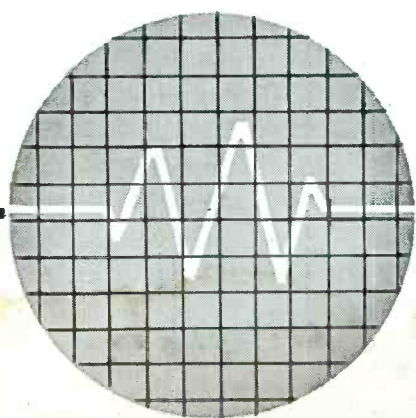


**KMOX
RADIO
CBS**



TECHNICIAN ENGINEER

APRIL, 1963

Published for the Employees of the Broadcasting, Recording and Related Industries

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS — AFL-CIO

FOUNDING OF THE INTERNATIONAL LABOR ORGANIZATION Washington, D. C., October 1919

American organized labor had a major role in creating the International Labor Organization. On January 29, 1919 the World War I Peace Conference as one of its first, if not the first, official acts, established a commission for international labor legislation under the presidency of Samuel Gompers. This commission was enjoined "to enquire into the international means necessary to secure common action on matters affecting the conditions of employment."

After 35 sessions, the commission presented a draft plan to the Peace Conference for a permanent international labor body. The recommendations became part of the Treaty of Versailles chartering the I.L.O. Preparations were made for the first world labor conference to be held in Washington, D. C.

The founding conference was held October, 1919 in the Pan-American Union building in Washington with Samuel Gompers, A.F.L. president, one of the most active participants. Albert Thomas of France was elected first Director General (1919-1932). Since then the organization has had four Directors General: Harold Butler (United Kingdom, 1932-1939); John G. Winant (U.S.A. 1939-1941); Edward Phelan (Ireland 1941-1948), and David Morse (U.S.A. since 1948).

The I.L.O. is a tripartite body (labor, employers, Government) and develops recommendations and conventions designed to lead to social, economic and labor legislation. By late 1959 a total of 111 conventions had been promulgated. Today the I.L.O. is also active on other fields, one of the most important of which is a global technical assistance program.



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The INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

GORDON M. FREEMAN

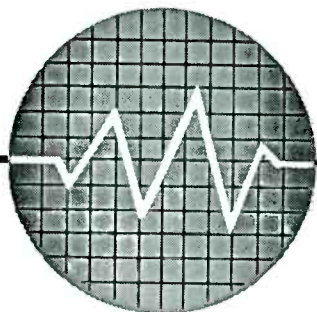
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TECHNICIAN ENGINEER



VOL. 12, NO. 4

ALBERT O. HARDY, Editor

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the cover

The front view of the modern and clean-lined studio building at 1144 Hampton Avenue in St. Louis, Missouri—home of KMOX and CBS Radio. A veteran of broadcasting, Station KMOX went on the air on Christmas Eve, 1925. A story on the station begins on Page 4 of this issue.

index

For the benefit of local unions needing such information in negotiations and planning, here are the latest figures for the cost-of-living index, compared with 1961 figures: February, 1963—106.1; February, 1962—104.9.

commentary

103 Degree Fever—The slight improvement in the rate of unemployment in March is a welcome addition to the spring season, but unlike the season's promise of a fruitful summer, there are no indications that the jobless rate will of its own accord continue to drop.

Economists studying month-to-month changes in the unemployment rate and evaluating the seasonal changes are persuaded that the drop in the rate from 6.1 percent in February to 5.6 percent in March is an over-adjustment.

They maintain that the increase from 5.8 percent in January to 6.1 percent in February probably overstated the unemployment situation slightly and that the drop to March was a natural correction of this situation.

But given the technical difficulties of measuring the jobless rate on a month-to-month basis, the hard fact remains that the drop to 5.6 percent in March brought the rate to the average for all of 1962. All indications of the moment are the rate will range between 5.6 and 6 percent for the next few months.

The high, persistent rate of unemployment will begin to drop when the economy receives the long overdue stimulus of a \$10 billion tax cut directed at the low and middle income brackets. It will begin to yield from its intolerably high level, also, when federal job-creating programs move through Congress and into the economy.

The March jobless situation was perhaps best summed up in Labor Sec. W. Willard Wirtz's comment that "my feeling is about what it would be if somebody's temperature dropped from 104 to 103 degrees."

The country cannot tolerate an economic illness reflected in a 103 degree temperature.

—AFL-CIO News



General view of the KMOX lobby and reception room.

KMOX—*"The Voice of St. Louis"*

ON Christmas eve, 1925, KMOX first went on the air from Kirkwood, Missouri, licensed as "The Voice of St. Louis." A venture spurred by the imagination of 15 prominent businessmen in the community, it was also strongly supported by the St. Louis *Globe-Democrat*. With studios in the Mayfair Hotel, its modified Western Electric 104-A transmitter supplied a husky 5-kilowatt signal to a flat-top antenna system.

Within a very few months, the station developed a personnel problem; its technicians were highly dissatisfied with their weekly wage of \$30 for 48 hours. Thus, the first union organization of radio-men took root in St. Louis, at KMOX, when they joined Local Union No. 1, IBEW. Almost coincidentally, the first articles on "Radio" began in the IBEW's *Journal of Electrical Workers and Operators*, in the April, 1926, issue.

In September of 1930, a new transmitter went

on the air, and from a new location. The 5-kilowatt transmitter was replaced by a 50 kw. rig operating from Baumgartner Road, near the Merimac River, 14 miles south of St. Louis proper.

In 1932, the studios were moved to the St. Louis Mart Building, where they remained for many years thereafter. It was generally said, at that time, that the new facilities were a far cry from KMOX's humble beginning, when the first tinkling notes of "Somewhere A Voice Is Calling" announced the first presence of the new station in town. That same year, CBS purchased KMOX. And by the end of the year, the list of CBS owned-and-operated stations had grown to eight: WABC, New York; WBBM, Chicago; WBT, Charlotte; WCCO, Minneapolis; WJSV, Washington; WKRC, Cincinnati; WPG, Atlantic City; and KMOX. With one affiliate in Canada, the relatively-new network consisted of 93 stations.

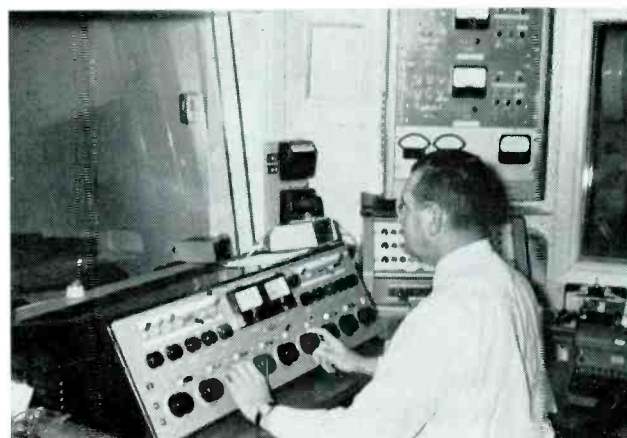
The accumulation of plaques, certificates and similar testimonials of awards for programs, community and public services and the like almost literally cover a large wall in the present studio building on Hampton Avenue. And these are the awards of only the recent years. From its 5,000 watts in the early days, to its present 50 kw. on 1120 kc., from its ponderous motor-generator sets of the '20s and '30s, the 104-A and the 5-C (later used by a station in Macon, Georgia, and until mid-1958), to its present air-cooled Westinghouse HG-1 and the Continental companion auxiliary at Stallings, Illinois—all are just about as far distant from each other as 1925 is from 1963.

