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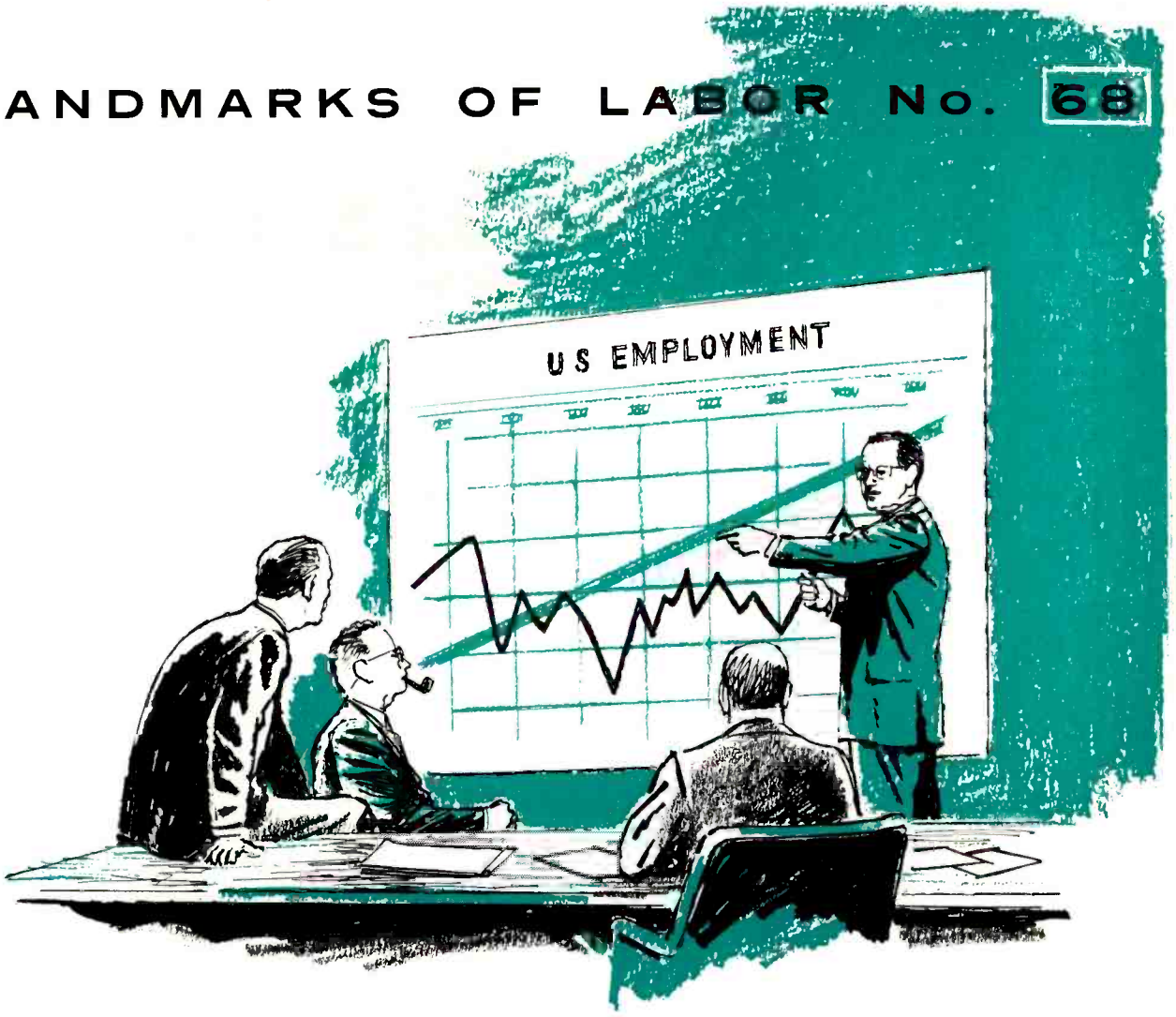
LANDMARKS OF LABOR No. 68



Employment Act of 1946 ☆ ☆ ☆ ☆ ☆ ☆

Unemployment has been the plague of laboring people since men began working in an organized society. Efforts to soften the blows of joblessness or to prevent unemployment altogether have commanded attention on the part of labor leaders and public officials for generations.

While the problem is by no means solved, important steps are being taken. One such step was made when Congress enacted the Employment Act of 1946. President Harry S. Truman when signing the bill into law said the Act "is not the end of the road but the beginning" and in 1956 on the tenth anniversary of the passage of the Act said "we are only at the beginning of the road leading towards a stabilized economy of continuing high and steady employment."

This legislation is distinguished through its proclamation of a new responsibility of Government, namely, the promotion of conditions for employment opportunities for those able, willing and seeking work. Much has been done in an orderly and scientific assessment of job opportunities and in studying ways and means of maintaining high employment. While much remains to be done, organized labor can regard the Employment Act of 1946 as an important landmark in the long road toward conquering the collective and private disaster of unemployment.

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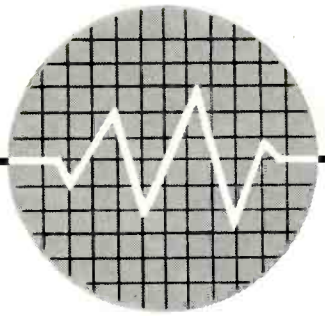

TECHNICIAN ENGINEER

VOL. 14, NO. 4
ALBERT O. HARDY, Editor

in this issue

the cover

Representatives of the Aircraft Division of the Hughes Tool Company, Culver City, California, hover above a busy California throughway in a demonstration of the versatility of their traffic-control helicopter. Almost two dozen U. S. radio stations now present traffic reports via helicopter to their listeners. For more on the subject see Page 4.

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 1964 figures: February, 1965—108.9; February, 1964—107.7.

commentary

The American Medical Association has renewed its war against the Administration's program to provide health care for the aged under Social Security. That is, of course, its right; but it stops being right when the association pretends that what it is fighting is "the invasion of voluntary relationship between the patient and the physician."

Nothing in the medicare plan interferes in any way with patient-doctor relationships. All that is proposed is a Federal insurance system to help elderly persons pay the cost of hospital and nursing care. Each person would have the same freedom he now has to choose his physician or hospital. The Government would have no supervision or control over the practice of medicine by any doctor. It would have no new voice in hospital administration or operation.

President Johnson and the Democratic party, with its strengthened majority in the new Congress, have assigned medicare a top position on their 1965 legislative priority list. If the A.M.A. questions the program's financial soundness, it can serve the cause of good health best by putting forward its ideas on how an adequate insurance system ought to operate. It makes no useful contribution by continuing to suggest that "the foundation of the nation's protection against disease and suffering" will crumble if the aged have a dependable instrument for helping to pay their hospital bills.

