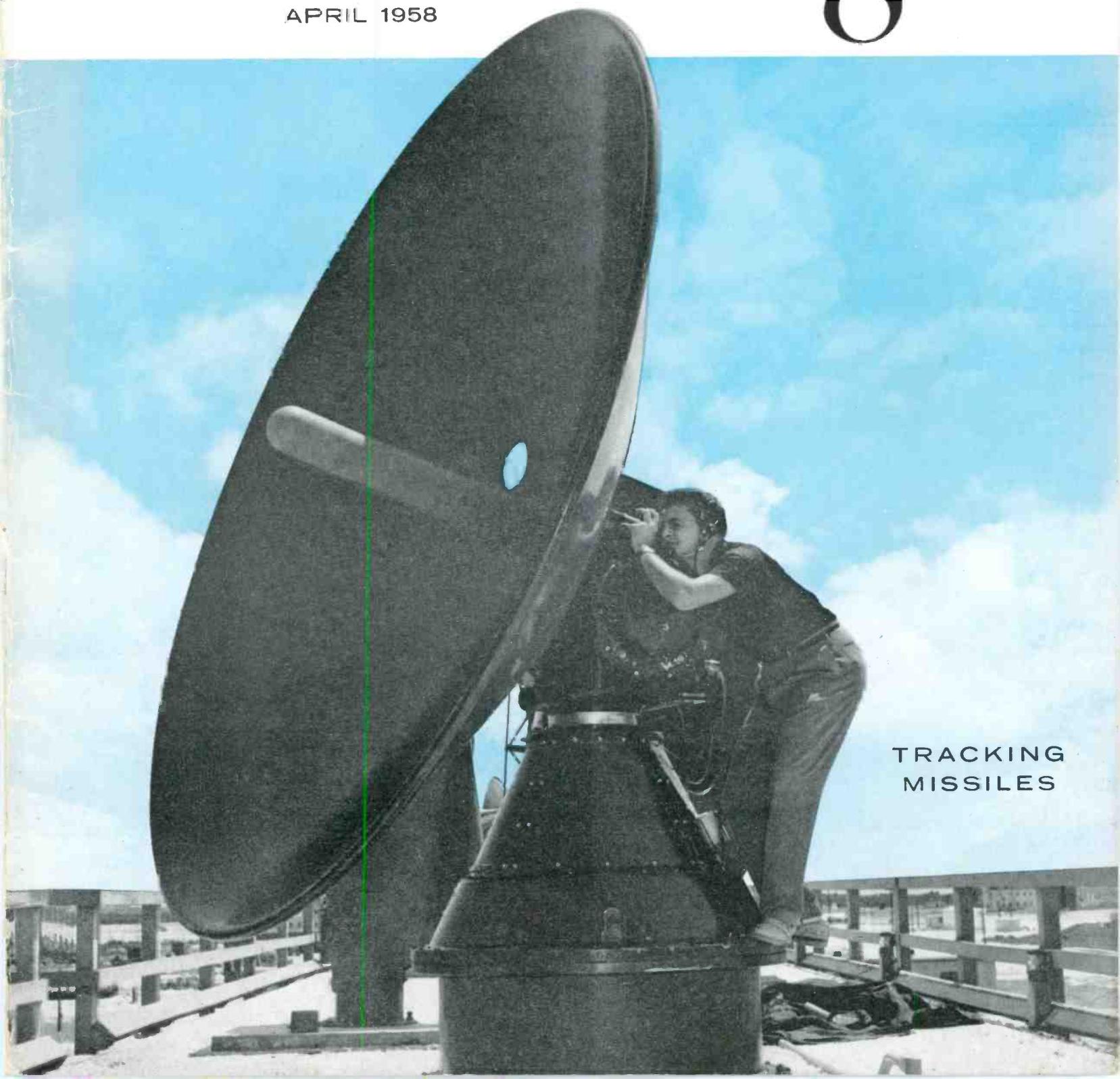




Electronic Age

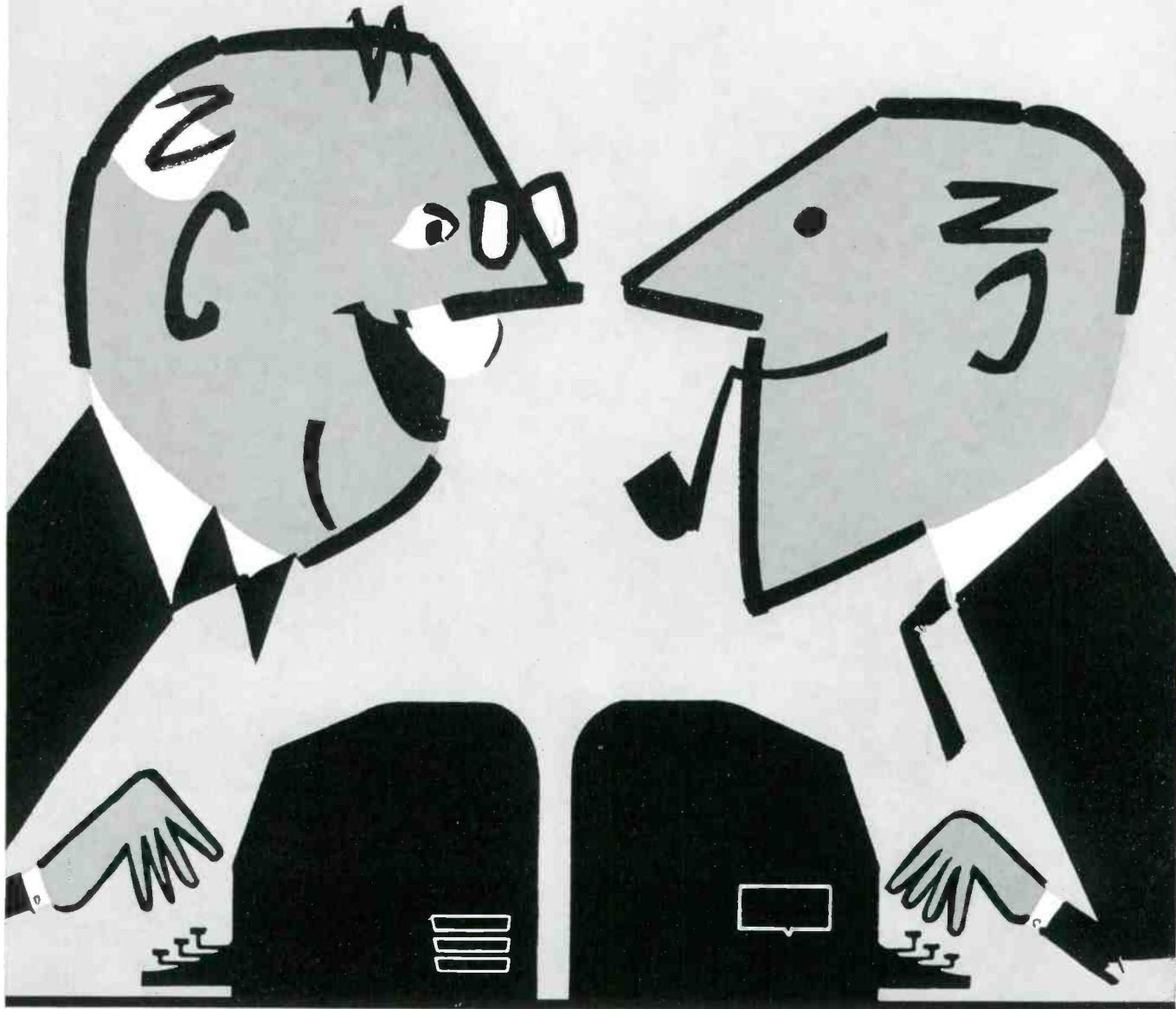
APRIL 1958



TRACKING
MISSILES



Overseas Teletypewriter Service



It's like doing business face-to-face

With TEX®, the RCA-pioneered international teletypewriter exchange service, you are practically "face-to-face" with your overseas correspondent because you can literally "talk back-and-forth in writing" with him.

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APRIL 1958
VOLUME 17
NUMBER 2



COVER

RCA Service Company technicians man electronic systems for tracking missiles at the Air Force Missile Test Center, Cape Canaveral, Florida.

NOTICE

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

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

Printed in U. S. A.

Electronic Age

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

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RADIO CORPORATION OF AMERICA

RCA BUILDING, NEW YORK 20, N. Y.

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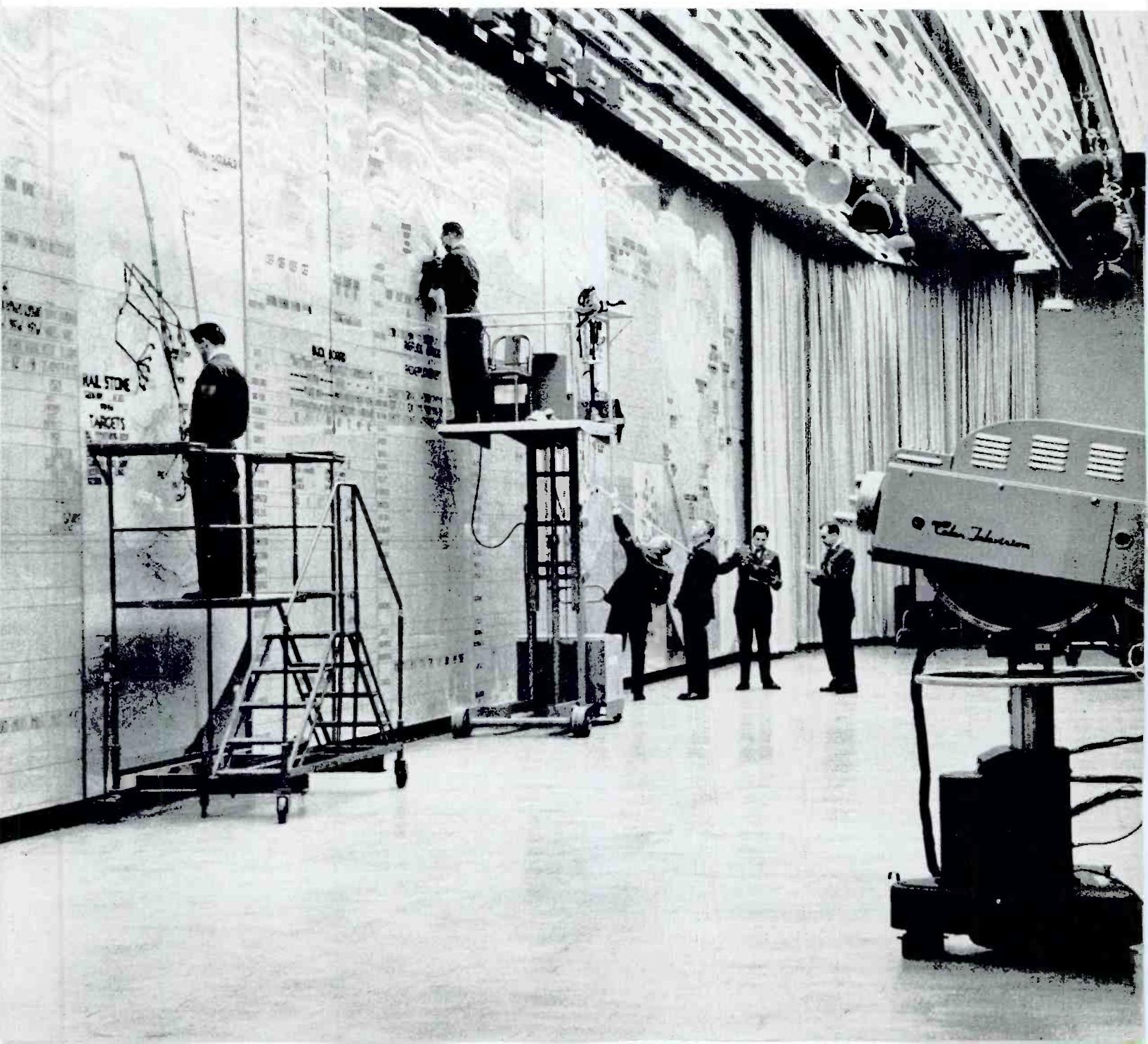
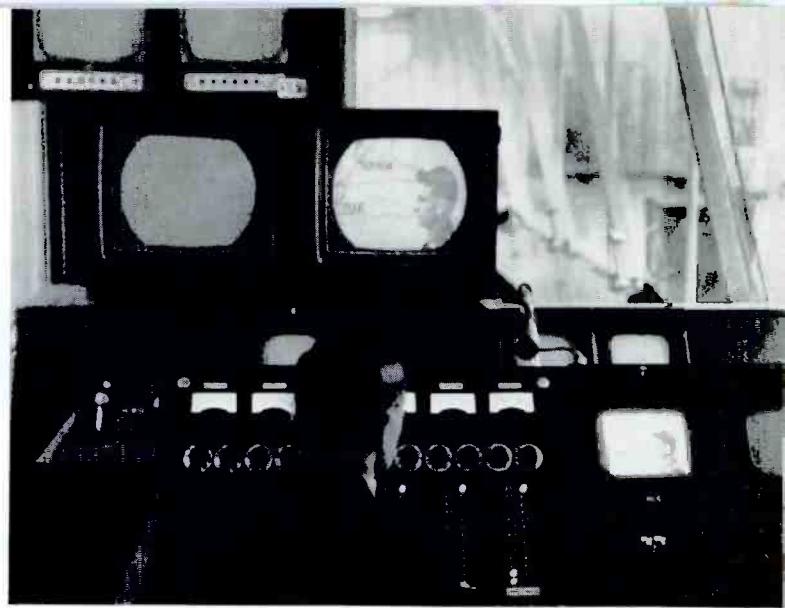
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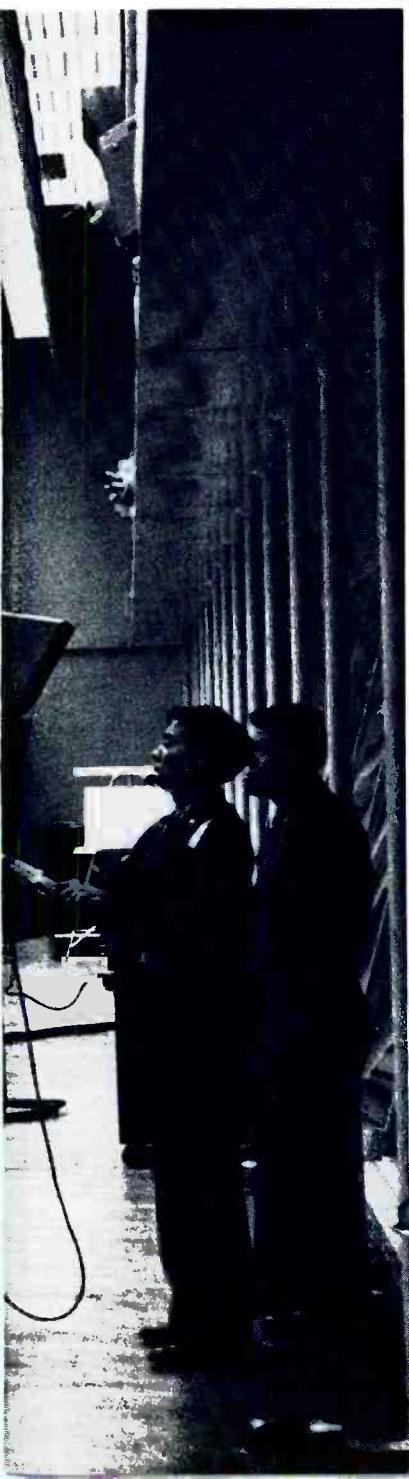
ERNEST B. GORIN, Treasurer

Color television cameras in the Strategic Air Command's operations room, below, instantly relay flight, plane and weather data to key viewing locations throughout the underground headquarters. The RCA color TV system can televise five separate staff briefings simultaneously. The airman in SAC's main control room, right, is at program switching position facing master color and black-and-white monitors.