KMOX-FM went on the air in February of 1961. Its Collins 830-Z-1A transmitter is licensed for 47 kw. ERP on 103.3 mc. This transmitter is remotely-controlled, as is the AM, from the studio and is located in the KMOX-TV transmitter building in Lemay, Missouri.

In December of 1960, KMOX began the operation of its transmitters by remote control. To date, it may well be the only station in the United States (or perhaps the world) which now employs a



Robert Hyland, general manager of KMOX and vice president of CBS Radio, at his desk.



Arthur Stout in the Studio Control Room, which has the transmitter remote-control equipment, to his right.



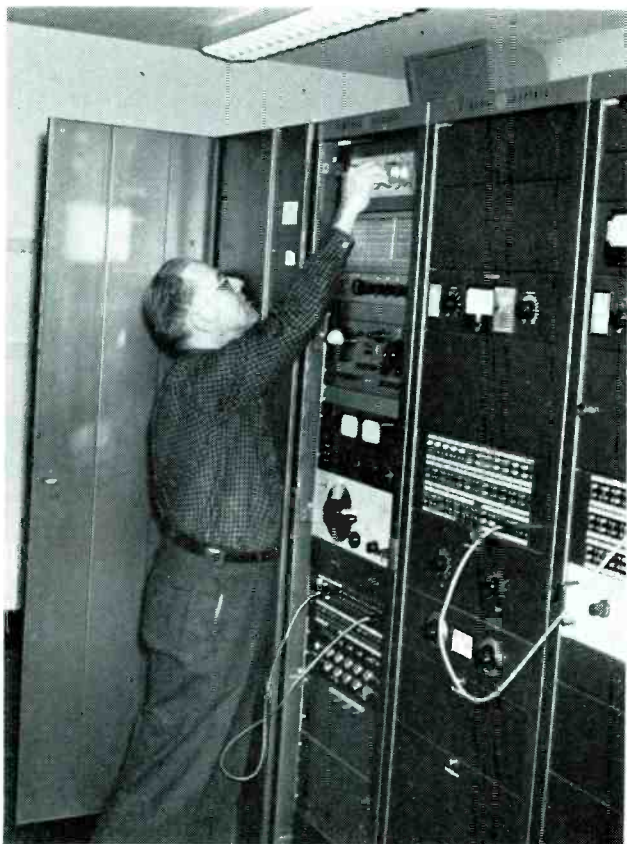
Left and below: Watson "Doc" Justice transfers words to tape in the recording room.



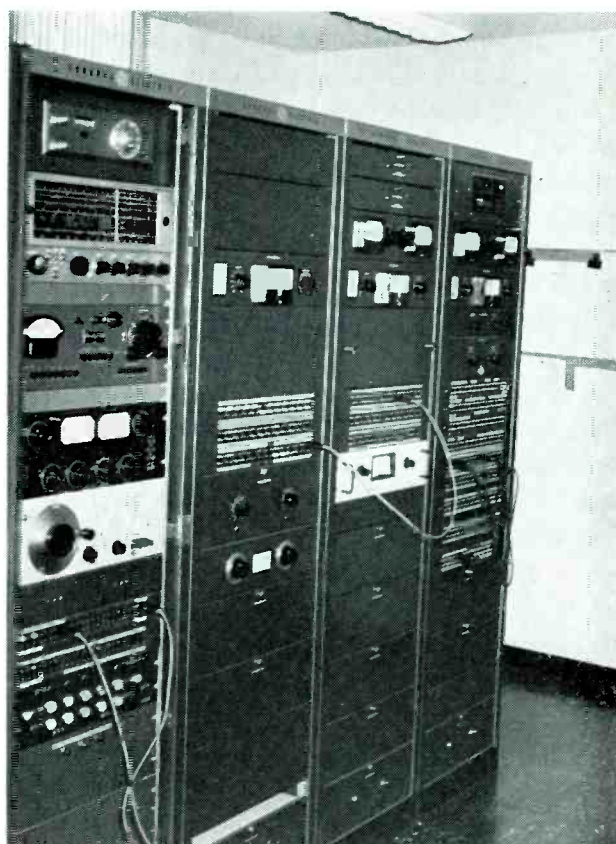
April, 1963

greater number of engineers than it had on the payroll prior to the advent of its automation. With heavy emphasis on sports, news and discussion programs, manpower requirements are correspondingly high; both the need and the fulfillment are tributes to the station activity and the far-sighted and astute management of "The Voice of St. Louis".

When L. U. 1217 was chartered on December 18, 1940, the engineering staff became charter members of that Local Union. Among the signatures on the actual charter are at least two members still employed at KMOX: W. E. Mansfield (many times a local union officer) and Chalmer H. Stoup. Another member with a long and distinguished record of service with KMOX and his Local Union is Robert W. Stetson, who has been enjoying retirement for some little time. Brother Stetson was the Financial Secretary of Local Union 4 when he retired on September 1, 1960. All the names on the original charter issued to



W. E. "Bill" Mansfield reaches for a high one on an air-monitor tuner.



A general view of some of the racks in the equipment room.

1217 were duplicated on the new one when Local Union No. 4 was chartered on January 1, 1959.

Thus, this month we are happy to salute this "old time" station and the men who have kept and

are keeping it on the air. But few stations have such a long and parallel history with the IBEW. Theirs is indeed a proud heritage and a bright future.

Every Vote Counts, As Fall Elections Proved

In the same sense that every single vote counts in an election, every single dollar counts. That's why the COPE Dollar, the voluntary dollar that you contribute to the AFL-CIO Committee on Political Education, is so important.

The COPE Dollar goes to help liberal candidates for the U. S. Senate and House of Representatives who will support progressive laws that are good for working people and oppose restrictive laws that would hurt working people. It's that simple.

The blunt fact is, liberal candidates have nowhere else to turn for financial aid than to the labor movement. On the other hand, their conservative opponents are backed up by the vast funds of big business, big industry and big finance.

COPE Dollars often can spell the difference between victory and defeat for a liberal candidate. Let's take a look at the crucial role they play in close elections.

In Minnesota in 1962, longtime incumbent Walter

Judd, an ultra-conservative, was defeated for the House by liberal Donald Fraser. Fraser won just 51.8 percent of the vote. In Ohio, liberal Bob Secrest dumped reactionary Rep. Tom Moorehead, winning 51.1 percent of the vote. In Indiana, Birch Bayh won the race for the Senate, defeating four-term Homer Capehart, a down-the-line conservative. Bayh captured only 50.3 percent of the vote. And in South Dakota, progressive George McGovern just nudged right-winger Joe Bottum with 50.1 percent of the vote.

These liberal candidates, and many others like them, are the type of men who are helped in their campaigns by the COPE Voluntary Dollar.

Without that dollar, they might well have lost.

In short, without that dollar, we might now have the most reactionary Congress in years.

Have you given your dollar to COPE? If not, do it now.



playback from YESTERYEAR

While digging for facts on the early history of Station KMOX (see story beginning on Page 4) we thumbed through some 1926 issues of The Journal of Electrical Workers and Operators, predecessor of the present-day Electrical Workers Journal and found some interesting reports of broadcasting in the "Roaring Twenties." Because they offer a fascinating preview of what was to come, we reprint them verbatim below.

