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JAN 23 1958



Electronic Age

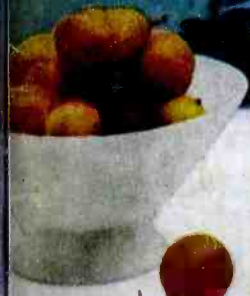
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COLOR TELEVISION - 1958



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RCA Victor announces world's first family of High Fidelity designed for Stereophonic Sound you can add now or later!

Today—buy a New Orthophonic High Fidelity "Victrola"® . . . Now or later—add Stereophonic Sound-on-tape and monaural tape recorder



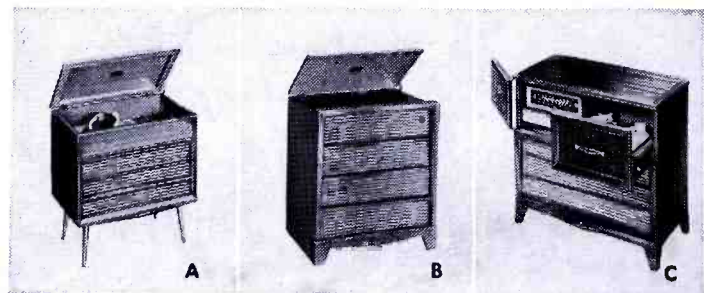
Above: The Mark IX—powerful 3-speaker High Fidelity (SHF8) in mahogany finish \$139.95—shown with matching stereophonic unit, the Recorder-"Victrola" Stereotape Player, Model STR6.

Today you can enjoy two kinds of fine recorded music at home: high fidelity on records, and stereophonic sound-on-tape. Here's how RCA Victor brings you *both*:

(1) **High Fidelity** "Victrolas" by RCA Victor are beautiful—each a laboratory-balanced system—ready to plug in and play. Each brings you 3- or 4-speaker Panoramic Sound, powered by a Supercharged Chassis.

(2) **Stereophonic Sound**—*add it now or later!* This is what it is: music is recorded with *two* microphones on *double-track* high fidelity tape. Instruments at the left are picked up more strongly on one track; instruments at the right are picked up more strongly on the other. You play this tape back through *two* speaker systems. One is in your "Victrola," the other in your Stereotape Player. You hear a *true* re-creation of the original.

Your Stereotape Player also has a built-in, single-track tape recorder. See all the new RCA Victor High Fidelity "Victrolas" at your dealer's today.



A: Mark VI. 3 speakers. 4-speed "Victrola." Mahogany, oak, maple, or natural walnut finishes. (SHF6) \$189.95. **B: Mark IV.** 4 speakers. Jack for AM-FM tuner. Natural walnut, mahogany, maple, oak finishes. (SHF5) \$229.95. **C: Mark III.** 4 speakers. 4 speeds. AM-FM. Mahogany, maple, oak finishes. (SHF3) \$375.

RCA **RCA VICTOR** 
TRADE MARK RADIO CORPORATION OF AMERICA

Manufacturer's nationally advertised list prices shown, subject to change. Slightly higher for West and South. Prices are for mahogany finishes, other finishes available slightly higher. Most models also available in Canada. © RCA trademark for record and tape players.

JANUARY 1958
 VOLUME 17
 NUMBER 1

Electronic Age

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION



COVER

The Brandywine, one of RCA Victor's Mark Series color television receivers, features orthophonic high fidelity sound.

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.

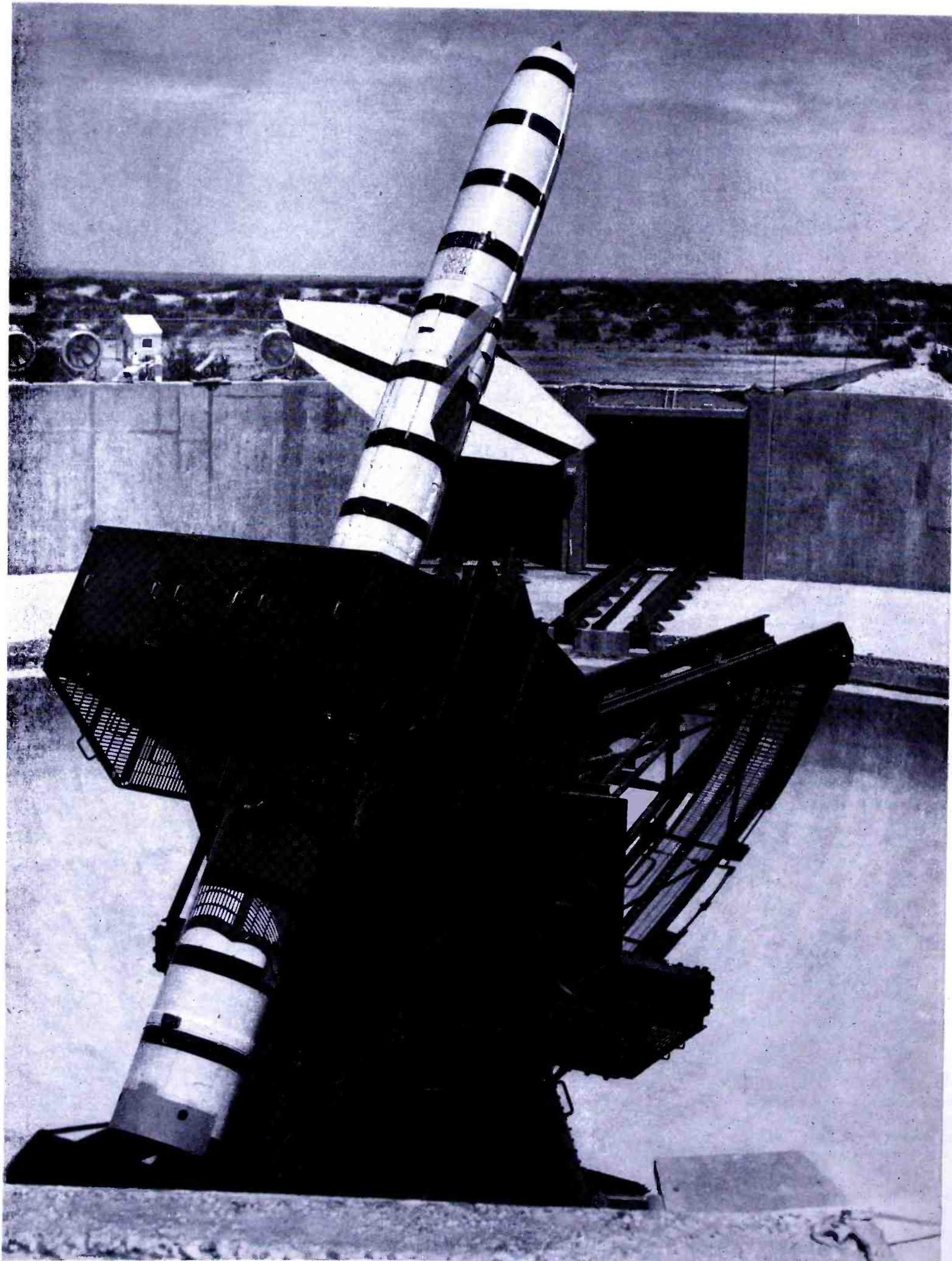
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Talos missile is ready for launching from Talos Defense Unit, built by RCA at White Sands, New Mexico. It is first fully automatic base for launching and guiding missiles to aerial targets. See story, page 10.

SARNOFF SAYS ELECTRONICS INDUSTRY READY FOR SPACE AGE CHALLENGE

Year-End Statement of RCA Chairman Reviews 1957 Advances and 1958 Outlook—RCA Business Volume Exceeds Billion Dollars for Third Consecutive Year

THE American electronics industry is "equipped and ready" to meet the challenge of the Space Age, Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, declared in a year-end statement.

"We believe that today America leads the world in electronic research and engineering — in new materials, components and systems," General Sarnoff said.

"America also holds the No. 1 position in the production of electronic goods for industry — computers, controls, communications and automated devices.

"With earth satellites and missiles now realities, electronics and technology of space propulsion form the keystone of our defense structure. The task before us is to retain our leadership in electronics and certain other fields of technology and to regain leadership in those fields where the advantage may have been temporarily lost."

Financial Review — And Outlook

General Sarnoff reported that for the third consecutive year, business volume of RCA exceeded the billion-dollar mark, reaching an estimated \$1,180,000,000. This represents an increase of about 5 per cent over 1956.

"While profits earned in the first nine months of 1957 showed a small increase over the prior year," General Sarnoff said, "the softening of general economic conditions in the fourth quarter and the highly competitive situation in the radio-TV industry now indicate that profits for the full year will be slightly below 1956."

Dividends to stockholders declared for 1957 amounted to \$23,917,000 (preferred \$3,153,000; com-

mon \$20,764,000). This equals \$1.50 per share on the approximately 14,000,000 common shares outstanding.

"Based on present indications," said the RCA Chairman, "we believe that in 1958 the total volume of business in the electronics industry will exceed the 1957 volume."

Government business accounted for 23 per cent of RCA's total volume in 1957. The current backlog of Government orders is about \$250,000,000. During 1957, the company invested approximately \$35,000,000 in capital improvements.

RCA Achievements in 1957

General Sarnoff said RCA continued its leadership in technological research and development in 1957. Among the major accomplishments he listed these:

1. The first fully automatic system to launch and guide missiles to their targets — the Talos Defense Unit — was turned over to the Armed Forces and tested successfully.
2. The first commercial method of recording and transmitting color television programs by means of magnetic tape was demonstrated publicly, and orders have been accepted for delivery in 1958.
3. An experimental electronic highway system was devised by scientists of RCA Laboratories, in cooperation with the state of Nebraska, to increase driving safety. This may lead eventually to full automatic control of highway traffic.
4. A new method was devised to transmit facsimile



The Wentworth, in the new Mark Series line, is one of RCA Victor's popular color receivers.

and-white — a plan that will facilitate program schedule regularity in every section of the country.

NBC-TV entered the fall season with an exciting schedule in which better than half the regular nighttime presentations consisted of new programs, he said. In addition, the network scheduled more than 100 "specials," the largest number ever undertaken in a single season. Color programming was expanded 67 per cent above the previous fall season to provide at least one hour of color every day and as much as 4½ hours on some days.

Color Television

The RCA Chairman said that during the year, there was significant improvement in the quality of both transmission and reception of color television to a point where the color picture received in the home now exceeds the expectation of even color's strongest advocates.

"The public bought more color receivers under the stimulus of increased programming, improved quality, and nation-wide 'Carnival of Color' promotions," he said. "Starting in Milwaukee, these 'Carnivals of Color' spread to New York, Philadelphia, Detroit, San Francisco and

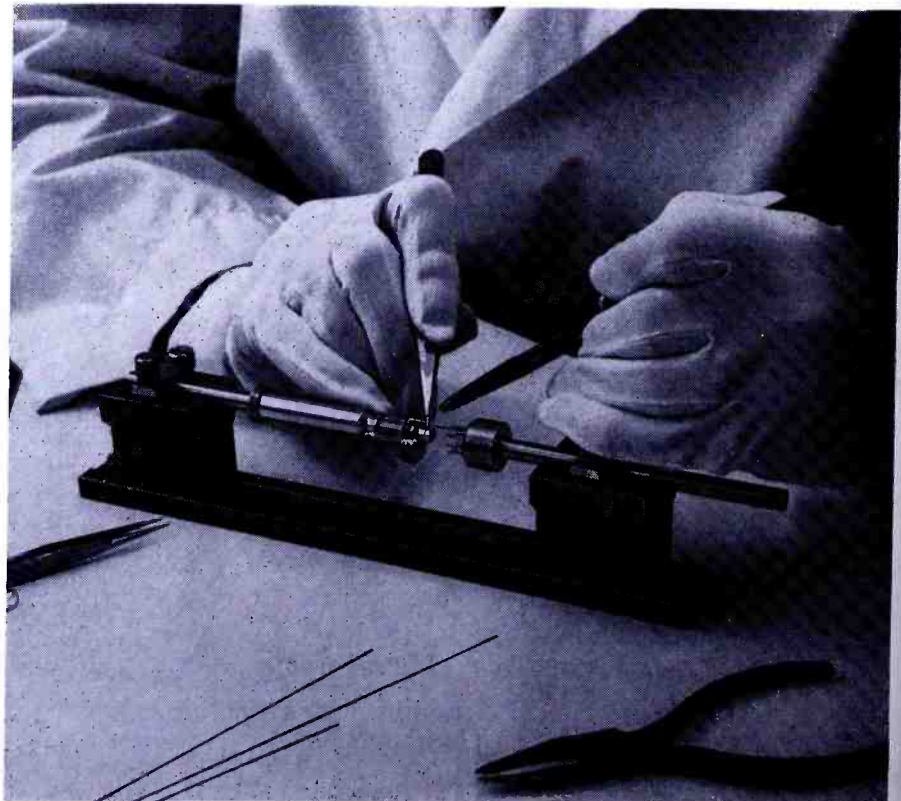
by "bouncing" high-frequency radio signals from ionized air particles created by the passage of meteors through the upper atmosphere. An experimental system was used to transmit still images nearly 1,000 miles without relays.

5. A new ultramagnifier which quadruples the enlarging power of RCA's electron microscope was developed and will be put into commercial production early in 1958. It increases direct magnification from 50,000 to 200,000 times, and photo-enlargement capability from 300,000 to more than 1,000,000 times.

NBC Progress

General Sarnoff reported that the National Broadcasting Company — a service of RCA — moved forward on all fronts during 1957, capturing a larger share of the viewing and listening audience and increasing its business volume over 1956. He said it was the first network to announce plans for comprehensive use of magnetic tape television — in both color and black-

Skilled hands insert element in base portion of tiny TV Vidicon at RCA's Lancaster, Pa. plant.



other cities. They are currently boosting sales in Baltimore, Washington, Harrisburg, Albany, Buffalo, Atlanta, Cleveland, Minneapolis, Los Angeles, and other prime market areas.

"While the sales of color sets have not as yet attained the desired volume, there is encouraging evidence throughout the country that a mass-market status for color TV is close at hand."

The Future

General Sarnoff said RCA also made notable progress during the year in electronic systems and devices for industry and science, in consumer products and in defense work.

"The electronics industry," he noted, "has grown in the past quarter century from virtually no place to fifth place among American industries. Its total volume for 1957 is approximately \$12 billion. We believe it will be double this amount ten years from now. There are four broad fields in which the industry will expand most rapidly:

"1. *Color Television.* The practical experience we have gained in our pioneering efforts with Color Television to date has confirmed our belief that the future

growth of television as a profitable business largely depends on Color. As we see it, this applies not only to the manufacturing and sales end of the TV business but also to the programming and sponsored advertising of TV broadcasting.

"2. *Automatic Systems.* Versatile electronic systems, applied in the fields of data-processing and computing, communications, and automatic control, are becoming increasingly important in defense as we advance into the age of missiles and space exploration. They are also essential to the operation of our complex industrial processes.

"3. *Electronic Components.* Electron tubes, electronically-active materials, solid-state components, and transistors will be in growing demand as electronic applications expand. These components are the basic building blocks of home entertainment and appliances, broadcasting and communications, and navigation and guidance systems.

