

RADIO, TV and RECORDING



TECHNICIAN-ENGINEER

JUNE, 1952



International
Brotherhood
of Electrical
Workers (AFL)

TV, LOOKING UP

First Annual Progress Meeting Offers A Third Avenue Toward Job Security

BY D. W. TRACY, President, International Brotherhood of Electrical Workers

DURING this expanding period of electrical communications, every division of the International Brotherhood of Electrical Workers must be keyed to progress . . . but none more than the radio, television, and recording division.

In this division are the men who handle the controls of instruments which only a decade ago would have seemed gadgets of science fiction. Here are the engineers and technicians who bring to a novelty-hungry nation its latest forms of entertainment. The microphones of their craft are an open sesame for drama, music, news, and much more.

To receive this constantly flowing river called broadcasting an eager public, through its advertisers and time buyers, pays the broadcasting industry well. Station facilities are constantly growing in size. Broadcasting executives are receiving not only exceptional salaries but huge bonuses as well.

Only A Minute Portion

Meanwhile, the engineers and technicians who bring energy to this big genie of the vacuum tube and rub the lamps which perform the miracles receive only a minute portion of the treasure the genie brings. They often have to bargain desperately to acquire some of the basic working conditions which should go to every member of the craft.

And to bargain effectively they have found, just as most working men have found, that they cannot operate little independent stations of protest. They must boost their power through union with other engineers wanting equal job opportunity and security.

Your Radio, Television, and Recording Division of the IBEW is tuned to the rights of the individual engineer, and its membership strength is such that it can bargain well for the craft.

What your division has needed most in the past has been the opinions and criticism of the individual engineer . . . suggestions for improved working conditions, complaints of wage and working injustices.

Heretofore, you have been able to express much of this through your local union and through the International representatives.

Now, you have a third and important method—the annual division progress meeting, the first of which will be held June 5, 6, and 7 at the Hotel Peabody in Memphis.

All IBEW locals with broadcasting members have been furnished with complete information about this event. Cards for hotel reservations have been sent to each union. By the time you receive this edition of the *TECHNICIAN-ENGINEER* many local representatives will have been selected and their reservations made.

