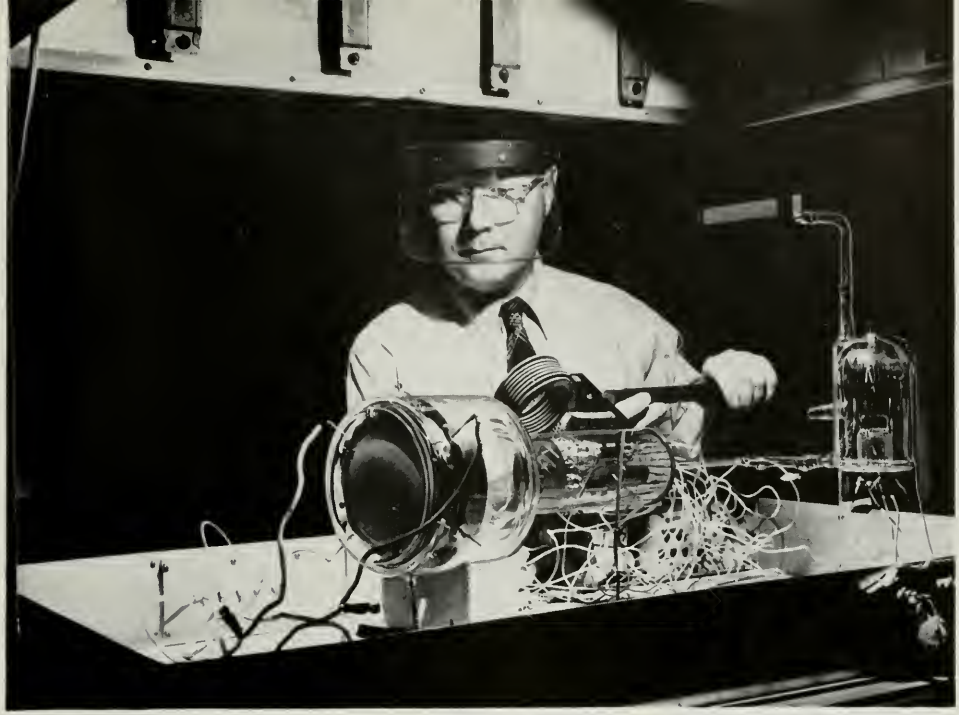
In other applications where half-tone reproductions are not required, such as the display on an airplane instrument panel of continuous visual instructions from a ground station, a single black-and-white image can be held on the tube for an hour or longer. The RCA research team said these characteristics of the tube point to possible use in airborne facsimile systems, oscilloscopes, and wherever a bright electronic picture of transient data needs to be held over extended periods for viewing or photographing.

In appearance and operation, the developmental tube is a small approximation of the standard television picture tube. Like the latter type, it uses controlled streams of electrons to paint a picture on a phosphor-coated screen on the face of the tube. However, to present exceedingly bright pictures and to retain them on the tube face for minutes or longer, a number of different techniques were developed.

Three Electron Guns

In the neck of the tube are three electron guns, each producing an independent stream of electrons directed toward the tube face. One of these, similar to the electron gun in a standard kinescope, "writes in" the picture. The second gun floods the viewing area with a continuous shower of electrons, producing the picture seen on the phosphor screen. The third "erases" the retained picture when it has served its purpose.

In a standard television picture tube, the writing beam directly scans the phosphors on the viewing screen,



Dr. R. P. Stone, another of the development team, puts final touches on the new tube before testing.

making them glow in a pattern that creates the picture. In the new storage tube, however, the writing beam does not produce the picture directly — it scans a special storage grid mounted about one-tenth of an inch behind the phosphor-coated screen. The grid is a fine-mesh screen (160,000 openings per square inch) supporting a thin insulating film. As the writing beam scans the insulating film, it builds up local electrical charges whose intensity varies with the pattern of the picture signal.

As the picture is thus built up on the grid, the continuous shower of electrons from the second gun passes through the charged openings of the grid, acquiring as it passes the pattern built up at these openings by the writing beam. The shower, or "flooding beam", then strikes the phosphor coating of the viewing screen, creating the picture for the observer.

