

SUPPLEMENT TO

NEW YORK

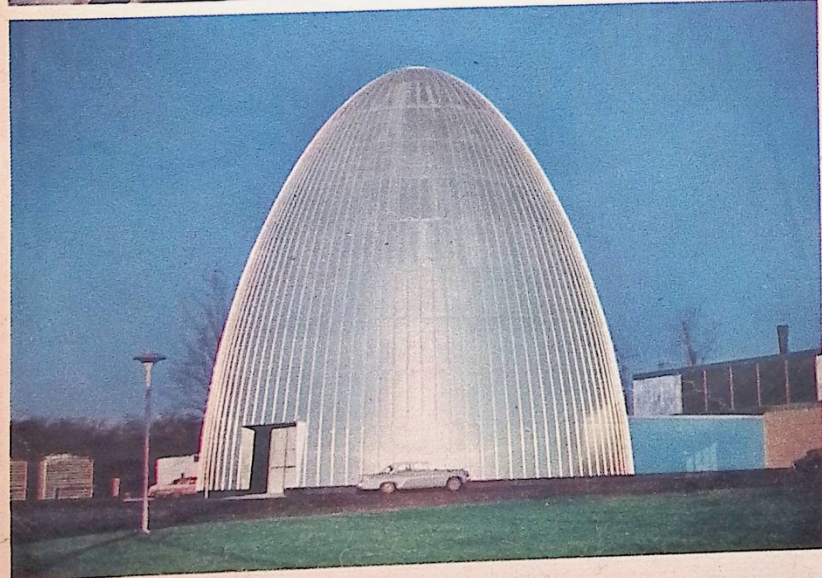
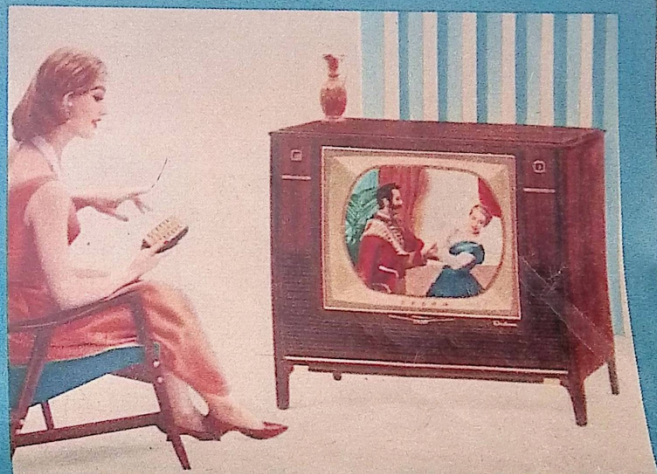
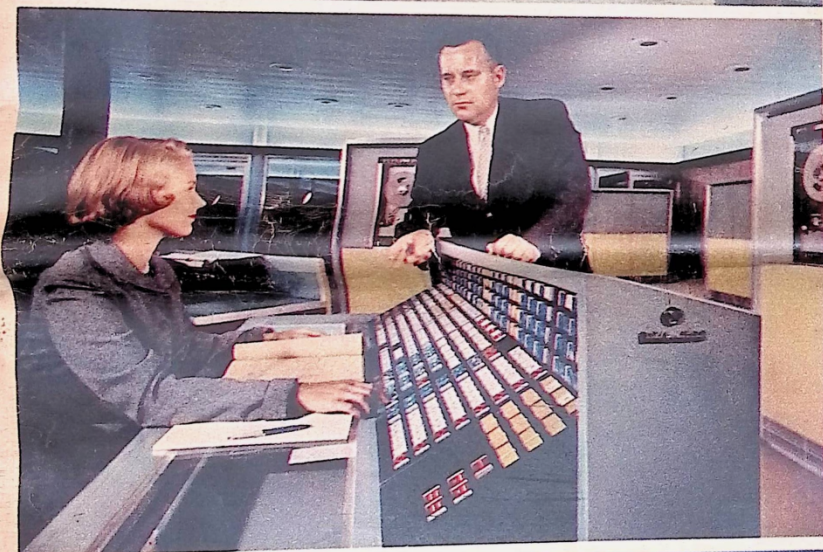
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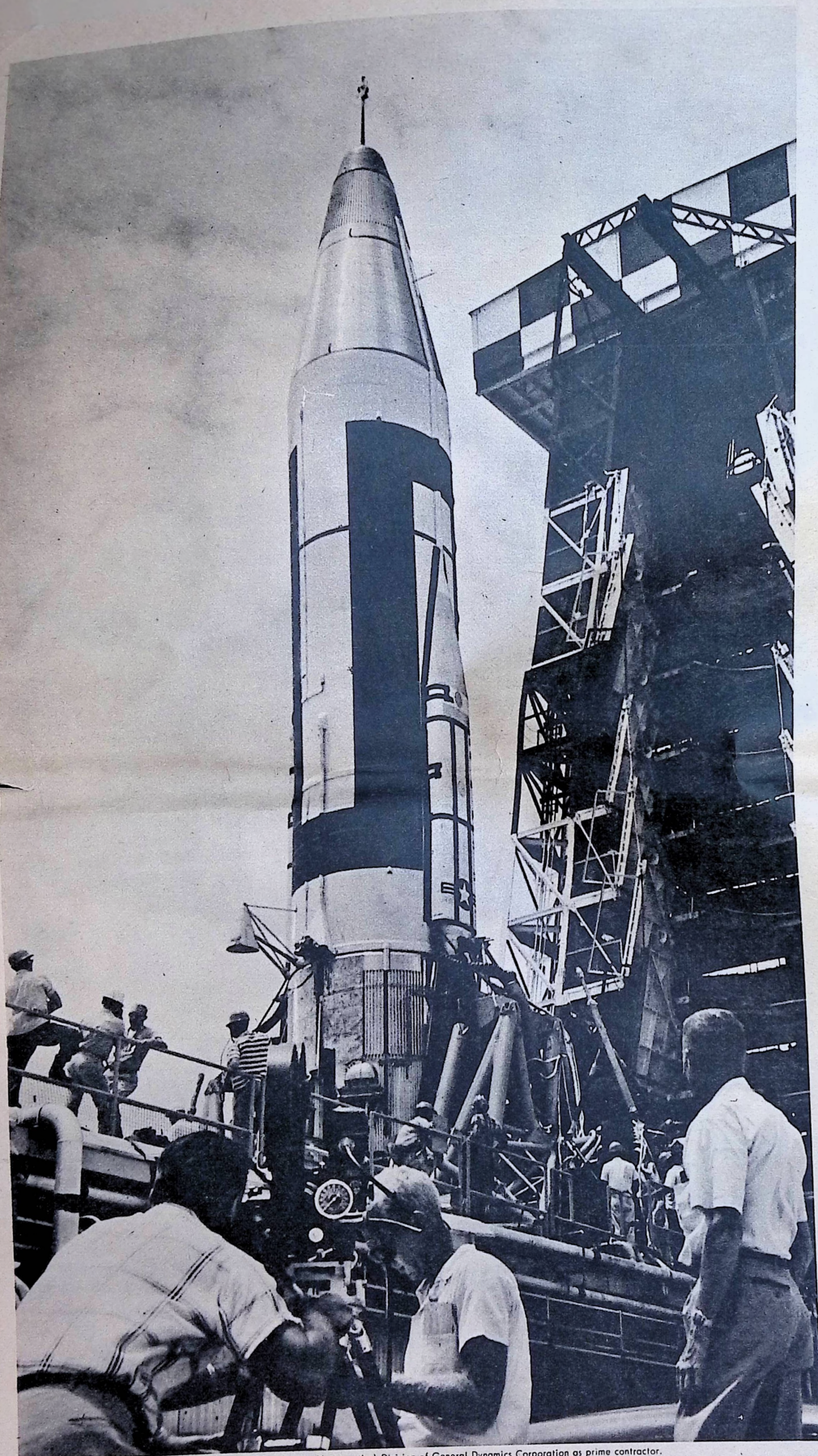
SECTION 11

SUNDAY, NOVEMBER 1, 1959



40th Anniversary Supplement





Atlas missile, built by Convair (Aeronautics) Division of General Dynamics Corporation as prime contractor.

RCA ELECTRONICS CUTS DOWN THE C O U N T D O W N

To our missile experts, "is it ready" is almost as important as "how far can it go." For retaliatory power, missile crews must be able to launch a maximum number of missiles in rapid fire order.

America's intercontinental ballistic missile, the Atlas, had already proved itself for distance—6,000 miles or more. But checkout and launching took several hours. So the next step in turning the missile into an operational weapon was to make it ready for quick action. RCA was selected to build an electronic system that would radically reduce the countdown time at the Atlas Operational Bases now under construction.

Now, in a matter of minutes, this elaborate electronic system can determine if any part needs attention—or signals that the missile will be ready to go.

This automatic checkout equipment and launch control system for the Atlas is one more of the many ways in which RCA Electronics works to strengthen our national defense.

**RADIO CORPORATION
OF AMERICA**



**DEFENSE ELECTRONIC DIVISION
CAMDEN, N. J.**

**R.C.A.,
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By Jo

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R. C. A.
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HERALD TRIB

From Crystal Sets to Space Ships

R.C.A., 40 Yrs. Old This Fall, Deals Mostly In Products That Didn't Exist in 1945

By John G. Rogers

FORTY years old this autumn and now the world's largest firm engaged solely in electronics, Radio Corporation of America is progressing so rapidly that 80 per cent of its more than billion-dollar business is in products that did not exist fourteen years ago.

As leader in the electronics industry—one that has jumped in twenty years from forty-ninth to fifth place among American industries—R. C. A. manufactures a constantly growing variety of electronic marvels ranging from tiny transistors to mammoth radars for the nation's defense system.

A keystone in the development of R. C. A. from a small communications firm with 457 employees to a big diversified one with more than 80,000 employees, has been research, research and more research, under the over-all direction of David Sarnoff, the board chairman, who has guided the company's growth almost from the outset.

Millions for Research

Into research on black and white television, for example, R. C. A. put \$50,000,000, and \$130,000,000 went into the research, development and production of compatible color television as R. C. A. advanced it from laboratory to commercial television.

R. C. A.'s already extensive research setup was greatly stimulated by critical demands in the electronics field during World War II, a period in which the firm suspended all civilian production for war work. Post-war consumer demands maintained the pressure on research, and today R. C. A. has one of the world's largest and

busiest research organizations working around the clock at seven laboratories in four states, Japan and Switzerland on projects almost too numerous to catalogue.

R. C. A. is already well into work in the field of space exploration. John L. Burns, its president, taking just a brief look at the future of the virtually unlimited application of electronics, has this to say:

"Electronics will make it possible, simultaneously, to probe the far reaches of the universe and the invisible world of the atom. It will help achieve levels of productivity far beyond the capacity of human hands and eyes. Electronics will bring into the American home new conveniences and new opportunities for personal advancement.

Industry Stimulation

"It will stimulate the growth of existing industries, and lay the foundation for many new ones. It will provide a protective military shield behind which all our advances will be made."

The company which, through radio and television alone, has touched the life of just about every American of this era and many millions abroad, has gone through several phases since it was founded on Oct. 17, 1919.

First, for several years it was merely a communications firm sending radio messages to foreign countries. Next, it entered radio broadcasting in that industry's infancy and, after founding the National Broadcasting Co., went on to become a giant in the radio and television fields.

Meanwhile, R. C. A. became a manufacturer of radios and radio equip-



A landmark of New York—and the electronics industry.

ment, phonographs and records and subsequently of television sets. Long associated in the public mind solely with the entertainment business, because of association with phonographs, records, radio and television, R. C. A. has for several years been carrying out a major diversification of its activity.

Mr. Burns, one of whose principal assignments was diversification when he joined R. C. A. as president early in 1957, explains the broadening of the base of output in the company's twenty-three factories in eight states:

"In just the last two years the non-entertainment aspects of R. C. A.'s business have increased by more than 30 per cent. We have created fifteen new units to move decisively into such growth activities as missiles and satellites, automation, electronic data processing and atomic energy.

New Products Launched

"Last year alone we introduced almost 100 new products or components. . . . If you include the new products that will be brought to the market during 1959, the list grows from 100 to nearly 400, a rate of growth that is three times as great as last year."

The ever-increasing activity of R. C. A. in the expanding electronics field is clearly reflected in financial records. Over-all sales for the first half of 1959 exceeded \$633,700,000 against \$542,539,000 for the 1958

period. Earnings were up 44 per cent. It seemed likely that sale of defense items alone might top \$300,000,000 for the year for a 50 per cent gain.

There is no one in the electronics field who does not acknowledge the important role played by Mr. Sarnoff in the development of electronics in general, of R. C. A. in particular. Key figure in the firm from the start, president from 1930 to 1947 and board chairman since, Mr. Sarnoff demonstrated his vision when in 1915—four years before formation of R. C. A.—he foresaw radio in the home.

Radio Oracle

Then a former telegrapher who had risen to administrative posts with the Marconi Wireless Telegraph Co. of America, Mr. Sarnoff outlined to his superiors:

"I have in mind a plan of development which would make radio a household utility in the same sense as a piano or phonograph. The idea is to bring music into the house by wireless . . . for example, a radio telephone transmitter having a range of, say, twenty-five to fifty miles, can be installed at a fixed point where instrumental or vocal music or both are produced.

"The receiver can be designed in the form of a simple 'radio music box' and arranged for several different wave lengths, which would be change-

(Continued on page 28)



R. C. A. CHIEFTAINS—David Sarnoff (left), board chairman, and John L. Burns, president, show tiny radio and satellite TV tape recorder.

HERALD TRIBUNE—R. C. A. 40TH ANNIVERSARY SUPPLEMENT—NOVEMBER 1, 1959

'No Security in Standing Still'—So Hundreds of Millions Go Into Research

ELECTRONICS — a word little known to the layman before World War II — occupied fiftieth place among American industries in the 1940's. Today, according to Commerce Department figures, it has risen to fifth place.

Behind this explosive rise is a dynamic program of scientific research and engineering that is turning out an ever-increasing flow of new products and services—from missiles to man's domestic conveniences.

Hundreds of millions of dollars are being poured annually into fundamental and applied research in hundreds of electronics laboratories across the nation. And tens of thousands of scientists and engineers are engaged in seeking new ways in which the tiny electron can improve man's way of life.

Called Major Asset

Electronics research must, in fact, be reckoned among the major assets of an American society faced with the three-fold challenge of military security, economic expansion and exploration of interplanetary space.

Electronics research today is a major enterprise bearing little apparent relationship to the makeshift facilities and small staff with which it began. The Radio Corporation of America, for instance, launched one of the industry's first combined research and engineering efforts nearly forty years ago. This pioneering program was housed in a tent on eastern Long Island and was carried on by a handful of engineers concerned with

long-distance radio communications techniques.

Today, R.C.A.'s David Sarnoff Research Center at Princeton is one of the largest laboratories in the nation devoted exclusively to research in electronics. Of approximately 300 R.C.A. specialists at the Princeton center, some 160 represent the sciences as distinct from electrical engineering. Nearly 100 are physicists, followed in numerical order by chemists, mathematicians and metallurgists. The majority are young men; the average age of the technical staff is thirty-five.

Half Hold Degrees

Nearly half hold Ph.D.s, and many others have earned master's degrees and are working for doctorates. The international flavor of scientific research is reflected by the fact that one scientist in every six was born, reared and received most or all of his technical education in other nations.

The new basic knowledge resulting from today's research has produced a strange paradox: with the multiplication of research facilities and the vast increase in complexity of research tools and procedures, the science of electronics has become increasingly concerned with happenings that occur within infinitesimally small segments of space and time—a constant pursuit of the almost imperceptible.

No one has ever seen, nor probably ever will see, an electron. The electron is a small constituent of the atom, which itself is so incredibly minute that one million million atoms

would barely cover the head of a common pin.

Knocked loose from its parent atom, the electron may be impelled with small effort nearly to the speed of light, which travels at slightly more than 186,000 miles a second. These are formidable facts—yet upon growing familiarity with the behavior of the electron and the ability to control its action with ever greater precision, a new science and technology is being built.

Electronics is concerned largely with transmitting, storing and processing information in myriad forms for use in systems of communication, computation, data-handling, detection and automatic control. Exploring thousands of materials and compounds, scientists have found new means to achieve or enhance many of the basic functions that go into these jobs. Of greatest actual or potential importance among these discoveries are the means to do these things:

†Generate, detect and amplify electrical signals by means of pea-size devices.

†Store electrical information in specks of magnetic material for instant recall on demand.

†Perform functions of selection and switching at incredible speeds in the routing of information through large systems.

New Uses Found

Furthermore, new useful effects have been discovered to broaden the application of electronics, including these significant examples:

†Methods of producing electrical energy directly from light, heat and nuclear radiation.

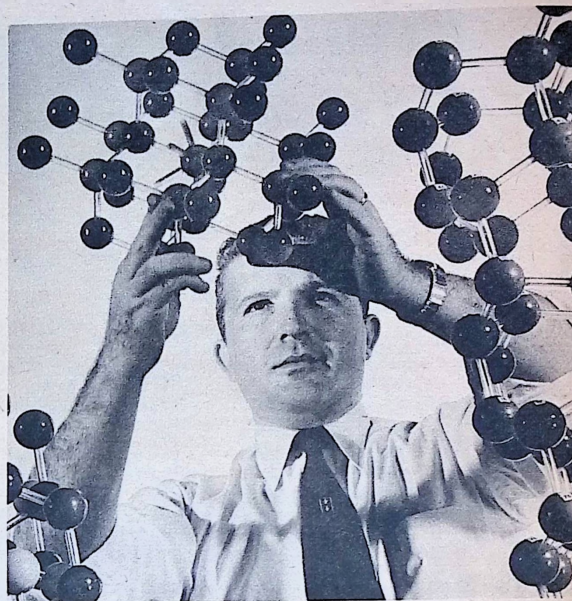
†Materials and techniques for converting electricity to visible light.

†Methods of cooling and heating simply by the passage of electric current through certain materials.

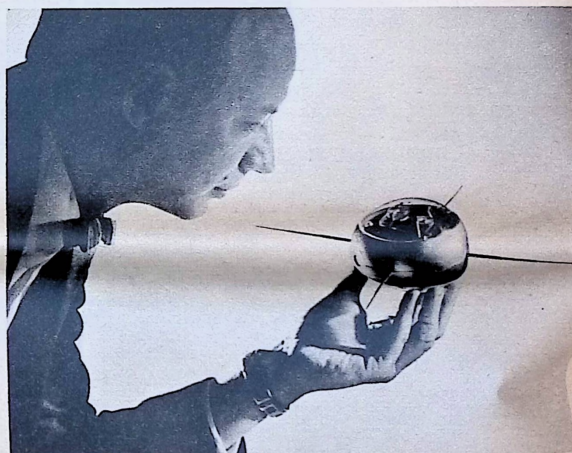
In the laboratory, the accomplishments so far are recognized as a mere beginning, an initial scratching of the surface.

The result is the emergence of a new order in electronics, featured by unprecedented versatility and finesse. Built into devices and systems, the new effects permit the design of smaller, more economical equipment to handle familiar jobs—the miniature radio systems that clip to a belt or slip into pockets, the small solar cells generating electricity from sunlight, the drastically short-

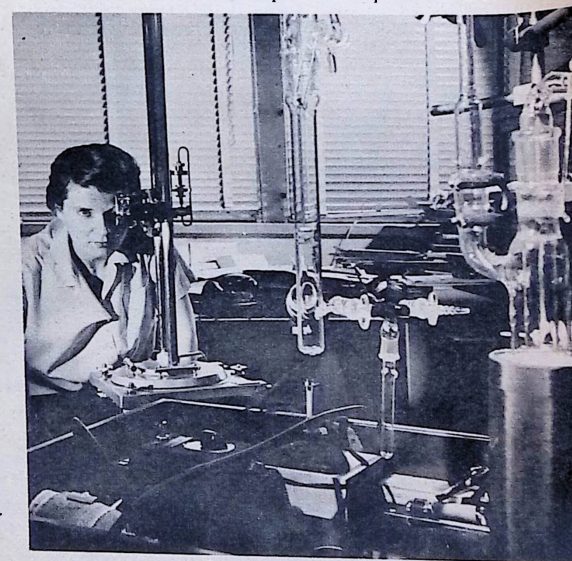
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SPACE AGE RESEARCH—A scene symbolic of work at David Sarnoff Research Center, Princeton, N. J.



SATELLITE MODEL—Step toward space communications.



WOMAN PHYSICIST—Dr. Betsy A. Johnson engaged in atomic research project at the Princeton laboratories.

