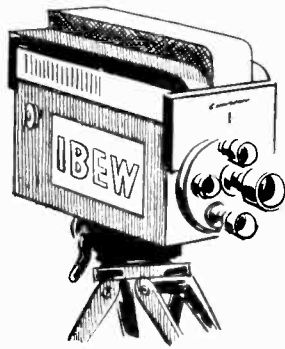


RADIO, TV and RECORDING **TECHNICIAN-ENGINEER**



FEBRUARY, 1953





'Suspension . . . immediately . . .
of all wage and salary regulations
and orders issued by . . . '

The IBEW Camera Spotlights: The End of Wage, Price Controls

ON February 6, President Eisenhower ended all wage controls and removed price controls from a number of consumer goods, including all meats. An executive order covering these two vital economic matters was issued after the President had concluded two hours

of closed session with members of his cabinet. The American economy has been operating under these various controls for two years. The text of the executive order of February 6 eliminating wage, salary and price controls is as follows:

Wage Controls

"1. Suspension by Executive Order—Immediately—of all wage and salary regulations and orders issued by or administered by the Wage Stabilization Board (or Wage Stabilization Committee), Salary Stabilization Board (or Office of Salary Stabilization), and the Railroad and Airline Wage Board. Adjustments, in compensation, including retroactive adjustments, proposed in

petitions filed by employers or by employers and unions jointly and still pending before any of these agencies may now be placed in effect. Provision is made in this order for continued authority to enforce penalties for past violations of these orders and regulations, but henceforth compensation may be adjusted without the restraints imposed by the controls.

Price Controls

"2. Issuance by the Office of Price Stabilization of Orders Removing from Price Control—immediately—a wide and varied list of consumer goods, including all meat products, all furniture, all apparel, all meals sold in restaurants and public eating places, nearly all of the thousands of items normally sold in department stores and many more. These controls have not been effective in protecting the family budget

against high prices. This is the first of series of orders under which all prices will be de-controlled.

"A more detailed report on the price de-control actions today will be made public by the office of Price Stabilization. Additional information on salary and wage de-control actions can be obtained from the respective agencies administering these programs."



RADIO, TV and RECORDING
**TECHNICIAN-
ENGINEER**

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D. W. TRACY, *President*

J. SCOTT MILNE, *Secretary*

Entered February 20, 1952 as second-class matter at Washington, D. C., under Act of August 24, 1912.

PRINTED ON UNION MADE PAPER

75 Million View The Inauguration



Stiff network competition, with each net scoring 'firsts,' marked the radio and television coverage of the 1953 Presidential Inauguration ceremonies in Washington, January 20

A TELEVISION audience estimated at 75 million witnessed the recent inauguration of President Eisenhower. The complete ceremonies were carried by at least 118 television stations in 74 cities.

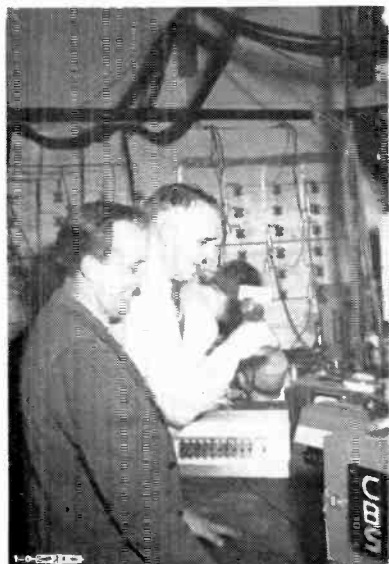
Those Americans not reached by the broadcasting industry's slowly-thawing TV nets were served by the hundreds of radio stations affiliated with the four major networks.

The TV coverage was a big improvement over the pooled telecasts of the ceremonies in 1949, when too many cuts kept

viewers confused as to what was actually going on. This time, the network stayed on one camera for much longer periods, switching only when some event was happening under another mobile crew which deserved a feed. The event was dramatic itself and did not need all the tricks of production required by a regular commercial show.

Radio and television gave unprecedented coverage to the day's activities. Beginning at 11 a. m., some phase of the inauguration, live or kinescoped, could be viewed until 12:50 a. m. the following day, when coverage of the Inaugural Balls came to a crowded end. Everything was shown from the solemnity of the oath-taking ceremony at the U. S. Capitol through the parade pageantry and the two or three attempts to dance at the Inaugural Balls.

A new feature of the coverage by the major networks was the passenger-car class mobile units used. The most expensive limousine in the Inaugural Parade was not occupied by the President nor by any member of the official family. Instead, it was a \$62,000 custom-built Cadillac used as an NBC "seeing eye." The unit had an independent power unit, camera turrets, control



• IBEW engineers at work among the equipment which was CBS Radio Master Control.

board, and other bits of equipment permitting it to operate independently of any power lines. The cameraman and transmitter engineer perched on top sat on grey kid bicycle seats which could be raised and lowered automatically by a push-button hydraulic mechanism. Inside the sleek vehicle an engineer monitored the control board and Newsman Merrill "Red" Mueller provided commentary. The driver was also a cameraman, who was ready to hop out of the car when possible and go to work with NBC's 8-pound hand camera.

CBS also had a luxury car for the parade. There was also the sponsor's product—a new, light-colored Packard, filled with gear.

Making the car sponsors just about unanimous was Willys-Overland, sponsor for the ABC coverage, which supplied Jeep station wagons for the ABC engineers.

The TV networks' cars sent video and audio signals by microwave to the top of the Capitol dome, where they were relayed to the two networks' originating stations.

More TV cameras and equipment were assembled in Washington for the big event than have been used to cover a single event before. Which was befitting the occasion, since more people saw this inauguration than have seen all previous ones.

When George Washington took office in New York City on March 4, 1789, the newspapers of the time



• Network engineers and supervisors gathered intently about their monitors as master control began handling the long inaugural parade from 15 camera positions.

reported the event was "witnessed by thousands." In 1841, 50,000 watched William Henry Harrison as he was sworn in. More than 100,000 gathered at the Capitol to see Franklin Delano Roosevelt become President in 1933. Approximately 10,000,000 viewers saw the Truman inaugural in 1949. The Eisenhower ceremonies topped them all many times over.

So that the millions of Americans gathered around receivers could get the full story more than 50 television cameras were in operation. ABC, CBS, and NBC used about 15 each.

In an effort to get crowd noises, horses, hoofbeats, band music, etc., on the air, the networks used parabolic microphones. Casting about for such equipment beforehand, NBC could unearth only four microphones and finally went to its exhibit of historic old radio equipment in the NBC Building in New York and recalled to active duty two venerable parabolic mikes which had seen honorable service during the 1929 inauguration.

The "firsts" accomplished by the networks included the following: NBC-TV picked up the President-elect and Harry Truman on the White House lawn at 11:28 a. m. CBS-TV came away with exclusive interviews with the military chiefs of staff. ABC's WMAL-TV, Washington, televised the entire parade, using the emergency lighting supplied by the District of Columbia as the skies darkened. DuMont TV network's WTTG (TV) wrapped up highlights in an hour-long film for late viewers.