Color TV in Uniform



CLOSED circuit color TV is extending its usefulness into two diverse areas of the nation's defense organization.

At Offutt Air Force Base, headquarters of the Strategic Air Command, in Omaha, Nebraska, RCA's closed-circuit color TV system is providing the utmost speed in presenting worldwide flight data to the staff.

At Walter Reed Army Medical Center in Washington, an RCA system, installed in the Television Division, is serving as a training and educational medium to bring to both Army and civilian medical men the advanced techniques developed at the hospital's medical and dental centers.

The RCA color TV network recently completed at Offutt Air Force Base, permits instantaneous closed-circuit colorcasting of briefing information, air intelligence, and weather data to any one or a combination of key viewing locations throughout the A-bomb-proof subterranean SAC nerve center.

In the RCA installation there are five live color television cameras; a three-vidicon color TV film camera system, for integration of filmed material; a monochrome industrial TV camera, for surveillance of personnel entering the Operations Control Room; complete control facilities in a centralized TV control room; special remote-control camera-operating equipment; associated power and program-switching systems; and RCA 21-inch color TV monitors.

Three of the RCA color studio cameras are installed in the Operations Control Room, the headquarters' briefing room which features giant sliding maps. Two cameras are mounted on an overhead track for televising any required portion of any map.

A color camera is installed in the Air Intelligence Room, for rapid telecasting of latest reconnaissance and intelligence information.

A fifth camera, an RCA-vidicon type, is ceiling-mounted in the SAC Weather Room. It overlooks a special weather-vision table developed by RCA which makes possible rapid adjustment of weather map data in accordance with changing conditions.

Color TV monitors are situated in individual offices and in key group locations.

Heart of the RCA color TV installation is the centralized TV control room, where the daily briefing, intelligence, and weather colorcasts are programmed, and into which signals from five color TV cameras are fed.



The SAC Controller can see any portion of main operations room without moving from chair. He can reach any SAC base in world through telephone switch console.



Long focal length lens is used in RCA color television camera at Walter Reed Army Medical Center to obtain a closeup of a denture model.

SIGNIFICANCE

The closed-circuit color television installation at Offutt Air Force Base offers outstanding advantages to SAC Headquarters:

- It provides speed and flexibility in the presentation of world-wide flight data to the Commanding General and headquarters staff.
- Reduces need for time-consuming group meetings by its ability to duplicate data simultaneously and with complete fidelity in as many locations as are required.
- Permits instant transmissal and mass duplication of maps, charts, weather data and other required SAC information material.

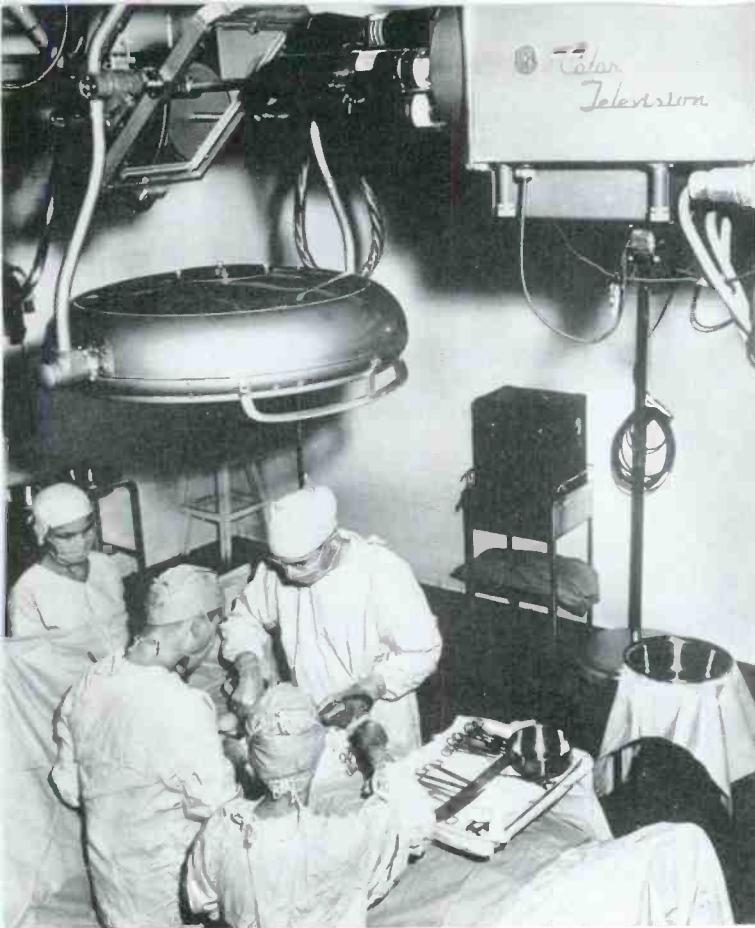
In short, color TV enables SAC Headquarters to step up its internal communications to maximum speed, in keeping with the requirements of the Jet Age.

Color TV at Walter

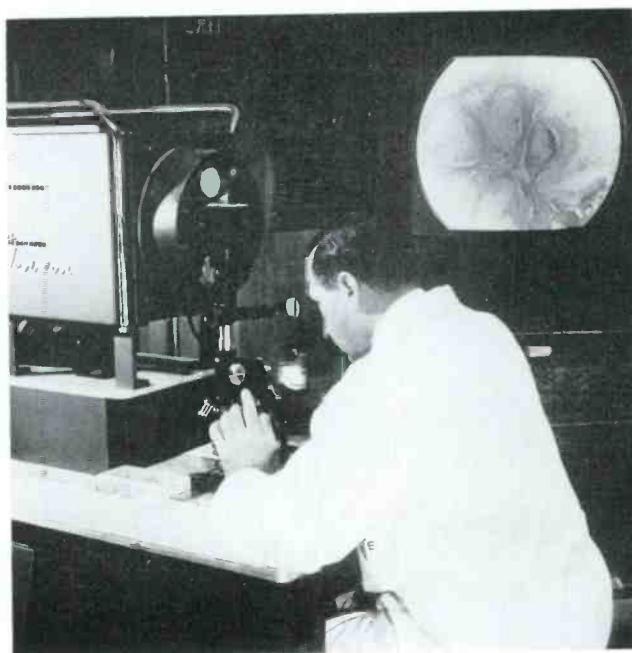
THE wide range of activities at Walter Reed gives color TV a chance to demonstrate its versatility. Here are located the Walter Reed Army Institute of Research, focal point of the Army's research in medical, dental and veterinary fields. Here, too, is the Armed Forces Institute of Pathology serving the combined military services and other U. S. agencies. In the Pathology building is the main studio which acts as the nerve center of the Television Division. Two smaller studios, each with its own channel and control system are also available.

In the main studio area, a color television camera operating through a reflector system, picks up images from a 16-mm motion picture film projector and two slide projectors. These can transmit in color or in black-and-white.

One of the most interesting pieces of equipment at Walter Reed is the color TV microscope camera mount, designed by the hospital's Television Division in co-operation with RCA engineers. This system enables groups of scientists to observe enlarged color reproduction of minute biological life on a TV screen.



Color TV camera in operating room at Walter Reed is aimed at mirror suspended above aperture in center of operating light.



New color TV microscope permits pathologist and surgeon to simultaneously examine tissue removed from patient during an operation.

Reed Hospital

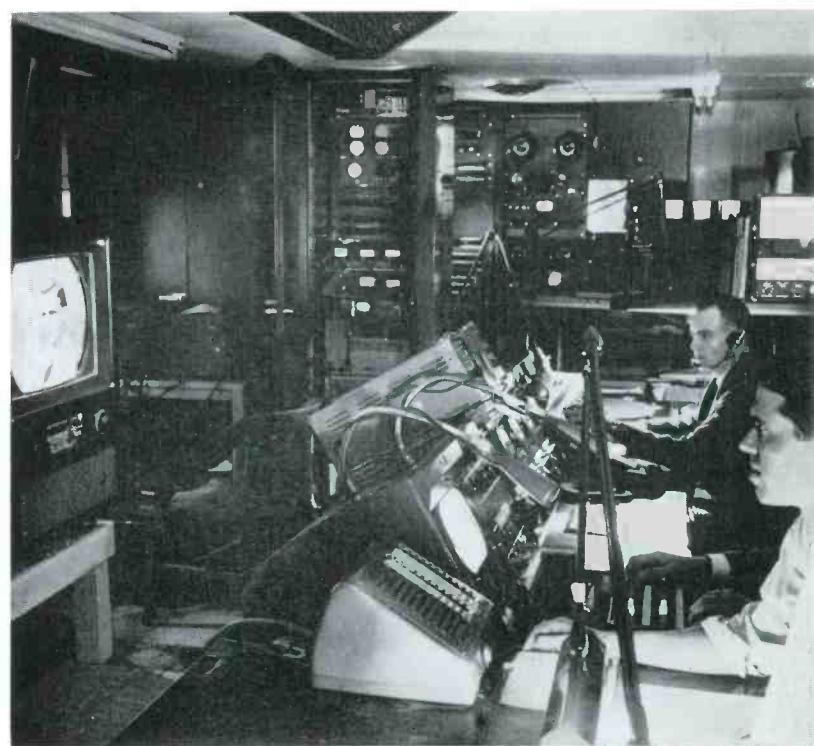
The operating room and pathology laboratory cameras, along with the TV microscope camera, are another aid to medical science.

By television, the pathologist can transmit microscope slides of tissue to the operating room, at the same time discussing the specimens with the surgeon over a two-way sound system.

Two floor cameras in the Army Institute of Research studio facilitate programming from that building. Enlargements of subject matter are obtainable by means of telescopic lens on the camera. By this means, a single tooth can be enlarged to fill the entire 6- by 4-foot TV projector screen.

Films taken by the TV Division's color kine recorder, known as the trinescope, can be shipped to Army posts throughout the world so that medical men can keep abreast of the latest advances in scientific knowledge. The trinescope photographs live color programs on 16-mm motion picture film with quality equal to that of the television screen image.

When called upon, the Television Division is able to televise shows and demonstrations to downtown locations in Washington and New York City, as well as to audiences within the Center itself.

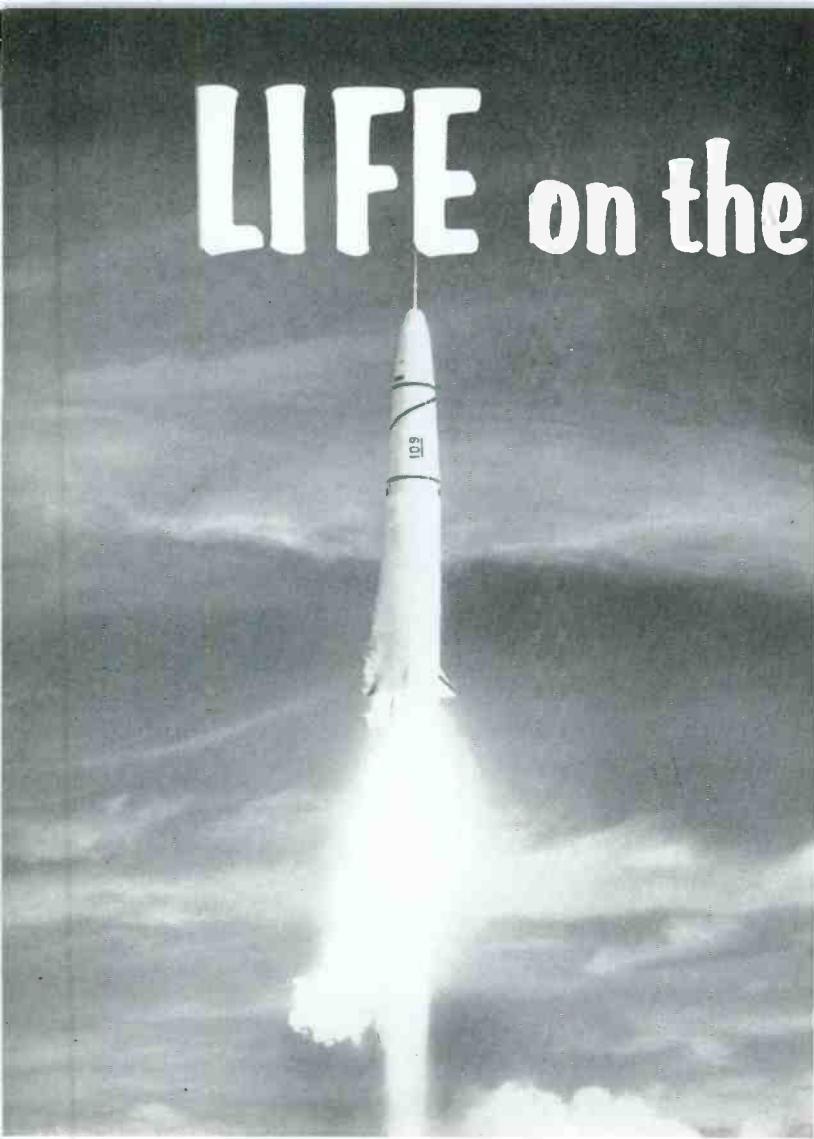


Rehearsals and programs originating from Studio "A" are supervised from the Master Control Room.

