

Communicate

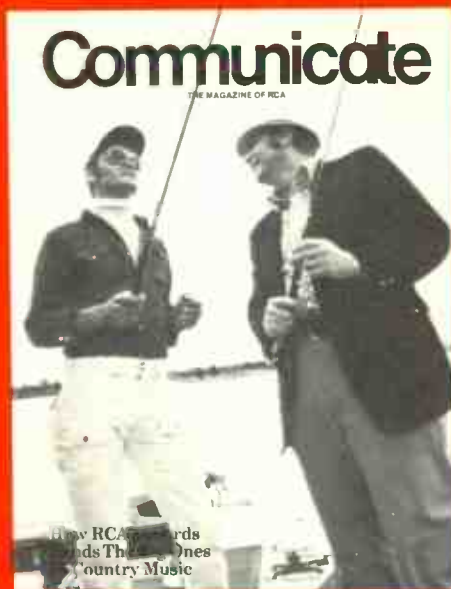
THE MAGAZINE OF RCA



**How RCA Records
Lands The Big Ones
In Country Music**

July/August 1973

Cover: It may not look it, but this is an RCA business meeting. RCA Records' Jerry Bradley (right), interrupts recording star Jerry Reed's fishing trip long enough to confer about an upcoming recording date.



Editor
DANIEL S. HIRSHFIELD

Managing Editor
Steve Blickstein

July/August 1973

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Photo credits: cover, pages 3 and 4, Jimmy Moore; page 8 (bottom) and 14, Bruce Davidson for RCA; page 8-9 (top), NASA; page 16 (left), Walt Disney Productions; page 23, Frida Schubert; all others, RCA.

LETTERS TO THE EDITOR

Communicate talks about you, your jobs, and your company. But it also gives you a way to speak to others throughout RCA. You're invited to use *Communicate* to share your ideas, suggestions, questions, and contributions by writing to us at the following address:

Editor, *Communicate*, RCA Corp., Rm. 4904, 30 Rockefeller Plaza, New York, N.Y. 10020

To the Editor:

I can't tell you how pleased all of us in NBC Sports were by the feature article in the first issue of *Communicate*. It was a superb job, and I appreciate this department's being selected for such prominent exposure throughout RCA.

Carl Lindemann, Jr.
Vice President
NBC Sports

To the Editor:

Congratulations on *Communicate*! Your first issue was most informative and interesting. The idea of an information-disseminating magazine specifically for RCA employees about RCA is excellent. We have long needed such a publication.

Of course, the article about women at RCA was of particular interest to me. Now that you have discussed the *women* at RCA, a discussion of the *women's Affirmative Action Program* at RCA would be a logical follow-up. There does not seem to be much information available to RCA employees about the aims and results of our women's program, and *Communicate* would be an ideal vehicle for sending this information to RCA workers.

I eagerly look forward to the next issues of *Communicate* and to more articles about the women's program.

Jane R. Lockshin
Manager
RCA Economic Research

To the Editor:

Read your new magazine today—think it's great.

Looking forward to future editions.

L. N. Ragusa
Regional Sales Manager
Manhattan District
RCA Service Company

To the Editor:

I would like to comment on your thumbnail sketch of RCA Service Company activities. One of them, you report, is the "installing and servicing of internal phone systems for hotels and institutions." To bring you up to date, the changes in tariffs now permit private telephone systems to be connected to the common carrier network. RCA Service Company is no longer restricted to internal systems. We are now installing thousands of lines of complete and modern telephone systems that provide complete internal and external direct dialing via connection to the telephone company's trunk lines.

B. F. Schroeder
Manager
Telephone Systems Marketing
RCA Service Company

To the Editor:

I have received and read your new magazine, *Communicate*, and I think it is a fine beginning. Most of the articles are interesting and I think the "RCA in 1973" piece will be particularly useful.

I hope that in the future you'll pay more attention to the scientific and technological aspects of the company, including our involvement in space, defense communications, and lasers. *Communicate* should also focus more on the communities in which RCA and its people work and live. I also think it would be appreciated if you were to provide the names of all employees whose pictures appear in your magazine.

With best wishes for the continued success of *Communicate*,

Gene Green
Administrator,
News and Information
Government and Commercial Systems

To the Editor:

We have found the lead article . . . "RCA in 1973" . . . very helpful in describing RCA's diverse business activities to new MBA graduates investigating our Marketing Associates program. I'm sure the article served the same purpose for many persons already a part of the RCA organization.

E. J. Homer
Director of Marketing Administration

To the Editor:

Congratulations on the birth of *Communicate*! It promises to be an exciting way of keeping informed about RCA and its many businesses.

The article on the Consumer Electronics' distributor show (January/February, page 16) was interesting, but it stopped short of explaining how our products are engineered and designed to give them the greatest marketability. I think most RCAers would be fascinated by that part of the process, and I urge you to consider the topic for a future article.

William H. Anderson
Division Vice President, Marketing
Consumer Electronics

To the Editor:

As a relatively new RCA employee, I would like to express my appreciation for *Communicate*. In addition to familiarizing me with the company, it gave me a graphic picture of what it takes in terms of people to keep a vast enterprise like RCA going. I look forward to future issues to put me even more into the RCA picture.

John Graft
Electronic Components
Marion, Ind.

RCA's Crown Prince of Country Music

Jerry Bradley's way of running RCA Nashville may be unorthodox, but it produces hits

It's 7:00 A.M., and Jerry Bradley, who put in his usual 16 hours as RCA Records' Director of Nashville Operations the day before, gazes sleepily at the local morning show on his bedroom TV set. On the screen, RCA recording star Jerry Reed croons a country lament. Bradley's eyes widen suddenly. "Damn!" he shouts, lunging with all his 235 pounds for the phone. "This is Jerry Bradley," he tells the TV-station receptionist. "You tell that boy I'm tired of chasing him all over Nashville, and I want him at the studio today to get pictures taken for an album cover or I'll find him wherever he is and stomp him. Hello? Hello...?"

Fits of temper that terrorize switchboard operators are not the usual order of business for Jerry Bradley. But business can take unconventional turns for the man at the head of the largest recording operation in a town where the principal cash crop is country music. Any time from 7:00 A.M. on into the early hours of the next morning, Jerry Bradley, 33, is immersed in every activity necessary to sell records, from, in his own words, "engineering to producing to emptying ashtrays." Chet Atkins, Division Vice President, Country Music, for RCA Records in Nashville and the man who built RCA's presence in the country music capital from six people in 1957 to 42 today, says of Bradley, "He's tough, honest, and he's Nashville born and bred."

Speaking of his beginnings with RCA in June, 1970, Bradley recalls that Atkins, an accomplished musician as well as one of country music's top recording executives, mentioned wanting to devote all his time to his own music. "He took me out to dinner one night and asked me if I was interested in coming to RCA. When I told him I already

had a good job, Chet said, 'This isn't any old job. It's joining me as my assistant, with the eventual possibility of becoming my successor.' So there I was, age 30, getting ready to step into one of the top spots in town."

Since he stepped in, Bradley has bent RCA's country music operation to his own management style. A big, shambling man given to loud shirts, double-knit blazers, and a dozen hats he swears he'll wear every waking hour until his hair transplants are completed, Bradley barrels through RCA's three-story

building on Nashville's Division Street, (locally called Music Row), like a perpetual-motion bear. One moment he is in one of the sound studios working with an engineer to find the proper sound mix for the quadrasonic sound version of Dottie West's "I'm a Country Girl." Next, he's arranging a concert tour for Waylon Jennings (who has almost singlehandedly made sophisticated New York City country music-conscious). Or he is coaching the increasingly popular Nat Stuckey on his stagecraft, or auditioning a new act





Bradley (far left) runs Nashville's weekly "family gathering" in Chet Atkins' office.

from a ringside table of one of dozens of clubs in and around Nashville that feature country music.

In his office, Bradley gives his view of country music today and tells how he's working to win the largest possible share of its renewed popularity. "Country music is a business of contradictions," he says. "The name of the game is to make hit records, but if you consciously try to make a hit, you'll flop. A hit just has to happen. Even though we have quad sound, a dozen new songs a week, and some pretty far-out instruments like harpsichords and banjos with electronic pickups and plywood sounding boards, country music hasn't changed much over the past 25 years. After you remove some of the new frills, every song is still about cheatin', drinkin', or sentimental love."

One of the unbendable principles of success in country music is to be true to your home base, Bradley contends. "Country fans don't like radical change," he says. "No matter how pop-

ular country gets, they still like to think of it as theirs."

In the chic, hip, trendy, urbane '70s, who digs songs with lyric lines like, "Pass me by if you're only passin' through," or "I'm lovin' on Back Street while I'm livin' on Main Street?" The answer, according to Bradley and—more to the point—the *Cash Box* Top

100, is more people than ever before. "Whatever the reasons the sociologists, psychologists, or politicians give, the answer is simple to me," says Bradley. "The music hasn't changed, they—the public—have. All we do is what we've been doin' for years. Just more people appreciate us now is all."

Actually, RCA Nashville, with Jerry Bradley in the control room, is not doing what it's always done. He has been making changes. Examples:

- He has added two producers, or A & R (Artist and Repertory) men, to his staff. "When an A & R man has only six acts, as is the case with our younger men," explains Bradley, "he can do a more thorough job and follow through better on the million and one details involved in getting out records."
- He has coordinated sales, promotion, and publicity. "When a disc jockey anywhere in the country plays one of our new releases," Bradley says, "we make sure that the sales department gets enough product (records) into the stores to handle the demand that may result."
- He has brought in new talent, including Dickie Lee, Johnny Russell, Johnny Bush, Norro Wilson, and Pat Daisy. Bradley has also kept the old favorites selling. "One of the beauties of country music is that the artists last longer and sell more evenly," says Bradley. "Hank Snow, Porter Wagoner, and Skeeter Davis have been on RCA for over 20 years and are still going strong. Jim Reeves recordings consistently sell



Recording artist Porter Wagoner reviews the arrangement of a new record with Bradley.



60,000-100,000 records per release, and he's been dead for nine years."

A day with Jerry Bradley—in this case the day that started with his irate phone call to the TV studio—gives some idea of how he keeps a respectable number of RCA records at the top of the country and general pop charts, and why Chet Atkins has chosen him as his successor.

"Whatever happens, I got to get Jerry Reed down here today," he tells Connie Hurt, his secretary, as she strains to keep pace with him while they walk down a corridor to a meeting. "When you find him, tell him to come with a couple of changes of clothes so we can photograph him for an album cover." In Chet Atkins' office (Atkins is not there), Bradley meets with Bob Ferguson, Ronny Light, Roy Dea, and Ray Pennington, all A & R men; Elroy Kahanek, Promotion Manager and the man mainly responsible for getting RCA's country product on the air; Wally Cochran, in charge of artist relations, press relations, and the self-proclaimed unofficial mayor of Nashville; Charles Smith, Sales Manager; and Dorothy Boyd, A & R Coordinator,

(also known as The Ramrod) whose job is to keep the A & R men—including Bradley, who still produces several artists—to their production schedules. "This is our weekly family gathering," Bradley tells a visitor. "We check our progress on everything from album liner notes to cover pictures to sound mixing. We also listen to a couple of new records."