■ Radio Opens Doors to Experiment

The transportation of the human voice upon electrical waves of recurring frequency, known as the radio principle, has opened doors of possibility. The future looms big with promise in the electrical field. At the same time the radio is having, and promises to have important social effects, as the following newspaper report suggests:

"The first radio novel—that is, a novel written solely for publication by radio and not in book form—was put on the air last night through Stations WJZ in this city and WRC in Washington, D. C., by the author, Cosmo Hamilton.

"In a statement made a few days ago the English author said that the age of novel reading was fast disappearing and foretold a future kind of novel that would be condensed from 80,000 or 90,000 words to a number of words that could be spoken in 12 to 15 minutes.

"'Sons and Mothers,' the first of its kind, was the novel Mr. Hamilton read to his unseen audience. The author commenced reading his work at 8 o'clock and reached the closing sentence about 15 minutes later. In that time he had read a novel that contained virtually all the elements to be found in the popular novel of today. There were no lengthy descriptions of persons or scenes, but where descriptive matter was essential to the continuity or development of the plot it was included."

Rather hard on our brothers, the printers, if this exaggerated view of Cosmo Hamilton comes true. The point is that we do not yet know just where the radio is going to take us. We do know that it is breaking down barriers between town and country. This may tend to decentralize our mammoth cities. It may make men more content to live on farms. It may tend to centralize propaganda into the hands of the rich and powerful. Whatever it eventually does, the radio is transforming our daily life, and leading the way to new developments in electrical science.

■ Wireless Movies Seen Next

Radio vision is said to be the next step. That is, moving pictures by wireless—in natural colors—as you sit in your favorite chair at home.

Moving pictures will flash across the world at the unthinkable speed of 186,300 miles a second, through

the invention of C. Francis Jenkins, Washington, D. C., of the so-called radio lamp. This lamp, contained in a radio vision receiving set, lights and extinguishes a half million times a second.

A disk or ring, containing small lenses around its outer edge, is contained in this box. The purpose of this disk is to chop up the light and shadows into lines and adjacent successive lines.

A small electric motor, likewise contained in this box, revolves the lens-carrying disk.

A white screen, which may be held in a small picture frame, is placed on the wall for receiving the motion picture.

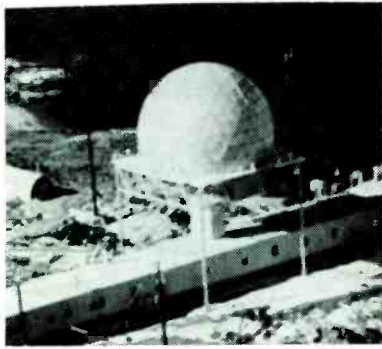
The light from the lamp inside of this box, or small cabinet, is reflected onto the miniature screen through a slit arrangement by means of prism reflector, placed on top of the box.

In this way, the receptionist can switch from hearing his favorite orchestra to watching it play. Or he may hear it and watch it at the same time.

The new device is the outgrowth of the Jenkins system of broadcasting photographs by radio, it is said. By this system the inventor transmits "stills" from photographic negatives at the rate of one every five or six minutes. Believing that if he could speed up this process to about 16 pictures per second, he would be able to receive radio moving pictures, Mr. Jenkins studied to make this improvement, with success.



"Radio vision is said to be the next step . . . moving pictures by wireless—in natural colors—as you sit in your favorite chair at home."



A radome at White Alice, Alaska

THE program launched five years ago by the United States military services and industry to provide a Ballistic Missile Early Warning System that would discourage ICBM attack on the Free World is moving steadily toward its final stage—completion of BMEWS Site 3 in Yorkshire, England. The big radar base under construction there will not be operational until late 1963. But a major milestone has been passed with the completion of the three huge radomes, shelters for the rotating radar antennas—equivalent to 15 stories high, on Fylingdales Moor, just a dozen miles from England's North Sea Coast.

The Fylingdales base, with its radome spheres now sitting like giant golf balls on the heather-coated moor, will be operated under Royal Air Force supervision as the easternmost "eyes" of the BMEWS. Its two companion stations—at Thule, Greenland and Clear, Alaska—are already in fully automatic operation under USAF direction. Ultimately, the three bases will extend a 3,000-mile-deep radar umbrella over all of Eurasia, to deter attack by giving the Free World nations time to mount a crippling retaliation.

Progress Reported

In a progress report, Major General Charles H. Terhune, Jr., Commander of the USAF Electronics System Division, made these points:

Much electronic equipment was installed during construction of the Site 3 radomes and is already undergoing tests. Each radome consists of a three-story building, 145 feet square, topped by a sphere 140 feet in diameter made of 1,700 hexagonal panels of laminated fiber glass sheets with heavy honeycombed paper sandwiched between. They will protect the 84-foot radar antennas from winds which, in winter, sometimes approach 100 miles an hour on the Yorkshire moors.

The same tightly-knit cooperation that has marked military and industry-wide cooperation of the first two bases of the billion-dollar BMEWS project has again been evident in the third stage in Britain. In the earlier phases, 2,900 different American firms contributed and all three military services participated; similarly, many firms in the United Kingdom are contributing directly to the construction of Site 3.

More than 1,500 British personnel have

been engaged in work at the site, including construction workers and technical and support personnel of various contractors and sub-contractors. Among them are a number of engineers and technicians trained by RCA-Great Britain Ltd., at Sunbury-on-Thames, England and some of them at RCA in Moorestown, New Jersey, to operate and maintain the base for the RAF. At present, about 150 American civilians are at work on technical and administrative phases at the Yorkshire site. These include personnel engaged in overall management in coordination with the U. S. Third Air Force and the British Air Ministry; Goodyear Aircraft Corporation, sub-contractor for the radomes, antennas and pedestals; and various other sub-contractors. In addition, numerous USAF and RAF officers are on duty, in supervisory capacities.

British Objections Overcome

For the most part, the original objections of Yorkshiremen and other Britons which made the base a subject of controversy when plans for it were first announced in 1960—that the radiation would endanger birds, honey bees, grazing sheep and possibly even grouse hunters (!), and that the big radomes would be a blot on Fylingdales Moor, which is part of the North Yorkshire National Park and one of the most picturesque hunting and hiking areas in northeastern England. Since then, British authorities, aided by press and broadcast media, have convinced most of the project's critics that the radio frequency beams from the site will be sufficiently high to eliminate danger. Indeed, where it was originally planned to fence off nearly four square miles of the moors as a hazard area (which raised the hackles of the local sheepherders), the British Air Ministry has reduced this to a mere one and a half, a move which eliminated the fears of most residents. Likewise, the complaints that the radomes would mar the scenery were countered with a promise that they would not remain glistening white—as is the prototype radome, on the premises of the RCA Missile and Surface Radar Division—just off the New Jersey Turnpike in Moorestown, New Jersey—but would be painted blue, to blend with the sky.

Most important, it is now generally accepted that the Yorkshire base is a vital part of the top-of-the-world radar network. The Yorkshire base, like its Greenland and Alaska counterparts, is an essential part of a system to maintain peace in the world.

Construction Problems

While the geographical location of the Yorkshire site did not pose some of the construction and transportation problems

that existed in the Alaska and Greenland sites, the project still was a challenging one.