"4. *Nuclear Research and Atomic Power.* Electronics supplies instruments and equipment essential to nuclear research and development, as well as the instrumentation and controls needed in applying atomic power to industrial and private use."

The RCA International high fidelity AM-FM short wave radio has five speakers, Magic-Eye tuning.

Face-plates of color TV picture tubes are treated in light- and atmospheric-controlled screening room.



Color TV Drive Intensifies

Upsurge in Sales Results in Areas Exposed to Local Live Colorcasts and Dealer Promotions

COLOR television sales are moving well in every one of the major markets spotlighted in RCA's intensive drive to achieve mass market sales for color receivers in 1958.

Perhaps the most significant fact to come out of RCA's color campaign to date is the tremendous upsurge in sales of color receivers in areas that are exposed to a regular schedule of local live color telecasts.

Color sales have been especially outstanding in those cities where live color programming has been supported by enthusiastic dealer and distributor promotions.

In such cities as San Francisco, Omaha, Milwaukee, Cincinnati and Chicago, where aggressive sales campaigns have had the benefit of live color shows, color set sales are soaring.

The excellence of the new Mark series color TV receivers has been of particular importance in the success of the color campaign. Dealers and servicemen, who had been apathetic to color's possibilities, have been won over by the smooth performance of the Mark series.

Not only have these sets proven themselves easy to demonstrate and sell, but servicing has been considerably simplified.

The promotions carried out in 26 markets have all

Crosley Broadcasting in Cincinnati works closely with area distributors to increase color sales.



Ruth Lyons' "50-50 Club" has helped zoom sales of color sets in four-city areas served by WLW stations.

been tailored on the highly successful "Carnival of Color" campaign in Milwaukee last Spring. Techniques developed in that promotion, with local variations, have been applied in cities all over the country.

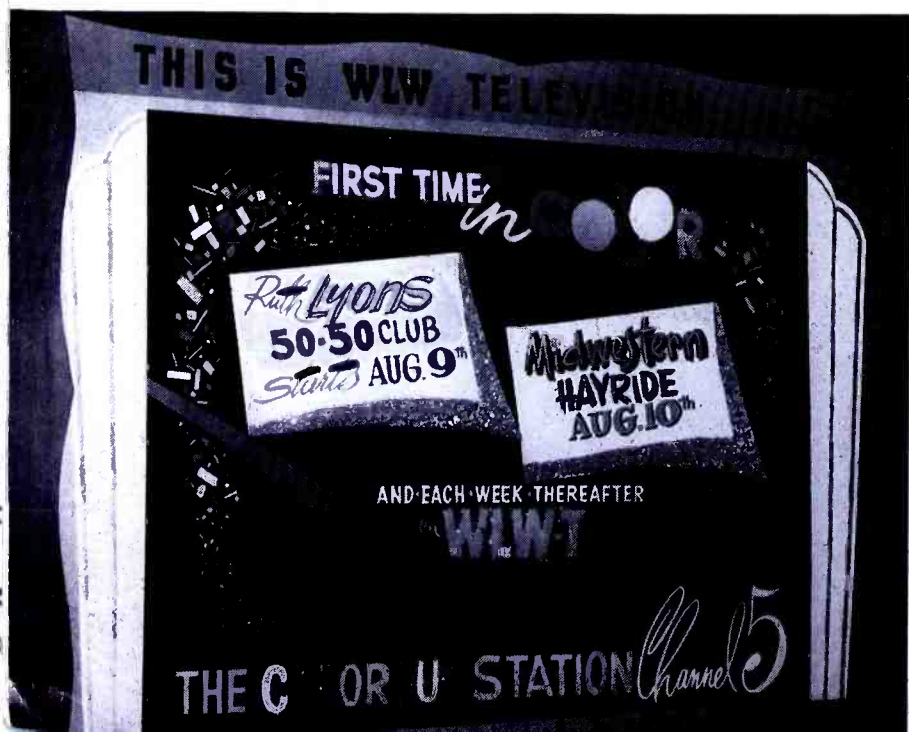
The Cincinnati Story

One of the most successful promotions in RCA's color drive has taken place in Cincinnati; it is typical of the campaigns underway in other cities.

A cooperative effort on the part of Ohio Appliances, an RCA Victor distributor, and the Cincinnati Gas and Electric Company, together with other major TV distributors in the area, the campaign has sent color TV sales skyrocketing.

Borrowing its theme from a highly successful movie, the month-long Cincinnati campaign was entitled, "Around the World in 80 Minutes — with Television."

Center of this promotion was a display in the lobby of the gas company's building. Designed to show that it is possible to be a globe trotter in the viewer's own living room, the display featured a revolving world, with



the main character in the movie, Phineas Fogg, alongside. Hovering overhead was a huge balloon patterned on the one used in the movie. A TV camera aimed at the globe, gave an instantaneous visual image of television's world-wide coverage.

The acquisition by the Crosley Broadcasting Group of an RCA mobile color broadcasting unit has increased color telecasting in the Cincinnati area by nearly 100%.

In addition to the NBC network shows, Crosley stations regularly broadcast four hours of color shows each day. With network color telecasts this adds up to six to eight hours of daily color programming.

The increased color programming on Crosley stations has resulted in sharp increases in color set sales in the four cities served by the group, Cincinnati, Columbus and Dayton and more recently Indianapolis.

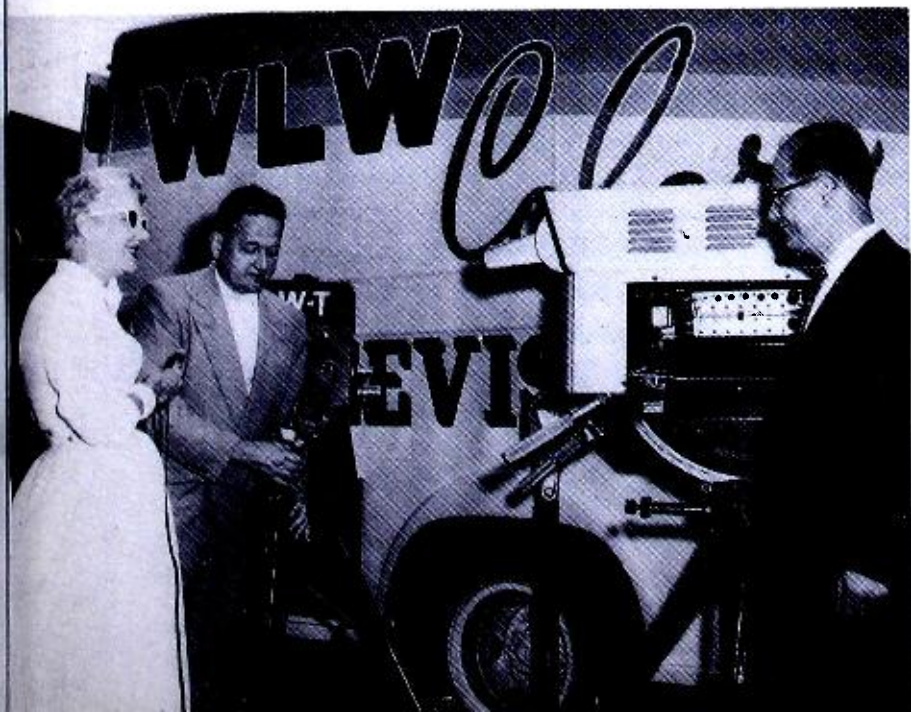
An important part of the Cincinnati promotion was in demonstrations. The public was invited in to see the World Series and the most important of the college football games. In Indianapolis, World Series parties were featured in the ballroom of a downtown hotel.

The "Magic Screen" contest was carried out with the cooperation of the *Cincinnati Post*. The paper printed each day a coupon that entitled visitors to the gas company's display to look into the "Magic Screen." An automatic timing mechanism was set to show either the prize the viewer was to get or, for unlucky ones, only a mirror reflection.

All prize winners were eligible for grand prizes in a lottery drawing. Winners carried off a \$500 color TV set, portable hi-fi sets and radios.

In addition to printing the prize coupon, the *Post* published a special section devoted to the campaign, as well as carrying special articles devoted to color television all during the campaign.

WLW was first independent network to originate live color shows, using RCA Mobile Color Unit.



Other Cities

In Omaha, station KMTV televised in color the Ak-Sar-Ben festival, including the crowning of the King and Queen of this annual state fair.

This was only part of the more than nine hours daily color television programming, network and live, carried on KMTV during the Fall.

The active color promotions carried on in Omaha, together with the televising of live local programs resulted in a more than 100% increase in color sales.

In Detroit, Saginaw and Minneapolis strong local promotions sent color sales soaring.

WGN-TV in Chicago, one of the first stations to provide local color programming on a regular basis, has now been joined by WNBQ, NBC's own station, giving the city a greatly expanded color telecast service.

In Boston, WHDH recently went on the air with three and a half to four hours of live color shows; WBZ provides NBC's regular network shows in the Boston market.

Dealers in Lansing, Michigan, are gaining big dividends in their guaranteed satisfaction promotion. This is an unconditional pledge to take color sets back if the customer is not 100% satisfied.

Color TV Demonstrations

One significant part of RCA's massive color campaign is the nationwide effort to expose as many people as possible to color television demonstrations. Since an overwhelming majority of the American people have never even seen a color television show, this facet of the campaign is of cardinal importance.

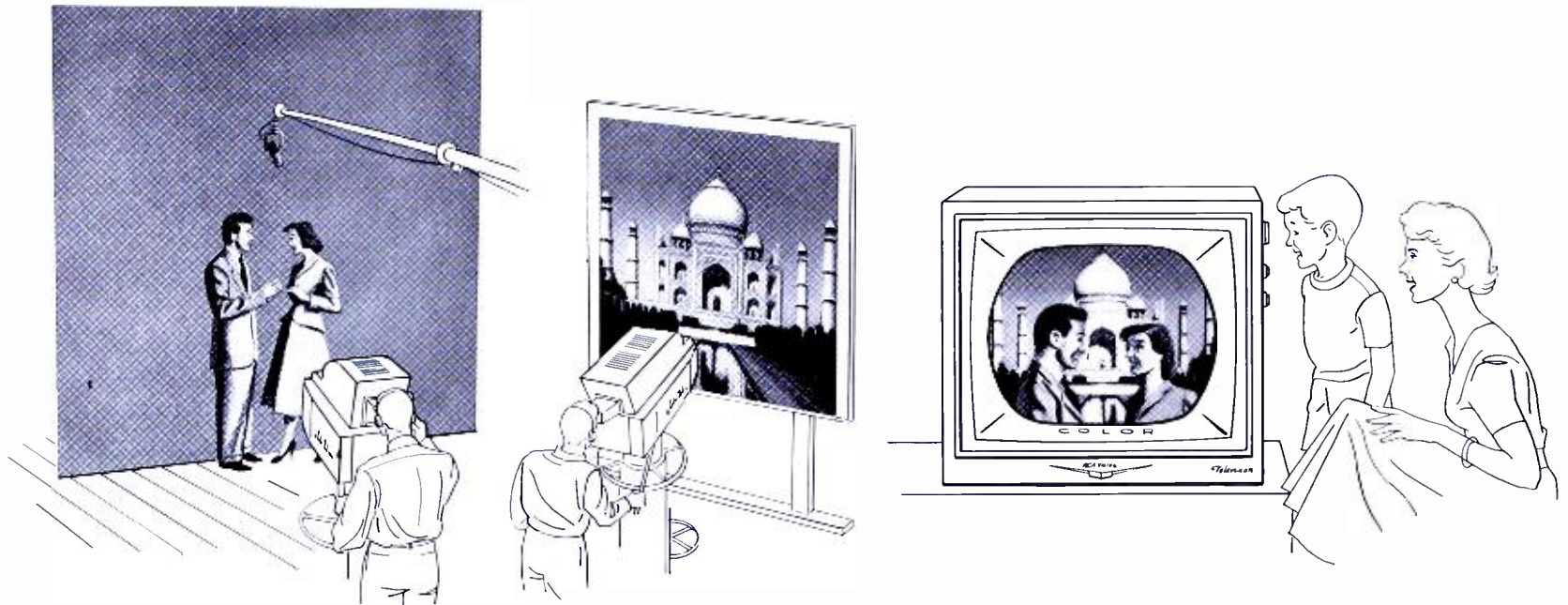
In all of the major markets, color demonstrations have been emphasized. In Cleveland, for example, veterans' and service organizations were loaned color television sets for the Army-Navy football game.

Notre Dame clubs throughout the country have been furnished color sets for outstanding games in which the Irish played.

In the Bergen-Mall area of New Jersey, a closed circuit color television presentation was arranged with Allied Stores; in the first weeks this demonstration of color television, which included fashion shows, drew over 20,000 spectators.

In the Cincinnati campaign over 200,000 people were exposed to the advantages of color television through special promotional color TV presentations.

An all-out national promotion of the 700 series will place heavy emphasis in 1958 on dealer trade-in plans and home demonstrations. Dealer advertising will concentrate on this type of promotion; intensified campaigns will be carried in newspapers, and on local radio and television stations.



In productions employing the "Chroma-Key" process the action takes place in front of a blue background screen. The setting in which the audience will see the play is fed

into the special effects amplifier either directly or from a second camera. The two effects are integrated in the amplifier and go out over the air as a composite picture.

STUDIO : THE WORLD

NBC Introduces "Chroma-Key" to extend scope of TV settings

IT IS two minutes until "curtain" time. One of the season's most-talked-about television plays is about to begin unfolding "live" and in color in the nation's living rooms.

The actors have taken their places on stage, waiting for the opening cue. It is a strange stage, for it is practically bare of scenery, props, furniture and all the other usual essentials of any well-done play setting. Bare, that is, except for its background screen and floor, both in a distinctive shade of blue.

One minute to go. In sixty seconds these players will be acting out their story on the empty stage.

But once the play flashes onto television screens across the country a "miracle" seemingly occurs. For these actors are seen in elaborate stage settings or perhaps in foreign cities or scenes.

The miracle is NBC's "Chroma-Key," or color key electronic inset, process.

The actors in our play will be seen, perhaps, sitting at sidewalk cafes along the Champs Elysees, or strolling in the Rue de la Paix, or seated in an Alpine lodge. Soon the scene will change and they may act out a sequence of the play in St. James Park, London, or in Piccadilly. The picture fades and suddenly we will be in New York, or Buenos Aires, or for that matter, in Tokyo or Timbuktu.

Due to "Chroma-Key," studios in Manhattan and

Color City, California, have, in effect, suddenly expanded to take in the entire world. Any scene or location anywhere on the globe is now at the almost instant disposal of TV writers and directors. Enlivened studio walls now give real meaning to Shakespeare's immortal phrase, "all the World's a stage."

The "Chroma-Key" process and apparatus was developed by RCA engineers working with patents granted to Dr. Alfred N. Goldsmith, RCA electronics pioneer and consultant.

Video insertion has been employed in black-and-white television in which the keying signal was derived by the difference in brightness of the person to be inserted from the background, which is usually jet black and arranged to reflect no light. This same technique was used successfully in color television on a number of programs, and it was suggested by Frank Gaskins, NBC Technical Supervisor, West Coast, that advantage should be taken of this technique to permit improved results in the use of color difference between the subject to be inserted and the background.