The Erasing Beam

Because the flooding beam continues to pass through the charges built up on the grid, the picture remains for some time on the screen. The erasing beam, controlled either by the viewer or automatically by associated circuits, may be brought into play at any time to clear the tube face for a new picture. It does this by altering the charges on the storage grid in such a way that the flooding beam is blocked at all points, preventing the shower of electrons from striking the phosphors of the tube face.

A non-electronic analogy to the process can be found in coating a window screen with heavy paint and holding it above a table in the sunlight. If a pattern is traced on the screen with turpentine, clearing paint from some of the holes, sunlight may pass through and create an image of the pattern on the table surface. Repainting the screen will cause the image to disappear. In this analogy, the table represents the phosphor-coated viewing screen, the window screen represents the storage grid, the action of the turpentine compares to the action of the writing beam, the sunlight to the flooding beam, and the repainting to the erasing process.

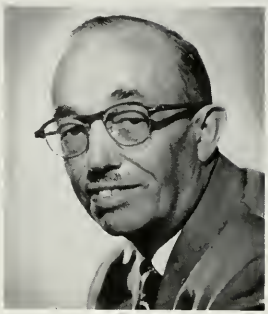
In its present form for radar application, the tube has a viewing screen 4 inches in diameter, capable of presenting an image of hundreds of foot lamberts of brightness in its high-lighted portions. To produce this brightness, the tube requires considerably less anode voltage than does the standard television picture tube, largely because of the tube's ability to light every spot on the viewing screen continuously with the flooding beam rather than intermittently, as is the case in the TV kinescope.

Dr. Elmer W. Engstrom

Ewen C. Anderson

Dr. Irving Wolff

Dr. D. H. Ewing



O. B. Hanson

Five Executive Promotions Announced by RCA

Promotion of five executives to new positions of responsibility was announced last month by Brig. General David Sarnoff, Chairman of the Board of RCA — four of them named at a meeting of the Board of Directors on June 4.

Dr. Elmer W. Engstrom, Executive Vice-President, RCA Laboratories, was elected Executive Vice-President, Research and Engineering, continuing at the same time as head of RCA Laboratories. In his new position, Dr. Engstrom has been given broad responsibility for all research and engineering activities of RCA.

Ewen C. Anderson, Vice-President, Commercial Department of RCA, was elected Executive Vice-President, Commercial Department, with responsibility for all patent license matters for RCA. Both Dr. Engstrom and Mr. Anderson will have their headquarters in the RCA Executive Offices in Radio City, New York.

Dr. Irving Wolff, previously Director of Research, was appointed Vice-President, Research, RCA Laboratories, Princeton, N. J. Dr. D. H. Ewing, who had been director of the RCA Physical and Chemical Research Laboratory, was appointed Administrative Director, RCA Laboratories.

O. B. Hanson, previously Vice-President and Chief Engineer of the National Broadcasting Company, was elected to the RCA staff as Vice-President, Operations Engineering. In his new position, he has been given responsibility for engineering matters pertaining to broadcast and communications operations and for directing the activities of the RCA Frequency Bureau.

The promotions of Drs. Engstrom, Wolff and Ewing and Mr. Hanson were designed to coordinate the research and engineering activities of the RCA organization as part of an over-all plan adopted earlier this year to meet the needs of the Corporation's steadily expanding business.

RCA Stockholders listen to the Chairman's Report at the Annual Meeting on May 4.

New First-Quarter Sales Record is Set by RCA

BUSINESS volume of the Radio Corporation of America for the first three months of 1954 was the largest of any first quarter period in the history of the Corporation, Brig. General David Sarnoff, Chairman of the Board of RCA, announced on May 4 at the 35th Annual Meeting of RCA Stockholders in a studio of the National Broadcasting Company in Radio City, New York.

"Our present inventories are well balanced with current sales and we foresee a good volume of business for the year 1954 as a whole," declared General Sarnoff. "We believe that color television will speed the day when the volume of RCA business will reach and exceed a billion dollars a year.