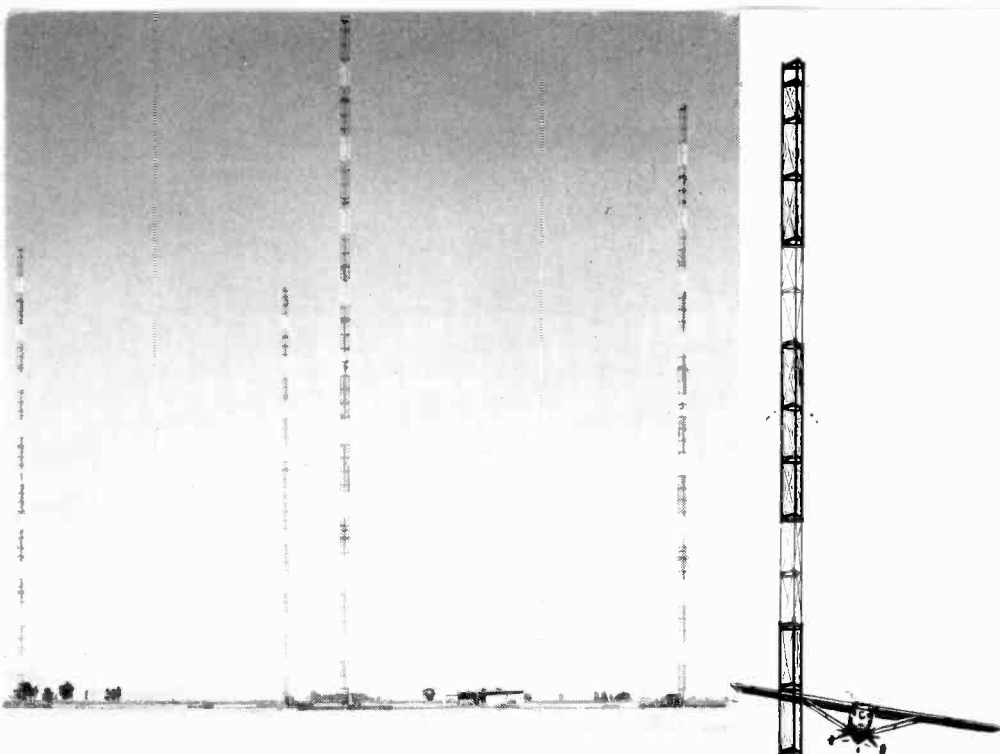
Not An Idle Gathering

This will not be an idle gathering of fraternal engineers. Instead, it is planned as a sounding board of opinions and suggestions. This meeting can be an outstanding success, if your local representative joins the representatives of the other 78 local unions in an earnest discussion of problems.

Not only must we discuss wage adjustments and union organization, but we must enlarge our plans to defeat the attempted invasion tactics of the National Association of Broadcast Engineers and Technicians, CIO. Since NABET went CIO it has gone far beyond its jurisdiction and wasted its already questionable strength in other labor ranks where it did not belong. NABET seems to have become the prime Trojan horse by which the CIO hopes to take over the broadcasting industry.

In taking on such a role, it has made our task of driving it out of broadcast engineering easier. No labor organization such as this can bargain for the specific problems of broadcast engineering, when it is busy trying to raid the stagehands, the writing and directing crafts, and other separate jurisdictions. It is now facing the united opposition of all AFL entertainment and broadcasting unions, and it cannot stand up to such progressive unionism.

Other matters, of course, will be up for discussion. Your International staff is still open for agenda suggestions. If you are not your local's chosen delegate to the Memphis meeting, take time out to make your thoughts known to the man who is. Let's make this first annual progress meeting a credit to the whole division.



Reports of 2,000-foot UHF antennas have caused a flurry in aviation circles. The question is what's too high for a broadcasting tower and what's too low for a pilot to fly.

LEFT: The four 500-foot towers of KCBS at Novato, Calif., needed only an FCC go-ahead for their erection. Above 500 feet, all towers require approval by Air Space Sub-Committees.

Tall-Tower TROUBLE

THE transmitter tower of Station CBW Winnipeg at Carman, Manitoba, rises 570 feet into the air. On February 4 three airmen flying a Royal Canadian Air Force training plane struck the tower and were killed.

As though this were not enough, three men were killed next day when they were attempting to make the necessary repairs near the top of the antenna. The plane collision had bent the top 80 feet of the tower so that it swayed as much as 30 feet off center. The repairmen were working under the glare of searchlights when a high wind struck. The bent section was hurled to the ground. The rest of the tower wavered, girders snapped, and the whole structure crashed to earth.

Was it pilot error that caused the plane to strike the tower? Was it map error? Administrative error in permitting a 570-foot tower? Or wind and fate?

If you take a poll of the broadcasting industry and then another of civil and military aviation officials, you'll get entirely different answers to all four questions. Poll many Federal legislators and you'll get still a third viewpoint.

All will agree, however, that the age of mass communications and its tall antenna towers is running smack into the age of aviation and its navigation problems, and something has to be done about it.

Recent air crashes near metropolitan airports

have caused a flurry of public demand for more stringent air safety rules. Civic committees are pounding the desks for air hazard legislation, asking that airports be moved further from populated areas and pointing accusing fingers at broadcasting transmitters anywhere within five miles.

And now that the FCC has lifted the TV freeze, a high TV tower bugaboo has run rampant through aviation organizations. Reports that ultra high-frequency TV would require 1,200 and 2,000 foot towers have caused mounting concern.

It's not a matter of placing blame or of calling names. It's a problem which will have to be worked out to the satisfaction of both—a jurisdictional dispute that can be settled by defining boundaries.