Work in this field is being conducted by Mr. Gaskins, Robert Pierce, Milton Altman and Henry Ball, of NBC West Coast operations, and by Ralph C. Kennedy, of NBC Engineering Development, under the direction of George M. Nixon. They have led the way to technical development of electronic composites techniques for

operational use in color programs. Within the past year "Chroma-Key" has been used on an increasing number of top shows, including those of Steve Allen, Julius La Rosa, and George Gobel.

The process involves the insertion of subjects (for instance, actors in a play) into a previously chosen setting, (such as location films, or still photographs).

The action in front of the screen is picked up by a regular television camera and fed into a special effects amplifier. Simultaneously, the "setting" or background material is also played into the amplifier, either directly or from a second camera. There the two effects are integrated and go out over the air as a completed picture.

The video signals transmitted in the live action wipe out and annul the signals of the filmed setting. In other words, the space occupied by the actors' bodies will blot out the background signals for that specific space. Likewise, the signals of the filmed background will blot out the blue screen before which the actors perform.

Special Effects Amplifier

A switching signal, or color key, used in association with the special effects amplifier controls the signals sent out over the air. The switching signal is in turn created by the camera photographing the live action in front of the blue screen. While the camera is scanning the blue screen the switching device automatically activates the second camera, which projects the background. When the scanning signal reaches that area covered by the live actors, the switching device turns off the camera projecting background material and transmits the action.

One restriction on the actors is that they must be careful not to wear clothing the color of the screen; in this case the switching device would automatically key in the background. For instance, if an actor wore a blue tie he would appear to have a hole through his body with the background showing through.

For a more realistic effect, a third element can be introduced. This may be a film clip showing objects in the immediate foreground, such as pedestrians or moving traffic, in front of both the live action in the middleground and the background. The signals from the foreground picture will obscure both the background and middleground live action signals; the pedestrians in the second (or foreground) film clip will be seen walking in front of the subjects (the actors) and the background.

Fitting the various elements into a finished scene can be likened to an electronic jig-saw puzzle. Extreme care must be taken to see that the lighting and perspectives in these elements match one another. And their outlines and boundaries must be in accurate contact.

Matching perspectives is all-important where live action is to be inserted within miniature sets or models. A longer focal length lens will magnify the model to correspond to the size of the actors. Or, a wide angle or short focal length lens will reduce the actors to the size of the model.

The background screen before which the action takes place is completely blotted out and eliminated by the chosen film or slide surroundings. The color of the screen must complement the predominant hue of the inserted subject matter. In action involving human beings, a blue screen is used because blue most nearly complements the strong red component of flesh tones. In other words, the screen must be at the opposite side of the color scale from the subjects to be inserted for best results.

The basic patents covering electronic composites and various special effects in monochrome television (which with modifications can be applied to color television) were taken out by Dr. Goldsmith between 1929 and 1939. Dr. Goldsmith's aim was to give television, then in its early developmental stage, the same freedom of scope, locale, and flexibility enjoyed by motion pictures. The movie industry had perfected by optical means such techniques as the split screen, where two separate pictures are shown side by side within the same frame; the inset, where one picture is inserted within another; and the fade-out, fade-in, or lap dissolve, where one picture gradually dims out to be replaced by another.

The processes developed by Dr. Goldsmith permitted

(Continued on page 30)

Filmed background scenes from anywhere in the world, such as this Parisian sidewalk cafe, can instantly be inserted into live plays with no break in continuity.



Talos missiles being readied for launching at White Sands, N.M.

Beyond Push-Button Warfare

A NEW ERA in the history of military electronics and automation has been ushered in with the completion of the Talos Defense Unit — the first fully-automatic weapons system for firing and controlling guided missiles.

Designed, developed and built by RCA's Missile and Surface Radar Department, Defense Electronic Products, at White Sands, N. M., Proving Ground, the Talos Defense Unit is a high firepower automatic system employing some of the most advanced engineering techniques now in use.

A successful firing of a Talos missile from the new unit was carried out on December 13. Target in this evaluation test was a B-17 drone, flying at medium altitude far down range. The officer in charge announced that the intercept was "completely successful."

Speaking at the dedication ceremonies for TDU on October 15, when the unit was turned over to the Army for evaluation, Dr. Elmer W. Engstrom, RCA Senior Executive Vice President, said that "this goes one step beyond push-button warfare, for at the Talos Defense Unit you don't even need to push a button to send this weapon into action."

Surface-to-Air

Engineered to control the 3,000 pound Talos, developed by the Navy, the TDU is a land-based automatic defense surface-to-air weapon system. It is designed to throw up a ring of powerful, accurate missile defenses around both military bases and industrial centers, guarding against both subsonic and supersonic air threats.

The Talos Defense Unit program came into existence in 1954, due to the advanced development status of the Talos missile. The Navy, in conjunction with the Applied Physics Laboratory of the Johns Hopkins University, had been working on the Talos missile program since the end of World War II. The Navy Bureau of Ordnance was designated to develop Talos as a land-based, surface-to-air missile.

The work was tackled under RCA's Weapons System project approach. This assured the company of complete,

Elaborate test equipment keeps tabs on all phases of TDU. Unit can tackle many targets simultaneously.



Dr. Elmer W. Engstrom, RCA Senior Exec. Vice President, speaking at dedication of Talos Defense Unit.



overall charge of the project, from planning to completion. Every phase of the installation was supervised by an RCA project management team, coordinating the work of both RCA technical personnel and the contributions of the subcontractors. Principal subcontractor was American Machine & Foundry Co., who developed and produced the automatic missile launcher.

How It Works

In case a fleet of enemy bombers, or perhaps a single missile, is detected by one of the numerous warning systems spanning the North American continent a signal is sent to the TDU. It is received by a series of data-handling and computing machines which decode the information and analyze the number of attackers, their location, course and speed of approach.

A scheduling and programming computer sets the logical points of interception. It then activates machinery to load the missiles onto launchers and fire them at the proper time and in the proper direction.

At this stage — still without the lifting of a human hand — the blast-proof concrete-and-steel cell doors swing open to release the missiles the computer has selected.

As a cell is opened, one of the launchers circles to face it and sends a small cart down a railed bridge to the door. Swiftly the missile is loaded on the cart and rolled onto the launcher.

The launcher then swings to the desired position of fire. After an automatic check-out — and at the proper time — the projectile is fired.

There are two stages of flight after the initial upward thrust. First, the missile follows a guidance beam to the vicinity of the target. This is a version of RCA's precision, long-range, high-power instrumentation radar which has been tested by the U. S. Bureau of Standards and found to be the most accurate radar in existence. Second, as the missile approaches the target, a secret "homing" device senses its presence and "locks on" to the target to close in for the kill.

Operators can easily observe and monitor each engagement. The main fire control console shows a continuous picture of the status of a multitude of engagements simultaneously. A three-color (blue, red, green) video display screen, based on RCA's techniques of commercial color television, provides a graphic display.

Operating Highlights

1. *Coverage:* The Talos range is sufficient so that each Defense Unit around a city or military base can engage a threat from any direction. With this range, along with its high and low altitude capabilities, Talos

gives the greatest coverage of any local defense system in existence.

2. *Firepower:* TDU uses early warning information from radar networks and other sources for midcourse guidance. Time-sharing of major components of the system, referred to as multiplexing, makes it possible for a single Talos Defense Unit to engage various targets simultaneously with many missiles in the air at the same time.

3. *Kill Probability:* High overall system accuracy and warhead lethality (either high explosive or nuclear) assure high kill probability.

4. *Accuracy:* Precision, high-power, long-range radars, electronic computers, programmed missiles guidance techniques and a precision missile homing seeker assure extremely high accuracy at short and long ranges and high and low altitudes.

5. *Reliability:* By use of highly-reliable components, redundancy, multiple data channels and automatic fault by-pass features, high reliability is assured. In case of component failure, system operation continues by bypassing that component.

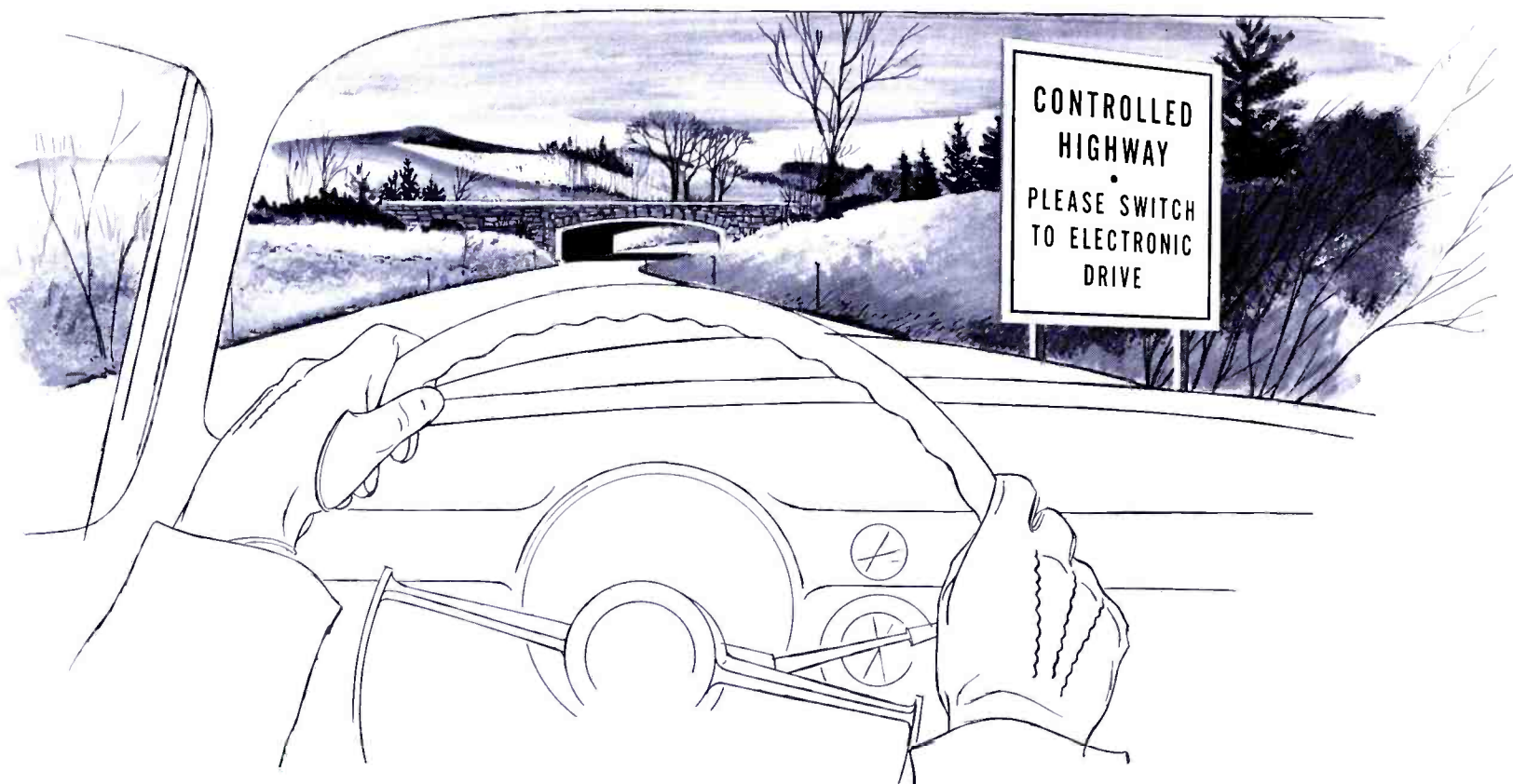
6. *Self-Checking, Ease of Maintenance:* Automatic system checkout equipment is built into the Talos Defense Unit, providing system check-out in a few minutes. Should trouble exist, it is quickly isolated and corrected by replaceable plug-in modules.

7. *Personnel Training:* Built-in equipment feeds in various problems on tape and simulates actual engagements, providing a method of maintaining a high state of personnel training and overall combat effectiveness.

The Talos missile is about 20 feet long, 30 inches in diameter and weighs 3,000 pounds. It is accelerated by a large solid fuel booster rocket some 10 feet long, which is jettisoned when the missile reaches cruising speed. At this point the main ramjet engine, using kerosene as fuel, ignites and provides thrust to keep the missile at constant speed throughout its flight. The engine develops 40,000 horsepower.

The Talos Defense Unit is composed of three structures, one a long, low concrete and steel building containing the control center, and the other two circular magazines with the launchers, resembling anti-aircraft guns, in the center and numerous cells on the perimeter to house the missiles themselves. All three are built to withstand the pressures of the missile take-off and near misses from enemy bombs, and all are air filtered for protection of the equipment and personnel.

The basic design of the Talos system provides for extension of capabilities with a minimum of modification to assure that the system will have continued effectiveness against present and future hostile air threats.



HIGHWAY OF THE FUTURE

PASSING the above sign as you enter the super-highway, you reach over to your dashboard and push the button marked "Electronic Drive." Selecting your lane, you settle back to enjoy the ride as your car adjusts itself to the prescribed speed. You may prefer to read or carry on a conversation with your passengers—or even to catch up on your office work. It makes no difference for the next several hundred miles as far as the driving is concerned.

Fantastic? Not at all. The first long step toward this automatic highway of the future was successfully illustrated by RCA and the State of Nebraska on October 10, 1957, on a 400-foot strip of public highway on the outskirts of Lincoln.

Both unequipped vehicles and a test car with special receiving equipment were used to show the immediate uses and the ultimate possibilities of electronic highway control.

Coupled to a series of RCA experimental detector circuits buried in the pavement were a series of lights along the edge of the road. In the test car were special RCA radio receivers and audible and visual warning devices to simulate automatic steering and brake controls.

In a series of tests, the installation at Lincoln proved its ability to:

- ▶ Provide automatic warning to a driver following too closely behind another vehicle,
- ▶ Indicate to a driver the presence of a parked vehicle or other obstacle in the highway ahead,

- ▶ Guide a car accurately along its traffic lane even under conditions of zero visibility for the driver,
- ▶ Cause remote operation of warning lights ahead at points of merging traffic, or along the roadside for any distance ahead of or behind a moving vehicle unequipped with special equipment.

The demonstration, observed by nearly 100 state and federal highway Officials, representatives of automobile manufacturers, and the press, made two major points. First, was the fact that the various elements of the system can be used immediately in conjunction with arrays of roadside and intersection lights to increase driving safety under present conditions, without requiring special equipment on cars or trucks.

Second, was the clear indication that the system as a whole can be developed without major technical complications into a fully automatic highway traffic control system.

Driving in the Future

Operating the system of the future will be as simple as it seems fantastic. From beneath the pavement, electrical signals will radiate from buried wires to be picked up by the tiny transistorized receivers built into the car. On one frequency will come the signals from the guidance cable, controlling the power steering mechanism to keep the car in its lane.