Most of the electronic equipment was produced in the United States and shipped to the United Kingdom—21,300 measurement tons by Military Sea Transport Service and 200 tons by Military Air Transport Service. Because of the delicate nature of much of it, extreme care had to be taken in the crating and handling. One piece of equipment—a computer known as a missile impact predictor—posed a unique problem. It had been planned to ship this in sections by C-124 Globemaster, one of the largest MATS cargo planes. As the time approached, these aircraft had been diverted to other duty. To fit the cargo into smaller commercial planes, it had to be recreated at the airport by RCA transportation technicians, a job which required great care to assure maximum protection and high speed to meet project schedules.

Another problem was transporting some of the larger equipment over narrow British roads and beneath many overhead obstructions. The 24 sections which make up each 84-foot radar antenna were packaged in wooden crates 40 feet long, 8 feet wide and 12 feet high. Each load weighed 3,000 pounds. To slip them under streetcar wires at some English locations, workers had to push the wires up with long wooden poles equipped with cross bars.

Some time near the end of this year, the defense and the vigilance of the Free World will be bolstered by this mammoth project—a tribute to the know-how, ingenuity and cooperation of the United States and Great Britain.

**Attend Your
Local Union
Meetings Regularly**

**Be An Active
Member**

Technician-Engineer



DOCTOR SEABORG

On March 3, Dr. Glenn T. Seaborg, chairman of the U. S. Atomic Energy Commission, spoke to the 18th National Conference on Higher Education in Chicago. His subject, "Education for the Third Revolution," offered an inspiring panorama of the world of tomorrow as foretold by present scientific developments. We have excerpted a portion of his speech which dealt with electronics, so that our readers, too, may consider the significance of recent developments in our own industry.

The Brave New World of Electronics

ONE of the most active of all fields of science today is the study of the solid state and its technological application to the unusual class of materials called semiconductors. The best known of these is the *transistor*. Here, we have a tiny chip of solid matter which can control an electric current in much the same way that this is done by a radio tube. Transistors can be made of a number of materials, but have almost incredible requirements of purity. For example, the amounts of certain contaminants must be kept down below limits of one part per hundred million. This is about the same level of purity, as you can readily see, as if there were only one lonely sinner in the entire population of the United States.

Transistors are manufactured by the millions today for use in small portable radios, computers, space satellites, television sets, and in hundreds of other less well-known applications. Yet its invention was first announced less than 15 years ago. Its success has enormously stimulated research in related areas, and we now have a whole family of semiconductor devices. Some of them, such as the silicon solar cells, convert sunlight directly to electricity. These are used in some space satellites to power radio transmitters. Others give off a pulse of electricity when hit by radioactive radiation. Some of these devices can actually be placed inside living tissue to measure the amount of radioactive material present, as for example, when a patient is being treated by a radioactive drug.

Scientists and technologists are excited about the potentials opened up by the *laser*, a new device which makes it possible to produce extremely intense and sharply defined beams of light. An ordinary light bulb puts out light waves of all colors, but a laser beam is very sharply tuned, like a radio station. Scientists have already shot laser beams off the moon and back, and are learning how such beams can be used to carry information of all kinds—even telephone and television signals. It will be possible to make a laser beam more intense than the entire output of energy of our sun at that particular wavelength. If we ever communicate

with civilizations outside of our own solar system, it may well be along such a laser beam.

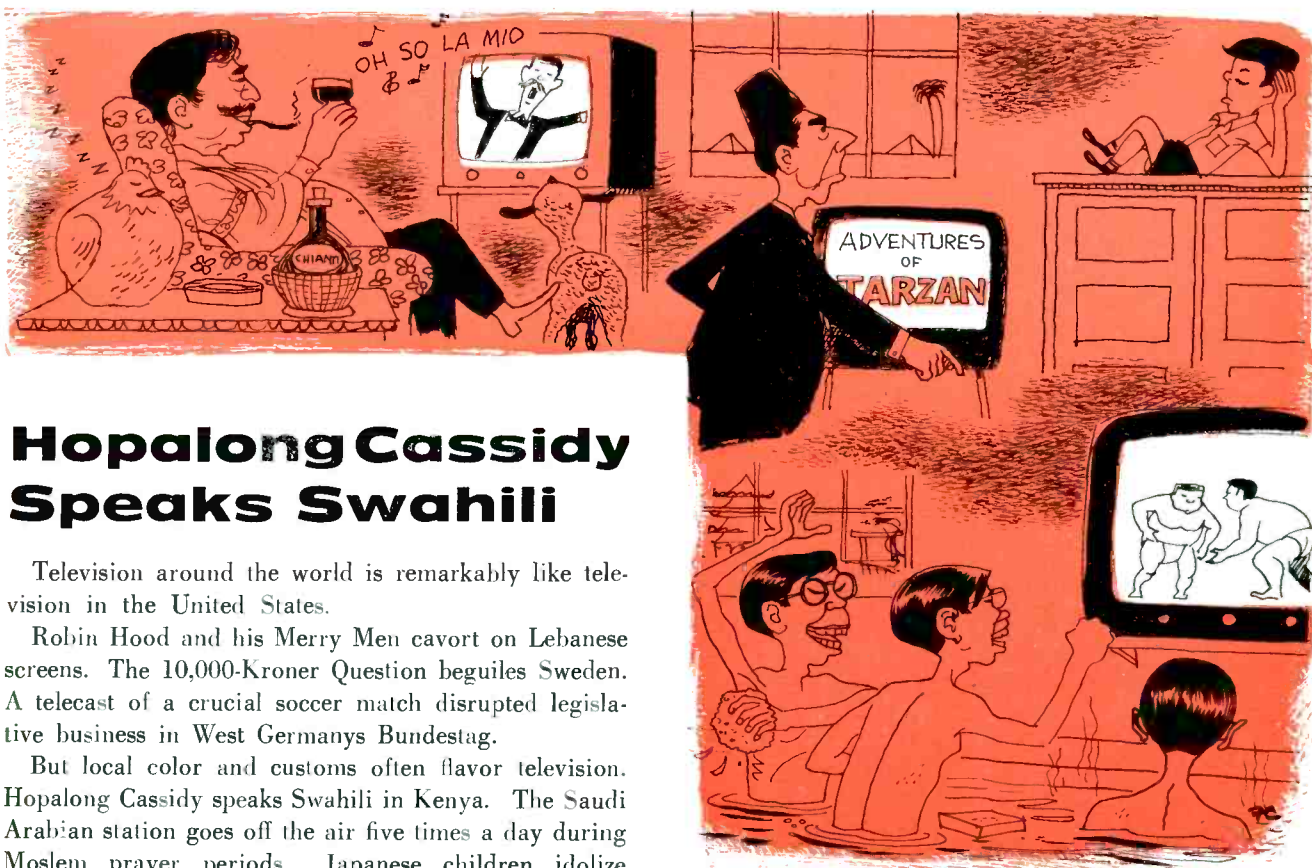
In addition, a new kind of semiconductor has just been announced, which gives off a laser beam directly from an input of electric current, with high efficiency. This may permit us to send tremendous amounts of information—television signals and telephone conversations—for great distances over light beams.

Still other semiconductors respond to sound waves, either as tiny microphones or even as amplifiers. Others can turn heat directly into electricity and as such show great possibility for increased power production from nuclear sources in space applications and the like—or perhaps even in a portable TV set that works on kerosene.