NBC

NBC had 250 staff members in Washington for the events, including 22 commentators. Five TV cameras and seven commentators covered the White House on the morning of the big day. Fifteen NBC cameras picked up the parade. Morgan Beatty and Clifton Utley coordinated monitor pick-ups from 10 points.



• The CBS counterpart to NBC's custom-built Cadillac "Seeing Eye"—a well-equipped Packard mobile unit—on Capitol Plaza.

Dave Garroway interviewed spectators; Ben Grauer covered the Inaugural Balls; NBC Newsmen Ray Scherer and Cameraman Bill Birch saw Mr. Truman off to Missouri.

CBS

CBS Radio went on the air at 11:30 a. m. with Bob Trout at the Capitol and Charles Collingwood traveling in a Packard in the procession to the Hill. The AM net carried a special program at 4 p. m. on President Eisenhower's office-taking.

CBS Radio had 100 staffers handling various assignments. Central master control was under the Capitol steps.

CBS-TV employed a staff of 150 newsmen, production and technical personnel. Edward R. Murrow did much interviewing and commentary. Walter Cronkite served as anchor man for the net.

CBS-TV supplied one and one-half hours of kinescopes of its coverage to the Voice of America for telecasting in Holland and Japan.

DuMONT

DuMont TV Network sponsorship was on an area basis. DuMont concentrated on pick-ups from a limited number of vantage points in the hope of preventing repetition of picture and comment. It located cameras at the Capitol, the Treasury Building, and the White House, and picked up oath-taking ceremonies at 11:30 and wound up with the parade at 5:30 p. m. An hour of filmed highlights narrated by Actor Edward Arnold was shown later in the evening.

ABC

ABC radio presented five and one-quarter hours of inauguration coverage, and ABC-TV was on six and one-half hours.

ABC utilized mobile jeep units and a miniature "peek-a-view" camera to supplement 16 TV cameras and more than 35 radio and video microphones in strategic locations. More than 150 editorial and technical workers helped cover the proceedings, ABC reported. For an hour during the evening ABC-TV presented an hour of inaugural film highlights, and ABC-Radio had an hour of commentary.

MBS

MBS had its battery of newsmen on hand; about 75 Mutual staffers had various assignments. The Wildroot Company of Buffalo, N. Y., sponsored part of Mutual's coverage, and other segments were carried as co-op features.

A Mutual jeep-type car trailed immediately behind the first wave of official cars in the parade, with Everett Holles and other newsmen describing events. Fulton Lewis, Jr.; Fred Fiske; and Hazel Markel were among the commentators.

NLRB to Seek Review Of WBT-WBTV Decision

The National Labor Relations Board has stated its intention to file a petition for a writ of certiorari in the Supreme Court of the United States to secure a review of the decision of the United States Court of Appeals for the District of Columbia in the WBT-WBTV case (Jefferson Standard Broadcasting Company, Charlotte, N. C.).

The court of Appeals, in an unanimous decision on November 20, 1952, reversed a ruling of the NLRB that the Company was justified in discharging ten members of IBEW Local Union No. 1229 on September 3, 1949 for the distribution of the so-called "Second Class City" handbill.

The NLRB is apparently of the view that the ruling of the Court of Appeals in favor of the Union raises a question of general importance in the administration of the law which should be reviewed by the United States Supreme Court.

The NLRB has until February 18, 1953 to file its petition with the Court.

The IBEW will file its opposition to the granting of the petition.

Civil Service Examination

The U. S. Civil Service Commission has announced an examination for electronic scientist, electronic engineer, and physicist positions in the Air Force Research Laboratory at Cambridge, Mass., and the U. S. Navy Underwater Sound Laboratory at New London, Conn.

Starting salaries under the classifications (GS-9 to GS-14) range from \$5,060 to \$9,600. No written test is required. Applicants qualifications will be judged from a review of experience, education and training.

Vacancies in other Federal agencies in the New England area having similar duties and requiring similar qualifications at approximately the same rate of pay may also be filled as a result of this examination.

Information and application forms regarding this examination may be obtained from first and second-class postoffices or by writing direct to the United States Civil Service Commission, Washington 25, D. C. Request Announcement No. 1-7-1 (53), issued January 14.

California AFL Studies TV

Scores of AFL unionists were among the 2,000 Californians in Sacramento recently at the call of Governor Earl Warren to weigh the possible use of eight television channels offered the state for educational purposes by the Federal Communications Commission last April.

The FCC Revises Operator Rules

IN A report and order announced January 27, the Federal Communications Commission took quiet action on the proposed changes in operator rules, which have been opposed so strenuously for many months by the International Brotherhood of Electrical Workers and other organizations.

The Commission amended its broadcast rules and standards so as to relax the operator licensing requirements and permit the remote control operation of certain low power AM, FM, and noncommercial FM broadcast stations. The changes take effect 30 days after publication in the *Federal Register*. No oral argument was permitted by the Commission in reaching its decision.

The amendments are the result of proposed rule-making issued June 4, 1952, and are based upon a petition of the National Association of Radio and Television Broadcasters.

In reaching its decision, the FCC considered these arguments proffered by station managements:

“the marked improvement and reliability of transmitter equipment,

“the satisfactory utilization of lesser grade operators during World War II and on a temporary basis at a number of broadcast stations since January, 1951,

“the successful operation by non-technical personnel of many electronic devices of a complex nature and upon which the safety of life and property is often dependent,

“and the extensive reliance of stations on their chief engineers for significant repair work.”

IBEW's Full Rebuttal

Your IBEW presented full rebuttal to all of these arguments in its official comment to the FCC. Approximately 2,000 comments, all told, were received by the Commission from individual operators, national labor unions, labor union locals, trade schools, individual broadcast stations, and associations of broadcasters.

Under the new rules, holders of commercial radio operator licenses of any class except aircraft radiotelephone operator authorizations or temporary limited radiotelegraph second-class licenses may be employed to stand regular watches and perform limited duties at all AM broadcasting stations with operating power of 10 kilowatts or less when employing non-directional antennas and at all FM and noncommercial educational FM stations with operating power of 10 kilowatts or

less. However, at least one person holding a radiotelephone first-class operator license is required to be employed as a regular full-time operator at all AM and FM stations affected, to supervise and insure the proper functioning of the station equipment.

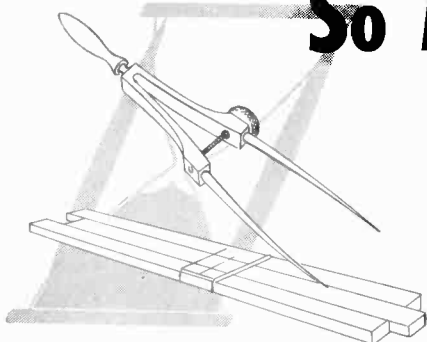
A similar requirement applies to noncommercial educational FM stations over 1 kilowatt. At noncommercial educational FM stations of 1 kilowatt or less but above 10 watts the operator may be a person holding a radiotelephone second-class operator license. At noncommercial educational FM stations of 10 watts or less, the operator may be a person holding a radiotelephone or radiotelegraph second-class operator license, but he is not required to be a regular full-time employee of the station, although he must be available on call.