Signals on another frequency will warn of obstructions in the highway half-a-mile or a mile ahead — per-

haps a stalled vehicle, or a highway maintenance crew at work. Whatever the cause, signals, picked up by another receiver in the car, will operate automatic controls that reduce your speed by letting up the accelerator, apply the power brakes, or guide the car automatically into the next lane to pass the obstruction.

Operating on a third frequency, the special highway receiver on the dashboard will pick up signals from a buried antenna and cut off the standard car radio to make an announcement of its own: "Exit Number Three for Pittsburgh area is five miles ahead. Connections at this exit with Routes 19 and 28. Please watch roadside signs for further directions."

Approaching the exit the radio will again cut in with an announcement supplementing the roadside signs. "Exit Number Three for Pittsburgh area is two mile ahead. Motorist for Exit Three please switch off electronic drive and move to exit lane at extreme right." The motorist will simply push a button to switch the car to manual control. He will then move into the right lane to approach the exit and turn off the superhighway.

How It Came About

Behind the Lincoln demonstration, and the further developments that are likely to come from it, is a story of imagination and enterprise in two widely separated locations. One is RCA's David Sarnoff Research Center in Princeton, N. J. The other is the State Capitol building at Lincoln, Nebraska.

The electronic highway control system is itself the conception and development of an RCA Laboratories' team including Leslie E. Flory, George W. Gray, and

Winthrop S. Pike, working under the direction of Dr. Vladimir K. Zworykin, Honorary Vice President of RCA. It is based on a concept demonstrated by Dr. Zworykin and his associates at the Center in 1953.

At that time, the principles were successfully applied in a small-scale system in which wires laid in a pattern on the laboratory floor were used to guide and control a miniature car. It was a sufficiently fascinating "toy" to inspire a feature article by writer John Lear in *Collier's* magazine.

The article sparked the imagination of Leland M. Hancock, traffic engineer in the Nebraska Department of Roads, and of his director, L. N. Ress, State Engineer. The decision was made to experiment with various aspects of the system in actual highway installations in the vicinity of Lincoln.

To accomplish their purpose, the Nebraska officials turned to the RCA Laboratories group at Princeton for the novel electronic equipment that was needed.

The opportunity that presented itself was the construction of a new main intersection of U. S. Route 77 and Nebraska Highway 2 on the outskirts of Lincoln. As the pavement was laid, the necessary wiring was buried, preparing the ground for the experimental work, the results of which were demonstrated on October 10.

How It Works

What the observers saw at the first public demonstration was a system comprising three basic elements:

- 1) a sequence of detectors installed at intervals slightly greater than car length along the road, capable of reacting to the passage of cars;

Cars with radio receivers run tests on highway equipped with buried detector circuits at Lincoln, Nebraska. RCA scientists are continuing developmental work on system.



- 2) a radio warning system for following vehicles, controlled by a signal from the detectors;
- 3) a guidance system to keep each vehicle centered in its lane.

The *detectors* consist of rectangular loops of wire, six by twenty feet, buried in the pavement in the traffic lane, and coupled to an associated circuit at the edge of the road. The loop carries a voltage from a high-frequency power line. Whenever a vehicle passes over the loop, the result is a variation in current which is detected by the roadside circuit. The circuit then produces an output signal that controls an indicating device, such as a warning light, and at the same time switches on the radio warning system for following vehicles.

The *radio warning system* is simply a transistor switch and an antenna that extends back beneath the pavement from each of the detector loops for any desired length. When the detector responds to a passing vehicle, the transistor switch is closed, causing the antenna to radiate a signal.

This continues for a certain interval of time after the vehicle has passed, so that the antenna radiates, in effect, a "radio tail warning" behind cars as they move along the highway. The tail warning signals can be used to actuate warning lights along the side of the road, or they may be picked up by following cars with appropriately tuned receivers that can be used ultimately to activate automatic control of brakes.

The *guidance system* is a cable laid down the center of the traffic lane beneath the pavement, carrying a signal current of yet another radio frequency. To use the continuous signal, a car is equipped with small receiving antennas mounted at either end of the front bumper or on both front fenders. These antennas are connected to a differential receiver which responds when it receives two signals of differing intensities.

Warning devices include left-right indicator (below mirror) and buzzer and warning lights for obstacles such as other vehicles or maintenance crews.

As long as the car is centered over the cable, nothing happens. As soon as the vehicle moves to either side, one signal increases in intensity while the other decreases, causing a response in the receiver. In the demonstration, the effect was shown on a meter in the test car; in the ultimate system, it would be used for automatic control of the steering mechanism.

A "Compatible" System

Perhaps the most telling point of the demonstration in the eyes of highway experts was the extent to which the electronic system is compatible with present highway conditions, having many applications in the near future without requiring any equipment in cars.

The point was demonstrated simply. As cars entered the test strip, a warning light automatically flashed on over a merging traffic sign 400 feet ahead, alerting drivers approaching on an adjacent road. Then, as each car moved over the buried loops, a light beside each loop was turned on automatically, tracing the passage of the car through the test area.

Dr. Zworykin pointed out that the use of lights along the roadside could provide a visual substitute for the "radio tail warning," serving vehicles without any receiving equipment. In this way, a vehicle moving along in the fog might light a series of lights several hundred feet behind it, warning approaching cars and immediately preventing rear-end collisions in fog banks — a type of accident that has involved as many as thirty cars at one time on the New Jersey Turnpike.

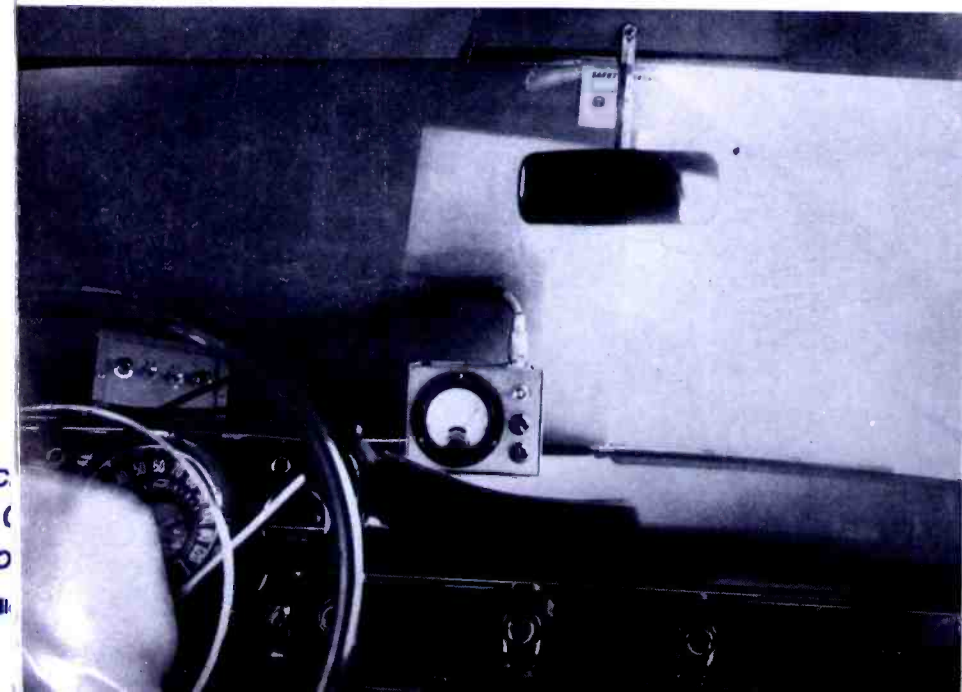
Introducing System

First stage: No auxiliary equipment in vehicles, but systems of warning lights activated by the buried detector units. This could be done immediately, perhaps beginning with isolated portions of the highway system.

Second stage: Some cars equipped with signal detectors which would give the driver a dashboard indication of the distance of clear roadway ahead, even under conditions of zero visibility.

Final stages: Automatic vehicle control would also be introduced on a step-by-step basis, beginning with installed equipment that would make use of signals from the guidance cable and buried antenna systems to control steering and braking.

Ultimately, automatic control devices would sense suitable opportunities for passing and would change routes in response to a program pre-set on an electronic computer in the vehicle. The driver would have to take over only as he left the high-speed road system.



RCA's Helpful 'Hams'

BY DAY their talk is of electron tubes — tube design, tube sales, and the like — but when they meet after working hours their jargon is embroidered with such terms as "rigs," "QSL cards," "DX" and "QSO's." These are the members of the Amateur Radio Society of Harrison, N. J., with membership drawn mainly from employees of the RCA Electron Tube Division plant in that city.

In the parlance of their hobby, the members of Harrison group are "hams," a fraternity that is active the world over. In the United States alone more than 100,000 radio amateurs man their transmitters and receivers to conduct gabfests — "rag-chewing" in their vernacular — with other hams half way around the globe.

Although the Harrison Club was formed only six months ago, it now has a membership of eighty, including seven women. These members represent a cross section of different departments at the Tube Division. Bob Leedy, who is President of the Society, is technical editor of *Ham Tips* and other house magazines issued by the Advertising and Sales Promotion Department. Fred Barkalow, the Club's Vice President, and John Capo, Treasurer, are both employed in the Equipment Development Section.

The Secretary, Jack McPartland, is in Plant Personnel and the General Manager of the group, Tom Ryan, works in the Receiving Tube Rating Laboratory. Other employees are from various departments of the Division including Purchasing, Chemical Laboratory, Merchandising, Commercial Engineering, Accounting, Microwave Engineering, Plant Administration and Receiving Tube Design Engineering.

One rather special member of the Society is W. Walter Watts, RCA Executive Vice President, Electronic Components. Mr. Watts, a radio amateur for many years, has taken a keen interest in the group since it was organized.

Article I of the Society's Constitution explains that objectives of the club are: ". . . the promotion of interest in amateur radio communication and experimentation; the relaying of messages by radio without charge; the furtherance of public welfare; the advancement of the radio art; the fostering and promotion of inter-communication by electronic means for the personal benefit of members, without pecuniary gain; the fostering of education in the field of electronic communications; and the dissemination of knowledge and information by electronic means."

As part of its activities, the society offers classes to members who are interested in learning code and radio theory which will enable them to pass their examinations for a novice, technician or general class operator's license. The code classes are held Monday through Friday during the lunch period, while theory classes are conducted one evening each week.

So far, twenty-five members have received their licenses from the Federal Communications Commission as a direct result of the club's training program.

A bi-monthly bulletin, written and edited by the club's president, keeps members up-to-date on the society's activities. It publishes highlights of the regular meetings and future plans; most popular column lists equipment that is offered for sale or swap.

With the announcement of the current International Geophysical Year, the Society immediately laid plans for member participation. A special committee was formed to coordinate plans for tracking the American satellite and transmitting data to IGY headquarters. Many club members received valuable practice by tuning their sets to the beeps of the Russian Sputniks.

Code classes are held each day during the lunch period by Harrison's Amateur Radio Society, using RCA facilities and equipment. Evening classes are held once a week.



Vaudeville stars Jimmy Durante and Milton Berle reached new popularity heights on television.



The Fabulous Infant

NBC-TV's "Wide Wide World" marked a television milestone with "The Fabulous Infant"—the story of network television. It was the first time that the three major networks, NBC, CBS and ABC, had ever cooperated to provide historic program excerpts of the great moments of television's first ten years.

"Wide Wide World," which is sponsored by General Motors and supervised by executive producer Barry Wood, presented "The Fabulous Infant" on Sunday, November 10. The program, produced by Herbert Sussan, began with a series of highlights from TV's first decade, including:

President Truman addressing the opening of the Eightieth Congress.

Maestro Arturo Toscanini conducting the NBC Symphony Orchestra in Beethoven's Fifth Symphony.

Dave Garroway demonstrating sound effects on his old Chicago program "Garroway at Large."

George Burns and Gracie Allen in a scene from their show, "Burns and Allen."

Gene Autry chasing a bandit across the prairie.

Anthony Eden addressing the Japanese Peace Treaty Conference in San Francisco.

The explosion of an atomic bomb at Yucca Flat, Nevada.

Bishop Fulton Sheen in a television talk on the evils of Communism.

Ozzie and Harriet Nelson in a scene with their two sons on "Ozzie and Harriet."

President Eisenhower at his first inauguration.

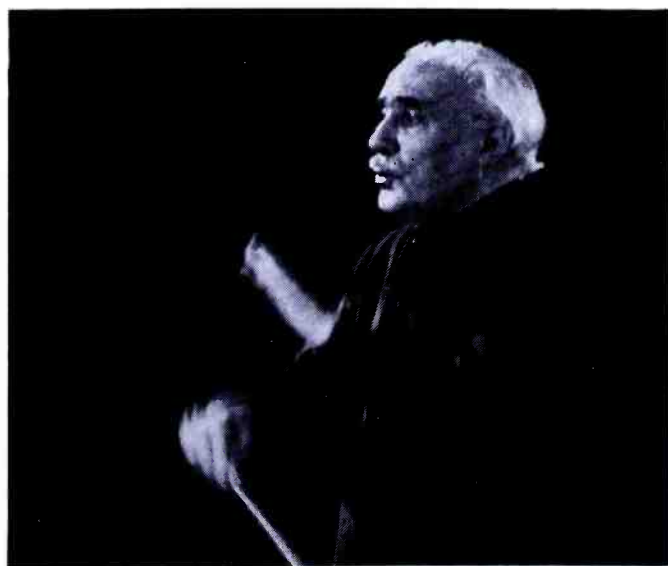
Sen. Joseph McCarthy and Joseph N. Welch in a clash at the Army-McCarthy hearings.

Fess Parker as Davy Crockett on "Disneyland."

Ernie Kovacs appeared on the program in a live telecast from Las Vegas and recalled his early days on TV and the "break" that brought him sudden fame.



"Mister Television" reminisces with Dave Garroway in Berle's old NBC studio, 6B, on "Wide Wide World's" story of television's first ten years.



Highlight was kinescope recording of Maestro Arturo Toscanini in rare TV performance with NBC Symphony Orchestra in Beethoven's 5th Symphony.

"That's the incredible thing about television," he said. "It's happened before and it will go right on happening. A performer appears just once before a vast audience and, if he is accepted — zoom, up he goes!"

Dave Garroway, host of "Wide Wide World," reminisced about his first assignment in broadcasting — a job as a radio disk jockey in Honolulu. "In between records," he said, "I just rambled on about anything that came to my mind. . . . In TV, I keep on doing just about what I had done before — talking to people as though I knew them — only more so because you're even closer to a person when you're in his home and he can see you."

Milton Berle appeared on the program in a live telecast from his old studio at NBC in New York — studio 6B. "There's no such thing as one television audience," Berle said. "It's hundreds, thousands, of audiences who are watching at one time. A joke that's funny in New York could be a bomb someplace else. You play enough vaudeville, big towns, small towns, and you discover there are a lot of Americans in America.

"Vaudeville was a great teacher. On just one television performance you play to more people than all the audiences of your life. And everything you'd ever learned — playing split-weeks and one-night stands in Steubenville, Fargo, Oxnard, Worcester, Gloversville — came in handy."

To look at a major source of new television talent, the program switched to three local TV stations around the country and sampled their programs: stations WBZ-TV in Boston, KMTV in Omaha, and KYTV in Springfield, Mo.