Editorial, New York Times, December 3, 1964

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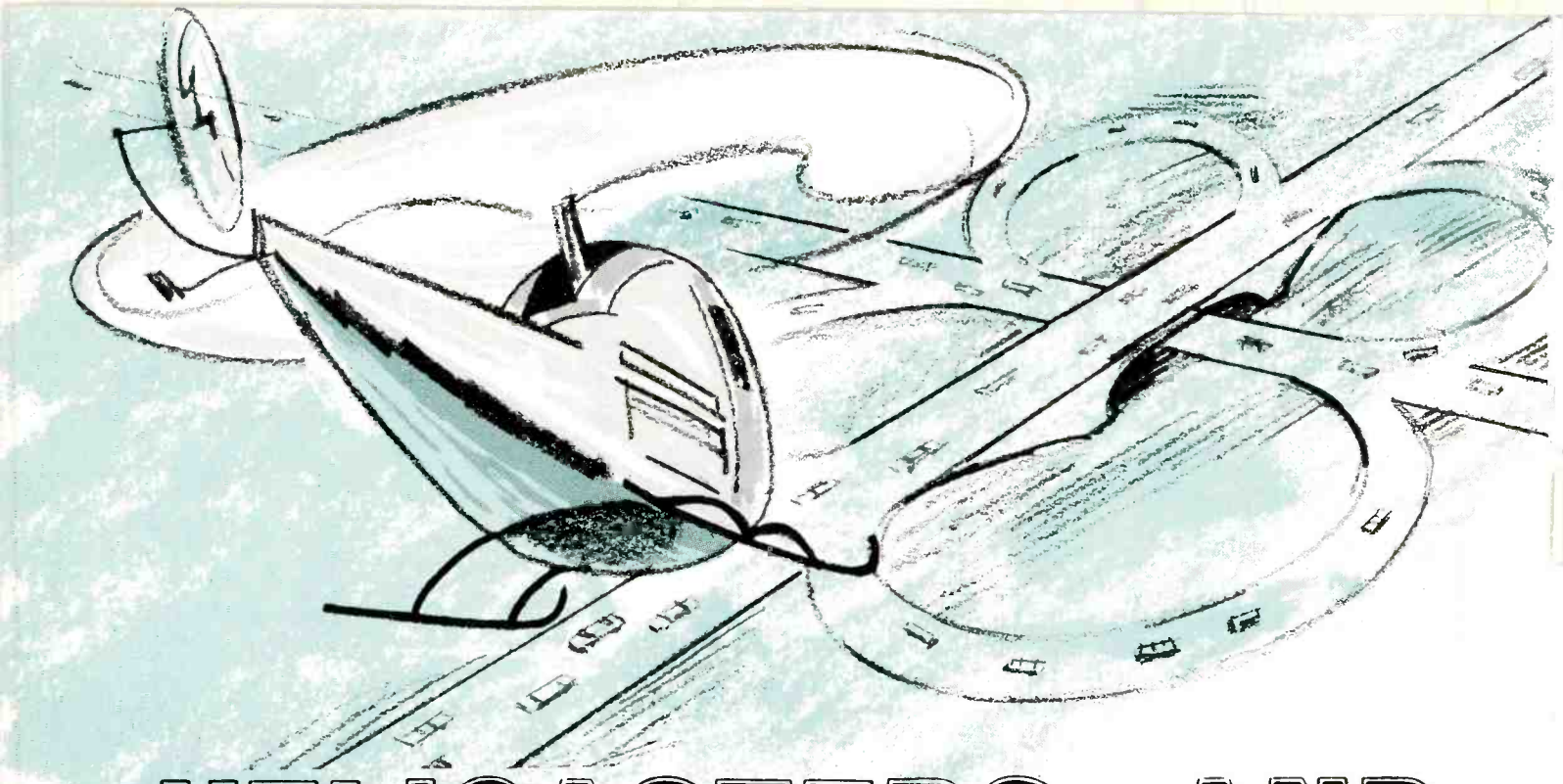


HELICASTERS AND

Radio stations in some 22 congested cities now offer rush-hour traffic reports

"Fire equipment is responding in the unit block of N Street, S.W. and in 17th and Gale Streets, N.E. We have an accident northbound on the Baltimore-Washington Parkway just after you pass Route 495 . . .

"There is a disabled bus on M Street that is tying up the inbound traffic on Key Bridge . . . Washington's beautiful bridges are famous all over the world—not for their construction, but for their obstruction. This is Marie, along with Dan the helicopter man signing off for the day. Don't forget to drive home this evening with Dee. . . . "

The voice, coming softly and soothingly through the speakers of countless crawling Washington-bound commuters' cars, belongs to Marie McDonald of Station WWDC, one of the two first feminine airborne traffic-watchers in the country. The other belongs to WWDC's evening commuters' angel, Dee Davidson. Since February 15, both of them have been helping Washington metropolitan area motorists avoid some of the city's more monumental traffic jams.

The attractive gals—an innovation which is good for public relations as well as listener attention—are not alone in the muggy skies over Washington. For four years, another Washington station, WMAL, has been telling motorists where there are traffic snarls and where to find rapidly-moving alternate routes.

Are two helicopters too much coverage for one city? Not at all. In many of the nation's largest cities, choking on an indigestible diet of traffic, two or more are

used. One simply can't keep up with the urban sprawl.

Out of 22 major U.S. and Canadian cities which now use helicopters for traffic reporting, six have at least two stations operating "choppers," and a number of individual stations operate more than one aircraft.

In Philadelphia, one of the best-covered of American cities, the combined capabilities of two helicopters, four mobile ground reporting units and a central police and fire report monitoring station are brought to bear on the traffic problem. The Philadelphia operation is somewhat unique, because it is not operated by a radio station. Sponsored and funded by the Atlantic Refining Company, the broadcasts are aired by nine subscribing stations. They pay nothing for the reports, but run adjacent commercials for Atlantic at no cost to the company. It is estimated that the service costs the firm about $300,000 a year.

An even more impressive station-owned terrestrial and aerial fleet monitors the sprawling traffic of Los Angeles, a city which moves more than 1.5 million passenger cars each day. In addition to five ground mobile units, station KMPC, Los Angeles, uses two Bell Helicopters and a small twin-engined Beech aircraft. The total investment for KMPC is around $750,000.

KMPC, whose engineers are members of Local Union 45, will not let anyone else pick up the tab for the sizeable annual operating expense. It does, however, get premium rates for adjacent spots.

Probably the most extensive aerial reporting service operated by a station, KMPC's "Airwatch" horizons extend far beyond the metropolitan limits of Los Angeles. The twin-engined Beech Baron aircraft easily covers the countryside within 200 miles in any direction. Regular surveillance extends from Santa Barbara to the Mexican border, and from Palm Springs to Catalina Island, 20 miles out in the Pacific. On weekends, the flying reporters will be telling listeners about the tides at Catalina, or the long wait to get through customs at Tijuana.