The Cover Story

THE cover of this special 40th anniversary section shows only a small part of the Radio Corporation of America's activities, but it nevertheless portrays the wide diversification of those activities. The cover shows:

Top, left: Broadcasting — A scene from the Dinah Shore Show, a regular program in color on the NBC-TV network on Sunday nights. (See NBC story on Page 14)

Center, left: Data-processing — A view of RCA's flexible 501 model, adaptable to business large and small. (See Pages 28 and 29)

Bottom, left: Research — World's largest privately owned nuclear research reactor at Plainsboro, N. J. (Page 34)

Top, right: Home Instru-



ments — With black-and-white TV 20 years old, RCA now is marking fifth birthday of color television. (Page 10)

Bottom, right: Defense — The checkout system for the Atlas, reducing its countdown time, is only one of many electronic contributions by RCA to the nation's defense. (Page 6)

From RCA's basic pioneering has come data processing—for the first time the complement of individual requirements 502, 503, 504, capability, and a wide all compatible, of service to business can enjoy transistor data benefit by an increased speed a

If you are among investigating these brief interest:

The RCA 501 simplify your will save you

From RCA's rich background in electronics...
the "new generation" of solid state computers...

Another way RCA
serves business
through
electronics



RCA 501 Electronic Data Processing System

To observe the RCA 501 Electronic Data Processing System in actual operation, visit the RCA Electronic Data Processing Center at Cherry Hill, near Camden.

From RCA's background of 40 years of electronic pioneering has come a new concept of electronic data processing—the RCA 501—a system which, for the first time, makes available to EDP users the complement of equipment best suited to individual requirements. Three computers, the RCA 502, 503, 504, each of different capacity and capability, and a wide range of associated equipment, all compatible, greatly extend the RCA 501's area of service to businesses of all sizes. Now small business can enjoy the advantages of full-scale all-transistor data processing. Large volume users can benefit by an expanded system with greatly increased speed and capacity.

If you are among the many businessmen who are investigating the feasibility of data processing, these brief and provable statements will be of interest:

The RCA 501 will do more work at less cost; it will simplify your conversion to automated procedures; it will save you money both in installation and opera-

tion. And RCA's comprehensive and thoroughly competent customer assistance program will bring you everything you require in back-up service.

The RCA 501 System you order need be no larger than you require now. New electronic concepts in the RCA 501 make it practical to limit the capacity and functions of your initial data processing equipment to your current requirements. This enables you to convert on an economical, easy-to-manage basis without being committed for equipment you may not need for some time.

You plan rate of conversion and enlarge the system in stages best suited to your requirements. Unique modular construction permits easy expansion of the RCA 501 as your workload grows. You simply add units without disrupting your day-to-day work.

The RCA 501's unusual features keep initial and operating costs low. The RCA 501 is an all-

transistor, solid-state computer system . . . it is smaller, lighter, costs less for equipment, site preparation, installation, power and cooling. Special method of organizing data saves hours of machine time and miles of tape. Time-shared electronics makes possible up to 16 pairs of simultaneous operations. Dual recording provides the highest accuracy.

RCA back-up service all along the line. RCA's large pool of talent available for counsel includes specialists in system analysis, site preparation, programming, service routines, maintenance—all the skills you may need for continuous high performance at low cost. These services are provided before, during, after delivery and for the life of your installation.



Tmk(s) ®

**RADIO CORPORATION
OF AMERICA**
ELECTRONIC DATA PROCESSING DIVISION
CAMDEN 2, NEW JERSEY

The Tiny Electron Is Biggest Gun In Defense Arsenal

THE tiny electron is proving to be a mighty weapon today in the arsenal for defense of the United States. The new science of electronics is being applied in every military field, as well as in experiments on space travel.

Electronics has made possible a wide range of accomplishments in defense. These include a canteen-sized radio transmitter-receiver for the soldier on maneuvers; a portable television camera that can be carried into combat; super-power radars in the Arctic to warn of missile attack; tiny missile instruments no longer than a paper clip, and comprehensive weapons systems designed to intercept satellites in outer space.

Radar-Base Contractor

The Radio Corporation of America is the world's largest electronics manufacturer. Because of its research facilities and its productive capacity, R. C. A. is serving the defense structure in many ways, some of them little known to the American public.

R. C. A. is, for example, the prime contractor for the Ballistic Missile Early Warning Sys-

tem (BMEWS) in the far north—a series of huge radar bases to scan the space above the Eurasian land mass for thousands of miles and warn America in the event of imminent missile attack.

Already radar antennas bigger than football fields turned upright have been constructed, and work is well under way toward completion of these silent sentinels against attack across the top of the world. BMEWS is being constructed for the Air Force in Alaska and Greenland and eventually the United Kingdom by the missile and Surface Radar Division of R. C. A.'s Defense Electronic Products. It will be operated initially by personnel of the R. C. A. Service Co.

The R. C. A. Service Co.—which most persons associate with the installation and servicing of TV sets rather than major defense projects—is also engaged in another important activity for the Defense Department, this time closer to the equator than to the North Pole. This is the tracking of missiles fired from Cape Canaveral, Fla., along the 5,000-mile South Atlantic range and the recording of data on their

performance for the benefit of the military services and the contractors who build the missiles.

These are only two of many

defense projects in which R. C. A. is engaged. In other areas:

¶ R. C. A. developed the electronic check-out system for the Atlas intercontinental ballistic missile. This enables military personnel to replace civilian technicians in launching and firing the missile. It also gives extreme accuracy and reduces the countdown from hours to minutes.

¶ R. C. A. installed a floating laboratory of electronic equipment on the missile-measurement ship, the American Mariner. The ship now is on duty on the Atlantic missile range tracking experimental ballistic missiles and checking their performances.

¶ R. C. A. installed in underground bomb-proof caverns at headquarters of the Strategic Air Command outside of Omaha, Neb., a communications system that keeps S. A. C. in constant touch with its jet bombers, which are poised for action all over the world. The system also keeps S. A. C. in touch with the White House and other military headquarters. This installation, with its huge "war room," employs the most modern electronic systems, including closed-circuit color television.

¶ R. C. A. completed two years ago for the armed services at the White Sands, N. M., Proving

Grounds a fully automatic system for firing the surface-to-air Talos missile. With all human personnel removed from the huge operations building this system could respond to signals from remote warning posts about incoming enemy objects, compute the logical interception points, load the missiles onto launchers, fire them at the proper times and guide them by radar beam to intercept the enemy.

¶ R. C. A. designed the world's most accurate tracking radar system, the sixteen-foot "dish" known as the FPS-16. This has been delivered to all missile test ranges and practically all radar-instrumented satellite tracking stations of the free world.

Other Systems Produced

R. C. A. also has produced numerous electronic systems for use in military air and sea navigation.

It installed secretly the first American-developed radars aboard United States Navy ships even before World War II.

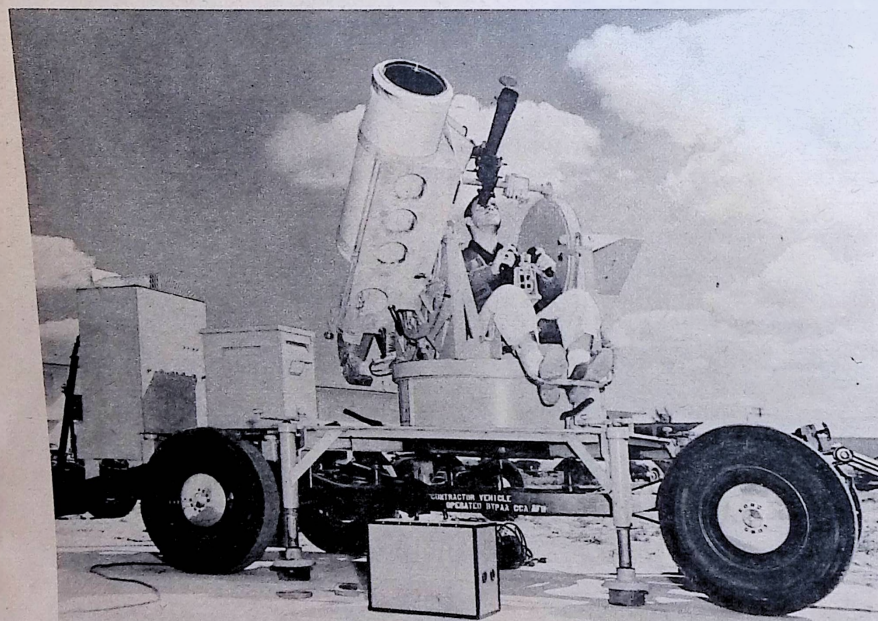
During the war it produced the long-range and short-range navigation aids known as Loran and Shoran.

It has developed, under Air Force contract, electronic systems for fighter planes that include not only communications

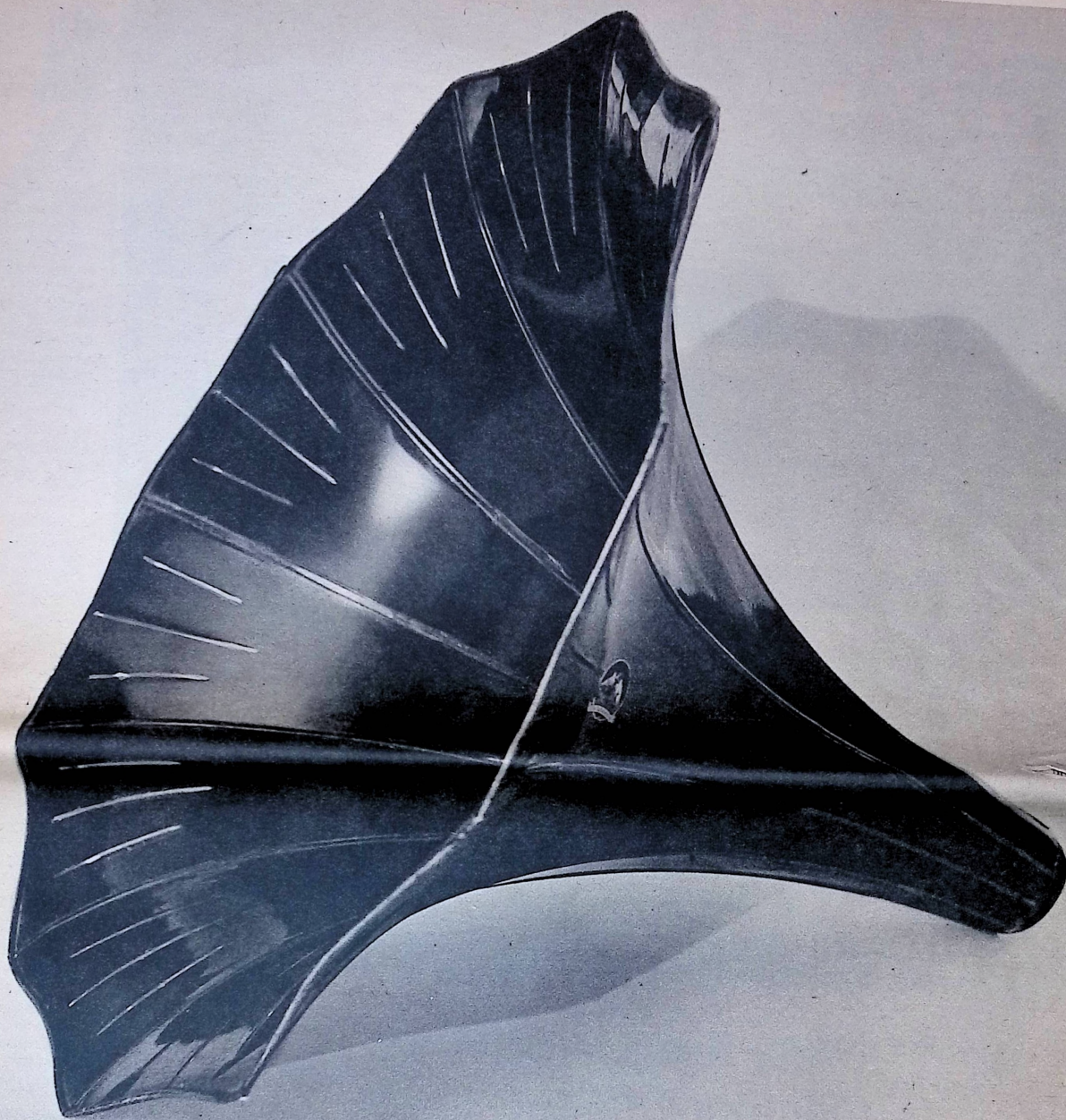
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TRACKING RADAR—Artist's cut-away sketch of radar being built by Goodyear Aircraft for R. C. A., prime contractor for Ballistic Missile Early Warning System in Far North. Prototype can be seen from the New Jersey Turnpike ten miles north of Camden.



STUDYING THE MISSILES—One of the many cameras (some take 1,000 pictures a second) employed at Cape Canaveral. R. C. A. Service Company has some 3,200 men tracking missiles and recording their performance on the 5,000-mile-long Atlantic Missile Range.



A big voice in electronic progress

Remember the wonder-struck moment when you first heard a Caruso aria soar magically out of a spring-wind phonograph?

It seems remote now, and almost quaint in recollection. But just 40 years ago an RCA record, played through a speaker the size of a country fair cornucopia, was just about the last word in sound reproduction.

The real wonder, though, is this. Although it took all the centuries of mankind to penetrate the sound reproduction barrier, it has taken only two generations

to reproduce sound as a living presence.

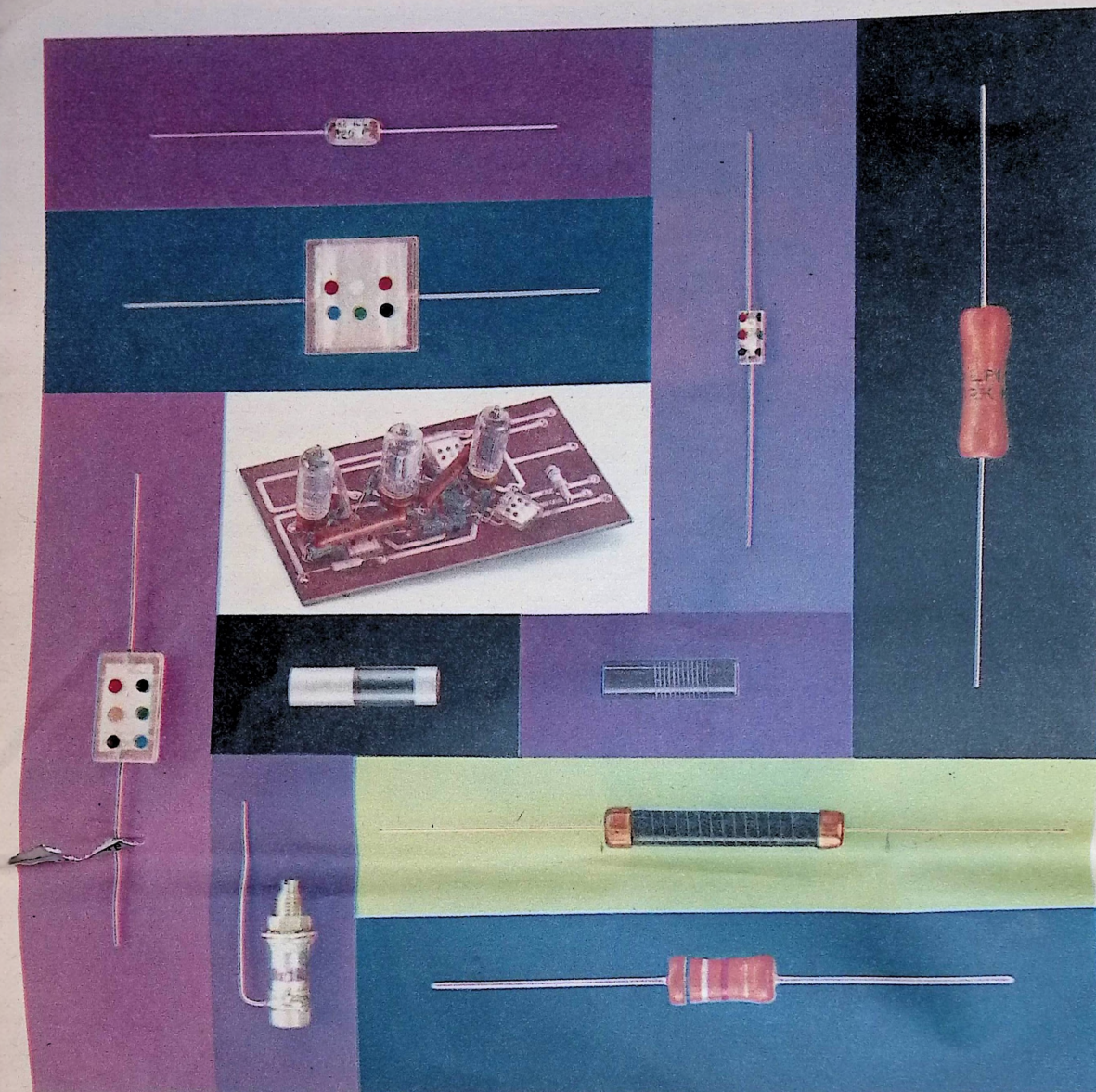
To the Radio Corporation of America, its planners and engineers, its scientists and all the people on the payroll, goes credit for the part they played in the progress of electronics. Their work has helped enlighten, educate and entertain all America by phonograph, radio and television.

The Chase Manhattan Bank, leading lender to business and industry, is proud to serve the Radio Corporation of America.

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Why these electronic components are glass

You can cover glass with dirt. Freeze it. Boil it. Bounce it. Take it up ten thousand miles where the air is rare. Bury it deep in a salted sea. And still it remains itself . . . with a set of electrical properties you can count on to stay fixed.

When you know its secrets well, you can put a metallic coating on glass, cut spirals in it, and come up with a rugged resistor. You can seal layers of aluminum between strips of glass and achieve a compact, reliable capacitor. You can make printed circuit boards on glass, and other components to the tightest specs.

Many are the marvels glass holds for electronics. There's

the glass tube with a phosphor coat that makes a TV picture possible. There are tiny glass wafers that make possible micro module radio circuits no bigger than a matchbox. There is a glass that you can etch small, precise holes into at a rate of 360,000 to the square inch. Even the PYREX glass labware used in electronic laboratories does much to aid in basic advances in materials and designs.

If you would like to know more about this fascinating and profitable material, glass, write to:

CORNING GLASS WORKS, CORNING, N. Y.

CORNING ELECTRONIC COMPONENTS



EIGHT

New Degree: MS in Space Technology

A NEW college degree appropriate to the era of rockets and satellites is being made available for the first time this year—a Master of Science in Space Technology.

The degree is offered at a unique college founded by two Radio Corporation of America scientists last year to provide educational facilities for the men who work on the Air Force Missile Test Center at Cape Canaveral and Patrick Air Force Base, Fla.

It is called the Brevard Engineering College, and it was established expressly to satisfy the hunger of missile workers for more advanced knowledge of electronics and related fields—and to take advantage of the activity at Canaveral to prepare engineers and scientists for new ventures into space.

Top Scientists on Faculty

The founders were Dr. Jerome P. Keuper and Dr. Harold L. Dibble, both former university instructors with Ph. D. degrees. The two men had become concerned at the number of technicians leaving their jobs because they had no ready access to college courses in the area. The problem was vital not only to R. C. A., which employs 3,200 men in tracking missiles and recording their performance, but to other contractors engaged on the Atlantic Missile Range.

For a faculty, they had available some of the best scientific talent in the nation—engineers, physicists and other technical personnel assigned to Canaveral by the contractors engaged in missile building and related fields.

In the first year, Brevard had an enrollment of 200 and a faculty of twenty-five. This year, occupying larger quarters at Melbourne, near the air base, the school has an enrollment of about 400, of whom 150 are graduate engineers, and a faculty of fifty.

The college offers an associate degree in engineering, a Bachelor of Science in Engineering and now a Master of Science in Space Technology. The courses leading to the latter degree will touch upon such strange subjects as space medicine, space communications, celestial mechanics, human behavior in space, the problems of weightlessness, even the bewildering topic of the dilatation of sound as outlined in Einstein's Theory of Relativity, in addition to more simple subjects such as missile guidance, radar techniques, and so on.

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Hundreds of Millions Go Into Research Every Year

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ened television picture tubes with large display area and the high-frequency radio relay and tape storage systems that are made to fit within missiles and satellites.

Near Development

Even brighter promise is apparent in totally new applications. Moving through the latter stages of research toward engineering development are such things as:

Large - area luminescent panels that emit light from an extensive surface, rather than from a single point, as in the incandescent bulb, or from a line, as in the fluorescent lamp.

Thermionic generators, producing watts of electric power directly from heat.

Thermoelectric cooling and refrigerating units operating solely from electric current, without moving parts.

Typical of current advances is the laboratory concept of "integrated electronics" — the combination of several active electronic functions within a single minute piece of material. RCA scientists have reported major progress in development of a multifunction logic element, the building block of electronic computers.