For a glimpse at the world of television films, the program went to Hollywood and the studios of "Dragnet." Jack Webb, the series' actor-producer-director, told

how he achieved a new kind of realism. "We didn't have money for sets. So we used the offices of the Los Angeles police department. . . . We didn't have money to hire Hollywood actors, so we used people from radio. They didn't look like actors. They looked like anybody — just as cops and crooks look no different from you or me."

The cameras also looked in on a rehearsal of NBC-TV's "NBC Matinee Theater," the series of "live" dramas colorcast on weekday afternoons. Executive producer Albert McCleery introduced "Matinee's" huge staff — three producers, three casting directors, six business managers, ten directors, five art directors and scores of artists, carpenters, technicians, cameramen and other specialists.

At NBC's "Color City" in Burbank, the cameras showed some of the facilities required for a TV production: scenery, machine shops, carpenter shops, props, costumes, dress-making rooms, control rooms, cameras, pianos, lights and special effects machines that manufacture bubbles, fog and snow.

To sum up the first ten years of network television, the program introduced two TV critics, Harriet Van Horne of the *New York World-Telegram and Sun* and Hal Humphrey of the *Mirror News* in Los Angeles, who listed some of the medium's failures and some of its achievements.

Then, to show what Dave Garroway called the "special impact" of a live telecast from the scene of an actual event, the program switched to Washington and the ceremonies marking the 182nd anniversary of the U. S. Marine Corps.

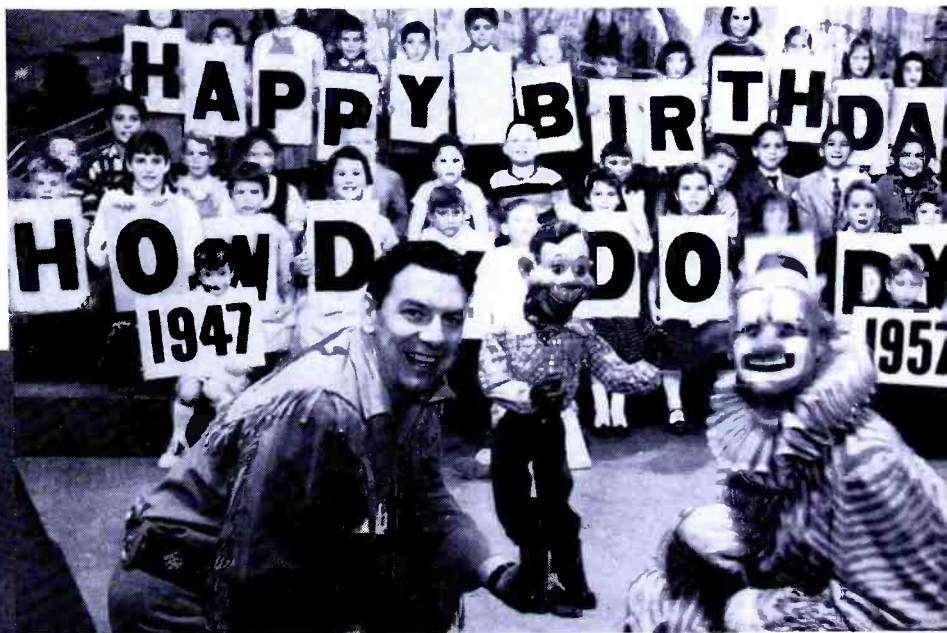
"The Fabulous Infant," according to a review of the program in the *New York Herald Tribune*, "was television's accolade to itself. All in all, it is a well-deserved one."



An early success on television, Dinah Shore is still a top performer.

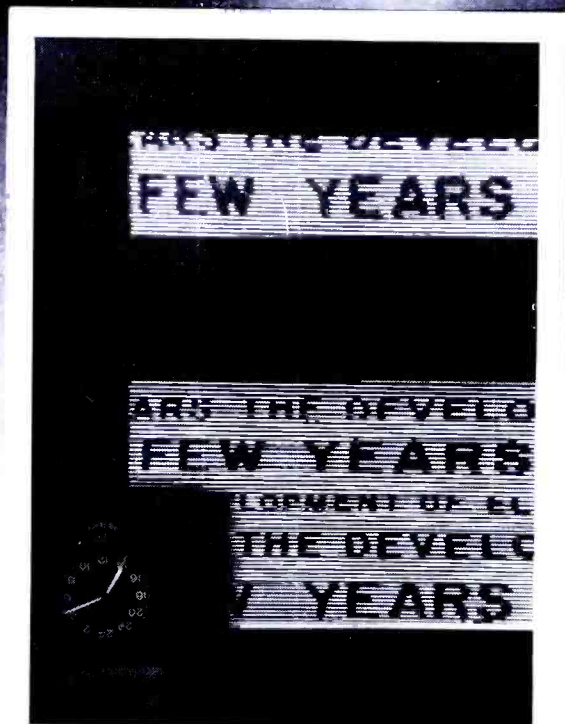


Ernie Kovacs recalled "break" that brought him sudden TV fame.



Howdy Doody celebrated tenth birthday on TV during 1957. The major networks — NBC, CBS, ABC — cooperated to present TV's great moments of past ten years.

Radio Via Meteor Trails



Ionized meteor trails, lasting but few seconds, are proving new means of transmitting high-frequency radio signals over long distances without the use of relays.

ELECTRONIC SCIENCE, one of the virtues of which is a remarkable ability to make orderly use of random effects, is turning to one of nature's most haphazard phenomena to achieve a new technique of radio communication.

The phenomenon is the apparently aimless but heavy bombardment of meteors penetrating the upper atmosphere 60 to 100 miles above the earth. The new technique is the bouncing of radio signals from trails of ionized air that linger briefly behind the plunging meteors before they are destroyed by friction.

RCA scientists, studying meteor path propagation of radio signals under an Air Force research contract, have recently employed meteor trails for the first time to transmit images of printed material over a distance of nearly 1,000 miles without relays. By means of experimental facsimile equipment developed at RCA Laboratories, high-frequency signals carrying the visual information have been bounced via meteor trail from the transmitting station of the National Bureau of Standards at Havana, Illinois, to the RCA Laboratories radio research installation at Riverhead, Long Island — an airline distance of 910 miles.

Built-in Camera

At the Riverhead receiver, the transmitted images have flashed briefly on the viewing screen as frequently as several times each minute during test transmissions, to be recorded each time by a camera built into the special receiving system. Each appearance of an image has signified the appearance along the transmission path of a meteor trail sufficiently long and persistent to reflect the signals downward toward the directive receiving antenna at Riverhead.

The experimental system, designed as a research tool for the investigation of meteor path propagation, was developed by RCA for the Cambridge, Mass., Research Center of the Air Research and Development Command. Principals in the development were Warren H. Bliss, of the technical staff at the David Sarnoff Research Center in Princeton, N. J., and R. J. Wagner, Jr., and G. S. Wickizer, of the RCA Laboratories radio research staff at Riverhead.

The scientists' explanation of the events involved in the system runs this way.

When a meteor enters the upper atmosphere, its high velocity causes the air particles to break down into

positive and negative ions. This trail of ionized air, which may persist for periods from one-tenth of a second up to several minutes after passage of the meteor, acts as a reflector of radio signals that would otherwise radiate out into space.

Meteors come in many sizes, leaving trails of varying lengths and persistence. The frequency with which useful trails may appear along any given transmission path is related to the amount of power employed for transmission and the bandwidth of the signal. Along the Havana-Riverhead path, employing a video bandwidth of 106 kilocycles, such trails may materialize from one to several times per minute to close the circuit.

Continuous Transmission

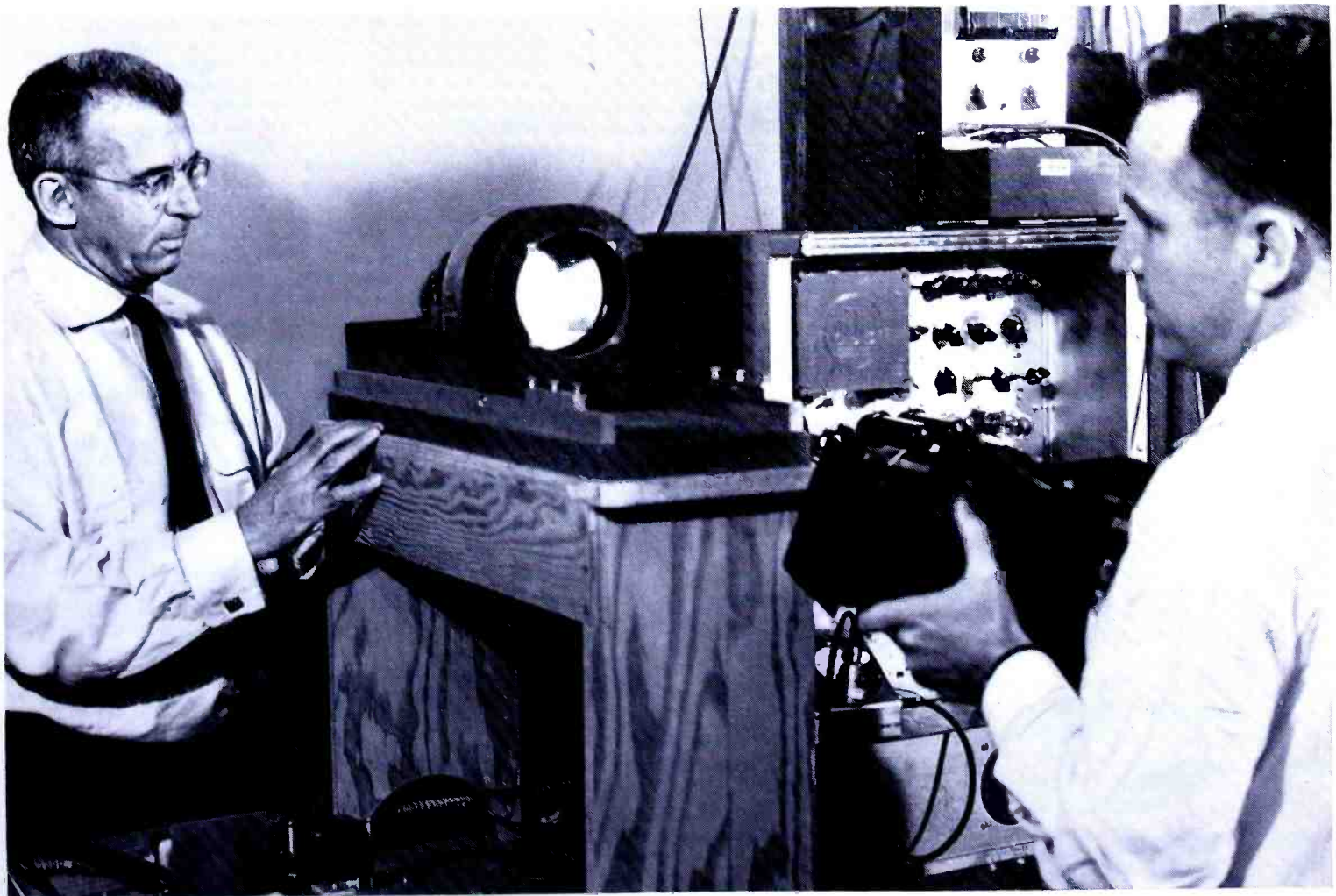
According to the RCA team, the experimental system transmits continuously, sending copies of a picture over and over at the rate of two complete scans each second. The receiver is also operated continuously, with the recording unit in a standby condition. When a passing

meteor closes the transmission path, the incoming signal trips the recorder to permit reproduction of the image on the phosphor screen, where it is photographed automatically. The circuit then resets automatically for the next burst.

Basic research in the field of meteor trails has been conducted mainly under sponsorship of the Department of Defense, at Stanford University, the National Bureau of Standards and other facilities in the United States. In addition, similar work has been done in Canada and England, including the development by the Canadian Research Board of a teletype system employing this technique.

Both Air Force and RCA specialists have indicated that meteor path propagation promises ultimately to increase the versatility of radio communications by providing a means of sending information at times and over distances for which other means may not be available. According to a report by the RCA team, the optimum distance for transmission by this means is 600 to 1,200 miles.

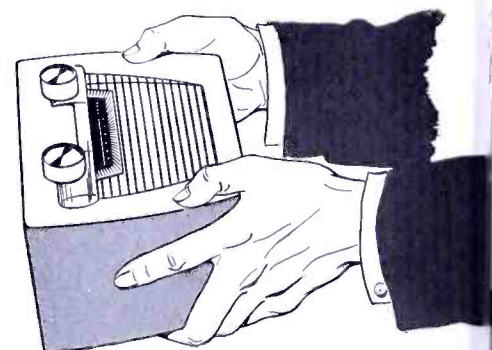
At the RCA receiving facilities at Riverhead, L. I., images from meteor trail transmissions flash briefly on a viewing screen; they are recorded by a fixed camera.





Courses for prospective student engineers are conducted for Moorestown, N. J., high school seniors by RCA engineers on voluntary basis.

ELECTRONIC "DIPLOMAS"



THE high school senior bent over the half-completed transistor radio on the lab bench. He listened intently as the course instructor, an RCA engineer, went over his work and pointed out the good and bad points of his assembly technique. In other parts of the laboratory nineteen of the senior's classmates had identical radios in various stages of completion.

To carry home the coveted "diploma", awarded at the end of the course, each student had to assemble entirely on his own the radio receiver furnished him in kit form by RCA.

The "diploma" was to be the radio itself.

These twenty seniors were from the Moorestown, N. J., high school. They participated in the first of the orientation courses conducted by RCA in an experiment directed at attracting teenage students into the study of science and engineering.

RCA is in the forefront of industrial efforts to encourage greater numbers of teenage students to enter scientific careers. The program inaugurated last Spring by the Moorestown (N.J.) Engineering Plant of the RCA Missile and Surface Radar Department with this object in mind has shown particularly good results.

The Moorestown students were put through an intensive twelve-week orientation course by RCA electronic engineers to acquaint them with career possibilities in the expanding field of electronics engineering. At the end of this training period, the twenty youngsters were given the five-tube radio receivers they had constructed as part of their laboratory exercises during the course.

RCA Engineers Volunteer

The one-night-a-week schedule was conducted by the RCA engineers on an entirely voluntary basis. The

program was arranged by Harry R. Wege, Manager, RCA Missile and Surface Radar Department, with the cooperation of Paul R. Jones, Superintendent of Moorestown Schools. Their express purpose was to provide senior students with a practical background for consideration of engineering as a profession.

Thomas G. Greene, an RCA Moorestown engineering leader in electronic development and design, served as class instructor. He was assisted by J. R. Schietinger and Earl R. Adams, of the Missile and Surface Radar Department.

Selected on the basis of achievement in science and physics and interest in electronics, the twenty seniors received definitive lectures on the various fields of engineering specialization; demonstration and lectures on the basic principles of electronics; and practical instruction in such laboratory techniques as wiring, crimping, soldering and the use and applications of test and measuring equipment.

The balance of the course was devoted to the construction by each student of a five-tube radio receiver, supplied in kit form by RCA. The radio assembly sessions were conducted under exact laboratory conditions and included technical discussions related to each major radio part and assembly.