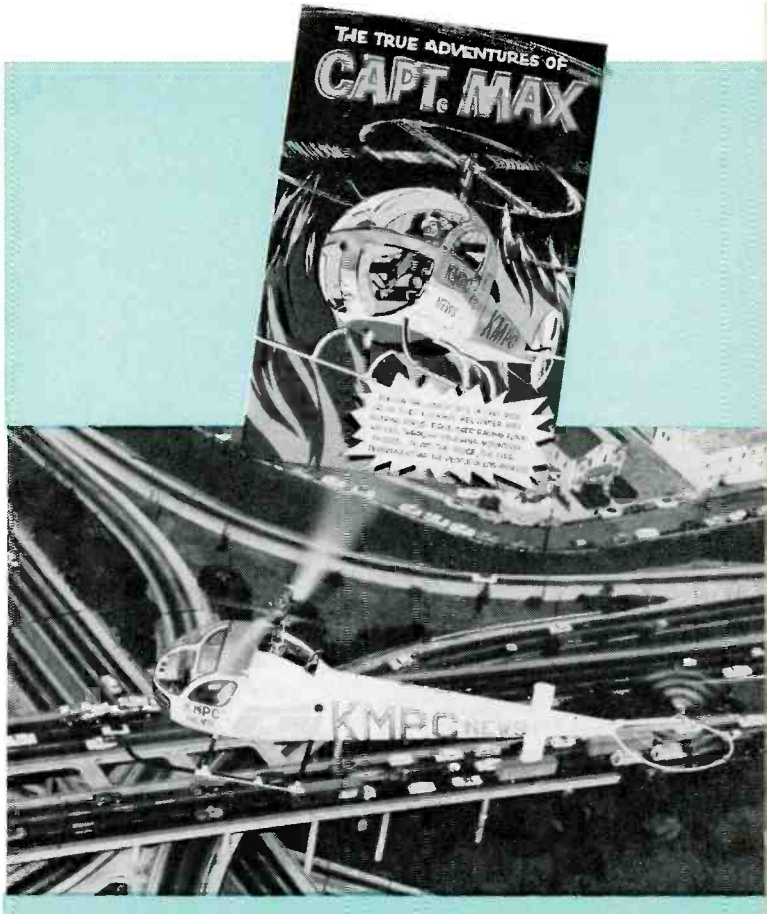
Station WGN, Chicago, where members of Local 1220 man the equipment, has been in the aerial traffic reporting business since its pioneering days—1950 to be exact—when WGN began by reporting summer holiday traffic. In 1957, the station took on the task full time, with daily rush-hour copter reports. By 1963, the fleet had been increased by the addition of a stand-by helicopter and a small single-engine fixed-wing airplane. After a very short stint with the airplane, however, WGN found the Chicago area of coverage too small to justify the speed advantage. Inability to hover and altitude restrictions hampered the Cessna's efficiency. A third helicopter replaced the light aircraft, giving WGN a boxscore of two choppers on constant patrol during reporting hours, and one on stand-by.

A number of other IBEW-staffed stations are offering copter traffic reports to their listeners. Among them are KFMB, San Diego, Calif. (Local Union 45); KMBC, Kansas City, Mo. (Local Union 1259); WHDH, Boston, Mass. (Local Union 1228); WFBM, Indianapolis, Ind. (Local Union 1225); WHIO, Dayton, O. (Local Union 1266); WKYW, Louisville, Ky. (Local Union 1286); and WDSU, New Orleans, La. (Local Union 1139). All these stations use Hughes copters.

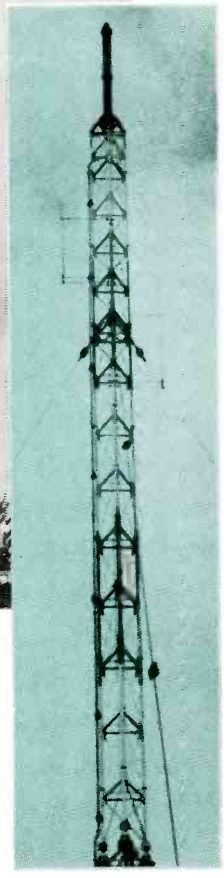
Station WINS, New York City, which employs members of Local Union 1212, is reported to have tried helicopter traffic reports for a time but gave up in frustration over the size of the city's mammoth traffic activity during the rush hours.

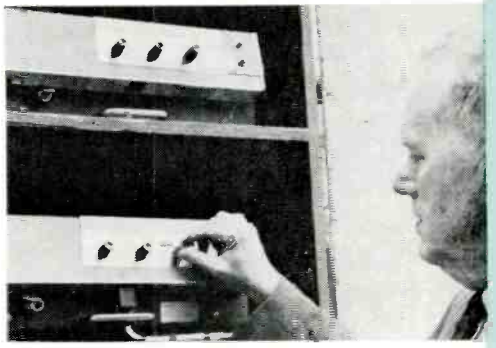
This leaves the bird's eye viewing of Knickerbocker traffic tieups to "Flying Fred" Feldman of WOR, who operates twice a day out of LaGuardia Airport.

TRAFFICOPTERS



The adventures of KMPC's flying trafficaster, Captain Max Shumaker, have been immortalized in a comic book (top) published by the station as part of its public relations program. Immediately above, the for-real Capt. Max whirs across one of Los Angeles' interleaved intersections. On the facing page Baltimore Mayor Theodore R. McKeldin gets set for takeoff on WFBR's inaugural trafficopter flight over the Maryland city.





Above: WWDC's chopper comes in for a landing at the station. At right, the station's FM antenna tower, which mounts two mobile-unit receiving antennas. Other pictures, top to bottom, show Charles Shaffer, transmitter supervisor, checking the mobile transceiver in the helicopter, the two relay units at the base of the tower, and Don Rice, production supervisor, a Local Union 1200 member, operating the control unit inside the station.

In Washington, WWDC's two women traffic reporters compete with WMAL's all-male crew, which is affiliated with the Metropolitan Police Department. Both pilot and shotgun-observer seats in the WMAL chopper belong to traffic officers. A similar police tie-in for many of the other services often has turned the vehicles into airborne angels of mercy and extremely effective extensions of law enforcement power.

WMAL's helicopter often lends a hand in police work: rescuing dunked boatmen from the Potomac River, scouting the scene of a robbery for signs of the culprits, or landing at the scene of an accident to provide emergency traffic and medical assistance.

Perhaps the granddaddy of them all, for spectacular heroism and helicopter daring, is KMPC's Capt. Max Shumaker. A former Air Force pilot who served in WW II and Korea, Capt. Max is not a police officer, but has a receiver on board for monitoring police calls, like all of KMPC's mobile units. Wherever there's trouble, Capt. Max puts aside the traffic reporting long enough to help, if he can. To date, he's credited with saving 12 lives and locating more than 250 stolen cars. When the Baldwin Hills Dam gave way in 1963, he was directly overhead. After he turned in the first report of the disaster, he stayed over the scene, reporting developments and joining in rescue operations.

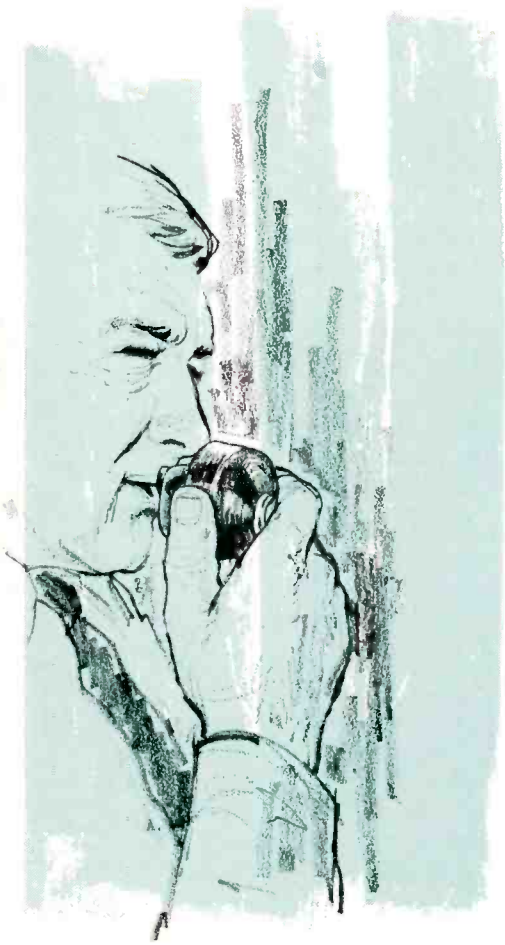
The help and rescue angle is a strong thread in any story of helicopter traffic reporting. Just about all of them have put the unusual capabilities of the helicopter to good use in emergencies.