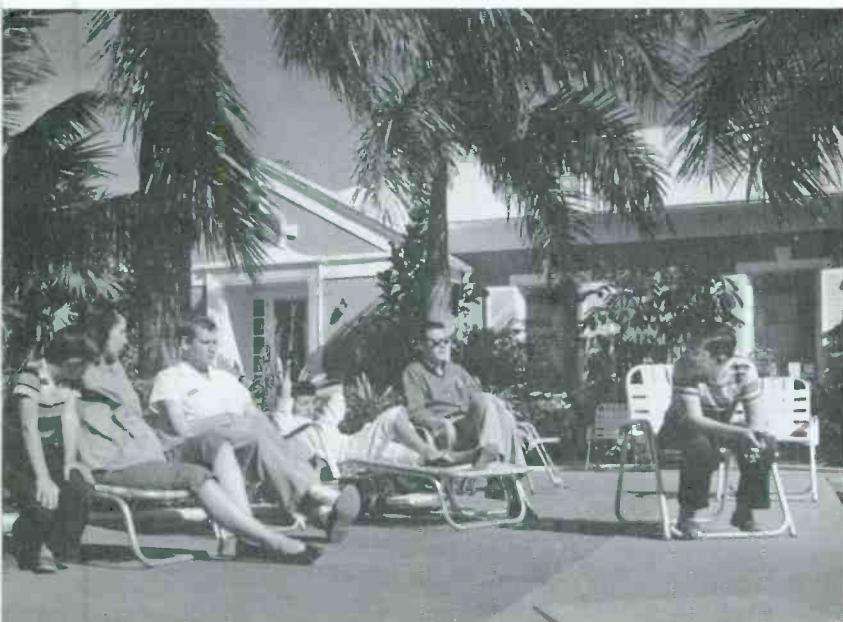
LIFE on the

Missile Range

*RCA technicians down-island from
Cape Canaveral lead the "Life of Riley"
. . . except during rocket tests*



A major test shoot, such as the Thor missile, may keep RCA Service Company technicians at their posts of duty for long hours of tense waiting.



Between tests, the technicians and their families can take weekend excursions to resort hotels; this one is on Eleuthera.

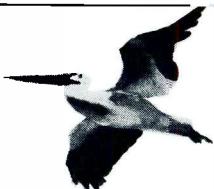
A GROUP of 20th Century "birdwatchers" work in the front rank of America's defense effort and lead the off-duty life of carefree beachcombers. These modern-day "Audubons" are the RCA Service Company technicians who man the Air Force Missile Test Center's 5,000-mile missile range from Cape Canaveral, on the east coast of Florida, to Ascension Island, in mid-Atlantic, and whose job it is to maintain and operate the electronic equipment which makes up the missile tracking, guidance, safety, and communications system.

During a missile test these technicians track the "bird" with long-range camera and radar, plot its altitude and speed, and monitor the complex radio signals which reveal its fuel consumption, skin temperature, and all the other information required to evaluate the test.

Most of RCA's 2,600 employees with the Missile Test Project are on the job at the Cape Canaveral site,

Several hundred RCA employees are stationed on 12 down-island bases on missile range; technician is manning optical tracker.





and 18 miles south at Patrick Air Force Base, headquarters of the test center. Several hundred of the total number are scattered among twelve down-range bases, and on eleven picket ships, which patrol the seas between. They are stationed on romantic islands first explored by Columbus, and now favored by yachtsmen, fishermen, and winter vacationers from the chilly north.

Some of the islands are small and sparsely settled—San Salvador, Grand Turk, St. Lucia, Fernando de Noronha. Others are somewhat more civilized—Grand Bahama Island, Eleuthera, Puerto Rico, Antigua. But all of them share the same balmy year-round climate and crystal-clear Caribbean water. As one down-range technician explains it: "We get all the advantages that well-heeled tourists pay \$20 a day for."

The men occupy comfortable rooms in breeze-cooled barracks and eat generous meals in a central dining room—all at no cost to themselves. They share these quarters with the Pan American World Airways personnel who operate the bases.

In addition, there are nightly movies, tax-free cigarettes and drinks, recreation rooms with pool, ping-pong, books, magazines, and hi-fi. Boats are provided for fishing. The entire area is a skin-diver's and spear fisherman's paradise, and rooms are festooned with flippers, masks, snorkels, and under-water cameras.

To make sure that no one goes "rock happy" from too long a stretch on the islands, vacations and special home leaves are provided which total from five to seven weeks a year, depending on length of service and other factors. Some of the bases are close enough to popular resorts to provide week-end excursions. Eleuthera, for example, is only 60 miles from Nassau, most famous winter playground on the Bahamas.

Many of the married missile watchers bring their wives to Nassau or Puerto Rico for vacation reunions. On some of the islands, such as Grand Bahama and Eleuthera, a few married men have brought their wives and families out to live in rented homes off the base. In most cases rents are not cheap and facilities are primitive. There are no super-markets or beauty shops. Electric power is sometimes non-existent, or it may be

provided by a balky generator in the back yard. In spite of such limitations many wives look on their life as an adventure and enjoy its lazy tropical pace.

The missile project has created many paradoxes on the islands. A technician who spends his working hours adjusting the most advanced electronic equipment may go home in the evening to trim the wick of a kerosene lamp or pump water for the shower to a rooftop tank. On Grand Turk it is sometimes necessary to shoo a herd of wild donkeys from the runway before a plane can take off or land. Recently a large chicken snake had to be evicted from the transmitter room.

Frolics such as this provide occasional relief from a demanding job. The usual working day is from 7:30 to 4:15, with 45 minutes off for lunch. But when word comes down from Cape Canaveral that a missile test is scheduled, then the men roll out at dawn and report to their posts in the radar timing, and telemetry rooms, and at the plotting boards, computers, and transmitters.

The Payoff

Tension builds as the count-down progresses, and the technicians on the range no longer feel like idle beachcombers, but rather like explorers of the space age. The years of preparation that have gone into the designing and building of the missile and the complex electronic systems that track it, the organization of bases and training of personnel—all are tested in a few hours.

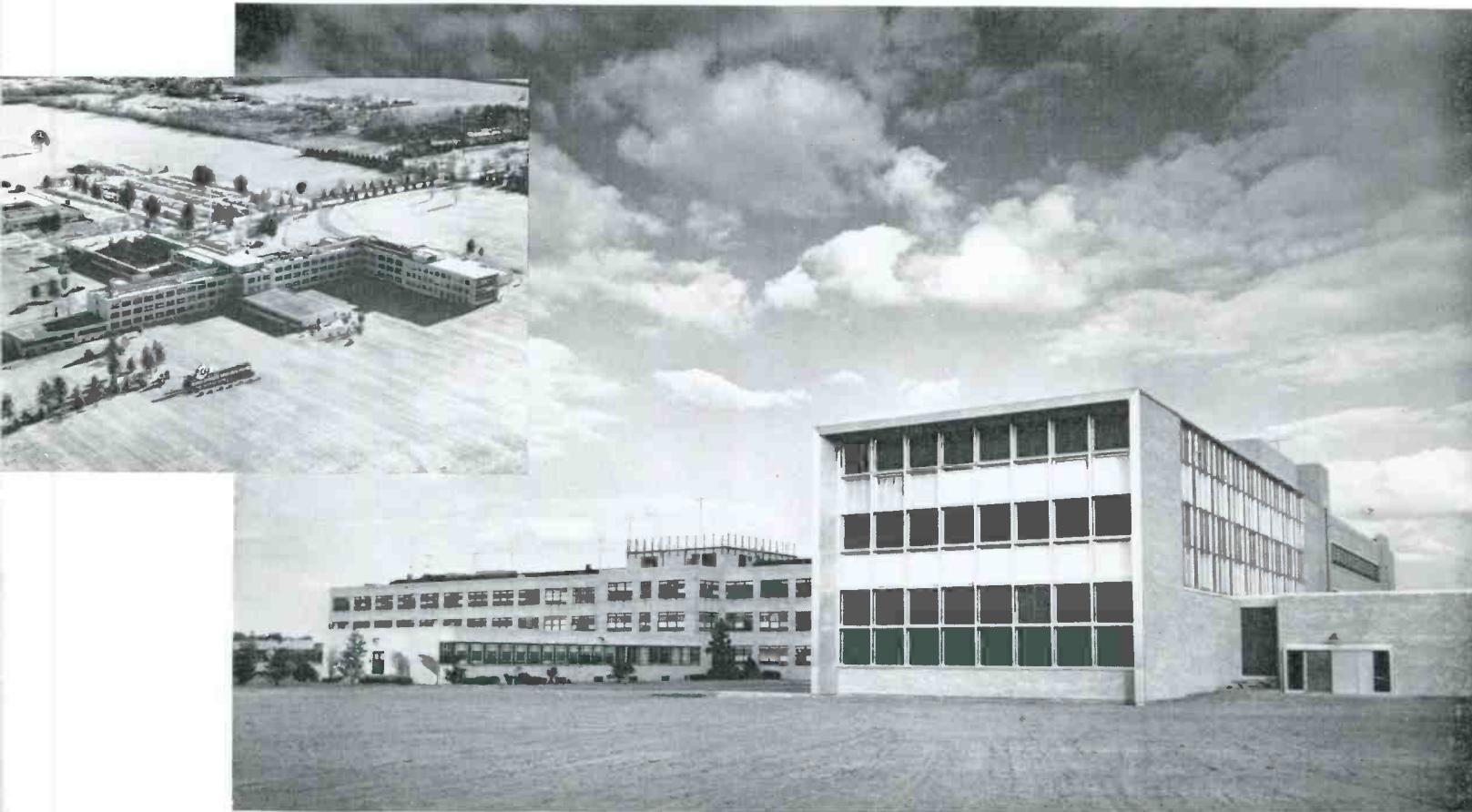
At first the time seems to pass slowly. But the final minutes come, and in the timing room at every island base a row of lights flashes across a panel, ticking off the seconds. Then a tense voice from Canaveral announces that the bird is in flight. Automatic pens follow it across the plotting boards as it speeds down-range. Men hunch over radar screens on the ground, on the waiting picket ships, and in aircraft cruising along the planned course of flight.

When central control announces the termination of the test, the men on the bases may not know whether it has been a success or not. Yet no test is a failure if it brings new information to the technical laboratories for future study and planning. Air Force Major General Donald Yates, Commander of the Test Center, has explained that his mission is not to "fly rockets but to collect data." That's the job of the missile watchers.

The missile watchers have at their disposal unparalleled beaches.



A NEW WING for RCA Laboratories



New wing provides the David Sarnoff Research Center with expanded library facilities and auditorium.

AHDSOME new wing expanding the facilities of the David Sarnoff Research Center of RCA at Princeton, N. J., invites attention to progress that for nearly sixteen years has kept this busy hub of RCA Laboratories at the forefront of scientific exploration and achievement.

It was on November 15, 1941 — barely three weeks before Pearl Harbor — that the cornerstone was laid on ground revered in American history. Less than one

year later, in September, 1942, construction workers left the scene and scientists and engineers moved into the streamlined modern structure.

At the dedication, Brig. General David Sarnoff, then President and subsequently Chairman of the Board of RCA, declared: "Our admiration for these Laboratories is based upon more than their obviously fine qualities of architecture and construction. We are moved by the deep respect in which we hold the virtues of scientific accuracies and intellectual integrity. These are virtues

possessed to a high degree by the type of men who will work within these walls. These are the qualities which are helping to preserve our civilization and which in turn make our civilization worth fighting for."

Thus RCA began setting the pattern for the Princeton Community to become a capital of science. The David Sarnoff Research Center — created from the outset an ideal climate and a nucleus around which other great industrial scientific organizations could build happily and grow.

Today the Princeton community is known throughout the world for contributions to science and humanity that "make our civilization worth fighting for."

RCA Laboratories engineers and research scientists working there have a background of distinguished service in war and peace that brings continuing credit to this growing center of research, the sharp individual lines of which themselves point toward the future.

A listing of the scientific advances that have come from this angular three-story structure in the past sixteen years would fill volumes. It has been a chief source of development of radar, sonar, shoran and loran; from its multitude of laboratory bays have come major advances in black-and-white and color television, elec-

tron microscopy, infra-red and supersonic communication, airborne and industrial television, improved sound reproduction, electronic data-processing, electrofax, and a host of other significant developments.

The new wing expands facilities and office area, as well as providing a huge technical library and reading room free of interior supporting columns. Construction represented an architectural and building feat.

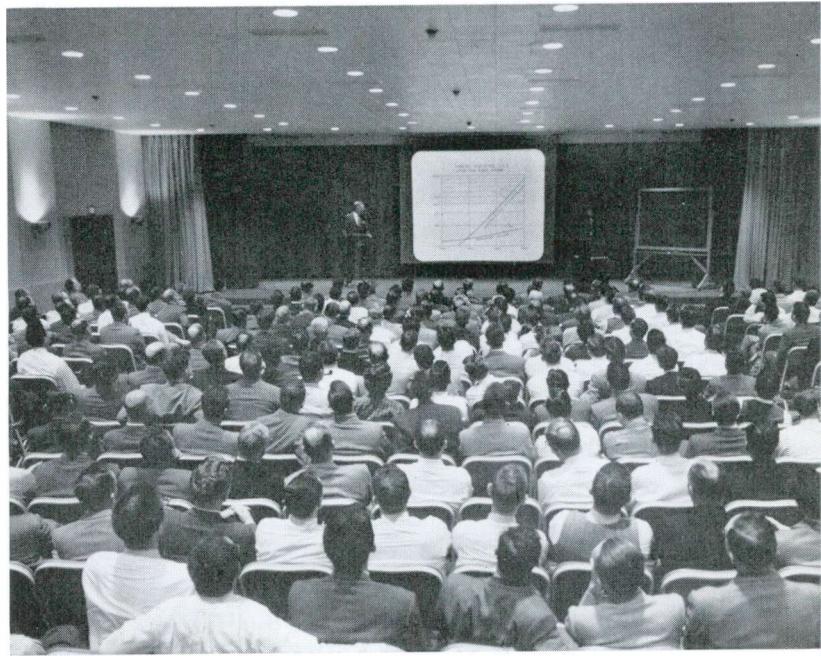
The second and third floors of the wing, extending toward U. S. Highway 1 from the existing west wing of the center, were hung from large girders at roof level. The concrete roof was poured first, followed in sequence by the pouring of the third and second floors. The finished addition terminates in a three-story glass and aluminum facade facing westward toward Princeton University.