The merits of such a program are being measured by its success in attracting students to the study of science and by its acceptance in the community. On both counts the Moorestown project has been outstanding.

Each of the twenty students was required to assemble radio receiver from kit furnished by RCA. So successful was the course that it is being continued this year on an expanded basis for twenty-five Moorestown seniors.

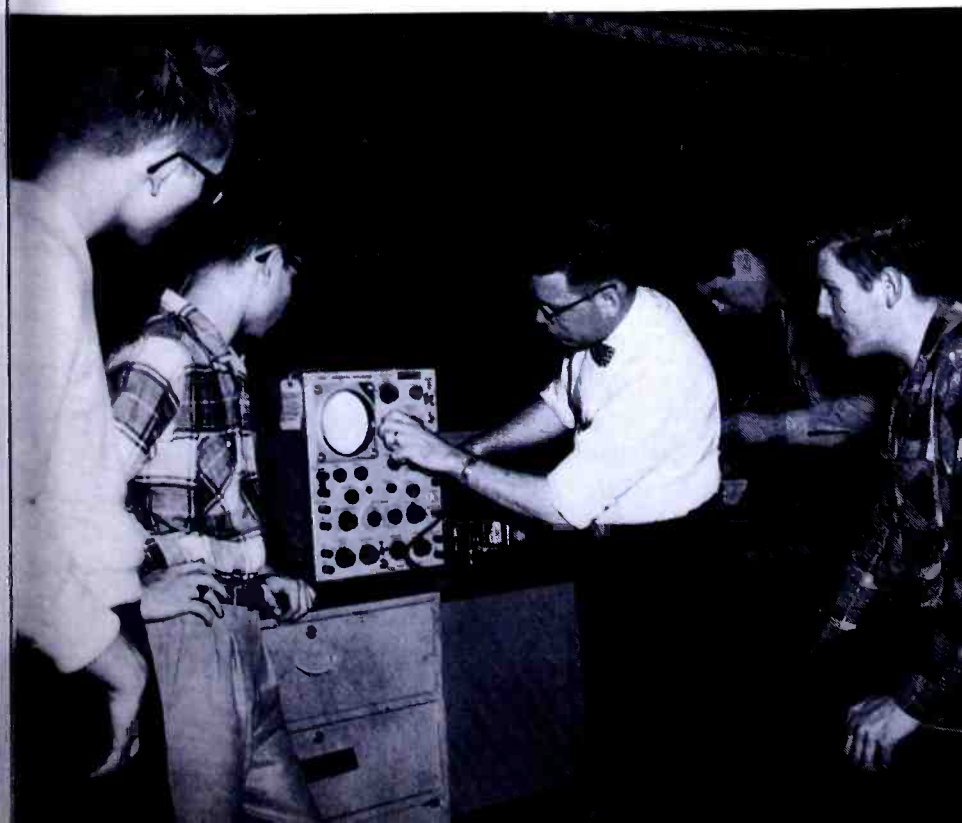
Thirteen of the twenty students who were in the first group have since gone on to college and are taking engineering courses.

Community Appreciation

Superintendent Jones had this to say of the program: "RCA is to be congratulated for its pioneering effort in giving boys the opportunity to learn more about engineering from the practical standpoint. The program was a wonderful and enlightening experience for each of the boys and from discussing their future plans with each of them I know they learned a great deal. Their reaction to the course was highly favorable. We are deeply indebted to RCA for such a fine expression of cooperation with our schools."

The decision to continue the course for another year, and probably for as long as the engineering shortage exists, was made almost as soon as the 1957 class "graduated." The enthusiastic response on the part of the students made it obvious that RCA was fulfilling a tremendous need in the community.

From now until June, twenty to twenty-five of Moorestown's 1958 seniors will be eagerly probing the mysteries of radio and the basic principles of electronics, a vanguard of the much-needed engineers of the future.





Microwave Radio for Cuba

A NEW microwave radio system being engineered by the Radio Corporation of America for the government of Cuba is already speeding up the island's communications and promises further advantages for the Cuban economy. This was noted in a statement by P. B. Reed, Vice President, International Sales, RCA, following the recent inauguration of the first half of the system.

"With the extension of Cuba's modern communications system to Camaguey, approximately 50 per cent of the installation and construction work for the nationwide network is completed," said Mr. Reed. "The flow of communication has been speeded up. More volume of communication has also resulted. Far reaching economic benefits are foreseen.

"Since early 1956 when the first link out of Havana was put into operation, the system has provided new telephone and teletype facilities to many other cities throughout the country. It is expected that the entire system, stretching from the eastern to western tips of Cuba, will be completed by the end of 1958."

The backbone of the network consists of thirty microwave stations located along the center of the island. Of these stations twenty-three have been completed, while others are being installed and under construction. The main portion of the system will provide sixty-six telephone and ninety teletype circuits for public telegraph service as well as various branches of the government. These circuits total 30,000 miles.

Areas of the island not directly served by the main

Cuban labor constructed the microwave network under the technical supervision of RCA engineers.

microwave trunk will be connected to it by branch circuits to 110 satellite stations. To date twenty-three of these stations have been completed, and thirty-five more are in various stages of construction. These satellite stations will also provide service with various types of mobile units.

Private Lines Available

Some of the satellite stations will be used to extend the public teleprinter service for the Havana area and others will provide service in localities not served by the original system. Private "leased line" facilities will also be made available to sugar mills, and similar agricultural and industrial organizations. Mobile microwave units are included.

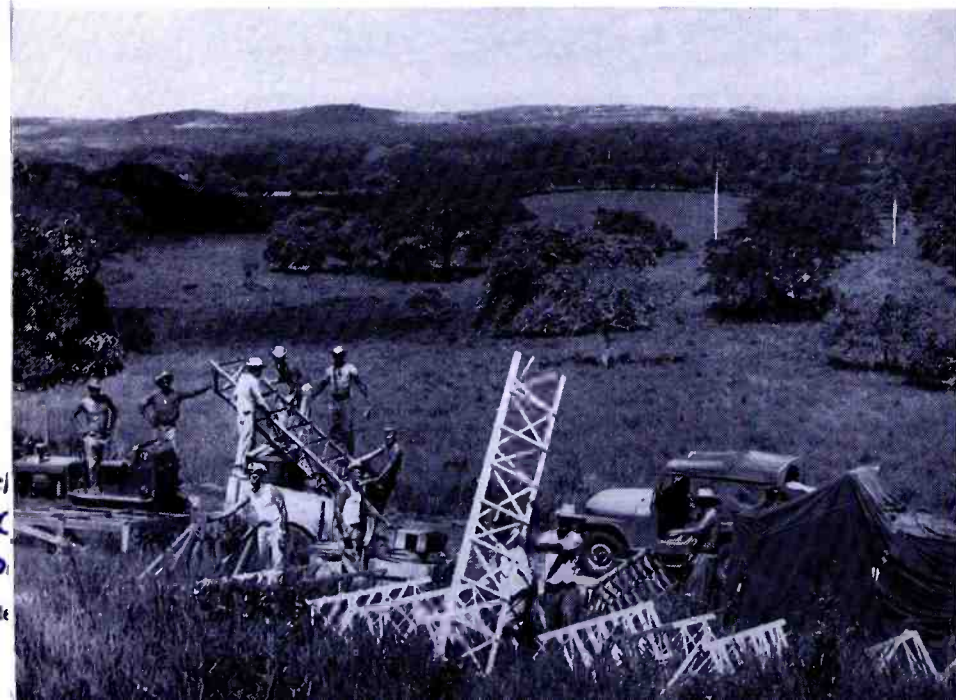
A vital role of the entire network will be the transmission of weather maps and data to the Cuban Naval Observatory in Havana which is participating in the U. S. Weather Bureau program to give improved hurricane warning service. All station buildings and antenna towers in the microwave system are designed to be hurricane proof.

Among the island's principal cities connected by the system, with direct telephone and telegraph service to the nation's capital, are Pinar del Rio, Havana, Matanzas, Santa Clara, Cienfuegos, Camaguey, Holguin, Santiago de Cuba and the U. S. Naval Base at Guantanamo.

The trunk system operates at a frequency of 2,000 megacycles while the satellite stations utilize 150 megacycle equipment.

Mr. Reed pointed out that construction of the network is being performed by Cuban personnel under the technical supervision of RCA engineers. RCA has organized a school to provide Cuban technicians with the specialized training for the installation, operation and maintenance of the system. Sixty-five men have already graduated from the school's intensive training course in electronic communications.

"The Cuban microwave network reflects the growing development of telecommunications throughout the world," Mr. Reed said. "RCA is engaged in similar engineering work in Colombia, Venezuela, the Dominican Republic and Pakistan."





Proper record care gives even better results on the RCA Victor Mark VI Orthophonic hi-fi "Victrola."



'CARE' and 'FEEDING' of Records

Advice from experts for record collectors

RECORDS are thin, round, usually black plastic discs. As they are inanimate and silent, unless spinning, they are often neglected, mistreated and ignored. Records do not respond to this treatment kindly. They give their best performance when pampered and respectfully handled.

There are do's and don'ts of record care that can give the record owner greater satisfaction and longer play from his pets. Starting at the dealer's where you buy your record, it is advisable *not* to play the record there. This will prevent scratching by a bad stylus. Nowadays records come with an inner sleeve to protect them and it's a good idea to keep them encased in this inside their jackets.

When a record is removed from its case, it should be handled only on the outer edge. If oil or dirt on the hands gets on a record it will attract and collect dust which acts as an abrasive that the stylus grinds into the record's grooves.

Before playing a record, it is advisable to dampen a lint-free cloth in water, or an anti-static solution and pass it lightly over the record's surface. This will insure its being dirt free before you play it. Cool moisture doesn't hurt records but any liquid solvent is harmful, such as alcohol, benzine, acetone or cleaning fluids.

Over the years, the vinyl material of which records are made has been improved and toughened to resist damage, but they do have a breaking point, melting point, and most of all, a scratching point. Human finger nails are harder than records.

An ingredient called "coldflow" is a property of all plastics which causes them to "droop" with an increase in temperature. Records should be kept away from radiators, heaters, fire places and other excessively warm

places. Another characteristic of plastic is that it has "memory," which means that it tends to revert to its original state when over-heated. One hundred twenty degrees is the warping point. On the other hand, extreme cold makes records more brittle.

The weight of your tone arm is critical. Excessive weight can cause wear. And the stylus should always be in good condition. A worn or chipped needle can cause scratching, skipping and excessive wear. It is wise to remember that a diamond stylus can give 400 to 500 hours of play, a sapphire stylus about forty to fifty, and a steel tip lasts four to five hours. The damage done by worn-out styli cannot be repaired.

In turning a record over, it should be flipped by holding on to its outer edges. Groove guard records do not actually touch each other during play except at the labels. The groove guard protects surfaces by a slight recessing between the bead at the outer edge and the label in the center. About 50% of records made today are groove guard.

A warped record can make those on top of it sound "off." Make sure that warped records are not played with others. To keep your records from warping, it is wise to stack them on end rather than flat, even though their stiff jackets are designed to keep them from warping.

It doesn't usually injure records to play them on old equipment, but remember that the tone arm is heavier on old equipment, which usually doesn't have a diamond stylus and whose sound could be inferior.

Well cared-for records can give years of satisfying play and make fine flying saucers for the kids when usefulness is over.



Tomorrow's Customers

Schoolchildren visit
RCA's Hall of Progress

A GROUP of high school students filed quietly into the thickly-carpeted room, looked with interest at exhibits lining the walls, then took their seats, like a class preparing to hear a teacher talk about geometry, history or English.

But this was different. It was a typical field trip visit to the RCA Hall of Progress at Cherry Hill, N. J. This class had traveled some nineteen miles by bus, crossing the Delaware River from Pennsylvania to New Jersey in the process.

Students, from sixth graders through high school age, are among the best customers at the Hall of Progress, which highlights the history of radio, television and recorded sound from the earliest days.

An open invitation is out to school classes from practically anywhere within traveling distance to visit the unique museum on Route 38, some six miles east of Camden.

The young visitors come from as far away as Reading, Pennsylvania, a trip of well over 100 miles.

To date, thousands of school children have trooped into the museum, ogled in disbelief at the early, primitive-looking phonographs, expressed delight over hearing a playback of their recorded voices, and clamored to see color television.

Word-of-Mouth Publicity

Each trip has its beginning when Emil A. Dodelin, RCA Hall of Progress Manager, receives a telephone call or letter from an interested school teacher. The teacher may have learned of the Hall of Progress through pro-

motional channels, or, as is often the case, via word-of-mouth — for RCA strives hard to make each visit a memorable one.

A future date is set for the class trip, and if the youngsters have an unusually long jaunt, arrangements are made for them to eat in the company cafeteria.

The class is greeted at the front door and escorted into the Hall of Progress (just off the main lobby) where Mr. Dodelin and Fred K. Homer, Assistant Manager, take over.

Seats are provided at one side of the museum for a short, interesting lecture — illustrated with actual RCA products.

Mr. Dodelin usually starts his talk with a brief background of RCA history, and a reference to the famous 1916 memo regarding a "radio music box," as the key to radio broadcasting. The memo was written by a young radiotelegraph official, David Sarnoff, now Chairman of the Board of RCA.

Display contains David Sarnoff's 1916 memorandum on the "radio music box" — the key to radio broadcasting.





Highlight of the tour for all student groups comes when they are allowed to record their own school song.

Then, Mr. Dodelin will point out an early "Victrola" phonograph exhibit in the museum — such as the "trade mark" model — and explain its development and eventual evolution to the next, improved model.

History of Radio, TV

Following the phonograph story, the lecture usually swings back into the history of radio, and winds up with television. Commercial and defense electronic products, records and electron tubes are also mentioned.

Mr. Dodelin effectively illustrates the vast improvements in recording by playing a record on an early "Victrola" phonograph, then playing the same record on a new Orthophonic high fidelity model.

He does the same in radio and television, and actually switches on these sets to prove that they still play — although many are anywhere from 10 to 40 years old.

The evolution of radio, TV, phonograph and records is pointed up by these displays, chronologically set up along the walls in specially built cases.

All the historical sets are in operating condition, and never fail to impress visitors when they play at the flick of a switch.

"Many pupils, who are too young to remember pre-television days, absorb quite a bit from our demonstrations," says Julius Haber, Director of Community Relations, who has over-all responsibility for RCA's permanent exhibits.

"Our exhibits, lectures and demonstrations at the Hall of Progress give a quick — but basic — course in



Students find early radios and phonographs fascinating, are always impressed when old models actually work.

the history of the radio, phonograph and television fields — a story that RCA Victor is uniquely fitted to tell because of its pioneering leadership in all three fields.

"These young visitors of today will be our customers of tomorrow and I can think of no better way to build future RCA customers."

Many of the hundreds of persons who visit the Company's Cherry Hill facilities daily take time to step into the Hall and "browse around" — looking at color television in operation, listening to a demonstration of RCA's new "Stereophonic Sound," or just looking at some of the older sets that stir memories.

Recording School Song

Following the lecture and demonstration the high point of the visit — as far as many of the students are concerned — is reached. They record their school song or individual voices on an RCA tape recorder, and the results are immediately played back amid reactions of delight and embarrassment.