Despite the glamor of the traffic reporting role, and the cost of helicopter operation (about $85 an hour), the radio equipment necessary is minimal.

In Baltimore, where station WFBR operates its Traffi-copter 130 service in conjunction with the police department and the city's Department of Transit and Traffic, an 8 watt Motorola Dispatcher unit is powerful enough to cover the city. The helicopter's altitude is an advantage in squeezing the most distance out of the 8 watts.

Normal conversation in a helicopter is impossible. It's necessary to talk loudly and directly into the listener's ear to get a message across. Because of the din, noise-cancelling mikes are essential. WFBR uses a Shure model 488T, which rejects virtually all sounds more distant than 3 or 4 inches.

Pilot and observer both wear headphones. The pilot is tuned in on standard aircraft radio equipment to traffic control and navigation facilities. The observer



At top left, the half-light of dusk catches Chicago's WGN helicopter over the first lights of the city. At the left—a trafficaster's view of one of Washington's superhighways, from the perspective of 900 feet. Above, kittenish Marie McDonald and Dee Davidson in flying togs. Marie handles the morning trick, while Dee oversees the busy, late afternoon traffic.

has two—one tied in with a two-way unit which keeps him in contact with the Baltimore Traffic and Transit Dispatcher, for exchange of traffic information off the air, and another connected to the output of a transistor radio tuned to WFBR. The observer gets his cues directly from the announcer.

Signals from the 8-watt unit for live traffic broadcasts are picked up by a base station at the AM transmitter site for relay to the studio. Operation is by remote control from the studio, by telephone line. WFBR's engineers are members of Local Union 1200.

Washington's WWDC helicopter, a Hughes 300, which is one of the smallest commercially available for the purpose, has room for pilot Dan Rosenson, either Marie McDonald or Dee Davidson, a 10-watt G.E. TPL transistorized mobile transmitter-receiver and a broadcast band portable. Both of these radio units are mounted on a pedestal between the seats.

The two-way unit is operated on 161.64 MC, within the VHF band set aside by the FCC for mobile-to-studio relay use. In setting up the equipment, WWDC has also installed a second antenna and ground relay unit, for simultaneous operation on its two assigned relay frequencies if the need arises.

Ground relay units are located in a weatherproof box at the base of one of the station's transmitting towers. Initially, the system was tried with the ground units inside the studio, but WWDC gets better results with the relays outside. They are GE KD 884 "desk type" remote transmitter/receivers.

During testing, several microphones were tried, but WWDC's transmitting-plant engineering supervisor, Charles R. Shaffer, finally selected a Shure noise-cancelling model to eliminate competition from the engine and rotor blade whine.

The girls use earphones to monitor both the traffic radio and the station's air broadcasts.

For about a week before Washington's traffic ladies opened up on the air, they made repeated dry runs of the area, learning the names of the streets and landmarks, and polishing their airborne microphone patter. Distinctively feminine, it did not come without some possibly painful self-appraisal. During the dry runs, all broadcasts were taped for later analysis.

Washington seems to have warmed to the new touch in traffic reporting. To a harried driver, grinding his way into the setting sun after a hard day's work, Dee's radio manner can be a soothing balm.

Man can now measure 1/254,900,000th of an inch! . . .

Today's Incredible Accuracies

TECHNICIANS who deal with micrometers, scales, gauges, and the like can appreciate the uncanny precision with which man can now place a satellite in orbit or produce the intricate machine tools of automation.

A glow of appreciation comes to their eyes when they come upon some new measuring instrument which is even more precise than those which went before. What agony they would have suffered in days of yore when knights were bold and their lances were about five cubits long . . . give or take a finger or two!

Ancient man used the most convenient measuring devices available — parts of his body. The cubit (20.5 inches) is man's oldest measurement. It roughly represents the distance between the elbow and the end of the middle finger, and was first used 7000 years ago.

The names of today's units indicate the rude measurements from which they originated. "Mile" is from the Latin *milia passuum*, meaning "1000 paces," each pace being about five feet—a double step.

"Inch" is from the Latin *uncia*, "Twelfth part." "Acre" is from a word meaning "field."

The pound, roughly equivalent to the old Roman *libra* (from which is derived the abbreviation "lb."), was long defined as the weight of 7680 grains of wheat. Hence the "grain" is still the smallest unit of weight in today's common systems.

The Romans had standards for their weights and measures which they kept in a temple in Rome. But when the Empire fell 1500 years ago, these standards were lost. In the Middle Ages, almost every town, and every guild in town, had its own system of weighing and measuring things.

A good example of the inconvenience caused by the lack of invariable standards is this 16-century surveyor's method of measuring a foot:

"Stand at the door of a church on Sunday and bid 16 men to stop, tall ones and small ones, as they happen to pass out when the service is finished; then make them put their left feet one behind the other, and the length thus obtained shall be a right and lawful rood (40 square rods) to measure and survey the land with, and the 16th part of it shall be a right and lawful foot."

The English yard was established by Henry I as the distance from the point of his nose to the end of his thumb.

In 1324 the inch was declared to be the length of three dry barleycorns (grains of barley) laid end to end. The "barleycorn" is still used as unit of length in shoe sizes, which are numbered by thirds of an inch, or "barleycorns," in a system of 13's.

In 18th century Europe, a foot was the length of the reigning king's foot—so there were 280 different sizes in use!

Today's measuring devices are unbelievably precise. Using the wavelength of light as a yardstick on interferometric techniques it is possible to make measurements to 1/200th of a wavelength or .0000001 (one ten millionth) of an inch. The smallest measure used by scientists is the Angstrom unit: 1/254,900,000th of an inch. But the biggest, the Parsec, measures 19,160,000,000,000 miles!

Advances in the field of optical measurements have had far-reaching effects in our defense system — but they've put spiders out of jobs! While one firm, Keuffel & Esser Co., was making reticles (a system of lines in the focus of an optical instrument eyepiece) for submarine periscopes during World War I, and range finders during World War II, it employed young ladies whose job it was to milk spiders for their gossamer which in turn was used to make hairlines on the glass.

In the last few years, K&E has developed equipment that enables it to produce lines on glass reticles as fine as a micron—five times thinner than a spider's thread. Thus the company now does all its reticle work on glass and the spiders are unemployed.

For our space program, specialists in optics have designed tracking cinetheodolites precise enough to measure angles to an accuracy of one second of arc (the angle equivalent to the width of a dime seen from two miles away.) Electronic autocollimators are capable of sensing angular changes to .05 second of arc (the angle equivalent to the thickness of a needle two miles away). Complex guidance systems for our Polaris missiles depend upon optical components which enable the missile to be fired "true" from a submarine 50 feet below the surface of the water while a severe storm is causing the ship to pitch, yaw and roll in unpredictable waves.