"The youngest child in the electronics industry—color television—offers the greatest stimulus for progress and the surest promise for prosperity. In our new, rapidly developing and fast changing art and industry, it is only natural to find growing pains and constant need for appraisal and adjustment. However, these symptoms of youth respond to intelligent treatment with much greater promise for a healthy future than do the ailments of old age.

"We look forward to the future of this promising industry and the maintenance of RCA's recognized position of leadership with complete confidence."

Sales For First Quarter

General Sarnoff said first-quarter sales of RCA products and services amounted to $226,609,000, an increase of 9 per cent over the first quarter of 1953. Profits, before Federal taxes, amounted to $20,470,000. After providing $10,404,000 for these taxes, the net profit for the quarter amounted to $10,066,000. This is an increase of 8 per cent over the profits earned in the first quarter of last year.

After Preferred dividends, the Common stock earned 66 cents a share compared with 61 cents a share in the first quarter of 1953.

Significant Developments In Television

Significant developments in black-and-white and color television were listed by General Sarnoff as follows:

Television continues to expand as a medium of entertainment, news and education. As a new service in commerce and industry, it has become a major factor in the Nation's business. In RCA, television accounted for 50 per cent of the total volume of business over the past seven years and it reached 54 per cent in 1953.

RCA's steadfast faith and confidence in the ultimate triumph of the compatible color television system which it advocated was completely vindicated when the Federal Communications Commission in December, 1953, approved compatible signal standards for commercial operation of color television.

RCA, intensifying efforts to bring this great advance to the American people, has helped and encouraged others in the industry to do likewise. Progress continues in development of the RCA tricolor tube, and RCA expects to improve its performance, increase the picture size and reduce the cost. Since February, tricolor tubes

have been produced at the rate of 2,000 a month. RCA has made and delivered four thousand 15-inch color television sets.

By the end of this year, NBC will be colorcasting two programs a week from New York and a third from Burbank, California. In addition, NBC is planning a series of especially produced 90-minute shows, "Spectaculars in Color," to begin in September. NBC expects to have 60 stations on its network equipped to transmit color programs by the end of 1954, covering 60 per cent of all homes in the United States.

During this year and next, RCA believes the demand for color sets will exceed the supply. According to these estimates the industry should be able to sell about 50,000 sets in 1954, several hundred thousand in 1955, and a progressively increasing number each year thereafter, adding up to a total of approximately 10 million color sets in use five years from now.

Government Orders

RCA sales and services to the Government were reported at $55 million in the first quarter of 1954. This was approximately 24 per cent of RCA's total volume of business for the quarter. Shipments to the Government for the full year of 1954 are expected to be substantially more than last year.

RCA international business continues to increase in volume and profits, said General Sarnoff, adding:

"The results for the first quarter of 1954 exceeded those of the first quarter of last year and the outlook is bright for continued improvement. Overseas, RCA products and engineering are helping to strengthen the security and economy of nations friendly to the United States.

"We continue to be the leader in supplying television equipment in the world markets. For example, in Latin America RCA has supplied 60 per cent of all the TV broadcasting stations now in commercial operations."

Home Appliances

RCA's recent entry into the manufacture and sale of home appliances, by adding air conditioners and home ranges to the line, has proved to be a sound financial move for the Corporation as well as for distributors and dealers, General Sarnoff reported. He said that this business was profitable in 1953, and that for the first quarter of 1954 RCA sales of these home appliances were 75 per cent greater than for the first quarter last year.

In discussing research and invention, General Sarnoff said:

"Since its earliest days in 1919, the Radio Corporation of America has followed a continuing policy of carrying on scientific research and development. The inventions and improvements resulting from this work have been made available to competitors and to industry in general. This is done on a uniform basis through patent licenses that are liberal in scope and at very low royalty rates compared with the value of these inventions. The royalty rates are less than one per cent of the usual retail price.

"RCA has previously granted to others several hundred patent licenses and the majority of them run to the end of 1954. By mutual agreement, these licenses can be extended for a further period of years. A substantial number of these license agreements have been signed and extended for a period of five years beyond 1954. In view of the great value to our licensees of their right to use the inventions covered by these licenses, we feel confident that by the end of this year substantially all of the remainder will also extend their agreements."

There are few, if any, industries in America as highly competitive as the radio-television industry, General Sarnoff declared.