Part 17 of the FCC rules requires broadcast antennas to meet certain criteria. All towers above 500 feet have to be approved by regional airspace committees of the Air Coordinating Committee at the city involved. They require "special aeronautical study irrespective of their location." It is the function of the subcommittees, composed of representatives of the Civil Aeronautics Authority, civil airlines, military services, etc., to determine whether a proposed antenna would be a hazard to air navigation.

Civil Aeronautics Authority rules, meanwhile, require that airplanes fly not less than 1,000 feet above the highest structure in the airway.



If an antenna goes up to 2,000 feet, a plane must stay above 3,000 feet. Place a tower within two or three miles of the airport, and the pilot of a plane coming in for a landing under adverse weather conditions will have good reason to worry about a hazard.

The trouble is that TV broadcasting, being a limited-range medium, must get antenna height and/or power to send a good signal. Ultra high frequency, especially, must go up toward the clouds.

The question of what to do about the ups and downs of this dilemma has prompted several suggested remedies. At a recent meeting of broadcasting and aviation interests in Washington, D. C., the FCC distributed a proposal stating that towers more than 500 feet high and located outside civil airways should not be considered hazards to air navigation if they are below a plane with a glide slope of 50:1. Details of this proposal were illustrated on a chart distributed at the meeting. It has to do with the ratio of free landing area to height above hazards, and the glide ability of a plane.

- There has been talk on going to Congress for legislation to restrict TV antenna heights.

- A system of short towers, relay towers, and high powers have been suggested.

- Another suggestion calls for radio warning devices on towers. (This idea gets further impetus from the recent announcement of successful testing of warning devices for use in planes, warning pilots approaching obstructions.)

- To cut down the number of air hazards joint towers and transmitter sites have been suggested for all the stations of a single city. (For this and other practical reasons, the manager of KFEL, Denver, recently suggested to all local TV applicants that they locate their transmitters atop nearby Lookout Mountain.)

The pressing problem right now is the question of government regulation vs. self-regulation.

Congress was suddenly injected into the controversy last month when Senator Ed. C. Johnson, chairman of the Senate Interstate and Foreign Commerce Committee introduced a bill "to authorize the Secretary of Commerce to remove obstructions or hazards to air navigation, to prevent further obstructions or hazards to air navigation, and for other purposes."



The Cover

TV, LOOKING UP

Speaking of tall towers, the Empire State Building, shown on our June cover, rises 1,472 feet over New York's glittering Fifth Avenue. Atop this—the world's tallest structure—is fixed a television antenna for WJZ-TV, another for WNBT, and still another for WPIX.

RADIO, TV and RECORDING TECHNICIAN-ENGINEER

Published monthly by the International Brotherhood of Electrical Workers (AFL), 1200 Fifteenth St., N. W., Washington, D. C., for the men and women employed in the recording, radio and television industries.

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VOLUME I

17

NUMBER 6

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

PRINTED ON UNION MADE PAPER

The bill would empower the Secretary of Commerce to set up standards for any structure (including radio and TV towers) more than 500 feet above ground.

It was understood that the aviation industry has tried sponsorship of similar bills over a number of years but heretofore has been unsuccessful in its attempts.

The bill has been referred to Senator Johnston's committee for study.

Government regulation has many opponents, especially in the broadcasting industry. Reasons for opposing the establishment of national rules are said to be two: (1) Cooperation between aviation interests and broadcasters has been effective in resolving hundreds of cases, although in some instances there have been failures. (2) Each situation is unique, and national instructions would be unfair to individual cases—an application for Dubuque should not be considered in the same way as one for Chicago.

On the other hand, if no nation-wide standards are established, some fear that there might be several, perhaps conflicting, tests—by CAA, Air Force, Navy and each of the 48 states.

The whole problem is made more complex by the antenna construction permits already approved or applied for.