The meeting breaks up after about an hour, and Bradley is back in his office, cooing into the phone. "Ain't heard from you in ages," he says. "How long you going to be around?" As the conversation continues, Cochran comments, "Whenever Jerry talks that sweet, you know he's talkin' to one of the acts."

After hanging up, Bradley amplifies on the conversation. "The average country music artist cuts three or four singles a year, maybe two albums, and some more singles and albums to be held in reserve," he says. "But unless you're a superstar, that's only half the story. This fellow I just finished talking with asked me why his album wasn't selling better. I told him to get him a bus and some pickers (musicians) and

play clubs around the countryside. That way, he'd get better known and people would buy his records, and he'd make money off the club dates besides."

Outside Bradley's office, Connie has managed to reach Jerry Reed's manager. Bradley is back on the phone. "Harry, where the hell is Jerry? Doesn't he know we want to photograph him today? He's where? Okay, that's where we'll have to go, I guess." He hangs up, looks steadily at Cochran, and says, "He's fishing off the Four Corners dock, and they're biting. Do I have to say more?"

Behind the wheel of his Cadillac, Bradley muses on the mountain having to go to Mohammed. "For the most part, country artists are really down-home boys. If they aren't fishing, they're hunting or playing golf—anything that keeps them outdoors," he says. "I can't really blame them. They work very hard, travel constantly, and have to be available to their public. So when they get some free time, they just don't want to be bothered."

A half-hour after leaving Nashville, while Jerry Reed's elaborate outboard motorboat gurgles impatiently next to

They All Love RCA's "Nashville Sound"



Like recording studios everywhere, Studio B at RCA Records, Nashville, is disarmingly casual. Coffee containers are everywhere. Masking tape and magic markers are standard labeling materials. The dress and the talk are informal, as are the hours. There is also, not so incidentally, about \$100,000 worth of recording equipment and materials, all of it tended with loving care by sound technicians and engineers.

Although there are four studios in the RCA building, Studio B has special significance. Since he cut his first record there in 1955, Elvis Presley will record nowhere else in Nashville but Studio B. During his phenomenal 18-year career with RCA, Elvis has made 55 worldwide, million-selling singles and has had 17 albums certified as Gold Albums for sales in excess of \$1,000,000.

A recent Presley concert in Hawaii (photo left) was televised by NBC via satellite, used as an airline promotion, and, naturally, released as an LP.

Presley is not alone among Nashville's million-sellers. Charley Pride has six LPs and a single, "Kiss an Angel Good Mornin'," mounted in gold. Other RCA country artists with one or more million-sellers are Eddy Arnold, the late Jim Reeves (who, though dead nine years, still receives fan mail and requests for public appearances), and Jerry Reed. In all, some 40 country artists record at RCA's "Nashville Sound" studios.

Such is the quality of RCA's "Nashville Sound" that non-country artists are beginning to record there. Perry Como, for example, won't record anywhere else.

one of the docks of J. Percy Priest reservoir, Bradley, with a photographer and Reed's manager in tow, strides down the gangway like a detective who has finally got his man. "The only reason I came in," says Reed with mock petulance, "is that the rock bass quit biting. But I don't want any pictures taken. That's too much like work, and I'm relaxin'." Bradley quickly sizes up Reed's fishing attire, which is more presentable than most people's golf outfits, and signals the photographer to start shooting. When Reed again objects—this time less strenuously—to being photographed, it's Bradley's turn to play at sternness. "If you don't shut up and do what the photographer tells you, we'll take your picture going under for the last time," he says.

When the photographer has taken enough, Bradley and Reed have double helpings of pinto beans and corn bread at a dockside sandwich shop. Reed, who is a successful song writer and publisher as well as a popular country singer, has a couple of songs he's eager to record. "Easy, hoss," says Bradley. "We want hits, but let's don't do them back to back. We want to space

them so we can record a hit single, put it in an album, then do the same later in the year." It makes sense to Reed, who now swears he can hear rock bass jumping about half a mile away. They make an appointment to meet about 10:00 that night at the recording studio.

The afternoon is spent in one of the editing rooms, where voice and accompaniment, usually recorded at different times, are electronically blended. In the editing room, where engineers put master tapes into final form for pressing, Bradley sits in the midst of four loudspeakers and instructs an engineer on volume and intensity of sound. "It's got to be perfect for a couple of reasons," he says. "If we're cutting an album, the sound level and quality have to be uniform. Can you see yourself adjusting your set for every band on an album? And we want to maintain our reputation for the best recorded product. With home equipment as good as it is these days, listeners will blame the record before their own set."

At 5:00 P.M., when most Nashvillians are heading home on the Interstate highway, Bradley is getting his second wind. He dines with Frank

Mancini, RCA Records Division Vice President, Promotion, who has flown down to make a presentation the following day, then returns to the studio at 9:00 P.M. to sit in with Chet Atkins on a Jerry Reed recording session.

Alone in the darkened studio, Reed hears his prerecorded accompaniment through a set of headphones. He's singing "Lord, Mr. Ford," in which he laments the effects of the automobile on the everyday guy's life. "Lord, Mr. Ford, I just wish that you could see what your simple horseless carriage has become," he sings in a throaty baritone. Later, he does "One Sweet Reason." In the control room, Bradley smiles and nods his head in time with the music. The recording session lasts until well after midnight.

"I'll probably be back here about 6:30 tomorrow morning," says Bradley, "so I can listen to some tapes before Mancini's promotion presentation starts." Asked if he sometimes wishes he could change his frenetic, nonstop life for one a little more orderly and conventional, Bradley perks up. "You mean be an executive?" he asks. "Hell, no. I'd have to come to work in a tie!"

RCA FACES



Alicia Weber takes aim.

Alicia Weber, Cameraperson

Probably one of the most familiar sights in the age of instant mass communication is the television film crew swarming over a news event or around a celebrity. An unfamiliar sight among all these cameramen, many of them veterans of the newsreel era, is NBC News' Alicia Weber, 25, the first woman camera operator in network television.

A 1970 graduate of Antioch College, Alicia joined NBC in May after freelancing on several documentaries, one of them a prizewinner in the Esquire International Student Film Festival and in the British National Student Film Festival.

Trim and athletic, 5'7" Alicia finds her sex a mixed blessing on the job. "Because I'm younger, lighter, and smaller than most cameramen, I can move faster and get closer to the shots," she says. "TV film work is far more demanding than documentaries because you have to make all your changes and think through all your shots on the spot. Most footage is taken from the shoulder with a 16mm sound-on-film camera weighing 30 pounds, plus a power pack."

Being new to the intensely competi-

tive world of television filming, Alicia concedes being the victim of competitive dirty tricks. "Filming a disturbance at a prison," she recalls, "I had an ideal shot of some inmates milling around a room, but I needed to shoot it in available light so as to preserve the mood. A competing cameraman saw what I was doing and had his electrician turn lights on. My shot was ruined, and I was enraged. But I learned my lesson. You can bet they won't try it again."

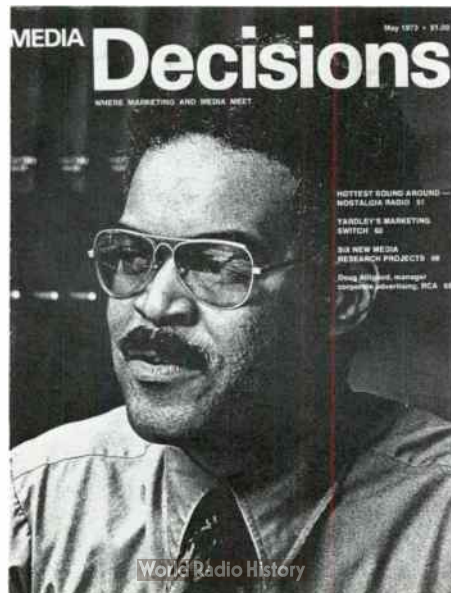
Alligood Guest-Edits Media Decisions

When Doug Alligood was asked to serve as the guest editor of *Media Decisions*' May issue, he was delighted. "It's one of the most respected and exciting publications in the media field," says the 39-year-old Manager of Corporate Advertising, "and being selected as guest editor and for the cover was a real honor."

But Alligood was surprised when he learned that he was expected to participate in real editorial decisions.

"The editorial meeting I went to was the real thing, complete with discussions, arguments, and fights. It was a unique experience."

Alligood joined RCA in 1971—after working at BBDO, a large advertising agency, and at radio station WCHB in Detroit.



Putting History in 3-D

If things go according to plan, in 1976 the Philadelphia Bicentennial Commission will exhibit a map re-creating the Delaware Valley as it was 200 years before. The map's creator is Ed Groman, a 20-year RCA veteran who is Manager of Plant Layout and Construction at Government and Commercial Systems in Moorestown, N.J., the Delaware Valley Project. He has been making maps and models since 1955.

"That was when I became interested in toy soldiers and joined the Miniature Figure Collectors of America," says Groman. "The same year, I built my first diorama, a reproduction of American troops capturing the Remagen



The Battle of Trenton à la Groman.

bridge over the Rhine in 1945. I built the bridge of bamboo sticks and even used tiny splinters of wood for railroad ties. I didn't skip one detail. Later that year, it won me first prize at the Miniature Figure Collectors' annual exhibit."

Groman estimates that, to date, he has completed about 20 dioramas. He has sold some of them, others are on exhibit, and a few are in his home. A diorama with five to ten figures takes him about 50 hours to construct. And Groman is quick to point out that his work is not all military history. "I did one a couple of years ago of George Blanda playing quarterback for the Oakland Raiders," he says. "I did it to commemorate all us guys over 40."

Doug Alligood meets the press.

The Sky's No Limit

From TIROS I in 1960 to ITOS E this year, RCA has been doing something about the weather

RCA is a veteran of space, beginning in 1958 with the orbiting Atlas rocket casing from which a special radio transmission system flashed a recorded message of peace to the world from President Eisenhower. Since then, RCA has been continuously involved in several major space ventures. But RCA's closest identification with space is as the builder and designer of the world's first weather satellite—and hence as the creator of the most enduring of all space programs, and the one that has had the most intimate and pervasive effects on daily life.

The program began on April 1, 1960, with the launching of TIROS I (TIROS stands for Television Infrared Observation Satellite.) It was by far the most complex space package of its time, and it launched RCA into a new communications technology that was out of this world.



The idea of using a television camera-equipped satellite to photograph the earth's cloud cover originated with the military in the middle 1950s. No one then seemed to be in much of a hurry, but when Sputnik I was launched in October, 1957, the timetable was changed. The program itself was first assigned to the U.S. Army Signal Corps, then eventually in 1959 to the newly organized National Aeronautics and Space Administration.

Enter RCA and 200 budding space scientists and technicians, a new Astro-Electronics Division at Princeton, N.J., and a prime contract from the U.S. Army Signal Corps, later transferred to NASA, to undertake the nation's most ambitious space project, the construction of a weather satellite. It was a tall order. RCA's new space team was told to assemble an array of miniature TV cameras (which first had to be designed and built), videotape recorders, transmitters, solar cells and rechargeable batteries, and an omnipotent set of controls.