Besides the large new one-and-a-half story library, the wing accommodates a 300-seat demonstration room and auditorium, a reception room and lounge, a kitchen and two floors of modern office area.

Architects for the new wing and its extension were Shreve, Lamb & Harmon Associates. The builder was Matthews Construction Company, of Princeton.



Floors of new wing were "hung" from large girders at roof level. Library provides enclosed study rooms and a reading room that will easily seat sixty-five persons.



Construction technique permitted room areas to be free of supporting columns, as in auditorium. This room was outfitted with specially designed acoustical features.

Rhapsody in Business

*Five artists at RCA Victor Record Division
double as company executives.*

A MUSICIAN is a dreamer with a childlike sense of business. An executive is a hard-headed, money-conscious gent with no time for anything that smacks of the aesthetic.

Five men at RCA Victor Records completely contradict these stereotyped images of the artist and the businessman. All five, Chet Atkins, Joe Reisman, Hugo Winterhalter, Henri Rene and Shorty Rogers, play the dual role of creative musician and successful executive.

Each one is a recording artist in his own right, having the aesthetic talent, temperament and other facets of the artistic make-up.

At the same time each man sits behind a desk every day handling office procedures and making cold business decisions with the acumen expected of any executive.

This paradoxical combination of the two opposite types may appear at first to be a mistake. Actually, it is a shrewd idea. The reason why is simply that the success of a record label depends on creativeness. Who is better equipped to produce hit records than the creative artist?

He is in close touch with the musical whims of the public and is always aware of new trends. He is in a logical position to get hold of suitable or "hot" songs and assign them to the proper artist. He can act as arranger and conductor on any given disk and even supervise the record date because he is able to make the actual recording, give all necessary engineering instructions and do recording or editing afterward.

His varied experience acquaints him with all phases of the record business. As a matter of fact, it is easier to make a businessman out of a musician than it is to make a musician out of a businessman.



Shorty Rogers

A good case in point is Chet Atkins, a guitarist and an authority on country-western music. He has even proved himself an inventor and electronics wizard. It was Atkins who developed an outstanding new guitar for the Gretsch Company, manufacturers of guitars. Among other innovations, he narrowed the width of the Gretsch fingerboard, allowing the instrument to become perfectly adaptable for "finger style" guitarists.

Atkins also invented a novel amplification system which can be attached to any guitar. This complex amplifier gives the instrument a unique sound and enables the guitarist to achieve unusual special effects.

Now, in his added capacity as an RCA Victor Artists and Repertoire Manager, he has shown his ability to produce hit records as well as discover and develop new talent. Operating from Nashville, Tennessee, which in

the current era of Rock 'n' Roll has blossomed into a recording center second only to New York, Atkins' combined artistic talent and keen business sense make him one of the top profit makers for his company.

RCA Victor's first "million seller" of 1958—"Catch a Falling Star"—is the handiwork of another artist-executive, Joe Reisman, Musical Director, Artists and Repertoire. It was Reisman who found the hit song and decided to give it to Perry Como. Reisman, incidentally, has been handling all of Como's recording activity for the past three years, and the results have been very impressive: "Papa Loves Mambo," "Home For The Holidays," "Round and Round," "Hot Diggity," plus other top-sellers.

Before taking a position as a company executive, he had been widely hailed in the field of music as an arranger and conductor. He had worked with June

out arrangements in an unusually short length of time. He was responsible for many brilliant arrangements that have resulted in hits for Tony Martin, Ertha Kitt, Dinah Shore and others. He has, in addition, enjoyed hits of his own including "The Velvet Glove," "The Happy Wanderer" and "The Chrystal Chandelier."

Milton (Shorty) Rogers is a much-heralded jazz name, and besides being an Artists & Repertoire manager he is an accomplished trumpeter-arranger-composer. Like his four colleagues, he is extremely versatile. He has produced records ranging from the coolest jazz to "Indian Giver," a release by actor Tony Perkins.

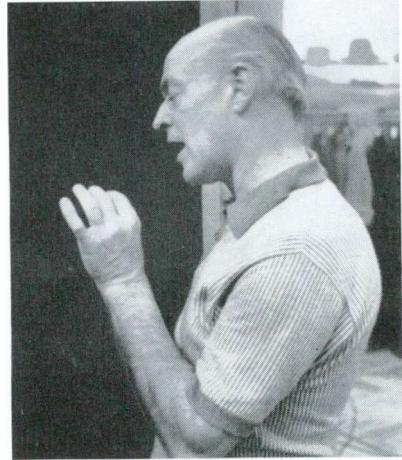
Rogers' jazz background began with stints in the bands of Will Bradley, Red Norvo, Butch Stone and Charlie Barnet during the Forties. In 1950, he was with Stan Kenton in his first "innovations" tour. After playing trumpet with Kenton for a year and a half, he stayed



Chet Atkins



Joe Reisman



Henri Rene



Hugo Winterhalter

Valli, Sunny Gale, Johnny Ray, Vic Damone, the Ames Brothers, Julius LaRosa, the Four Lads and Patti Page among other vocalists.

The Hollywood office of RCA Victor has two artist-executive people who patrol the West Coast music beat: Henri Rene, Administrator, Artists and Repertoire Specialties, and Shorty Rogers, Musical Director, Artists and Repertoire.

Although he cuts all kinds of records well, Henri Rene's background is strongly classical. He attended the Royal Academy of Music in Berlin, where he studied piano and composition and was greatly influenced by the music of Mozart and Debussy. He organized his first orchestra in 1926 and toured the capitals of Europe.

Rene returned to the United States in 1936 and soon won recognition as both arranger and conductor. He also became well known as a writer who could turn

on as an arranger and became an influence in making modern jazz catch on.

Of the five artist-executives, Hugo Winterhalter, Musical Director, Artists and Repertoire, holds the longest service with RCA Victor. Also an arranger-conductor, he is closely associated with numerous hits by Eddie Fisher, the Ames Brothers and others. He has had a sizable string of his own hits, too—"Canadian Sunset," "Blue Tango," "Blue Violins," "I'll See You In My Dreams," and "Count Every Star."

Winterhalter made his professional debut at the age of 16 as an orchestra musician, at the modest wage of \$6 per arrangement. Since then his outstanding—and more highly paid—arrangements have been seen in the work of Will Bradley, Count Basie, Vaughn Monroe, Jimmy and Tommy Dorsey, Claud Thornhill, Billy Eckstine and the Ames Brothers, and others.



wears a Mortarboard

IN THE wake of the highly enthusiastic response from educators, students and the general public, the NBC Educational Television Project is being continued in 1958, again in cooperation with the Educational Television and Radio Center at Ann Arbor, Michigan.

"The response that we have had," says Edward Stanley, NBC Director of Public Affairs, who is in overall charge of the Project, "leaves no doubt in our minds that there is a great need for such programming and that television will make as great a contribution to education as printing has made."

It is the conviction of Robert W. Sarnoff, President of NBC, that every citizen has a stake in the success of the country's educational television stations. "Those of us who live in television, and who seek its full development in every area of society," he said, "have a particular sympathy for the difficult problems of financing and programming which these educational stations face."

From this conviction grew the NBC Educational Television Project, launched March 11, 1957, bringing into being the first live programming ever to be produced expressly for educational TV stations on a nationwide basis.

During 1957, NBC and the Center, working together, furnished 115 live educational TV programs over the NBC network lines without cost to the educational stations, which now number thirty. The programs included series on government, Greek art and mythology, world geography, higher mathematics, the International Geophysical Year, world resource use, opera history and American literature.

The live network shows have directed public attention to the educational television stations. Viewer interest has been attracted by the challenge and the variety of the educational television station programming. Affirmative response has come, unexpectedly and unsolicited, from commercial stations for which the service had not even been intended.



Dr. Joseph Kaplan, Chairman of U. S. Committee for IGY, appeared on NBC's fall educational TV series.



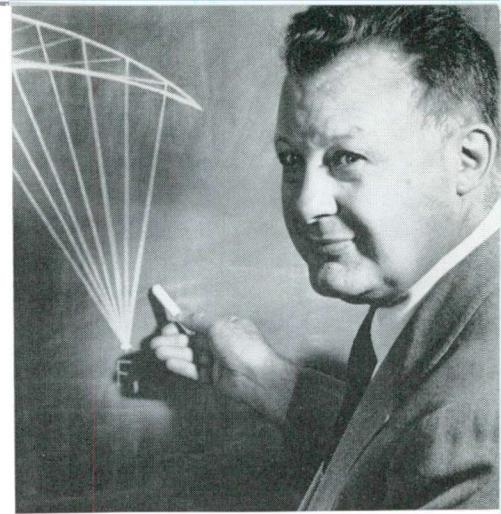
Alexander Scourby and Edith Hamilton explored the Greek myths in New York's Metropolitan Museum.



Dr. Paul Henry Lang delivered lectures on music.



NBC's Frank Blair presided over programs on the aims of the IGY.



Clifton Fadiman conducted lectures on mathematics.

Meets Enthusiastic Response

Teachers, both high school and college, have found in the Project something of value. Indeed, all of the Project's series have been required viewing by teachers in many of the nation's schools. Students have voluntarily viewed the programs, and many have written in saying that the material covered has amplified or supplemented their special studies.

Men and women long out of school have found a wonderful opportunity to refresh their interests, to learn new things, and to participate with their own youngsters in the process of learning. For this was adult education under the guidance of some of the best teachers, scholars and thinkers of the country, with visual demonstrations which only television can offer, produced with commercial network skills.

New this Spring are 13-week program series devoted to American jazz, American foreign policy, and medical and scientific research. Gilbert Seldes, writer and commentator on the popular arts, is weekly host on "The Subject Is Jazz," the aim of which is to analyze the music by which the United States has, in his words, made its "first artistic conquest of the world," and to present the facts about its past, present and probable future.

There is a jazz-playing combination featured on each session, and most of the shows have as guest a noted musician or jazz authority. Duke Ellington, Benny Goodman and Wilbur de Paris are among the noted jazz musicians who are taking part in "The Subject is Jazz."

The new American foreign policy program series, "Briefing Session," has Erwin D. Canham, Merrill Mueller and Dr. Robert Strausz-Hupe as the weekly on-camera team. Canham, editor of the *Christian Science Monitor*, is host; Mueller, NBC News correspondent, is facts communicator, and Dr. Strausz-Hupe, chairman of the American Political Science Research Association, University of Pennsylvania, is political analyst.

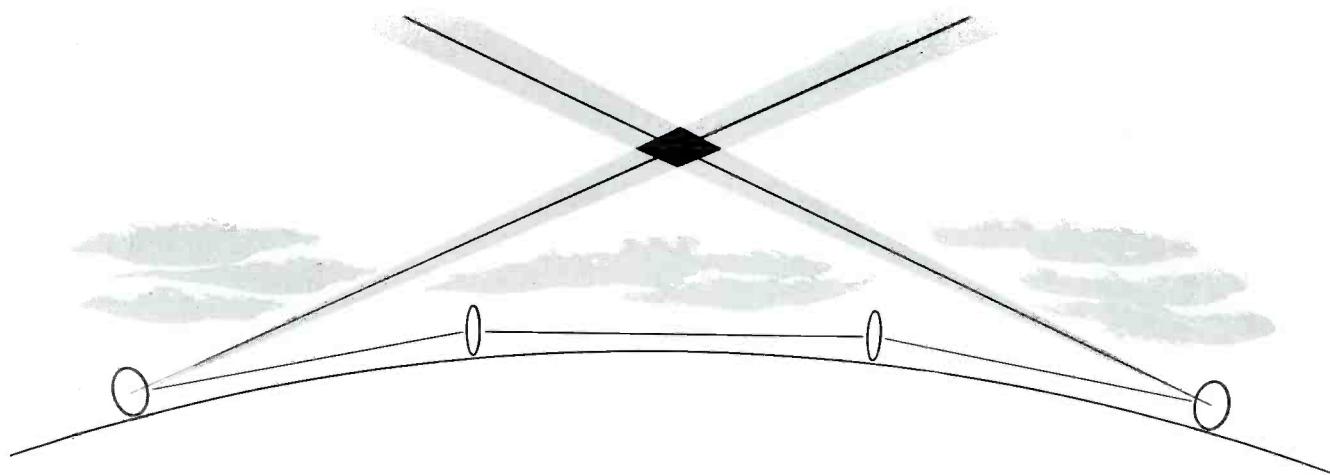
With them each week are representatives of the present Administration responsible for national policies and outside experts who present divergent points of view. The program aims to explore major world issues confronting United States foreign policy, to present facts pertaining to the issue in a manner which will allow the viewer to weigh and evaluate for himself the various viewpoints involved, and to examine the nature of this country's interest and policy in regard to the issue.

Encouraging Scientific Careers

The third new series, "Decision for Research," has as its sole mission to step up the number of promising young people who turn to medical and scientific research as a career. The program is being presented in collaboration with the American Heart Association. On camera each week are a medical specialist, one or more student researchers, and a regular host.

All three of the new series are being broadcast over a thirteen-week period. "Decision for Research," which started March 24, is on the air from 6:00 to 6:30 p.m. EST, on Mondays; "Briefing Session," which started on March 25, is broadcast from 10:30 to 11:00 p.m., EST, on Tuesdays; "The Subject is Jazz," on the air since March 26, from 6:00 to 6:30 p.m., EST, on Wednesdays. Many NBC affiliated stations are carrying, or soon will carry, some or all of the program series on a delayed basis by kinescope.

When Edward Stanley recently accepted, on behalf of Robert Sarnoff and NBC, a Citation of Merit from the Alabama Educational Television Commission for this pioneering experiment in educational television, he said: "If we are to meet the great crisis in education, and the imperative necessity for an informed public which can make sound judgments for our destiny, then we must not neglect the magnificent opportunity for education which television offers us."



Radio's "Scatter" Signals

by Edmund A. Laport

Director, RCA Communications Engineering

THE history of radio transmission is spiced every few years by some new technique of propagating radio waves from one point to another. Each such advance extends the utility and capability of radio to new applications, and broadens the technological frontiers. A relatively new technique for radio transmission is called "tropospheric forward scatter." The troposphere is the name given the airspace surrounding the earth, and reaches a height of 40-50,000 feet.