During the first week of March the FCC authorized a 1057-foot tower for WJBK-TV, Detroit, reducing the station's power from 16.5 kw to 3 kw, and a construction permit was issued to Cleveland's WXEL to go up to 776 feet and cut power from 21 kw to 7.5 kw.

Only a few weeks ago the Oklahoma Television Corporation, a syndicate of businessmen, proposed to build the world's tallest made-made structure for an Oklahoma City TV station—a 1,500-foot tower, at a site eight miles north of the city.

Highest man-made structure so far is the Empire State Building in New York City, which is 1,250 feet above ground. And there's not much that legislation can do to whittle it down to air navigation size.



ON March 25th KFAB technicians and newsmen recorded an exclusive interview with Brig. Gen. Don Shingler, Missouri River Division Engineer, in which he revealed that Omaha-Council Bluffs, sister cities on opposite banks of the Missouri River, were in for a flood—the “granddaddy of them all,” as he expressed it.

That such a statement was indeed true was verified by reports from cities in Montana, South Dakota, and upper Iowa, which were experiencing a flood of record proportions. It hit Omaha Thursday night, April 17th, with a crest of 30.24 feet, 11.24 feet above normal flood level, 7.84 feet above the 1943 flood level, and 5.64 feet above the highest known mark registered in 1881 for which the protecting dikes and walls were designed.

A night and day struggle involving the Corps of Engineers, Army, National Guard, Navy, and Coast Guard personnel, civil defense workers, and thousands of volunteers from miles in every direction was called for before Omaha won out over the river. The dikes were raised by adding 6-foot splash boards along the full 13 miles of dikes on the Omaha side and the 23 miles of additional dikes on the Council Bluffs side. By constant vigilance, hard labor and the grace of God these bastions held.

What does such a tremendous event do to the radio industry and, more specifically, to the technicians of the broadcasting stations?

When the KFAB technical department was alerted Tuesday, April 8th, plans were immediately set up by the studio supervisor, Al Bates, and put into motion. Two mobile units—one with radio relay equipment, and another, normally stationed at the Lincoln studios and completely equipped with tape recording equipment, re-

mote amplifiers, converters and associated equipment—were pressed into service for immediate use anywhere in the flood area. Additional equipment, remote amplifiers, field telephones, and portable tape recorders, were made ready for use in the field. Battery-equipped field gear and permanent auxiliary power units at both the studio and the transmitter insured uninterrupted service in case of power failure, which was anticipated if the dikes didn’t hold and the power plant flooded.

The possibility existed that transportation between the two cities would be cut off if the river flooded bridge approaches. To assure complete coverage in this event, a technician and newsmen, with the tap-recorder-equipped mobile unit, was assigned to the flood headquarters in the Council Bluffs City Hall. Remote amplifier equipment was set up in the press room adjoining the Mayor’s and Corps of Engineers offices. A direct line connected this setup with the control room and the KFAB news center. A 24-hour watch was maintained by the two men.

Close liaison was maintained throughout the flood with all official activities, the Corps of Engineers, the Mayor’s office, Civil Defense, and relief agencies, and service rendered as requested.



Tired KFAB Engineer Roy Rydberg, President of Local 1221, waits for the announcer’s next move, his equipment ready for action.



LOWER LEFT: Edward R. Murrow broadcasts from the KFAB Mobile Unit on the night that the big flood reached its crest.

AT THE TOP: On flood stand-by in the Control Room—IBEW Members Brooks Jones, Normon Rothwell, and Roy Rydberg.

LOWER RIGHT: Thomson Holtz with the KFAB Mobile Unit, interviewing levee workers near the Council Bluffs water plant.

The actual work could be divided into two distinct operations, namely, field and control room. Technicians doubled in both capacities. It was only through full cooperation between the field and control room that the coverage was completely successful. The field men included those who made on-the-scene pick-ups. They arrived at the flood scene by every feasible means of transportation, including the two mobile units, Navy and Corps of Engineers aircraft, "Ducks," outboard motor boats, and private cars. Others took portable tape recorders to control centers and flood-fighting headquarters for pick-up of important statements, and still others sat at remote equipment to feed in directly to the control and news rooms. They were the "leg men" who went out to get the story.