"We had to put 40,000 components into a 42-inch by 19-inch drum," recalls Abraham Schnapf, then the assistant program manager for TIROS, "and make it all strong enough to take a rocket launch and reliable enough to perform once it got into orbit."

Since nothing like TIROS had ever been built before, it meant starting from scratch on almost every piece of equipment on board. And it meant working without regard for the clock.

"We knew we were doing something important for the company, but also something that had great national urgency behind it," Schnapf says now. "There was an excitement about it all and, when you're working in that environment, you don't count the hours or the days. Overtime was when you went home on a different day than when you came to work."

If TIROS I became a genuine labor of love, no one on the team thought that love would ever be enough to make the satellite work. They knew that the key to the eventual success of the mission

Dr. Frank Field, WNBC-TV, New York weatherman, uses a satellite picture to describe East Coast weather patterns.



Is there rain in Spain? A complete view of the world's weather is pieced together from multiple photos taken in orbit by weather satellites.

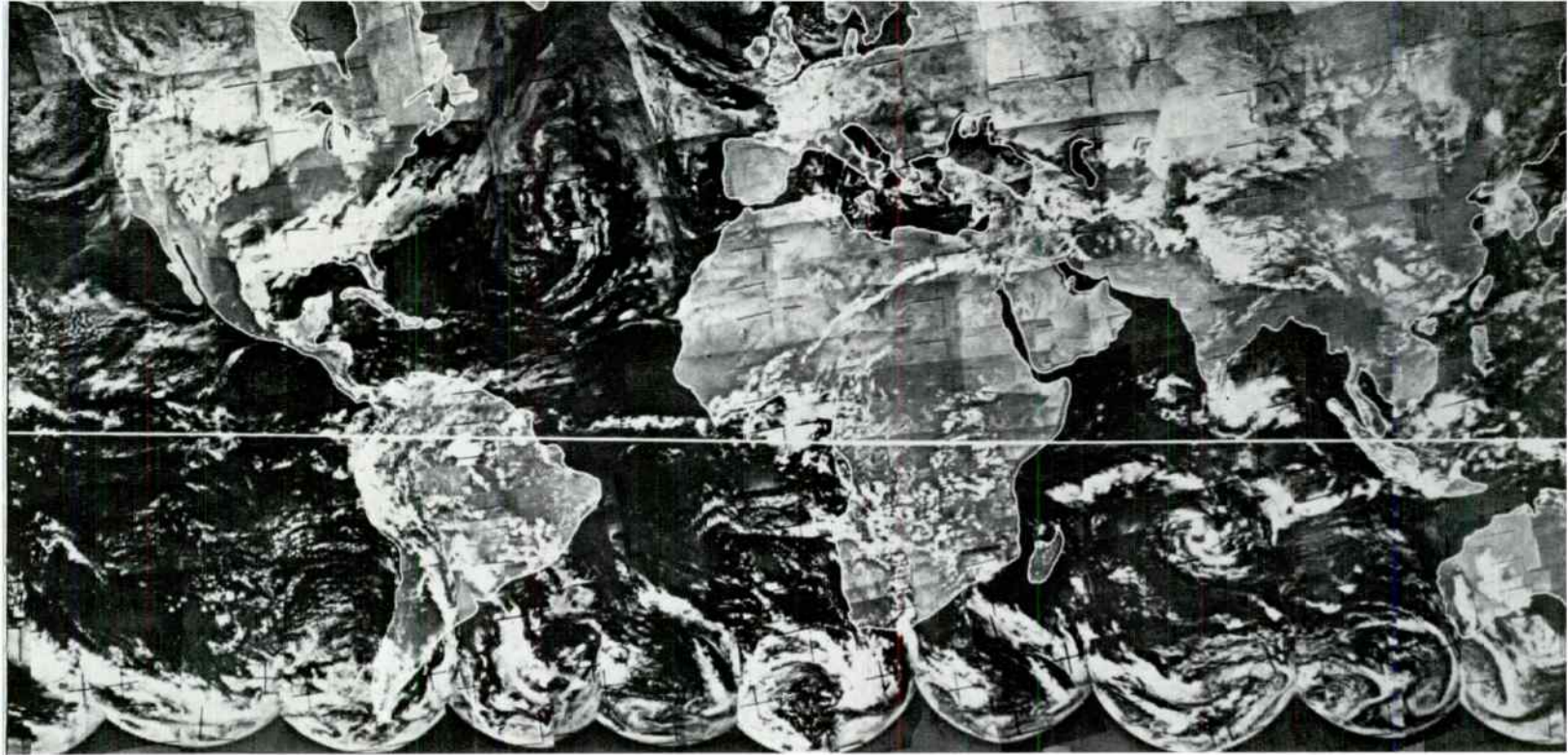
was the painstaking testing procedures that accompanied production. Components were tested as they were built, tested as they were assembled into subsystems, and then after assembly, tested again inside tanks that simulated the temperature and vacuum of the expected space environment.

A pair of TIROS satellites—the one that would fly and a backup model—was finished on schedule in early March of 1960. Although the RCA team had given pinpoint attention to the big trip that TIROS would make, there was a little trip that had to be made first: from New Jersey to Cape Canaveral (now Cape Kennedy), Fla.

Says Schnapf: "We rented a truck, and then we got a little nervous about that arrangement. So we got one of our best technicians, Frank Fels, to drive his own car behind the truck and kind of babysit the drive to Canaveral."

Once in Florida, an RCA launch team helped NASA crews prepare TIROS for liftoff. The bird, by now a real personality to its RCA creators, was tested again and certified for its mission. In a mood of great confidence, technicians fitted TIROS to its Thor-Able rocket launcher, and the mission began to close hard on countdown.

Nothing mattered now but the essentials. "Get us one useful TV picture," a



60 Billion Miles in Space

When the astronaut crew finally settled into Skylab's Orbital Workshop (OWS) in May, they found that, despite the craft's unexpected ordeal, the RCA space systems on board were fully operative. A VHF ranging system assured the astronauts of safe, accurate docking of their Command Service Module (CSM) with OWS; a videotape recorder stored and transmitted astronaut activity during part of the mission; and narrow-band telemetry recorders and transmitters recorded and sent voice and biomedical data produced by the Skylab crews. Two other time-tested RCA systems, the Saturn rocket countdown computer and a satellite radar tracking network, supported the mission from the ground.

This latest—and, to many, most significant—space venture reaffirmed a simple, compelling fact: almost nothing is shot into space these days without a major contribution from RCA.

RCA-built spacecraft, in fact, have logged more than 47 billion miles in space. And when the spacecraft on which RCA has major subsystems are added, the total approaches 60 billion miles—a distance that would have

carried a spacecraft, flying straight out, beyond the planet Jupiter.

The RCA equipment that has rolled up this score ranges from television cameras and receiving equipment to radios, power supply packages, data storage and in-flight transmission systems, all supported by sophisticated RCA ground station equipment that tracks satellites and collects and processes data gathered in space. Some



of the Apollo missions used 14 major RCA systems.

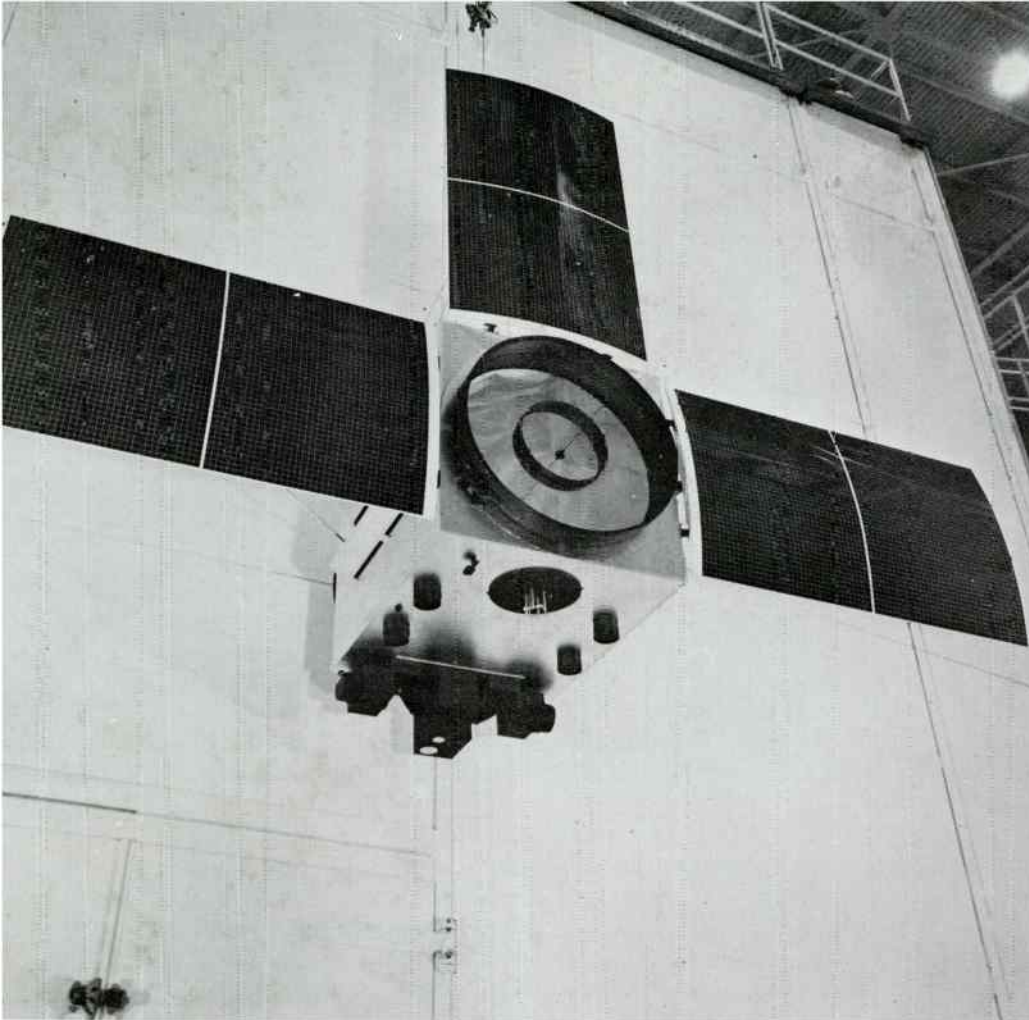
RCA's continuing leadership in space communications is built on the company's strength in its traditional commercial radio and television endeavors. But comparing those businesses to the technology of space communications today is like comparing old-fashioned checkers to three-dimensional chess; to perform in space, equipment has been made smaller,

more powerful, and more reliable than any earthbound products. For example, color pictures televised from the surface of the moon reached earth over an RCA Lunar Communications Relay Unit no larger than a standard briefcase. And some American weather satellites carry RCA vidicon cameras with lenses a mere half-inch in diameter.

As for the future, RCA will maintain its vital role in space. Skylab will be followed by the Viking program, the mission in which the U.S. plans to land investigatory equipment on Mars on July 4, 1976—the 200th anniversary of American independence. RCA is building the landing communications system for the mission, but this time the job has a new wrinkle: The components have to be sterilized at high temperatures to make sure that no contaminants from earth are carried into the Martian environment. (See inside back cover.)