It seems to me almost inevitable that the life of every human being either on or away from our planet will become more and more interrelated through advances in science and technology. For centuries, one of the most isolated groups of people in the world has been living in the high Andes Mountains of South America. They are the descendants of ancient Incas. Yet today, the most highly prized possession of many of these Indians is often a transistor radio. In a few years, it may very well be a transistorized television set picking up signals from orbiting relay satellites.

What the peoples of the world will see and hear on these television sets will inevitably be a matter of education on the grandest scale. Yet we will be faced with problems equally large. Thoreau said many years ago, "We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate." So what will we have to communicate to the peoples of the new countries of Africa and the East, to the nations of the Latin Americas? Will it be old cowboy movies?

My own feeling and deep hope is that the forces of higher education will have an important influence upon what will be presented. This could be a magnificent educational opportunity of a lifetime—not just of our own lives, but perhaps of the lifetime of our planet.



Hopalong Cassidy Speaks Swahili

Television around the world is remarkably like television in the United States.

Robin Hood and his Merry Men cavort on Lebanese screens. The 10,000-Kroner Question beguiles Sweden. A telecast of a crucial soccer match disrupted legislative business in West Germany's Bundestag.

But local color and customs often flavor television. Hopalong Cassidy speaks Swahili in Kenya. The Saudi Arabian station goes off the air five times a day during Moslem prayer periods. Japanese children idolize Super-Samurai, who wear dark glasses, white tights, and cape.

Television has spread to 70 countries from Trinidad to New Zealand, the National Geographic Society says. The small screen glows in unlikely places such as Kuwait, Malaya, Malta, and Uganda. At least 115,000,000 television sets are in use around the world.

Japan ranks third behind the United States and the United Kingdom in number of television sets—9,000,000. Japanese television fans gather in noodle shops and bath houses to watch traditional kabuki plays, sumo wrestling by gigantic grapplers, and "Wakai Kisetu," a comedy series set in a cosmetics firm.

In many nations, community television sets are installed in public places. San Juan, Puerto Rico, houses sets in waterproof boxes in public squares. They are tuned to different channels, and there is a nightly rush as viewers hurry from one plaza to another to catch favorite programs.

In new African nations, such as Gabon and Sierra Leone, villagers cluster around public sets to watch educational programs. When Nigeria started its television system three years ago, the government lent civil servants money to buy sets. The emphasis is on education, but Nigerian programs also include the popular local High Life bands and Laurel and Hardy.

Egypt operates a highly developed television service, manufacturing its own TV receivers and broadcasting on three channels.

Tarzan movies and westerns are popular in Cairo,

and parents complain of the "cowboy menace." A cabinet minister returned home one day to find his son perched on the top shelf of a high cupboard. The boy refused to come down until his parents promised to call him Tarzan.

Television in Iraq stresses educational programs such as "Your Children's Ears" and "Water for Dry Land." But Baghdad residents also assemble in tea gardens to watch "The Scarlet Pimpernel." Premier Abdel Karim Kassem encouraged the development of television. Ironically, the revolutionists who recently overthrew Kassem displayed his body on TV to prove that he was dead.

Television has had varying impact in Europe. Telecasts revived waning interest in Spanish bullfighting. The younger generation was indifferent to the fights until they saw them in vivid close-up on the TV screen.

The individualistic French seem apathetic towards television. They appear to prefer an evening at the *Bistro* to even a high quality program like a two-hour remembrance of Marcel Proust.

The Italians, however, embrace television wholeheartedly. They enjoy quiz shows, a class in reading and writing called "It's Never Too Late," and a 10-minute program made up entirely of brief commercials.

In Italy, even the animals watch television. Some farmers bring poultry and sheep into their homes during severe weather. Chickens go to sleep as soon as the screen lights up, but sheep will stare bemused at each program from beginning to end.

The News in Brief

"COTTON GOOSING"

The bracero, the temporary farm-hand from Mexico working in American fields, has been increasingly faced with mechanization of crops from the mechanical cotton-picker to machines that field-harvest lettuce and even tomatoes. He now has a new rival to face. Believe it or not, geese are replacing people.

The Wall Street Journal recently reported the current remarkable increase in the practice of "cotton goosing" by plantation owners. It seems that geese—notably, the White Chinese variety—can weed the cotton fields more cheaply and more effectively than a man with a hoe. They thrive on the weeds and grasses, especially the stubborn Johnson grass, that infest cotton fields. Two geese can handle an acre of cotton; a dozen will do the labor of one man.

The University of Tennessee has investigated the economics of the situation, to find that growing an acre of cotton with weed control done by chemicals costs \$119. With the use of farm hands, such as the Mexican nationals now on the decline in employment opportunities, the cost is \$124 per acre. But "cotton goosing" brings the price down to \$98 per acre. One Louisiana grower with a 10,000-acre plantation says, "If it weren't for geese, I couldn't stay in the cotton business." He figures that his 4,500 geese save him \$16.50 an acre over the cost when he used braceros and local hands for "chopping cotton." Besides this \$165,000 saving in a year's operations, he gets a profit from selling 30,000 to 40,000 geese a year to other farmers in a "sideline" goose-raising operation. In addition, the geese are so thorough that yields run 6 to 10 per cent higher than in fields weeded by chemicals or men.

No less than a million geese, it is estimated, will work in cotton fields this spring. Some geese-raisers rent the birds out for \$1.50 a season; some of the owners, who pay about \$3 each for them, sell their geese in the food market after the spring work is done; but many keep them, at a feeding cost of only about 50 cents a year per bird supplementing their weed diet—and they may live as long as 25 years.

Five years ago more than 400,000 braceros were being brought to the U. S. annually; last year the number was only 194,978, and it is expected to shrink further this year. Of course there are many factors involved besides competition from geese. But as the *Wall Street Journal* reporter quotes the observation of one Jose Bravo Manza, Mexico City would-be bracero, "It's a sad thing to be replaced by a machine, but to be replaced by a goose is even worse."

AN ACCIDENT, A LESSON

The Associated Public-Safety Communications Officers' "APCO Bulletin" recently reported a tragic accident at the Joliet, Illinois, state police radio station. Maurice H. Cryder encountered trouble in the keying circuit of the station's CW transmitter and hurried to the back of the rig and climbed upon a chair to reach a suspected part. As reconstruction of the accident best permits, it would seem that he came in contact with the final amplifier plate lead while his left knee was touching the metal cabinet. Despite almost immediate first aid, thanks to three nearby troopers, mouth-to-mouth breathing, an inhalator on the way to a hospital and heart massage at the hospital, he never recovered consciousness.

This was the first fatal accident in the some 27 years of operation of the Illinois State Police Radio System. "Bud" Cryder had been with the System since December 15, 1947, and since 1951 was assigned to the Joliet station—for the past two years as a supervisor.

As the APCO Bulletin points out, this accident "contains many meaningful messages." Have you looked at *your* transmitter with a critical eye lately? And do the interlocks work?