A few added details regarding the relay equipped

Thanks to Al Bates of KFAB for the excellent story of how his station crew covered the flood, and to Roy T. Rydberg, President of Local 1221, for the reports from KOIL and KBON. Engineers at these three stations are all members of IBEW Local 1221. Photos of KFAB's work were all taken by the KFAB engineering staff.

mobile unit may be of interest. Throughout the flood operation, the 50-watt Link 150mc FM shortwave transmitter installed in the unit delivered such a strong signal into the two local receiving points that news material and special broadcasts normally taped in the field and rushed to the studio were shortwaved in and recorded in the control room. This permitted the unit to continue to maneuver in the flood area and do shortwave broadcasts as far as 40 miles from the studio. Edward R. Murrow also did a broadcast from the mobile unit via shortwave. The unit was equipped to monitor all emergency frequencies of the related agencies operating in the flood area, including police, sheriffs of Nebraska and Iowa counties, as well as the special dike watchers and Corps of Engineers. The field crew was thus fully informed of all critical areas at all times. These monitoring facilities were duplicated in the KFAB newsroom.

The efforts and results of the field men were channeled to the Omaha control room where the four Ampex tape machines, and two transcription lathes, were kept spinning to take down and play back the news. On many occasions, originations were aired directly, but in general, material was transcribed and edited prior to airing to insure accurate, informative, interesting, and coordinated broadcasts. This editing doubled the labors of

the control room crew, since all editing was accomplished by the technicians as directed by the news department.

In addition to recording and maintaining KFAB programs, the control room was faced with the task of making facilities and equipment available, checking lines, and performing other operations coincident with CBS network feeds and feeds to local stations in the area. The technicians in the control room operated under almost super-human pressures of split-second timing, transcribing, editing, answering numerous jangling phones, and listening to the din of monitor speakers talking their individual tales.

These labors added up an impressive net result. The regular KFAB news periods were augmented by numerous special flood newscasts and bulletins. The all-night operations were interrupted as necessary to broadcast flood news, and Thursday and Friday, the after-midnight programs were built around flood broadcasts. Material was gathered, edited, and combined for three documentary shows aired on KFAB. The first such broadcast included material received from both mobile units via radio relay and tape, remote lines, two portable tapes, and the Lincoln and Omaha studios. This show was dreamed up at 2 o'clock in the afternoon, material collected, put together, and aired at 7 p. m.

Twenty CBS network feeds originated from the studios. These feeds included Edward R. Murrow's shows and Doug Edwards' news portion of the "Wendy Warren" shows on Thursday and Friday. In addition, numerous inserts were fed and incorporated in CBS news programs. Fourteen studio originations were fed to other stations in the Missouri River Valley region.

An idea of the extent of the coverage is revealed by the fact that approximately 16 miles of tape were used in recording the fight against the raging river. The radio relay mobile unit covered over 1,000 miles along the levees. Technicians taking part were Al Bates, studio supervisor;



● KFAB studio tape equipment in operation at the height of the flood activities. The technicians of the Omaha station worked under constant pressure, editing tape, transcribing, getting news on the air quickly.



● Lyell Bremser short waves to the studios an interview with an Army officer on duty at the levee. Regular Army units joined the Army Engineers in the big job of holding back the river, and protecting property.



● Mayor Mulqueen, left, of Council Bluffs, Iowa, issues a proclamation to the people of his city via direct wire from the City Hall. Announcer Bob Gillan, center, and Engineer Harlan Underkofler at the controls.