But for all the enormous space achievements so far, and the promise of more to come, men like Abe Schnapf, who now manages all the RCA Space Center's NASA programs, rarely tarry over the past.

"We are always at a new beginning," he says. "What we have found out so far is how much more we have to discover."



A scale model of TIROS-M, the weather-tracking satellite.

NASA official told Schnapf, "and you're in business." Replied Schnapf: "We want more than a TV picture. If that rocket gets it up there, we want TIROS to make history."

That it did. At 6:40 A.M. on April 1, 1960, the Thor booster belched flame, and TIROS 1 went into orbit 450 miles above the earth. Its "one picture" came back on its first orbit—a view of the eastern half of the United States—and it remained in operation for 88 more days and sent back a total of 22,952 additional photographs.

"It was a strange feeling to see it go up," says Schnapf. "Two hundred of us worked on that satellite for 18 months; it was a part of every one of us, and it just disappeared in two minutes. I guess we all should have hollered and cheered, but I felt like I had lost something."

But the pang passed, and Schnapf, for one, never looked back. America had its first functioning meteorological satellite, science had its first firm foothold in space for observing the world's weather, and RCA had the makings of the longest-lived, most nearly flawless satellite program of the space age.

Twenty-one other TIROS family sat-

ellites followed the first one into space, each successively embodying advances in equipment capability. Controls became more precise; the areas of the earth that could be photographed became larger and larger, and the photographs themselves sharper in detail. Infrared instruments were finally added on the 20th flight, and since then TIROS has been able to photograph a planet's cloud cover by night as well as by day. The only TIROS mission failure—a satellite crashed in the Arctic wilderness before reaching orbit—was due to launch vehicle difficulties.

The satellite now in operation—NOAA-2, named after its sponsoring organization, the National Oceanic and Atmospheric Administration—can take soundings of the temperatures in the earth's atmosphere in addition to making cloud cover photographs. Its signals are received by more than 550 meteorological stations in 80 countries around the world, and its findings, by now routine, are indispensable to the world's airlines and ship operators. NOAA-2's scanning radiometers produce enough pictures to give meteorologists a photographic record of weather systems over

the entire world twice a day. Since 1966, no major storm has gone undetected and untracked by RCA-designed weather satellites and, in cities around the world—and in television studios as well—weathermen use the photos to help make their forecasts.

To RCA, TIROS 1 became not only the precursor of a family of weather satellites but a bellwether of the company's entire space effort. Beyond that, TIROS has had stimulating effects on many company technologies, among them, solid-state integrated circuitry, advanced TV tubes, information processing systems, and advanced space systems.

As to the future of the TIROS program, the sky's the limit. In July of this year, RCA's TIROS-E is slated to be launched by NASA at Cape Kennedy and will, in orbit, become NOAA-3. Its temperature-sounding capability will be available to earth stations around the world, not just the U.S., as has been the case with NOAA-2. As the NOAA-3 designation implies, the new satellite will be up one from NOAA-2.

"That's what we're doing here," says Schnapf, "and we expect to go right on doing it better all the time."



TIROS Program Manager Schnapf.

The Moonlighting Mayors of RCA

**After office hours,
these men begin their
work at City Hall**

For most people, the close of work is a time to clean off the bench and head for dinner and an evening with TV. For a handful of RCA men, it is generally something else—a hasty bite, papers jammed into briefcases, and an evening of wrestling with the cost of fire engines and the handling of Mrs. O'Grady's garbage.

These exceptions are among the company's most distinguished moonlighters. By day they are engineers, administrators, and financial managers. Evenings, weekends, and at other odd moments, each of them answers to the title of Mayor. Five men now play this dual role; another was managing it until recently.

The salaries of the six as mayors range from zero in a township with a population fewer than 1,000 to \$3,500 in a small city. Whatever the income—or lack of it—it's hardly money that attracts them to the cold suppers and lost weekends. Without exception, they are drawn to public office by the challenge and the opportunity of making some contribution to their communities. And they thrive on the double workload.

Here is what it's like to be an RCA man by day and a mayor the rest of the time.

Robert P. Murkshe, Manager, TELTA Project, Government Services, RCA Service Company. Mayor (1963–1971) of Cocoa Beach, Fla.

Cocoa Beach: Before the missiles—mostly sandspit. A space-age community. Cape Kennedy to the north;

Patrick Air Force Base to the south. Population in 1950, 256. In 1972, over 10,000 and still growing.

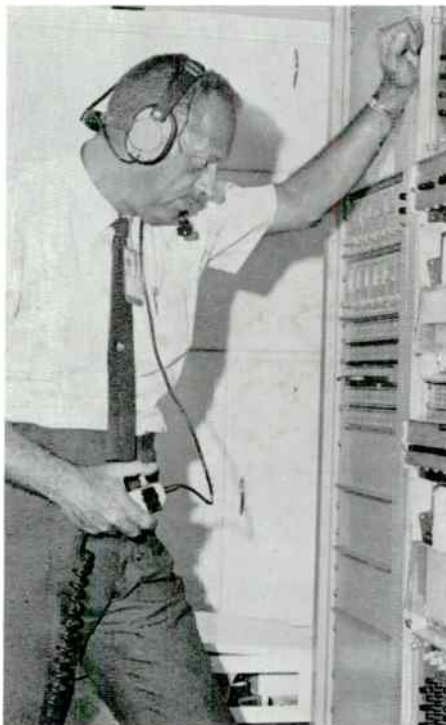
Mayor Murkshe: "Cocoa Beach had every growth problem—traffic, schools, sewage, proper land use. The inhabitants are well paid and well educated, and want good answers.

"I ran for Mayor because I figured I could apply aerospace systems management techniques to municipal government.

"I was Mayor three terms—nine years. It involved 30 to 40 hours a week, with seldom a weekend home. Apart from the regular duties, there were the extracurricular chores—banquets, surfing contests, riding horses in parades.

"There were important accomplishments. One of the best was a solid-waste treatment plant which converted the waste to commercial fertilizer. It won the state award for the best of its kind.

"I think you must have a wife that



Bob Murkshe: At work as an RCA technical manager and as Mayor, Cocoa Beach, Fla., introducing Gen. Jimmie Doolittle.

can go along. My wife is a good mixer, but I can't say she enjoys it that much."

Max L. Horn, Superintendent, Entertainment Tube Division, Marion. Mayor of Sweetser, Ind.

Sweetser: In the heart of the Indiana farm country—wheat, corn, oats, soya beans. Also one grain elevator and a paper box manufacturer. Population at latest count, 1,134—a rise of 450 in 10 years.

Mayor Horn: "A fellow said they needed some new blood on the Town Board and asked if I would run. Actually, it was pretty much a popularity contest between myself and the other fellow; we were good friends.

"This is my second term as President of the Board. The town business is mostly sanitation, planning for additional sewage facilities, and occasionally the police.

"It's been a matter of using what I learned at RCA—looking out for the safety of the team, working with people on a daily basis, preparing the budget. It's tough sometimes to handle both jobs, and the company's business comes first.

"My three kids think it's tremendous. Of course, I don't have much time for the family. I see them a few hours an evening and I manage to find some free time on Sundays. My wife feels good about it—and since it's a small place, nobody calls me 'Mayor.' They generally call me by my first name and a few adjectives."



John T. Holden, Manager, Technical Services Administration, RCA Service Company. Mayor of Cherry Hill, N. J.

Cherry Hill: A high-speed transit bedroom of Philadelphia and Camden. Route 38 knifes through southern New Jersey's high-rise terrace apartments, shopping malls, and rapidly diminishing countryside. Population 30,000 ten years ago; now 68,000 and growing. Home of the Garden State Race Track. Headquarters of RCA Service Company.

Mayor Holden: "When I came here nine years ago, I didn't like the way the town was being developed and got into politics by joining the party of the 'outs.'

"For three months I campaigned every evening and weekend as part of a four-member team running for Town Council. We won.

"Today, both jobs demand 80 to 90 hours a week. There isn't a night I'm not attending a meeting. Sundays, I go to early church services with the family, and later I'm back at Town Hall or preparing for next week's meetings. However, I insist on breakfast with the kids on weekends, and I try to keep some part of Sunday for the family.

"Experience in finance and administration at RCA has helped me greatly as Mayor. But it's still an odd feeling to sign a multimillion-dollar check. I've

also gotten into some interesting activities. "For example, when I became Mayor, I had no idea I'd be performing marriages, but I've done 126, including one where the couple wrote their own ceremony. They recited poetry, and I married them in the park.

"Run again? My Irish mother would say: 'Don't bid the divil good mornin' until you meet him.'"

Edward M. Bien, Administrator, Financial Planning and Controls, Entertainment Tube Division, Harrison. Mayor of New Providence, N. J.

New Providence: Settled in the 1700s. Once largely farms and greenhouses, today primarily a bedroom community that jumped in population in 20 years from 3,000 to 14,000. High percentage of residents are either professional or management personnel.

Mayor Bien: "My start in politics was gradual. First came election to the Board of Education, then to the New Providence Borough Council. In 1966 I ran for my first term as Mayor in a hotly contested race characterized by personal debates. The first election was close. Since then, I've been re-elected twice by substantial margins.

"I spend approximately 60 hours a week between RCA and Borough Hall. I devote substantial time on weekends preparing for the coming week's municipal affairs. This doesn't take into account the time I spend with individual citizens and their problems, usually on Friday nights.

Sweetser, Ind., mayor Max Horn reviews a plant problem with lead foreman Bob Barmore (right).



Some mayoral duties are standard. John Holden (opposite page) and Edward Bien (second from right) prepare to snip ceremonial ribbons.

"I manage to separate my RCA business from my community work. That way, I concentrate my energies where—and when—they do the most good."

Anthony J. Bianculli, Manager, Engineering Standards, Solid State Division, Somerville. Mayor of Rocky Hill, N.J.

Rocky Hill: Settled in 1703 and still essentially rural. Four miles north of Princeton. George Washington wrote his farewell address to the troops here. A population mix of blue collar and professional types. Total: 917.

Mayor Bianculli: "It's hard to stay out of politics in a town this small. I

Anthony Bianculli: "It's hard to stay out of politics when you're in a small town."



attended Council meetings and felt I would like the chance to influence policies in the town. I didn't have a hectic campaign, and the conclusion was almost inevitable.

"Generally, I spend two full nights a week on the job plus innumerable phone calls. There's an enormous amount of reading; I guess I'm on every list in the state.

"One of the main problems is to maintain the character of the town and keep the services within a budget we can afford. For example, a new fire engine is a big thing to us.

"As Mayor, I see people concerned with their parochial interests. I want

Herbert Anderson: "I enjoyed it. There were great satisfactions."



them to say how issues will affect them, so I can get at the facts.

"I have an analytical mind, but politics requires more of a gut feeling. Things don't always turn out the way the facts indicate they should. An ordinance on dog leashing, for example, can turn out to be dynamite.

"You have to know how to laugh. People will call you at midnight to complain, 'You didn't pick up my garbage. When are you going to do it?'"

Herbert H. Anderson, Jr., Leader, Design and Development Engineering, Missile and Surface Radar Division, Moorestown, N.J. Mayor (1972) of Mt. Laurel, N.J.