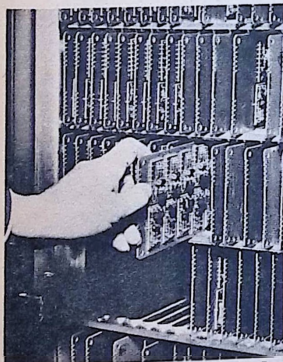
Incidental Hazards

Displaying the tiny integrated element recently beneath a low-power microscope, one of the research specialists called attention to the incidental hazards arising from this trend toward ultra-miniaturization:

"We have to be careful when we turn on the fans in the laboratory. It's pretty easy for the experiment to blow away."

The concern with happenings within small bits of material has accelerated electronics research along a revolutionary new course. The transition can be described in terms of a single device.

Until just about a decade ago, the keystone of the electronics



STORING DATA—Printed circuits slide easily into a computer.

science and industry was the electron tube, which provided both a source of free electronics and a means of controlling them.

Boiling Out Electrons

In the tube, electrons are "boiled" out of a hot cathode into a vacuum, where they can be manipulated in various ways to perform a desired function. Compared with the ease of freeing and manipulating electrons that function within solid material, obtaining free electrons by boiling them out of a

hot cathode is doing it the hard way.

A new era began with the transistor, whose invention at the Bell Telephone Laboratories in 1948 presented electronic science with the first effective solid-state device capable of amplifying in the manner of the electron tube. It was followed by other devices based on the use of materials with varied characteristics of conductivity, luminescence and magnetism. The end results will be translated into goods and services

for application in society, strategy and space.

Considering the rate at which new knowledge is being generated by today's exploration of the sub-atomic world, the effect upon the laboratory is a pale shadow of the ultimate effect upon society.

Nearly twenty years ago David Sarnoff was called upon to state the reason for the corporation's continuing substantial investment in scientific research. His reply has taken on even deeper significance with

the subsequent expansion of electronic science and the growing challenges of military security and economic growth.

"There is no security in standing still," he said. "Those who rest on the rock of stabilization sooner or later find that that rock becomes their tombstone. There is hope and opportunity in what we can learn tomorrow. That is the greatest asset on the balance sheet of humanity and on the balance sheet of any organization engaged in scientific research."

This
FREE BOOK
opens the door
to your career
in electronics!



Young Men! Young Women! RCA will prepare you for a promising future in Computers, Television, Missile Electronics, Automation and Technical Writing.

PLAN NOW FOR YOUR PLACE IN THE RAPIDLY EXPANDING FIELD OF ELECTRONICS



"The most important factor to keep in mind is to continue your education. Science and industry will reward you for your talents and energy. Out of your efforts may come inventions, new products, processes and services. There is everything good yet to be accomplished in our lives and in our work. What man has done, man can do better."

David Sarnoff
Chairman of the Board,
Radio Corporation of America

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What will you be doing a few years from now? With the training that RCA Institutes can give you, the future is yours in any electronic field you may choose. No previous technical training needed. Free Placement Service. Either day or evening classes. Winter term starts Dec. 2, 1959; Spring term starts March 1, 1960. Send for FREE booklet.

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Color Is Called Key Word For the New TV Season

"THE KEY word for the coming year in television is color."

That was the introductory paragraph in the leading article of a special ninety-eight-page "Salute to the Fifth Anniversary of Color Television" published a few weeks ago by "Radio-Television Daily," trade paper of the broadcasting industry.

It was based on (a) reports of network plans for increasing color programming, (b) polls of local stations on acquisition of color equipment, (c) surveys of families owning either color or black and white, and other data.

The report gave strong support to statements by the Radio Corporation of America, which developed color TV, that "color is now winning the recognition that it so richly deserves."

Selling Faster

Color sets are selling today at a pace far ahead of last year. Color programming on the air is nearly 50 per cent greater than last season. And the outlook, R. C. A. says, is for both to continue increasing more and more rapidly until ultimately color will be the predominant medium on the nation's telecast waves.



ENGRAVED WIRING—Today's TV set has circuitry etched on panel to guarantee quality and dependability.

TEM

R. C. A., which has invested some \$130,000,000 in the development and production of color television, attributes this growing acceptance principally to these factors:

1. **Increased color programming.** Network attitudes toward color, reports "Radio-Television Daily," are "bullish." NBC has scheduled at least 285 hours of colorcasts in the last quarter of this year, an increase of 48 per cent over last year—regular entertainment, musical and drama specials, children's programs and sports — and has plans for stepped-up programming next year. CBS plans tinted specials for 1959-60. And ABC, while not yet scheduling any color, has allotted funds in preparation for colorcasting when the color audience increases.

2. **Local colorcasting activities.** Some 350 TV stations around the country have facilities for broadcasting color network shows. One hundred and nine can transmit color film material and thirty-nine can originate their own live color shows. Many now have color TV tape recorders. Ninety-six per cent of the nation's homes are within range of NBC color stations alone.

3. **Advertisers' interest.** Major

network advertisers, especially in the automotive field, are becoming increasingly enthusiastic about color TV. For example, of the \$70,000,000 invested by auto companies in network television this season, at least \$43,000,000 will be in color programming.

More See Color

4. **Increased exposure of the public to color TV.** Two years ago a survey showed only one in four persons had seen even a single color program, even then frequently not under favorable conditions. Today the ratio is considerably higher — perhaps 40 per cent — and surveys have shown beyond doubt that people who see color are sold on it. R. C. A. believes that every new color set in a home is a potential salesman of color to others who see it, thus causing a chain reaction in set sales.

5. **Color set performance.** Color receivers today are simple to work, even for a child, and need very little more servicing than black-and-white sets. The latter is evidenced by R. C. A.'s sharp reduction in service contract prices during the past summer.

6. **Recognition of picture quality.** Those who see color shows on sets properly installed and properly tuned are convinced that the color picture has been achieved to a point far superior to the black-and-white picture, not merely for the added tint but for evenness, shading and contrast. Furthermore, this is true of the black-and-white picture received on a color set.

7. **Enthusiasm of dealers and service men.** "Home Furnishings Daily" and other trade publications are quoting more and more dealers as expressing enthusiasm for tint TV in contrast to the apathy and uncertainty they showed upon its introduction. Likewise service men, many of whom feared complex problems with color sets, have become familiar with the necessary additional circuitry, largely through a nationwide series of clinics conducted by R. C. A. technicians, and are now largely enthusiastic supporters of color. Thousands of service men have bought their own color sets.

8. **New interest among manufacturers.** While R. C. A. has been the chief producer of color TV sets, there are increasing indications other companies will begin or step up color production in the near future, giving new impetus to its promotion. Admiral entered the



THE COLOR SPECTRUM—An R. C. A. "quality control" technician checks picture with model spectrum above.

market with a full line of color models this fall.

Another factor that portends increased sales of color in the coming year, R. C. A. points out, is that a large percentage of TV owners, many of whom bought sets in the early groundswell of television a decade ago, are now about to replace their sets and obviously will consider color. In addition, the trend to two sets in the home is gaining.

More Color on Air

NBC programming will be one of the strongest inducements for color set acquisition all across the nation in coming months. More important than the number of color hours scheduled — 285 in the last quarter of this year — is the type of programming. There will be major color programs every night in the week and color throughout the week end — including two Saturday morning children's shows, "Howdy Doody," and "Ruff and Reddy."

More than ever before, NBC colorcasts will be programs planned from the beginning for color, such as:

1. The new Tuesday night Ford series of sixty, ninety and 120-minute specials — biggest series of specials produced for TV for one sponsor.

2. "Sunday Showcase" — a new series of weekly specials primarily of outstanding live, original dramas featuring top name stars.

3. A third series of major specials every Friday night, ranging from musicals to live drama to one-man shows.

4. A long list of other color specials.

5. The first hour-long weekly Western film in color — "Bonanza" every Saturday night.

6. A greatly expanded sports schedule including eleven football games — N. C. A. A. games, Pro Bowl, Blue-Gray and Senior Bowl games — on the heels of the World Series and Davis Cup tennis matches, already seen in color.

7. "Continental Classroom," an educational television program presenting a two-semester college course in modern chemistry by Dr. John F. Baxter five days a week from 6:30 to 7 a. m. local time. More than 300 colleges will offer credit.

These are in addition to the regular colorcasts such as "Perry Como, Dinah Shore, 'The Price Is Right,' the 'Arthur Murray Party' and others.

NBC has greatly expanded its color facilities in the last two years. In New York, besides its color facilities in Radio City, the network operates two huge color studios known as "Brooklyn I" and "Brooklyn II." It also has two "colorized" theaters, the Ziegfeld and the Colonial, and two scenic production centers, one in Manhattan and one in Brooklyn.

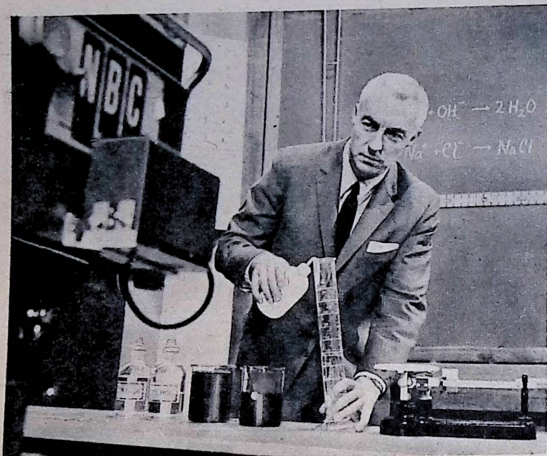
On the West Coast, in addition to its studios at Sunset and Vine in Hollywood, NBC has constructed a major complex known as "Color City" in near-by Burbank.

The network also has two mobile color studios, housed in large vans, for colorcasting sports and other events.



BIGGEST BOOKING EVER This year the network that brought color to television continues to lead the way with the greatest season of color ever presented—almost twenty hours a week—with major programs representing drama, music, comedy, sports, variety, education and children's shows scheduled every day . . . every night . . . and throughout the weekend. All in Living Color on NBC, the network of total television.

TV Brings Education Into the



EDUCATION AT DAWN—Dr. John F. Baxter teaching chemistry on NBC's "Continental Classroom."

AN EARLY riser, tuning his television set to NBC-TV any weekday morning between 6:30 and 7, may see a college professor drop a pale fluid into a test tube and explain the nature of some basic chemical process.

If the viewer is fortunate enough to have a color receiver, he may see the pale fluid turn pink as it joins another ingredient.

The program is "Continental Classroom," and for two reasons it is regarded as the most

dramatic advance so far in educational television:

1. It is the first educational program to be broadcast regularly by a network utilizing the full advantages of television's electronic wonders—not only picture and sound, but color as well.

2. It is offering a course that already has the recognition of 300 colleges and universities for credit toward a degree. The course this year is modern chemistry, being taught by Dr. John F. Baxter, head of the

general chemistry division of the University of Florida. An estimated 400,000 persons are watching the courses being broadcast from 6:30 to 7 a. m. local time from about 150 stations. (The first "Continental Classroom" course, atomic age physics, conducted last year by Dr. Harvey E. White, noted physicist of the University of California, is being repeated on many of these stations from 6 to 6:30 a. m.)

Educational TV Grows

While dramatic in its presentation, "Continental Classroom" is only one of many developments taking place across the nation in the application of television to education.

Scarcely six years old, educational television (referred to now in educational and television circles as "ETV") has burgeoned almost as rapidly as its commercial counterpart. Well over half a million elementary and secondary school pupils and college students are now getting at least part of their instruction by television—practically every course from arithmetic to zoology.

Educators see television as a possible tool for upgrading educational standards and a par-

tial solution to the shortage of teachers and classrooms. The classroom shortage is estimated at 130,000, with nearly 2,000,000 pupils in excess of what is called "normal" capacity. And authorities figure that right now the shortage of qualified teachers is in the neighborhood of 195,000. Conditions are expected to worsen, rather than improve, in the next decade.

Television's role in this situation is twofold: To bring the best teachers to a maximum number of students and to make it possible for larger groups of students in a single classroom to receive good instruction.

Two Types of ETV

There are two general types of ETV—(1) open broadcast, from either a commercial station or an educational station supported by a community or a foundation, and (2) closed-circuit television, in which cables connect the receivers with the studio or classroom where the program is originating.

A comprehensive nationwide survey just completed by the Radio Corporation of America shows sharply increasing activity in all forms of educational TV. This is the picture in brief:

Of the nation's 553 television stations today, forty-three are non-commercial educational stations. A dozen more are under construction.

There are some 300 closed-circuit installations in schools and colleges throughout the country.

Closed-circuit television is being used for instruction and training at more than a score of military bases.

Commercial stations and networks are offering an ever-increasing fare of educational and cultural programs, many of them for college credit as in the case of "Continental Classroom."

Ford Foundation's View

The operations in these fields have amply confirmed TV ability to broaden and brighten the nation's educational horizons. The Ford Foundation and its Fund for the Advancement of Education—which have spent more than \$10,000,000 on some fifty educational TV projects—expressed it this way in a recent report:

"Today the question is no longer whether television can plan an important role in education. That question is in the affirmative. . . . The question

that now is television actively."

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to the Home

that now needs fuller exploration is *what kind of a role television can play most affirmatively.*"

In an effort to explore this vital question, R. C. A. is collaborating with New York University on a Center for Instructional Television, which began operation in September.

First of its kind in the United States, the new center has two sections—one concerned primarily with studio teaching and the other with the classroom use of televised presentations. The center's program includes teacher-training, apprenticeships, institutes and in-service workshops, consulting services and research. R. C. A. has provided \$100,000 in funds and equipment.

"The primary aim of R. C. A. in supporting the center," said John L. Burns, president of R. C. A., "is to benefit all education. The center will bring together the best ideas of professional educators, responsible laymen in the education movement, broadcasters and experts in the graphic arts. Electronics can go a long way toward helping to raise today's educational standards and meet tomorrow's staggering needs if we are willing to take bold action—not five or ten years from now, but immediately."

In All Sections of U. S.

Educational television stations—specially licensed by the Federal Communications Commission and supported by state and local governments, business, civic and professional groups and foundations—are now operating in every section of the United States. Most of them are R. C. A.-equipped.

They have a potential listening audience of 60,000,000—50 per cent larger than the nation's total public and private school enrollment. Surveys show that around 15,000,000 persons watch ETV stations on a fairly regular basis. They take the courses seriously, too. In Chicago, for instance, 6,500 viewers sent in a half-dollar each for study guides in a beginner's course in German. In Denver, 5,600 paid \$1 apiece for Spanish-language guides.

The ETV stations broadcast more than 1,000 hours a week of informative and cultural programs for the home and school. Some of them are on the air from early morning until late at night. Their programming includes story-telling, music and drawing for pre-school youngsters, courses in the basic subjects for broadcast into classrooms and adult-education programs, such as Dr. Frank Baxter's series on Shakespeare, Dr. Edward Teller on atomic energy and Dr. Benjamin Spock on child care.



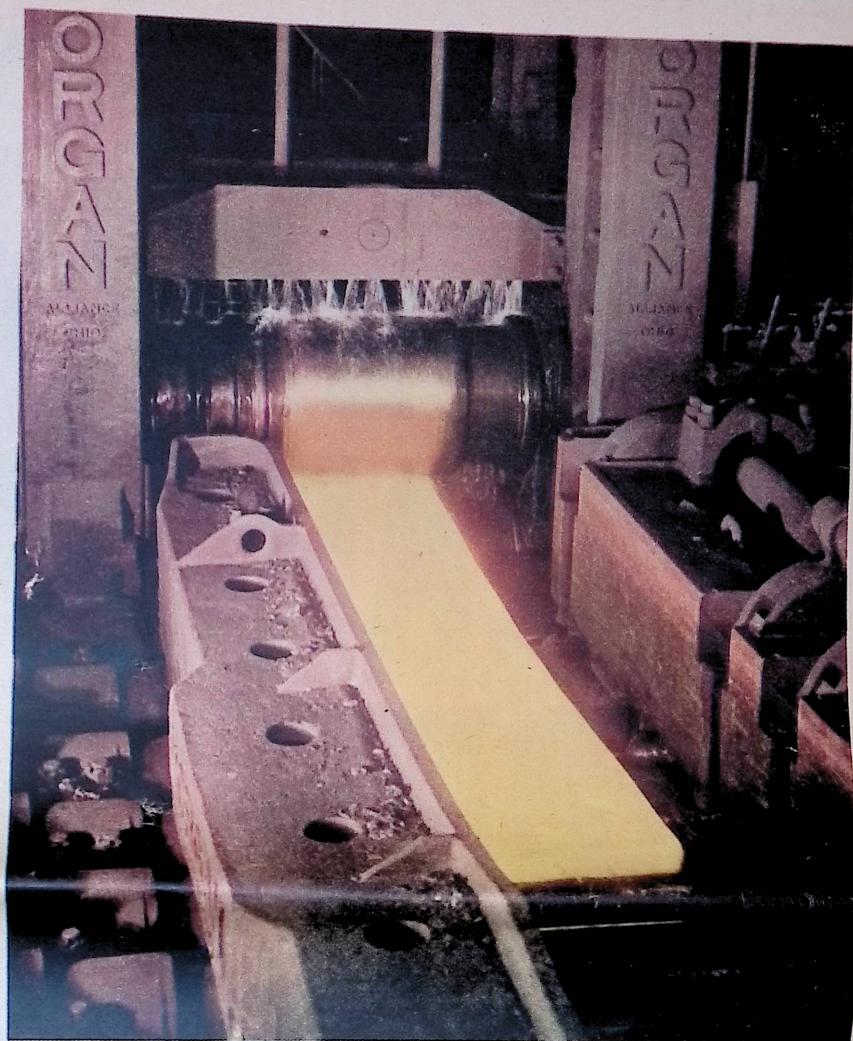
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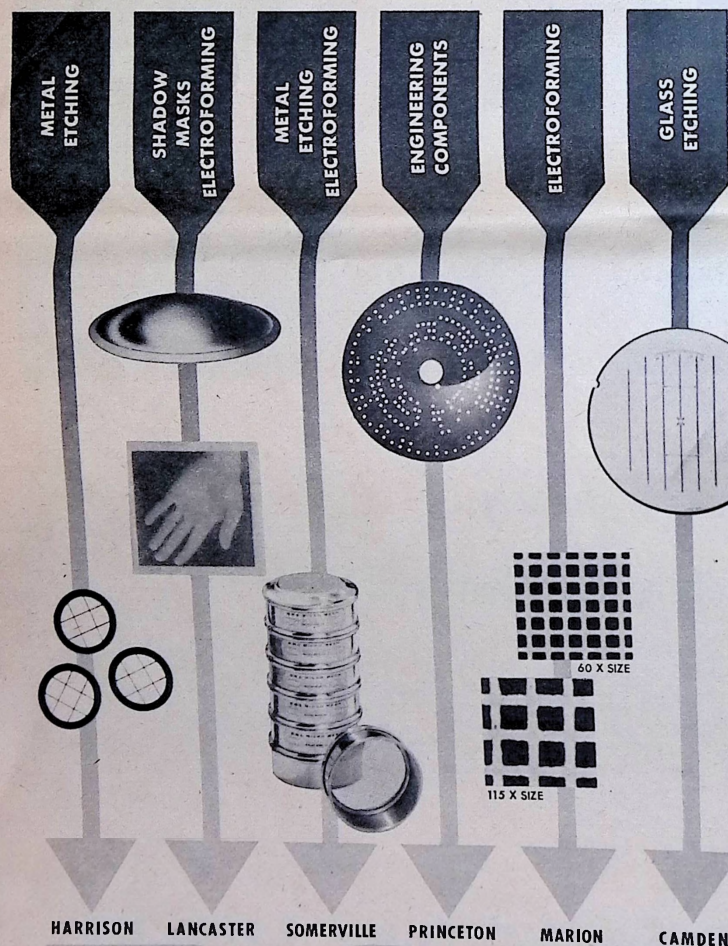
Your aggressive policy of finding smaller organizations of particular skills to share in your larger needs has allowed us to expand and be useful.

With keen anticipation we look forward to knowing and serving Radio Corporation of America better in your next 40 years. With best wishes on your 40th Birthday.

From 300 of us at BUCKBEE MEARS

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BEHIND THE SCENES—A typical moment in an NBC master control room as directors choose the best picture for the television audience.

Second Only to Bread-Winning

Nation's No. 1 Pursuit: TV

WITH the sole exception of bread-winning, television-viewing now ranks as America's chief waking-hour activity. The time spent watching the TV screen in the average home amounts to more than thirty-seven and a half hours each week.

The evidence is unmistakable that today's network TV and radio are social forces that are changing our world. In the thirty-three years since the birth of network broadcasting, the average American has had at his fingertips an increasingly wide and wonderful experience in worlds of entertainment, news, culture, information and education known to only the most-favored individuals of earlier generations.

This revolution in communications is the result not just of technical marvels but of the network system of broadcasting.

Events Moved Swiftly

The revolution has been extraordinarily swift.

In 1916, David Sarnoff, then a young American Marconi executive, conceived the idea of using radio to bring music and information into the home regularly.

In 1920, the first radio station, KDKA in Pittsburgh, went on the air. By the end of 1924, there were 1,400 radio stations in the nation.