But while these may seem like giant steps in the field of accurate measurement, the real challenge lies ahead. Most of us know what a slight deviation means to a rocket heading for the moon. The fantastic requirement for accuracy and precision hit home under such conditions. The challenge has to do with measuring angles and distances in space, and in relation to the axes of moving bodies and vehicles in the universe.

Somewhere between the production line and perhaps a distant thought in the mind of an engineer, lies the answer. . . . Or is this a completely accurate estimate?

Why are labor unions against 14(b)?

SECTION 14(b) of the Taft-Hartley Law specifically permits states to enact "right-to-work" legislation, hamstringing trade unions and restricting free collective bargaining. These laws prohibit union security agreements in labor-management contracts, regardless of the wishes of employers and their employees.

They are completely contrary to federal policy which, since passage of the Wagner Act in the 1930s, has encouraged free collective bargaining as the cornerstone of industrial democracy.

The "right-to-work" appeal has been a good game for union-busting reactionaries—for the National Association of Manufacturers, the U. S. Chamber of Commerce and right-wing extremists. They have everything to gain, nothing to lose.

But it has been a costly, bitter game for the working people, for their unions, and for the nation. The best unions can hope for in any "right-to-work" battle is to defeat the proposal. Victory, in this sense, simply means holding your own. There is no gain to be made, everything to lose.

This is why organized labor in 1965—during the current session of the 89th Congress—is making a determined effort to repeal Section 14(b) and open the gates once more to union shop agreements in all 50 states of the Union. (Nineteen states still have the so-called "right-to-work" laws on their books, denying union shop protection to millions of workers within their borders.")

'Them? My Partners'

Working Man's Viewpoint

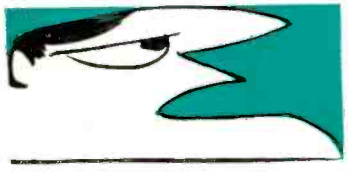
I don't want a "Right-to-Work" law, but if there is instituted such a law in this state, there are a few other things, I would like to have included in it:

1. *If I were a business man, I would want to use all the facilities of the Chamber of Commerce and the Retailers Association without belonging to them or paying any dues or fees to them.*
2. *If I were a manufacturer, I would want to use the facilities of the National Manufacturers Association without cost.*
3. *If I were a Doctor, I would want to be free to practice medicine anywhere I wish without belonging to the American Medical Association.*
4. *If I were a Dentist, I would want to be able to practice dentistry without belonging to any Dental Association.*
5. *If I were a Lawyer, I would want to practice my profession without hindrance from a State Law requiring me to belong to the Bar Association.*
6. *If I were an Engineer, I would not want my employment to be contingent upon my belonging to an Engineers Association.*
7. *However, I am JUST A WORKING MAN. But, if the state can pass a law which will protect my "right" to ride the coat tails of my labor association without paying my share of the Association's expenses, I think the same law should entitle me to live in a community and enjoy all the benefits of city facilities without paying taxes to the city. It seems to me to be the same principle exactly.*

As a matter of fact, if I can be a free-rider of a labor union, I should also be protected by state law in my "right" to be a free-rider of any collective enterprise, be it city, county, state or national government, club, church or whatever it may be. I don't know who will get together and provide these facilities for my free use, but I imagine it will be the same forward-looking people who are providing them at the present time.

THE LABOR-MANAGEMENT WHIRL

As reported by Les Finnegan in CAVIL-CADE, *distributed by* Press Associates, Inc.



Husband Nags for a Living

• *IN SANTA FE, N. MEX., the story went like this. First housewife: "What does your husband do?" Second housewife: "He's an efficiency expert in a manufacturing plant." First housewife: "What are his duties?" Second housewife: "It's hard to say, exactly, but if a woman did it they'd call it nagging."*

Management Has Elephantine Problem

• *IN NYERI, KENYA, the first case on record of a group of union workers demanding—and getting—overtime pay because of a herd of elephants, came to light here recently.*

A number of union construction men were busy with renovations of the famous Treetops Hotel, when suddenly a herd of 200 elephants appeared beneath. At first the workers paid no attention because the elephants came once a day to visit the waterhole near the hotel, but this time, for some reason, they didn't leave when they had finished drinking. Worse than that, they refused to be chased away by the usual banging of pans and yelling. And every time one of the workers made an attempt to climb down from the hotel, several elephants would start toward him menacingly. It was only after 18 hours that they were finally driven away and the workers had a chance to go home.

Before escaping, however, they held a meeting and resolved to demand overtime pay and also to ask for an "occupational hazard" bonus in compensation for having been kept away from wives and families.

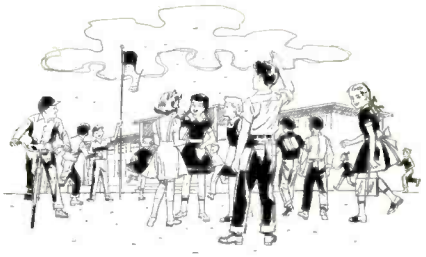
The Sensory Disc Knows All

• *IN NEW YORK CITY, a captive audience to end all captive audiences was proposed to a meeting of the Magazine Advertising Bureau by advertising executive A. Edward Miller. According to the N. Y. Herald Tribune, Miller introduced "a revolutionary new system for measuring magazine readership, 'SD,' standing for Sensory Disc, an instrument inserted under the subscriber's skin which sends back impulses to a Super Panel." Bigshot ad tycoons didn't know whether Miller was being serious or not when he continued to explain that "After surgery every sensory reaction of the consumer is recorded automatically. We will know what ads were seen and we will know the impact with which they entered the brain of the respondent. While the advertising implications of 'SD' are obvious, we are rather intrigued with the other possibilities of the technique. We will know whether the respondent really loves his wife, enjoys TV, votes Democratic, or really hates his job."*

But Does He Wear a Union Suit?

• *IN LOS ANGELES, union oil workers insisted they had no objections to one of the largest companies in their industry electing as president a man named Fred Hartley—the same name as the co-author of the detested Taft-Hartley Act. But why, oh why, asked the labor men, did a Fred Hartley have to become head of the Union Oil Company?*

OUR BIG BILL FOR EDUCATION



Cities Suffer As Affluence Moves to the Suburbs

A LARGE SCALE ASSAULT on the inadequacies of our national education system, and indirectly on poverty which is inextricably tied to lack of education, has been mounting in Congress. It is an important piece of President Johnson's Great Society program—one which can have a lasting and permanent effect upon the productive capabilities of young people and adults.

The present cost of inadequate education is high. The President, in his special message to the Congress on education, noted that one student out of every three now in the fifth grade will drop out before finishing high school at the present rate. This adds up to about a million young people each year. And although it may cost as much as $450 a year for a student in a public grade or high school, the bill for a family on relief is $2,500, and for a criminal in a state prison, $3,500 each year.

The biggest single proposal, for $1.25 billon worth of assistance to elementary and secondary schools, was moved into closed-door work session of a House education subcommittee in February, after a number of witnesses, among them the Legislative Director of the AFL-CIO, had a chance to express their views about the legislation.

Johnson's proposal was keyed to low-income children —those from families at the bare subsistence level of $2000 or less in income each year. In an effort to overcome historic resistance to assistance to private schools, Johnson has asked only that federal funds be of "maximum service" to pupils attending private schools, as well as the directly benefited public school districts.