Mt. Laurel: In the old days, a resort for Philadelphians escaping the heat. In transition from rural to suburban. Apple, corn, horse, and pig farms; also a modern subdivision around the golf course and two industrial parks. In the talk stage—a multimillion-dollar expo project, including a convention building, coliseum, theater, pools, tennis courts, and so on. Population: 13,000, nearly tripled since 1960.

Mayor Anderson: "I went in because of what was happening. Development was too fast for the good of the community. I spoke my mind at township meetings. One of the parties kept asking me to run.

"After a grueling campaign—on a reform platform—we won, and I became Mayor in 1972.

"I found myself giving 25 to 30 hours a week to the job. There were always three or four meetings plus projects and complaint areas to visit on weekends. At the same time, I was also working on the Aegis project at the office. I enjoyed it, but by the end of the year I was getting pretty tired.

"There were great frustrations, including trying to hold a stable tax rate in an inflationary economy and controlling traffic. But there were also great satisfactions. We inherited a \$134,000 deficit, but we closed the gap within two years, and by the end of my term we had over \$1.3 million invested and floated a \$700,000 bond issue."

Where the Company Goes From Here



What does the future hold for RCA? And what are the company's plans for making the most of it? To these and related questions, here are some answers from Chairman Robert W. Sarnoff:

Q. What is RCA's greatest strength for the future?

A. Our electronic know-how. RCA's competence in electronics has made us a world leader in the field. We have a history of technological innovation. We've pioneered and established whole new industries based on electronics. Today, electronics accounts for approximately 75 per cent of our total volume and profit. It's a dynamic business, and it will be even more so in the future.

Q. Will electronics really grow as fast in the 1970s as it has in the past?

A. I think so. This industry functions like a breeder nuclear reactor. It creates more fuel than it consumes. Our technology turns out new products, services, and markets faster than our older businesses mature.

The domestic market for electronic goods and services in 1972 was approximately \$33 billion. We expect it to exceed \$44 billion by 1975, and to reach nearly \$63 billion by 1980.

Q. Can we expect to create whole new industries—as we did radio in the 1920s and 30s, black-and-white television in the 30s and 40s, and color TV in the 50s and 60s?

A. No, I don't see that. There are no such gaps waiting to be filled now. Instead, we expect to advance by steps. We will generate new uses of electronics. We will replace outmoded technologies. We will create "sub-industries" that alter or build upon existing systems and services. The consumer will see electronics extend into virtually every aspect of his life at home and at work. There will be scores of new electronic businesses. There will also be new products and applications for maturing businesses.

Q. How are we positioned to take advantage of these opportunities?

A. I'd say this is a situation made to order for us. Major innovations are in the making in our consumer operations, our solid-state business, our global and domestic communications services, and our government and commercial systems.

Television in particular is ripe for the application of new technology. There will be supplemental equipment to work with the TV set; a basic redesign of the home receiver; and new information systems in which the TV set is a central element. We're moving ahead in all these directions at our laboratories and product divisions.

Q. How soon will we see these new products?

A. We expect to begin pilot marketing of our first supplemental equipment about the end of this year. It's the SelectaVision MagTape system, which can record and play back videotape cassettes on a home TV receiver. I think our MagTape system is by far the best and least expensive home video recorder yet developed. It should appeal to businesses and schools as well as consumers.

Q. What other new consumer electronics products is RCA working on?

A. There are several additions to the SelectaVision line now on the way. One is a low-cost TV camera for the consumer to make his own pictures. In the laboratories, we have a wholly new kind of camera—a completely solid-state unit no larger than a cigarette package. It will record color as well as black-and-white pictures.

We're also working on the next step in supplemental equipment for the home TV set: the SelectaVision Video Disc. This will be a simple and relatively inexpensive unit. It will play prerecorded color TV programs from television's equivalent of the phonograph record—a grooved disc that is placed on a turntable and rotated under a pickup arm. It should be available to consumers in 1975.

Q. What else is on the horizon for the consumer?

A. One prospect is an entirely new approach to TV design—a receiver that consists simply of a flat, luminescent display screen that could go on a wall. Our researchers and others have been working in this area for nearly 30 years. Several new and promising technologies are bringing it considerably nearer. This has a high priority with us.

Q. Where is all this consumer electronics technology leading?

A. Many of the electronic products now on the way will form elements of a comprehensive home information system. It should eventually link households through a great variety of communications channels. Besides the television set, it would include a TV pickup unit, computer terminal equipment, credit-card readers, and an electronic printer. It would provide two-way sight, sound, and data communications for anything from individual instruction to remote shopping, banking, paying bills, or even voting. We have a depth of competence in all the principal technologies that will go into these systems.

Q. When will all this happen?

A. Home information systems should develop by stages through the 1970s. They will probably start with the introduction of supplemental TV equipment, such as SelectaVision, and grow in tandem with the growth of two-way service for homes.

Q. Aside from consumer products, what do you expect RCA's role to be in the electronics field?

A. Technological progress is opening wholly new markets for RCA and enlarging those in which we are already active.

For example, one of our most promising new activities is the design and production of solid-state integrated circuits for important new users of electronics, such as the automobile and watchmaking industries.

Take the car. By 1980, manufacturers may be spending as much on solid-state electronic systems as on the engine in every car they make. New integrated circuits can be used to sense and process electronically the information needed to control steering, braking, and collision avoidance.

Q. What's ahead for RCA's oldest business—global communications?

A. Growth, and plenty of it. The international message business is expected to expand at a compound annual rate of 16 per cent through the rest of this decade. We're the nation's leading international message carrier, and the reason is clear: we've maintained a vigorous research and engineering program and translated the results into practical service. Thus the modernization of the Alaskan domestic telecommunications system. Thus our construction of communications satellite earth stations for China. Thus our development of Video-voice, the first system to display pictures sent over ordinary telephone circuits.

Q. What is RCA's interest in satellite communications?

A. We're moving in two areas. First, Glöbcom has arranged for channel capacity in the newly launched Canadian domestic satellite system. These channels will link four RCA earth stations to serve the East and West coasts and Alaska.

Second, we're requesting immediate authority from the U.S. government to establish our own system of satellites and earth stations linking all 50 states. It's targeted to start operations in 1975. It would meet the customer requirements of RCA Glöbcom and RCA Alascom from 1976 on. It would also have sufficient capacity to offer service to other users.

Q. Does RCA have any other prospects in the electronics business?

A. What I've described is only the tip of the iceberg. Our scientists and engineers are developing innovations that will

affect practically all our products and services.

One example is the planning and installation of automatic systems to handle communications, security, environmental control, and other functions in large modern buildings. Another is development of a systems approach to one of the largest and most persistent challenges yet faced by engineers—the operations of the U.S. Postal Service.

Q. What about the future of RCA's non-electronic businesses?

A. We think their prospects are excellent. Apart from its traditional activities, RCA is now engaged, of course, in publishing, vehicle renting, frozen prepared foods, carpets and home furnishings, and commercial real estate. As a group, these newer subsidiaries continue to grow substantially and consistently in both sales and earnings. Most of them are in industries that have shown above-average growth rates, and we expect that pattern to continue.

These additions have given us new sinews in the consumer and service markets. And, since different businesses are affected at different times by market variation and fluctuations in the economy, they also contribute to greater stability in RCA's total performance. We think our non-electronic businesses will continue to make a large and growing contribution to RCA's volume and profit in the future—and to our ability to venture into new ground.

Q. How would you sum up RCA's posture toward the years ahead?

A. Let me emphasize three points that bear specifically on that. First, RCA now possesses the breadth and flexibility essential to success in a dynamic and expanding world market.

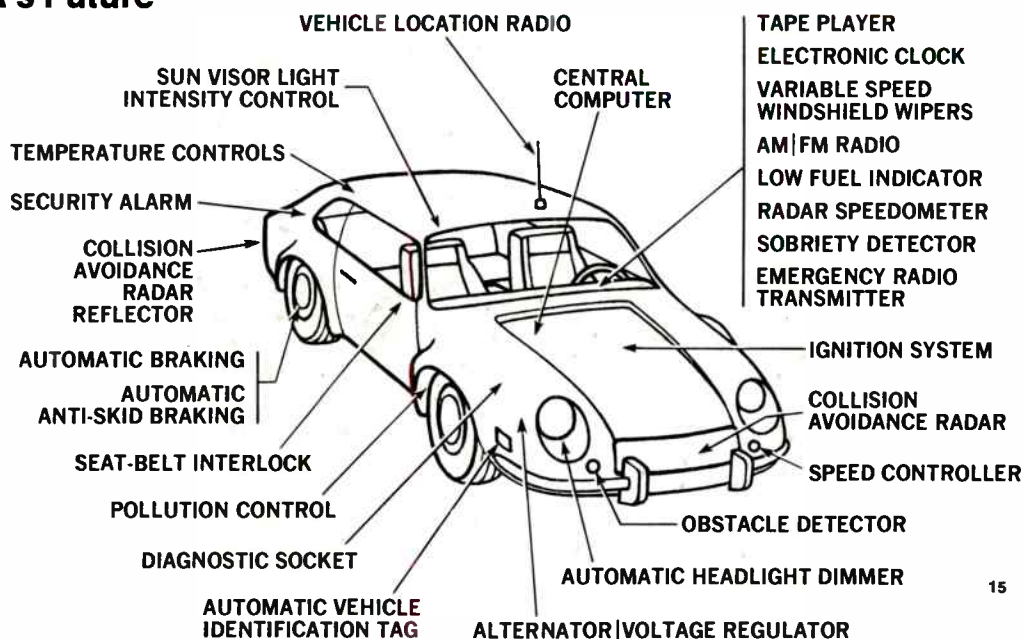
Second, we have strengthened the high technological skills that have made RCA a leader in the past. Also, they have been brought closely into line with our business objectives.

Third, we foresee rapid development of large new markets in precisely those areas of business and technology where RCA excels.

In short, RCA is in the right place at the right time and in the right shape to capitalize on the future. I have great confidence that the company will be able to maintain a strong and stable rate of long-term sales and profit growth.