But by 1926, more than half of all United States radio stations had folded. Some of the remaining ones had make-shift, irregular programs that did not satisfy all of the country's 5,000,000 set owners.

On Nov. 15, 1926, NBC went on the air with the first network broadcast. Twenty-five stations as far west as Kansas City carried it, a four-and-a-half-hour all-star show. Before the end of the year, NBC went coast-to-coast. Within a year, CBS was on the air, then Mutual.

By 1931, there were 50,000,000 radio sets which could tune into programs starring Rudy Vallee, Amos 'n' Andy, Eddie Cantor, Jack Pearl, Al Jolson, Paul Whiteman, Fred Allen and other well-remembered names.

With the early "Music Appreciation Hour" and Arturo Toscanini and the NBC Symphony Orchestra, network radio helped raise the level of music appreciation in the country. The years of World War II brought radio to full maturity as a news medium.

Meanwhile, television was being developed in the laboratory. In 1930, NBC sent out its first experimental television program; in 1939, TV became a public medium.

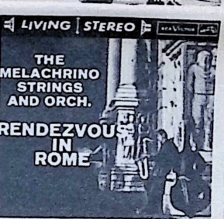
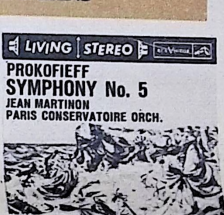
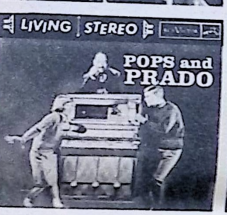
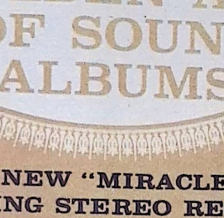
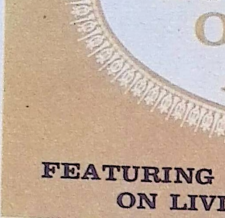
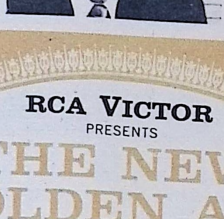
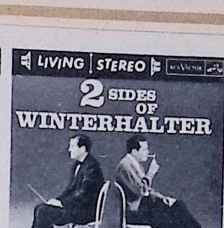
War's End Spurs TV

For two years, from 1939 to 1941, a handful of television set owners saw programs that ranged from opera to major-league baseball and political conventions.

With the end of the World War II, TV swiftly became a dominant feature of the American scene. Longer, flexible formats such as "Today" and "Tonight" (now the "Jack Paar Show") were introduced by NBC. Specials such as "Peter Pan" and Britain's Royal Ballet brought change of pace into weekly TV schedules.

With the advent of perfected color television, broadcasting took a technical leap forward in 1954. NBC brought more and more color to the public. Five years brought a ten-fold increase: sixty-seven hours in 1954, and 668 in 1957.

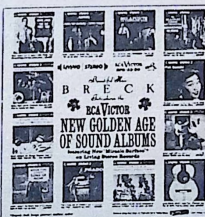
This season, the NBC-TV network will offer its most comprehensive color schedule. In the fourth quarter alone, seven days a week of color-programming will total more than 250 hours—nearly 50 per cent more than the same period last year. The season's program also will include 150 specials.



24 NEW ALBUMS ON REGULAR L.P. AND LIVING STEREO BY THE WORLD'S GREATEST ARTISTS!

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Special offer! Get details of this PREVIEW L.P., containing six complete popular and six complete classical selections, all in one album. Offered now by BEAUTIFUL HAIR BRECK in beauty parlors, drug stores, supermarkets, department stores . . . wherever Breck preparations are sold! The PREVIEW L.P. is available in Living Stereo or on regular long play.

RCA **RCA VICTOR**
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The Super Service Man

Just to Fix the TV Set Is Not Enough These Days

THE burgeoning world of electronics, with its insatiable appetite for brains and manpower, has produced the super service man.

In a scientific-minded era that sees yesterday's inventions nearly obsolete tomorrow, the service man has to be more than a handy fellow who keeps the washing machine, radio or phonograph in running condition.

Missiles or Computers

The composite service man of 1959 can repair a television set, install a complex computer or track a missile through space. Obviously, all TV service men are not equipped to chart the course of a space satellite. Nor would many R. C. A. technicians working on the Atlantic Missile Range care to tackle a complicated television repair problem. By the same token, a man engaged in the R. C. A. Service Company's third major field—industrial products, such as data-processing machines—might not feel at home with the problems of consumer products or government service.

But, in total talent, today's service man approaches the scientist. He represents a new concept

in an industry which has grown to multi-billion-dollar proportions in the brief period since World War II.

It has been estimated that there are 1,500,000,000 tube sockets in the radios, television sets, phonographs, tape recorders and other electronic equipment in America's homes. To keep them glowing requires the attention of an army of some 200,000 technicians.

Their ranks increase daily to keep pace with new product developments and mounting production. Even the conservative estimates foresee a tremendous expansion of the service industry in the next decade.

Training Program

Historically, R. C. A. has been a pioneer in the servicing of electronic home products as well as all types of electrical equipment and there is corporate pride in the role the company has played in the industry's advances.

Throughout the years, R. C. A. has operated on a basis of full co-operation with the independent servicing profession, particularly in the field of consumer products. When R. C. A. pioneered television in 1946, the

R. C. A. Service Co. inaugurated a comprehensive program of education and training for independent servicemen.

The same policy was followed with the introduction of color TV in 1954. R. C. A.'s free lectures and clinics have been attended by nearly a quarter-of-a-million service technicians, sales personnel and others in 460 cities. These efforts have helped raise the general level of servicing to its present professional standards.

2,000 Service Manuals

More than 2,000 different editions of service data manuals on R. C. A. Victor products have been distributed throughout the world and have been read by hundreds of thousands of technicians.

The R. C. A. Service Company now operates in every state and in twenty-eight foreign nations. Its trained men install and maintain the electronic equipment on which broadcasting and communication networks depend. Its technicians build radar installations in the Far North and instruct armed forces personnel in the country's military training centers.

Technical Products Service



THE SERVICE MAN—A fact little known: the R. C. A. service men also track missiles and tend big computers.

Department engineers have for many years kept the sound systems of American moving picture theaters in working order. More recently, closed-circuit theater television has provided a new entertainment medium, and R. C. A. now provides the largest group of trained special-

ists in the country to handle such telecasts.

Another group of specialists install and service radio and television transmitter and studio equipment, and these men have made important contributions to the growth of the broadcasting industry.

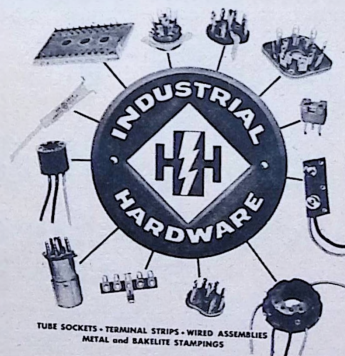
"INDUSTRIAL" CONGRATULATES RADIO CORPORATION of AMERICA

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We are proud to have had a part in this fortieth celebration of progress with RCA.

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In its relationships with leading companies, Bankers Trust is particularly proud of its association with the Radio Corporation of America. The fortieth anniversary of RCA is also the fortieth anniversary of our business friendship. We are happy to commemorate the occasion and look forward to being of continuing service to the growth and progress of this world leader in communications and electronics.

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Fort Wayne, Indiana



**ESSEX WIRE
CORPORATION**
Fort Wayne, Indiana

Home Entertainment: Always New Items

CULIMAXING forty years of pioneering in home entertainment, the Radio Corporation of America has introduced more innovations this year in television, radio and recorded music than at any time in its history.

In fact, the 1960 R. C. A. Victor line of home instruments contains so many new styling and performance features from R. C. A. laboratories that it has been christened the "News-maker" line.

"Only from a company which pioneered and developed the phonograph, the radio, both black-and-white and color television and stereophonic recording would such innovations be possible," said Charles M. Odorizzi, R. C. A. group executive vice-president, consumer products.

Principal Innovation

Mr. Odorizzi listed some of the principal innovations as:

1. A hide-away TV console that converts into a living room table when not in use.

2. A TV set with a "magic memory" that allows the viewer to pre-select up to twelve hours of automatic programming, changing channels and turning the set on and off.

3. A new line of ten color television receivers featuring new styling and pre-set fine tuning which automatically locks in the best picture for each station for color as well as black-and-white reception.

4. Three new "Wireless Wizard" TV remote control units, including the first unit on the market that turns the TV set off completely by remote control and an improved seven-function remote for color TV.

5. A portable stereophonic player-recorder using the new R. C. A. Victor four-track tape cartridge which completely eliminates the need to thread tape and brings stereo music on tape at a new low price, approaching the price of records, is now being shipped to distributors.

6. A complete line of stereophonic phonographs featuring five different kinds of stereo systems and with power to spare ranging up to eighty-seven watts.

7. R. C. A. Victor's new "Mural TV"—the first line of "built-in" television receivers, both color and black-and-white, designed for wall installation by home owners and builders.

8. Stereophonic high fidelity combination radio-phonograph consoles with separate tuners that permit the reception of AM-FM stereo on one instrument.

9. A transistorized clock radio

with the first rechargeable clock battery that keeps the clock running for a week even after the radio batteries are exhausted.

10. The first TV set designed especially for the bedroom—a table model with a clock timer and slumber switch that automatically turns off the set after a pre-determined length of time up to an hour and turns the set on the next morning.

Hide-Away Set

The hide-away television set was described by Mr. Odorizzi as "TV's most dramatic styling innovation of the year."

A twenty-one-inch high walnut table when the TV is not in use, the Hillsborough converts to a console television receiver by folding back a section of the table top. The concealed screen moves into viewing position at the touch of a finger.

The "Magic Memory" programmer set automatically turns itself on or off or changes channels at thirty-minute intervals according to a pre-selected twelve-hour viewing schedule set up in advance via a series of selector buttons.

The latest development in the booming stereophonic music field is the R. C. A. Victor tape cartridge player-recorder instrument that makes the playing of stereo tapes as easy as playing a phonograph record. Gone is the bother and fuss of threading pre-recorded tape on a reel (a job similar to loading a camera) as the tape is enclosed in a plastic cartridge.

Placed in Position

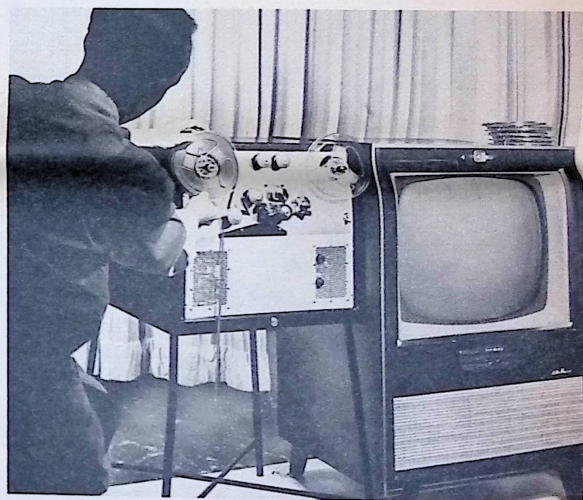
The cartridge is placed in position and a button pushed to start the music. One model even eliminates the need to turn over the cartridge as one does when he plays the other side of a record. The cartridge plays up to an hour of stereophonic music or two hours of monaural high-fidelity music.

Five other stereophonic sound systems are featured in the R. C. A. Victor "Victrola" phonograph line with prices for complete stereo units starting as low as \$39.95 for single-play, four-speed portables. One of the highlights is a new Danish modern console with eighty-seven watts of measured music output that provides the ultimate in speaker flexibility for the most dramatic stereo effect anywhere in a room through the use of two small companion speakers.

Other models have swing-out speakers, both speaker systems in one cabinet, detachable extra speakers on the front of portable cases or portables with



TODAY—One of television's newest innovations: the "Hideaway" that becomes a table when TV is not in use.



TOMORROW—Television of the future will have tape device to play scenes (and sounds) recorded in the backyard or reproduced from actual television broadcasts.

extra speakers in detachable lids. Combination AM-FM stereo radio models and a remote control unit are also available.

Although radio has been around for nearly thirty years, R. C. A. engineers and designers have even come up with innovations in that old home entertainment standby, "Filteramic" antennas cut out most man-made electrical interference which causes static on many radios. Transistor portables operate on inexpensive flashlight batteries for more than 100 hours. A cordless transistorized clock radio features a battery that automatically recharges for life from the flashlight-sized cells in the radio.

The home of the future may well have an entertainment center built into the wall of its living room or party room.

This is a concept on which R. C. A.-Victor engineers now are working. They envision television, radio and hi-fi, with whatever extra speakers are needed, installed decorously in the wall of a room rather than taking up unnecessary space as individual pieces of furniture.

The first step already has been taken in R. C. A.'s "Mural TV" line introduced this summer—providing built-in sets flush with the wall, with picture-framed screens and controls in the front.



RCA'S CONTINUING RECORD OF ACHIEVEMENT PROVIDES THE PROMISE OF TOMORROW

■ ■ ■ To engineers and scientists, RCA offers virtually unlimited opportunities for professional achievement and for contribution to the electronics industry. At RCA, the pioneering spirit in research and development remains fresh and vigorous, and makes itself manifest in a multitude of interests. Today, RCA's many activities and assignments cover the entire field of electronics, from Fundamental Studies of Matter to Integrated Space Vehicles and Communications Systems, from Beam Power Tubes to High-Power Transmitters and Radar Networks, from Semiconductor Device Research to Micromodules and Commercial Electronic Data Processing Systems. This diversity—both in projects *and* locations—is one of RCA's strongest features, insuring to engineers and scientists a stability and personal satisfaction of achievement that would be difficult to find anywhere else in the industry.

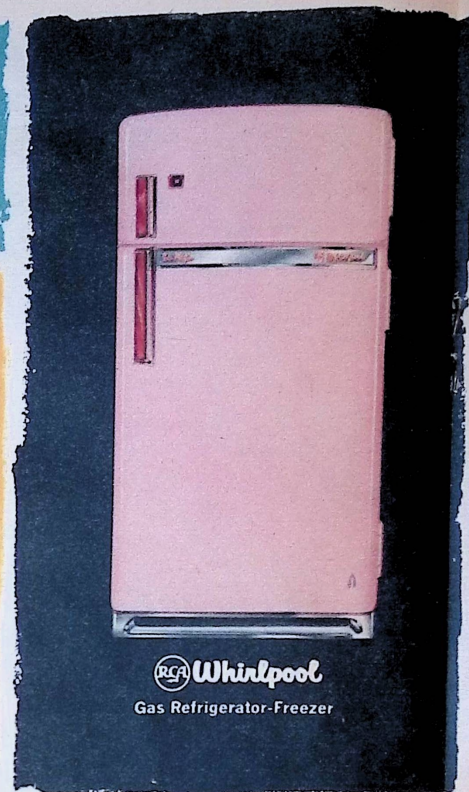


RADIO CORPORATION of AMERICA

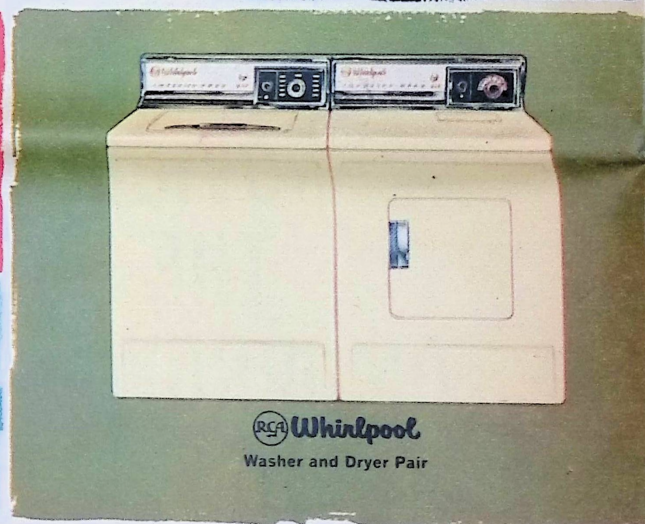
America's
first
family
of
home
appliances
bears
the
brand
name...



RCA Whirlpool
Portable Dishwasher



RCA Whirlpool
Gas Refrigerator-Freezer



RCA Whirlpool
Washer and Dryer Pair



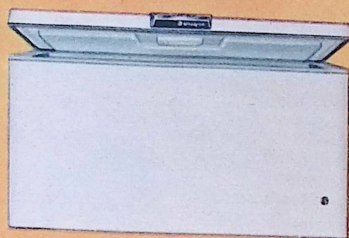
Whirlpool

Whirlpool Corporation, manufacturer of the fine appliances shown on these pages, extends its sincere congratulations and best wishes to Radio Corporation of America on its 40th anniversary. When you see the brands RCA and WHIRLPOOL on an appliance, you are assured of the best engineering and highest quality.

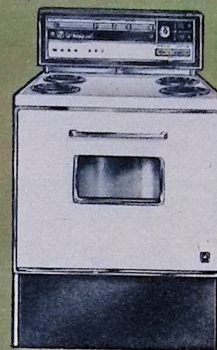
Whirlpool Corporation, St. Joseph, Michigan. (Use of trademarks RCA and  authorized by trademark owner, Radio Corporation of America.)



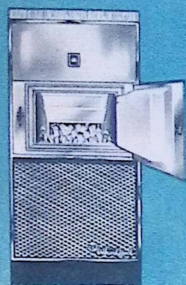
Whirlpool
Built-in Electric Oven



Whirlpool
Chest Freezer



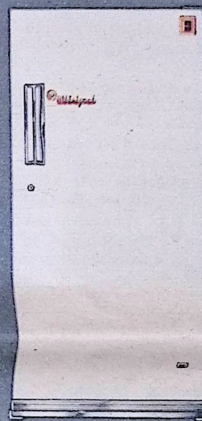
Whirlpool
Electric Range



Whirlpool
Ice Maker



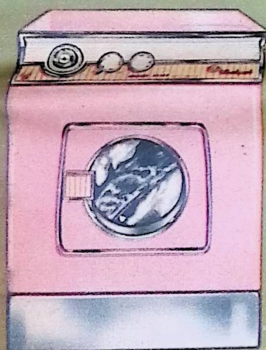
Whirlpool
Gas Range



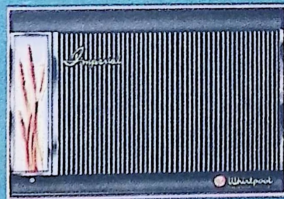
Whirlpool
Upright Freezer



Whirlpool
Food Waste Disposer



Whirlpool
Combination Washer-Dryer



Whirlpool
Air Conditioner



Whirlpool
Dehumidifier



Whirlpool
Home Cleaner



Whirlpool
Electric Refrigerator-Freezer

Whirlpool

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Small Business and R.C.A.

A LONG-STANDING team effort involving the Radio Corporation of America and thousands of small businesses helps turn out television sets for the home, broadcasting equipment, computers, scientific instruments, automation controls for the factory, communications devices, radar, missile guidance systems and a variety of other RCA products.

"The productive ability of this nation stems from a unified effort by small companies and large companies," said R. C. A. president John L. Burns. "Capacity to do a job fast and well is the important factor."

11,000 Suppliers

More than 11,000 suppliers representing virtually every state provide R. C. A. with vital materials, techniques, components and services each year. Nearly three-fourths of these firms are classified by the Federal government as small business, or those with fewer than 500 employees. In 1957 and again in 1958, those companies received approximately 40 per cent of the dollar volume of R. C. A. purchases. This year's figures are following the same trend.

In 1957 and 1958, 340 new

suppliers were added to the approved R. C. A. vendors list for the corporation's defense electronic products operation alone. Of those, 90 per cent, or 308, were classified as small businesses.

Earlier this year, Dr. Elmer W. Engstrom, R. C. A. senior vice-president, accepted an invitation to tell the story of this highly successful working relationship to the Government Procurement subcommittee of the United States Senate Select Committee on Small Business.

Not Big Enough

After detailing the broad range of R. C. A.'s operations, Dr. Engstrom had this to say:

"In this complicated modern world, no single company is big enough, or possessed of enough skills and resources to produce all the materials and components required to build so diverse an array of product. In order to provide our production lines with the parts, materials and subassemblies needed for these products, we purchase from a great number of suppliers in many lines of industry. We believe that the strength of American industry lies in its reliance, not on one company or any small group of companies, but on the teamwork of many business organ-

izations, both large and small, working together."

What sort of items come from the various members of the R. C. A. team?

Literally mountains of materials are needed for the production of radio, television and electronic equipment to fill civilian and military needs.

Tons and Tons

Every 100,000 R. C. A. color television sets produced require 3,500 tons of wood, 1,750 tons of steel, 50 tons of brass, 35 tons of solder, 30 tons of copper, 25 tons of zinc, and enough glass, plastics and miscellaneous materials to bring the total to over 10,000 tons.