"Three thousand radio broadcasting stations now are on the air, and by mid-year 400 television stations will be in operation," he said.

"In many of the principal cities of our country already there are more radio and television stations than newspapers. For example, New York City has twenty-eight radio stations, seven television stations and only nine English-language daily newspapers. Chicago has twenty-six radio stations, six television stations and only four daily newspapers. Los Angeles has twenty-one radio stations, eight television stations and only five daily newspapers. Even in Washington, D. C.—the Capital of our Nation—there are only three daily newspapers, while there are sixteen radio stations and four television stations.

"The number of manufacturing companies in our industry is also most impressive. Manufacturers of radio sets, 110; television sets, 75; electron tubes, 60; phonograph records, 200.

"There are about 2,000 wholesale distributors; 100,000 retail dealers, and 20,000 service shops handling these products.

"In this young and vigorously competitive industry approximately one million people are now employed.

"Here is an outstanding example of how the American system of free enterprise provides opportunity for small as well as big business to prosper and to grow. In this, as in other industries, the organizations most likely to succeed are those which have efficient management, maintain good relations with their employees, operate on a sound financial basis, manufacture good quality products at the lowest cost, sell them at reasonable prices, and render the best service to the public."

Open House at Princeton

The staff of RCA Laboratories was host to some 4,000 friends and neighbors at an open house at the David Sarnoff Research Center in Princeton, N. J., on the evenings of May 5-7. These pictures present a glimpse of some of the fifty different activities examined by the visitors.

Dr. E. G. Linder explains transistor oscillator producing tone from light falling on silicon junction of type used in RCA Atomic Battery.

John E. McCool, supervisor of glass room, demonstrates his art to an interested visitor.

Young guest peers through microscope at an experimental RCA transistor.

Robert Anderson shows device used to chart path of electrons in a tube.

Stanley Forgue explains cloud chamber for observing radioactive particle tracks.

The magnetic memory is explained by its developer, Dr. J. A. Rajchman.

Souvenir ashtrays were made for the guests by William E. Carpenter.

RCA news in brief

Happy Birthday

An RCA broadcast tube recently celebrated its fourteenth birthday with a normal day's work at radio station KPOJ in Portland, Oregon. The venerable tube, of the type known as a forced-air-cooled triode, was installed in KPOJ's modulator circuit in March, 1940, and is showing no signs of its advanced age, according to the station's chief engineer. Experts of the RCA Tube Division believe this is the longest life recorded yet for a large power tube, with more than 91,000 operating hours—the equivalent of 25 months of continuous operation.

Electronic Allergy

A phototube described by its makers as "allergic" to spots before its "eyes" has been added to its commercial line by the RCA Tube Division for a wide range of industrial applications, including production-line inspection of soft drinks, medical solutions and similar translucent liquids. The tube, previously produced only on a custom-order basis, reacts only to pulses of light caused by particles in motion, so the bottled liquids to be inspected are rotated swiftly and suddenly stopped, causing the contents to swirl around in the bottle as they pass before the electronic "eye." Transparent bits of foreign matter that may have been bottled inadvertently cause the phototube to react sufficiently to trigger an electronic reject system.

High Eye

The television camera has now been moved up to the ceiling to cover NBC's "Home" show from the end of a telescoping arm. Operated by remote control, the camera can be moved easily and quickly to any point on the circular set—the most elaborate and advanced yet constructed for a television program. The camera itself is mounted at the end of its boom by means of a so-called "cradle and yoke," converted from the device that holds the gun turrets of a B-29 bomber. The arrangement was conceived and its construction supervised by Sol Cornberg, NBC's supervisor of plant facilities and development, who also designed the "Home" set itself.

It Still Marches On

The March of Time Film Library, considered by the trade to be the outstanding source of news and special events films unduplicated anywhere else, was taken over on May 1 for sales and distribution by the NBC Film Division in the largest transaction for film footage in television history. The transaction swelled to over 30 million feet the amount of footage contained in the NBC Film Library, which already ranked as the world's largest collection of stock footage shot exclusively for TV. Addition of the March of Time film extends the historical range of the film library's inventory back to 1934.