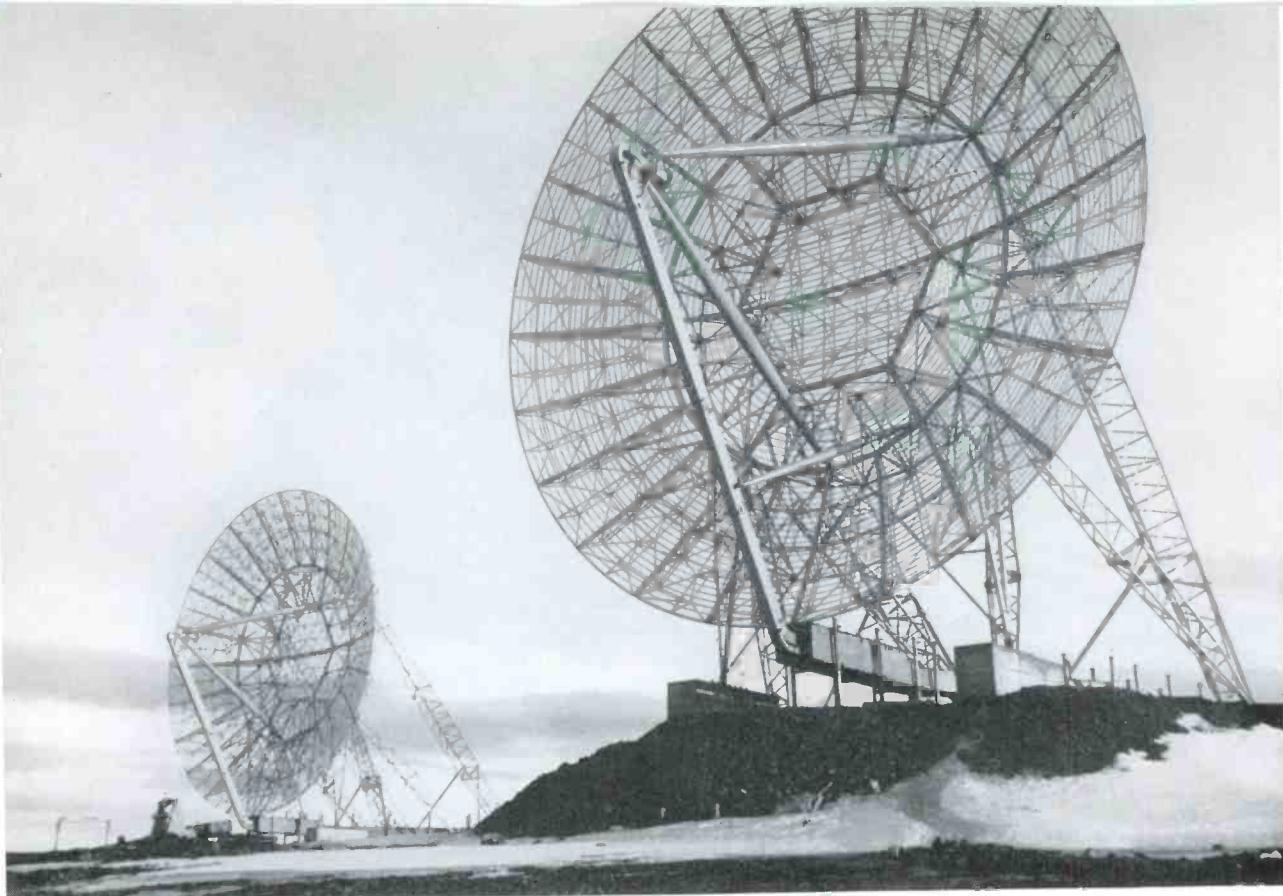
Scatter Propagation permits reliable communication

over hundreds of miles at frequencies (wavelengths) that were formerly limited to essentially line-of-sight distances. Tropospheric scatter propagation is particularly adaptable to frequencies above about 100 megacycles per second, and includes the so-called "microwave" frequencies. Its importance is evident when it is realized that station separations of 100 to 500 miles can be used instead of the more usual twenty-five to thirty-five miles typical of the familiar radio-optical transmission techniques.



Tropospheric scatter antennas mounted on the side of a new Texas Tower radar installation in the Arctic.

An RCA Laboratories experimental tropospheric scatter antenna at Riverhead, L.I., receiving station.



Sixty-foot antennas, showing dual horn and wave guide, were erected in the Arctic by RCA Service Company.

In remote, uninhabited, and often inaccessible areas of the world, high capacity communication systems can now be built that formerly would have been impracticable. It is for this reason that tropospheric scatter systems were first applied to the Arctic regions of North America.

World-wide radio transmission is as old as radio itself, but such transmissions were basically of small communication capacity — one telephone or one broadcast program, or a few telegraph channels for each system. On special international circuits, certain techniques permitted four simultaneous telephone conversations. The new long-distance tropospheric scatter method allows dozens of telephone channels and even television to be transmitted.

Large Antennas Necessary

The scattering effect takes place in the atmosphere due to localized turbulence and variations in moisture distribution. There is some wave scattering from these atmospheric variations, but the effects are small. Nevertheless, if adequate power is transmitted in narrow beams, these scattered waves are detectable at locations far beyond the horizon and can be received with large antennas and abnormally sensitive receivers.

The principles of scatter propagation have been known for several years, but the equipment necessary to produce sufficient power economically for transmission at these frequencies has only recently been developed. Power sources, as well as receivers, depended on the evolution of electron tubes, to which RCA is constantly making outstanding contributions.

RCA Laboratories engineers were among the first to conduct research into tropospheric scatter propagation to provide information on its reliability, and to determine quantitatively the power, antenna and capacity requirements for engineering applications. A beam circuit between Montreal and Riverhead, N. Y. — 290 miles — was measured for more than one year as part of RCA's experimental research. The Corporation conducted a thorough tropospheric scatter research program for the U. S. Signal Corps, part of which included the installation of a permanent system. Important theoretical work was done on this project.

RCA Defense Electronic Products and RCA Service Co. divisions have been installing several tropospheric scatter communication systems for the U. S. Air Force in the high- and sub-Arctic as part of the Continental defense system.



A group of lepers at Hong Kong's Isle of Happy Healing staged a Chinese opera for NBC-TV crew filming report on U. S. doctors abroad.

Dedicated

NBC-TV records fight against disease
in remote areas of the World

IT WAS around the world in 79 adventure-packed days for David Lowe as producer and director of "MD International," the "March of Medicine" report on American doctors who serve in the far corners of the Globe.

His achievement — which ranks as one of television's most difficult technical feats to date — was presented on NBC-TV Thursday, January 23, in color and in black-and-white.

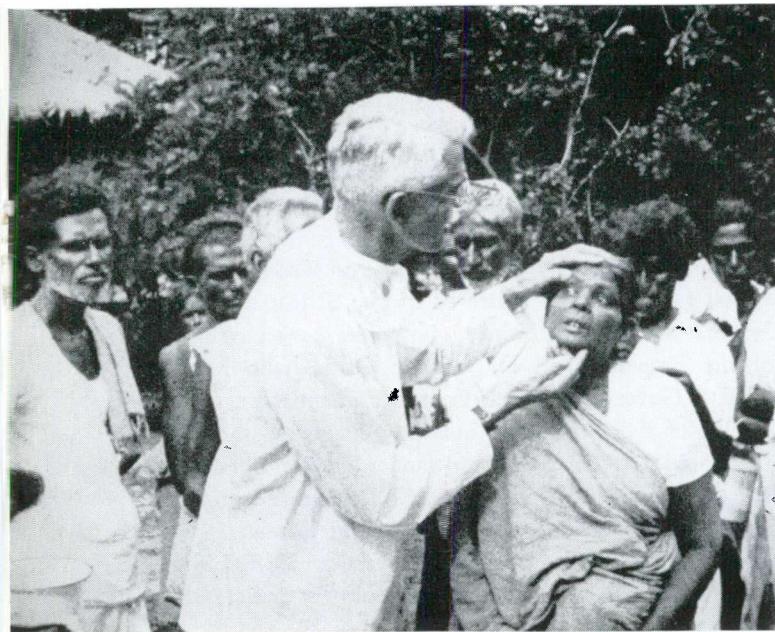
"The film," says Lowe, "may herald a new day in TV. I believe we have proved that the TV camera can go anywhere in the world to tell its stories without fear of impassable technical difficulties. We have shown it can be done at a cost far less than that of a Hollywood movie. There can be no boundaries to what TV can do to bring the world to the American living room."

The script for the TV film, which has received press and medical acclaim, was written by Lou Hazam, of

Silver Spring, Md., who describes the experience as "the toughest and most challenging" assignment in his twelve years as a television writer.

To get the story of Americans serving abroad not only as men (and women) of medicine but as unofficial U. S. ambassadors, Lowe faced more problems than he had met in his previous 20 years in show-business and all his 1,500 earlier TV programs put together.

On their 34,000-mile expedition, Lowe, Hazam and the five men who made up their crew risked their lives a half-dozen times to get remarkable footage in Korea, Hong Kong, Sarawak, Burma, Nepal, Lebanon, Ethiopia and India. They worked under greater physical handicaps perhaps than any other crew in TV's history. Exposed on their journey to many contagious diseases, Lowe and his men came down with amoebic dysentery, malaria and Asian flu.



Dr. Victor Rambo often performs 100 cataract operations a day at his "Eye-Camp" in Vellore, India. He travels from village to village in a trailer.

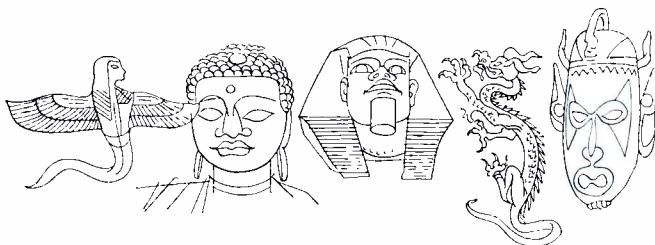


Clinic of Maryknoll Sisters' in Pusan, Korea, has what has been called world's longest charity line. NBC-TV crew spent 79 days putting "MD International" on film.

Doctors

They were almost drowned when the Rejang River in Borneo flooded; almost roasted alive when the heat in India regularly topped 100 degrees. They traveled by turbo-jet airliner, Tibetan pony, walla walla boat, donkey bus, car, horse, sedan chair — and walked for three days over mountain trails. With and without interpreters, they worked in 13 languages.

As Executive Producer of the NBC Educational Television Project, Lowe is well known as producer and director in TV and in the legitimate theatre. He came to TV in 1950, joining Dumont Television as producer and director. In 1953 he was named head of news and public affairs there, and in 1955 head of programming. He left Dumont in 1955 to produce, direct and write "Coke Time Starring Eddie Fisher," and the following year produced, directed and wrote "Chevrolet on Broadway," starring Snooky Lanson, both for NBC-TV. On Broadway he produced "The Enchanted," by Jean Giraudoux, and other plays.

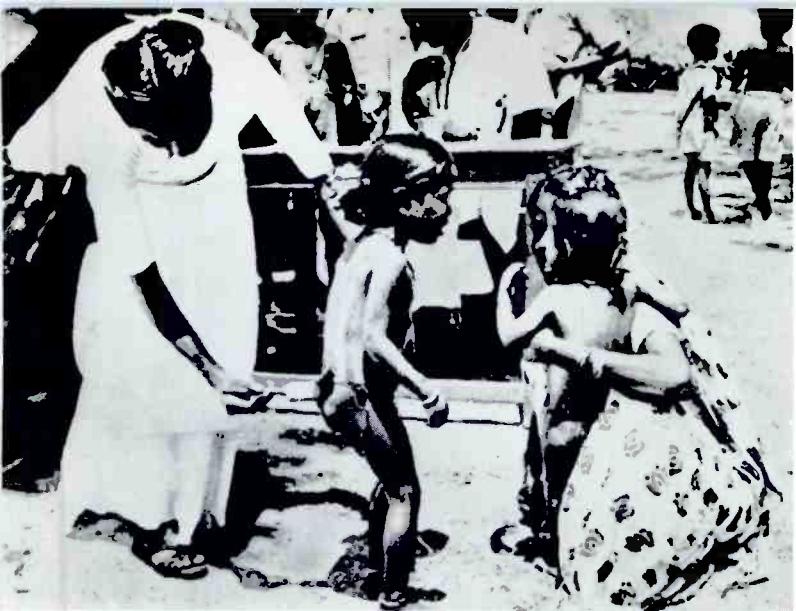


Isle of Happy Healing

"MD International" opened with a visit to the Maryknoll Sisters of St. Dominic, in Pusan, Korea, where their clinic caters to what has been called the world's longest charity line. Lowe traveled to Hong Kong, in the shadow of Red China, where Dr. Olaf Skinsnes, medical missionary of the Evangelical Lutheran Church, cares for lepers on the Isle of Happy Healing.

He and his crew went to Sarawak, in Northwest Borneo, where Dr. Harold Brewster, a Methodist medical missionary, was shown living with and treating the Ibans, a tribe of one-time head-hunters in the interior. In Rangoon, Burma, he filmed Dr. Phillips Greene at Rangoon General Hospital.

In Nepal, remote kingdom that lies between India and Tibet high in the Himalayas, roof of the world, he recorded Dr. Carl Friedricks of Reading, Pa., practicing general medicine in an almost inaccessible village. Dr. Friedricks is perhaps the U. S. physician practicing



Nurse at Christian Medical College, Vellore, India, giving a child treatment for scabies.



The Maryknoll Sisters' clinic at Pusan treats up to a thousand destitute patients every day.



farthest from home. Also in Nepal, Loew covered the activities of Dr. Bethel Fleming, formerly of Chicago, who has set up a child-and-maternal care center in an abandoned cholera hospital in Katmandu, the capital.

"MD International" also told the story of the Medical School of the American University at Beirut, Lebanon, where the country's Foreign Minister, Dr. Charles Malik, served as on-camera guide and narrator.

Lowe introduced Ethiopia's Emperor Haile Selassie as well as Dr. Brooks Rider of the U. S. International Cooperation Administration, who trains health officers for the Emperor, and Dr. Arthur Curtis, who heads the U. S. Government Point Four medical mission.

One of the film's most inspiring sequences showed 86-year-old Dr. Ida Scudder, founder of the Christian Medical College at Vellore, India. Its climax showed scenes of the "Eye Camps" of Dr. Victor Rambo as he carries eye surgery into the field by trailer. Dr. Rambo travels from village to village performing sometimes as many as 100 cataract operations a day.