COURT UPHOLDS ACTION

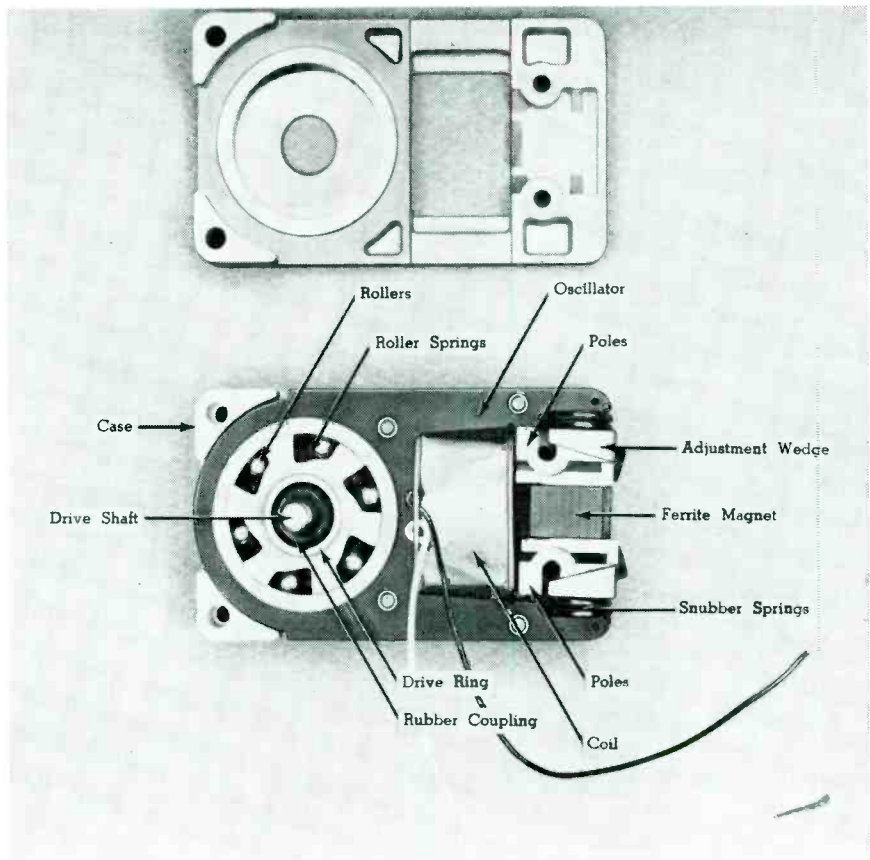
On Monday, April 22, the Supreme Court of the United States issued a decision denying the petition for a Writ of Certiorari in the case of *Parks, Local 28 IBEW, et al., vs. IBEW*. The Court's action, in effect, upholds the decision of the Fourth Circuit U. S. Court of Appeals and sustains the position of the International President of the IBEW in revoking the charter of Local Union No. 28, Baltimore, and his issuance of a charter for a new Local Union (No. 24) in Baltimore.

The matters involved have thus been litigated in all the available Federal courts, in addition to having been subjected to the Constitutional procedures of the Brotherhood.

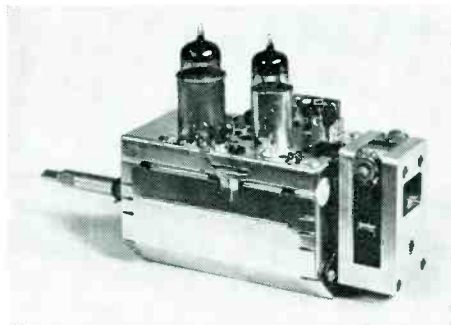
R.O.U. JOB OUTLOOK POOR

We note that the *Radio Officers' News* recently reported that in 1937, the year the ROU was chartered, there were 428 dry-cargo ships in the coastal, inter-coastal and Great Lakes trades. The roster in 1963 shows only 102 ships in the category, despite the call of the Merchant Marine Act for the U. S. to maintain a merchant fleet "sufficient to carry its domestic water-borne commerce." And the RON wryly comments that most of the latter "are getting ready to fall apart at the seams." Most recently, approval was given for ships with foreign flags to carry lumber from the West Coast to Puerto Rico.

RIGHT: Side view of Enercon motor without side plate shows how parts fit together. Enercon produces mechanical oscillation and turns it into rotary shaft motion. The oscillator swings about the center of rotor shaft, guided by annular ring riding in groove in outer housing. Rotor is inched around by rotor clutches as oscillator swings back and forth. Power to move oscillator comes from AC flowing through coil surrounding center leg of E-shaped end of oscillator. Since current is alternating, polarity created reverses 60 times a second. Poles of a ferrite permanent magnet fit into oscillator-pole gaps, giving four sets of working pole faces. On each cycle, two pairs of poles pull, two push. Snubber springs and adjustment wedges control amplitude of oscillation and, hence, speed of rotor.



BELOW: Enercon electric motor is shown attached to TV tuner control for either push-button or remote control of station selection function. With Enercon, tuner control is smaller and lighter, and accurate detent of Enercon (within five minutes of arc) enables push-button tuning to become a reality. Economic advantage over other devices also is claimed.



Radical, Slow Electric Motor Eliminates Gear-Down Devices

A new oscillating electric motor called the Enercon—light enough and small enough to fit into the palm of your hand—defies just about every electric-motor axiom you've ever heard:

- It goes slowly. Without gears, the motor rotor turns at a deliberate pace of as little as $\frac{1}{2}$ rpm. It can be adjusted to run up to 25 rpm, but indications are that it can be designed to accommodate up to 100 rpm.
- It delivers full torque and reaches operating speed almost instantly when you switch on.
- It can't be damaged by overload. It draws the same current whether or not the rotor is turning.
- It will index accurately to one-tenth of a degree without brakes or clutches.
- It can be built to run forward or backward or even alternate rotations rapidly by manual or automatic control.

Enercon's big asset is its elimination of gear-down devices which waste space and add weight. Its inventor, 29-year-old industrial designer James Neal, says the motor will be equally useful in space vehicles and electric can openers. The manufacturers of Enercon, the

Energy Conversions System Corp. of Grafton, Wis., are aiming their first models at the rich market for servo controls and low-speed drives in consumer appliances and office machines.

The first use of the motor, however, is expected to be in motorized TV tuners. It may be either push-button-operated or remote-controlled. Present design work on this application indicates a 70-per cent reduction in size over power units now in remote-controlled sets and a substantial reduction in costs.

One company is investigating the possibility of eliminating all the cams, gears, and levers in their automatic record changers; an Enercon would accomplish all the motions needed during the change cycle. Tape recorders, ice makers, photocopy machines, and coin-operated vending machines are among the products now being redesigned to use the new motor. With the addition of a transistor oscillator so the motor can run on battery current, some auto makers are considering it for power windows, power seats, and windshield wipers.

The Nation's Most Important Single Statistic



What's the most important single statistic in the United States? Why?

It's the Consumer Price Index, published each month by the Bureau of Labor Statistics in the Department of Labor Statistics in the Department of Labor, according to a Congressional report of a few years ago. At that time, it was important because changes in the index—or the CPI as it is commonly called—could affect the wages or salaries of some 4 million workers. Today, wage and salary adjustments based on the index aren't so prevalent, but some 2 million workers are still covered by wage escalation plans geared to changes in the CPI.

Both the CPI and the Department of Labor are 50 years old this year. Thus it is also one of the "oldest" statistics in the country as well as the most important.

The index is a single number—carried to one decimal place—that shows changes in the prices of the items that workers' families buy—from a box of aspirin to a new house. Information on prices—from some 32,000 individuals (such as the family physician and the tenant) and 5,000 stores in 46 cities (all of the largest ones and some as small as 2,500)—pours daily into the Labor Department in Washington.