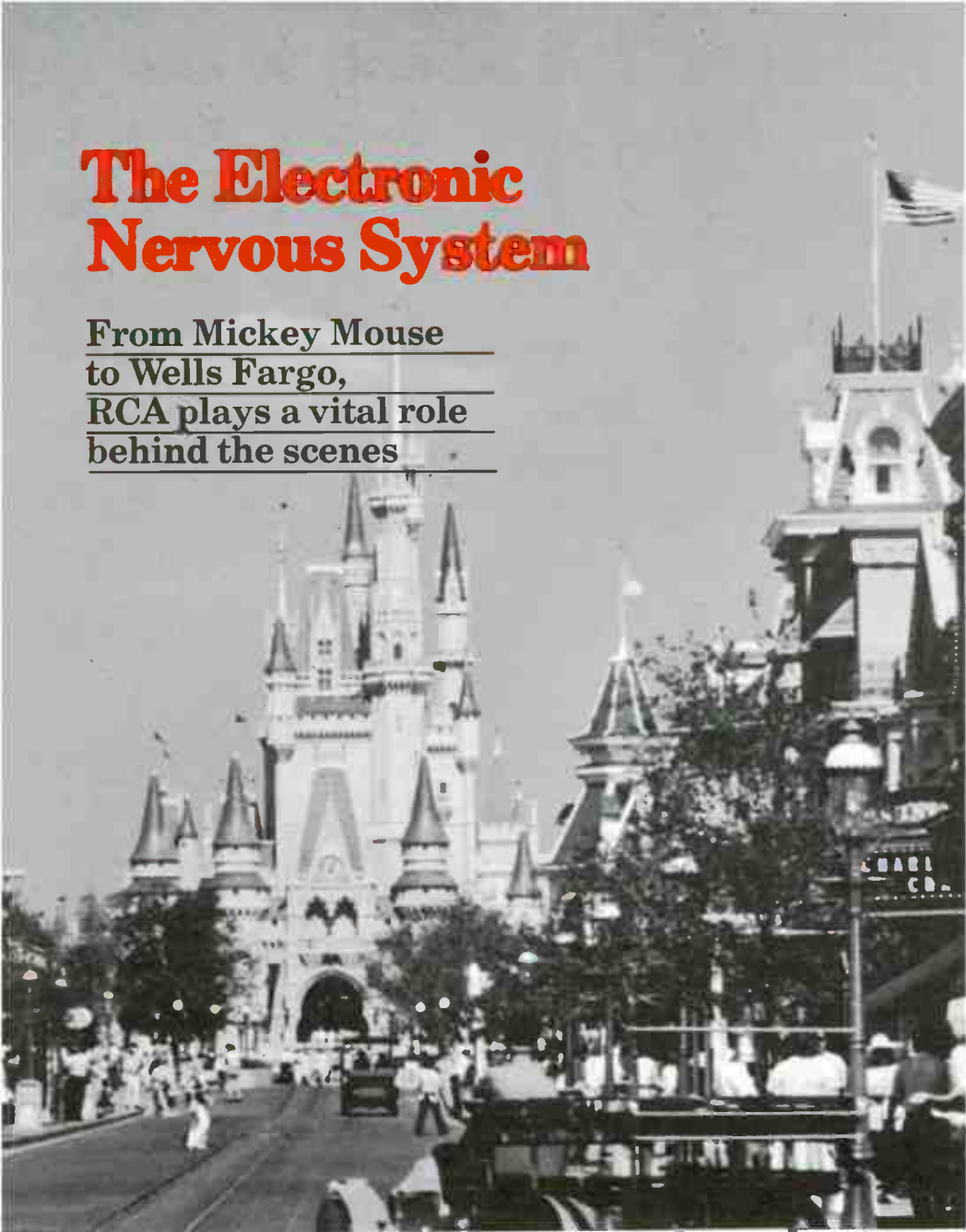
A Look At One Area Of RCA's Future

By 1980, auto manufacturers will spend about \$3 billion on solid-state electronic systems—or as much as goes into today's engines. As this diagram shows, a variety of automotive functions, many of them vital, will be performed electronically. One result will be a safer car, made possible by small radars to warn of sudden obstacles. Another advantage will be fast, accurate analysis of car performance through a central processing unit. Electronically assisted driving and maintenance will make future automobiles models of safety, reliability, and efficiency.



The Electronic Nervous System

From Mickey Mouse
to Wells Fargo,
RCA plays a vital role
behind the scenes



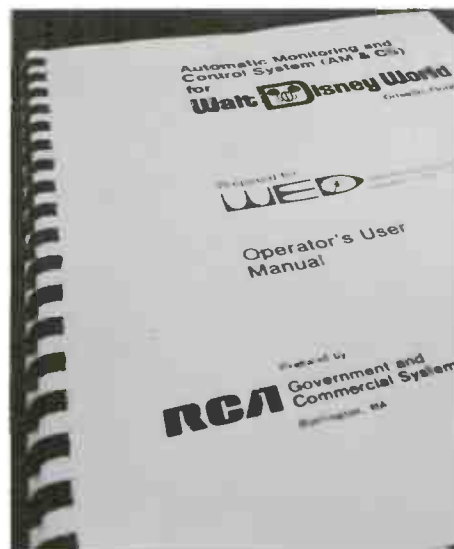
Strange as it may seem, Walt Disney World in Orlando, Fla., the Wells Fargo Bank building in San Francisco, and an Air Force jet's engines have a lot in common. Hidden away, where tourists, tellers, and pilots don't see them, are RCA-designed electronic "nervous systems" that combine with computers to sense, test, and evaluate the condition and performance of the buildings and engines. Called automatic test systems, these devices make the equipment in which they're used safer, more reliable, and more economical.

Although many professionals in this rapidly growing field recognize RCA as a leader, few people realize that the company pioneered automatic test equipment as long ago as the early 1950s. As

a major supplier of radios to the Army, RCA, along with other radio suppliers, learned that more than 20 per cent of all equipment didn't work satisfactorily when it arrived in the field.

RCA rallied its technological skills to solve this costly problem a generation ago. And while this automatic test equipment business today remains an important source of jobs and profits at RCA, it has also given rise to several major civilian applications.

Basically, the problem of testing electronic equipment was solved through the happy marriage of the computer and a number of sensors and testing instruments, including ohmmeters, voltmeters, and signal generators. The sensors detect specific functions and relay the



results to the testing instruments. These instruments then feed their readings into a computer programmed to distinguish between normal and abnormal performance. When a defective piece of equipment is submitted to a test, the computer immediately identifies and locates the problem.

Arthur Orenberg, Manager, Systems Projects, Building Management Systems, RCA's Aerospace Systems Division, explains that, "in the old days, a serviceman had to pull the back off an Army radio and use his array of probes and testers to diagnose a problem. Then we developed what came to be known as DIMATE (Depot-Installed Maintenance Automatic Test Equipment), which enabled the serviceman to check out 1,000

Automatic Test's Ralph Shirak (left) runs a check on the Disney World computer memory. Manual (below) tells Disney people how to operate the system.

field radios a day in an Army depot and find the malfunctioning ones. At first, the factories, including ours, didn't believe we were finding so many defective sets. But, thanks to our new test methods, we were able to pinpoint the trouble areas. Quality control at the factory was improved, and in a single year, we were able to reduce the rejection rate from 20 per cent to 2 per cent."

An electrical engineer who taught for two years at Massachusetts Institute of Technology, Orenberg puffs furiously at cigars while illustrating his thoughts on the blackboard of his Burlington, Mass., office. "From such purely military applications as DIMATE and LCSS (Land-Combat Support Systems) it was a natural step for us to apply some forms of automatic testing to RCA's own manufacturing process," he says. (LCSS provides maintenance support in the field for several Army missile systems. Its computerized testing devices may be transported by cargo planes, standard Army trucks, or helicopters.) "The results were the Automatic Production Test-Equipment System for checking all RCA color tubes manufactured at Lancaster, Pa., and Marion, Ind., and the Computer-Controlled Operating System for testing FM-AM tuners."

Ralph Shirak, Manager, Program Operations, for the Automatic Test System Program Management Office, puts it another way: "We had to show the potential customers for our systems that we believed in them strongly enough to use them ourselves."

Shirak, who received his degree in electrical engineering from Drexel Institute of Technology in Philadelphia and who directed the installation of the first DIMATE system for the Army in 1955, points out one benefit of RCA's years of experience in automatic test systems. "We've gotten to the point where the basic design of most of the various systems we produce is fairly constant. About 75 per cent of the electronics are common to all the test systems, and only 25 per cent are specif-

ically tailored to the individual items to be tested."

James A. Murnane, Manager, Automated Test Systems Sales, makes a similar point. He explains that the new EQUATE system (Electronic Quality Assurance Test Equipment) "will check out any electronic 'black box,' in a depot, a factory, or out in the field."

And William W. Barone, one of the members of his sales team, notes that the ATSJEA system (Automated Test System, Jet Engine Accessories) will work just as well for any airliner as it will for any Air Force jet.

The fact that the same automatic test systems that work for the military can work in the civilian world is also seen in Disney World. Shirak relates that, "RCA and Walt Disney Productions

have long ties, going back to when we were in the business of providing sound equipment for movie theaters. So it was natural for them to come to us when they were planning the electronic monitoring for Walt Disney World."

Orenberg, who was RCA's man in the field on the Disney job, explains that Disney World uses RCA's Automatic Monitoring and Control System to monitor and control all the utilities and facilities involved in fire prevention and health and safety services. "The RCA system also monitors the equipment at the central energy plant, two resort hotels, the entrance complex, golf course and club house, and the waste disposal plant. It's a huge job, but it's working just fine."

While Orenberg was in Florida, at

An entire building management system can be monitored by one man at his console.



INTERNAL COMMUNICATIONS



FIRE-SMOKE DETECTION



HEATING & AIR CONDITIONING



BUILDING MANAGEMENT



INTRUSION ALARMS-SURVEILLANCE



work at the Disney site, Shirak was deeply involved in still another application of the same technology, which, although currently applied by the military, has great civilian potential.

"Two years ago," he recalls, "we began to work for the Army Tank and Automotive Command in Detroit on a system to automate vehicle testing. The result is that today we have equipped Army jeeps and trucks with diagnostic connectors and special monitors and sensors that give us 'electronic windows' to test and evaluate each vehicle's engine, brakes, fuel and electrical systems, cooling system, and ignition. Our system was first installed on a vehicle in 1971, and it predates and is more comprehensive than the much-adver-



Vehicle readiness unit cuts time Army has to spend diagnosing vehicle problems.



Missile components are tested automatically in the ATE's Land-Combat Support System.

tised Volkswagen system you see described on television these days.

"The prospects for our automotive system are vast," according to Shirak. "First, the Army has already determined that every new vehicle now being designed must come equipped with a diagnostic connector — which means there will have to be quite a demand for the test equipment to do the diagnosing. And the civilian potential of this system is obvious. It's just the sort of thing that should appeal to the auto manufacturers, fleet operators of cars, trucks, and buses, and leasing companies. One major bus company alone has 70 maintenance centers, and some of its buses go 4 million miles, which means a lot

of maintenance along the way."

Shirak explains that the expanding applications of RCA automatic test equipment make him feel like a midwife. "I saw our military test systems applied first to our own consumer products manufacturing, then to Disney World, and now to the auto business. It's fascinating to be in on the birth of an idea and then watch it grow."

But cars, jets, and amusement parks are only some of the offspring. Another one is now at the stage where, having already taken its first steps, it is advancing on its own as a separate entity within RCA.

Called Building Management Systems and directed by Melvin E. Lowe,

this RCA activity assists in the automation of office buildings and other structures. "We're general automation contractors," Lowe explains. "We have the capacity to design and install a total package of automated equipment for a building, including security systems, communications, fire prevention and detection devices, heating, ventilation and air conditioning, lighting, the operation of elevators, and the monitoring of utilities. All these functions are computer-controlled for economy and safety so that, for example, electricity, steam, and gas will be used most efficiently. The same system can also handle a hospital's or hotel's registrations and billing, and other specialized functions are easily added to fit most circumstances."

The Wells Fargo Bank building in San Francisco was the first to be automated by RCA, giving the company a head start in what is expected to become an expanding field.