"MD International" was produced for Smith, Kline and French Laboratories. It was sponsored by the Philadelphia pharmaceutical firm in cooperation with the American Medical Association. Alexander Scourby and Norman Rose were the film's narrators. George Kleinsinger composed and conducted the original orchestral score.

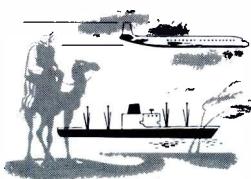
Farthest from home of any U. S. doctor is Dr. Carl Friedricks of Reading, Pa., below, left, who practices in Nepal.

Dr. Ida B. Scudder of Christian Medical College, Vellore, India, accompanies mobile clinic on its rounds of villages.





ANNUAL REPORT: HIGHLIGHTS



DOLLAR sales of RCA products and services — topping the billion mark for the third consecutive year — totaled \$1,176,277,000 in 1957, up 4.3 per cent from 1956, it was stated in the Annual Report issued on February 27. Net profit, before Federal income taxes was \$77,049,000, and after taxes \$38,549,000.

Earnings per share of Common Stock were \$2.55 in 1957, compared with \$2.65 in 1956.

Dividends totaling \$23,909,000 were declared by RCA in 1957. This included \$3.50 per share on the Preferred Stock. Dividends on the Common Stock were \$1.50 per share, the same as in 1956.

The Annual Report placed the number of RCA employees at 78,000, including 7,200 in foreign subsidiaries. Wages and salaries paid to employees in the United States in 1957 amounted to \$417,350,000, or 35 cents out of each sales dollar.

Numerous contributions were made to the nation's defenses in 1957 by RCA, and its years of pioneering in electronics placed it "on the new frontier of *missionics* as a key to man's conquest of outer space."

The Company now is prime contractor in constructing the multi-million-dollar Ballistic Missile Early Warn-

ing System (BMEWS) for the Air Force. RCA's work for the U. S. Government in 1957 — amounting to nearly \$267 million — was 11 per cent higher than in the previous year. The current backlog of orders is about \$250,000,000.

RCA continued its leadership in the home entertainment market and it recorded the sale of its nine-millionth RCA Victor receiver.

The National Broadcasting Company, a service of RCA, made progress in five major areas in 1957: television network billings, TV programming, and public service broadcasting. NBC's leadership in color television advanced on all fronts.

RCA formed an Industrial Electronic Products organization in 1957. Major activities of this organization included closed-circuit television, electronic data-processing, and video tape recorders.

RCA Laboratories made major contributions in fundamental and applied research to many vital areas of communications and industry.

Other advances were achieved in international communications services, activities of the RCA Service Company division, development of electron tubes and expansion of transistor production.

Know Your Schools

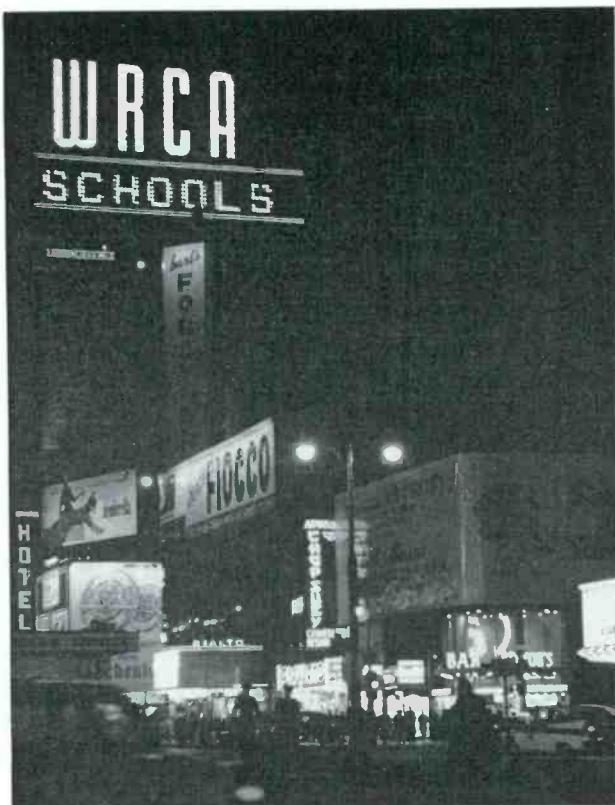
THE American public's reappraisal of its education system during the current school year was given added impetus in eight cities in which the National Broadcasting Company owns and operates radio and television stations.

The NBC Owned Stations organized a six-weeks community service project called "Know Your Schools." It was planned with the cooperation of the United States Department of Health, Education and Welfare and executed on a local level with the assistance of school boards, parent-teacher associations and other civic-minded groups.

In a report to members of the House of Representatives, the Senate, the Federal Communications Commission, and prominent educators, Thomas B. McFadden,

Vice President in charge of NBC Owned Stations and Spot Sales, stated that 200 hours of program time and 3,000 public service announcements had been devoted to the project in the eight cities. This broadcast time, if sold, would be worth approximately \$1,000,000. Mr. McFadden estimated that "Know Your Schools" had made a total of 800,000,000 audience impressions.

NBC stations participating in the project included WRCV and WRCV-TV in Philadelphia; WRCA and WRCA-TV, New York; WRC and WRC-TV, Washington; WKNB and WNBC, New Britain-Hartford; WBUF, Buffalo; WMAQ and WNBB, Chicago; KNBC, San Francisco; and KRCA, Hollywood. Station WAMP, Pittsburgh, was acquired by NBC after the project was underway.



NBC's community service project, "Know Your Schools," got 12 million impressions from WRCA sign on Broadway.



NBC Special Projects Manager Frank Hall explains program to recent school convention in Atlantic City.

Eight Approaches

"Know Your Schools" was an application of the "Impact Public Service" technique which is regularly employed by the NBC Owned Stations. In this instance, it was carried out simultaneously by the entire group of stations in order to demonstrate eight different localized approaches to one subject—greater public knowledge of the education system.

The Department of Health, Education and Welfare assisted in the project initially by submitting a score or more subjects on which it would welcome the concentrated attention of broadcasting media. The NBC Owned Stations chose education as being the subject on which the General Managers and their staffs thought the best job could be done. Each station developed its own special programs, features integrated into existing programs, public service announcement campaigns, and promotions attuned to "Know Your Schools." The project was formally launched the same weekend the Soviet Union sent up Sputnik I.

Because there were so many problems to be considered in education, programs of the "Know Your Schools" project varied from one city to another. The stations utilized special film reports, philosophic discussions, demonstrations, man-on-the-street interviews, dramatic vignettes, documentaries—in short, all the techniques of broadcasting.

WRCV-TV, Philadelphia, showed the need for increased numbers of science students in a half-hour series called "Dimension." The six-weeks program was presented in color, as were other special programs. During one typical broadcast, Dr. I. M. Leavitt, Director of the Fels Planetarium of the Benjamin Franklin Institute in Philadelphia discussed satellites with high school science students. On "Progress," students interviewed Pauline Frederick, NBC's United Nations correspondent, and James Wadsworth, then U. S. Deputy Ambassador to the U. N. "Progress" also offered a simulated classroom scene of 11th grade pupils learning correct speech. Dr. Allen H. Wetter, Superintendent of Philadelphia Schools, played himself in showing a typical day in the life of a school administrator.

Emotional Problems

WRCV Radio utilized its program, "The Psychiatrist," for a series dealing with the emotional problems of children and their effect on school work. On another series, "Why," students discussed such problems as "How Can Our Schools be Improved?" and "Summer Work for Science Students." Promotions and other activities



Lloyd E. Yoder, left, NBC Vice President and General Manager of WRCV, is given award by president and president-elect of New Jersey Education Assn.

on both radio and television included a "Favorite Teacher" contest; a campaign to urge attendance for an open house at Holy Family College; presentation of NBC Public Service Awards to school bus drivers; and a model PTA meeting broadcast on WRCV-TV.

WRCA-TV, New York, presented "We Deal In Futures," with Charles Van Doren as educational advisor and moderator. Films made in local schools depicted a number of subjects of community interest, such as a study of school administration, a child's first day at school, etc. "Hi, Mom" invited educators to discuss preparing for school and "Sunday's Schedule" saluted William Jansen, New York Superintendent of Schools, who was presented with an NBC Public Service Award. "Pulse" held man-on-the-street interviews about schools and humorist Sam Levenson presented his "Ten Commandments to Combat Juvenile Delinquency." "This Is Your Business" on WRCA Radio considered problems ranging from racial minorities to recruiting qualified teachers. The WRCA spectacular sign at Times Square carried messages supporting "Know Your Schools."

Stations WNBC and WKNB, Hartford-New Britain, featured "Education Day" as part of a four-day public service festival which was sponsored by the stations with attendance of 60,000. Several special programs were planned, including "This Is Your World," conducted by Prof. Albert E. Burke, and "Understanding Our Schools," produced by Dr. Irving S. Starr, chairman of the education department of Hillyer College. An

actual elementary school class was shown in the studio to give viewers a realistic demonstration of how writing and penmanship are taught in the local public schools.

In Buffalo, Station WBUF integrated special school features in their educational programs. A new 30-minute program, "Bored With Education?", considered educational matters ranging from attitudes on progressive education to the teacher shortage. Civic organizations were provided with speakers on educational topics. A campaign to bring visitors to the schools during American Education Week resulted in attendance of 55,000—almost one visitor per student in the public school system.

University Participation

WRC and WRC-TV, Washington, concentrating on the problems of higher education, enlisted the cooperation of the area's six institutions of higher learning: American University, Catholic University of America, Georgetown University, George Washington University, Howard University and the University of Maryland. "Teen Talk" considered the problems faced by students who look forward to going to college and "The Other Two Billion" pointed out how a great university grows. The six universities combined their efforts in "The Twenty-Fifth Semester," which probed the problems which will face prospective students who will enter college in 1970. Patty Cavin utilized her popular program for the main effort on radio.

In Chicago, WNBQ and WMAQ considered a wide

range of problems, including new school construction and overcrowding in a new series, "The Critical Challenges of Education in Greater Chicago." The stations endeavored to assist in the prevention of juvenile delinquency by cooperating with the Community Mobilization for Youth project. Religion was related to education on WNBQ's "The Pulpit" program and more than 90 separate programs on both radio and TV were devoted to the project.

KRCA, Los Angeles, surveyed the area's educational problems in "Pathways to Knowledge." A series, "Our Greatest Resources," dealt with the influence of the small liberal arts colleges. The station originated a TV program from Pierce Junior College; carried a telecast of a youth band to raise funds to finance a trip for the band to Chicago, and had school authorities answer questions on operating a school.

KNBC, San Francisco, supported a campaign for the PTA which brought in 1,500 new members; conducted a contest on how to improve local schools; broadcast a series of visits to San Francisco classrooms; enabled twenty-eight students to "operate" the station for a day and supported UNESCO's plan to buy books for schools in underdeveloped countries. NBC Public Service Awards were presented to an outstanding teacher in Northern California and to the San Francisco District of the Congress of Parent and Teacher Groups. Among the subjects covered on such programs as "Operation Brotherhood" and "Listen Ladies" were: school facilities and equipment, teacher training, the citizen's responsibility in education, and the elementary school curriculum.

Thomas B. McFadden, Vice President of NBC Owned Stations, explains program to Joseph O'Connor, Department of Health, Education and Welfare; Robert Sarnoff, President of NBC, and William Davidson of WRCA.

KNBC engineer Don Hall explains workings of a recording studio to a group of engineering students from San Francisco high schools. Twenty-eight of the students were permitted to take over operation of the station for a day.



LISTENING POST

FOR SATELLITES

At 12:38 P.M., EST, on March 26, the U. S. satellite Explorer III, riding the nose cone of a Jupiter-C rocket, was blasted from its Cape Canaveral launching pad. Five minutes later, as it arched high over the West Indies racing toward outer space, the Explorer's radio voice was received and recorded by RCA Communications, Inc.

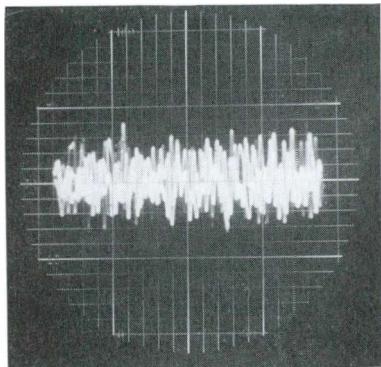
The sounds of the first transmissions from the metal-moon were then immediately piped to radio and TV networks across the country, bringing to the nation additional proof that the United States was an active contender in the international satellite contest.

These signals, as well as the first signals from America's Explorer I on January 31, were picked up at "RD," RCA's giant east coast receiving station at Riverhead, Long Island, the first station in the free world to pick up the sounds of the Russian sputniks. Signals from the Navy's Vanguard satellite on March 17 were also monitored by RCA.

Designed and constructed in 1921 to handle commercial radio telegraph communications from a few European countries, the facilities of RD have been expanded over the years to a point where the station now regularly receives thousands of radiograms each day from over fifty trans-Atlantic points.

To accomplish this job more than 700 antenna towers probe into the sky above Riverhead's 2,000-acre site. Miles of wire strung on 6,000 transmission-line poles feed the international signals from the antennas to eighty groups of sensitive diversity receivers. The radio-telegraph messages are then automatically relayed by micro-wave radio to RCA's central operating terminal in lower Manhattan where they are processed and quickly delivered by messenger, telephone, or private RCA teleprinter to the business organizations, government agencies, and private individuals for whom they are intended.

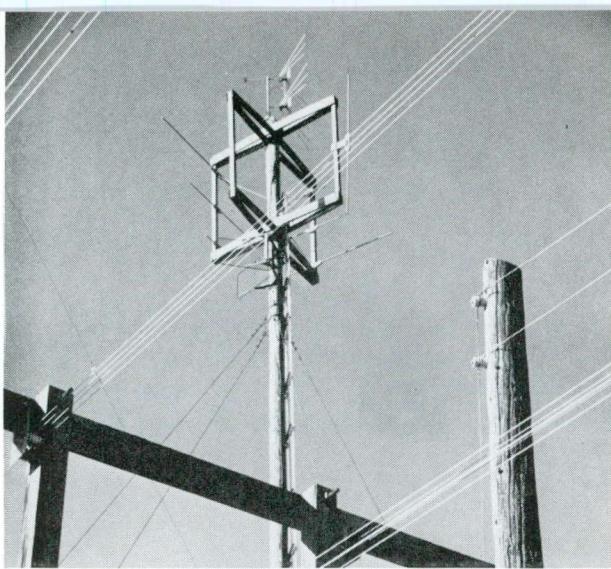
Although the engineers who designed the Riverhead station probably never envisioned its use as a listening post for signals from outer space, the advent of man-



Radio signals from Russian and American satellites were first recorded on oscilloscopes at RCA's Riverhead, L.I., receiving station.