If color is being telecast at the time of the visit, the RCA color set is turned on and the visitors get a chance to see RCA Victor Big Color TV — many for the first time.

"We know from past experience that the favorable impression which RCA and RCA Victor products and services make on school children often has a lasting effect in terms of future customers," says Emil Dodelin.

"We try to generate that kind of an impression at the Hall of Progress."

RCA . . . Good Neighbor



Ewen C. Anderson, Exec. Vice President, Public Relations, accepts award for RCA's community service from South Jersey Public Relations Assn.

THE Radio Corporation of America is "one of the neighbors" in nearly three hundred communities throughout the United States.

That is the number of locations in which RCA operates—factories, laboratories, offices, warehouses, broadcast and communications stations, service branches. All of these units have established some kind of friendly working relationship with the communities in which they operate, as a company and as individuals.

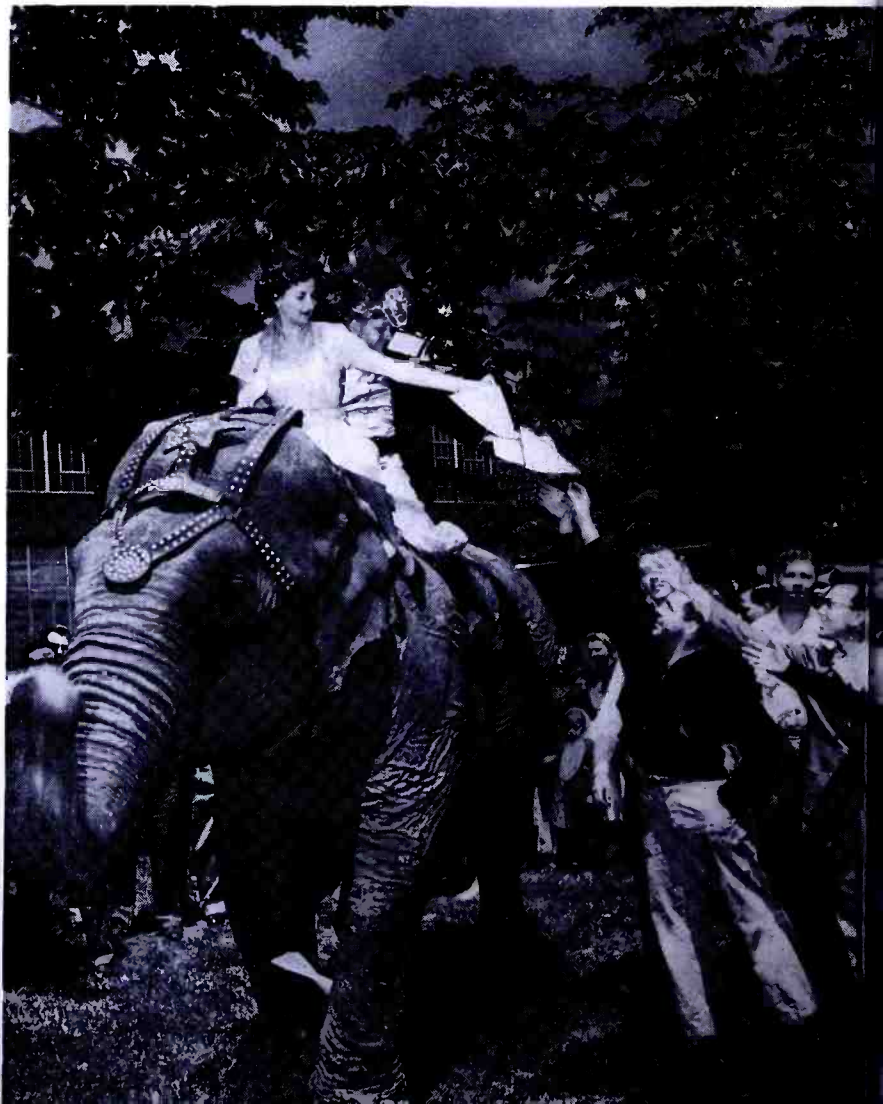
Community participation requires the donation of time and money to many causes. RCA has supported and contributed to every worthwhile cause with which its employees have come in contact. Community Chests, local and national charities, blood banks, savings bond programs, disaster relief, medical and health needs, youth programs, these are only a few of the different kinds of community participation to which RCA and its individual employees contribute.

Donations to funds and charities are made as a matter of company policy, taking into consideration the size of a given plant, number of employees, budgetary needs of the agency, and the recommendations of local

Camden Plant employees are given applications for savings bond purchase by volunteers riding an elephant.



Nicholas J. Cappello, Personnel Manager, Defense Electronic Products, visits agency in Camden, N. J., providing care for neglected children.



RCA executives. And, these donations are substantial ones. For instance, one such gift, to the Bloomington, Ind., United Fund amounted to \$15,000.

Employee contributions give much needed support to hospital drives in particular. One such campaign in Camden, which oversubscribed its goal of \$6,600,000, was sparked by RCA employees from the initial planning phase. A similar effort in Indianapolis, where Company and employees gave of their money and time, raised \$12 million for a five-hospital United Building Fund.

RCA volunteers sponsor youth activities at many Company locations. Employees act as advisers in Junior Achievement groups, which help young people learn the elements of business organization and operations. At the Moorestown plant (see story on page 20) RCA engineers gave a 12-week course for 20 high school students to acquaint them with engineering as a profession. Hundreds of classes from grade school through college level are regularly conducted on tours of the RCA Exhibition Hall in New York, the Hall of Progress

in Cherry Hill and the Company's permanent exhibit at the Museum of Science and Industry at Chicago.

Last year the South Jersey Public Relations Association Annual Award for Community Service was presented to RCA "in acknowledgement of its outstanding corporate good citizenship." In accepting the award, Ewen C. Anderson, Executive Vice President, Public Relations, said that the company's overall objective is to help make each community in which it operates a better place to live and work.

"We regard our corporate duties and responsibilities," he said, "as being the same as those of the individual citizen — to contribute to the community's progress, as well as to benefit from it.

"A Company such as ours seeks to carry out its civic responsibilities in two major ways. First, the Company assumes a fair share of the contributions to the financial support of worthwhile community projects. Second, the Company encourages its people to participate with their talents, their experience, their time and their own money in support of progressive community endeavors."

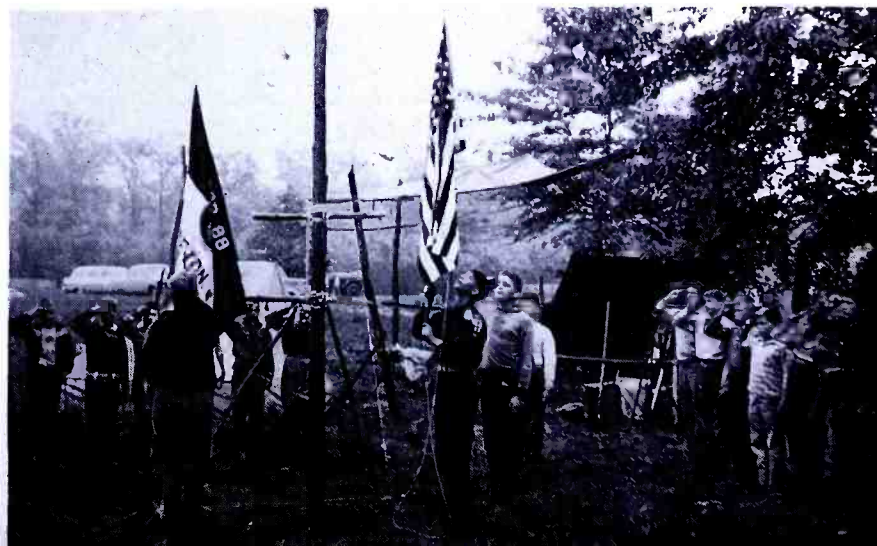
Over 300 RCA-NBC employees have won Red Cross commendations for donations to the New York area blood bank.



Boy Scouts hoisting flag during one of their frequent camporees on the grounds of the David Sarnoff Research Center in Princeton, N. J.



JARCA Junior Achievement girls selling their products in the Harrison, N. J., Plant cafeteria.





George Gobel

PRIZE FOR A DAY

GEORGE GOBEL himself was given away as a first prize in a national television contest. His sponsors, Radio Corporation of America and Whirlpool Corp., gave the diminutive monologue specialist as a prize for a day to the winner of a contest aired on "The George Gobel Show" and on the NBC network show, "Today", conducted by Dave Garroway.

Mrs. Fred J. Schneider, wife of a referee in Cincinnati's Probation Court won Gobel for the city of Cincinnati and for twenty-four hours on November 20-21 Gobel was at the disposal of the citizens of the Queen City, body, talent and all.

"I don't know what the people of Cincinnati will ask of me," said Gobel, "but, if they want me to shinny up a greased flagpole or milk a purple cow, I'll do it. I'm a prize — and prizes don't talk back."

Arriving at the Greater Cincinnati airport Gobel was met by high school bands, majorettes and cheerleaders,



Gobel was met at the Cincinnati airport by an Air Force guard of honor and high school drum majorettes.

At St. Aloysius Orphanage, Gobel received an orchid from a four-year-old, sang, danced, played checkers — and left behind a portable RCA Victor television set.





On Ruth Lyons' WLW "50-50 Club" show, Gobel presented Ohio's governor fruit from governor of California; at Central High School he served in cafeteria line and was later made honorary fireman.

an honor guard platoon of Air Force sergeants, a Mayor's Committee, the city's three television editors, who acted as co-hosts for Gobel, and representatives of television, radio, newspapers, and *TV Guide*. Colonel Woods Rogers, USAF, presented Gobel with a U. S. Certificate of Appreciation for his work in connection with Air Force recruiting. Prize-winning Mrs. Schneider officially turned Gobel over to the City of Cincinnati.

Gobel's Cincinnati Day began the following morning. He donned RCA Service Company coveralls and personally delivered Mrs. Schneider's real prizes, an RCA Victor "Aldrich" color TV set and an RCA Whirlpool freezer, to her home. Wittekind Terrace, the street of her residence, was changed to Gobel Terrace for the day.

At Central High School, an honor guard of twenty strutting majorettes escorted Gobel into the cafeteria where he served lunch to the students until someone produced a guitar. That ended lunch.

On leaving, enroute to Station WLW, the majorettes

bodily carried him outside to a waiting cavalcade of limousines. On Ruth Lyon's "50-50 Club" show, broadcast over WLW to Cincinnati, Columbus, Dayton and Indianapolis, Gobel presented Gov. C. William O'Neill of Ohio a goodwill basket of fruit from Gov. Goodwin Knight of California.

At the St. Aloysius Orphanage he entertained a couple of hundred children who had been assembled from various Catholic orphanages throughout city.

At the Cincinnati Fire Department Chief Dan Vogel made him an honorary Fire Chief for the day.

In a borrowed fire engine, Honorary Chief Gobel and Chief Vogel rode to downtown Fountain Square where Gobel turned policeman. After tying up the evening rush hour traffic in sixty seconds flat, Gobel left to attend a March of Dimes meeting. There he urged workers to support the "Mothers' March" next January.

The promotion department at Kenyon and Eckhardt advertising agency arranged the tour.

He donned RCA service uniform to deliver color TV set to home of real prize winner.

As honorary traffic cop Gobel tied up evening rush hour traffic in sixty seconds flat.



STUDIO: THE WORLD

(Continued from page 9)

these optical techniques to be transferred by electronic means into television.

The "Chroma-Key" process, or colormatte as it is sometimes called, enables television to:

- ▶ project live action against any background (film, slide shots or even live), no matter where located.
- ▶ use representational or non-representational, fixed or mobile backgrounds.
- ▶ use elaborate and distant scenes or structures to be shown as backgrounds at limited cost.

Heretofore, television has had many of the same limitations as the stage in presenting plays and other dramatic offerings. Only elaborate and expensive productions could afford more than two or three sets at most. The perfection of the "Chroma-Key" process promises to free television from these limitations to a great extent, permitting the same wide range of settings that are enjoyed by movie makers.

The technical difficulties have been largely overcome, but many technicians, directors, producers and lighting experts will have to gain experience and training in the use of these techniques before the full potentialities of "Chroma-Key" can be realized. It does not of course, mean the end of stage settings for television plays. Many stationary settings, particularly interiors,

will still be used. But the writer and the director are no longer arbitrarily restricted to one or two locales.

A story can begin, say, in a New York apartment, which will be presented in an ordinary stage setting. If the script calls for the next sequence at the top of the Eiffel Tower in Paris, this scene can be introduced by "Chroma-Key" using either slides or stock film shots. Other sequences of the story can take place on a transatlantic liner, on top of a peak in the Alps, or at the rim of the Grand Canyon, all inserted into the telecast by "Chroma-Key" with no break in the continuity.

The method literally puts the world at the disposal of the writer and the director. Studios will suddenly find new uses for their libraries of stock film shots, slides, paintings and photographs from all corners of the globe. Scenes from the jungle, the veldt, the steppes, south seas islands, cities, villages, shrines are ready for instant use in these libraries.

Economically, "Chroma-Key" will effect tremendous savings by the elimination of individual scene paintings and in set construction. Rather than having an artist paint a forest or jungle scene for a safari story, the actors can be inserted into a film clip of the actual jungle with live lions moving about.

The use of "Chroma-Key" will, on the other hand, make even greater demands on the dramatic talents of actors and actresses. It is one thing to project an emotional mood in a simulated "actual" setting, say, the mood of reverence in an elaborate cathedral setting. It is quite another to put across the same feeling when acting on a bare stage.

Film TV Portrait of Rome

DOCUMENTING a great city on film is a tremendous undertaking. And, when the city is Rome, with all of its officially protected art treasures and ruins, the preliminary red tape involved in getting permission to film sacred and historic sites can be discouraging.

Overcoming such obstacles became routine for the NBC-TV production unit that filmed the four-part series "Rome Eternal," being shown this month on "The Catholic Hour."

Headed by NBC producer Doris Ann and director Martin Hoade, of the National Association of Catholic Men, the unit spent over six weeks committing the glories of Rome, the "Eternal City" to film.

The series, largest single project ever undertaken by "The Catholic Hour," presents Vatican art treasures, recent excavations under St. Peter's Basilica, Christian art of the Renaissance, and historic sites famous in the early history of the church.

The last program in the series features an audience with the Pope himself, with glimpses of the Pontiff's private apartments, the Vatican post office, radio station and mosaic factory.

NBC-TV production unit spent six weeks filming a four part series on Rome for "The Catholic Hour."





Surveying Color TV Trends

WHAT kind of people are the first to buy color television receivers? . . . What effect does color have on viewing habits? . . . What can color TV offer to advertisers? . . .

For answers to these and related questions, the television industry and the advertising profession are keeping a close watch on "Colortown," a major survey underwritten by the National Broadcasting Company and Batten, Barton, Durstine and Osborne, one of the nation's leading advertising agencies.

Colortown is a typical medium-sized American community selected for study as a living laboratory. A panel of 4,000 homes has been selected, and these homes are periodically re-contacted in order to trace the pattern of color television's growth.

