



Electronic Age

SPRING / 1960

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ELECTRONICS' THREE C's
Computers, Controls, Communications



RESEARCH
 MANUFACTURING
 COMMUNICATIONS
 BROADCASTING
 TELEVISION

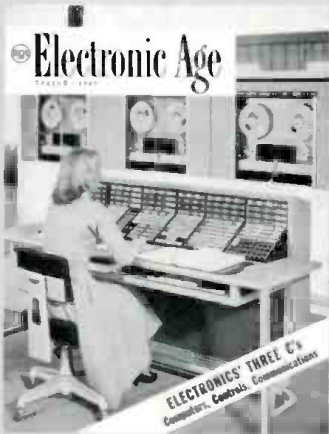
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Electronic Age

SPRING 1960 / VOLUME 19 / NUMBER 2

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COVER STORY. The Electronic Systems Center, pictured here, is a new and advanced concept of data processing pioneered by RCA. The first Center is now in operation in Wall Street. Others will be installed in cities throughout the nation this year to extend the advantages of electronic computers to the widest possible range of businesses, large and small. Together with controls and communications, computers make up The Three C's—Electronics' Newest Surge. See Special Section beginning on Page 13.

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ERNEST B. GORIN, Treasurer

The latest in radios from RCA Victor is this transistor model which serves both as a car and a portable set.



Finishing touches are put on the Tiros satellite by Robert Schmiker of RCA Astro-Electronic Products.

RCA-DEVELOPED TIROS SATELLITE AND ITS RELATED GROUND CONTROL EQUIPMENT GIVE THE U. S. A FAR-REACHING NEW TOOL FOR METEOROLOGICAL RESEARCH

WEATHER EYE IN THE SKY

AT 6:40 A.M., into the low-hanging clouds over Cape Canaveral, Florida, April 1, sped a three-stage Thor-Able rocket. A short time later came an announcement from Washington. The rocket had successfully put into orbit the United States' new TIROS I satellite.

Carrying the nation's most advanced space-borne television "eye" to study the world's weather, TIROS I is the information-gathering element in a complex satellite-and-ground system developed for the U.S. Government by the Radio Corporation of America.

The first several pictures of the earth's cloud cover were released by the National Aeronautics and Space Administration later April 1. Before being made public, they had been shown to President Eisenhower at the White House by Dr. T. Keith Glennan, the head of the space agency. The President remarked:

"I think it's a marvelous development."

The satellite comprises perhaps the most elaborate electronics package yet sent into orbit around the earth, containing specially-designed miniature television cameras, video tape recorders, transmitters, solar cell and rechargeable battery power supplies, and an array of control and communications equipment.

The name TIROS is derived from the initial letters of the words describing the project: Television Infra-Red Observation Satellite.

Speeding along its course in space, the satellite is linked to an extensive ground network of tracking and receiving stations, data-processing systems, and programming and control centers. Together, the satellite and ground equipment form a unified system to gather and analyze world-wide data on cloud formation in the earth's atmosphere.

The TIROS system, including the satellite and its associated ground network, was designed and constructed by scientists and engineers of RCA's Astro-Electronic Products Division at Princeton, N. J., under the general systems management of the National Aeronautics and Space Administration and the technical direction of the U. S. Army Signal Research and Development Laboratory at Fort Monmouth, N. J.

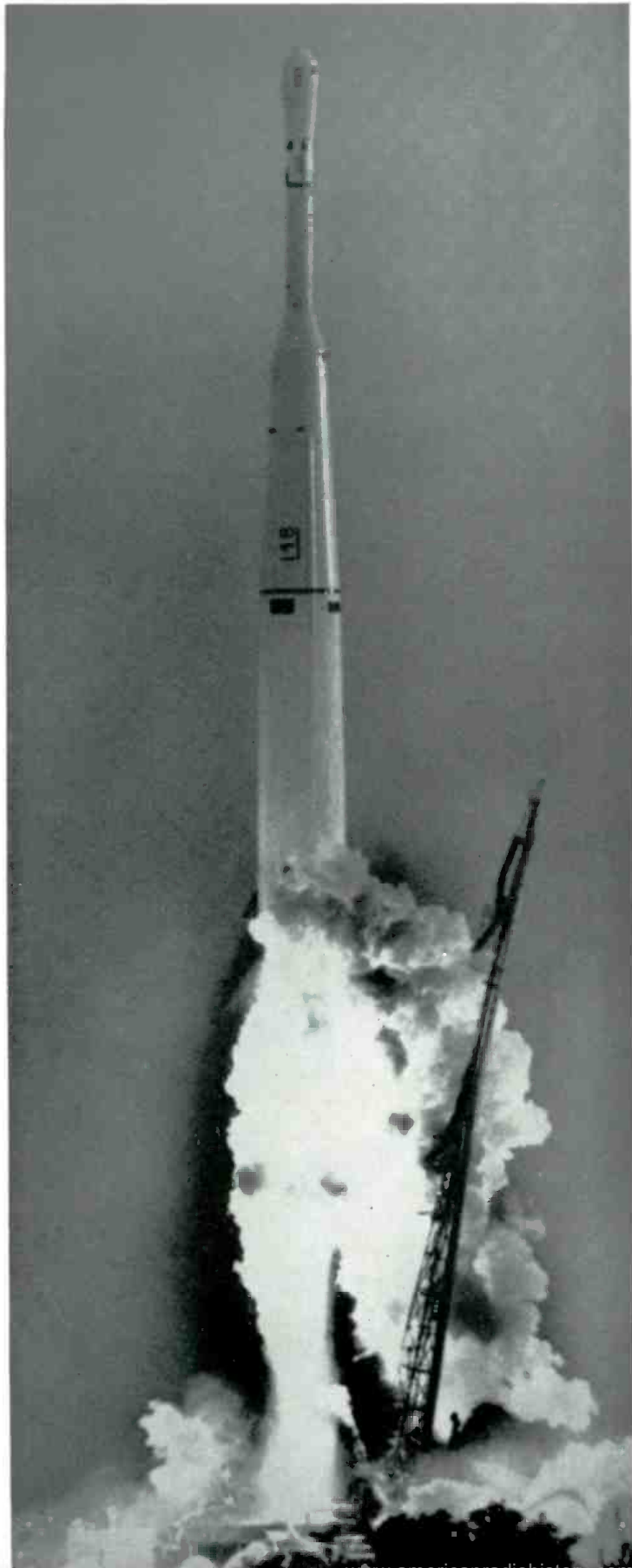
The importance of the TIROS system as a new experimental tool for meteorologists was emphasized by Barton Kreuzer, Manager, Marketing, of the RCA Astro-Electronic Products Division, who said:

"The mission of the TIROS satellite is the visual observation of cloud formations over large portions of the earth to produce new information about such weather phenomena as hurricanes, typhoons, and the movement of weather fronts. Besides providing unprecedented and comprehensive visual coverage of global weather on a swift and continuous basis, the satellite will give meteorologists for the first time a

(continued on page 6)



WEATHER EYE IN THE SKY



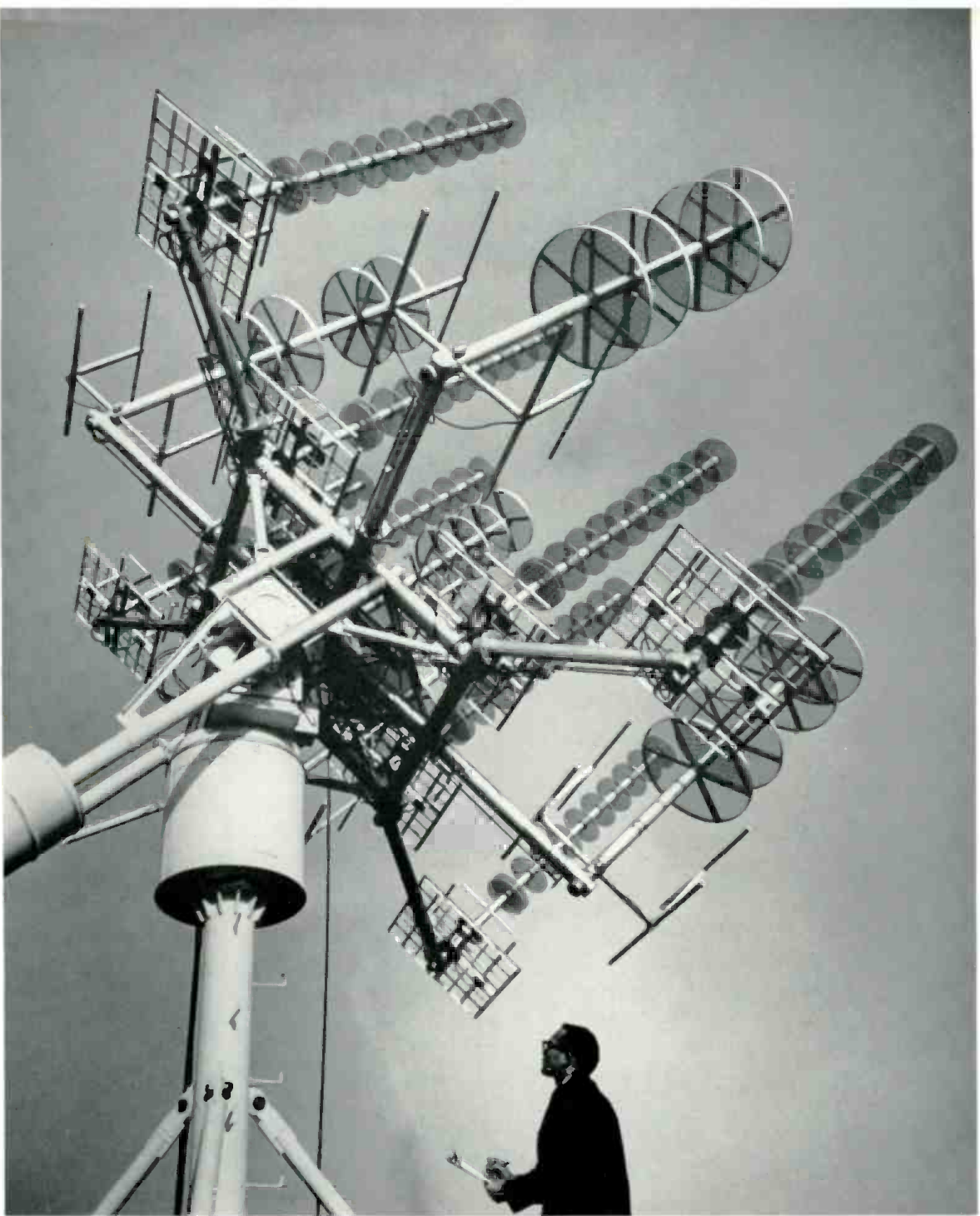
6:40 A.M. (EST)
Cape Canaveral.

TIROS

THE FIRST HISTORIC HOURS
OF APRIL 1, 1960...
THE DAWN OF A NEW ERA
IN METEOROLOGY



6:57 A.M. Final stage of the Thor-Able rocket
is fired, putting Tiros into orbit.