Based upon data supplied by broadcast stations which have been granted authority to operate by remote control, new rule sections have been added to provide, under certain conditions, for remote control operation on a regular basis by those AM stations employing non-directional antennas with operating power of 10 kilowatts or less and FM and noncommercial educational FM stations with power of 10 kilowatts or less. Under the amended regulations, if the station licensee wishes to have his station controlled from another place, such as the studio, and meets the related technical requirements, the operators may be on duty at that place instead of at the site of the transmitting apparatus.

With respect to operation under the CONELRAD plan to be used for defense purposes in case of an air raid alert, the Commission feels that participation is possible by operators holding other than first-class radiotelephone authorizations, provided that they have been given adequate instruction by the station's regular full-time first-class operator.

The Report and Order was adopted by Commissioners Walker (Chairman), Hyde, Webster and Bartley on January 26, 1953, with Commissioner Merrill concurring but favoring oral argument, and Commissioner Hennock voting for oral argument. Commissioner Sterling did not participate.

EDITOR'S NOTE: *As we go to press, no authoritative statement can be made as to the action the IBEW will take in this matter. However, the subject is being studied by the legal department and all members will be kept advised of developments. "Don't call us . . . we'll call you."*



So Much Can Happen in a Year

In the busy 12 months labeled '1952' the broadcasting industry came up with some novel and ingenious engineering techniques. Here are some gadgets which kept the U. S. Patent Office busy.

SCIENCE will no doubt remember 1952 as the year of the Hydrogen Bomb and as a year of progress in atomic energy. During 1952 American scientists began the operation of the world's largest accelerator of atomic particles, the cosmotron at Brookhaven National Laboratory, which will rival the cosmic rays with energies up to three billion electron volts. Accelerators which will double, and even triple, this energy are under construction. The keel of the first atomic submarine was laid. The first atomic cannon was produced.

In addition to these advancements, however, there were many, many inventions and discoveries on a lesser scale which greatly improved man's measure of life.

The fields of electronics and broadcasting were particularly marked by progress. Here are some of the achievements:

- Work advanced on methods for recording television programs on magnetic tape.

- A "Walkie-Lookie," portable television camera for spot news coverage having a built-in power supply, was developed.

- The British Navy developed two new television cameras for underwater work, to be used in salvage and hull-inspecting operations in situations where divers cannot be used.

- Six new compounds were found to serve as superconductors at extremely low temperatures.

- Studies of wind currents and cosmic action in the ionosphere furthered man's knowledge of the upper air and its effect on radio signal dissemination.

- The transistor, tiny germanium crystal device, was adapted to function at very high frequencies, and so can be used in television of FM apparatus.

- The first portable television receiver was produced as an experimental model, using transistors wherever possible.

- A new system of making movies by first televising the scene and then photographing the result was patented, making possible lighting by lamps of lower intensity.

- Work continued in color television research in spite of the freeze on commercial production. Approaches to compatibility between color-sequential and electronic-scanning methods were achieved.

- Industrial television saw great expansion, as video equipment was used in factories, banks, libraries, and in numerous government projects.

With the lifting of the freeze on TV station construction and allocation during 1952, many stations began expanding facilities. New York's WOR-TV installed one of the largest VHF transmitters ever built to improve reception in fringe areas. The effective radiating power of the station was boosted from 22,000 to 90,000 watts. This is spreading Grade A reception from a 30-mile radius to 39.5 miles, and Grade B from 50 miles to 57 miles.

The first ultra high frequency station went on the air at Portland, Oreg., using RCA experimental equipment, and the results were very successful, encouraging other UHF applicants.

Diagram 1, on the preceding page, illustrates an interesting patent granted last year. Patent No. 2,586,-

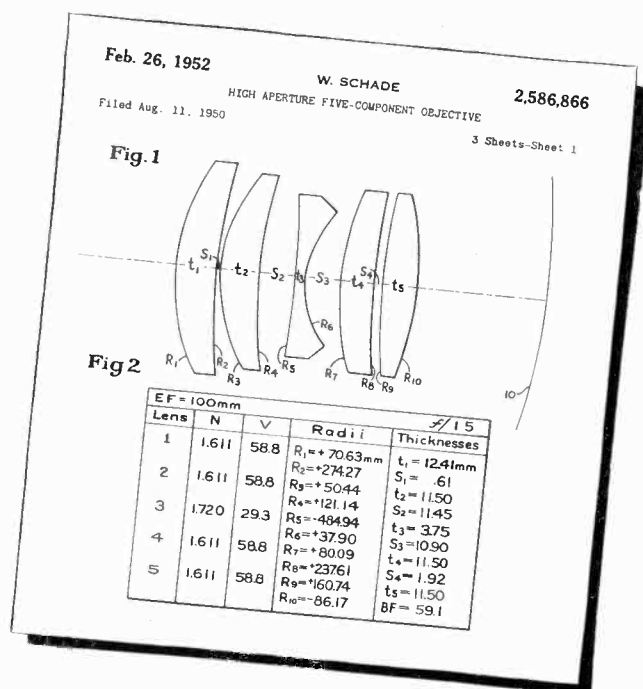


DIAGRAM 1—A five-component lens objective, based primarily on a concave center lens, developed by Willy Schade for large-scale projection. Figure 1 shows an objective which covers an angular field of plus or minus 20 degrees at five-times magnification. Figure 2 shows constructional data.