The monthly index of consumer prices is compiled from these reports, as well as separate indexes for major items of family spending such as housing, medical care, food, transportation, clothing, and reading and recreation. Prices for the individual items are combined according to their importance in family buying.

The basic information on buying habits is obtained in studies of consumer incomes and expenditures in urban areas in all parts of the United States. Since many things lead families to change buying habits—their incomes change and new products become available, for example—such studies are made periodically to keep the consumer price index accurate. Results of the most recent studies are now being published on a city-by-city basis.

After reports for all of the 66 cities where surveys were made have been completed, the information on current buying habits will be introduced into the index, effective with the CPI for January, 1964.

This voluminous information from around the Nation is vital to the national welfare. These statistics will help determine future salaries and payroll costs. They will also provide valuable information about the living conditions of American workers and their families and, in fact, the state of the Nation's economy.

READING TIME

A REVIEW OF RECENT BOOKS

Challenge to Americans, *The Struggle We Face and How to Help Win It*, a 28-page booklet issued by The Advertising Council, Inc., 25 West 45th Street, New York 36, N. Y. Single copies free.

What are the five major challenges facing Americans today. A little booklet recently issued by the Advertising Council lists them thus:

1. *The Challenge of the awakening peoples*—What do we do about the emerging nations of Africa and Asia and about the people struggling for economic freedom all over the world?

2. *The scientific and technological challenge*—How do we prepare ourselves and our children for the mental, moral, and economic strains which the tightly knit "brave new world" of science opens up to us?

3. *The challenge of international cooperation*—Can our nation stand up to the stresses and strains of United Nations and the politics of other world bodies?

4. *The Communist challenge*—Khrushchev says that the Reds will "bury" us.

5. *The challenge of our own permanent revolution*—The problems of our new society are growing—overpopulation, crowded cities, problems of the aged, needs for greater education, etc.

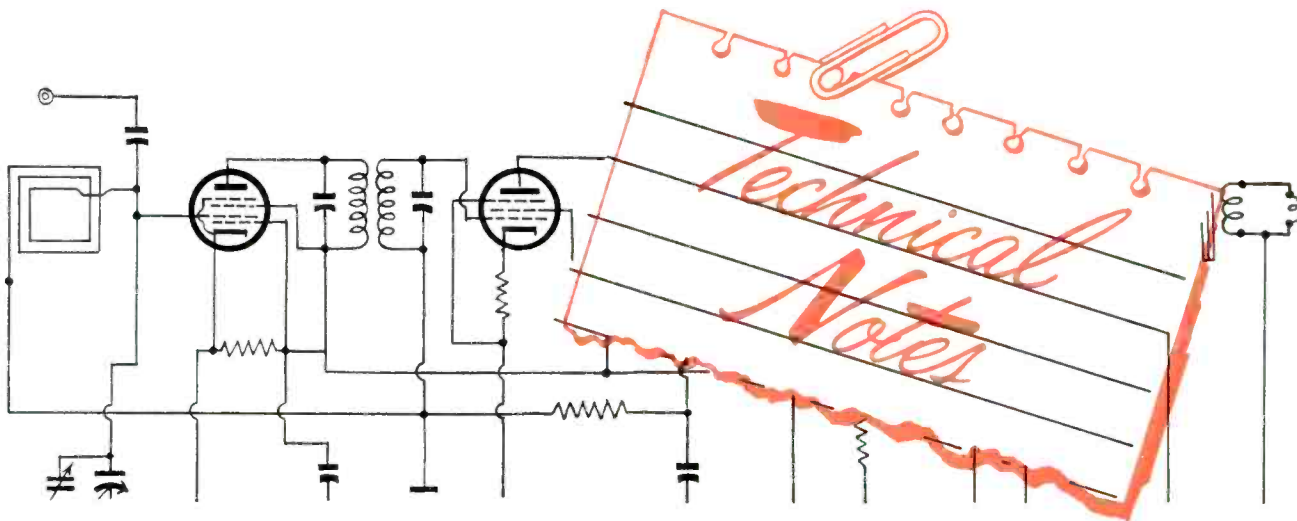
The Advertising Council's booklet divides its booklet into five sections for the five challenges and then lists "What You Can Do to Help" at the end of each section. If President Kennedy's inaugural address has caused you to wonder what you can do for your country, this booklet offers some concrete answers.

Computer Arithmetic by Henry Jacobowitz, Rider Division, Hayden Publishing Company, New York. 120 pp., \$3.

If you're confused as to how 1111 really means the number 15, or how 1000000 is really 64, this book is for you. The author explains that digital computers treat even the most complicated problems in terms of simple (binary) arithmetic. He has designed the book to refresh trainees and other interested readers with the decimal, binary, octal, hexadecimal and other arithmetical techniques and processes.

Perhaps most important of all, one chapter of the book shows how one number system may be converted into another—it is most helpful in understanding computer practices and systems.

"The greatest task before civilization at present, is to make machines what they ought to be, slaves, instead of the masters of men."—HAVELOCK ELLIS



TRANSISTOR ADVANCE

A new semiconductor device, capable of amplifying electric voltages in a manner analogous to a pentode vacuum tube, has been developed by RCA.

Called a metal oxide semiconductor transistor, it is made of silicon and should make possible, Dr. James Hillier, RCA Labs. vice president, said, portable, battery-operated, high speed computers; lightweight, high performance communications systems, and a new generation of tactical and industrial equipment. The new solid-state element is the result of a two-year research effort sponsored jointly by the U. S. Air Force and RCA.

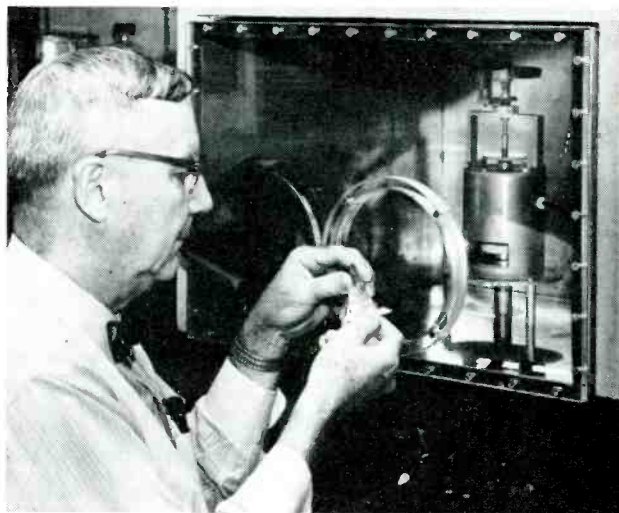
TIME SIGNAL UNCHANGED

During 1963 the standard frequency broadcasts of stations WWV, WWVH, WWVL, and WWVB of the National Bureau of Standards will continue to be offset from Ephemeris Time by 13 parts in one billion. This offset—which follows the current recommendation of the International Bureau of Time, Paris, France—is so slight that it cannot be detected by ordinary radio receivers. However, it could be significant to laboratories and industries making highly precise time or frequency measurements.

The standard frequency and time signals broadcast by NBS are regulated by cesium atomic standards. The cesium atoms "tick" 9,192,631,770 times during an ephemeris second which is the international basis for scientific time. A time scale, UT2, on which we base the time of day, is determined by the period of the earth's rotation on its axis, which we subdivide into hours, minutes, and seconds. As the period of the earth's rotation is not constant—in fact, varies from day to day—the length of the second as given by the atomic standards does not exactly coincide with the second determined from the earth's rotation. Therefore, the broadcast signals are offset from the scientific scale as much as is necessary to keep them in close agreement with UT2.