12:25 A.M. First signals heard at RCA Astro-Electronics in Princeton.



10:15 A.M. First pictures are received, clearly showing the Gulf of St. Lawrence.

5:00 P.M. Photos are shown to President, who says: "It's a marvelous development."

means of checking the accuracy of present weather reporting from ground stations around the world. Thus it promises not only to lay the groundwork for new satellite weather services in the future, but also to increase the effectiveness of present world-wide weather information gathering methods."

In describing the usefulness of the TIROS I satellite, Brig. General David Sarnoff, Chairman of the Board of RCA, said:

"The information it gathers will give new precision to weather forecasting. The day is approaching when you will be able to scan a dependable 90-day forecast and decide whether to begin your vacation on July 1 or July 15. The farmer will get a better idea when to plant and when to harvest; the weather forecaster will at last become a happy, well-adjusted man."

In its first four days in orbit, TIROS I had sent back nearly 1,200 pictures covering such diverse areas as Communist China and Central America.

Scientists of NASA and the U.S. Weather Bureau were favorably impressed by both the quantity and the superior quality of the pictures received.

Dr. Harry Wexler, Chief of Meteorological Research of the Weather Bureau, told members of the House Space Committee:

"We've suddenly gone from rags to riches overnight."

The paths of the satellite, circling the globe from west to east about every 90 minutes at an altitude of about 450 miles, permit cloud observations throughout a belt extending from the latitude of Montreal, Canada, in the north, to the latitude of Santa Cruz, Argentina, in the south. During its planned operating lifetime of 90 days, the satellite is expected to complete about 1,300 orbits.

Operation of the TIROS system involves the following sequence of three principal functions:

1. Preparation of a program and transmission of commands to the satellite at the start of each orbit, including instructions for picture-taking in specific areas of interest to the meteorologists.
2. Operation of the television and other equipment in the satellite during its passage, in response to the control commands received from the ground.
3. Read-out of the pictures and other information from the satellite on command from the ground at the completion of each orbit.

The principal ground stations are situated at Kaena Point, Hawaii, and Fort Monmouth, N. J. During all but three or four orbits each day, the satellite passes within range of one of the stations, permitting read-out of information and programming of the satellite electronic apparatus for the next passage.

Shaped like a drum 42 inches in diameter and 19 inches in depth, the satellite is covered on its top and sides with over 9,000 solar cells which generate electricity directly from sunlight to charge an assembly of small storage batteries that power the equipment.

The key function of the satellite is performed by two complete television systems capable of taking a series of still pictures of cloud formations.

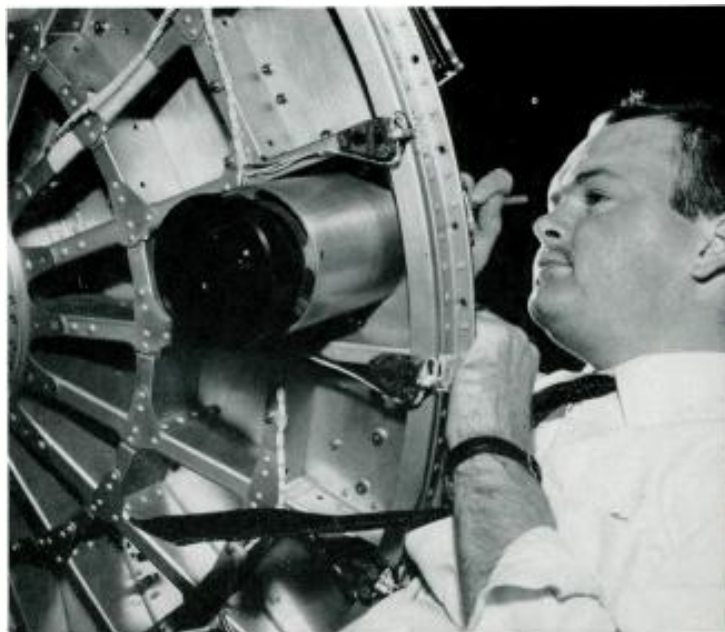
The two television cameras, identical except for the lens equipment, were specially developed by RCA for the TIROS I satellite. Each of the cameras is about the size of an ordinary water tumbler and employs a rugged half-inch Vidicon pickup tube.

One of the cameras has a wide-angle lens for viewing a large area of cloud cover nearly 800 miles on a side. The second camera has a narrow-angle lens for viewing a somewhat smaller area. The two cameras and their associated electronics operate independently, so that any failure in one chain will not affect operation of the other.

In contrast to broadcast-type television equipment, the cameras are designed to take a series of still pictures by means of electrically-operated shutters.

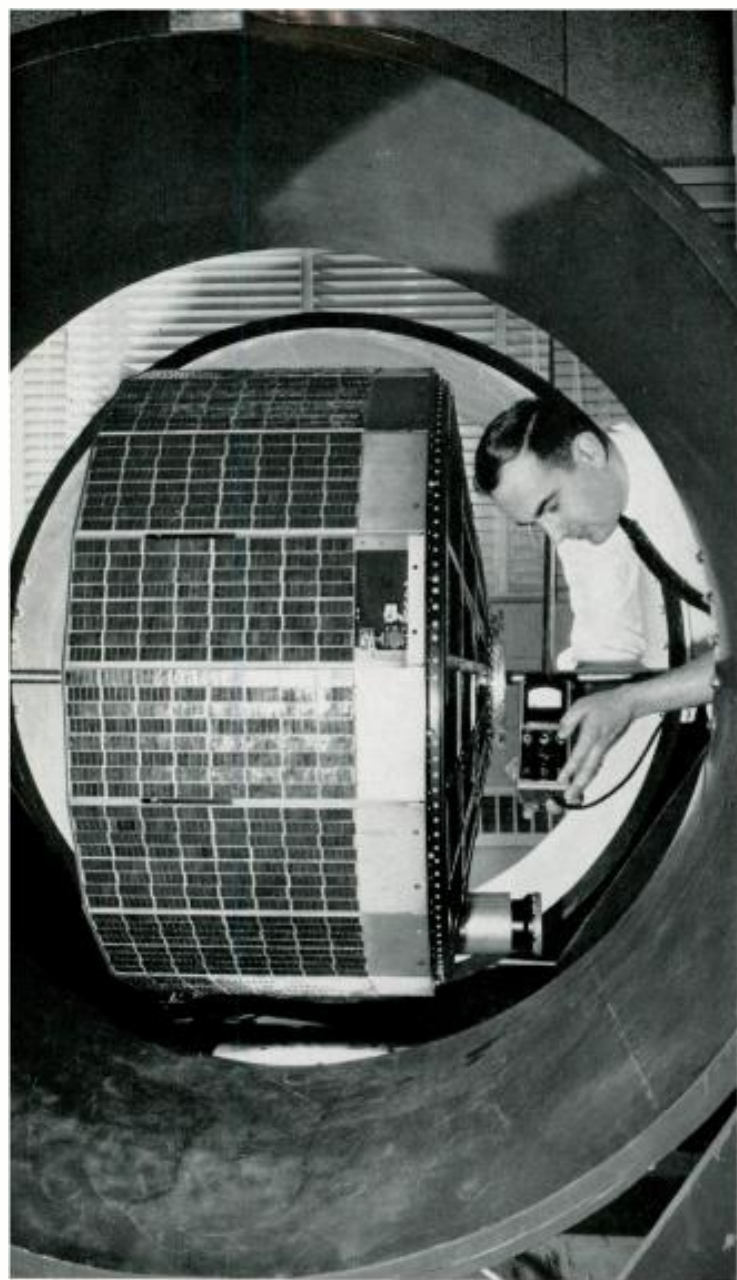
Associated with each camera is an RCA-developed magnetic tape recorder for storing the TV pictures to be played back on command from the ground. Tape capacity is 400 feet of specially developed half-inch Mylar-base tape in each recorder, moving at 50 inches per second during recording and playback. As the pictures are played back for transmission to the ground, the tape is erased.

Besides recording the pictures from the cameras, each of the tape recorders also records coded signals



Rex Waddell of the Astro technical staff adjusts the wide-angle television camera during tests at Princeton.

Effect of the earth's magnetic drag is tested by Robert Wilkes.



indicating the rotational position of the satellite as a time reference to help in identification of the pictures when they are received on the ground.

Each of the camera-type recorder chains has its own transmitter, a 2-watt FM unit operating in the 200-megacycle band. Each of the transmitters weighs one pound and occupies a space measuring 6 x 3¼ x 1¼ inches. The transmitters operate only on command, while the satellite is within transmitting range of a ground station.

When the satellite passes within range of one of the ground stations, a command signal causes the information to be read from the tape into the satellite transmitter for transmission to the earth. For picture-taking while the satellite is within range of the station, the cameras can be instructed to feed their information directly to the transmitter rather than to the tape storage systems.

To permit meteorologists to identify the direction of each picture, the satellite carries a "north indicator" system which automatically measures the angle of the sun in relation to the vehicle. The resulting signal, sent to the ground with each picture, is processed by a "sun angle computer" and displayed on a television screen beside the picture to indicate the north direction of the image.

In addition, an infra-red detector on the satellite senses the crossing of the earth's horizons as the vehicle rotates at its spin rate of 12 revolutions per minute. This information also is transmitted to the ground and is processed to determine the attitude in space of the vehicle at the time of picture taking.

At the start of each orbit, the television cameras can be instructed electronically to photograph an area of specific interest — such as a typhoon center over the Pacific or a hurricane in mid-Atlantic. The instructions, prepared at the NASA Computing Center in Washington in cooperation with specialists of the United States Weather Bureau, are sent to the ground stations. At the appropriate station, the program is sent in the form of radio signals to an "electronic clock" in the satellite. The clock stores the instructions somewhat in the fashion of a remotely operated alarm clock, causing the cameras to start a sequence of operations at the specified time during the succeeding orbit.

As the satellite swings around the earth and comes again within range of a ground station, a command signal is sent from the ground for transmission of the cloud cover pictures stored on the tape. At the ground station, the information is displayed on a television picture tube and recorded on another magnetic tape system. The image on the picture tube also is photographed for further study and future reference by experts of the Weather Bureau and other services.

The ground command and control equipment was designed by RCA engineers to permit either automatic or manual operation of the satellite system, or a combination of both. With automatic operation, the program for the orbit is pre-set and each step is started by the electronic clock control in the satellite. With manual operation, the commands are transmitted by an array of push-buttons at the ground station, permitting direct operation of the television cameras while the satellite is within range, and providing an opportunity for checking individual satellite functions. By combining the two methods, the program is pre-set, but each sequence is started manually by push-buttons at the ground station when the satellite is within range. This combined method was used during the first few orbits of the satellite when the now-historic first pictures were taken. ■



RCA International to develop a huge manufacturing complex in Southern Italy in an unprecedented agreement with the Italian government

ITALY PLANS FOR THE FUTURE

IN THE WIDE VALLEY of the Aterno River, surrounded by mountains, lies Aquila, peaceful in the bright Italian sun and relatively untouched by the surge of industrialization which other areas of Italy have enjoyed since the end of World War II.