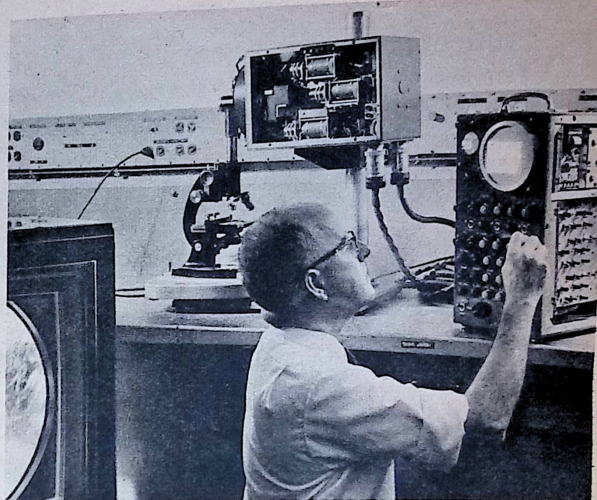
In addition to these conventional items, R. C. A.'s suppliers provided such precious metals as iridium, platinum, gold, silver and palladium. There also flow into R. C. A. plants such unusual, but essential, items as castor oil, ethyl ether and marble flour.

Well over 100,000 miles of wire will be used in R. C. A. products this year—enough to reach four times around the equator.

Spread Over Nation

What sort of small businesses make up the R. C. A. team of suppliers?

In Harrison, N. Y., a firm



COLOR TV OF FUTURE—Laboratory model of transistorized set that can be operated on auto-type batteries.

with only 57 employees provided in the first half of this year nearly \$100,000 worth of antenna assemblies for R. C. A. television products—a substantial part of this particular company's total business.

In Santa Monica, Calif., an organization with thirty employees has done machine-shop work for R. C. A. totaling \$57,000, nearly half that company's business.

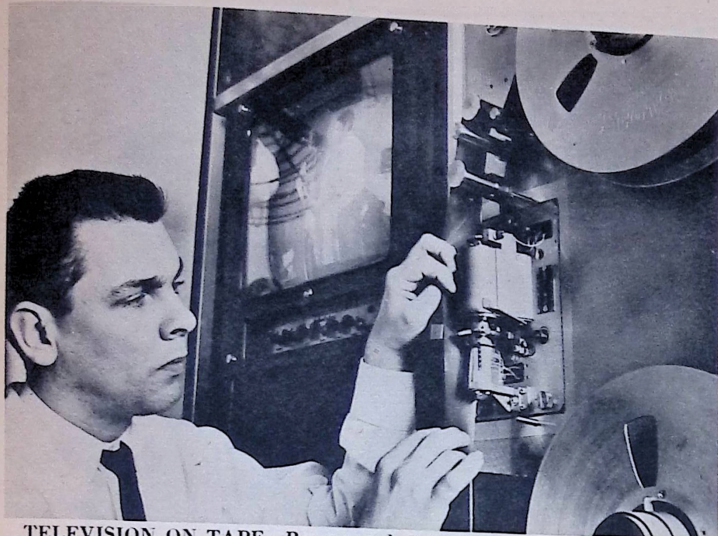
In Haddonfield, N. J., a company with fifteen workers has directed much of its machined

parts production toward R. C. A. defense projects in the first six months of 1959.

In Cincinnati, a considerable part of the production of a 220-employee concern is in the form of coils for R. C. A. television products.

From a small business in Chicago come plastic products. From another in Virginia come capacitors. Gears are provided by a small firm in Houston, Tex. Quartz crystals are shipped to R. C. A. by a concern with 230 employees in Kansas City, Kan.





TELEVISION ON TAPE—Boon to television broadcasting is new tape recorder-player that reproduces programs in color and black-and-white.

Drama of a Plastic Ribbon

Magnetic Tape Aiding TV

TELEVISION broadcasters, their sponsors and the audience they serve are becoming increasingly aware of the changes being effected by a cocoa-colored plastic ribbon formally known as magnetic tape.

By leaps and bounds, magnetic tape is becoming the predominant medium for recording television sound and picture signals. Not only is more and more tape being employed by broadcasters in the studio and for remote pickups, the same trend toward tape is evident among independent producers of TV program material and commercials.

The popularity of magnetic tape in a field where motion-picture film formerly held sway can be attributed to tape's immediate availability for playback with no need for processing and its close approximation to "live" presentations.

Color TV a Factor

The attainment of maturity by color television broadcasting has added to the acceptance of magnetic tape recording. TV productions in color are, understandably, more costly than a black-and-white show.

Through the use of magnetic tape, a color production can be recorded in advance—with no loss of picture quality—at a time when talent, crews and equipment are more readily, and economically, available. The tape can be re-run immediately to permit production personnel and the sponsor an opportunity to make any desired changes before the show goes on the air.

How do today's television tape recorders accomplish all this? The TV tape recorder basically is an electronic machine that converts the sound and picture signals from the camera to electrical impulses. The impulses are then registered on magnetic tape.

The instant the TV picture and sound track have been entered on the tape, the tape can be re-run or played back. In this process, the sound and

picture tracks on the tape are "read" by the recorder. The resulting electrical impulses are reconverted to their original electronic form for broadcasting.

The Radio Corporation of America's TV tape recorder for black-and-white broadcasting consists of five stand-up cabinets of equipment. All the circuits and components are geared for color broadcasting by interconnecting a sixth cabinet or rack of equipment.

A fourteen-inch reel in one of the cabinets holds 7,200 feet of magnetic tape—enough for ninety-six minutes of recording.

First to Charlotte

R. C. A. announced last March it was in full production of its advanced recorder. The first production model went to station WBTV, Charlotte, N. C., which already was using an R. C. A. recorder to produce from twenty to thirty hours of taped programs a week.

Among the shows taped in advance at Charlotte is a homemaker program, done partly in color and partly in black-and-white. A microwave relay enables WBTV to relay taped material to WBTV, Florence, S. C., which is operated by the same company that owns WBTV.

In sports-conscious Milwaukee, WISN-TV has installed two R. C. A. TV tape recorders to bring winter league baseball and Marquette University home football games to its viewers.

During the Marquette football season, WISN-TV will make tape recordings of all Saturday afternoon home games and play back the tapes on Sundays.

Station WBAL-TV in Baltimore put its first R. C. A. tape recorders in operation just an hour and forty-five minutes after it was delivered. The station plans to get another.

Brent Gunts, station manager, said the two machines will be used for more efficient programming of locally orig-

(Continued on Page 39)

STANDARD TOOL AND MANUFACTURING CO.

CONGRATULATIONS TO RCA
ON 40 YEARS OF
DYNAMIC GROWTH

We are happy to have been able to contribute in a small way to RCA's notable progress by supplying automatic equipment for the manufacture of RCA electron tubes, television picture tubes, semi-conductor devices and other electronic products.

Our 40 year relationship has been a most pleasant experience. We look forward to growing along with RCA during the many years that are beaoning in the future.

Very sincerely
B. K. Crawford
President

EXPERIENCE and the Future

For half a century the specialized services at Standard Tool & Manufacturing Co. have been available to industry.

Beginning in 1910, as contract machine builders, Standard Tool has expanded its facilities over the years until today its services include the specialized engineering and research necessary for the proper development of custom built automatic machinery. It is this experience and background combined with a close customer contact, that makes it possible for Standard Tool to fabricate

individual components so that they will function as integral parts of the most complex machines.

Under a long range continuous expansion program of planned obsolescence, Standard Tool facilities are maintained at the highest possible level of productivity.

Standard Tool confidently faces the future assured that its specialized services can meet the urgent requirements of industry in automating its production equipment for greater and greater output.

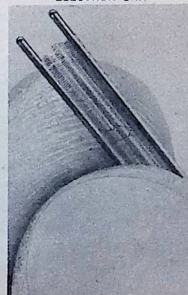
STANDARD TOOL & AUTOMATION

STANDARD TOOL & MANUFACTURING CO.

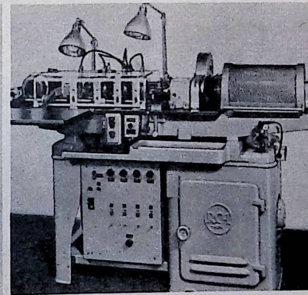
KEARNY, NEW JERSEY

LYNDHURST, NEW JERSEY

ELECTRON GRID



AUTOMATIC GRID WINDER



ELECTRON TUBE



Photographs thru courtesy of RCA

TWENTY-THREE



**We are proud
to have been
a vendor to**



**for 27
of their
40 years**

**UNITED
TRANSFORMER
CORPORATION**

New York Los Angeles
**Producers of the most
reliable transformers,
reactors, filters, and
related networks in
the entire electronics
industry.**

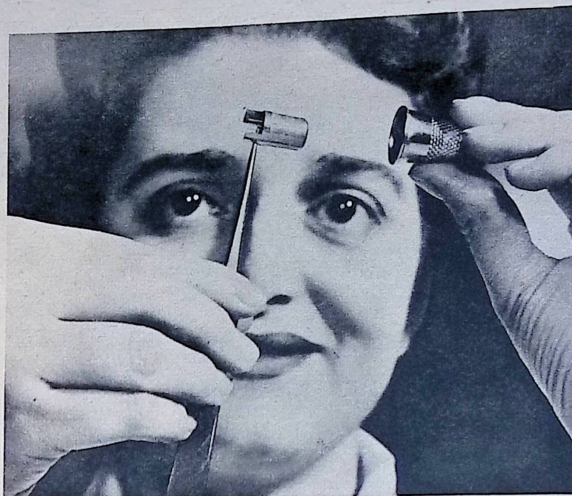
Behind It All: The Tube and Transistor

WITHIN a maze of colored wires and behind the control panels of electronic instruments are many versions of two "unsung heroes"—generally uncomprehended by the public—the electron tube and its tiny cousin, the transistor. These building blocks of America's fastest growing industry make electronic circuits "tick" and perform their remarkable feats.

Each time an intercontinental ballistic missile blasts off from the launching pad on one of the nation's missile ranges, scores of electron tubes and transistors pulse inside the rocket and control its flight. On the ground, tubes are at work in communications, timing and telemetering systems which record flight data. In a single test at Cape Canaveral, as many as 100,000 tubes may be in use.

Relay Space Data

America's satellites contain midjet broadcasting stations operated with transistors. While the satellite is in orbit, these radio stations relay vital space data back to the earth. Such information will help United States scientists chart the safest routes for man's future trips into outer space. Also aboard the missiles are transistorized



THE VACUUM TUBE—Latest development is thimble-sized "Nuvisor" with high power, wide range of usages.

radio receivers that pick up instructions from ground bases.

Electron tubes are not only basic components in defense but in industry and in the home as well. They perform the critically important function of detecting, amplifying or strengthening electrical signals. They are familiar to most persons merely as domed glass cylinders in radio and television sets. They come in a multitude of sizes and shapes. The prices of these tubes range from 50 cents to more than \$50,000 each.

In 1919, when the Radio Corporation of America was formed, tubes were made mainly by electric lamp manufacturers. The company began in 1930 to make its own tubes in a former lamp works at Harrison, N. J. The first R. C. A. tubes were simple types designed for use in early battery-powered radios.

Over the years, the uses of tubes expanded and the number of units being manufac-

tured continues to multiply. By 1958 R. C. A. manufactured its two-billionth electron tube. Today, the company makes more than 850 different types in six plants in New Jersey, Ohio, Pennsylvania and Indiana.

Help Plot Storms

The numerous uses of tubes grow every day. For example, here are but a few of the unusual jobs they are performing:

¶Tubes indicate storm formations to air-line pilots and enable them to plot the least turbulent route for the comfort and safety of passengers.

¶Some 27,000 tubes in an R. C. A. electronic data processing system at the Army Ordnance Tank-Automotive Command in Detroit are required to keep track of the Army's spare parts all over the world.

¶A 150-pound super-power tube, built by R. C. A. is used in an Army Signal Corps trans-

mitter to beam messages for the Pentagon to any spot on earth.

¶The remarkable picture tube in a color TV receiver "paints" all the hues of a brilliant sunset.

¶A new R. C. A. "ultrascope" tube is expected to aid medical research and increase knowledge concerning such diseases as cancer, arteriosclerosis and virus infections. It converts invisible ultraviolet microscope images into visible pictures.

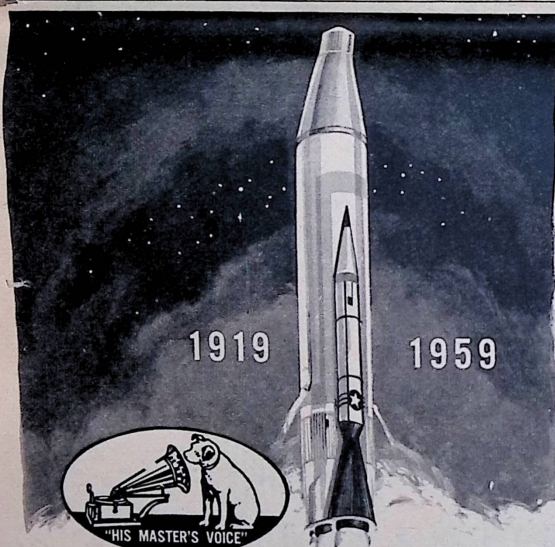
The "Nuvisor"

In their search for improved products, R. C. A. engineers have recently unveiled a revolutionary development in electron tube design. Called the "Nuvisor," this thimble-size, high-performance tube is expected to lead to important developments in such instruments as television sets, communications receivers and computers as well as more compact and efficient electronic equipment for defense and industry. Engineers anticipate the tubes of the Nuvisor design can have useful lifetimes of tens or even hundreds of thousands of hours.

In 1948 the world of science learned that a group of scientists at Bell Telephone Laboratories had developed a small device that could perform many functions of the electron tube. This device, the transistor, changed almost overnight the basic belief that the electron could be harnessed only when surrounded by vacuum, as in the electron tube.

A common transistor is encased in a small metallic cylinder and perched on three wire legs. Its small size, long life, light weight, low power consumption and stability make the transistor ideally suited for

(Continued on page 38)



**A SALUTE TO
R. C. A.**

H. L. YOH Co., Inc.



Industrial Consultants



LOS ANGELES
CINCINNATI
WALTHAM

PHILADELPHIA
SAN DIEGO
MARIETTA
WASHINGTON

SAN FRANCISCO
MOORESTOWN
TORONTO

Congratulations on Your Fortieth.

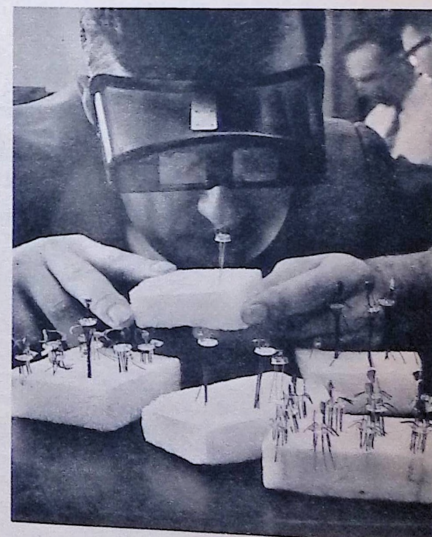
**We Are Proud To
Have Been A Member
Of the RCA Team
Through This Entire
Period.**

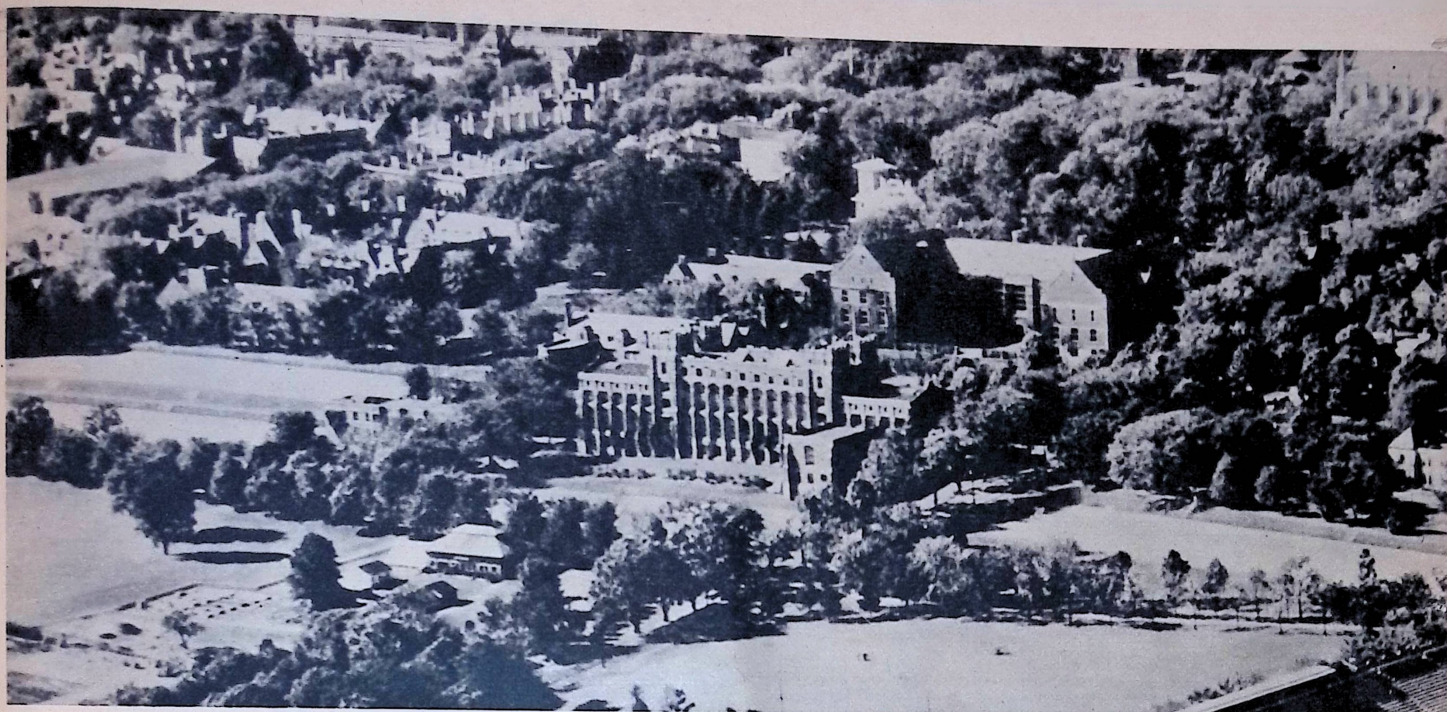


**CHICAGO TELEPHONE SUPPLY
Corporation**

THE TINY TRANSISTOR

— Replacing tubes in many cases, complementing them in others, transistors are making possible miniature instruments useful in products for home, military, industrial functions.





Princeton, N. J.: Today the area around this historic educational center is one of the country's foremost communities of scientific research.

RCA Electronics helps build a new capital of science at Princeton, N. J.

Explorers once looked for new opportunities beyond the mountains and the oceans. Today, our frontiers are somewhere out in space or deep inside the atom. The modern explorer is the research scientist. He seeks new ideas, new knowledge.

Research has been an important activity at RCA ever since it was founded in 1919. And eighteen years ago many scattered operations were united in the RCA David Sarnoff Research Center, which set the pattern for a new capital of industrial research at Princeton, N. J. Here, RCA provided gifted men with fine facilities—and created a cli-

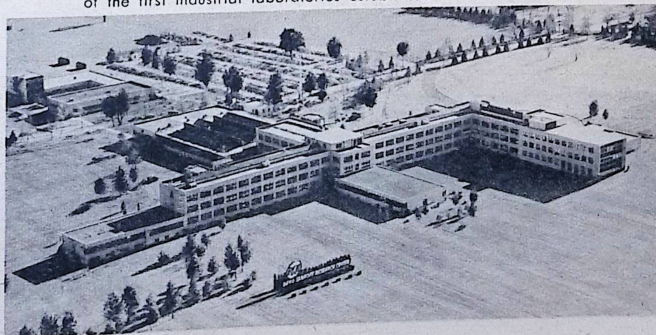
mate in which research thrives. Since then, many other institutions dedicated to research in a variety of fields have been erected in the area.

From RCA's vision has grown a reservoir of scientists and research men whose achievements put electronics into service on an ever-broadening front, and with such success that RCA means electronics—whether related to international communications, to the clearest performance of television in color or black-and-white, radio and stereophonic music or to national defense and the electronic conquests in space.

RADIO CORPORATION OF AMERICA



The RCA David Sarnoff Research Center, dedicated in 1942, was one of the first industrial laboratories established in the Princeton area.



we take
RCA, a giant in
relationship of mutual

ture of continued suc-
and brighter by the
ination, exploration,
realm of electronics.

GLASS
CO.
VA.

TV Technician... Electronics Expert... Missile Man



RCA SERVICE COMPANY "GETS AROUND" THE WORLD

A factory-trained technician from RCA Service Company protects the performance of your RCA Victor home products, including the wonderful world of color television. He knows them all, inside and out.