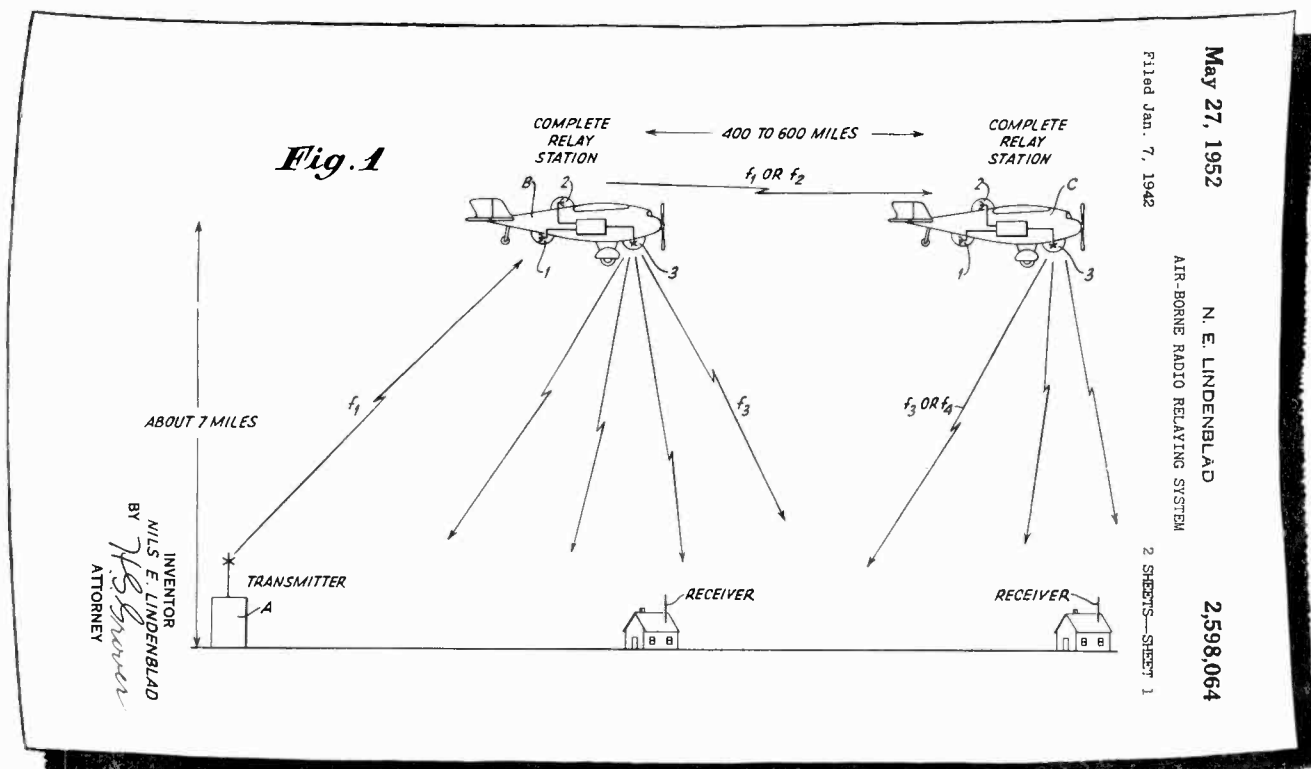


DIAGRAM 2—A radio relaying system devised by Nils Lindenblad for the aerial transmission of ultra high frequency television signals over a broad area, replacing microwave and other ground transmission devices. About 20 of these airplane transmitters would be enough to blanket the United States, states the inventor.

366, it is a system of five lenses used for large-scale projection of TV pictures without loss of sharpness. The illustrated diagram, from the original patent, is only one of four variations for "high aperture five-component objective" achieved by Willy Schade, the inventor. (His patent has been assigned to Eastman Kodak.)

This invention relates to optical objectives and particularly to objectives which are designed especially for the projection of the image on a cathode ray tube on to a larger screen. The object of the invention is to provide an objective which is relatively simple in construction and suitable for mass production at moderate cost and which has a very large aperture for providing high illumination of the projected image with a sufficiently high degree of correction of the lenses aberrations so that the image on the cathode ray tube is projected without loss of detail.

Image Focused on a Curve

It has long been known that it is possible to simplify the construction of an optical objective without loss of detail in the image, if the image is allowed to focus on a curved surface concave toward the objective. A curvature of image toward the objective flattens the field and projects more corrected details. This principle would be applied to photography to prevent distortion and correct fringe illumination, if it were found practical to produce and develop curved film, optically

corrected. Although it isn't practical to do this in film photography, TV projection, requiring no film, offers possibilities.

Schade, with his five-lenses arrangement, has also provided for a large, simple aperture in the optical system, which makes reflector devices in TV projection obsolete.

Because of a relatively short distance in the Schade objective, good illumination near the edges of the picture area are achieved.

Figure 2, page 8, shows an airborne radio relaying system developed by Nils E. Lindenblad of Port Jefferson, N. Y., which has been assigned to RCA. It is Patent No. 2,598,064.

UHF Relaying System

Briefly stated, this invention contemplates an ultra high frequency relaying system, using transmitters in airplanes flying at considerable heights. The inventor prefers that the transmitter planes be flying in the stratosphere during operation, about 35,000 feet or higher. At such altitudes the airplanes would be flying above "surface" weather and would have a service radius of about 230 miles.

Each plane would be a completely equipped receiving and transmitting station capable of serving a circular area about 500 miles in diameter. By positioning adjacent airplane relay stations 400 to 600 miles apart, it would be possible to give adequate television service to

the entire United States with about 20 stratosphere relays, which would perform the same service "and perhaps better service" than a comparable 1000 ground relay stations," says the inventor.

Lindenblad contends that a high-lift, slow-speed airplane might fly continuously at an altitude of six to seven miles for from four to eight hours. After that another plane takes over the job. He suggests that a plane hovering over New York City could receive signals from the top of the Empire State Building and spread them over an area 500 miles wide.

"The airplane relay station could employ a different frequency for serving the receivers immediately below than the frequency upon which it receives signals," he adds.

Considering this patent, it occurs to us that the FCC might find its allocations and frequencies problems compounded manifold, if such a plan were put into effect over the continental U.S.A. However, this invention might be a good method to carry TV signals across the Atlantic and Pacific Oceans, until some better method comes along. We might get the British Coronation in this manner.

Our third invention illustrated has Patent No. 2,607,845. It is a motion picture photography and monitoring system for color television, developed by Lauriston Clark of Los Angeles and assigned to Technicolor Motion Pictures Corporation.

The production of motion picture films by conventional photographic apparatus involves a number of major difficulties. One of these is the inability of the supervising personnel to view the scene being filmed exactly as it is recorded on film in order to make the continuous adjustments of lighting and exposure to obtain the desired pictorial effect on the film.

Need for Bright Lights

Another difficulty, especially in color motion picture photography, is the necessity to light the scene with very high intensity lamps because of the comparatively low intensity of the exposure light reaching the individual recording emulsions. These high light levels are not only uneconomical but cause discomfort to the actors and also abnormal appearances, such as contracted pupils in close-ups.

Yet another disadvantage of present systems is the necessity of preventing the noise of the motion picture camera and associated equipment from reaching the recording mikes, which requires heavy sound proofing equipment.

The invention is also said to provide more color sensitivity for recording on film.

The invention records through the scanning of a scene by a television pick-up device such as the image orthicon tube, which is many times more sensi-

tive to light than film. The video output signal from the tube representing the scanned image of the scene is connected to an amplifier having an adjustable manual gain control together with an adjustable automatic gain control to provide any reasonable degree of straight line amplification, if desired combined with signal expansion or contraction. The output of the amplifier is applied to television receiving and reproduction apparatus including a high intensity TV cathode ray tube remotely positioned from the scene to be photographed. The scanning frequencies of this tube, plus the orthicon tube, are synchronized with a motion picture camera which will record the scene.