On March 28, 1960, some 4,300 miles away in New York, a ceremony took place which is destined to have far-reaching effect on Aquila and its neighboring communities in the Mezzogiorno area of Southern Italy.

On that date, an agreement was ratified between Radio Corporation of America and the Italian government's Istituto per la Ricostruzione Industriale (I.R.I.) to create an electronics manufacturing complex at Aquila, calling for an initial investment of \$25 million and promising substantial new employment in the Mezzogiorno.

In this agreement of unprecedented scope between a European state agency and private industry of an-

other nation, I.R.I. obtains the assistance of RCA International, Ltd., of Montreal, to direct the project, drawing on the services and facilities of the various subsidiaries and affiliated companies of RCA.

Principal purposes of the program, to get underway immediately, are:

1. To expand Italy's electronics business in the new European Economic Community (European Common Market), composed of Italy, France, Germany, Belgium, the Netherlands and Luxembourg.

2. To assist the industrialization of the Southern section of Italy known as the "Mezzogiorno," the economy of which is today largely agricultural, with scant industry and considerable unemployment, and in this way raise its standard of living, business and industry.

3. To encourage private capital, both internal and from foreign sources, to invest in manufacturing enterprises in Italy.

In the latter connection, Dr. Aldo Fascetti, Chairman of the Board of I.R.I., expressed the hope that RCA International, Ltd., would purchase from the Italian agency all or part of the manufacturing network it creates during the period of the contract — five to ten years — and then to continue operating it as a private enterprise. The agreement contains a provision envisioning this possibility.

The initial phase of the program is expected to involve the gradual investment in several projects by the Italian group of some \$25 million, which will be utilized, with the fullest collaboration of RCA International, Ltd., to expand existing facilities and build new ones in the manufacture of tubes, semiconductors and other components.

Subsequently, the program is intended to encompass other fields of electronics.

The program contemplates, among other things, the eventual establishment of a data processing center in Rome to serve Italian government and business.

Italian personnel will be trained in electronics in RCA schools to be established. The creation of a research laboratory and formation of an Italian branch of RCA Institutes are also contemplated.

To implement the program, RCA International, Ltd., selected Meade Brunet to become Managing Director of Aquila-Tubi Elettronici e Semiconduttori

IN ELECTRONICS

(ATES). ATES is a tube-producing company operated by Finmeccanica, an I.R.I. agency that finances enterprises in the mechanical, shipbuilding and electronics industries. Mr. Brunet, a Staff Vice President of RCA, was Managing Director of RCA International Division from 1946 to 1956. He is being loaned to RCA International, Ltd., as part of the plan for the company's overall support of the project.

The first step in the program will be to expand the present ATES tube-manufacturing plant at Aquila.

An RCA survey of the electronics industry in Italy indicated a large growth potential for business both at home and in other countries of the Common Market.

The electronics business in Italy, now centered principally in the more industrialized northern areas, has an annual sales volume of about \$200 million. At present about 25 per cent of Italy's electronics needs are filled by imports from other countries. ■

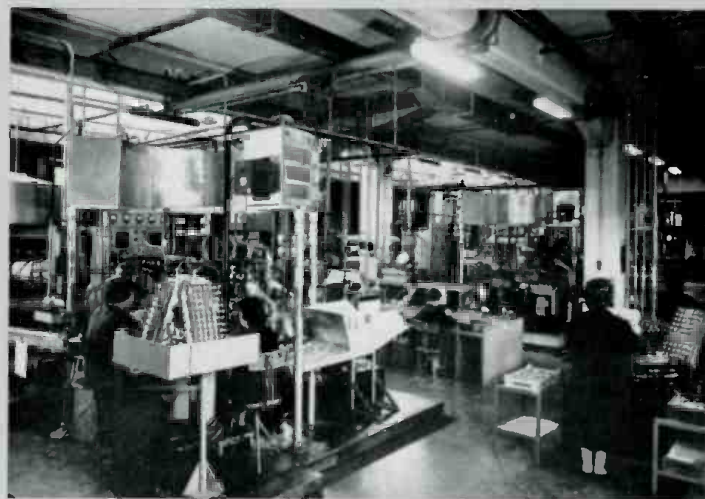
ELECTRONIC AGE / Spring 1960



A general view of Aquila, Italy, and the tube plant RCA will manage



Present production techniques at Aquila will be modernized



Facilities will be expanded and new products introduced



The concept of built-in, or "Mural TV," has gained widespread favor among home builders and buyers since RCA introduced its line of specially designed sets last year. Included in the line are both color (left and right) and black-and-white sets (above). Built-in AM-FM radio and stereo units also are available.



Built-in Entertainment

A GROWING NUMBER OF HOME BUILDERS OFFER SPECIALLY DESIGNED MURAL TV UNITS AS CONCEPT OF IN-THE-WALL TELEVISION GAINS FAVOR

PROSPECTIVE home buyers visiting a new development in a heavily wooded section of North Stamford, Connecticut, come away talking excitedly of a new feature.

In Texas, California, Pennsylvania, Arizona and Florida, the reaction is much the same.

Object of all the excitement is the new concept of a built-in home entertainment center. The television, stereo, radio and speaker systems are built right into the wall.

Like yesterday's newspaper, last year's dress, and big, sweeping automobile tail fins, tastes and styles change. The built-in or "Mural" concept is "the" coming thing in home entertainment products, say home builders and electronics industry spokesmen.

"Built-in stereo, radio and 'Mural TV' sets are dramatic new products which provide a trim, uncluttered look and add a mark of distinction to any home," says Robert N. Baggs, Vice President, Special Sales Ac-

counts, RCA Sales Corporation. "The ideal display of television today is as a picture-on-the-wall. No matter how it is installed, a 'Mural TV' installation adds to the room's warmth and informality."

RCA introduced a built-in line of five especially designed color and black-and-white TV receivers, "Victrola" phonographs, AM-FM radios and matching speaker systems last year. Since then, the line has gained widespread favor.

"Early visitors to Woodbine Acres are excited about mural television," says Harvey Pletz of Stamford, whose firm supplied the units for the Stamford project.

Another builder, Willard Woodrow of Miami, Florida, who is offering "Mural TV" in his Carol City Gardens development, says:

"From the reaction of the people who have seen these sets at Carol City Gardens, I'd say this is the coming thing in television." ■



BROADCASTING: *The Course Ahead*

An Arden House conference of “best of American brains” is proposed to analyze television’s role and “penetrate curtain of misunderstanding”

By **DAVID SARNOFF**,
Chairman of the Board,
Radio Corporation of America

The status of television today, and a new proposal for advancing the progress of the medium, were discussed by RCA Chairman David Sarnoff in an address March 10 before the Radio and Television Executives Society. The following article is adapted from that address.

AROUND THE WORLD of commercial television today an intellectual curtain is descending. A minority of American society, articulate, intelligent, highly influential, has woven this curtain because of a deep dissatisfaction with the most visible element of the service — the so-called popular or mass appeal programs.

I do not believe television will ever alter this group’s deep feeling of antipathy toward popular programming. Nor do I believe that selective viewing, within the framework of a mass-oriented service, will ever give the minority a complete sense of fulfillment. Certainly the quality of popular fare can be improved substantially, and the scope of programming can be broadened. But the patrons of the specialized arts will still hunger for more of their specialties.

It is in part at least because of this unfulfilled appetite that television is accused today of a tired and

static maturity. The facts are to the contrary. Television is in a stage of technological and creative ferment. In terms of specialized activities, television is approaching the growth phase that the mass appeal service began experiencing a decade ago. Foundations, private companies, commercial networks, stations, endowments, universities, are pouring funds and creative effort into educational and experimental television.

Technical developments, I firmly believe, will one day provide numerous additional channels capable of supplying many different services to small audiences with special educational, scientific and cultural interests. A medical network is being formed, special telecasts for classrooms are growing in number, new closed circuit applications are emerging and stations specializing in minority programming are increasing.

But if we are to fit all these ancillary services into a proportioned spectrum of television for the mass and for the minority, we must first penetrate that curtain of intellectual distrust and misunderstanding which hardens at a dangerous rate; and we must do so by enlisting the best of American brains to help us seek that proper proportion.

As an initial step I suggest that the broadcasting industry, through an appropriate industry organization, sponsor an annual conference along the lines of the highly successful American Assembly of Arden House. Its purpose would be to analyze the role of television, in all of its aspects, in American life.

To it would be invited leaders of all areas of American thought and endeavor — leaders in government, religion, education, business, labor, advertising and publishing. In an appropriately cloistered atmosphere, away from klieg lights, microphones, printing presses, the broadcaster and his guests could exchange views face to face, could seek new ideas from each other, could clarify misunderstandings, could explore new uses of the specialized services and in the process perhaps could dislodge chips from shoulders on all sides.



Arden House

Arden House is the home of the American Assembly, a national conference and discussion program established in 1950 by Dwight D. Eisenhower, then President of Columbia University, and aimed at providing the public with non-partisan information on complex national problems.

Given to Columbia University by W. Averell Harriman in memory of his father and mother, Arden House is located in the Ramapo Mountains about 90 minutes by car from New York City. Between American Assembly meetings it is used for University conferences and other educational and cultural programs.

As stated in its charter, the purpose of the American Assembly is "to stimulate the growth of informed opinion with a view to the preservation and strengthening of the democratic processes and principles of freedom."

These would be no summit conferences conducted in secrecy for the purpose of deciding the fate of television. Neither would they constitute a solicitation from the commercial broadcaster for someone else to shoulder his obligations. To seek informed advice is not to abdicate responsibility; it is the timorous leader, not the bold one, who fears fresh ideas.

In their best sense I see such assemblies as a rational and considered attempt to place in clear perspective the role of all television in our society. Ultimately they might evolve into a broader examination of all mass communications as they relate to contemporary civilization. Few subjects could be more pertinent at this stage of our democratic evolution.

It is my hope that such annual assemblies will materialize promptly, perhaps this year. And if they do, I suggest that each delegate be given a badge with Michelangelo's famous phrase imprinted on it: "Ancora Imparo" — "I am still learning." Television has much to learn from others, but others, I respectfully suggest, also have much to learn about television. It is, like the society in which it exists, neither all good nor all bad. It is a viable service with formidable opportunities for use or misuse. The public, as well as the industry, can benefit more from constructive critical interest than from biased attack or hostile neglect.

Above all, television can benefit from a period of reflective calm in which to assess its progress, its mistakes, its prospects. An assembly such as I suggest, perhaps conducted under academic auspices, could be an important approach toward meeting that need. ■

Arden House . . . away from klieg lights, microphones, printing presses . . . calm analysis.

THE THREE C's...