Evaluating Color Potential

The survey is designed to evaluate the potential of color television both as a mass medium which will soon be reaching millions of homes, and as an advertising vehicle offering unique advantages.

Already accepted is the concept that color television is the most complete advertising medium — combining sight, sound, movement, demonstration and color. One of the objectives of the Colortown project, was to measure this power through statistical methods.

An interim report, recently released, sums up findings to date. While color circulation in the selected city is still relatively low, several significant trends have emerged as a result of the study.

Findings To Date

Who owns color sets? Present color owners earn more, live better. Seven times as many color owners as black-and-white owners fall in the high-income groups. One quarter more own their own homes.

Color owners are more influential, more active in the community. They belong to more church organizations, more social clubs, do more fund-raising, take part in more civic and business associations.

Are owners satisfied with color TV? A total of 91 per cent of all owners were satisfied with the performance and effectiveness of their sets. Of this group, 54 per cent said their sets were actually performing better than they had expected. Less than 3 per cent said they were dissatisfied because of too many service calls.

Of the group interviewed, 83 per cent reported they had recommended the purchase of color receivers to their friends.

How does color affect viewing? Color doubles the audience for TV programs on a per-100-homes basis. More color homes watch the shows, and there are more viewers per set. Color appears to induce increased viewing among a group which ordinarily views at a less-than-average rate.

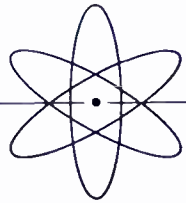
Color owners will watch a program in color when they would not care for the same program in black-and-white.

How effective is color for advertisers? Color was found to provide a tremendous boost in the effectiveness of TV commercials. As an indication of this effectiveness, respondents said they were "more inclined to buy the product" when they saw it in a color commercial. This "inclination to buy" was two-thirds higher than among monochrome viewers.

As another indication, both color and black-and-white viewers were asked to name — unaided — the products advertised on color shows they had seen a week earlier. The number of products named per 100 homes was almost four times as great in color homes.

Why did owners buy color sets? More than half the color owners said they had purchased the sets because they had seen one or more programs in color and were impressed.

Who enjoys color television most? While reaction was favorable at all income levels, it was found that the lower the bracket, the more enjoyable color was found to be. Highest interest was in the under-\$5,000 income group.



Briefly Told . . .

Vice Presidential Commendation

A personal commendation from Vice President Richard Nixon greeted Tony Scott, jazz clarinetist, on his return from his recent tour through Europe and Africa. Scott, who records exclusively for RCA Victor, spent eight months on a personal goodwill tour, in which he not only gave concerts but played American music with musicians from abroad.

"I am sure that you had many memorable experiences while you were visiting the different countries," Mr. Nixon said in the commendation, "and that you were able, through the medium of music — when language was a barrier — to create among the musicians with whom you met, as well as your audiences, a feeling of friendship for our country."

Tony Scott's most recent record release, the Complete Tony Scott, is one of RCA Victor's best sellers in the jazz field.



"Radiomarine" Gear . . .

Anglers can have their fish-finding work done for them by new equipment being shown by RCA this month at the 48th Annual National Motor Boat Show in New York's Coliseum. Electronic navigation, communications and fish-finding gear for pleasure craft and small commercial vessels are being demonstrated at the Show by RCA "Radiomarine" Sales.

The "Lodar" system for small craft provides both horizontal and vertical scan of ocean depths for fish-finding and depth-sounding. A new navigation

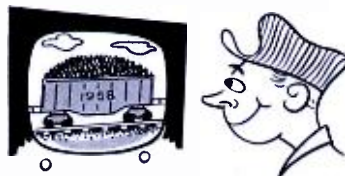
radar system gives maximum clarity in short ranges of one to four miles and long ranges of twelve to thirty-two miles. The system can, in addition, detect objects within twenty yards of the vessel. The "miniskop," fish finder features a shallow-water range from zero to sixteen feet, as well as ranges up to 500 feet deep. A 15-watt radio-telephone is designed for ship-to-shore and ship-to-ship service; it provides twenty channels of operation.



Global Sales . . .

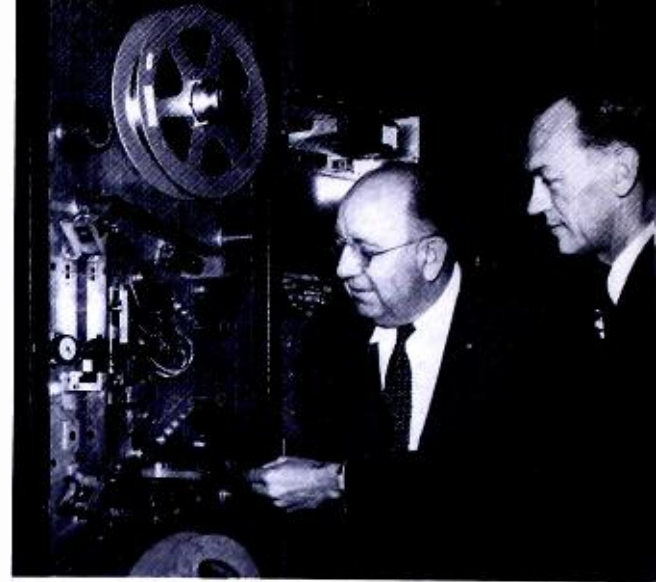
"Shoot for the Moon" was the theme of the RCA International Sales convention held in New York from November 17 to 23. In an atmosphere that was liberally sprinkled with "launching platforms," "guided missiles," and "space ships," Regional Managers and Field Representatives from all over the world sat in on a discussion of RCA's plans to reach new heights in customer benefits, profits and services for 1958.

Held under the direction of Michael F. Dowley, Jr., Director, Export Operations, RCA International Sales, the convention held sessions at the Warwick Hotel in New York, the offices of RCA Victor in Cherry Hill, N. J., and the Distribution Center of RCA International in Clark, N. J.



Railway TV Network . . .

An RCA closed-circuit TV network now keeps tabs on all freight opera-



Latest advance in RCA video tape for color is examined by Theodore A. Smith, right, Executive Vice President, and George H. Brown, Chief Engineer, of RCA Industrial Electronic Products.

tions in the Southern Railway's new \$20 million yard in Atlanta, Georgia.

A clerk at a master console can "see" and identify all freight cars rolling into the yards on six inbound tracks over distances of more than two miles. The nation's largest industrial television system for automatizing complex railroad freight operations, the network consists of ten TV cameras. Each camera is paired with a standby unit that can be switched automatically into emergency service.

Era of TV Tape . . .

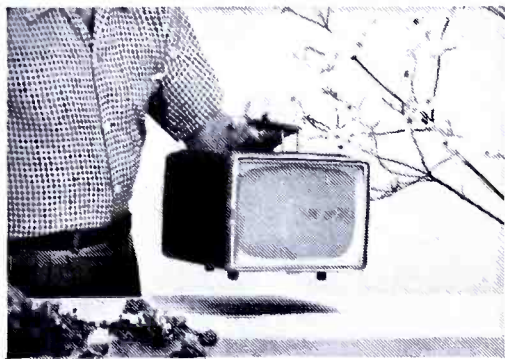
The era of magnetic tape television — both in color and black-and-white — will be launched this Spring by NBC.

Robert W. Sarnoff, President, made the announcement on November 4 at a press demonstration of RCA video tape at NBC's Color City studios in Burbank, California, attended by more than 100 television editors from all over the country.

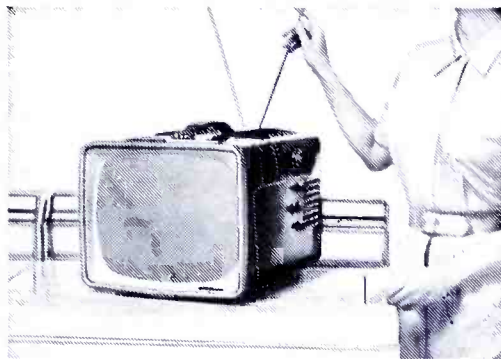
Mr. Sarnoff said that by means of magnetic tape recordings, color TV programs will be made available on regular time schedules throughout the country. This will be accomplished through the construction of a new \$1,500,000 video tape central in Burbank, and a similar tape central at Radio City, New York.

Introduction of magnetic tape will end scheduling problems and confusion caused by time zone differentials.

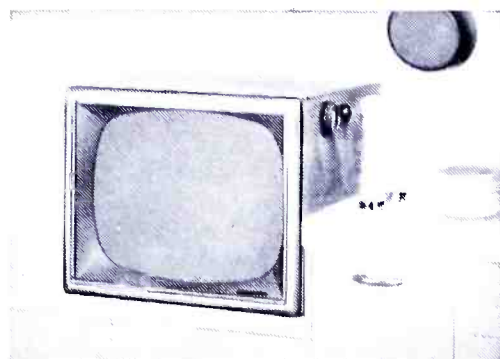
You name the place—any place in your home RCA Victor has the TV to fit it—perfectly!



Puts the show on the patio—or any place else you like. Smallest, smartest TV of all with sharp 36 sq. in.* picture, handle, antenna connection. "Personal." Ebony. (8PT701) \$99.95.



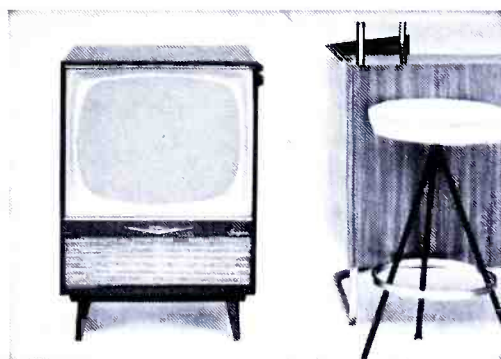
Makes light of the laundry! Pleasure is as automatic as the washer with this compact, easy-to-carry portable. "Living Image" 108 sq. in.* picture. *Wayfarer*. Red. (14S707) \$149.95.



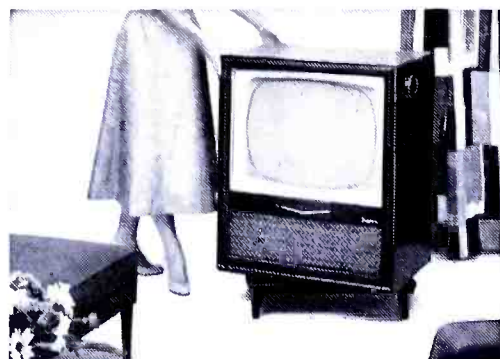
Serves you in the kitchen—with easy lookin' while you're cookin'. In good taste on any table. 261 sq. in.* screen. *Dixon*. Lined oak grained finish. (21U715) \$229.95. Other finishes \$219.95.



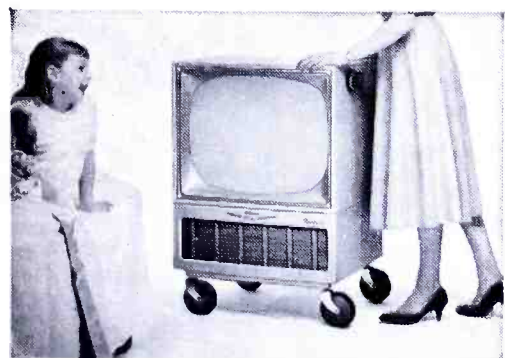
Saves space in small apartments—in a big way. This sleek Deluxe table model is ideal—makes any room roomier. 261 sq. in.* picture, many extras. *Bailey*. Tawny gold. (21D717) \$239.95.



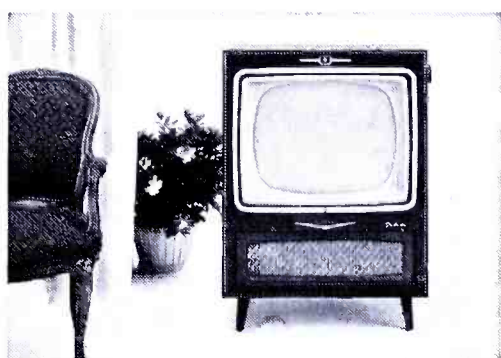
Sits pretty in the playroom, fits in with the fun perfectly. Terrific value in console styling. 261 sq. in.* picture. Balanced Fidelity Sound. *Eaton*. Mahogany grained finish (21T735) \$249.95.



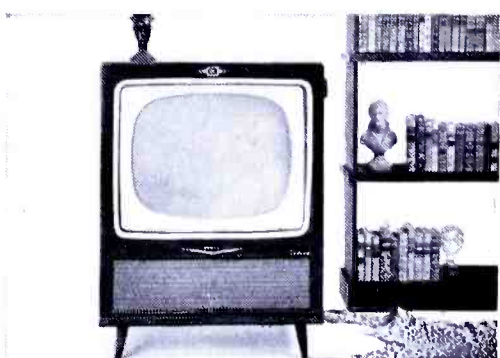
Aims to please—anywhere. Swivel TV makes every seat front row center. Phono-jack for record player. Balanced Fidelity Sound, 261 sq. in.* picture. *Enfield*. Mahogany grained finish. (21T738) \$299.95.



Rolls entertainment into the sickroom. Good medicine on rubber-tired wheels! Deluxe sound, tuning and 329 sq. in.* picture. *Oakmont*. Lined oak grained finish. (24D729) \$299.95.



Goes formal in your living room. Handsome is and handsome does this Deluxe TV with 3-speaker Panoramic Sound and 261 sq. in.* picture. *Whitman*. Mahogany grained finish. (21D744) \$349.95.



Puts a man-size picture in your den. You'll get the picture bigger-than-life (329 sq. in.*) and superlative 3-speaker sound, too! *Ellsworth*. Mahogany grained finish. (24D754) \$369.50.

See black-and-white TV from \$99.95 and Big Color TV from \$495 at your RCA Victor dealer's



RCA VICTOR
TRADE MARK
RADIO CORPORATION OF AMERICA



Manufacturer's nationally advertised VHF list prices shown. Prices and specifications subject to change. UHF optional, extra (not available on "Personal"). Some sets slightly higher for West and South. Most models available in Canada. At your service: RCA Victor Factory Service Contracts available in most areas but only to RCA Victor owners. Special low-cost 1-year contract on "Personal" or portable—only \$14.95.

*Square inches of viewable picture area	36	108	261	329
Picture tube, overall diagonal	8"	14"	21"	24"



Every 3 seconds!

Every three seconds, an RCA Factory Service Technician performs a service call somewhere in the United States!

That means, in the time it takes you to read this ad—approximately 45 seconds—15 contacts were made all over the country. Fifteen RCA Victor TV owners have taken advantage of their exclusive opportunity to call RCA's own technicians for service!

As the sole RCA consumer-contact, the factory technician is truly a "goodwill ambassador" for RCA products.

He specializes on RCA Victor television, uses RCA parts exclusively, and works out of the friendly neighborhood branch of RCA Factory Service.

No wonder so many customers count on him for technical advice, especially on color TV! No wonder he lays the groundwork for RCA Victor "Living Color" sales!

Yes, it happens every three seconds—RCA Factory Service Technicians make contacts that create color-conscious customers!



RCA SERVICE COMPANY

A DIVISION OF RADIO CORPORATION OF AMERICA

CAMDEN 8, NEW JERSEY