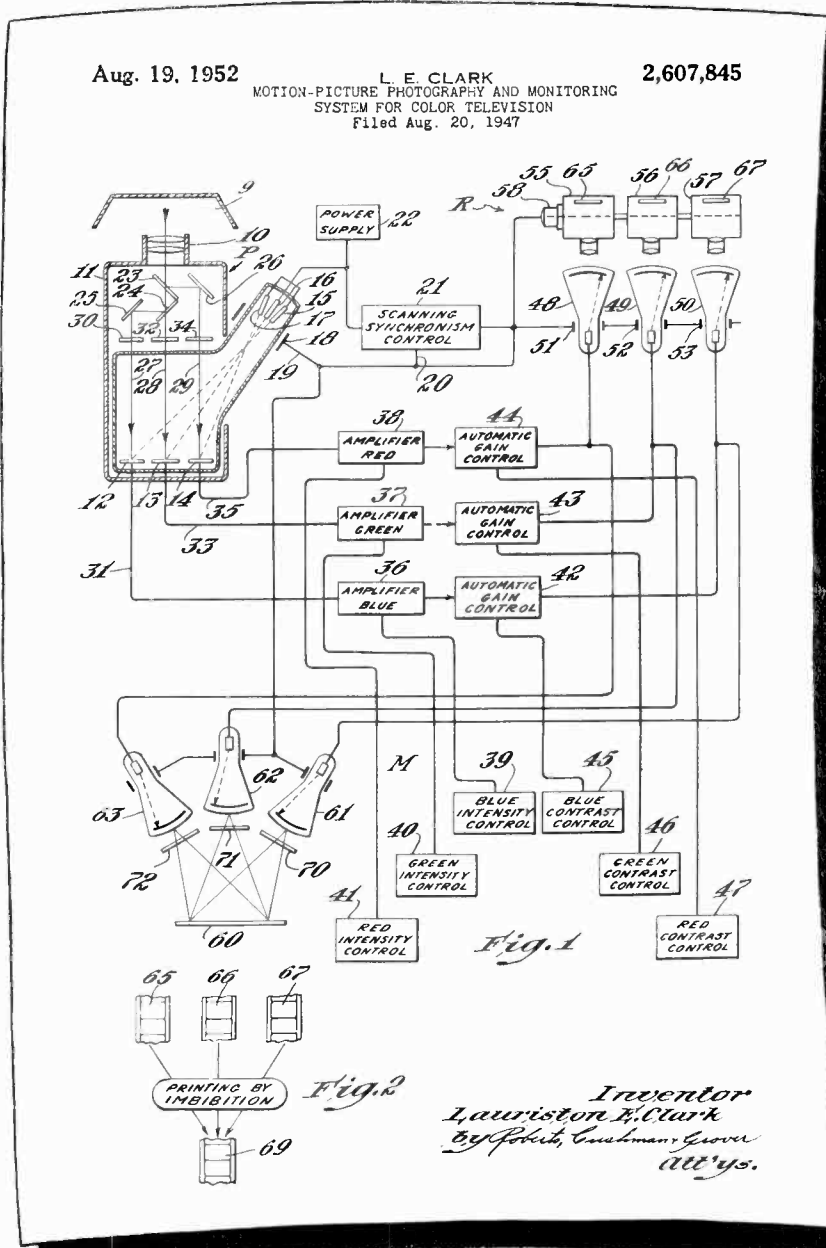


DIAGRAM 3—A motion picture photography system based on color television principles, recording different color aspects of a scene on a plurality of films. Figure 2 shows a process for producing a final color positive.

MANY union brothers in open-shop stations are confronted with having to work with non-union employees who profess that "this or that" reason keeps them from joining your union. Some of the reasons usually given are:

1. Family objections to unions.
2. Unions cause a lack of harmony among employees.
3. Employer will do more for worker than union.
4. Wronged in the past by a union member.
5. Employer has great plans for non-union man.
6. No reason at all.

Brothers, it has long been my desire to put in print an answer to these excuses so that all non-union radio workers can see how utterly ridiculous their statements

FAMILIAR REASONS

for non-membership in the union

LEIGH CARDWELL, Local 1178, Shreveport, Louisiana, suggests answers to these excuses

are to union members and a majority of the station staff in the program, continuity and sales departments.

EXCUSE No. 1—Family objections

Have you ever heard of a non-union employee letting a union officer speak to his family to explain the reasons for the Unions formation, its aims and ambitions, its advantages? No, the non-union employee's family hears only what he has told them and in most cases a sordid picture of Unions in general has been painted. The non-member's family would certainly want the breadwinner to do his share in establishing and guaranteeing their material security.

EXCUSE No. 2—Lack of harmony

This excuse is repeated so much that one is suspicious that it originated in the managers office! What actually causes the lack of harmony is not the existence of the Union, but the fact that year in and year out the Union members fight to better radio working conditions for themselves and the non-union workers who contribute absolutely nothing to the achievement of the gains. How could a reasonable person even expect harmony under such circumstances?

EXCUSE No. 3—Employer will do more for workers

This excuse is so ludicrous as to hardly justify comment. If the employer was in the habit of providing more benefits, then why did a majority of his employees unionize?

EXCUSE No. 4—Wronged by a union member

In many of these cases, the circumstances include a strike or other labor difficulty! In most instances, the non-member suffers from a well-deserved guilt complex and is trying to justify (to himself) his position by saying that Union Members are uncouth, keeping a gentleman such as himself from joining.

EXCUSE No. 5—Employer has plans for non-union man

Yes, the employer has great plans, and he'll keep on having—plans! If the non-member is a long-time employee he should suspect the veracity of his employers promises by this time. If he is new to the job (most are, or they would

know why Union was formed) he should ask himself—Since the employer didn't keep his promise to other employees who later unionized, why should I expect him to keep them in my case? Are the employer's promises materializing like the Unions negotiated pay raises each year at my station? Why are radio workers in the large stations union members?

EXCUSE No. 6—No reason at all

If any honor is to be accorded a worker who takes your benefits but won't help get them, this type worker deserves it. He knows the Union members recognize him for what he presently is—an opportunist with no pride in himself or his chosen profession. This type of worker might merit some respect if he refused your yearly negotiated raises; your call-back guarantees; your double-time on holidays; your 3 week vacations; your guaranteed rest periods; your guaranteed sick leaves with pay; your travel allowance guarantee; etc. The non-member will never find these benefits in a totally non-union radio station which he professes to believe in.

Brothers, I would appreciate you leaving this magazine opened to this page in the transmitter or control room. Maybe some non-member will realize he is convincing no one but himself that he rightfully should stay out of the union. In 100 per cent of the cases the union can show more and better improvements of the radio workers lot than any non-union worker has ever achieved for himself under the individual merit "system."

The union needs all non-members—and all non-members certainly need the union. If the union were to drop jurisdiction over our work, what would we have to look

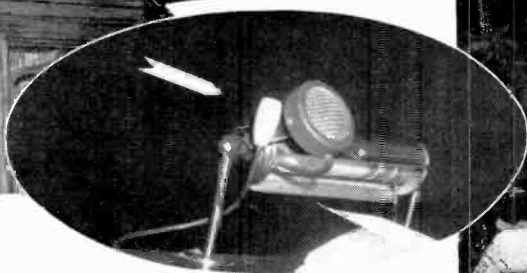
forward to? Raises? Increased sick leave? Better working conditions?