**ELECTRONICS'
NEWEST
SURGE**

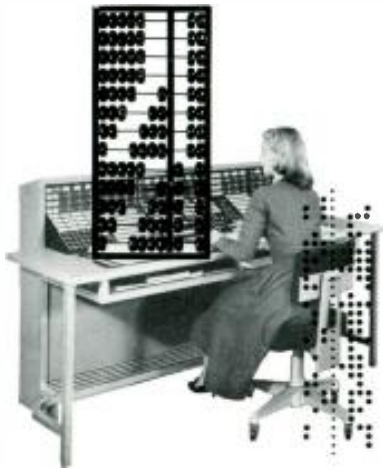
*They stand for
Computers, Controls
and Communications,
and they spell
booming business
for the industry*

Spokesmen for business and industry have labeled the Sixties "the decade of explosive growth." It might more appropriately be labeled, says RCA President John L. Burns, the decade of the 3 C's — computers, controls and communications. "Mine is a more restricted label," Mr. Burns says, "but it places in proper perspective, I believe, the importance of the three C's of computation, communications and controls as the electronic building blocks for a decade of explosive growth."



COMPUTERS: *Management's*

Versatile new systems open broad areas to
in management's constant battle against mounting



SIXTEEN FLOORS above New York's financial district, two men scan a mosaic of illuminated panels — squares of flickering reds, blues, whites and greens.

To their front and flank, pastel-tinted steel cases reveal twin plate-size reels. Some reels are motionless; others spin with swift purpose.

Glass walls enclose the area, sealing it completely from noise, dust, the vagaries of temperature and humidity. Only the occasional clatter of a printer or tape machine breaks the silence.

This is Wall Street, 1960 — the hushed clinical world of the RCA Electronic Systems Center, where

invisible electronic impulses record the nation's financial transactions with the swiftness of light.

The concept of a Center in which companies, large or small, may share the efficiencies of electronic data processing, is the latest in a rapidly multiplying range of services which the computer extends to business and industry. High speed processing of paperwork, solution of complex equations, instantaneous links between business operations, complete and timely data for management decisions, factory controls — these are some of the ways electronics and computers are pacing the economy to a new decade of explosive growth.

The flickering panels and spinning reels trace their origin back over a quarter century to the laboratories of such electronics pioneers as the Radio Corporation of America. The objective then, and during World War II, was the development of computer-type devices for the automatic control of anti-aircraft fire.

Like so many other military projects, the computer ultimately found its way to peacetime uses. For RCA, it was the giant "Bizmac" electronic data processing



New Tool

electronic data processing paperwork and costs

system, with its thousands of vacuum tubes, that blazed the trail to commercial applications.

In 1958, RCA President John L. Burns announced the first completely transistorized, general purpose electronic data processing system — the RCA 501.

The 501, designed for the average company as well as the large corporation, is capable of performing several operations simultaneously, such as storage, “reading” or computing data. It holds in its high-speed memory unit up to 260,000 characters. Sixty-three tape stations can be harnessed to the computer, each tape containing up to nine million characters — roughly equivalent to the contents of all the new novels published in the United States during 1959.

In February, 1960, a giant step forward in computer concept was made with the inauguration of the RCA Electronic Systems Center on Wall Street.

Here, companies whose size and volume of business do not warrant full use of a computer, can have their paperwork processed and their operational problems handled for them.

Staffed by RCA specialists — systems planners, programmers, operators and maintenance people — the Center provides not only computing skills but also securities experts to work out customers’ needs and programs. It will further provide data processing support for large companies with computer systems of their own.

The Wall Street facility is the first of a nationwide network of data processing centers which RCA will build to serve businesses across the country. As these Electronic Systems Centers begin operations, commerce and industry, regardless of size, will have immediate low-cost access to their wizardry.

Although some 35,000 companies may profitably share the services of Electronic Systems Centers, there are approximately 20,000 companies whose size, nature and volume of work warrant full time purchase or rental of an electronic data processing system. For these companies, RCA now has a complete range of data processing systems — large, medium and small.

Slightly more than a year after its announcement, over 60 RCA 501’s were in delivery or on order.

With the introduction April 13 of two new electronic data processing systems — the 301 and the 601 — RCA became the first company to offer a complete range of electronic computer service, basic and peripheral equipment, for all types of business, big and small.

Introduction of the two systems, RCA President John L. Burns pointed out, “takes the wraps off the first total concept of computer service.” Joining forces with the RCA 501, already in service in many places and the New York financial district, the 301 and 601 will provide all-transistorized computer service for companies ranging from small firms with as few as 300 employees to the biggest corporations, Mr. Burns said.

The RCA 601 was described as the world’s fastest business computer. “For example,” Mr. Burns said, “in a second’s time, it can make up to 666,667 ‘decisions’, or it can add 183,000 eleven digit figures.”

The compact 301 system, he said, is designed to provide full-scale data processing for small firms. It is the first system to use magnetic discs, similar to 45 r.p.m. records, for its “memory storehouse.” It also can use magnetic tape on reels.

The two new systems, he added, will be integrated into the network of RCA Electronic Systems Centers, now equipped with the 501, currently being established.

From polar wastes to sub-tropic waters, command centers to combat posts and rear storage depots, the computer also is fast becoming the focus of the nation’s most advanced defense systems. At launching pads, where giant man-made “birds” begin their flight into outer space, computers plot the course of our own



The RCA Electronic Systems Center in Wall Street is the first of several to be established throughout the nation to cut business costs and paperwork.



General Sarnoff and President Burns (third and fourth, right) explain use of magnetic tape in computers to Edward T. McCormick (left), President of the American Stock Exchange, and Keith Funston, President of the New York Stock Exchange.

space ventures through the heavens or back to earth. Without these lightning instruments for data gathering and calculation, in fact, much of the country's military strength, as well as its space program, would be nullified.

BMEWS — Ballistic Missile Early Warning System — for which RCA is prime systems contractor to the U.S. Air Force, illustrates the computer's vital role in national defense. A series of computers, working in split-second coordination with giant radars, will give instant warning of any possible missile attack across the north polar cap.

Within seconds after the first blip has been spotted, information will flash to North American Defense Command headquarters at Colorado Springs. The nation will have maximum warning to alert its defenses.

Computers also are playing a key role in helping to determine effective counter-measures against such attack. In the waters of the South Atlantic, RCA and other scientists and technicians aboard a floating elec-

tronics laboratory, the U.S.A.S. American Mariner, are gathering vast quantities of information on the characteristics of missiles and nose cones as they re-enter the atmosphere. These data, compiled and evaluated by a computer, are the nation's prime source of direct information on the missile's final, decisive behavior.

Thousands of miles away, at Vandenberg Air Force Base in California, a computer-type device is performing a diametrically opposite task for the nation's safety. RCA's automatic checkout and launch system readies the giant Atlas, the nation's only operational intercontinental ballistic missile, for firing within minutes after an alert. Another RCA computer-type project, the Multi-Purpose Test Equipment, is being developed for similar functions with the Army's growing arsenal of tactical surface-to-air and surface-to-surface missiles.

As they become smaller, swifter and ever more versatile, computers will lead to increased military security, greater business efficiency, and new economic growth. ■

CONTROLS: *Genii Without Lamps*

Electronic controls overshadow even legendary lamp-dwellers in their ability to perform increasingly complex tasks

THE STORY is told of a pretzel manufacturer who boasted that his product in the making was untouched by human hands. He employed a work force of trained monkeys.

Rapid strides in the field of electronic controls are enabling today's industrialists to make virtually the same claim as the tongue-in-cheek pretzel baron — without benefit of monkeys.

By double-teaming electronics and modern machines, a growing number of factory operations are being performed automatically, faster and more efficiently than ever before. This in turn is freeing increasing numbers of workers from tedious, time-consuming chores for more highly skilled tasks.

Little imagination is required to visualize the industry of tomorrow in which a white-shirted operator in an air-conditioned "command post" operates a push-button panel to control, electronically, all steps of the manufacturing process from the time raw materials arrive until the finished product is ready for shipping.

Industrial automation now has developed far beyond the mere automation of individual factory operations. New control devices and the electronic computer have made possible a complete plant system, linking all the steps in a production process under a master control.

The RCA 110 is the first of a series of custom-designed industrial control computers that the Radio Corporation of America is developing for such basic industries as steel, petroleum refineries and chemicals, oil and gas transmission, electric power, and ultimately, large warehouse operations.

Designed in modular form to fit virtually any job, the RCA 110 will be manufactured at a new plant at Natick, Massachusetts.

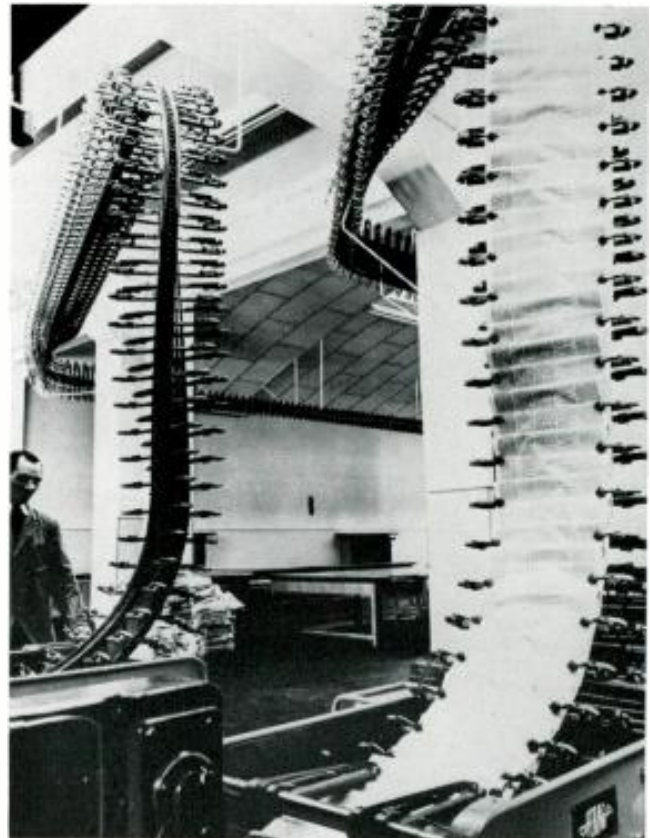
Unlike more demanding data processing systems for paperwork, the industrial computer can take the searing heat of the steel foundry, the corrosive vapors of a chemical process, or the dust of a cement plant.

Unattended on the factory floor, the RCA 110 stands twenty-four-hour vigil over the production run. From as many as a thousand different points, it receives second-by-second sensing reports on the process. It measures, adjusts, computes and issues control instructions in one twenty-thousandth of a second.

If something serious goes wrong, the 110 automatically closes down the line and indicates the place and cause of the trouble. Moreover, it constantly checks its own state of health, and if everything isn't working properly, it instantly types out a report, indicating the nature of the malfunction.

In a steel plating run, racing at several thousand feet a minute, the 110 will hold the plate to a uniform thickness, check for imperfections, and shear it.