During 1962 the International Bureau of Time consulted observatories throughout the world and compared astronomical and atomic measurements of time. From these data was determined the average variation from Ephemeris Time expected in the speed of the earth's rotation during 1963. Their findings indicate a difference of about 13 parts in a billion—the same value as was used in 1962. The correct frequency on the Ephemeris Scale can be determined by adding 13 parts in a billion to the frequency signal as received.

HUMIDITY AND POLYMERS



National Bureau of Standards scientists are studying the electrical effects on certain polymers (plastics) in long-time exposure to changing humidity. Current findings show that such exposure affects the dielectric properties of certain polymers used in cable insulation on, for example, underwater telephone and telegraph cable. Above: A. H. Scott of NBS inserts one of a group of polymer specimens into a humidity cabinet. One of each pair of duplicate specimens was kept in a dry atmosphere for up to six months and then placed in an atmosphere maintained at 52 per cent relative humidity. The other underwent reverse treatment.

At various time intervals over a three-year period, the dielectric constant and dissipation factor of each specimen were measured to determine the influence of humidity on these properties. The results are significant to the care and measurement of dielectric reference standards.

LASER WORK GOES ON APACE

Developments are coming fast in the field of laser research. Surgeons, astronomers, and other specialists are finding uses for the concentrated beams of light.

In broadcasting, General Telephone and Electronics Corp. has demonstrated a system that it says could transmit television and telephone signals over a laser beam.

The system, the firm said, theoretically can handle much more volume than today's best similar system, the microwave relay of radio signals.

General Telephone spokesmen said that much more research, maybe 5 to 10 years' worth, would be needed before the system could be put to these uses economically.

The Third International Symposium on Quantum Electronics, held in Paris, last month, forecast a bright future for the accelerated development of Laser devices. Those in attendance came away with the very strong feeling that the foreseeable future will contain a fork in the road—basic scientific work and practical applications will proceed concurrently, but independently.

The interest of the delegates was particularly caught by a report of the production of single-sideband suppressed-carrier modulation of light at frequencies up to microwave. Modulators, demodulators, mixers and amplifiers were shown, discussed and theorized. Compagnie Francaise Thomson-Houston showed a ruby-laser telemeter which can read out a range with an accuracy of 2 meters at 10 kilometers; .02% accuracy in a field which only a few years ago was non-existent.

The Ford Motor Company research laboratory reported second-harmonic generation at a conversion efficiency of 22 per cent and detectable third-harmonic generation.

And so goes the search for practical devices which can be reliably and routinely used outside the laboratory, putting light to work in the communications industry.

TO MONITOR THE MOON

The National Aeronautics and Space Administration plans to launch 18 unmanned mooncraft called Rangers in the coming months, in order to get a closer look at the crater-pocked surface of our only natural satellite. Five lunar craft have already been sent skyward, but none have reached their destination.

NASA must keep trying, however, for the US hopes to launch a *manned* flight to the moon by 1971.

The next group of Rangers to fly, it is thought, will be chiefly television stations in space. They will carry a battery of six television cameras each and send back pictures until the moment they smash into the moon—so hard they will instantly vaporize while digging new craters.

It is possible that later Rangers will attempt to crash-land with instruments which will tell, by radio, the firm-

ness of the moon's surface and something of the basic lunar structure.

To follow up the Rangers, plans now call for the launching of 12 more complicated "flying laboratories" called Surveyors. The design of these lunar vehicles has not been decided upon, pending determination of the size of the rockets which will be used to lift them from Cape Canaveral.

The Surveyors will be of two kinds, immensely complex, if present plans hold. One model will land softly, take television pictures in black and white, color, and stereo. It will also reach out, grab samples of the moon's surface, chew them up, analyze them, and report the findings to earth.

A Surveyor-Orbiter will circle the moon as a satellite, taking pictures that will enable cartographers to map the whole surface.

HANDY DISTRESS BEACON

A simple distress beacon developed by the Canadian National Research Council underwent its third and final trial last December and was acclaimed by the Royal Canadian Air Force as an invaluable aid for searchers seeking distressed pilots, lost yachtsmen and hunters.

Waterproof and buoyant, the device is put in operation by breaking a seal and pulling out its aerial to its full length. The antenna is a quarter-wave dipole operating at 243 mcs. The lower part is formed by a cylinder inside which are the transmitter and battery. The battery lasts 90 hours.

The complete unit weighs only three pounds including the mercury battery supply, which weighs one of those pounds.

Initial tests, conducted off Halifax, Nova Scotia, show that the maximum range of the beacon is between 30 and 34 miles. Subsequent trials were carried out over Lake Ontario. The signal from the distress beacon was operated on the M.V. "Radel II" and was picked up and identified within 35 minutes from a plane's takeoff at a distance of 27 miles. The final trials confirmed the 34-mile maximum range as well as the remarkable reliability of the device. Four times out of four tries, the distress beacon guided an RCAF "Albatross" over the Canadian Coast Guard vessel "Porte Dauphine" with pinpoint accuracy.

●
Despite the well-known speed of travel of radio waves, it takes approximately 6½ minutes for a pulse to make a round trip to the planet Venus.

●
There are about 351.5 million radio and 115 million television receivers in use in the world. In addition, some 38.9 million "wired speakers" for public listening are estimated to be in use, chiefly in Europe and the Far East.



STATION BREAKS

'ALEX' ALEXANDER RETIRES

A KNX, Los Angeles, studio was the scene of both a happy and somewhat poignant event on March First. The occasion was a farewell party for Adolph "Alex" Alexander, marking the twentieth anniversary of his employment at the station and his sixty-fifth birthday. Alex can be justly proud of his record as an engineer at the Columbia Square studios and the many friends he has made over the years.

A large turnout of his associates expressed their esteem and admiration and, by the presentation of several gifts, gave Alex something special to cherish among his memories. Among the "gag" gifts was a handsomely-embellished key to the "Executives' Wash Room" and, among the more practical ones, a portable television receiver.

At retirement, Alex vacated the 18th seniority spot on the list of CBS-Hollywood engineers. He was initiated as an IBEW member by Local Union 40 and has maintained his membership in Local Union 45 since its formation in 1947.



Views of the crowd at Alexander's retirement.

SOCIETY CITES LEONARD



Harry Leonard, business manager of Local 160, Minneapolis, Minn., is alive and well and cured of cancer, thanks to his habit of an annual physical checkup. His doctor saw the early symptoms in time. He is shown here at home with his daughters. The American Cancer Society is telling the nation about Leonard and many other cured cancer cases, as it conducts its annual Cancer Crusade this month. Medical men consider a former cancer patient cured if he is still alive and hearty five years after surgery, radiation, or X-ray treatments.

UNION INDUSTRIES

The AFL-CIO Union Label and Service Trades Department holds its annual Union Industries Show May 17-22. This year it's at the St. Louis Arena, St. Louis, Mo., and again IBEW will be a major exhibitor. Admission is free, and there are free gifts and souvenirs. The exhibition is a dramatic showcase of union crafts and union products. Many unions and employers have exhibits in the show. IBEW members in the St. Louis area are urged to attend.