By contacting the business manager and joining the union, non-members will gain respect in the eyes of their fellow employees and employer, regardless of how anti-labor the employer might be. He is a *business man* and *would not tolerate* a member of management who aligned himself with the union for bargaining purposes. Consequently, he cannot understand a *working man's* principle who aligns *himself* with management under the *same circumstances*.

Technician-Engineer



• Monsignor Nicholas Wagner delivers the Christmas message from the pulpit. In the closeup is his well-hidden Stephens mike.



FOR the second year technicians of IBEW Local 1221 and KFAB, Omaha, Nebr., were asked by KMTV, another Omaha station, to step in and handle the complete audio facilities for KMTV's origination of the Boys Town Christmas Eve Mass for the CBS-TV network. This in spite of the fact that the technicians at KMTV are members of NABET.

The KFAB technicians, needless to say, were flattered by the request from KMTV and bent over backwards to set up the audio on this extensive undertaking. Great pains were taken to keep microphones out of the picture feed to the net. Nine microphones were used on the entire pick-up for the many mic circuits and monitor circuits. Complete harmony existed between the men from the two unions throughout their joint effort.



• Arrow indicates the broadcast mike placement at the altar for TV-audio pick-up of the Boys Town Mass feed.



• Flanked by boys of the Boys Town Choir, an engineer mans a KMTV channel camera for the CBS-TV pick-up.



• A Stephens mike above the choir director's podium, upper right hand corner, above, was used for the choir pick-up.



• KFAB's audio set-up in the sacristy, a small room adjoining the sanctuary of the Boys Town Chapel.



• From the doorway of the sacristy, a cameraman focuses on the Christmas Eve observance of mass at the altar.

The Era of the **TALKING MACHINE**

Hard rubber hearing pieces attached to rubber tubes were a feature of the first juke box . . . Caruso demanded \$4,000 for his first recording and 50c royalty for each record sold . . . Musicians crowded around recording horns.

WITH the year just ended marking the Diamond Jubilee of the phonograph, a glimpse back through the pages of history might prove interesting and informative. . .

1877: Thomas A. Edison invented the talking machine, a crude affair with a tinfoil coated brass cylinder as the first record. The first recording? "Mary had a little lamb."

1885: Alexander Graham Bell, Chichester Bell and Tainter substituted a wax cylinder for Edison's clumsy brass and tinfoil arrangement. The quality was greatly improved but the level was so low, it could only be heard through the use of rubber hearing tubes.

1888: Emile Berliner introduced the disk record. Edison and the Bells used a method in which the sound was recorded up and down with relation to the surface of the record (hill and dale). Berliner's grooves were of uniform depth, with smooth bottoms but irregular side walls (lateral cut).

1889: **FIRST JUKE BOX!** Introduced in November at the Palais Royal, New York. Hard rubber hearing pieces attached to rubber tubes. A nickle was required to actuate each of many tubes coming from the machine.

Driving power in these days varied: storage battery operated motors, foot treadles and water power from the nearest handy faucet!

1901: Eldridge Johnson, Camden, N. J., machine shop operator, improved the Berliner machine by adding a governor controlled, constant speed spring motor. Other improvements brought the quality of the disk record to that of the wax cylinder—but with much greater volume. The talking machine was no longer a toy—but a musical instrument.

1902: A year of much legal battling between the many contributors to the perfection of the talking machine. After the big settlement, three companies remained which dominated the industry for a long time. The Bells and Tainter for Columbia; Berliner and Johnson for Victor and Thomas A. Edison.

1903: Dealers refused to sell the instruments—artists refused to sing into the "recording horns." Along with inventive talent Johnson had sales ability unmatched in that era—and still in great demand today. Not only did he break down dealer resistance, he persuaded Caruso to make records for him. Johnson had to pay Caruso \$4,000 for the first recording session and reportedly had to guarantee the highest royalty fee ever paid, fifty cents a record.

Johnson spent twenty-four million dollars in 25 years making the Victor trade mark world famous. Do you remember? The dog listening to His Master's Voice.

Most of the famous artists followed Caruso into the recording studios—but this was in the days before microphones! Recording sessions were rugged. The power that vibrated the diaphragm actuating the cutting stylus making the grooves in the wax was unamplified sound; sound belated by the recording artist in front of a horn.

Recording a soloist was not too difficult, but a session with a "musical aggregation" was something else again. The musicians had to crowd around the horn. Some of the bald heads in 802 may be due to being konked on the noggin by a slide trombone as musicians gathered in a tortured mass around the horn.

Duplicating records was relatively easy in the case of disks. The master was plated with metal and from it were made the "stampers." The stampers pressed duplicates from "biscuits" of warm oozy batter. Today's batter may be Vinylite and other plastics or a mixture of filler and shellac.

Duplication of the cylindrical records was never easy. Mechanical linkage of cutting stylus was not too successful. In the early days, if a company wanted sixty copies, the singer performed sixty times! Or, if he had a good loud voice, six times in front of ten machines.

1916: Victor produced their first long playing record.

1925: The beginning of modern recording—the work

of many inventors, but notably Bell Labs. The mechanical recorder gave way to "electric" recording—the microphone, vacuum tube amplifiers, etc.

1926: Edison made and sold some 12-inch certical cut disks capable of playing 22 minutes of music on a side.

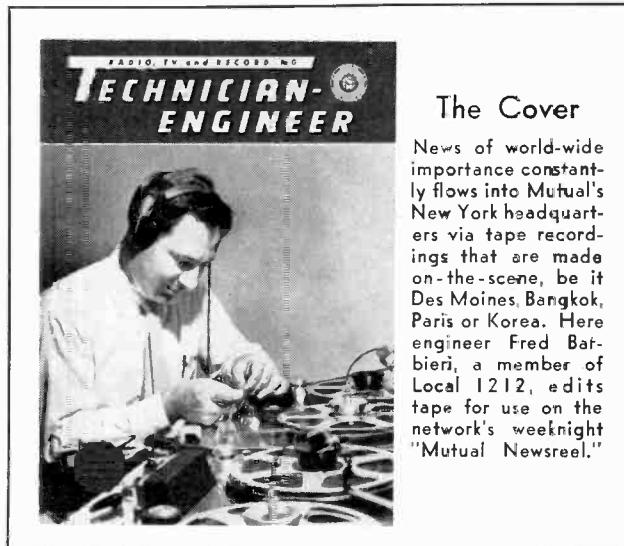
1948: Columbia introduced 12-inch disks with 25 minutes on a side. Variable pitch recording has increased playing time to 32½ inches. Some broadcast stuff runs to 35 minutes per side.

The early disks revolved at 78 rpm and the number of grooves 100 per inch. Both of these standards will probably disappear in a few years.

Since 1948 the field of classical music has been almost completely taken over by the long playing 33⅓ rpm, with up to 350 grooves per inch. RCA's 45 rpm, 250 grooves per inch, may soon dominate the popular field.

The introduction and perfection of tape recording threatens, in time, to revolutionize the entire recording field.