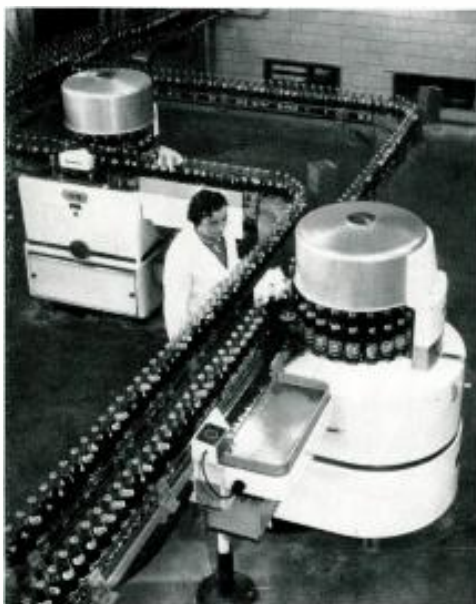
Newspaper printing can be controlled electronically.





The RCA 110 industrial computer can reduce substantially the time required to generate steam in an electric power plant and can also direct an entire electrical grid system.

Automation has made great strides in the beverage industry already. More than 1,000 RCA beverage inspection machines of the type shown here are in use and electronic controls handle a variety of other tasks as well.



This automatic grinder is one of many electronic controls now in use in the steel industry. It can automatically gage metal slugs and send rejects back through the grinder.

In a refinery operation, the 110 industrial computer can scan operations and compute, in seconds, production equations that a mathematician could not complete in weeks. Once the computer is correctly programmed, it never makes a mistake. Ultimately, the 110 will be able to operate an entire refinery.

In an electric power plant, the 110 can reduce substantially the time required for starting up a steam generating plant, at tremendous savings in fuel and electricity. Where it directs an entire electrical grid system, it can compute the operating efficiencies of each power plant, determine the points of greatest demand, and order the most efficient and low-cost output. Based upon circuit elements of the RCA 501, the 110 will be custom-adapted to larger plant operations. Other specialized industrial computers, the RCA 150 and the RCA 160, are being readied for such functions as data accumulation. Remote control and supervision of industrial equipment at distant locations by way of conventional communications facilities is still another RCA development – the RCA 130 Central Operations Control System.

Even before the advent of the industrial computer, automation made steady progress in many industries.

In the petroleum industry, automation is in extensive use. In some instances a lone technician forms the work force for an entire plant.

In the chemical industry, the precise processing of ingredients soon will be under control of computers and electronic sensing devices.

One of the most fertile fields for automation to date has been the beverage business. More than 1,000 RCA beverage inspection machines are in service

throughout the world, while other RCA electronic and mechanical servants remove empty bottles from their cases, load and unload pallets of cases in the bottling plants, and clean cases for re-use.

In newspaper offices, RCA Electro-Typesetters are at work helping to convert “copy” into the printed word, automatically. Another RCA device keeps count of the papers as they come off the presses and helps to prevent costly over-runs or premature press shut-downs. Linking the presses and the mail-room may be a light-weight conveyor with a flexible “backbone” and a thousand arms to enable it to twist its cargo around any intervening obstacles.

Electronic controls also play a vital role in today’s automotive industry. Automatic machines can test the hardness of piston pins and machine bearings with a degree of accuracy and speed far beyond the manual method. An electronic inspection machine can make a four-way dimension check of engine valves at the rate of 3,000 an hour, while another machine grinds metal parts for a variety of products to an extremely fine tolerance as it automatically resets its grinding wheel to compensate for any natural wear or “drift.”

Strides made toward industrial automation so far are minor by comparison with the growth expected during the decade of the Sixties. Continued research in basic circuitry promises to turn out smaller and smaller tubes, transistors, and other components to help direct the flow of materials, sort parts and ingredients, measure components, and handle countless other tasks, swiftly, silently, automatically.

In the truest sense, electronic controls are the geni of modern industry. ■

COMMUNICATIONS: *The Vital Link*

Electronic systems such as RCA's DaSpan bridge the final gap between Computers and Controls and make automation possible



The complexity of the communications systems which handle the data flowing between two points is apparent in this maze of connections.

COMMUNICATIONS — the “Third C” — closes the circuit between electronic computers and controls. It provides the vital bridge for the flow of information and instructions into and out of the machine.

From primitive tom-tom to telemetry instruments aboard the Pioneer V satellite streaking into orbit around the sun, communications has been the link between man, thought and action.

More recently, communications has extended its reach to link instruments with persons. Tiny devices within our space satellites, for example, will send a signal directly back to earth, automatically or upon command from the ground.

The latest and perhaps most spectacular advance in communications is the link-up between instruments and instruments without human intervention. This is the ultimate objective of the “Three C's” — when electronic computers and controls directly accept information and instruction from other instruments and from each other, and act immediately upon the data. The importance of this direct link lies in the fact that without the ability

quickly to relay such intelligence, the great speed and volume capacity of electronic computers and controls are seriously compromised.

As one of the nation's pioneers in electronic communications, RCA is taking a commanding lead in the development of devices and entire systems for the lightning-swift transmission of information.

RCA's DaSpan, for example, is the first digital communications system designed to integrate electronic data processing with remote operations. The equipment can be linked to telephone or teletypewriter facilities, on private leased lines, or on a station-to-station basis, as in regular telephone service.

Within minutes after a factory or branch office has information to communicate, no matter how distant the point, DaSpan is flashing it to the computer at speeds of up to 100 characters a second.

In the split-second it takes the computer to process the data, DaSpan is whipping it back to the point of origin, or any other equipped location. Within a few hours or less after a business order is placed, action can be under way at any number of points across the country — in factories, warehouses or on delivery trucks. Business management, moreover, has immediate information on any part of the operation, or all of it, without the usual delays in transmission.

The problems of communications can be as great within a single industrial location as in an office or across the nation. An inexpensive device, the size of a shoebox is providing one answer to efficiency of information gathering in the factory. RCA's Electronic Data Gathering Equipment (EDGE), takes reports of various types directly at the place of production and codes it into electronic impulses. At a central switch, a data concentrator assembles the information from hundreds of EDGE locations and forwards it on to the computer for processing. Instead of days for factory records to find their way to the front office, the information can be at hand in minutes. Both plant and

Construction work is speeded by the use of mobile communications systems.

company headquarters have immediate view of the production line.

Automatic communications has an equally vital role to play in today's high speed jet transport era. To solve the growing problem of air traffic control RCA is developing an Automatic Air-Ground-Air Communications System for the Federal Aviation Agency. The system will make possible automatic flight information, by electronic means, to and from as many as 500 aircraft in two minutes. Requiring no intervention by the pilot for routine questions, the system will have twenty-five to fifty times the present voice-channel capacity.

As billions of bits of information criss-cross communications arteries with lightning swiftness, they create problems as complicated as a traffic tangle.

RCA has the vital assignment of designing and manufacturing the electronic switching equipment for an ultra-high-speed communications network being established for the U.S. Air Force by Western Union. Its name is VODACOM—Voice Data Communications.

Up to ninety million words a day, double the 24-volume Encyclopedia Britannica, will streak through this network. Each message will carry a "header" noting priority, destination and length of message. As it enters any one of five centers, the RCA switching equipment instantly will check out the message for errors. It will process the data at one quarter of a million bits of information a second, select the destination and present the data to the circuit for transmission, either to a single address or simultaneously to all stations on the network.

If the message has top priority, the switching equip-



ment will interrupt all other communications. It will store the lesser messages for later transmission the moment the line is clear. If delays for any message exceed ten minutes, an automatic alarm will sound.

The VODACOM computer will translate different codes into a single "language" for processing and transmission. As the message is delivered, it automatically is retranslated into the code used by the equipment at the receiving end.

VODACOM is expected to save the Air Force millions of dollars in its supply services. More important, the great accuracy and speed made possible by the communications switching equipment, will help assure the readiness of the Air Force for any action.

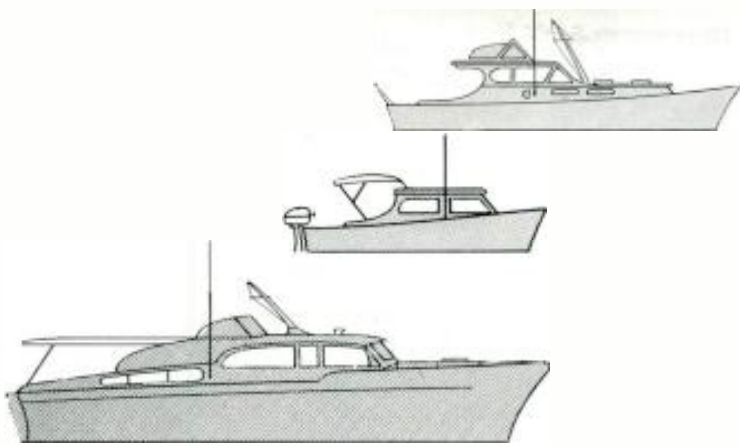
Simpler versions of the VODACOM switching center are being developed for civilian uses. They bring closer the time when the nation's transactions will move with the speed of light.

With the development of these new automatic communications systems, the gap between electronic information processing and electronic controls rapidly is closing. The time soon is coming when man's most advanced methods of production and defense will function largely without his intervention, freeing human energy and intelligence from their burden of responsibilities to the machine. ■

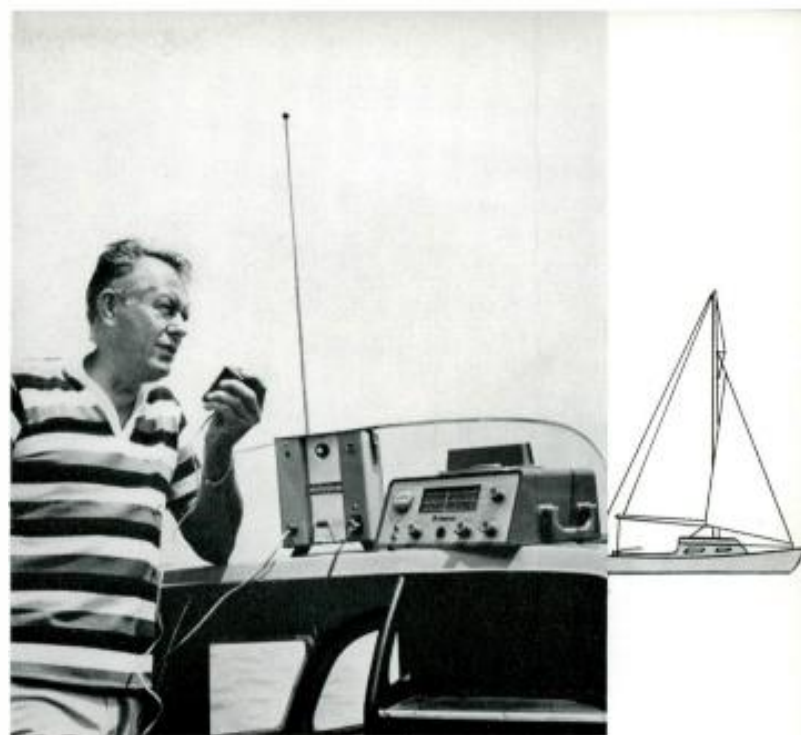


The "Megacoder" (above) is a high-speed miniature decoding device that can select one correct coded signal out of more than a million sent from a central transmitter. At right, operators at RCA Communications' San Francisco terminal process thousands of messages that each day flash to and from the Pacific islands and Asia.