While this House subcommittee was considering the elementary and secondary school aid proposal, a Senate subcommittee was conducting hearings on the same proposal.

Elsewhere in the House, another prop in the education program—a $260 million bill for aid to colleges—was going through the subcommittee hearing stage.

This college aid would be earmarked mostly for college libraries, small colleges and children of lower and middle income families.

When these measures are finally forged into a law, a possibility considered likely during this session of Congress, the national educational system should be strongly bolstered.

It would be the public school district, under this program, which would receive the direct grants for teacher salaries, additional teachers and construction. But improved services, such as better school libraries and special courses taught by well-trained teachers, would be available to pupils of private as well as public schools. This would also be true of improved instructional materials, and the community education centers.

These community centers would provide a broad range of special courses and regional education "laboratories" for research and teacher training.

During House hearings on the elementary-secondary school aid proposal, AFL-CIO Legislative Director Andrew J. Biemiller cited labor's long struggle in behalf of free public education. The President's omnibus program of aid, Biemiller pointed out, is rallying the support of the working man and he pledged the full support of the Federation.

"Concern for the educational needs of low income children is no new-found interest on the part of organized labor," Biemiller said. "The story of labor's pioneering struggle to bring the public schools into being has often been told. What is not so well known is that from its earliest statements in support of public school, labor expressed special concern for the educational needs of children from poor families.

"In 1829, a group of workers in New York mounted a campaign to establish a system of universal free public education. Their platform included one of the earliest and most important statements of labor's educational goals.

"Among the things which they said was that they wanted a school system 'that shall unite under the same roof the children of the poor and the children of the rich.' The educational roof which today must unite the children of the poor and the children of the rich is the roof of federally-assisted equal opportunity."

This goal, Biemiller indicated, is drawing closer with the proposed legislation. It is, he said, "impressive fulfillment" of a key labor goal of substantial Federal aid to schools which serve large numbers of culturally-disadvantaged children from low-income areas.

These children may have the seeds of genius just as surely as those from the middle and upper economic brackets, Biemiller said.

The migration of more affluent households into the suburban areas has left city centers with a high proportion of underprivileged children. As with high incomes, so has high tax revenue slipped away from the cities. The result is greater need for educational assistance in the cities, and less money to provide it.

Biemiller pointed out that "while suburban school outlays often exceed $1000 per year per pupil, few cities spend half that much and many spend less than a third."

But the farther-out rural areas also are in need of education assistance. One quarter of all the school districts in the United States have just one teacher. In these one-teacher districts, the educational cost for each pupil is high, because of transportation and other difficulties related to the remote location, while educational advantages are below the suburban level.

An additional bar to general improvement in the quality of education, pointed out by Biemiller, are the "inequalities of resources among the various states and communities. . . . The out-of-date tax structure of most states and most cities are ill-equipped to reach the best sources of school revenue. The Federal Income Tax alone is able to do the job guaranteeing equal educational opportunity."

LBJ's Education Plan Backed

The Johnson Administration's proposals for Federal aid to education have received the enthusiastic endorsement of the AFL-CIO Executive Council.

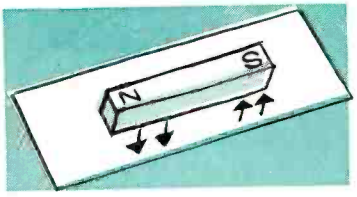
It particularly welcomed inclusion of labor education as a subject for which Federal funds may be spent, describing this as a "step in the right direction."

It also repeated its support for the so-called "Cold War G. I. Education Bill" which would extend educational opportunities to service men not covered by legislation enacted for men who served in World War II and Korea.

The Council, however, expressed opposition to the proposal made by Senator Abraham Ribicoff, Connecticut Democrat, called "tax credit for higher education."

The Council took the position that this would help only upper bracket tax payers, that the aid would be reflected in higher tuition costs and that it would be a handicap for low income bracket workers.

It also reiterated its support for extending public education to fourteen years instead of the present twelve. This would carry boys and girls through two years of junior college rather than cutting them off at the end of high school training.



Superconductivity Explored Further

New Theory Promises Infinite Possibilities

SOME TIME AGO (February, 1961), the TECHNICIAN-ENGINEER reported experiments being performed in the field of cryogenics. Superconductivity by certain metals was found when the temperature of these metals was reduced within a few degrees of absolute zero (—273 degrees centigrade). A few years previously, a Massachusetts Institute of Technology experiment demonstrated that a current, induced to flow in a small metal ring, had not diminished by a measurable amount a year later!

Of course, scientists deprecate the possibility of perpetual motion. Resistance losses, friction losses, the effect of gravity, and so forth appear to preclude the possibility of the existence of a perpetual motion device or phenomena. However, the M.I.T. experiment—if one will neglect the energy-component represented by the constant maintenance of the low temperature involved—came closer to perpetual motion than man ever produced before. Physicists explain the lack of current loss in the ring by theorizing that the lack of electrical resistance permitted the undiminished electron flow.

Such experiments are not only of laboratory interest, of course. The use of superconductors could bring about lossless power transmission, more efficient motors, extremely efficient amplifiers—even the lack of repeater amplifiers on telephone, telegraph and teletype circuits. The drawback is—how can a long line be kept as cold as is apparently necessary? So the search continues for superconducting materials. Thus far, the alloys which have shown some promise become superconductive about 18 degrees above absolute zero, much too far below readily obtainable refrigeration systems.

The search has now turned to non-metallic substances. W. A. Little, an indefatigable pioneer in superconductivity, has proposed research in synthesizing organic substances and points out that some organic molecules may afford superconduction at ordinary temperatures. However, he points out that the construction of such molecules must be so precise as to strain the best facilities of organic chemistry.

It seems clear that electrical losses occur when thermal agitation of electrons is present—and thermal agitation ceases at the general level of absolute zero. The state of electrons being highly coordinated in the absence of other stimuli, only the desired flow takes place.

A further phenomena in superconductivity is that the highly-coordinated motion of electrons cannot be influenced by an external magnetic field. This has been demonstrated by the positioning of a bar magnet above a sheet of superconducting metal. The magnet remains suspended above and entirely free from the sheet! The inability of the magnetic field of the magnet to penetrate the superconductor provides an invisible "cushion" on which the bar rests. Now we have progressed from perpetual motion to levitation.

If the hypothetical molecule can be produced, obviating the need for super-cold conductors, all kinds of advances can be made in many fields of human behavior and even present space age accomplishments will seem ordinary and simple.

What Have You Done For YOU, Lately?

Where is YOUR Skill Level?

Perhaps an appropriate title for this article is "Have You Read Any Good Books Lately?" This is not just an idle or a conversation-stimulating question. On the contrary, consider this question carefully, take inventory of your capability, evaluate your present technical knowledge and whether your value to yourself is greater today than it was a year ago, five years ago—or even yesterday. And don't neglect to reflect upon what you may have once known but through disuse have forgotten.

Your maintenance of skills, your skill improvement and your overall ability are personal assets just as valuable as money in the bank. More valuable, actually, because of their future availability to afford higher pay levels and to provide opportunities for promotion or for a change to a better job.