More Juice

The swing toward 12-volt automobile batteries has encouraged RCA engineers to work up new two-way mobile radio equipment that can be converted easily to operate on either the larger battery or the 6-volt variety. The new RCA "Fleetfone" units, shown for the first time recently at the Dallas convention and show of the Petroleum Industry Electrical Association and the Petroleum Electrical Supply Association, can be ordered for either voltage and for use in adjacent channels with either 20 or 40 kilocycle separation. Whichever is specified, the equipment can be readily converted at any time these requirements change.

Awards Department

Honors descending upon the National Broadcasting Company during the second quarter of the year included top honors in the George Foster Peabody Awards competition for 1953, and plaques and citations from "Variety" for a number of NBC programs, divisions and affiliates. The Peabody awards went to the NBC Television Opera Theatre in the television music category; to the "Television Playhouse" and its producer, Fred Coe, as top television entertainment; to Imogene Coca, star of "Show of Shows," in entertainment, and to "Mr. Wizard" in the category of television programs for children and youth. Among the "Variety" awards were a special citation to the NBC Television Opera Theater and a "Variety" TV Film Award to the NBC Film Division for "sparking a drive that pumped life into the floundering economics of the TV-film industry."

3,000 islands . . . welded together by radio

How 100 million people on 3,000 islands form a unified nation . . . with the aid of a vast radio network

INDONESIA, one of the newest and largest nations of the modern world, is a strong union of original art forms and tremendous natural resources; of ancient cultures and alert progressive world responsibility. Its nearly 100 million people live on a vast chain of 3,000 islands spanning 3,000 miles across the subtropics.

Early in the new nation's existence it became evident that such a far-flung structure required a communications setup of unique scope and flexibility.

Government and military leaders acted quickly . . . and soon a highly mobile fleet of RCA radio-equipped vehicles began operation. The isolated land areas acquired ears and voices. The Indonesian armed forces equipped vehicles, planes and boats with radio for personnel training and national security.

Not long afterwards a centralized radio broadcast network began a long-range program of education and enlightenment for all the people. Progress has been so rapid that today there is no spot in the huge republic beyond the reach of this alert and intelligent voice.

Through the development and installation phases of the huge project RCA field engineers worked with Indonesian authorities . . . teamwork which is now bearing fruit in the highly successful operation of the entire communications system.

RCA products and services are available in all world markets open to trade, through RCA distributors and associated companies. The new book "Communications, Key to Progress" tells the inspiring story of radio at work in many countries. Simply write to RCA International Division, 30 Rockefeller Plaza, New York, U.S.A. "Marcas Registradas"

RCA INTERNATIONAL DIVISION
RADIO CORPORATION of AMERICA
RCA BUILDING
30 ROCKEFELLER PLAZA, NEW YORK, N.Y., U.S.A.

World leader in radio, first in recorded music, first in television

Celebrating the 5th birthday of "45 Victrolas" and records.

The 5th Anniversary of "45" brings many happy returns to you!

Crowning achievement of the "45" system is the *Extended Play Record* which brings you great music for 40% less than you used to pay

Just 5 years ago RCA Victor introduced the "45" RPM system and gave you a reward of new listening pleasure.

With the touch of a button you could sit back and enjoy nearly two hours of your favorite music. There were no changes to make . . . no bulky albums to tote and store . . . and you were rewarded with music that was richer, truer—with all the brilliance of "live" performance.

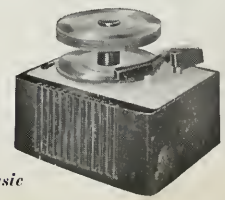
Moreover, the "45" became the *only* system that played every kind of recorded music—and played them all automatically, selectively.

Today, with the new RCA Victor 45 Extended Play records, you have all these advances—plus one happy financial return: *more music for less money.*

These extraordinary little records bring you the same amount of great music as two 12" old-style records, yet cost little more than half as much.

RCA's continuing program of research in other fields of home entertainment—radio, television, tape-recording, and high fidelity, brings happy returns for millions of Americans.

RCA pioneered and developed compatible color television



RCA

Radio Corporation of America

World leader in radio—first in television—first in recorded music