Lowe, who has an MBA degree as well as a BS in electronic physics from Harvard, has spent most of his career in engineering. He joined RCA in 1968 in Moorestown, N.J., and was transferred to Burlington, Mass., six months later as planning manager.

"I'm relatively new at marketing," he says, "but it's certainly an exciting function, especially in this business. Right now we're concentrating on office buildings, college campuses, hotels, and hospitals, but down the line I can see us using the same skills in sewage-treatment plants, water-resources management, pollution monitoring and controls, and centralized airport-management systems.

"Two or three years ago, architects simply didn't include a computer in their building plans. Now, builders are coming to us. And, as time goes by, some of our building applications will be increasingly exotic. For example, today, there's no way to tell how well an elevator is functioning until it stops running. I'm sure we can improve on that. Also, today's buildings require thousands of feet of expensive electrical wiring. Why not go to a wireless system where possible—a radio transmitter in a thermostat, for example, to signal the heating unit and the air conditioning?

"I'm sure it will happen," says Lowe. "We have a history of making things happen."

RCA SHOWCASE

Liquid Crystals

Liquid crystals — flat, low-power devices that display graphic data electronically — are being prepared for commercial production by a Solid State Division management group located in Somerville, N.J. With projected applications in watches, clocks, calculators, and test and laboratory instruments, liquid crystals consist of two clear glass plates with conductive coatings that are separated by a thin layer of liquid material. They are controlled and operated by solid-state integrated circuits. Patrick L. Farina, an engineering manager in the Solid State Division, will head the Liquid Crystal Products department, reporting to Dr. D. Joseph Donahue, Division Vice President, Integrated Circuits, Solid State Division.



The Shape of 1980

What will the American consumer electronics market be like in 1980? That was the topic of a recent meeting of RCA design engineering, product de-



velopment, and marketing people at the RCA Consumer Electronics Design Center in Indianapolis. Some of the answers given by a panel of consultants and economists:

The population will increase 12.7 per cent to 231 million in 1980, and the prime market for electronic products will grow much more sharply. The 20-24 age category will jump 22.4 per cent, nearly twice as fast as the entire population. A still greater rise (41.7 per cent) will take place in the 25-29 segment, and the 30-34 group will increase 51 per cent.

The trend toward smallness will continue in dwelling units, furniture, and room sizes, and electronics products will be more compact.

Increased use of vacation homes and recreational vehicles indicates a growing demand for even more portability in home electronics products.

Flying Saucer? No, an Antenna

A four-year joint effort by the RCA Laboratories in Princeton and the Parts and Accessories Engineering Operation in Deptford, N.J., has resulted in a min-


iaturized home UHF/VHF television antenna. Called the Mini-State Antenna, the product could soon replace the ungainly twists and stalks of metal that mar the skylines of America's cities and suburbs. Housed in a specially designed "radome" that resembles a flying saucer, the Mini-State is 21 inches in diameter and weighs only six pounds. The antenna can be rotated 360 degrees on a rooftop, in an attic, or even on legs on a closet shelf by a hand-size remote-control unit.

Wayne on Vinyl

There's a new star in the RCA recording firmament, and it's none other than John Wayne, whose first record, "America, Why I Love Her," is enjoying a healthy public reception. Written by John Mitchum, with musical background by Bill Liebert, the LP is a spoken tribute to individuals, from Louis Armstrong to Sandy Koufax to Jack Dempsey to Jonas Salk, and institutions that embody the character of America. The record has risen rapidly on the sales charts and won considerable radio air time.

Science For Its Own Sake—and Ours

RCA Labs—birthplace of new and improved products and services



A few of the old apple trees are still there, and the Gothic spires of Princeton University still quicken pulses as they catch sunlight across the rolling, green Jersey meadowland. Scientists peer just as intently at their oscilloscopes and scrawl just as fiercely on their blackboards as they did 30 years ago when RCA Laboratories was opened. In fact, some of the scientists are the very ones who helped start RCA Laboratories on the way to becoming one of the world's foremost industrial research organizations.

But while the past is ever present, the key word for RCA Laboratories is change—change not only in the research going forward but in the underlying philosophy of research. Dr. William Webster, Vice President in charge of the Labs, explains the change this way:

“The Labs started off on the right foot and always had good rationale for development. But, through the years, some ivory towers—real or imagined—seemed to grow. The impression got around that our research efforts weren’t sufficiently down to earth. The Laboratories today functions in the real world, where technical excellence alone is not enough; it must be well integrated with excellence in marketing, planning, and manufacturing. RCA’s central research organization is trying more than ever to provide the technological base for the development of new and improved RCA products and services.”

RCA President Anthony L. Conrad, emphasizing the value of their role to

Labs scientists, technicians, and engineers recently said, “You and your technical colleagues in the divisions hold the key to our future. . . . Without your input, the bulk of our product and service activities would slow down and eventually cease to move.” Conrad reminded the Labs people that the substance of their research “involves a lot more than the delivery of a demonstration model.” Added Conrad: “It calls for an understanding of the market our research is designed to serve, the needs it is supposed to fulfill, and the factors that will make the results acceptable in cost and performance . . . It has to recognize that creativity can be found in a market study as well as a mathematical model.”

“Helping solve RCA’s problems is our greatest challenge,” says Dr. James Hillier, who as Executive Vice President, Research and Engineering, is the Corporation’s top technical man. He adds, a little tartly, “We all know that now, but some years back, as we were developing in a rapidly changing and uncertain research environment, we were misunderstood by the divisions and, ironically, by our own people. Some of our researchers may have opted too strongly for ‘science for science’s sake.’ Perhaps the influence of Albert Einstein living in Princeton with us was a little too much. Also, when you’re trying to recruit the top 5 per cent of the graduates from the nation’s best engineering and technical schools, you have to offer them pleasant working conditions and a

chance to do meaningful creative work in their scientific fields. The 342 acres of the David Sarnoff Research Center, which houses RCA Laboratories, do provide a pleasant place to work. And the more than 300 members of the Technical Staff—about two out of three of whom have Ph.D. degrees—constitute the type of community that appeals to a new graduate.”

Thus the Labs—built to concentrate RCA’s research in a single spot convenient to major installations at Camden and Harrison and corporate headquarters in New York—appeared to grow into what some called “RCA’s college

Hillier and Webster:



The monthly colloquium of Labs engineers hears RCA President Anthony L. Conrad.

campus," "the ivory tower," and then "Camelot."

That had never been the idea. Back in 1942, when the doors of RCA Laboratories first opened, the emphasis was on the pragmatic work of developing useful electronic products. There was a war on, and the scientists at RCA Laboratories helped to create RCA radar, communications equipment, and infrared night-vision combat equipment that were marvels of World War II technology.

Immediately after the war, RCA Laboratories kept the accent on the practical. Some of the Laboratories scientists, who had worked on RCA black-and-white television before Pearl Harbor, gained more expertise during the war. The image Orthicon, started at Harrison in 1941 and completed at RCA Laboratories, provided military television systems with a pickup device 1,000 times more sensitive than that for the original Iconoscope. For postwar television, the image Orthicon meant vastly improved flexibility of operation in the studio and in the field.

But by then the name of the game was becoming color television, and RCA Laboratories was pressed to produce a color system that would be the



model for the entire industry. RCA Chairman General David Sarnoff, who envisioned color television as a quantum leap for RCA, urgently spurred the Labs' scientists and technicians to develop the first compatible color system. He personally led them in the struggle against time and as a result of the General's vision and tireless urging, the Labs devised the color television system now used in the United States and most widely throughout the world.

The first public demonstration of RCA's all-electronic compatible color system was in 1946. Next was the development by RCA Laboratories, supported by engineering groups from RCA's tube plant, of the three-gun, shadow-mask color tube.

In 1953 came the victory everyone had worked for. The FCC adopted the all-electronic color TV system, basically

as developed by RCA Laboratories, as the nation's standard. This victory was made even sweeter when, in 1955, RCA Laboratories was the winner of an "Emmy" from the National Academy of Television Arts and Sciences for the color television picture tube.

But even before the Emmy, the research philosophy at the Laboratories had begun to change after the war in response to the burgeoning of electronics with its massive diversification of products. To this was added the need to become expert in the greatly broadening scientific foundation of electronics. For example, the transistor's arrival had already led to new products and with them the need to understand solid-state physics.

The Laboratories slowly shifted emphasis to fundamentals. Electronic engineers, once the mainstay of the Lab-

Vigorous Promoters of Innovation



The men who guide the destinies of RCA research bring scientific creativity and proved leadership to their roles as leaders of technological innovation.

Dr. James Hillier, Executive Vice President, Research and Engineering since 1969, rose to prominence for his role in the development of the electron microscope, which he vigorously promoted for research in biology, medicine, chemistry, and other sciences. A winner of the prestigious American Public Health Association's Albert Lasker Award, Dr. Hillier in 1963 was elected president of the Industrial Research Institute, a 200-company organization dedicated to improving industrial research management

techniques. A holder of 40 patents, Dr. Hillier joined RCA in 1940 as a research physicist in Camden. Since then, Dr. Hillier has served as Chief Engineer, RCA Industrial Electronic Products, General Manager of RCA Laboratories, and Vice President.

Dr. William Webster, since 1968 Vice President, Laboratories, is a leading solid-state engineer credited with many contributions to tube and transistor developments. Dr. Webster, who joined RCA Labs in 1946, holds patents in such diverse fields as television, vacuum tubes, circuitry, and semiconductor devices. The problems of being a division executive are not new to Bill Webster. He was Manager of Advanced Development for the RCA Semiconductor and Materials Divisions from 1954 to 1959.

oratories' Technical Staff, joined interdisciplinary teams with theoretical and experimental chemists, physicists, and metallurgists who were schooled in fundamental research.

The Labs' calculated return to helping RCA's manufacturing divisions develop profitable products started in the early 1960s with Drs. Hillier and Webster, both well suited to the task, leading the way.

Reflects Dr. Hillier: "I told our top research people we were in a serious situation relating RCA research to RCA's businesses. I can almost say I locked them up for six months and told them not to come back without some answers.



Alfred C. Schroeder displays the shadow mask he invented at RCA Labs in 1946. It was a major step in the development of color TV.

"They did, and the answer was simple, fundamental, and perhaps best expressed by a famous line from the Pogo comic strip: 'We have met the enemy, and they is us.' Or, more specifically, our people found the problem was with our thinking, our philosophy of research. All along I had hoped they would reach that conclusion."

From that revealing moment on, RCA's central research organization has not been quite the same. The change is not apparent on the surface; basically the Labs still is filled with the best scientists RCA can find, working in the same cluttered laboratories with the same type of highly complex, expensive, and one-of-a-kind equipment.

The Laboratories now has broad contact and involvement with all of RCA. Some examples:

- Every day, specialists from RCA

product divisions, service activities, or corporate headquarters consult with Labs' scientists—a scene rarely seen a few years ago.

- Moreover, Labs' management has assigned individual "contact" men for each division. Usually, the contact is the director of one of the eight research laboratories whose work is closest to that in the division. Even if the problem



Dr. Wilber C. Stewart and an optical memory laser beam developed at Princeton that writes, stores, reads, and erases information.

is far afield from that particular laboratory, the man in the division merely has to call his Labs contact and he will be quickly steered to the specialist he needs, no matter which laboratory the scientist works in.