Radio programs from Europe are piped into Riverhead's Program Control Board and from there are transmitted to the networks.





The first signals from the two Russian sputniks, as well as from America's Explorer I, were picked up at Riverhead.

made satellites has cast RD in this role. The success of the station in being first to pick up the signals of the three man-made moons launched since last October has turned it into a general Satellite Information Center.

News agencies, broadcasters, universities, scientific institutions and the general public continue to flood the station with calls and letters for data on the satellites' radio signals. And while answering such requests is in no way related to the normal operations of RD, each request is nevertheless cheerfully answered.

In addition to its well publicized satellite spotting activities, however, RCA Communications is also working closely with American scientists who are painstakingly plotting every inch of the orbits inscribed by the satellites as they spin around the earth. To help assemble this information, RCA has assisted the Smithsonian Astro-physical Laboratory in setting up a communications network that links its Cambridge, Massachusetts headquarters with U. S. optical tracking stations scattered strategically around the world.

At each of these stations a Baker-Nunn Schmidt tracking camera is operated by skilled personnel who, at regular intervals, photograph the satellites against a background of stars. Measurements are then made from the film plates to produce accurate position/time data which is immediately speeded by RCA's international radio circuits to the Smithsonian Computing Center for refinement of the orbit calculations.

From this information, science has much to learn, for the tiny satellites hurtling 200 to 2,000 miles above the earth can actually uncover more information about the innards of the earth than could ever be discovered by probing the deepest mine. From these orbit calculations above, data of inestimable value is being produced on the size, shape, waistline bulge and upper atmosphere of the globe.

David Sarnoff Outstanding Achievement Awards



WINNERS of the first David Sarnoff Outstanding Achievement Awards in Science and Engineering are Dr. Albert Rose of the technical staff of RCA Laboratories, and David K. Barton of the engineering staff of RCA Defense Electronic Products.

Dr. Rose was cited "for basic contributions to the understanding and utilization of photoelectronic phenomena." Mr. Barton was honored "for important contributions to precise tracking radars."

The two awards were established in September, 1956, to commemorate General Sarnoff's fiftieth anniversary in radio. They are to be presented annually to the outstanding scientist and the outstanding engineer of the corporation; each award consists of a gold medal and a citation.

NBC Radio: New Pattern of Success

A new philosophical and practical awareness of the values of network radio has succeeded to such an extent that "radio salesmen walk about Madison Avenue today like men reprieved." This is one of several headline-catching views of Robert W. Sarnoff, President of the National Broadcasting Company, expressed on March 31 in an open letter to America's radio and TV editors. A summary of Mr. Sarnoff's comments follows:

I can speak with some authority on the relationship of trouble to network radio. Since 1953, the NBC Radio Network has had a cumulative loss of about \$9 million. In one particularly grim year, our losses totalled more than \$3 million. Since radio's salad days of the late Forties, we have gone through countless organizational changes in the radio network, through severe cost-pruning exercises, through repeated crises meetings with affiliates, through endless ventures into new programming — always with the goal of finding an operational pattern that would permit radio network survival in the age of television.

To me personally, the current talk of crisis seems strangely out-dated. If it were three to five years ago, I could better relate it to our own experience. Then, many network affiliates were at the breakaway point. Most of our major sponsors had pulled out; radio salesmen couldn't get a foot in the doors of the bigger agencies; the network's annual dollar volume was melting away to nothing.

But today all this is changed, not only with NBC but with network radio as an entity and as a concept. There is a new philosophical awareness of its values,

which is reflected in a tangible intake of dollars. Radio salesmen walk about Madison Avenue today like men reprieved. They can discuss million dollar deals with key executives without apology for star gazing. Most of the advertising giants who underwrote the radio networks in their pre-television heyday are now back in, although not in the massive fashion of a decade ago.

True, the major radio networks are on record that they lost money last year. But the important consideration, at least as it relates to NBC, is that our loss was substantially less than that of the previous year. For the first time since 1953, the loss graph reversed direction, and the reversal continues at an accelerated pace into this year. We are now talking about a break-even point without rubbing a rabbit's foot when we do. I believe we will reach it, and soon.

Several things have happened in the last eighteen months to give me this confidence. In August of 1956, I put a new and youthful management team in the radio network headed by Joe Culligan, then thirty-eight years old, a salesman with a missionary belief in the power of salesmanship and with an inborn desire to sell ice-boxes to Eskimos. The problem facing him, to sell some of the then current program product against the power and glamour of television, was even more challenging than iceboxes. As a first step, Joe and his associates revamped the product — top, middle, and bottom.

They established a strong news-on-the-hour operation, and a unique hot-line service to handle news flashes; they introduced a morning program lineup of broad commercial appeal; they created a Stardust plan at night which lured the greatest stars of television back into radio as a profitable sideline. They freshened up Monitor with new program inserts. . . . Above all, they conceded the living room to television and fashioned an image of radio as a companion in the kitchen, on the beach, in the car, at summer camp.

I am consciously a little boastful in recounting the progress of the new radio management. It has, without exaggeration, snatched NBC Radio back from the Potter's Field of broadcasters. It has also given new vitality to the concept of network radio as a national communications instrument and as an effective vehicle for national advertising.

Robert W. Sarnoff tunes in RCA Victor transistor radio at his desk in NBC executive headquarters, Radio City.





Nowadays, Moran tugs all over the world keep in constant contact with home office via radio. These dispatchers are in radio control room overlooking New York harbor.



Before the advent of radio tug captains were, wherever possible, given instructions by megaphone — a system that demanded iron lungs and king-size horns.



MICROWAVES FOR TUGBOATS

AT 17 Battery Place, in lower New York, twenty-five floors above the North River, is one of the most strategically located operations offices in the maritime industry—the radio communications and control room of the Moran Towing and Transportation Company, nerve center of the entire organization.

In this room, which affords an unimpaired view of the bustling harbor, Moran's 11-man dispatching team creates a beehive of activity twenty-four hours a day every day of the year. Here, surrounded by many types of communications equipment including land telephones, ship-to-shore radiotelephones, VHF radio, Western Union ticker, telefax machine, walkie-talkie radios, light-signal system, whistles and telescopes, sit Chief Dispatcher Nick Bodlovic and his associates. All former tug crew members, these men are responsible for the daily movements of Moran tugs in and around the world's busiest harbor.

At peak hours, the phones ring incessantly and three men are kept busy taking orders regarding upcoming jobs and handling the VHF radio. Another dispatcher devotes his time to scheduling the next day's work on a chart which lists all tugs assigned to harbor service. Conversations with tug captains are terse—"17 to Jr." and the reply, "Jr. to 17," can be translated "Moran Company office to the tug *Eugene F. Moran, Jr.*" and vice versa. "We docked those barges sooner than we thought and can get underway now—what's next?" And from 30 miles away the immediate reply is "Three dumpers on the next high tide."

Suddenly through the din of phones and ticker tape the voice of a tug captain booms in. He is talking to another Moran captain. "Diane to Carol, come in Carol. Just left Pier 10. Meet you at Erie Basin for that Norwegian freighter." An so it goes, day and night.

All Radio-Equipped

Moran's fabulous fleet of 52 diesel, diesel-electric, and steam powered tugs and towboats is completely equipped for ship-to-ship and ship-to-shore radio communications. Many of the boats not only carry the 30 watt VHF radio used in and around the New York Harbor (which operates in the 150 MC band), but also multi-channel 2-megacycle RCA radiotelephone equipment, and some also are RCA-equipped for radiotelegraph communications.

The VHF equipment most frequently used handles ship-to-shore communications in and around New York Harbor.

The radiotelephones are used principally by Moran tugs engaged in coastwise towing on the Atlantic Coast and the Gulf of Mexico. Tows of dredges, drydocks—virtually any object capable of staying afloat—are common between Boston, Tampa and New Orleans. And all along the routes, Moran tugs are in contact with their home office, the Coast Guard and other ships via radiotelephone, operating through a land-based phone service.

Radiotelephone equipment also is used on Moran boats operating on the Great Lakes and some of the nation's important waterways such as the New York State Barge Canal System, the Penobscot River and Bay, the Chesapeake and Delaware, the Mississippi, and the Ohio.

Radiotelegraph equipment is necessary only on Moran's ocean-going tugs which carry wireless operators and are most commonly assigned to international towing. These amazing tugs, carrying a crew of only sixteen, are constantly towing ships, dredges, cranes, derricks, etc., to ports all over South America, Europe, Africa, and the Pacific.

Radio signals beamed from six strategically located land-based transmitters saturate the principal areas in

which Moran tugs operate. The RCA transmitter used by dispatchers at 17 Battery Place is located on Grymes Hill, Staten Island. Remote control to Moran headquarters is accomplished by wirelines. Normal range of this transmitter is between 15 and 25 miles, although transmissions have been received up to 100 miles distant.

Standby Transmitter

Because a radio failure of any duration would seriously disrupt harbor dispatching, Moran uses a second RCA transmitter at Battery Place as standby equipment only. At Port Richmond, where Moran's shipyard facility is located, a third RCA transmitter is used to communicate with boats operating in local waters, and at Tottenville, a fourth transmitter serves boats in the Amboys and Raritan River area. Transmitter Number 5 operates from one of the railroad drawbridges which cross the Raritan and is used largely to coordinate action on the bridge and traffic beneath it.

At Portland, Maine, where a Moran subsidiary company functions, an RCA transmitter is used for dispatching and communication with boats towing in the New England region.

In addition to radiotelephones, many Moran tugs are equipped with RCA Radiomarine radar, loran, depth recorders, direction finders and other devices which save time, make navigation safer and more accurate, and assure Moran clients of completely reliable service.

In speaking of these instruments, Joseph Moran, Moran Executive Vice-President says, "We are fully aware of the practicability of radar and other electronic devices for our harbor, coastwise, and deep-sea operations. Such modern navigational gear is of inestimable value to us under difficult and hazardous operating conditions."

The inestimable value of radar, to which Mr. Moran refers, was demonstrated recently when two of three dumpers under tow in rough seas on a foggy day broke away from the tug and were drifting into the shipping lanes. Moran's dispatchers back at "No. 17," alerted by radiotelephone, immediately radioed another tug to the rescue. Through the use of radar both dumpers were located—one more than seven miles away—and work was resumed. Electronic devices had not only helped to avert a possible collision, but had enabled Moran once again to "deliver the goods" with a minimum of delay.



Moran tugboats now operate in all principal inland waterways. Entire Moran fleet, 52 boats, are equipped with RCA ship-to-ship and ship-to-shore radio.

Color Moves Ahead

*Set sales continue to rise because
of customer satisfaction . . .*

COLOR TV set sales continue their steady increase this year following a record-breaking Christmas season.

"The first two months of this year are about the best we have ever enjoyed, comparable to the final weeks in December and 50 per cent higher, on a national average, than the same time last year," Martin F. Bennett, Vice President, Merchandise, said in a speech before the Indianapolis Advertising Club.

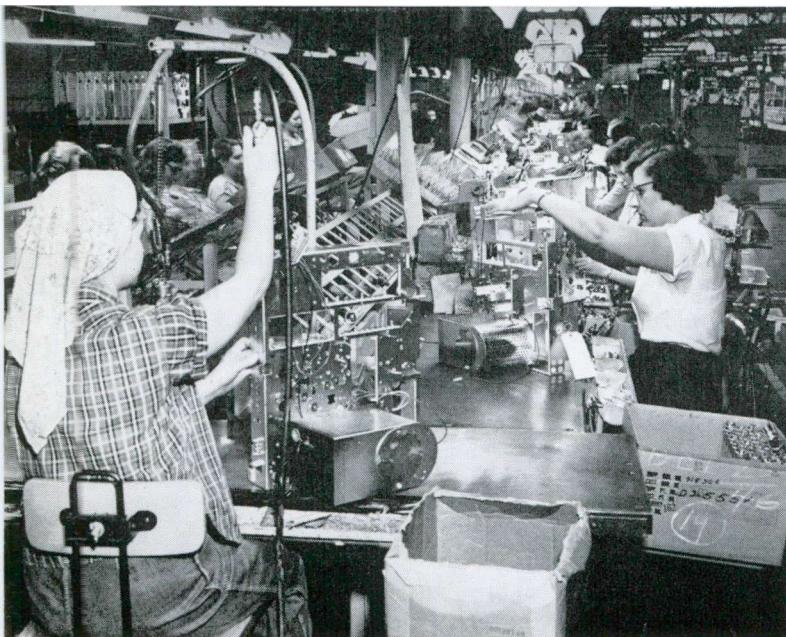
That color TV owners are completely satisfied with their sets is best shown by the fact that two out of three people who buy color TV today do so on the basis of recommendations by friends who already own sets.

A good share of the credit for this unusual degree of customer satisfaction must go to the thousands of

RCA workers who play a part in the manufacturing of RCA Victor "Living Color" television receivers and their component parts. The skill and effort of these craftsmen—both male and female—has helped make possible the high quality of today's color sets.

There are several major steps in assembling color TV receivers at RCA's modern plant in Bloomington, Indiana. Here the various components from other RCA locations and outside suppliers are put together into an RCA Victor Color TV set.

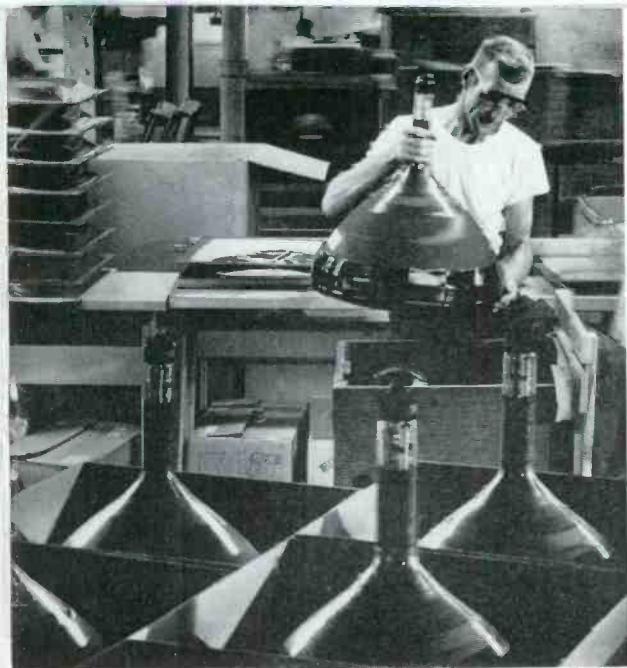
It takes approximately 12 hours from the time a bare chassis base receives its first components on the assembly line to the time the finished set—completely packed for shipment—comes off the assembly line.