1953: And what in 1953? Experiments have already produced 3.5 to 6 megacycle band width on



The Cover
News of world-wide importance constantly flows into Mutual's New York headquarters via tape recordings that are made on-the-scene, be it Des Moines, Bangkok, Paris or Korea. Here engineer Fred Barbieri, a member of Local 1212, edits tape for use on the network's weeknight "Mutual Newsreel."

tape! Possibilities? A TV show-picture and sound in a small, neatly taped up package. Watch too for possible development and expansion of binaural recording and broadcasting.

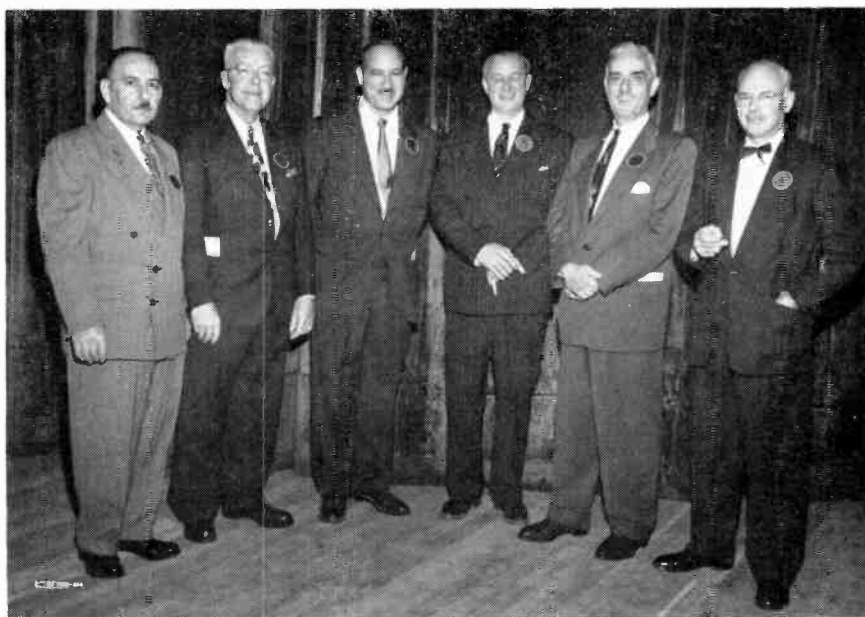
There you have a quick run through the years. Obviously there are many gaps. How about some one in recording filling them in and bringing it up to date?

Columbia Veterans

CBS, Hollywood, recently honored all employees of 20 years or more standing. The engineers, right, all members of IBEW Local 45, were among those honored. Left, to right, they are: Leo Shepard*, KNXT transmitter, Mt. Wilson; Harry F. Felch, KNX; Herman Bruck, KNXT; William Pearson, KNX; Les Bowman, KNX director of technical operations; and Ben Harper, KNX transmitter.

*Leo Shepard, W6LS

It is with deep regret that we report the untimely passing of Brother Shepard on January 18, 1953. Originally a member of A. B. T. and a Charter Member of L. U. 1226, of late Brother Shepard was a member of the Executive Committee of L. U. 45, Hollywood. We know that many members of our organization, radio amateurs and his countless friends join in extending their sincere and heartfelt sympathy to his family.



Help Wanted

We are in receipt of a request from Local Union 1216, Minneapolis-St. Paul, for information leading to the procurement of applications of persons with experience in the following various positions in broadcasting: AM and TV transmitter operation, AM and TV studio operation, TV camera operation and lighting operation. Anyone interested in future openings in the Minneapolis-St. Paul area should write to the Business Manager, enclosing an outline of qualifications and experience. Address such letters to Business Manager Bernard J. Renk, Local Union 1216, 3239-41st Avenue, South, Minneapolis 6, Minnesota.

TECHNICAL NOTES

Big Year for Ultra High Frequency Predicted

A BIG year for ultra-high-frequency television in 1953 was predicted today by Henry G. Baker, vice president in charge of the RCA Victor home instrument department. The forecast was made as Mr. Baker announced his company's final item in the complement of special equipment required for UHF broadcasting and reception—an automatic 16-channel combination VHF-UHF rotary tuner for RCA Victor home receivers.

"All the necessary units of equipment for a truly national expansion of television in the new ultra-high-frequency channels have been developed and are now in quantity production," he said.

"RCA is ready with UHF broadcast transmitters and antennas, transmission line, receiving antennas, sets with combination VHF-UHF tuners, and UHF selectors for use with VHF-only sets."

FIRST TRANSMITTERS SHIPPED

RCA has already shipped the first commercial UHF transmitters to come out of production assembly in its transmitter plant here, it was noted, and additional 1-kilowatt transmitters are being readied for delivery against existing orders. UHF broadcast antennas are also being made available.

In announcing RCA Victor's plans for UHF receiving equipment, Mr. Baker stated that all of the 25 new TV receiver models just announced will be available with either a VHF-only tuner or, optionally, with the company's new combination VHF-UHF tuner, at approximately \$50 more.

The new tuner, Model KRK-12, is interchangeable with the VHF tuner used in all of the new 1953 sets, as well as in the deluxe and "Super Set" models in earlier lines.

READY FOR MODIFICATION

Quantities will be shipped separately with installation accessories (Kit KRK-25) to RCA Victor distributors, to permit modification of sets by the distributor or the dealer when required to meet customer demand.

The new sets will also be shipped with the combination tuner installed at the factory when requested by the distributor.

Mr. Baker said the tuner is a rotary type, providing automatic tuning for any combination of VHF and UHF stations up to a total of 16. "As an example," he said, "the consumer can have his set adjusted for eight VHF

and eight UHF stations, or four VHF and 12 UHF, or 16 UHF."

As shipped, 12 of the 16 inserts for which the tuner is designed will be pre-tuned for the 12 VHF television channels. Inserts pre-tuned at the factory for any specified UHF channels will be supplied to RCA Victor distributors and dealers for insertion in the remaining four spaces. Should more than four UHF channels be required in any area, inserts tuned for the additional channels can be quickly and easily substituted for an equal number of the VHF inserts incorporated in tuner. In such cases, the company will accept return of VHF inserts on an even exchange basis for UHF inserts.

Mr. Baker emphasized that the KRK-12 differs basically from most other UHF tuners now on the market because it operates on the fundamental of the oscillator frequency rather than on a harmonic.

"This is a more costly, but a more satisfactory design," he said, "because it means a better picture."

The tuning is automatic, he explained, in that the owner need only turn the station selector dial to the desired channel. This system," he said, "is much simpler and more convenient than the manual-type which requires tuning across the entire television band—as a radio is tuned, across the entire radio band.

LESS INTERFERENCE SHOWN

The new combination tuner, Mr. Baker said, is less susceptible to interference than any previously demonstrated.

Initial units of the new tuner and the new TV sets have already been shipped to distributors, he said, and quantity shipments will begin early in January.

To provide UHF reception for owners of sets which cannot be readily equipped with the new tuner, RCA Victor will continue to supply its one-channel and two-channel selectors, already in use in the initial UHF areas, and its new all-channel UHF selector, covering all of the 70 UHF channels.