Specialists in many different fields from RCA Service Company help keep things rolling in industry and the entertainment world. Movie theatre to medical laboratory to dockside, they maintain and repair electronics equipment made by RCA.

Both engineers and technicians of RCA Service Company install, maintain and operate complex equipment for the testing of our nation's missiles at the Cape Canaveral range. RCA Service Company people do similar essential work on BMEWS, the Ballistic Missile Early Warning System, a project of unprecedented scope in the Far North of our continent. On scores of other government projects as well, RCA Service Company performs a multitude of vital tasks.

In your living room... in a network broadcasting studio... on a lonely South Atlantic island... the man, the expert, from RCA Service Company is doing a job no one else can do so well. Sure enough, RCA Service Company "gets around"... the whole wide world over!

ANOTHER WAY RCA SERVES THE NATION THROUGH ELECTRONICS

H. L. YORCA SERVICE COMPANY



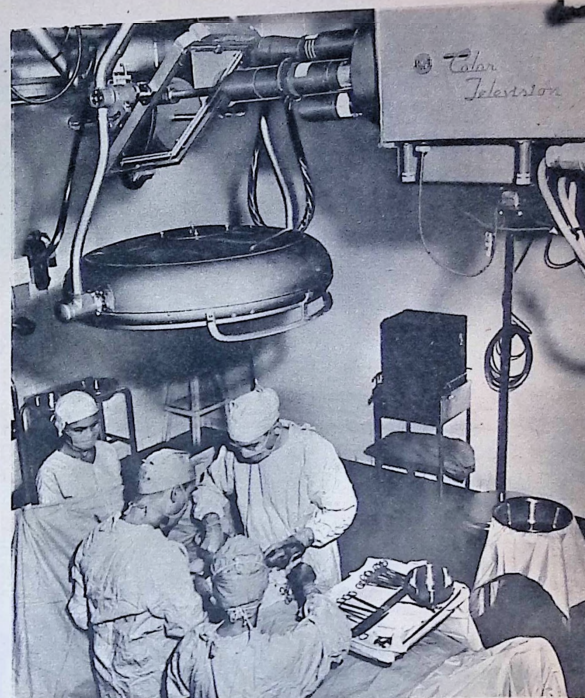
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A DIVISION OF RADIO CORPORATION OF AMERICA

CAMDEN 8, NEW JERSEY

LOS ANGELES
CINCINNATI
WALTHAM

TWENTY-FOUR



SURGERY ON TELEVISION — Color TV is used at Walter Reed Army Medical Center in Washington.

Electronics a New Tool For Medical Research

ELECTRONIC techniques, which have enabled men to girdle the globe with radio and television communications systems, solve complex mathematical computations and guide missiles and satellites, also are aiding today in the treatment of illness and providing new tools for medical research.

Collaboration between the physician and the electronics engineer is a recent development, yet medical authorities agree that many of the major advances in the life sciences have resulted from electronic research.

The electronic computer, for example—already a basic tool in the automated office and factory—is now beginning to serve the medical profession.

Dr. Vladimir K. Zworykin, of the Radio Corporation of America and the Rockefeller Institute, has pointed out that physical examinations have become so complicated that making various tests and evaluating them consumes a tremendous amount of a doctor's time. Now some physicians are asking: why not feed all the measurements of pulse, blood pressure, temperature and other data into a computer to provide a permanent record for each patient? Then at successive physical examinations the computer would instantly detect any changes in the indi-

vidual's physical condition. Experiments have been made which suggest that computers may eventually be able to compare a patient's symptoms against stored information on various diseases and supply an instant diagnosis.

In the field of basic medical research electronics has already made many vital contributions. The electron microscope—about 150 times more powerful than the ordinary light microscope—has given scientists their first view of such minute organisms as the polio virus and the leukemia virus.

Electronics engineers have developed tiny transducers, or miniature microphones, which can be attached to a wire and pushed through a blood vessel into the heart. They send out signals which enable physicians to pinpoint the location of a heart effect without exploratory surgery.

A "phonocardiograph" has been invented as an electronic improvement on the stethoscope. It converts heart sounds into graphs which can be compared with various kinds of disease patterns.

A "ballistocardiograph" measures electronically the minute recoil action of the heart as it pumps blood and has become an aid in the early detection of heart weakness.

In the field of medical education (Continued on Page 39)

HERALD TRIBUNE—R. C. A. 40TH ANNIVERSARY SUPPLEMENT—NOVEMBER 1, 1959

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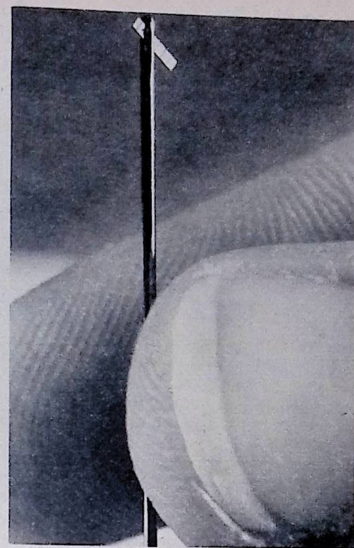
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field of medical educa-
tion on Page 39

ENT—NOVEMBER 1, 1959



THE UNIVERSE IS GETTING SMALLER—Electronics scientists are striving to shrink vital instruments for use in appliances both worldly and celestial. Left: R. C. A. equals a five-tube radio's mechanism in sugar-lump-sized micro-module device. Center: A human hair, in foreground, dwarfs experimental circuit intended to perform numerous functions. Right: A needle's eye can hold an element designed to perform many duties in computers and other machines.

Magic in Ever-Tinier Packages

DRAMATIC advances in micro - miniaturization have led to the development of a vast array of new electronic devices that are helping the United States meet the challenge in national defense and space exploration—and will ultimately provide improved products for the home.

A ten-ounce radio, designed by Radio Corporation of America for the Atlas satellite, relayed President Eisenhower's voice from outer space last Christmas.

An entire computer has been compressed into a little black box to control a fighter plane in flight.

Tiny new electronic controls are adding startling dimensions of accuracy to our planes and missiles.

An electron tube small enough to fit inside a thimble promises to revolutionize the tube business.

More Marvels in Offing

Amazing as the progress has been in recent years, even more accomplished miniature marvels are in the offing. A half-inch strip of germanium promises to perform functions that now require a circuit arrangement of eighty separate components. A tiny drop of metal will shrink huge computers a hundredfold, yet make them 1,000 times faster than present-day models.

Electronics industry spokesmen say the total being spent on miniaturization runs into many millions of dollars a year. Among the most active in the field are such giants as I. B. M., General Electric, Westinghouse, Bell Telephone Laboratories and

R. C. A. The list also includes hundreds of smaller companies.

R. C. A. alone, in its role as prime contractor, has some sixty electronics companies working on contracts totaling about \$7,500,000 from the United States Army Signal Corps to develop miniature military equipment.

The requirements of defense and space exploration have been largely responsible for the big trend toward smallness in electronics.

The importance of miniaturization is shown by the fact that it takes between 500 and 1,000 pounds of thrust at liftoff to place one pound in orbit.

Missiles an Example

Missiles and satellites must have communications and control systems capable of handling dozens of vital jobs without adding substantially to the over-all weight. It is not unusual for a missile to have an entire guidance system—equal to five TV sets—squeezed into a space six by ten inches.

During World War II, a soldier's combat radio weighed forty pounds. It has now been reduced to fifteen and the current goal is a five-pound belt set.

On the way is a complete television station, including a four-pound camera and fifteen-pound back pack, which will transmit a picture of the battlefield to combat commanders.

An essential factor in miniaturization is improvement in what the electronics industry calls "basic circuitry." This consists of the tubes, transistors and other components and materials that amplify, direct

and control the electrical impulses in any piece of equipment. In fact, the trend toward miniaturization is usually regarded as having begun with the Bell Telephone Laboratories' invention of the transistor a decade ago.

The key to making electronic devices smaller is "micro module" design, in which transistors and other basic elements are built as tiny sandwiches of uniform size and shape. Each component becomes a ceramic wafer about 3/10th of an inch square and 1/100th of an inch thick, on which conducting and insulating materials are fused. Bulky wiring and soldered connections are eliminated. The various components are assembled to form small blocks which function as amplifier,

oscillator or some other circuit element.

Micro modules are expected to make possible a tenfold—
(Continued on page 38)

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40th
Anniversary

We are proud to participate in your 40th anniversary celebration commemorating an exciting and historic era of vision, enterprise, and success as trailblazers in the fabulous electronics industry.

RCA, because of its success and stature in the electronics industry, must have quality products of close tolerances from its suppliers. As a supplier of curved etched face plates for the tube division of RCA, it is a significant indication of our own skill and ability to furnish a product to meet these most exacting requirements.

Being a small progressive business, we take great pride in our association with RCA, a giant in the industry, in a working relationship of mutual confidence and trust.

We wish RCA a glowing future of continued success in a world made better and brighter by the part they play in it using imagination, exploration, and enterprise in the marvelous realm of electronics.

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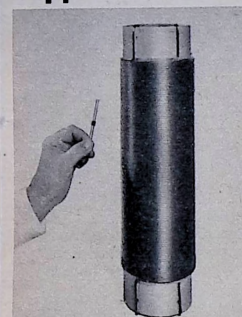
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to the progress

of the

Electronic Industry

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MUTER
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Muter Division, Chicago
Jensen Division, Chicago
Rola Division, Cleveland

TWENTY-EIGHT

40 Years of Progress

(Continued from page three)

able with the throwing of a single switch or pressing of a single button . . .

'Box' Becomes Reality

Mr. Sarnoff's "radio music box" became, of course, a commonplace over most of the world in relatively few years. Instrumental in the steady improvement of the "box" was the amount of money and talent he poured into research, beginning in 1919 with a laboratory in a tent at Riverhead, L. I.

When he was asked one time to explain the large investment in research, Mr. Sarnoff replied:

"There is no security in standing still. Those who rest on the rock of stabilization sooner or later find that the rock becomes their tombstone. There is hope and opportunity in what we can learn tomorrow. That is the greatest asset on the balance sheet of humanity, and on the balance sheet of any organization engaged in scientific research."

Delegated Authority

While Mr. Sarnoff continues to hold principal responsibility for R. C. A. policy, operating authority has been delegated to Mr. Burns who had the odd experience of working for ten years in association with R. C. A. before he began to work for R. C. A. in 1937. The point was that as a management consultant commissioned by R. C. A. to improve efficiency, he knew the company intimately from 1945 on, and subsequently Mr. Sarnoff personally selected him for the presidency.

Holder of degrees in electrical engineering and metallurgy, Mr. Burns is far more than an administrator from a desk—he understands the workings of most of the hundreds of intricate electronic devices made by his company and sold all over the globe.

R. C. A. was, in a sense, born out of World War I. During that conflict, the Federal government became worried about American dependence upon foreign-owned cables and wireless stations for communications with many important parts of the world.

Founding of R. C. A.

As a result of negotiations in which a part was played by then Acting Secretary of the Navy Franklin D. Roosevelt, the General Electric Co. was instrumental in founding R. C. A., later to be joined by American Telephone & Telegraph Co. and Westinghouse Electric Co.

As part of the founding arrangement, the new company took over the assets of Marconi of America. Perhaps the most important of these assets,

so to speak, was Marconi's young commercial manager — Mr. Sarnoff, who was one day to be called "the father of television." He became R. C. A.'s first commercial manager.

R. C. A.'s principal intended activity was international and marine radio communication. Some new transmitter towers were built and in 1920 service was established with England, Germany, France, Norway, Japan and Haiti. Every year since then, R. C. A.'s communications function has been expanded and improved and has long been world-wide. Meanwhile, a large number of originally unforeseen developments have happened with R. C. A.

Broadcasting Advance

In 1921, the company took its first step into the infant radio industry by broadcasting the Dempsey - Carpentier heavyweight boxing championship bout in Jersey City. Over the next few years, R. C. A. opened new radio stations in New York and Washington. The big advance came in 1926, when R. C. A. and associates founded the National Broadcasting Co., creating the beginning of network radio, later network television.

In these years, R. C. A. was only a selling agency of radio equipment manufactured by the electric companies. The firm suffered disadvantages in this and was anxious to do its own manufacturing. The opportunity came in 1929, when the Victor Talking Machine Co., weakened by the growth of radio, sold out to R. C. A. That year, R. C. A. also made arrangements to take over tube manufacturing from General Electric and Westinghouse.

During the 1920s, A. T. & T. terminated its R. C. A. ownership. Then, in 1932, R. C. A. became an independent firm when General Electric and Westinghouse divested them-

The Tiny Electron Is a Big Defense Gun

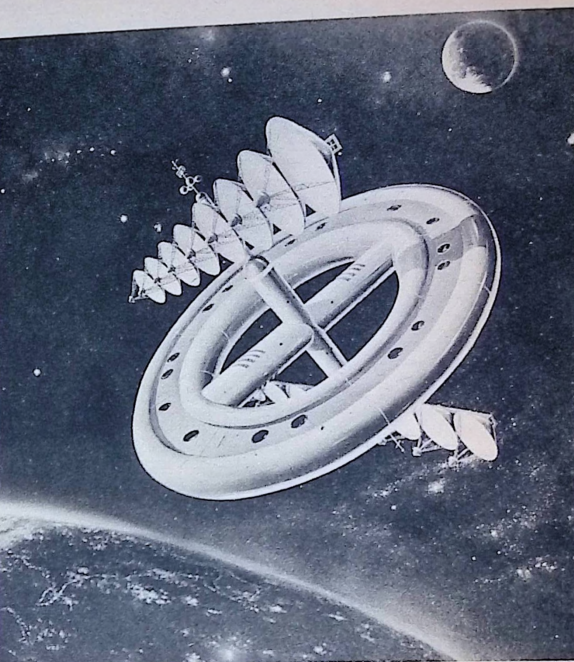
(Continued from page six)

and navigation aids, but flight control and fire control.

Its highly successful flight control data link is now being adapted to the guidance of the Bomarc missile.

R. C. A. is engaged in numerous research and development programs intended to strengthen the country's bulwarks against attack and to make its military operations more effective if war should come. Some of the major ones are, in brief:

"A pioneering concept in the miniaturization of electronic circuitry, known as the "micromodule program." This is being developed to reduce the



OUTER SPACE POSTOFFICE—"Flying saucers" such as this, with microwave antennas beamed at key cities on earth, may someday serve as orbital postoffices to transmit messages and even television programs. Sketch is based on actual plans under laboratory study by R. C. A. scientists.

selves of their holdings in the company at the insistence of the Federal government.

Military Devices

In 1938 R. C. A. was beginning to widen its horizon into such fields as television, radar and air-borne electronics. The outbreak of World War II a year later dictated the need for American military preparedness and by the time of the attack on Pearl Harbor virtually all of R. C. A.'s facilities were devoted to military requirements for radio equipment, radar, special tubes, acoustical devices and navigation systems.

Contributions of R. C. A. factories to the war effort were recognized by the award of seven Army-Navy "E" pen-

size of components and systems for space vehicles, satellites and missiles; for field communications and other uses.

"Several studies leading toward methods to intercept, destroy and neutralize the effectiveness of unfriendly satellites. Details of these are highly classified.

"Research work leading toward new methods of propulsion of space vehicles, high-efficiency transmitters for space vehicles and improved guidance systems for missiles.

"Development of the communications systems for the launch and control sites of the Minuteman missile, possible backbone of United States defense against missile attack.

nants, two Navy Bureau of Ordnance flags, the Maritime pennant, Victory Fleet flag and twenty-seven stars for continued excellence in operations.

The biggest immediate post-war event was the establishment of commercial television in 1946. However, the revolution in electronics, both in methods and materials, brought on by World War II and subsequent research, affected R. C. A. and the electronics industry so completely that vast new horizons opened up.

It was against that background that Mr. Sarnoff observed, "There is no element of material progress we know today . . . that will not seem, from the vantage point of 1980, a fumbling prelude."

R. C. A., though the largest in the electronics field, is only one of many hundreds of companies contributing to this essential new element in the defense of the United States and its allies.

In plants and laboratories across the nation, scientists are designing new instruments, from tiny transistorized micromodules to giant computers, to guide supersonic aircraft, speed up communications and make more precise the operation of America's defense system.

The importance of this work is underlined by the words of Maj. Gen. Carl Spaatz, former Air Force chief of staff: "In any future war, superior electronics would be decisive."

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Electronic Brains to Aid Wall Street

THE Wall Street area, work center for some of the country's best financial brains, is adding a new kind of brain to its operations. Faced with ever-swelling floods of paper work, New York brokerage houses are calling on electronic data-processing systems to handle the daily deluge of record keeping and speed up communications with customers.

Early next year the Radio Corporation of America will open a Computer Service Center in New York's financial district. It will help brokers process millions of daily stock and bond transactions with greater efficiency and speed.

E. F. Hutton & Co. was the first firm to sign a contract for the center's services. Goodbody & Co. and Reynolds & Co., both among the nation's largest brokerage houses, will install R. C. A. electronic data-processing systems in their New York headquarters.

Service Center

Wall Street's new "office helper" is the R. C. A. 501 electronic data-processing system. Completely transistorized not only in the computer but in all operating units, it occupies less space and requires less power than earlier systems. Its "brains" are three R. C. A. computers, the 502, 503 and 504.

Those brains soon will be working for small business as well as for the financial and industrial giants. By using computer service centers, like R. C. A.'s financial district installation, a business firm would no longer need to own or rent a computer to process data.

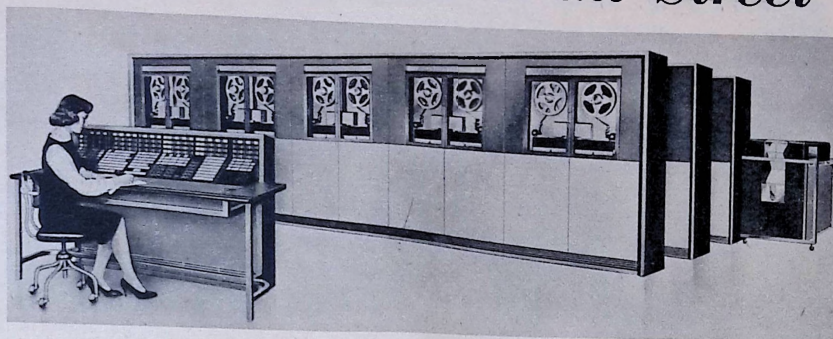
In opening the first R. C. A. Computer Service Center, at Cherry Hill, N. J., John L. Burns, president of R. C. A., predicted that "the day may not be far off when it will be as easy for a small business man to make use of a data-processing center as it is for a housewife to use a laundromat."

Helps Utilities

"Up to now," he said, "full-scale data-processing systems could be justified only by about 3,000 of America's larger corporations. The R. C. A. project adds more than 30,000 companies to those which can profitably use data-processing service."

The R. C. A. 501 serves many masters. It will help public utilities, such as the Niagara Mohawk Power Corp., at Syracuse, to process more than 1,000,000 bills a month. The Fidelity-Philadelphia Trust Co., expecting its 90,000 daily checking and deposit transactions to double in the next decade, is installing a 501 to simplify and speed up the job.

This month the New York Telephone Co. will use the



TO REDUCE THE GROWING PAPER WORK—Sketch of new R. C. A. 501 model data-processing system, flexible enough to be used by business firms, large and small. A 501 center soon will be in service in Wall Street area to handle accounts of brokerage houses.

R. C. A. system in distributing the 1960 Manhattan classified directory. The electronic brain will apportion directories to proper delivery trucks, turn out printed delivery orders and "instruct" delivery men. Later it will help in delivery of the thirty-two other directories for 3,500,000 telephone users in New York City and Nassau, Suffolk, Westchester and Rockland Counties.

Leased by Navy

The same brain that helps the telephone company keep tab on phone book delivery also will help the Navy Bureau of Weapons keep track of ammunition from production until it is expended in maneuvers. The Navy has leased an R. C. A. 501 for inventory control.

The Air Force also will utilize an R. C. A. 501 system, but for keeping tabs on men rather than ammunition. The system will be installed at the Air Reserve Records Center in Denver to control service and mobilization records of more than 535,000 air reservists.

More than thirty-five business and government organizations have arranged to lease R. C. A. 501 systems in the first year of their availability. They include utilities, banks, manufacturers of industrial products, consumer goods makers and transportation firms. When the R. C. A. Computer Service Centers are in operation, almost every element of American business will be able to use the electronic "brains."

'Managerial' Machine

The new R. C. A. computer that "thinks for itself" has "managerial" as well as clerical capabilities. This is the R. C. A. 110. It combines a magnetic core high-speed memory device with a magnetic drum large-capacity memory storage unit. Drawing facts and figures from these two sources, it can make its own "decisions" in controlling industrial processes and solving complex engineering problems.

To such smaller and smarter

electronic "brains" soon will be added other members of the family that will be still smaller, in keeping with space-saving trends, yet capable of prodigious feats of memory and action.