Try a few questions like these, for size:

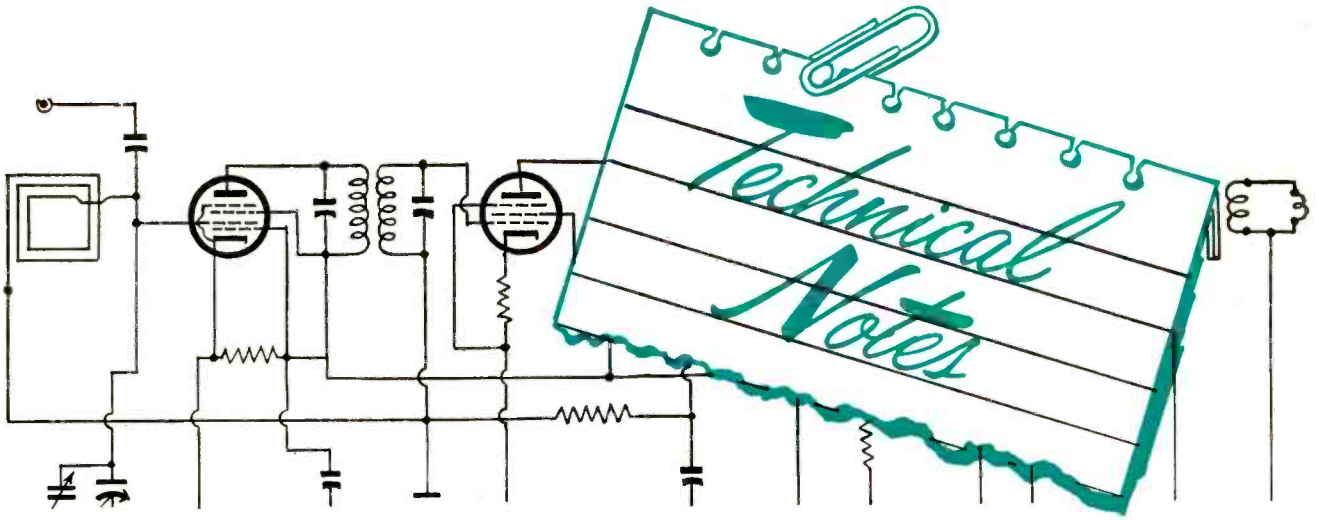
1. ***Name four causes of distortion in an amplitude-modulated RF amplifier output.***
2. ***A series circuit is made up of 12 ohms resistance, 15 ohms inductive reactance and 40 ohms capacitive reactance. If an a.c. current of 5 amperes flows in this circuit, what is the total voltage impressed across it?***
3. ***What is the resonant frequency of a parallel circuit of 150 microhenries and 160 micromicrofarads?***
4. ***What is the db loss involved in bridging a 600 ohm audio line with a 20 K ohm to 600 ohm transformer (assuming 100% efficiency in the transformer)?***
5. ***The bandwidth required to pass a 50 mc. AM signal whose maximum modulating frequency is 2 mc. is (a) 52 mc., (b) 4 mc., (c) 104 mc., or (d) 2 mc.—which one?***
6. ***What determines the maximum peak inverse voltage rating of a junction rectifier —the ability of its mounting to dissipate heat, the melting point of the semiconductor, the zener voltage, or the arc-over voltage of its terminals?***

Finally, and again, have you read any good books lately? Why not re-scan the old standby, "Television Broadcasting," by Howard A. Chinn, McGraw-Hill Book Company (1953). How about "Video Tape Recording," by Julian Bernstein, John F. Rider Publisher, Inc. (1960); or the Broadcast Engineering Notebook Volume 1, "Television Tape Fundamentals" by Harold E. Emmes, a Howard W. Sams publication of 1962. A new (1964) edition of "Color Television Fundamentals" has been published by McGraw-Hill and its author, Milton S. Kiver, has done an outstanding job of detail.

If you've forgotten the configuration of oscillators, your Hartley, Colpitts, Ultra-audion, et al, they will quickly come back to you in a review of Irving M. Gottlieb's "Basic Oscillators," a 1963 publication of John F. Rider. And if you've been confined to a studio operation for some time, the subject of "Radio Transmitters" is a book by Laurence F. Gray and Richard Graham. Published by McGraw-Hill in 1961, it is a valuable reference volume in 1965.

Broadcasting and electronics are fast-growing industries. To keep abreast of change in terminology and technology, it's a good idea to read the periodicals in the field, too. Technical publications are often on the local newsstand, or they can be obtained regularly by subscription. Though it does not go into much detail in its articles, the TECHNICIAN-ENGINEER should be on your regular reading list, too.

Your library shelves may either be dusty or vacant, but don't let a shortage in those respects result in a shortage of your knowledge. You owe it to yourself to keep up-to-date and to stay brushed-up. The job you save—or progress to—may very well be your own.



LOOK MA, NO SECRETARIES

A most lamentable state of affairs could develop from some research now going on in Japan. Engineers at Kyoto University are working on a phonetic typewriter, called a Sonotype, which could short-circuit the need for typists in a business office. Reportedly nearing perfection, the machine takes voice from microphone input and directly translates it into printed words.

The bugs may be worked out in two or three years, with commercial production possible by 1970 to 1972. The President of the Office Employees International Union, Howard Coughlin, who was introduced to the machine on a recent trip to Japan, estimates that introduction of a perfected model in the U. S. could eliminate jobs for 1.5 million secretaries, stenographers and typists.

Research on similar phonetic typewriters is also being conducted in the U. S. by RCA and in Switzerland.

One question: Can you send them out for coffee?

SHAD SITUATION

Man's inquisitiveness leads him to all sorts of electronic excesses. We have seen, in past issues of THE TECHNICIAN ENGINEER, how Man has eavesdropped on bears' home lives . . . how turkeys have been electronically tracked . . . how St. Bernards can be equipped with walkie-barkies so hapless victims of the storm can call for another brandy. . . .

Now, however, has come the crowning achievement of all . . . wiring shad for sound!

The shad is a little fish that never did any real harm to anyone. Mostly, shads just swim around, school up with other shads, and lay oodles of eggs. These eggs are highly-prized as shad roe.

Several years ago, the shad were wild about the Susquehanna River and Chesapeake Bay into which it flows. But then men began to (1) build dams on the Susquehanna and (2) pollute the Susquehanna. This made the shad sad . . . so sad they quit swimming up the Susquehanna to lay their eggs. (Shad live in salt water but lay their eggs in fresh).

Now the Federal Government, interested in all things, is considering whether the shad would consider going up and down the Susquehanna if it was cleaned up and fish ladders built around the dams. So they're transplanting shad from the Columbia River into the Susquehanna and tracking them to see what the shad do.

It's hard to keep track of fish, what with them swimming madly about and disappearing into muddy spots and grass and things, so the wildlife people came up with a new wrinkle. Now they're tagging the shad with a kind of a tag that gives off a sonar tone. The biologists, equipped with hydrophones, now can track the shad all over the place, listening to the shad play sonar sonatas on their scales.

LARGEST MOBILE ANTENNAS

The world's largest mobile antennas, eight 130-foot adjustable dish-type radio telescopes costing $1.2 million, mounted on rails 40 feet apart and extending for three miles with a T spur 7,500 feet long, will be built next year at the California Institute of Technology's Owens Valley Radio Observatory, 250 miles north of Pasadena, California, by Westinghouse Electric. Using the devices, technicians can focus down on objects in space only a few seconds in arc. Each of the eight big dishes will weigh 406 tons. (For a better understanding of the antenna's focusing ability refer to "Today's Incredible Accuracies," page 8, column 2, line 27.)