John Bruna; Jerry Flyr; Brooks Jones; Al Kamprath; "Rocky" Rothwell; Roy Rydberg; and "Har" Underkoffler. The total man-hours for the week starting the 13th were 537, or an average of 67 hours per man. Not satisfied with these hours, technicians also volunteered their "spare" time and helped on the dikes. Throughout the week, under pressure, there was only one minor personnel-equipment failure and luckily one

that didn't affect actual broadcast of flood coverage.

The outstanding feature of the flood in this area was the whole-hearted cooperation and labor of everyone. This same spirit pervaded the KFAB personnel, from the general manager to the office boys, and it was through the cooperation of all departments that complete and accurate news of the flood was supplied to the residents in the five-state area served by KFAB.

Other IBEW Engineers Keep Watch on the Missouri

KBON Extends a Helping Hand to KOIL, As Flood Threatens
Station Transmitter; Overtime Donated to Flood Relief Agency

STATION KBON began 24-hour operation on Monday, April 24, and continued through Saturday, April 29, until the flood crest had passed.

Many tape recording broadcasts were scheduled from the flood area. On-the-spot interviews with officials of Civilian Defense, Army personnel, Red Cross workers, voluntary dock workers, and evacuees were made by Bill Baldwin, KBON studio supervisor, who also covered President Truman's stop-over at Offutt Airforce Base during his inspection of the flood area.

Dick Welna, KBON chief engineer, correlated all engineering activities and fed portions of the President's talk, together with periodic flood coverage, to the full Mutual network.

KBON extended a helping hand to KOIL, Omaha, by placing a spare 250-watt Western Electric 451 A-1 transmitter at its disposal. Due to the proximity of the KOIL transmitter building to the flood waters, an emergency set-up was established at the KBON transmitter site—38th and Wright Street in Omaha. KOIL erected a long-wire antenna, and Don Mehl, KBON's transmitter super, made all connections and tuning adjustments necessary to operate on KOIL's frequency. Coverage and signal strength proved to be excellent.

Fortunately, the emergency set-up was not needed, but the action by KBON did serve to point up the cooperation between station managements and Local 1221 engineers at Omaha stations.

WHEN the Missouri River Valley flood crest began moving down from South Dakota, Station KOIL of Omaha went on a 24-hour schedule. All through the night its programs were interrupted with news flashes and public service appeals.

The station's IBEW engineers handled all manner of tough assignments before the crisis was past. KOIL's field coverage consisted of telephone recordings from the Council Bluffs City Hall, taped reports from airplanes and motorboats, and direct reports from the

middle of Ak-Sar-Ben Bridge overlooking the raging river.

The majority of the station's reports came from its mobile unit, which was bolstered by a remote unit from KOIL's sister station in Minneapolis, WDCY. From another station in Lincoln, Nebraska, came equipment and engineering aid.

Had the river won its battle, the KOIL's transmitter would have been flooded. It became apparent that a standby transmitter was needed. Thanks to Station KBON, Omaha, such was procured, since the IBEW engineers there were high and dry and had no need for their standby unit.

Three members of the KOIL engineering staff had to evacuate their homes, but, since the levees held, they suffered no losses.

When all the work was done, the members of the Brotherhood considered charging the companies involved in the flood work straight time for any overtime work. But after discussing the matter, they decided it would be better for the local as a whole to pool the overtime and contribute it to the Salvation Army, "figuring they could put it to much better use, and who, incidentally, did a whale of a job all during the emergency."

More Flood Work By Union Stations

IBEW engineers of L. U. 1216 and a busy station staff of WCCO, Minneapolis-St. Paul, climaxed coverage of spring floods on the Mississippi and Minnesota Rivers with an "Emergency Call" program, April 15, which featured a plea for flood relief funds from Governor C. Elmer Anderson.

Meanwhile, three union-contract stations in Omaha—KBON, KOWH, and KFAB (featured in our accompanying story)—helped raise \$10,674 for three relief agencies: The Red Cross, Salvation Army, and Volunteers of America.