Dr. Irving Wolff, of the R. C. A. Laboratories in Princeton, N. J., has announced a new kind of computer element so tiny that 100,000,000 of them can be packed into one cubic foot. Each element consists of a piece of silicon measuring sixteen ten-thousandths of a cubic inch.

Paper Work Problem

The all-service computer is a logical development in this age of communications, Theodore A. Smith, executive vice-president of R. C. A. Industrial Electronic Products, believes.

"In an economy in which distribution and service are just as important as production, the burdens of recording, classifying, sorting, summarizing and interpreting information are tremendous," Mr. Smith explained. "In the past fifty years our paper work has increased even faster than our technology."

"Without the automatic record-keeping that electronic data processing provides, there just wouldn't be enough people to man today's paper work. As we enter an era of more leisure, more productivity and wider distribution, business and government must turn over more and more paper work to the machine. Only by doing so can we realize tomorrow's promise of more goods for more people with less work."

Transistors Responsible

Adaptation of the R. C. A. 501 system for small and medium-sized businesses as well as huge industrial concerns was made possible this fall through introduction of two new all-transistor computers. Until now, the R. C. A. 501 system had utilized only the R. C. A. 501 medium-scale computer. The new high-speed R. C. A. 504 computer, in

addition to processing greater data volume, brings within range of the 501 system the fields of data reduction, engineering problems and other types of scientific computation. The R. C. A. 502 computer was developed for smaller businesses.

"A growing business now can keep pace economically with growing paper work without any major change in its data-processing system," Mr. Smith pointed out. "An average business firm can start with a basic system using the 502 computer and expand it by adding transistorized equipment as the need arises."

CONGRATULATIONS

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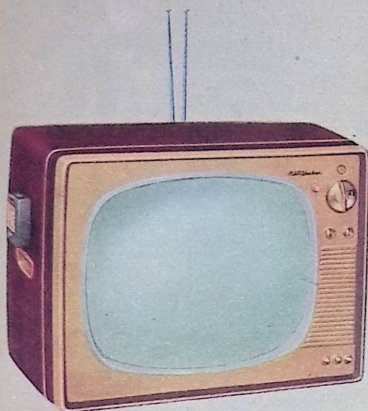


To three generations, this is the
symbol of excellence
in home entertainment—
and you'll find RCA Victor's
“Nipper” on today's greatest
Newsmakers, too!



IT'S TABLE TV—IT
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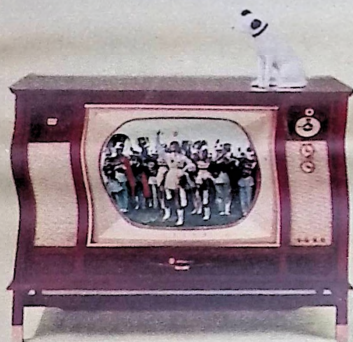


IT'S TABLE TV—IT'S PORTABLE—it tunes by-remote control! This versatile RCA Victor is a perfect set for your bedroom. And with its slim styling and recessed handgrips you can carry it anywhere. The miniature "Wireless Wizard" remote control unit turns set on or off, changes channels. *The Modernette Tote-able.*

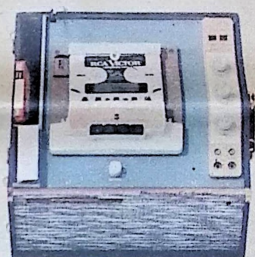
ANOTHER RCA VICTOR EXCLUSIVE. World's first TV that rises out of a modern living room table—disappears again when not in use. A pleasure to decorate around, RCA Victor's Hide-away TV has a finish of genuine walnut veneers and solids. *New Vista Hillsborough.*



ANOTHER WAY RCA
SERVES YOU
THROUGH
ELECTRONICS



PUSH-BUTTON COLOR TV that's perfection itself. You do all tuning—even adjusting exact shade of color—from your easychair. Lets you enjoy top color shows every day—and gives superb black-and-white reception too. *The Kenbridge.*



AN RCA VICTOR FIRST! Stereo Tape Cartridge Player Recorder plays or records monaural or stereo. Cartridge clicks in—easy to play as a record. Model SCP2. Ask your RCA Victor dealer for a list of tape cartridge selections.



THIS TRANSISTOR RADIO has the exclusive "High-T" circuit for improved fidelity, extended tonal response. Comes in the famous non-breakable "IMPAC" case. *The Rio.*



COMPLETE 2-IN-1 STEREO SYSTEM. Left speaker unit swings out—lifts off—can be placed for best full-range stereo effect. Plays all four speeds of records and Stereo AM-FM radio, through six speakers with 58-watt output. *The Mark VIII.*

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Dies for Precision
Molding

THIRTY-TWO

'Nipper' Has a Birthday

THIS year marks the sixtieth birthday of Nipper, the world-famous black and white fox terrier celebrated in R. C. A.-Victor's dog and horn trademark — "His Master's Voice."

In the years since Nipper was first painted by his master, Francis Barraud, he has appeared on the labels of countless R. C. A.-Victor records and on all album covers and advertising. Reproductions of the painting have been published everywhere. In turn they created a huge demand for actual painted copies, which, incidentally, kept Barraud busy for almost his entire lifetime.

But even more, the sixty years at R. C. A.-Victor Records represent both a mirror of American musical life dating back to the turn of the century and the development of recorded sound up to the latest wonders of stereo.

Recording Started in 1902

When, in 1902, the great tenor Enrico Caruso was recorded in Milan, Italy, using the Victor master disk method, a new era was under way in home entertainment.

The industry advanced steadily during the following decades as recording techniques and instruments improved. By 1932, annual record sales had reached \$100 million but still the path of progress was not always an easy one.

The advent of radio had a severe but stimulating effect on the record business. As radio grew in the next ten years, record sales declined, yet the slump had its compensating factors.

It is acknowledged, for example, that had it not been for the competition of radio broadcasting, recordings of the lighter types of music might have continued merely to provide faithful transcriptions of established hit songs, sung exactly as introduced by the top personalities of vaudeville, night clubs and musical comedies.

But when radio began bringing these same performers into homes at no cost, records had to provide a different musical fare or lose the paying public. It was a big challenge.

That, essentially, was the situation which inspired the record industry to develop a new philosophy and course of action, which led to the "break-through" and new vistas. Basically, success was centered on the fact that records could be played by choice again and again, as often as listeners wished; whereas, radio's playing of a number was merely a single offering.

In 1939, RCA Victor initiated



NIPPER—The fox terrier in Francis Barraud's painting is 60 years old this year.

a comprehensive study of the record and phonograph situation, while continuing its leadership in the production and sale of records and instruments. Less than ten years later, despite delays necessitated by World War II, this study known as "Project X," resulted in a new phonograph system.

The goal of company engineers in this project was the development of a music reproducing system that would eliminate the shortcomings of conventional phonograph systems and incorporate the advantages made possible by the increased knowledge of electronics, recording techniques, and instrument engineering.

This goal was achieved by the RCA-Victor 45-r. p. m. system, introduced to the public in 1949.

The '45' Made History

The RCA-Victor "45" system has made history. More than 10 million of these instruments now are in American homes and record sales have attained a going rate far beyond the most optimistic estimates of manufacturers and dealers.

Then, last year, came stereophonic sound — recorded and played through two sets of instruments to match the listener's left and right ears. "Three-dimensional sound," R. C. A.

called it. Fortunately, for at least three years the company had been recording all music stereophonically, providing a large library of stereo music for both records and tape.

Another major "break-through" in recorded sound was disclosed by RCA Victor within recent months when the firm introduced its new stereophonic tape cartridge player-recorders after years of research and extensive field testing.

The first of three RCA-Victor stereo tape cartridge player-recorders were announced last June, and only a few weeks ago two more instruments were added to the line.

Future Tape Cartridges

The RCA-Victor tape cartridge, a plastic magazine 5x7 inches and one-half inch thick, is inserted in the player as easily as a phonograph record. The tape itself is not touched by the individual and never needs to be threaded by hand or rewound after playing.

The RCA-Victor record division has announced that approximately 150 tape cartridges, each containing up to an hour of stereophonic music, both popular and classical, will be released over the next few months.

ATTA BOY, RCA

Happy to be on your team and glad to be able to supply you with quality-grade capacitors. We appreciate your insistence for high quality and are proud that Pyramid's engineering and production fit these requirements.



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Factories: Darlington, S.C., Gastonia, N.C.

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**CAPACITORS—SELENIUM
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Congratulations

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On Your 40th Anniversary!

Your friendship over the years has been valued and enjoyed. And we at Stainless are proud to be serving an organization which has scored so many significant achievements in the advancement of science and technology.



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General Instrument Corporation is proud that RCA recognizes the achievements of our various divisions and subsidiary companies in advanced research, development and manufacture . . . Proud too, that we are one of this great American corporation's important sources for electronic components and devices.

General Instrument Corporation includes Semiconductor Division, F. W. Sickles Division, Automatic Manufacturing Division, Radio Receptor Co., Inc., Micamold Electronics Manufacturing Corporation and Harris Transducer Corporation (subsidiaries)



**GENERAL INSTRUMENT
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65 Gouverneur Street
Newark 4, N. J.

TA OY, A

R.C.A. Institutes Older Than 'Parent'

ALTHOUGH the Radio Corporation of America is observing its fortieth anniversary this year, R. C. A. Institutes—one of the world's leading training centers for electronic technology—will mark its golden anniversary on Nov. 15.

That the world-renowned school of television and electronic technology in Greenwich Village pre-dates its parent corporation stems from the fact that it was organized in 1909 as the United Wireless School to train "wireless operators" for ships. Later, the American Marconi Wireless Telegraph Co. acquired it and renamed it The Marconi Institute. Among its instructors during this period was a young man named David Sarnoff; today he is chairman of the board of R. C. A.

With the formation of Radio Corporation of America in 1919. The Marconi Institute became a part of the new corporation under the new name of Radio Institute of America, which it remained until August, 1929, when it was incorporated under its present name as a wholly-owned subsidiary of R. C. A.

Foreign Students Attend

Students from practically every state of the United States attend the school, as do an average of 100 students each year from Thailand, Formosa, Brazil, Israel, Burma, Chile and other nations. Many foreign broadcasting networks, such as Radio Burma, are staffed by R. C. A. Institutes alumni.

In addition, the United States Coast Guard regularly assigns selected personnel to the Institutes' advanced electronics technology course.

Like most other centers of higher learning in New York



ELECTRONICS STUDENT—A student in an advanced electronics technology course in the Institutes' laboratory.

City, R. C. A. Institutes is a "subway college." This "college" is a nine-story converted factory building, its classrooms and laboratories equipped with thousands of dollars worth of electronic apparatus and test equipment for courses covering all branches of practical electronics.

2 Resident Schools

At present, the Institutes' two resident schools—the Technical Institute and the Vocational School—have an enrollment of more than 3,000 students. Added to this number are 12,000 students now enrolled in the Home Study School's four correspondence courses.

"The Institutes' growth over the last five years," says George F. Maedel, its president, "reflects the increasingly important role technical schools are

playing in helping this country to ease its critical shortage of technical man power.

"By eliminating non-technical courses and by placing emphasis on applications as well as on theory, technical institutes are able to produce in two years engineering technicians ready and capable of entering industry in a variety of semi-professional engineering positions with a minimum of additional training."

Tracking Satellites

The school's graduates currently are playing important roles in guided missile and satellite tracking, and in the research, development, operation and servicing of such electronic marvels as computers, data processing systems, television, all-weather radar, and fire control systems.

Evidence of the growing demand for semi-professional engineering technicians, Mr.

Maedel says, is the increasing percentage of students enrolling in the Technical Institute's college-level advanced electronics technology course, which is accredited by the Engineers Council for Professional Development.

Approximately 40 per cent of the beginning students who enrolled this fall are taking the twenty-seven-month Technical Institute course. This is an increase of 10 to 15 per cent over past classes.

Vocational School

The remaining 60 per cent of the resident students are enrolled in the Vocational School, taking courses in television and general electronics, radio and television servicing and radio telegraph operating.

The Vocational School courses are shorter in duration and make lesser demands on a student's mathematical ability than does the Technical Institute's advanced course.

Beginning with a review of high school algebra, physics, geometry, trigonometry and study methods, students in the advanced electronics technology course spend twenty-five hours a week in class. They progress through such subjects as electricity and magnetism, advanced algebra and calculus.

Congratulations



ON YOUR 40th ANNIVERSARY

from—



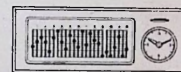
ON OUR 40th ANNIVERSARY

WBD Precision Electronic,
Electrical and Mechanical
Alloys for All Industries

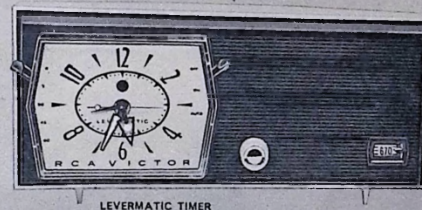
**WILBUR B.
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We salute the
40th Anniversary of RCA
Westclox is proud to be associated with
RCA in electronics—America's fastest-
growing scientific field.



"MAGIC MEMORY" TV PROGRAMMER

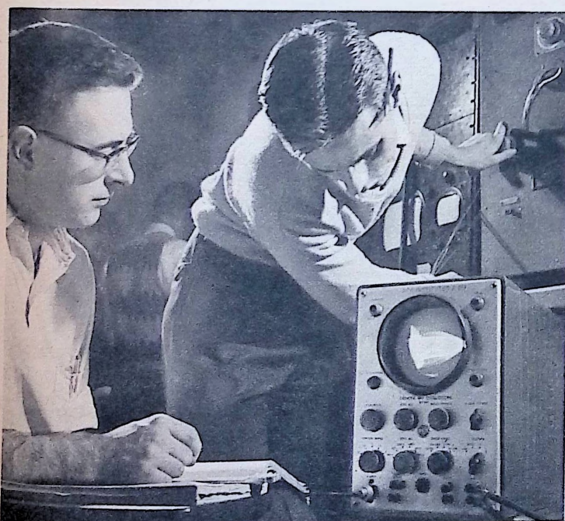


Above are just three of the RCA Victor products in which Westclox timing devices play an important part.

WESTCLOX

MAKERS OF BIG BEN • DIVISION OF GENERAL TIME CORPORATION • LA SALLE, ILLINOIS

THIRTY-THREE



CHECKING PERFORMANCE—Studying the cathode ray oscilloscope, R. C. A. Institutes students run a test.

HERALD TRIBUNE—R. C. A. 40TH ANNIVERSARY SUPPLEMENT—NOVEMBER 1, 1959

Congratulations
from

**JETRONIC
INDUSTRIES
INC.**

Main and Cotton Streets
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Manufacturers of
custom built
electronic assemblies

NORTH SALUTES RCA

OVER a decade of working with RCA has been mutually beneficial in the areas of professional stimulation and advancement.

Such team efforts as have been expended by North and RCA have triggered many of the most significant developments of the past and will certainly provide the springboard to future advances.

North looks forward to a long continuing association with such kindred spirits as RCA in the ever expanding field of electronics.

**NORTH
ELECTRIC
COMPANY**

GALION, OHIO



RCA's FIRST AC RADIO SET...

a superheterodyne set which used capacitors—was made in 1928. One of the firms that supplied those capacitors was **CORNELL-DUBILIER**, the company that created the first compact, commercially practical "condensers" 18 years earlier.

Now celebrating its 50th anniversary, C-D is still supplying RCA with capacitors of Consistently Dependable quality. Such continuous confidence must be deserved.



CORNELL-DUBILIER ELECTRIC CORPORATION, SOUTH PLAINFIELD, N.J.

THIRTY-FOUR

10 Firms Share Big Private Reactor

THE biggest privately owned nuclear research reactor in the world is contained in a gleaming aluminum dome in sylvan surroundings at Plainsboro, N. J. Its name is Industrial Reactor Laboratories, Inc.

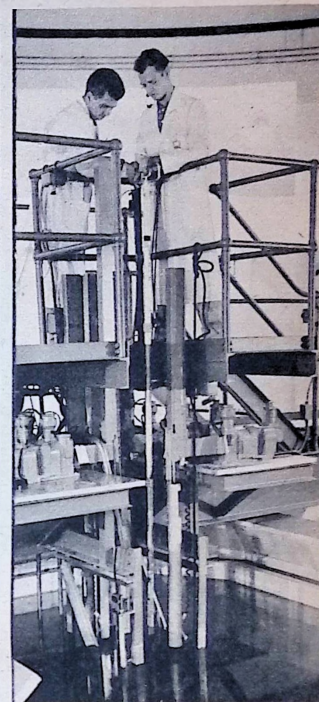
The reactor is a joint project of the Radio Corporation of America and nine other big corporations. The ten companies banded together to share the costs of nuclear research—the reactor and laboratory spaces cost something over \$4,500,000 to build.

The participating companies in addition to R. C. A. are: American Machine & Foundry Co., American Tobacco Co., Atlas Powder Co., Continental Can Co., Corning Glass Works, National Distillers & Chemical Corp., National Lead Co., Socony Mobil Oil Co., Inc., and United States Rubber Co.

Major Contribution

When the reactor went into operation last Jan. 21, Harry L. Hilyard, president of I. R. L., called it a major contribution by private enterprise to President Eisenhower's "Atoms for Peace" program. He said:

"Industrial Reactor Laboratories, dedicated to 'atoms for living,' is a pioneering example of co-operation among leading



INSIDE A NUCLEAR REACTOR—Shielded by three-foot-thick laminated window, operator at left can perform experiments by remote control. At right is reactor core.

American industries to apply the most advanced scientific techniques to the improvement of goods and services for our peace-time economy."

The dome over the reactor is eighty-seven feet high. The shape, which resembles the up-ended nose of a dirigible, was chosen as the strongest without internal supports and also because of its advantages for interior lighting.

Glass-Enclosed Room

Inside is a pool-type reactor. This means that the uranium core is at the bottom of a big pool of water, twenty-seven feet deep. The water circulates

through the core, removing heat, and provides a protective shield against radiation.

Around two-thirds of the top of the pool is a platform and on the platform is a glass-enclosed room. Inside are the controls for the reactor.

At ground level, chambers have been built into the reactor where scientific experiments are carried on. Materials can be inserted into the chambers for exposure to various kinds and different degrees of radiation.

Scientists will use the nuclear particles emitted from the reactor to bombard metals, chemicals, electronically-active materials, plastics and organic matter. They will study the effects and also use radiation to alter the atomic structure of materials, thus creating new substances.

These industrial scientists hope that the result of their experiments will be new basic materials, new products and new techniques that can be used in homes and industries and by the armed services.

Adjacent to the dome is the one-story laboratory building. In it, each of the ten companies has identical laboratory space staffed by its own scientists.

Valuable Knowledge

R. C. A.'s laboratory staff at Plainsboro is headed by Dr. D. A. Ross. Dr. Ross also is on the staff at R. C. A.'s David Sarnoff Research Center at

Princeton, which is about five miles away.

The rewards R. C. A. hopes to reap by participating in the research reactor have been summarized by Dr. E. W. Engstrom, senior executive vice-president. He said the knowledge gained at Plainsboro will be valuable "in at least two specific areas":

1. "In determining the effect of atomic radiation in altering the characteristics of many materials used in electronic systems, as well as in the development of useful new materials."

2. "In studying the effects of radiation on the various types of electronic equipment for communication, navigation, control and other commercial and military functions in which electronics plays a leading role."

"R. C. A. has already explored with initial success the direct conversion of atomic radiation to electrical energy through an experimental atomic battery," he added. "The facilities of I. R. L. will permit further work in this important area."

He listed these projects to be undertaken by R. C. A. at the reactor: tracer studies of luminescent phosphors, semi-conductors and other electronic materials; use of neutrons to study the arrangement of atoms that cause magnetic effect; studies of the effect of radiation damage on materials used in electronic systems, and creation by radiation of useful new effects in materials.

Congratulations

to

RCA

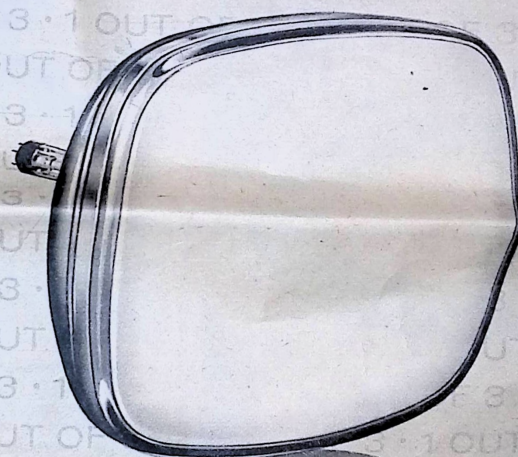


Weyerhaeuser Company

Shipping
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Division

Of the 3 largest-selling brands of replacement TV picture tubes . . .