Compact radars, radiotelephones, and other electronic gear are extending the range of small pleasure craft and enhancing the safety of Sunday sailors



Weekends Before the Mast

PLEASURE BOATING, formerly the relaxation of millionaires, is fast becoming the recreation of millions.

An advertising executive in New York . . . a steel worker in Gary . . . a dentist in Seattle . . . a government clerk in Miami . . . Americans in all walks of life are turning to boating in huge numbers for sport, for a hobby and for family recreation.

A few figures illustrate the tremendous surge boating has enjoyed in popularity in the past decade — from \$680,000,000 spent at retail in 1950 to nearly \$2,500,000,000 in 1959 — making it the nation's largest single leisure activity in dollars spent. During the same period, boats in use increased to 7,800,000 — more than double the 1950 total.

This headlong rush to the nation's waterways has, in turn, sparked a growing demand by weekend skippers for compact, simple-to-operate communications and navigational devices such as radiotelephones, radars, direction finders, and depth indicators. Industry sales of such equipment in 1959, which totaled \$4,500,000, were more than double 1956 figures, and projections indicate an annual volume of \$17,000,000 by the end of 1963.

To meet demands, manufacturers of small boat equipment, such as Radio Corporation of America, offer a wide variety of equipment to aid the weekend helmsman navigate unfamiliar waters, stay on course, and maintain contact with shore and other craft.

The popularity of these electronic "gadgets" stems from a usefulness much more basic than the mere convenience they afford. As Commander Norman L. Horton, Chief of the Search and Rescue Section of the Third U.S. Coast Guard District in New York, puts it:

"A ship-to-shore radio is your best lifeline to safety."

The Coast Guard, which keeps a fatherly eye on users of the nation's coastal and inland waterways, long has favored safety equipment for small boats. Letters have been sent to yacht and motor boating clubs advising their members how to get in touch with the Coast Guard in emergencies.

Commander Horton personally has conducted a one-man campaign on the advantages of safety equipment for recreational boats.

The compact radar, which searches up to 18 miles through the fog; the transistorized radio direction finder, which directs the small craft skipper in offshore navigation through darkness and fog; the radiotelephone, with which calls for help can be made; the depth indicator, which warns of shoaling waters — all are becoming "musts" for the weekend sailors who want peace of mind to enjoy their leisure afloat.

Most of the nation's boat buffs are content to limit their cruising to friendly waters. But there are those whose search for adventure leads them into areas more hostile and foreign to the outboard-class boat.

For example, Tony and Al DeLucio, boat-building brothers of El Segundo, California, wanted to prove that outboard-powered boats, when properly equipped, could make it across the stormy waters of San Pedro Channel — an 82-mile, open-water run from San Pedro to the Point Loma Lighthouse near San Diego.

The DeLucios equipped their 16-foot, open-cockpit craft — which was powered by a pair of 40 horsepower outboard motors — with the RCA “Portaguide” portable direction finder, and the RCA “Golden Sentry” radiotelephone.

No sooner had the DeLucios left the San Pedro Lighthouse than they ran into strong winds and high swells. A short time later, trouble developed in one of the motors and a quick check showed the rough weather had increased fuel consumption beyond the rate planned.

Rather than risk further complications, the DeLucios decided to turn back to Newport Beach, the nearest harbor. After reporting their decision to the Coast Guard, the brothers took their bearings with the direction finder and reached Newport Beach safely.

“The radio contact with the Coast Guard was never broken despite the pounding we were getting,” Tony DeLucio reported later.

Even more telling of the value of electronic equipment for small boats was the part it played in the first successful crossing of the Atlantic Ocean by a 22-foot outboard cruiser.

Said Ole Botved of Denmark, skipper of the three-man crew which did the trick in July, 1958:

“Without the radiotelephone, the trip would have been impossible.”

Four times during the 3,433-mile voyage from Den-

mark to New York the cruiser lost sight of the Swedish freighter Clary Thorden, its escort ship for the voyage. Each time, however, the two craft were able to rendezvous with the aid of the RCA radiotelephone and direction finder aboard the smaller craft.

Most nerve-wracking moments of the voyage came on July 18, 1958, 400 miles off the coast of Newfoundland, when gale-force winds of 44 knots created 40-foot swells and forced the escort ship to hoist the small boat aboard to ride out the storm.

James R. Wynne of Miami, who served as engineer of the small outboard said: “The phones and direction finder took a terrific beating in the heavy going. Still, they never ceased to operate when needed.”

In another display of the vital role these electronic “gadgets” fill, Frank Schmudde of Hialeah, Florida, took an outboard boat out for a 42-day endurance test off the Florida coast. For security’s sake, he equipped his craft with an RCA radiotelephone. Clear sailing and stormy days were part of the 1,008 hours of the endurance run. The boat and its equipment took a relentless pounding from rough seas.

After the gruelling test was over, Schmudde had this to say of his adventure, “Nothing gave us a greater feeling of security than our radiotelephone. The set was in constant operation for the entire test.”

No longer are the various tuna fishing tournaments the sole province of the larger inboard craft either. Thanks to such things as radiotelephones, direction finders and radars, smaller outboard-powered boats now venture without hesitation to areas 25 to 50 miles at sea where formerly only the larger inboard types dared go in search of the big fish.

The 1959 Atlantic City, N. J., Tuna Tournament was



Depth-O-Meter III

Portable direction finders are popular items



RCA "Portahorn"

Small boats are a multi-million dollar market

enlivened by a pair of small outboard-type cruisers.

Skippers Fred McCarthy and Russell Homan, both of Oaklyn, N. J., equipped their boats with electronic navigation and communications gear, then ventured more than 50 miles from shore. What is more, they came back with fish, through a thick fog on the last day of the three-day journey.

Neither boat finished among the prize winners, which are rated on total fish poundage, but McCarthy's crew landed one 17-pound tuna, and three of similar weight were brought aboard Homan's craft. Both skippers were pretty proud of themselves since only 20 of the 60 boats entered were able to display tuna flags.

Both boats were equipped with RCA radiotelephones and RCA "Portaguides", which proved their worth, especially on the third and final day of the tournament, according to Homan.

"We wanted some fish in a bad way," he said. "The only way to get them was to keep looking. We eventually wound up 52 miles from shore and still no fish. Then, using the portable direction finder, we homed-in on some of the larger boats between us and land. With ten minutes to spare before the official end of the tournament, we boated the third of our three tuna for the day. Each one was reported to the judges by radiotelephone."

As for getting the two boats back to port through the fog, it was, in Skipper Homan's words, "as easy as cruising down the open highway in your car. We picked up a signal from an Atlantic City radio station with the portable direction finder and headed straight for home, maintaining contact between boats with the radiophones. In a fog that heavy, your neighbor can be out of sight 50 feet away.

"All the way in, we could hear some of the larger inboard cruiser skippers chattering away, asking each other for fixes. We didn't have to say a word, homing in on that radio station signal until we picked up the beacon at the entrance to the channel just as though there were no fog at all."

Among new items introduced by RCA at boat shows in Chicago and Miami recently were the RCA Radio-Homer; the RCA Cruisephone 35 and Cruisephone 65 radio-telephones; and a transistorized depth indicator operating either on flashlight batteries or a boat's power source.

The Radio-Homer is a battery-powered, transistorized radio direction finder which also serves as a detachable three-band portable radio receiver. The receiver is easily removed from its base and becomes a portable, battery-powered radio capable of receiving beacon, broadcast or marine band transmissions. It also can be used to monitor the 2182-kilocycle calling and distress frequency.

The Cruisephone 35 provides six-channel coverage in the 2-3 megacycle frequency range. The Cruisephone 65, with eight-channel switching, provides extended frequency coverage for long-distance ship-shore communications.

The transistorized RCA depth indicator bounces a sonic signal off the bottom, an underwater obstruction or fish, and the return signal is converted to an electrical impulse. The impulse activates a neon light at the proper spot on the indication dial, ranging from zero to 120 feet.

With such equipment available it is little wonder that the former sport of millionaires is now the sport of millions. ■



This 22-foot boat crossed the Atlantic in 1958



"Citizens" radio



The RCA Radio-Homer



Radio telephone for yachtsmen



4-DJ-LORZ-4

AZA-DZ

NBC

DELANOH

A video engineer assigned to one of the national political conventions checks a TV monitor for picture density. Television coverage of the major conventions and candidates has had a profound effect on American politics.



By **ELMER W. LOWER**,
Manager, NBC News,
Washington, D.C.

POLITICS, 1960 STYLE

Television is forcing politicians and parties alike to make fundamental changes in techniques and tactics to win votes

THE FOLLOWING PROGRAMS will not be seen this evening in order that we may bring you, live from Los Angeles, the opening ceremonies of the 1960 Democratic National Convention . . .”

This simple announcement, by newscasters of the nation’s major television networks on July 11, will set in motion the most prodigious array of electronic gear ever to cover a news event. Behind it will be months of planning . . . days of hard labor . . . and an investment of millions of dollars.

When Democratic National Chairman Paul M. Butler gavels his party’s delegates to order, he — and they — will be caught in the unwavering stare of 70 live television cameras of all descriptions. Pistol-sized creepie-peepies, carried by newsmen prowling the floor of the spacious Sports Arena will peer over the shoulders of the delegates. High-reach cameras will stretch to the rafters for “cathedral shots.”

Outside the arena, mobile units will roam the city, searching street corners, hotel lobbies and airport waiting rooms for meaningful sidelights to the main event.

In Los Angeles — and two weeks later in Chicago, where the Republicans convene — the networks will marshal more than a thousand newsmen and technicians with enough cameras, microphones, tape ma-

chines, news rooms, studios and control centers to make up half a dozen radio and television stations.

This is the kind of massive electronic coverage that has made itself felt on the American people and, through them, on American politics.

This is the kind of penetrating coverage which contributes interest and excitement to the campaign that the eminent British diplomat, Lord Bryce, once described as “the spectacle of half the honest men supporting for the headship of the nation a person whom the other half declare to be a knave.”

Television, and radio before it, have opened a window on the smoke-filled room and have shown that a single broadcast can reach more voters than a candidate could address in three solid years of touring the whistle-stops and speaking from the back platform of a campaign train.

William Allen White, the famous Kansas newspaper editor, remarked of the radio coverage in 1924 that “the convention is no longer held within four walls but is out in the broad universe.” Thirty years later, actor-producer Robert Montgomery, serving as President Eisenhower’s television consultant, described TV as “the greatest mass ‘lie detector’ of the age.”

“It can unmask a phony in one minute flat,” said

The advent of television has enabled Americans everywhere to have a ringside seat at the proceedings which decide the Presidential candidates.

Montgomery, "and all the ghost writers, TV consultants and pancake powder in captivity can't come to his rescue."

The broadcast media, in short, are at once universal in their coverage and intimate in their insights. In the past nine Presidential years, they have profoundly affected the course of conventions, campaigns, elections and the democratic process in general.