CBS

AGREEMENT

**Proposals Consolidated, Purposes
Unified in Full Week of Conferences
Between Local Union Representatives**



Much paper work and discussion, clockwise, included, Lewis Smith, LU 1216; Stanley Carr, LU 45; A. J. Cunningham, LU 45; George T. Cairns, Bus. Mgr. LU 1228; Charles A. Calame, Bus. Mgr. LU 1212; and, back turned, in the foreground, Ed Harley, LU 1212.

AFTER several weeks of intensive negotiation, agreement between seven local unions and the Columbia Broadcasting System, Inc., was executed on Friday, May 16. The new two-year pact covers more than nine hundred engineering department employees and includes the laboratory technicians, draftsmen and machinists in the Engineering Research and Development department.

Effective May 1, 1952, the new agreement is in effect at WCBS-AM-FM-TV, KMOX, WCCO, WEEI-AM-FM, WCCO, KCBS-AM-FM, KNX-AM-FM and KNXT as well as at the CBS short-wave facilities at Wayne, N. J., Brentwood, L. I., and Delano, Calif.

Pay differentials between cities are abolished by the new contract which provides for a uniform 4-year escalator beginning at \$74 per week and reaching \$147.50 for technicians, with assistant technicians receiving \$70 per week, assistant supervisors \$164 and supervisors \$171.50. Effective May 1, 1953, all scales are increased by \$2.50 per week. Fifty per cent of the monies involved in the new straight time and overtime rates,

calculated from May 28, 1951, to May 1, 1952, will be paid the men as retroactive pay just as quickly as the amounts are figured for each man.

New features of the CBS agreement include upward adjustments of the vacation allowances to adjust inequities of former agreements, a fourth week of vacation for five years of service, a 10 per cent differential for work between midnight and at 7 o'clock a. m., an increase in premium pay for work which disturbs the normal 12-hour rest period, very substantial improvements in advance scheduling, a specific provision which avoids any disciplinary action for any employee who may choose to observe an authorized A. F. of L. picket line, very constructive improvements in field assignments, an increased allowance for personal car use and complete liability insurance for car use during company assignments, three weeks' notice of layoff, increased travel allowances for transmitter assignments, etc., etc. Altogether there are some 55 changes (improvements) of the former agreement, 36 of those changes being entirely new provisions.

A relatively small part of the new agreement is subject to the approval of the Wage Stabilization Board, since much of the new pact is automatically approvable under Regulations 6 and 8. However, agreement was reached by the parties to cooperate in jointly seeking any necessary approval by the Board and it does not appear that such approval will be unduly delayed.

At the Bargaining Table

Present at the bargaining table: for Local Union 45 were Int'l Rep. George A. Mulkey and Andrew J. Cunningham; Business Manager John J. Dunn and Asst. Business Manager Gilbert de la Laing for Local Union 202; Business Manager Charles A. Calame and Edward C. Harley, Carl H. Harris, Pat Iodice and Ray-

Continued on next page



Foreground: Ed Harley, LU 1212. Left to right, Gilbert de la Laing, Asst. Bus. Mgr. LU 202; Raymond A. Wood, Asst. Bus. Mgr. LU 1212; and Seel P. Wiegand, who represented LU 1220.

mond Wood for Local Union 1212; Lewis Smith for Local Union 1216; President Denis E. Volas of Local Union 1217; Business Manager Walter H. Thompson and S. P. Wiegand for Local Union 1220 and Business Manager George T. Cairns for Local Union 1228. International Representatives Russell D. Lighty and Albert O. Hardy represented the International office.

CBS was represented by a negotiating committee headed by William C. Fitts of the Legal Department. Mr. Fitts was flanked by Robert E. Kalaidjian, Director of Personnel Relations; Henry Grossman, Assistant to Vice President of Operations, CBS Television and Horace Guillotte, Director of Operations, CBS Radio.