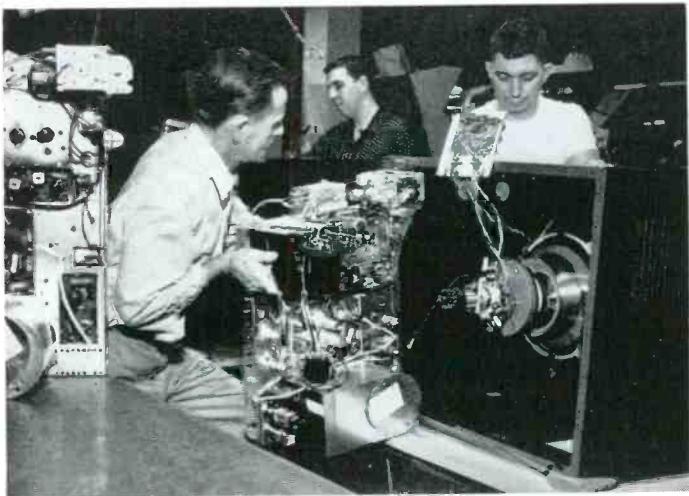
1. Color TV chassis, which will contain some 1,800 parts, at start of assembly line in RCA's Bloomington plant.



2. Inspectors give completed chassis thorough check before it is moved to final assembly area.



3. RCA tri-color picture tube, heart of a color receiver, is inserted along with kinescope mask—on bench at left.



4. Inserting chassis and picture tube; chassis is mounted vertically to save space and permit use of compact cabinet.



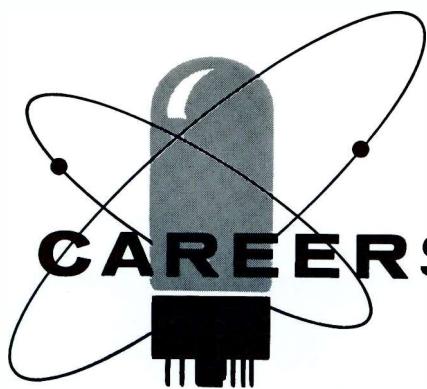
5. Series of mirrors in rear permit inspectors to make adjustments quickly and easily from the rear of the set.



6. Before protective rear cover is installed cabinets are given final check, then sent to packing area.



7. Final step is packaging completed set. Empty carton has followed cabinet along assembly line.



CAREERS in ELECTRONICS

Courses and facilities of RCA Institutes expand to meet industries increasing demands for scientists and technicians

AT A time when science and technical education signify front page news, increasing contributions are being made to America's pool of trained electronic and radio technicians by RCA Institutes, Inc., the oldest radio-training school in the country.

The greatly increased demands of government and industry for trained electronic specialists already has touched off a program of expansion in facilities and curriculum which is making a radical change in the Institutes' appearance and function.

The bulging resident enrollment—2,900 now compared with 1,300 in 1946—necessitated the acquisition last fall of a third entire floor at the headquarters building at 350 West Fourth Street, New York City.

Still further plant enlargement is planned for next fall, when the Institutes will take over the entire ground floor of the modern building. Acquisition of this fourth floor will make possible the consolidation of all Institutes activities under one roof.

The space already acquired has permitted the construction of three new classrooms and two new laboratories, both equipped with more than \$20,000 worth of the latest electronic apparatus.

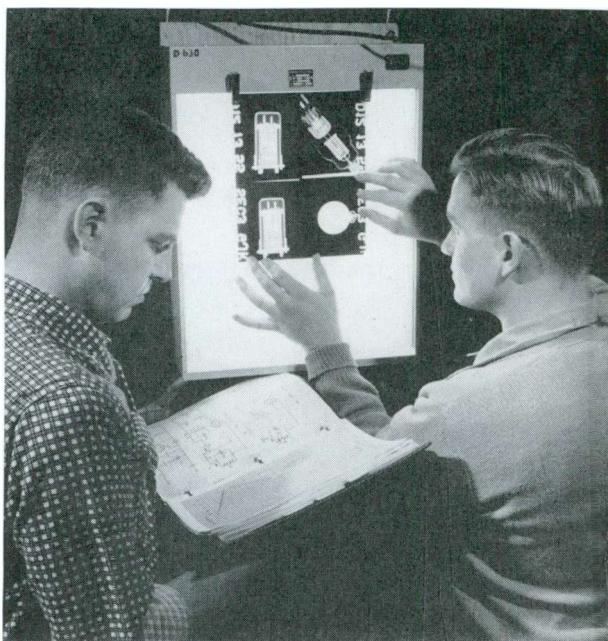
Students in the Advanced Electronics Course began using the new industrial electronics laboratory last September, while a new radio frequency laboratory was ready for the start of the spring term in February.

New Courses

More pronounced perhaps than the growth of the physical plant are the changes and expansion taking place in the Institutes' curriculum and in the basic principles guiding the school and its officers. Following the pattern set by industry, the Institutes broke away from a strictly communications-oriented outlook to a multi-

purpose one stressing industrial applications of electronics.

A technical institute offering instruction at college level in advanced electronics technology, and a vocational school providing courses in television and general electronics, television servicing and marine communications, RCA Institutes also has a thriving home study course which now has 11,000 active students. The Institutes offers Resident School training in computer systems and conducts special evening classes in color TV and transistors for engineers and technicians in the industry.



New industrial electronics laboratory at RCA Institutes provides \$20,000 worth of additional equipment, such as industrial X-ray shown here.

"While the demand for broadcast and servicing technicians is less than that of a few years back," explained George F. Maedel, President of the Institutes, "the number of technicians trained in industrial applications of electronics, such as computers, is growing and should continue to do so for the next 10 years or longer."

"Eventually," Mr. Maedel said, "we plan to offer courses in nucleo-power instrumentation, but naturally we will have to lag behind the development of this phase of the industry until the demand for trained technicians is sufficient to warrant such courses."



Devices such as electronic motor control give students experience with industrial equipment.

One of the most successful of the new courses is the Preparatory Mathematics, Physics and English, introduced last fall for the benefit of applicants who may lack some of the necessary qualifications to meet the Institutes' high entrance standards.

Officials at the Institutes say the course was made necessary by the low proficiency in physics, algebra and English grammar demonstrated by many students applying directly from high school and by those who had been out of school for several years.

In this three-month schedule, the student enrolled in the preparatory course receives the background instruction to qualify for admission into one of the regular courses.

Enrollment in the preparatory course has grown

from one class last September to three at the start of the new term in February.

Home Study Course

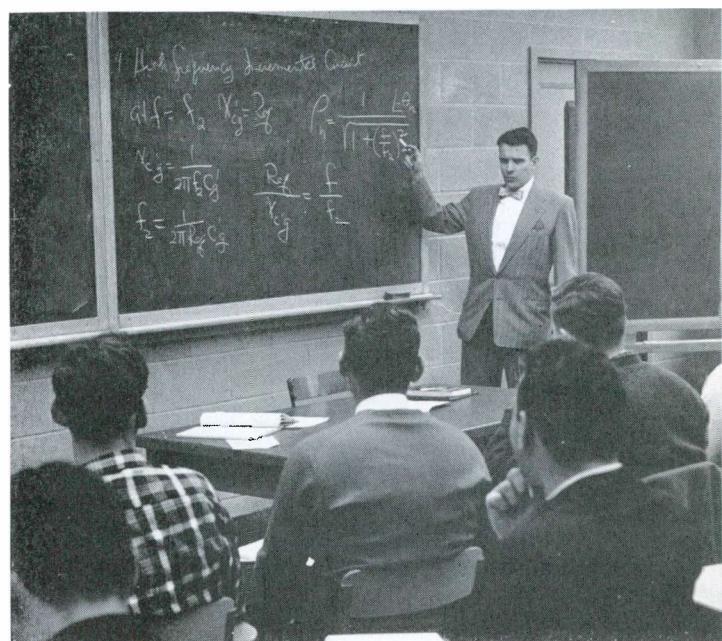
The growth of industrial applications of electronics also has made itself felt in the RCA Institutes Home Study Courses.

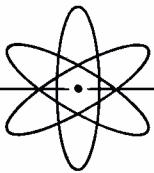
Enrollment in the Home Study department has more than tripled in the past three years, with eighty per cent of the students taking the General Electronics course which teaches the fundamentals of radio, television and electronics.

Officials of the Home Study department expect a large number of those currently enrolled in the General Electronics course to pursue a new Industrial Electronics course when it becomes available in the fall of 1959 rather than either the black-and-white television servicing or color television servicing courses now available.

Founded in 1909, the Institutes' Golden Anniversary will be celebrated next year. In this 50-year span the RCA Institutes has become one of the country's foremost schools in the area of technical education through careful attention to the needs and trends of the electronics industry, and by adherence to sound educational practice.

Students who take Advanced Electronics require intensive instruction in higher mathematics.





Briefly Told . . .

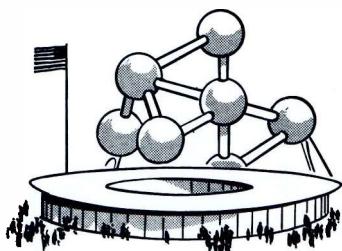
President's Program . . .

The President's program—a vigorous campaign for reducing paperwork costs — begins in April throughout RCA. Company-wide participation has been urged by John L. Burns in a directive to operating heads.

The objectives of the program:

- To limit creation of paperwork to essential business records.
- To eliminate purchase of additional conventional filing cabinets and microfilm equipment.
- To reduce retention of business records through schedules conforming with corporate requirements.
- To improve and simplify filing practices.
- To eliminate unnecessary internal mail.

Administration of the program is the responsibility of David P. Agnew, RCA Records Management Administrator. Professional guidance is being provided by Irving Zitmore, a consultant on the staff of Administrative Services.



Color TV at World's Fair . . .

RCA color television equipment is one of the features of the American Pavilion at the 1958 Brussels World's Fair. It is the first public demonstration in Europe of a compatible color television system. The American Commission is presenting daily color programs designed to portray life in the

U. S. A. to Fair visitors. The Pavilion's RCA-equipped TV studio is set up to originate both live and filmed programs for closed-circuit transmission.



Mortgage by Radio . . .

The Dime Savings Bank of Brooklyn has installed an RCA two-way radio communications system in its fleet of twenty-nine automobiles to speed up service to mortgage applicants.

With the new system, the home office can contact the field appraiser nearest the property in question and direct him to make a survey. When the examination is completed the appraiser reports his findings and recommendations by radiophone.

The bank's home office is handled by two RCA Carfone 450 megacycle radio base stations. One transmitter is located on Wall Street in Manhattan, the other, a relay station, is at Dix Hills, L. I.



Metropolitan Opera Recordings . . .

The magic of grand opera, as interpreted by New York's Metropolitan Opera, will soon be available to music lovers on RCA Victor records. Recording sessions, now in progress, of the Barber-Menotti opera "Vanessa" rep-



Don Ameche presents the 1957 Sylvania Award to William R. McAndrew, Vice President, NBC News.

Sylvania Award . . .

NBC News has developed the habit of being first in getting important news stories to the American TV and radio public. This performance won for NBC the coveted Sylvania Award for 1957.

The citation said in part that NBC News "has shown an overall improvement in the coverage of news; because it has not hesitated to preempt time for newsworthy events; (and) because it has taken a big step in 1957 in doing more things and greater things with news than it has ever done before."

resent the first steps in a recording program announced jointly by Rudolph Bing, General Manager of the Metropolitan Opera Association, and RCA through George Marek, Vice President and General Manager of the RCA Victor Record Division.

The first opera recording under the arrangement will be ready for release early in the fall of 1958. An RCA Victor-Metropolitan Opera Record Club has been formed, and recordings will be distributed to its members through the Book-of-the-Month Club.

Future recordings of the Metropolitan Opera will be made by RCA Victor and will utilize Metropolitan Opera and RCA Victor artists. Recordings will also be made available on the RCA Victor Red Seal label for over-the-counter sales.



RCA ELECTRONICS KEEPS A RADAR "WEATHER EYE" ON YOUR COMFORT ON THE GREAT AIRLINES



Airlines equipped with RCA all-weather radar include: United Air Lines (DC-7 above), Trans-World Airlines, American Airlines, Continental Airlines, Pan American, Braniff, CAA, Air France, Cia Mexicana, Swissair, Sabena, BOAC, Iberia, RAAF, Air India, Qantas, Cubana, Karhumaki, Real-Aerovias, TCA, Japan Air Lines, Panair Do Brasil, Swedish Nabol Beard, Pakistan Airlines, SA5, Thai Airways Ltd., Ethiopian Airlines, Olympic Airlines.

Flying into a starless night, the pilot's vision may reach a mere 50 yards. Yet he sees a storm brewing 150 miles ahead.

Within minutes he plots a slight change in course and flies a smooth, safe corridor through the weather. His passengers complete their trip in comfort and on schedule.

Credit RCA Electronics for the "Weather Eye" radar that makes all this possible. And United Air Lines' all-radar fleet for being first (among 24 leading airlines) to

use this important development.

RCA has also produced radar to guide ships at sea, and track man-made satellites through space. RCA pioneered and developed color TV, produced the world's largest electronic computer, peanut-sized transistors and much, much more.

Progress like this helps explain why RCA means electronics—and why electronics means a happier, healthier, more secure future for you.



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THE EXCLUSIVE ORIGINAL SOUNDTRACK ALBUM,
in New Orthophonic High Fidelity, of America's immortal
musical. Hear all the glorious songs from the magnificent
new movie! Enjoy them in the Long Play album, the

THE HIT OF THE YEAR

IS ON

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RECORDS

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deluxe L.P. edition with 12 pages of full-color photo-
graphs and commentary by Rodgers & Hammerstein.

THE BEST OF HOLLYWOOD IS ON RCA VICTOR