SEE A MILE-HIGH FLY?

Another super-sensitive radar antenna has been built by technicians at the University of Texas. According to reports, the device, about 18 feet in diameter, has an aluminum foil lens with super-accurate focusing. It is said the device is so exact it can pick up a housefly on the wing a mile away.

CAPITOL RECORDS DELUGE

The influence of the late Nathaniel Adams Coles, better-known as Nat "King" Cole, on the recording industry over the years has been considerable. Over the years Cole was responsible for the sale of $50 million worth of recordings. On the day following his recent death from lung cancer, Capitol Records was deluged with orders for more than 1,000,000 of his recordings, according to TIME magazine. Many retail outlets could not keep pace with the customers' demands for his last album recording: "Love."

CLOSED-CIRCUIT G.E.

More than half the shareholders in U. S. investments are women. Easily the most-outspoken of all the millions of women investors is Mrs. Wilma Soss, who heads up an organization known as the Federation of Women's Shareholders in American Business, Inc. Mrs. Soss' latest statement on the problems of women investors is designed to cause General Electric to link stockholders in various cities by closed-circuit television at the next stockholders' meeting. She says all women, not only those within commuting distance of the annual meeting, want to know what goes on for a variety of reasons, not the least of which might be that they be "in on the know" so they will have something to talk about.

INTERLOCKING LASERS

For the first time, two beams from a laser have been locked to each other in phase, or in step. The beams, which give an extremely intense light, combine and interfere with each other, resulting in alternating light and dark rings. The experimental locking was achieved by Drs. Louis H. Enloe and John L. Rodda of Bell Telephone Laboratories, using a feedback loop.

In experimental light communications systems, a transmitting laser would be tracked by a receiving laser and phase-locked onto it some distance away.

(Bell Telephone Photo)

1½ MILLION RADIO STATIONS

The Federal Communications Commission has ended its 30th year with nearly 1½ million radio stations (including short wave) under its jurisdiction.

That's nearly 30 times the number the Commission started with when it went into operation on June 19, 1934.

The Commission's 1963-64 annual report says there also are nearly 29 million radio operator authorizations, both commercial and amateur, or about 45 times as many as in 1934.

In three decades, the number of applications received by the Commission has multiplied 100 times, from less than 10,000 in 1934 to almost one million in 1964.

During the 30-year period, the FCC has had 37 different commissioners from 27 states. One of the commissioners served two separate terms.

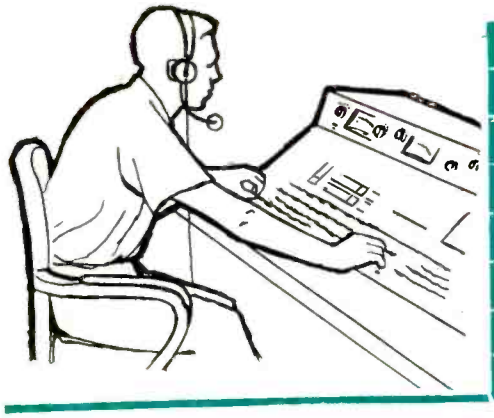
The Commission was the first regulatory body to have a woman member, Frieda B. Hennock. The New York Democrat served from July, 1948, to June, 1955.

COVERING A COLD

When President Johnson caught a cold following his inauguration and went to the Bethesda Naval Hospital in Maryland right outside of Washington, D. C., not only did a battery of naval doctors swing into action, but here's what happened so newspapers, radio and television could relay every detail to the waiting public:

The telephone company sent a crew of 40 men to the hospital and they worked 24 hours a day to install a total of 51 special telephone lines for newsmen. There were several direct extension lines to switchboards in downtown Washington establishments . . . including a big white house on Pennsylvania Avenue. A special newsroom was established in the hospital and coin telephones were hung around the walls. Needing more room, a mobile coin telephone truck was wired in on the parking lot alongside the hospital to handle additional calls. In addition, microwave channels were provided for the national television networks and periodic bulletins were issued on the President's condition.

After a few days, the President's doctors decided he could return to work and, after he walked out the front door, down came the wall phones, out came the connections, away rolled the mobile 'phone truck and down came the microwave antennas.



STATION BREAKS

SUBSCRIPTION TV BID

On March 10 Zenith Radio Corporation asked the Federal Communications Commission to authorize subscription TV on an "extended nation-wide basis" and to make it available to all operating or proposed TV stations as a supplemental broadcast service.

Supporting the petition, filed jointly with Teco, Inc., was a detailed analysis of the Hartford, Conn., subscription TV test, making public for the first time the factual, public interest data developed during the nation's only large-scale, over-the-air trial of box office TV.

Now in its third year, the test is being conducted over WHCT, Hartford, by RKO General who made the test data available. The operation uses the Phonevision subscription TV system and equipment developed and manufactured by Zenith.

WPIX EXPANDS COLOR

In an effort to expand color programming in the New York market, WPIX(TV), New York, has reportedly ordered $400,000 worth of equipment from RCA, including color camera-film chain and auxiliary transmitters. The engineers of WPIX are members of Local 1212 in New York City.

This summer is the target for more color programs by WPIX, although there are no plans, as yet, to transmit color coverage of the New York Yankee baseball games, which WPIX carries.

VIDEOTAPE, CREATIVE TV PACT

The New York firms of Videotape Center and Creative Television Inc., have signed a co-production agreement. Under the agreement Videotape, a 3M subsidiary whose engineers are members of Local 1212 in New York, will provide its production personnel and facilities to Creative TV for the production of TV programs and commercials.

Creative Television, which was formed last June, is headed by Arnold Brown and has produced programs and commercials. Videotape Center is directed by John Lanigan, vice president and general manager.

'MARCH OF TIME' COMING

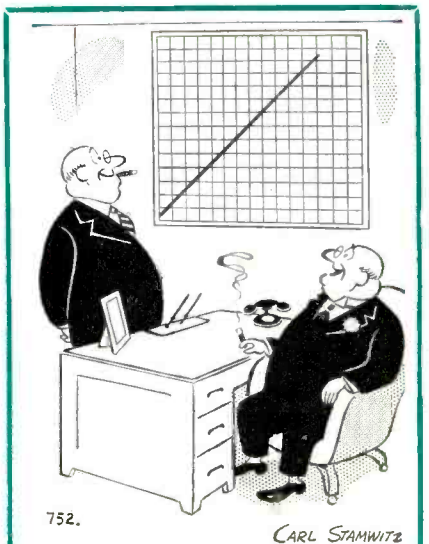
The top news documentary radio series of the 1930's and 1940's, *The March of Time*, is coming back this fall as a TV series of half-hour programs.

An association has been formed between Time Inc. and Wolper Productions to produce the new series that will "range around the the world and across the spectrum of human experience." Following leads from the 500 correspondents for *Time* and *Life* magazines, Wolper camera crews will travel the globe to film material for the series. The series will be ready for broadcasting in the 1965-66 season.

MEETING REMINDER

The 14th Annual Progress Meeting of the Radio, TV, and Recording Division, IBEW, will be held at the Belmont Plaza Hotel, New York City, August 24, 25 and 26.

LAST LAUGH



"Remember the old days of wage increases and only normal profits, when it used to zig zag a little?"