Only RCA Guarantees You An All-New Tube



Let's face it—when you have to replace your TV picture tube, it means a sizeable investment. Doesn't it make sense, then, to be sure that the tube you get is *all-new*? That's why you should bear this in mind: Of the 3 largest-selling brands of replacement TV picture tubes, only 1...RCA...offers you a line of completely all-new tubes...RCA Silverama!

With RCA Silverama, you know what you're getting!

RCA guarantees that each and every Silverama picture tube is all-new, totally new...new glass, new phosphor, new gun, new everything...and gives you the added assurance of a full-year warranty.

If your TV picture tube needs replacing, guarantee yourself the clearest, sharpest picture possible—insist on an RCA Silverama. There's one to fit virtually every make and model TV set. Ask your TV technician for complete information and prices.



RADIO CORPORATION OF AMERICA • Electron Tube Division, Harrison, N. J.

Silverama®

Congratulations

RCA

on
your

40th
Birthday!



from
Alliance

your supplier of miniature motors for
RCA record players, record changers, tape
recorders and remote control TV tuners.

Since 1939 Alliance has been privileged to supply
many kinds of motors for RCA products. RCA's
high quality standards and strict specifications
call for the kind of workmanship that has helped
make Alliance the leading producer of sub-fractional
horsepower motors. Our thanks to you...
and Happy Birthday too!

**THE ALLIANCE
MANUFACTURING COMPANY**

Division of Consolidated Electronics Industries Corp.

ALLIANCE, OHIO

THIRTY-SIX

'Via RCA': It Girdles Globe

Radio-Telegraph Net Links 68 Foreign Nations

THE biggest commercial radio communications system in the world is operated by R. C. A. Communications, Inc. This is the overseas radio-telegraph division of the Radio Corporation of America.

This system is the oldest part of the company—R. C. A. was started in 1919, in fact, for the purpose of organizing an overseas wireless system.

The communications system is made up of radio-telegraph circuits to sixty-eight foreign countries; teletypewriter circuits to forty-five countries and radio-photo circuits to forty points overseas.

Ships at Sea Messages

An important part is the sending and receiving of messages from ships at sea. R. C. A. now has forty years of experience in ship-to-shore wireless and has built ten radiomarine stations—eight on the coasts of the United States, one in Hawaii and one in the Philippines. The biggest of these stations, Chathamradio, on Cape Cod, can send wireless messages to ships anywhere in the world.

International law requires all ships over 1,600 tons to carry radiotelegraph equipment and operators so that messages can be sent to and from almost all ships at sea. More than 400,000 of these marine telegrams are sent "Via R. C. A." each year.

Via Automatic Tape

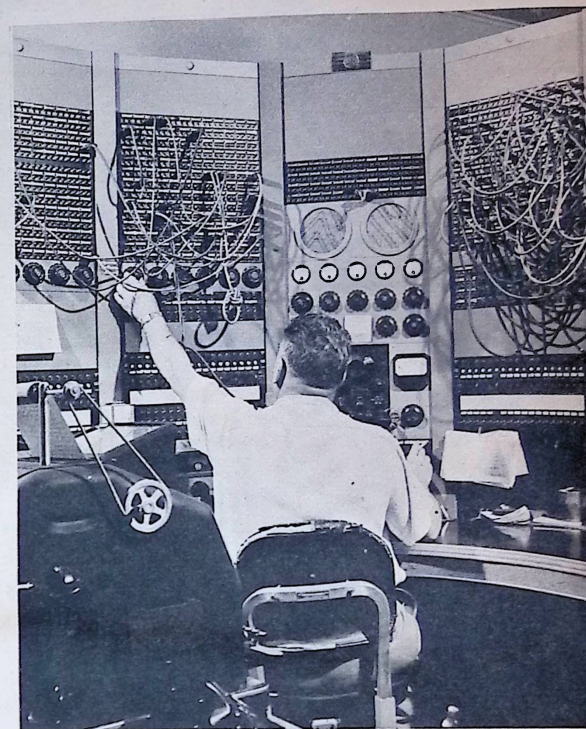
The global radio facilities of R. C. A. Communications, on the other hand, carried over 8,000,000 overseas telegrams last year. All the major R. C. A. circuits are operated with automatic tape transmitting and receiving and automatic signal monitoring equipment.

Electronic multiplex equipment is used to increase circuit capacity during peak load periods.

International Teletypewriter Exchange service was pioneered commercially by R. C. A. Communications when it put into use its "Telex" service in 1950. Telex communication gives two-way, person-to-person communication through the direct connection of teletypewriters and a printed record of everything transmitted.

To 45 Countries

This service is available through R. C. A. now between the United States and forty-five countries. As an example of how it works, headquarters of a steel company in Pittsburgh can get in immediate touch with its branch office in Japan.



TRANS-ATLANTIC SWITCHBOARD—Master control panel of R. C. A. Communications.

As the secretary punches a message on the keyboard of her teletypewriter in Pittsburgh, the words appear simultaneously on a teletypewriter on the other side of the globe in Japan. Messages can be received, acknowledged and replies returned within minutes, with printed records at both ends to prevent misunderstanding.

Pictures by Radio

But not only words—pictures as well can be sent around the world via R. C. A.

Through the radiophoto service, facsimiles of anything pictorial that cannot be sent in telegram form can be transmitted to forty-three foreign countries.

Radiophoto was developed for the press. As a matter of fact, the first radiophoto was a picture of the late Charles Evans Hughes sent by R. C. A. from London to the New York Herald Tribune on July 6, 1924.

The advantages for the press inspired the use of radiophoto by private industry. Business houses now send photographs, drawings, blueprints, formulae, signatures, legal documents and messages in non-Roman characters overseas by R. C. A.

Leased Radio Channels

Still another service provided by R. C. A. Communications is leased radio channel service.

This was developed for companies and organizations that have large volumes of overseas

telegraph traffic. Through this service, a subscriber leases a channel, R. C. A. installs the equipment and the subscriber then handles the messages on the channel himself.

This gives him maximum control over the flow of outgoing messages, fastest service and full knowledge of the status of message traffic. For large volumes of messages, it provides the most economical form of communication.

All of these forms of communications have evolved over the last forty years from the days when messages were tapped out in Morse code by hand key on simple circuits to a handful of nations overseas.

Marconi's Invention

The rapidity with which radio communications have developed is underscored by the fact that only a century ago it took four months to get messages between America and Europe.

Electrical communication began when Samuel F. B. Morse discovered in 1832 that wires could carry information. In 1896 at Bologna, Italy, Guglielmo Marconi was able to send messages through the air by "wireless."

Continuing his experiments in England, Marconi in 1901 sent a signal across the Atlantic. Radio's dramatic use in rescue at sea won it acceptance. After World War I, R. C. A. was started as a national wireless system.

R. C. A. Is a World-Wide Business

FAMOUS places and people are not the only things that impress American tourists abroad nowadays. Most Americans traveling overseas today are amazed by all the familiar United States products and labels they see in foreign markets.

The average tourist, however, only knows part of the whole story. He usually is aware of imported American movies, cigarettes and automobiles. But often he does not see the role American industrial products are playing behind the scenes, performing unobtrusive yet important jobs in national defense, medicine and communications.

The size and complexity of the field can be judged somewhat from the vast operations of the R. C. A. International division.

The R. C. A. name and trademark are carried abroad by a network of fourteen associated companies and by more than 200 major distributors in 145 countries.

Cosmopolitan Personnel

The Division's headquarters are at the R. C. A. Building in New York City. Its operational activities are centered at Clark, N. J., where a staff of some 500 specialists is required to handle marketing, traffic, advertising and engineering matters. The personnel includes many nationalities—Europeans, Latin Americans, Japanese, Chinese and North Americans. Total employment at the division is more than 4,000.

Its far-flung interests are indicated by some of its recent projects:

1. A multi-million-dollar contract was signed with Brazil for television transmitters and microwave relays. This system will provide interchange of TV



IN SAUDI ARABIA—A single-sideband radio in use.

programs to viewers in Rio de Janeiro, Sao Paulo, and Belo Horizonte, linked by a 500-mile microwave radio circuit.

2. Four TV transmitters were installed in Finland. The first commercial TV station in the Middle East went on the air in Teheran, R. C. A.-equipped. Another station in Abadan was scheduled for operation in mid-1959.

3. An R. C. A. TV transmitter is being installed by the Spanish government on a 7,500-foot mountain thirty miles from Madrid. The first R. C. A.-equipped TV color station outside of the United States was opened in Havana, Cuba. Peru began commercial television with R. C. A. helping to pioneer in this land, as well as in El Salvador. Japan also is active in color TV broadcasting.

4. Yugoslavia's TV system began network operation, using R. C. A. mobile units and studio equipment in Belgrade, Zagreb, and Ljubljana.

5. The 3,000-mile archipelago of Indonesia is improving its overseas as well as its internal communications with R. C. A.

equipment. In Venezuela, Ecuador, Chile, Guatemala, the Philippines, Burma, Kuwait and on the African continent, government agencies, air lines, oil companies, banks, newspapers and other enterprises are extending their communications with R. C. A. apparatus.

6. Sales of R. C. A. all-weather radar provided this navigational aid to the planes of Yugoslovskii Aerotransport, Cathay Pacific, Japan Air Lines, Ethiopian Airways, Portugal's TAP, Greece's Olympic Airlines, Finnair, Thai Airways, Pakistan Airways.

These airlines are in addition to the impressive list of international air carriers already equipped with R. C. A. radar.

Another aspect of this foreign commerce is the sale of phonograph records. American music is enjoying unprecedented popularity around the world, as witnessed by the fact that the sale of records outside the United States jumped 250 per cent to \$350,000,000 last year.

R. C. A. International has played a part in fostering that growth. Besides direct exports

of its records from the United States R. C. A. associated companies in South America, Europe, Mexico, Canada and Australia manufacture the R. C. A. Victor repertoire in their own plants from tapes flown to them from New York.

In addition, R. C. A. licenses manufacturers in some twenty-one other nations to press records locally and this particular phase has increased more than 250 per cent in the last two years.

Dates Back to 1929

R. C. A. first entered international marketing in 1929 with the purchase of the Victor Talking Machine Co. Today International Division's network of distributors market R. C. A. products, ranging from tiny electron tubes to the most complex national radio communications systems, around the world.

R. C. A. International has sold and installed, either completely or in part, scores of television broadcasting facilities in twenty-nine foreign nations. Latest government and industry figures indicate there now are more than 26,000,000 TV sets in use outside the United States. The number is expected to surpass the United States total of about 50,000,000 sets within five years.

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Mallory is proud that their electronic components have helped RCA achieve the highest standards of performance in radio and television receivers . . . home appliances . . . industrial electronic products . . . broadcasting and military electronic equipment.

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Indianapolis 6, Indiana



IN PERU—Girls in a Lima store check Victor radio and records.

PARTNERS IN PROGRESS

Helping to tell the world of RCA's technical progress, product superiority, and unexcelled facilities has been our fortunate task for 22 years.

As literary and graphic communications specialists, we've provided RCA with:

- brochures
- proposals
- presentations
- technical data
- product literature
- commercial and technical publications

**EXPERT COMMUNICATIONS SKILLS
PLUS CLOSE TEAMWORK**
have made Ewing Tech. the undisputed voice of industry.

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2ND. MARKET STS., CAMDEN, N. J.
8128 ORION AVE., VAN NUYS, CAL.

Magic in Tiny Packages

(Continued from page 27)

and in some cases a thousand-fold—reduction in the size and weight of military communications equipment and in guidance and control systems for missiles and satellites. For example, a digital computer under development for a missile will have 8,000 components sealed in a can only 2 by 4 by 5 inches. This little "brain" will be an essential part of the guidance system, and it will be replaceable in a few seconds.

An even more advanced concept, called "integrated electronics," has enabled scientists to create computer components so small that 100,000,000 of them can fit into a cubic foot of space. They are microscopic bits of semiconducting material, such as silicon, which will amplify or control electric signals just as do tubes, transistors, resistors and condensers. They will make up the logic circuits which enable computers to calculate, sort and remember information. R. C. A. scientists describe these versatile dots of matter as a step on the road to computers as compact as the human brain.

Tube Holds Its Own

Despite advances such as these in "solid state" electronics, the tube more than holds its own today among new components. Engineers point out that new applications for tubes are being found every day. Keeping in step with the trend toward smallness, R. C. A. researchers

recently announced a "Nuvisor" tube, smaller than a thimble, which sets new standards for performance, toughness and dependability. And a new super-tube—the size of a beer keg and capable of generating 5,000,000 watts of power—is under development for long-range missile detection in America's defense network.

Electronic devices for industry, the home and everyday personal use are also following the trend toward smallness.

The Port of New York Authority recently equipped its patrolmen with pocket-size two-way radios to help control the flow of traffic through the Lincoln Tunnel. Transmitter and receiver weigh only thirty-eight ounces and have a range of two miles.

Micro-module capabilities have also been demonstrated in the R. C. A. fountain-pen-size radio receiver. Five doughnut-shaped modules inside the case provide circuits and components equal to an ordinary five-transistor superheterodyne radio.

Medical - electronic researchers have even found ways of applying miniaturized devices to the diagnosis of disease. At the Rockefeller Institute, New York, a radio "pill" has been designed—a plastic capsule one-and-one-eighth inches long and four-tenths of an inch in diameter—which can be swallowed. The pill is actually a tiny battery-powered broadcasting transmitter which passes through the intestinal tract and

sends out information relating to pressure, temperature and other internal conditions. It is proving valuable in the diagnosis of intestinal and stomach ailments.

The Hughes Aircraft Co. has crammed circuits equal to five television sets into a 6 by 10 inch package for its Falcon air-to-air missile. American Bosch Arma Corp. has reduced its airborne digital computer to one-fortieth the size of its equivalent device of five years ago.

The A.C. spark plug division of General Motors has developed a cigarette-pack-size 7-ounce radio receiver which can be used to summon supervisory personnel in large industrial plants. When a man is wanted at the main office, an operator pushes a button and the tiny "Vibacall" vibrates like a tickler in his pocket.

Forecast More Changes

Developments such as these are bound to bring many changes in American living. Devices now in the laboratory stage will make possible miniature electronic controls able to guide and land high-speed jet air liners automatically and safely. Desk-size computers for offices may eventually become as common as adding machines.

We Salute

RCA

on their

40

Fine Years

CAPACITORS

of

**"Time Tested
Quality"**

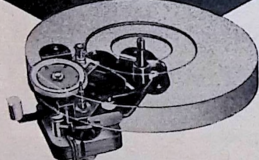
**ILLINOIS
CONDENSER
CO.**

1616 NORTH THROOP ST.
CHICAGO 22, ILLINOIS

Congratulations

RCA.

on your 40th
Anniversary



... from one of America's
leading manufacturers of

**F.H.P. MOTORS and
MOLDED PLASTICS**

We are proud to have enjoyed a continuous business with RCA for over 25 years and to have played a part in the success of their many notable achievements.



Accept our wishes for continued success in the fields to which you have contributed so much.

THE GENERAL INDUSTRIES CO.

Tubes and Transistors

(Continued from page 24)

use wherever miniaturized electronic equipment is required.

Starting with hearing aids, transistors have found wide applications in a broad variety of electronic equipment, replacing the bulkier vacuum tube in many applications. RCA's two transistor plants in Somerville, N. J., and Findlay, Ohio, manufacture many different types for use in military, industrial, computer and home entertainment instruments. The company has announced plans for another plant for transistors and rectifiers which will soon be built in Mountaintop, near Wilkes-Barre, Pa.

Current transistorized equipment ranges from missiles to portable radios, from clocks to telephone equipment, from toys to communications apparatus, from data-processing systems to juke boxes, from satellites to auto radios.

RCA recently disclosed the 501, the first business-type data-processing system that employs transistors throughout. The system is designed to bridge

the gap between the giant electronic brain and electromechanical accounting machines.

In another field, transistorized two-way radio systems have been designed for a patrolman to carry on his belt. These are now extensively used in police work.

Amateur radio operators have done many unusual things with transistorized equipment. A short time ago, a California "ham" beamed a signal over 16,000 miles with his low-power radio transmitter built with two RCA transistors. The total power required was less than 1/1000 of the power used in a 100-watt light bulb.

Although transistors have found favor in many pieces of equipment, tubes remain superior in their ability to amplify and generate signals of extremely high frequencies and to handle power of many kilowatts. The consensus is that as the electronics industry grows, both tubes and transistors will continue to find many new applications.

Congratulations

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Switches

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Choppers

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Electronic
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of
"Quality with
Distinction"

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S.S. & S.

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200 East Morgan Ave.
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Congratulations
to

R. C. A.

on their

40th

Anniversary

We are proud
to be a supplier
of
corrugated
shipping containers

BELL

FIBRE PRODUCTS
CORPORATION

MARION, IND. CHICAGO, ILL.

Exhibit Hall Draws Tourists

THE R. C. A. Exhibition Hall in Radio City—a veritable showcase of electronic age advances—has become one of New York's top tourist attractions.

More than 20,000,000 persons from every state and many foreign countries have visited the newly-decorated hall at 40 W. 49th St. during the twelve years it has been open. It is open seven days a week from 11 a. m. to 9 p. m., and it is the only place in New York where practically all the R. C. A. consumer products can be seen together.

From 6,000 to 8,000 viewers are currently pouring through the doors daily to view the latest in color television, stereophonic sound and a wide array of other electronic developments. At the present rate it appears certain the Exhibition Hall will have entertained its 21,000,000th guest by the year's end.

An ever-popular feature is "See Yourself on Television," which enables visitors to stand before a TV camera and see



LATEST IN SOUND—Stereo music is heard in Exhibition Hall.

themselves on a television monitor.

This feature, curiously, is the

only original exhibit to survive the tremendous electronic advances which have occurred since opening day in the spring of 1947. Then there were just two television models on view, one with a seven-inch screen and the other with a ten-inch screen. Today there are nearly forty models to see, with screens ranging up to twenty-four inches and in many shapes and finishes.

Another popular feature at the Hall is the high-ceilinged listening room where a visitor can relax in quiet comfort, although in the middle of bustling Manhattan, and enjoy the latest of R. C. A. Victor's stereophonic productions. The room includes new R. C. A. stereophonic equipment and the R. C. A. stereo tape cartridge player-recorder.

Vying successfully for sightseers' attention, too, is the wide assortment of R. C. A. products, ranging from "Sportable" and "Tote-Able" television sets to "Citizen's Radio" sets and transistorized clock radios.

There have been special added exhibits at various times and many will remember the R. C. A. Exhibition Hall as the "studio" for several NBC radio and TV programs, including the Dave Garraway "Today" show.

Congratulations

to

RCA

on the occasion
of their

40th

Anniversary

We at Bogue Electric gain added inspiration from the dramatic achievements that are RCA all the way.

PRECISION ELECTRICAL EQUIPMENT
Bogue
SINCE 1892

BOGUE ELECTRIC
MANUFACTURING CO.
PATERNON 3, NEW JERSEY

Electronics Aids Medicine

(Continued from Page 26)

tion. television has proved itself a revolutionary new tool. For training surgeons the color TV camera may become standard equipment in medical and dental colleges.

Operation on TV

In addition to its educational uses, television makes possible diagnosis and consultation among specialists thousands of miles apart. For example, a patient with heart trouble, living in Boston, had his heart beat amplified and his diagnosis explained to a closed-circuit TV audience of doctors in fifty cities. He was wheeled into the operating room with the camera following. Anesthetics were administered and the complete operation was performed with a nation-wide professional audi-

ence looking over the surgeon's shoulder.

An interesting example of the electronics engineer's contribution to medical progress is the "radio pill" developed jointly by the Rockefeller Institute, the New York Veterans Administration Hospital and R. C. A. The pill is a complete transistorized FM broadcasting transmitter inclosed in a plastic capsule measuring one and one-eighth inches long by two-fifths of an inch in diameter. It is made to be swallowed, and can then transmit messages from the stomach and intestines, much as an earth satellite sends information from outer space. It is providing valuable new knowledge of pressure, temperature and other internal conditions useful in diagnosing intestinal and stomach ailments.

TV Now on Magnetic Tape

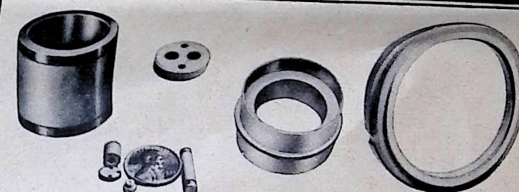
(Continued from page 23) inated material. They also will be used to play back daytime news highlights during the evening hours.

The swing toward the use of TV tape recorders by producers of program material and commercials was given further impetus last month when the Reeves Sound Studios, Inc., in New York, and R. C. A. announced a revolutionary method of electronically editing taped scenes and sounds.

This will make possible the use of motion-picture tech-

niques in television production for the first time, permitting mixing information on TV tape with much the same flexibility as on film.

The new method involves the use of pre-recorded tapes bearing picture information from any number of cameras, along with the sound tracks. By employing several tape machines with matching monitors, the system will enable the producer and director to see different views simultaneously and choose those they want incorporated into the end product.



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