Politics and electronics were mated in 1924 when radio first covered the conventions. The Republican gathering in Cleveland was a tame enough affair that lasted only three days and nominated the incumbent Calvin Coolidge. The Democrats met in New York and during 17 days, with every minute of the sessions covered by radio, they loudly aired their deep divisions over Prohibition, the Ku Klux Klan and other issues. By the time they had nominated John W. Davis, any chance of winning over "Republican prosperity" had vanished in the ether.

Radio did not decide the 1924 election but it did prove itself as a medium that could bring political candidates and political conflict directly into the home. "Radio," as a contemporary analyst put it, "has found a way to dispense with the political middlemen. In a fashion, it has restored the *demos* upon which republican government is founded."

In succeeding election years, Presidential candidates discovered that their new pipeline to the voter was at times a problem. In 1928, Herbert Hoover

made better use of radio than Al Smith, who insisted on calling it "RAD-dio" and was somewhat handicapped by other lapses of pronunciation and grammar. Franklin Roosevelt's personality seemed made for the new medium and he took full advantage of it in campaign broadcasts. In his use of radio, Roosevelt easily outdistanced Hoover, Alfred Landon and Wendell Wilkie, though the consensus was that he nearly met his match in the radio manner of Thomas Dewey.

By defeating Dewey in 1948, Harry Truman became the first candidate to win the election despite the fact that he was generally believed to have had less radio appeal than his opponent.

Television had looked in on the conventions in 1948, but in 1952 it was geared for national coverage and moved into Chicago with \$4 million worth of equipment. NBC News alone mobilized more than 20 cameras, three mobile units, hundreds of miles of wire and cable, and a repair shop to keep the whole mechanism going. To directors' cries of "Wipe it," "Pan right," "Switch," and "Take the pool," the networks covered the conventions from "gavel to gavel."

TV reporters, who then lacked a perfected crepeepie, covered floor events by combining a radio signal from walkie-talkies with a video signal from long-range cameras. When it was all over, *Fortune* magazine declared that no other medium had ever shown the conventions with such clarity.



In covering the conventions this summer from "gavel to gavel," NBC's Chet Huntley and David Brinkley (above left) will be backed by a staff of over 350 reporters and technicians, including "legmen" on the floor (above center).

"It was," the magazine said, "as though the national conventions were being seen for the first time through the innocent eyes of a child."

Some observers noted the advent of television coverage with misgivings. One of them, the late Senator Richard Neuberger, even proposed a bill which would make it obligatory to state on the air whether a public servant or political candidate wore make-up and spoke from a prepared script.

Social scientists, on the other hand, found that the reality and immediacy of both television and radio made them a preferred source of political information.

Radio coverage was compared with that of newspapers in a study made by Columbia University during the 1940 campaign. This survey, conducted in Erie County, Ohio, found that political information seldom converts a voter from one party to another, but instead tends to reinforce the beliefs he already holds and to prod him into action. To the extent that the media do exert influence, radio was found to be more effective than newspapers. This finding was confirmed in a 1944 survey in which a cross-section of voters was asked which medium provided the most accurate news of the Presidential campaign. The score was radio 1137, newspapers 517 and magazines 126.

Television was found to have "striking" impact in 1952 during its first national coverage of a Presidential campaign. A survey made by the University of Michigan found that the public went out of its way to

watch the campaign on television. Although only 40 per cent of the homes in the U.S. had TV sets at the time, so many people went "television visiting" that 53 per cent of the population saw TV coverage of the campaign. Furthermore, television led the other media in the number of people who rated it most informative. Nearly 60 per cent of the viewers considered TV their most important source of news on the campaign.

A more recent national poll, conducted this year by the American Institute of Public Opinion, showed that Americans favor by a five-to-four margin having opposing Presidential candidates campaign entirely by radio and television instead of by other traditional methods, such as extensive tours.

Perhaps the finest tribute to television was recorded during the Republican convention in 1952. The late Earl Godwin of NBC News discovered in a series of interviews that the delegates — confused and anxious to learn what was really going on around them — were placing long-distance phone calls to friends and relatives who were watching the TV coverage at home.

The Democrats showed their awareness of television in other ways. Chairman Sam Rayburn disciplined parading delegates at the 1952 convention and asked them to keep their balloons from obstructing the television view of the speaker. Officials took care to locate banners and slogans within easy camera range and constantly checked TV monitors to see that nothing



A technician trouble-shoots cables (above left) which carry the audio and video signals selected by Program Directors in the "On-The-Air" Control Room (above center) from the bank of TV monitors in front of them (above right).

was wrong with the picture. They published special leaflets warning delegates to be on time, to maintain decorum and to remember that a long-range camera might be zooming in on them at any minute.

Such precautions have not always pleased TV directors who believe that natural action and reaction make for the best television. They recall with some embarrassment the episode in 1948 when Southern delegates dramatized their exit from the Democratic convention by tearing off their badges and throwing them in a pile before the TV cameras. As soon as the cameras had turned away, the delegates came back, picked up their badges and put them on again.

In the 12 years since then, television newsmen have covered two more national conventions and countless other world events wherever they may have happened. They have, in effect, developed a new kind of news medium, one that takes the marvels of electronics in stride and uses them as a means rather than an end in themselves.

"The experience, knowledge and character of our news staff are our greatest asset," says William R. McAndrew, Vice President of NBC News. The NBC network's convention coverage this summer will again be headed by Chet Huntley and David Brinkley, who won the acclaim of both the press and the broadcasting industry for their coverage of the 1956 conventions.

New electronic tools are being fitted to the hands of the newsmen, rather than the other way around. One of these is a convention control center more complex and versatile than that of an aircraft carrier. It will permit a single TV editor to control the coverage as precisely as a managing editor controls the content of his newspaper — and to do it in a matter of seconds rather than hours.

At Los Angeles this summer, Huntley and Brinkley will report the convention from a broadcast booth looking directly down on the floor of the new Sports Arena. The commentators will be in two-way communication with the specially-built NBC center under the stands — a radio-TV complex occupying 10,000 square feet of space and including not only master control, but studios for interviews and panel shows, film developing facilities, and a complete news room.

In addition, Huntley and Brinkley will be tied-in with twenty newsmen who will cover the floor of the hall, using walkie-talkie radios and crepie-pepie cameras to pass along news of the delegations. For developments outside the Arena, NBC will have a headquarters in downtown Los Angeles nearly as large as that inside the convention hall. From there, correspondents, accompanied by mobile units or film crews, will look in on the private meetings that will inevitably crop up in hotel rooms and elsewhere.

"We'll cover as many of these private meetings as possible," Brinkley says. "And I say 'possible' because I remember in '56, when Senator Kennedy got news that he was getting votes for Vice President on the convention floor, he was in a hotel room, lying in a bathtub. He came out to the television set with a towel wrapped around himself to watch and see what happened. By the time he got himself dried off, Kefauver had beaten him."

Thanks to radio and television, the debate over party platforms is gradually being pried out into the public view. As for campaign trains, the last really effective one to hit the whistle-stops was Harry Truman's in 1948. The campaign of the future, it is generally conceded, will be marked by quick airplane trips and radio-TV speeches originating from widely separated spots.

The greatest effect of television has been to make the political process an intimate one. Today's candidate is projected right into the living room, where every gesture, every intonation, is closely scrutinized.

"The TV camera," says Senator Hugh Scott of Pennsylvania, "goes right under the skin."

This year, candidates and delegates will be forced to take into account the fact that 46 million American homes — a record of 87 per cent of the total — have television sets. This means that most of the nation's 100 million potential voters can see a good deal more of what is happening at the conventions than the delegates on the floor, or the visitors in the galleries.

The result is a new sense of participation in politics, an awakened interest and a keener appetite for more coverage of candidates, issues and events.

The sheer magnitude and thoroughness of their coverage has led to endless debate over the effects of radio and television on the political process. However, one thing is certain. Since the electronic media entered the political arena, more and more Americans have been exercising their franchise.

In 1920, the last campaign year before the start of radio coverage and the first year that women voted, 43 per cent of the eligible voters cast ballots.

In 1924, radio's first Presidential year, the percentage rose slightly to 44 per cent. Eight years later, in 1932, more than 52 per cent of the electorate cast their ballots. The figure has continued to move gradually upward — 59 per cent in 1940, to its highest point of nearly 63 per cent in 1952, the first year of full television coverage.

Thus, it can be said that the impact of electronic journalism on politics *has* forced a healthy change. For, the greater the participation and coverage, the more enlightened will be the decision on election day 1960. ■



CALIFORNIA'S NEW GLAMOR INDUSTRY

Dedication of RCA's missile and radar plant at Van Nuys

emphasizes growing importance of electronics to the West Coast economy

CALIFORNIA . . . the land of make-believe, klieg lights, movie stars and gossip columnists . . . that's the average layman's conception of the Golden State.

True, the motion picture industry is an important one in the state. But of late, it's had to take a back seat to a new glamor industry — electronics.

A mere ten years ago, 80 electronics firms in California employed 10,000 people and grossed \$150 million annually. Today there are 600 firms employing 123,000 men and women and grossing nearly \$2 billion annually, making it now second only to the related aircraft industry in volume.

Symbolic of the growing importance of electronics to the California economy was the dedication April 6 of Radio Corporation of America's new West Coast Electronics Center at Van Nuys.

Described as the nation's most advanced facility

for the engineering and production of ballistic missile checkout, guidance and control systems, the plant already is producing electronics equipment for the military services. Included among its products are the automatic checkout and launch control systems for the Atlas ICBM and the launch-control automatic pilot for the Thor IRBM.

Other electronics systems developed by RCA and now being produced at the Van Nuys plant include long-range radar navigation instruments (Loran); weather radar for the Air Force and Navy; electronic countermeasures equipment, and elements of the Ballistic Missile Early Warning System (BMEWS).

The division also is currently engaged in the design of highly classified electronics systems that should play an important part in defense and space exploration.

John L. Burns, President of RCA, in a brief dedi-



catory speech, pointed out that systems such as these, while designed for military use, also can lead to dramatic new peacetime applications. He cited as an example the potential use of electronics, through computers and other devices, to solve the knotty traffic problems of the freeways of the Los Angeles area.

Commenting on the growth of the electronics industry in California, Mr. Burns said:

"As these buildings attest, the past is only prelude. By 1965, if your state merely matches the projected growth pattern of electronics nationally, you should attain an annual business volume of \$3.5 billion, an increase of 75 per cent. For California, with its vast human and technical resources and its front-rank educational and scientific institutions, this is a modest challenge indeed—and if it is met, electronics will then become the dominant industry of your state."

The new center in Van Nuys will supplement facilities leased by RCA in West Los Angeles beginning ten years ago. Three of the six buildings are devoted to engineering activities and are grouped like the spokes of a wheel around a tower which serves as a radar testing facility.

Harry R. Wege, Vice President and General Manager, RCA Missile and Surface Radar, commented on the speed with which the Van Nuys program was implemented to meet RCA's growing requirements:

"Only a year ago this ground was an open field. Today, it is a completely operational center equipped for the most efficient handling of military programs.

"This center has six major buildings, all modern in design, which contain some 240,000 square feet of floor space. In its offices and laboratories 1,800 engineers, technicians, administrative and production people are now working on advanced programs of many kinds. It is incredible that all this has been achieved in only one year."