The selector Model U-1 is suitable for areas where one UHF station goes on the air. The Model U-2 is designed to bring in two UHF stations. And the U-70 provides for the reception of any and all UHF stations within range of any locality. The U-1 is attached at the rear of the receiver, and the two larger selectors are housed in separate cabinets and can be placed on top or at the side of the set.

A Quick Drop at Sunrise

Last September your **TECHNICIAN-ENGINEER** presented an article entitled "The Mysterious Ionosphere," telling of the ionization in the upper reaches of the sky and of how it affects long-range radio and may eventually influence telecasts.

Since that time, continued research has turned up new facts about this mysterious portion of the heavens. One particularly important fact had been missed, heretofore.

The ionosphere is important to broadcasting because it reflects radio waves, bouncing them earthward in many patterns. Just as the sun begins to rise each morning, a daytime radio reflecting layer forms in at heights of 180 to 350 miles above the earth's surface. The sun's ultraviolet rays ionize this section of the upper air, and, as the sun's intensity increases, the new layer rapidly gets lower and lower, until it merges with the ever-present nighttime layer, at about 125 miles up, and there it settled to a daytime level. This is the layer which controls the maximum usable frequency during the daytime.

To study this mysterious upper layer of ions, radio signals are beamed straight up, and scientists note how long it takes for the signals to return. Until recently the speed with which the daytime layer descends had been missed, because the research signals were usually sent about 15 minutes apart.

Scientists now have found that it takes the ionized layer only a couple of minutes to descend those many miles to the daytime level. Comes the sunrise, count the seconds, and its there. During March the sunrise effect on radio signals is simultaneous with the ground sunrise.

During April they're two minutes apart; during the remaining months its a few minutes longer.

Multi-Channel Line Reported

Development of a copper transmission guide which has the potential of carrying 30 TV picture channels has been announced by the U. S. Signal Corps.

The system is an offshoot of the 1950-51 "G-string" development work carried out by Dr. Georg Goubau, German scientist now working at Fort Monmouth Signal Corps Labs in New Jersey.

Signal Corps labs have strung a single copper line, three-quarters of an inch in diameter, for two miles on telegraph poles, according to Raymond Lacey, chief of the microwaves section at Coles Laboratories. It carries a 200-mc bandwidth in the vhf, he said, and is virtually in commercial development. The wire is covered with a polyethelene insulation.

An antenna at one end of the line is oriented to pick up TV signals from Baltimore, Washington and Philadelphia. These signals have been fed "through" the

One Moment Please



Jack Dentz, newsman for WCTC, New Brunswick, N. J., wanted to be johnny-on-the-spot. Acting on a 3:30 p. m. tipoff, about a finance company robbery, he grabbed a tape recorder, rushed to the finance company and interviewed the office manager even before the police arrived. The radio reporter, hurrying back to WCTC studios, was detained by police as he rushed away from the robbery site. They were suspicious of his rush, until he was able to convince them that he was not involved in the crime.

line and have shown up as images in TV receivers at the other end.

Possible application that occur immediately include master antenna lead-ins (in place of coaxial cable), community-TV systems, and as transmitter lines for vhf broadcast stations. Possible future development may mean an entirely new and cheaper method of linking cities for communications and TV.

New UHF Antenna Produced

First commercial use of a new uhf TV antenna recently developed by the Workshop Assoc. Div. of Gabriel Co. is scheduled for uhf Channel 43, WICC-TV, Bridgeport, Conn.

A 10-foot high single-bay antenna, it has 12 slots on each of the four sides of the element and a power gain of 14. It is said to have no connectors or insulators. A 20-foot two-bay antenna has a power gain of 25. Workshop Assoc. has plans for still another type of antenna to work with low powered uhf transmitters, it was reported.

Station Breaks



Local 1218 Presents Lectures

A program of technical lectures has been established by Local 1218 at Detroit, Mich. President John McGraw has appointed Brother Hal Dushane as chairman of a technical lectures committee.

The first talk featured a very fine discussion of the RCA Synch Generator. This talk was given and amply illustrated by Brother Chester Mitchell.

A second meeting featured a talk by Brother Maurice Logan, who told about the transistor development. A very lively discussion followed, which indicated that many of the brothers were interested in the various types.

At the December meeting, a new corner loudspeaker was discussed and demonstrated by Brother Kurt Schmeisser. Again, a lively discussion followed, which indicates the interest of our local membership.

In addition to these very fine technical talks given by members of Local 1218, travel movies that the brothers have been taking while on their vacations may be seen by those who show up a half hour early. Naturally, movie and camera fans have a field day and an outstanding example was a movie of a Windjammer Cruise around the coast of Maine taken by Brother Don Farmer.

Meeting attendance has been very gratifying.

Chicago CONELRAD Finalized

Plans for the operation of CONELRAD in Chicago in case of air attack were finalized recently, with IBEW stations in the Windy City playing key roles in the program.

CONELRAD is the temporary broadcasting set-up for confusing enemy planes' directional equipment in case of air attack. (See the January issue of your *TECHNICIAN-ENGINEER* for full explanation.) Engineers from seven Chicago stations recently met with FCC men to plan a permanent CONELRAD system for this hub of the mid-west.

The Chicago plan centers on WGN, which will sound the initial alert and also serve as the key station in one of two station "clusters." The other "cluster" is headed by WBBM, the CBS outlet. WMAQ (NBC) will serve as a WGN alternate.

The seven Chicago stations participating in the plan will operate in a sequential mode through their respective clusters. This means that during the air raid alert

they will continually switch broadcast material from antenna to antenna outside the city at irregular intervals, change the radio beam every few seconds. A test run of the Chicago plan, already made, showed that the stations knew how to handle the plan successfully.

Station representatives at the final meeting which detailed the entire plan included Carl J. Meyer, director of engineering at WGN; H. R. Lindsay and T. E. Schreyer, WMAQ; Kenneth C. Shirk, WIND; Lee N. Hon and J. F. Novy, WBBN; W. H. Cummings, WENR; H. C. Krumbein, WSBC; and Thomas Rowe, WLS.

Engineers Aid on Visual Aids

Jim Fleming, news editor of NBC-TV's *Today*, recently urged TV news commentators to seek the advice of station engineers before planning the use of visual aids on their newscasts.

"Commentators in this news era should realize that they have much to learn from the TV engineer," he suggested in an industry magazine article. "He will be able to tell you whether a still will 'scan' on the screen, whether it is too cluttered to make a point. Maps are great aids in telling the story, but here again they must be simple. The cluttered map is less than useless. Someone in your shop will be able to construct the simple and clear maps that help tell the story. Keep the printing to a minimum and use arrows to point out centers of interest."

Aviation's Tall Tower

Speaking of tall towers . . . and that's what the FCC and aviation circles are still pondering . . . the Army Air Forces have produced a sky-sweeping rig that rises 1,218 feet into the air at Rome, N. Y.

Constructed for the Air Research and Development Command as a radio experimental aid, it required 772 tons of fabricated steel. The tower's top is only 232 feet lower than the antenna atop the Empire State Building. It can easily be tabbed one of the highest man-made structures in the world.

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