- The Labs has improved its liaison with Corporate Marketing. Several scientists have been assigned for a few months at a time to work with Marketing personnel at corporate headquarters, so that each organization will have a better idea of the other's problems. Says Dr. Webster of this relationship: "Marketing's function is to determine what products and services the consumer will want five or 10 years from now. Our function is to use our scientific knowledge to provide such products and services.

That means, for example, employing the Labs' basic scientific talents to identify the technical breakthroughs as they come along—inside the company or from somewhere else. "We're maintaining our membership in the pure science club because we have to know what's going on," says Dr. Hillier.

The Laboratories has strengthened its role as a wellspring of topnotch technical talent for RCA. Dr. Webster points out that the recent appointment of Dr. Donald S. McCoy, formerly Director of the Consumer Electronics Research Laboratory in Princeton, as Division Vice President, Advanced Development Engineering for the RCA Consumer Electronics organization in Indianapolis, is the latest transfer of technical talent from the Labs to another part of RCA. Between 35 and 40 Labs alumni now serve in significant roles at RCA product divisions.

The hard work of the Labs is in technical innovation, and some of the best results are the least publicized. For example, a team of Labs materials processing specialists, including chemists, physicists, and metallurgists, devised a new plating solution for TV set circuit boards that were causing reliability problems for Consumer Electronics.

Other accomplishments and developments include:

- *COS/MOS (complementary symmetry metal oxide semiconductor) integrated circuits.* Several years of creative research at RCA Laboratories and the strengthening of communications between the Laboratories and the Solid State Division are major factors in RCA's strength in this field.

- *Silicon targets (light receptors) for TV camera tubes and silicon storage tubes.* The latter, developed with the Electronic Components Division, led directly to the development of Globcom's Videovoice system, and the silicon targets led to the development of the silicon intensifier tube that provided such outstanding color TV pictures of last year's Apollo moon landings.

- *The LOC large optical cavity semiconductor laser.* Although the market for such a device is limited to military purposes at present, RCA has managed to obtain the major share of it.

- *A method for refurbishing a production tool that increased its useful life*

tenfold. The tool, used to attach wire leads to integrated circuits, now produces a higher yield of acceptable circuits and has helped minimize downtime on the assembly line.

• *Precise controls in the chemical fabrication of silicon transistors.* This made possible a substantial production increase. Labs scientists also helped in major reductions in warranty costs for replacement of TV tubes and TV tape recorder heads through the development of new processes that extend the lifetimes of these products.

"Everyone's pleased with the solutions we provided them yesterday," says Dr. Webster, "but the real question the product divisions ask the Laboratories is 'What are you doing for us tomorrow?'"

And the Laboratories has plenty of answers. Efforts are under way in auto safety, gas and semiconductor lasers, cable television, miniaturized solid-state TV cameras, the use of holography for computer memories and other types of data storage and displays, and various new and improved solid-state devices and integrated circuits.

However, the largest single project for tomorrow at the Laboratories is the Video Disc.

Under development by RCA Laboratories scientists working with Consumer Electronics and the RCA Record Division, Video Disc represents an ingenious combination of the expertise RCA has built up through the years in television circuitry, light and electron beam optics, sound reproduction, materials processing, and the pressing of records.

It will take the form of a simple and relatively inexpensive playback unit that will play prerecorded color TV programs from a grooved disc rotated on a turntable under a pickup arm.

Along with all this work on the "products of tomorrow," Dr. Webster points out, "the Labs is continuing to emphasize fundamental research in materials and processing and in ways to apply achievements in these areas to a broad range of RCA products."

All this is just what Drs. Hillier and Webster have been after: a new focus by RCA Laboratories on its RCA challenge—to help provide new and improved products and services so that RCA can continue its profitable and dynamic growth.

290,000 Owners

How RCA Shareholder Records keeps track of who buys, sells, and owns over 72 million shares



Charles Carmelich and the specimens of current and historical RCA stock certificates that dominate the wall behind his desk.

When an investor buys RCA stock, he wants all the dividend ownership rights and information he is entitled to. And since RCA is owned by almost 290,000 shareholders, it is a huge, complex job throughout the year to send each shareholder four dividend checks, three quarterly statements, the year-end statement, Annual Report, Report of the Annual Meeting of Shareholders, and proxy material.

The job is done by the men and women of the RCA Shareholder Records Department, who work in Manhattan offices at 29 Broadway, near Wall Street. "We're responsible for keeping the records of who owns the approximately 72 billion shares of RCA capital stock up to date," explains Charles H. Carmelich, recently appointed Corporate Assistant Secretary, Shareholder Records Operations, who heads the department. "Since the company relies on these records to help meet its legal and financial obligations to its shareholders and various government agencies, we have to make sure that we keep the records accurate, current, and usable. That means meticulous and demanding work, use of a sophisticated

RCA's shareholder record-keeping system links this terminal at 29 Broadway to the computer in Cherry Hill, N.J.



computer system, and cooperation with several other departments of the company as well as with outside firms and agencies."

George E. Morris, Secretary of the Corporation and the man who oversees Carmelich's operation, says that RCA Shareholder Records issues more than 150,000 new stock certificates each year. RCA is the 22nd most actively traded issue on the New York Stock Exchange and ranks 12th in the number of shareholders. "The sheer numbers of our shareholders also mean we get some unusual situations," he comments, "like the fact that we have 46 shareholders named Robert Brown and 57 named Robert Smith."

Although the handling, recording,

and updating of trades in RCA stock sounds complicated, that is only part of what RCA Shareholder Records does. Its other responsibilities include:

- Submitting periodic reports on the status of shareholder dividends and accounts to federal and state government agencies. Last year, for example, Shareholder Records had to submit more than 362,000 forms to federal and state revenue departments regarding dividends paid to shareholders.
- Preparing, inserting, and mailing over \$72 million each year in dividend checks, more than the total annual sales of all but the top 887 American industrial corporations.
- Coordinating with a bulk mailing house to send the Annual Report, proxy

material, and Report of the Annual Meeting to the shareholders. In 1972, total mailings exceeded 1,740,000—more pieces than were handled that year by more than half of the post offices in the country.

The work of RCA Shareholder Records doesn't stop there. The department reconciles the checking accounts in three banks that are used to pay dividends; it follows up on uncashed checks; it handles the tabulation and follow-up of proxies and balloting at the Annual Meeting; and it verifies the credentials of shareholders attending the Annual Meeting.

Sitting beneath his collection of framed RCA stock certificates, Carmelich recalls how extensively the day-to-day operations of Shareholder Records have changed since he joined what was largely a manual operation 25 years ago. He speculates that the years ahead hold even more changes—such developments as a computer information system similar to those used for savings accounts, or the isolation of certificates in large depositories. Both of these concepts are designed to immobilize the stock certificate without impairing an efficient trading process.

"You could see the trend beginning with the New York Stock Exchange's Central Certificate Service," he says. "It started a few years ago and has made our job somewhat less hectic. But under any system that evolves in the future, we at RCA Shareholder Records will still be dealing directly with the owners of the company. That's the reason we'll always be working as hard as we have up to now."

How RCA Stock Is Bought and Sold

When someone buys shares in RCA, what does Shareholder Records do? "To illustrate our role," says Charles H. Carmelich, Corporate Assistant Secretary, Shareholder Records Operations, "let's follow what happens when an investor—call him Robert Cooper of Pittsburgh, Pa.—decides to buy 100 shares of RCA Common stock. He places the order to buy with his broker and, after the trade is executed (usually on the New York Stock Exchange) and paid for, he's the new owner of the stock. But because of the way the stock exchange works, it is conceivable that neither he nor his broker knows the individual or company that sold him the RCA shares. He doesn't have an RCA stock certificate, and we at RCA don't yet know that he has purchased the stock."

"Now," Carmelich says, "let's assume that the 100 RCA shares that Mr. Cooper bought were the same ones sold by Mrs. Selma Smith, of Miami, Fla. She's probably in a similar position to that of Mr. Cooper; neither she nor her broker knows the individual or company that bought her shares; and, while she's interested in getting the money her shares were sold for, we at RCA would like to know she has sold them so that we don't keep sending dividends and company information to her."

"We begin to get the information we need," Carmelich says, "when the seller's broker forwards the shares to the purchaser's broker, who fills out the assignment on the back of the certificate and sends it to us or our transfer agent who issues a new 100-share certificate in the name of the buyer—in this case Mr. Cooper."

"The transfer agents, which in our case are the RCA Corporation and The First National Bank of Chicago, then send both the canceled and new certificates to one of our registrars, the Chemical Bank of New York or Continental Illinois National Bank and Trust Company of Chicago, for further checking and validation. Then the new certificate is sent to Mr. Cooper and the canceled one is retired."

"Meanwhile, we've begun revising our records to reflect the results of the trade. Using our computer information system, which employs an alphanumeric code to give each shareholder account a separate listing, and our computer located in Cherry Hill, N.J., we debit Mrs. Smith's account 100 shares as of the date her stock was transferred. Then, we either credit Mr. Cooper's account or, if he doesn't already own RCA stock, establish a new one for him. Later on, we will use the information in his account to determine his dividend payments and other shareholder rights and mail him all the information and checks he's entitled to for as long as he remains a shareholder."

When you go to Mars, you've got to be clean, right? Especially when you're an S-Band High Gain Antenna (pictured with model-maker Tom Kane), one of three types of antennas RCA Government and Commercial Systems in Moorestown, N.J., is preparing for Viking's soft landing on Mars, scheduled for 1976. Because one of the purposes of the Viking lander is to detect life on Mars, the antenna and all other parts of the spacecraft must be kept absolutely clean at all times so that any life-related particles it finds can be only Martian.



VIKING



CLEAN ROOM



30 Rockefeller Plaza | New York, N.Y. 10020



Down by the Old Mill Stream.

Yes, Virginia, there really is an Old Mill Stream. The Blanchard River in Ohio.

At the turn of the century, it was where boy met girl. A spot for spooning and crooning. June-mooning. And fishing was a lazy pastime.

It was the idyllic setting that inspired Tell Taylor to write his famous song in 1910.

Today, sweet sixteens still stroll there, but not in gingham blue. You're more likely to see them in hip boots.

The water is polluted. Fishing is poor. But the catches are bigger than ever. Old cars, refrigerators, stoves, tires.

The romance is gone. But not for long. RCA employees are helping make the Old Mill Stream good as new again.

The Blanchard runs through Findlay, Ohio, the site of one of our plants.

RCA volunteers there have joined with Hancock County civic groups to start a major cleanup campaign. Not because we're one of the polluters, but because we're members of the community.

In fact, our plant engineering manager is co-chairman of the local environmental committee directing the project.

They plan to clean up the river, plant flowers and shrubs along the

banks, build walkways, and install lighting and benches.

Thousands of people at over 40 RCA plants across the country are involved in similar projects, all part of the RCA Environmental Improvement Program initiated by Robert W. Sarnoff to encourage voluntary action in our plant communities.

At RCA we make good things. It's our responsibility. We also try to do good things. That's our responsibility, too.

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