Although the Center took but 10 months to construct, it took 4,000 man-years to train the engineers needed to staff it. That is the combined professional experience of the engineering team that will develop the advanced devices for national defense and the space age.

Of the more than 1,800 employees, some 20 per cent are graduate electronics engineers, many of whom have post-graduate degrees.

Thirty per cent of the remaining employees are top-ranked electronics technicians, technical writers, draftsmen, and personnel and administrative specialists.

The forerunner of the present West Coast Missile and Surface Radar Division was established by RCA in October, 1950, in the Houston Corporation building in West Los Angeles. The original work force numbered 150 persons.



Laboratory technician Claude Wilton of the West Coast Electronics Center carefully threads a tiny grid which can hold 2,200 "bits" of electronic memory. The grid will replace present grids more than 10 times its size.

Two years later RCA completed the construction of a new building at 11819 West Olympic Boulevard.

In the following years, the rapidly-growing demands of both the national defense and civil aviation for advanced electronic systems required the leasing of 10 other buildings in the area. RCA will continue to occupy several of the leased buildings to supplement the new Center's activities.

State-wide, the RCA family, including its subsidiary, the National Broadcasting Company, is made up of 6,300 men and women, engaged in 34 different company activities, with an annual payroll of well over \$50 million.

Throughout the state these activities are carried on at 28 locations, representing many diversified operations, and including television broadcasting, recording, radiomarine and international communications, design and manufacture of industrial and defense products, distribution, service, and educational facilities. ■

Shown left is what the Chicago Daily News has called the "Face of The Space Age" — part of the 400-plus space electronics engineers who work at Van Nuys, and whose combined professional experience exceeds 4,000 man-years.

ELECTRONICALLY SPEAKING

VANISHING LANDMARKS

Progress soon will deprive residents of eastern Long Island, N.Y., of a familiar landmark and will do away with a hallmark of RCA's pioneering in the field of long distance radio telegraphy.

The remaining six of 12 original radio antenna towers at Rocky Point are being demolished to make way for modern antenna arrays which will handle RCA's fast-growing volume of overseas communication traffic. The 400 foot-high towers were the last word in radio engineering art when the Rocky Point station was officially opened by President Warren G. Harding in 1921. But as higher frequencies took precedence over long-wave transatlantic radio, the giant towers became obsolete.

In 1952, the first six towers, containing 130 tons of structural steel each, were razed and the remaining half-dozen were leased to the American Telephone and Telegraph Company as standby equipment for their London radio-telephone circuit. This spring, however, the last of these pioneers are being felled to write *finis* to the era of long-wave communications.

EVERYTHING BUT THE PEANUTS

As proof that the biggest bargain in sports entertainment is a television set, NBC offered sports fans throughout the nation savings up to \$1,157 in ticket admissions during 1959.

That's the amount it would have cost John Q. Fan to buy a single seat at every one of the 194 sports

events televised by NBC-TV last year. The variety of sportscasts ranged from football to tennis, including special events for which tickets are at a premium. The TV fan, however, just flipped a switch for the best seat in the house.

A WORLD OF PEOPLE

The mysteries of Africa proved to be a realistic problem for Jack Sughrue, NBC News director, when filming a documentary "Freedom Is Sweet And Bitter" in the Dark Continent.

"World Wide 60" scouts found many teeming villages perfect for their purposes but when the NBC contingent arrived to film, they found their shooting schedule threatened by the complete absence of all Ghanaian natives. The repeated disappearance of the residents is still an enigma. It became painfully obvious to the harried TV crew, however, that the mere sight of their bus or sound truck prompted the African "extras" to vanish into the dense jungle.

"Finally," said Sughrue, "we devised a scheme to speed up the re-appearance of the Ghanaians. After unloading our equipment, we would look around and shake our heads, and pretend we were going to pack up and leave. This brought the people out in a hurry!"

WHERE HE LEFT OFF

Making a swift come-back after his Army career, RCA Victor recording artist Elvis Presley has received the traditional gold record symbolizing sales of one million

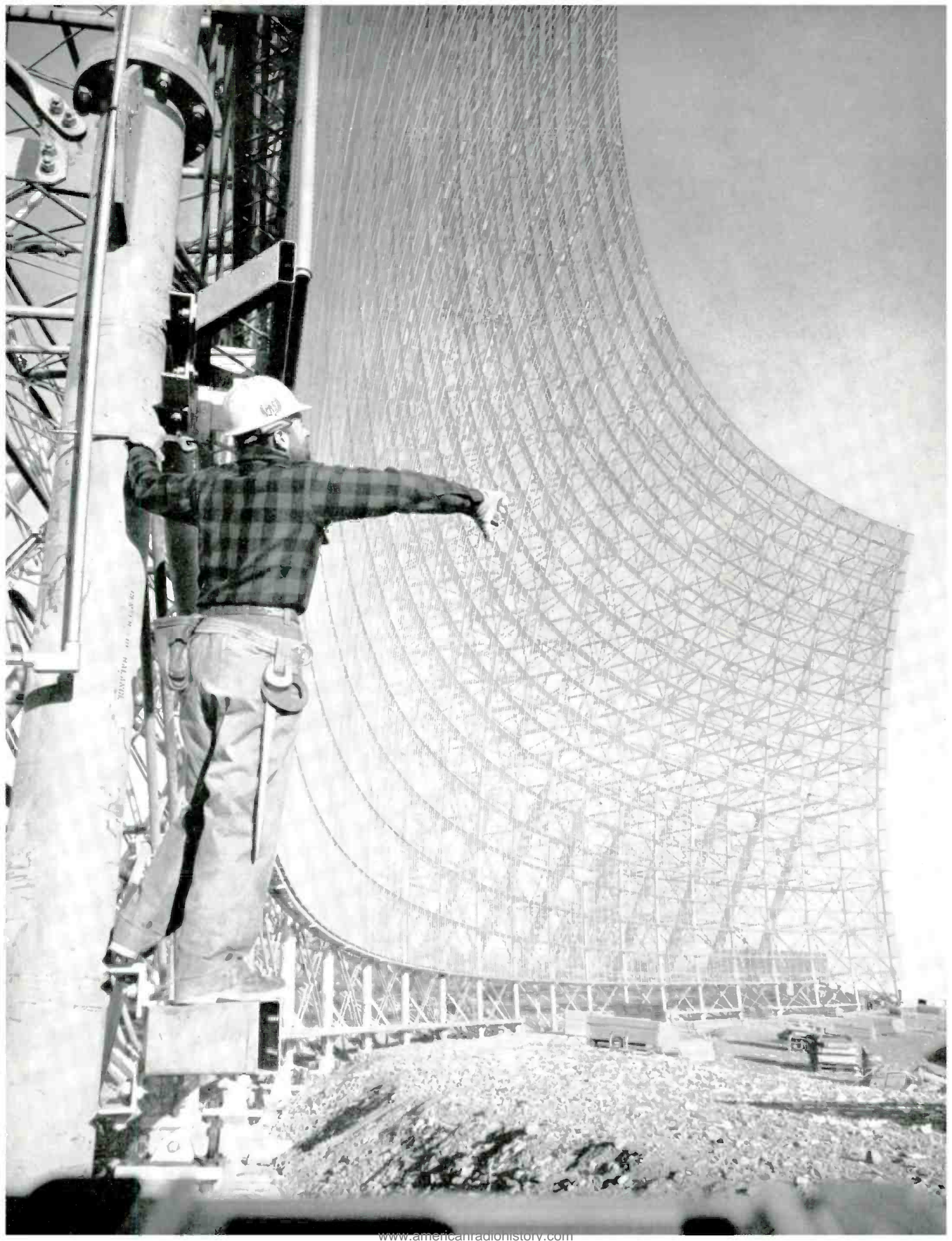
copies of a record — before the release was available in many stores.

Long before Presley's discharge, plans were made to insure the manufacture of a minimum of one million records within five days of his first recording session. On March 22, the day after the session, presses in Rockaway, N. J., Indianapolis and Hollywood were swinging into action to fill the initial orders which totaled well over the million mark.

The tunes, "Stuck On You" and "Fame And Fortune," were chosen by Presley while he was still in the Army, and RCA Victor spokesmen say they promise to measure up to his best performances. The rock n' roll idol has to his credit 14 single records which sold over one million copies; seven of these sold two million, and one, "Hound Dog" and "Don't Be Cruel," were purchased by over five million fans.

ARCTIC ACTIVITY

Six hundred miles north of the Arctic Circle a steel worker guides a crane in the positioning of a section of a giant Ballistic Missile Early Warning System antenna (right). American industry and the military are pooling resources in Greenland, Alaska and England in building BMEWS to insure adequate warning in the event of a missile attack on the North American continent. RCA, as prime contractor for BMEWS, recently reported that 36.1 per cent of the project is sub-contracted to small business concerns. These small businesses are spread throughout at least 29 states. ■





Harry Belafonte's dream of recording an album of rare, authentic chain gang songs comes true at last. The Belafonte Folk Singers join in this collection of dramatic music of the chained convict—toiling on the road under a scorching sun...or in the bunkhouse, singing the loneliest of blues.

Frankie Carle touches the piano and out jump notes of pure gold. In this showcase, the gold is set against a variety of musical backgrounds: voices and strings, strings and brass, a smooth-flowing rhythm section. The tunes, including fine originals, are gems that belong in solid gold settings!

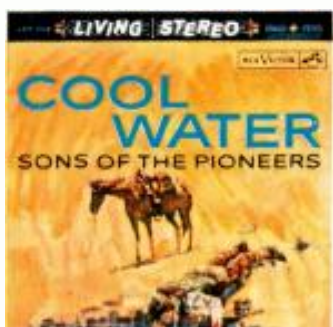


The diminutive choir of RCA Victor's Hugo and Luigi consists of 22 lark-like lads and lassies. The happy inspiration here was to give them some unlikely songs to sing, such as "Lullaby of Birdland," "Love and Marriage," "Don't Fence Me In," and "True Love." The result — most refreshing!

Red hot! This peppery package unites, for the first time, Rosemary Clooney and Perez Prado's big band. The "Touch of Tabasco" title is our subtle way of suggesting that their concoction of songs, in mambo and cha-cha tempos, is liberally laced with spicy Latin flavors. Keep the ice water handy!



Henry Mancini's high-voltage "Peter Gunn" was the first TV score to triumph as a record. A second "Gunn" album matched the feat. Now, Mancini portrays a new TV character. "Mr. Lucky" is a cosmopolitan, and Mancini writes for him in moods of tingling mystery, suave sophistication, sultry romance and modern jazz. It's new, it's thrilling...it's Mancini!



From trail and campfire comes this Western sound roundup by the Sons of the Pioneers. "Cool Water," "Red River Valley," "Wagon Wheels"—18 songs in all—are sung here just as the pre-TV cowboys sang them. There's nothing quite like this album west of the Pecos...or west of Broadway!



the world's greatest artists are on... **RCA VICTOR**
RADIO CORPORATION OF AMERICA