The negotiations were preceded by a full week of conferences between the representatives of the local unions. These conferences resulted in a consolidation of proposals and projects and a complete unity of purpose and understanding. Our CBS members can well be proud of the new agreement and the men who represented them in the negotiations. This has truly been a good job, well done; the new agreement is a polished product of true unionism at work.

Television Frontier Now Reaches Around the World

TELEVISION is pacing off new paths of communication over the face of the world, and it is taking its strides with twenty-league boots. Only a quarter of a century ago, the first crude silhouettes appeared on glass screens in London, New York, and Washington. This year, Tanganyikans may see a television show.

At latest count, 17 countries other than the United States have television transmitters on the air, the National Geographic Society reports. The list includes England, France, Germany, Russia, Italy, Denmark, the Netherlands, Spain, Sweden, Switzerland, Czechoslovakia, Canada, Mexico, Cuba, Brazil, Argentina, and Japan.

As this country lifts its television freeze and opens the way for more than 2,000 stations at home, at least 13 additional nations are planning TV tests. Nigeria and Morocco, Cyprus and the Dominican Republic, Thailand and India are among them.

In conquering new fields, television's towers are rising from deserts and jungles, seacoasts and mountaintops.

Coaxial transmission lines—hollow tubes carrying electronic impulses at the speed of light—span the United States. Above ground, 107 reflector-topped microwave towers zig-zag between New York and San Francisco. Both systems carry television programs to local transmitting stations. Both have been seriously proposed for sending TV around the world.

Curiously, it was a telegrapher at Valentia, Ireland, at the far end of the first trans-Atlantic cable, who first



International Representative Russell D. Lighty; John J. Dunn, Bus. Mgr. LU 202; and Gilbert de la Laing, Asst. Bus. Mgr. LU 202 during a pause in the three-day discussions.



Getting down to shirtsleeves—Carl Harris, LU 1212; Pat Iodice, standing, LU 1212; Denis E. Volas, President of LU 1217; Lewis Smith, LU 1216; and B. Stanley Carr of LU 45.

set the stage for modern television in 1873. He discovered that the element selenium transmitted (more or less) electricity, depending upon the amount of light falling on it.

Using that early observation, made even before the first wireless radio message had been sent by Marconi, inventors in many countries began laying the foundations for today's television industry. Men had dreamed for centuries of being able to project their vision afar. Slowly, over 50 years, the dream became reality.

More than half the people in the United States will be within range of television under the recent air-wave allocations of the Federal Communications Commission. Much higher percentages of population are already blanketed in such countries as England and the Netherlands. Within the coming year, the Voice of America estimated recently, as many as 25,000,000 people in other countries will see TV regularly.

WTOP Engineers Install FM Antenna Inside TV Tower

The engineering staff of WTOP, Inc., CBS outlet in Washington, D. C., wanted to rig up a multi-V FM antenna at the station's TV transmitter. Operating in the FM broadcast band at 96.3 megacycles, it had in mind a four-element antenna with a good power gain.

Shopping around for something both economical and efficient, the staff liked an antenna produced by a Mid-West manufacturer which featured folded dipoles bent into V's to form a lightweight array which could be mounted on existing towers.

According to specifications, the multi-V antenna could be mounted on the top or side of a tower. As the specifications read "when top mounting is desired, the antenna is equipped with a 5-inch steel I-beam, 20 feet long; this mast projects 4 feet into the top of the tower for anchoring."

That was out. A big TV installation already dominated the top of the tower.

The specifications continued: "If the antenna is to be side mounted, a mast is not included; instead the radiators are attached directly to the side of the tower using special mounting brackets designed to fit your particular tower."

This didn't appeal to the engineering crew either.

For one thing, WTOP was afraid that FM transmission from such a setup might cause a distorted radiation pattern—with a good intensity on the side of the tower where the multi-V rig was installed and not-so-good on the opposite side. The station felt that to set up a side antenna and get maximum coverage, they ought to balance the radiation off with a duplicate antenna on the opposite side. But this involved additional cost, and they had another alternative.

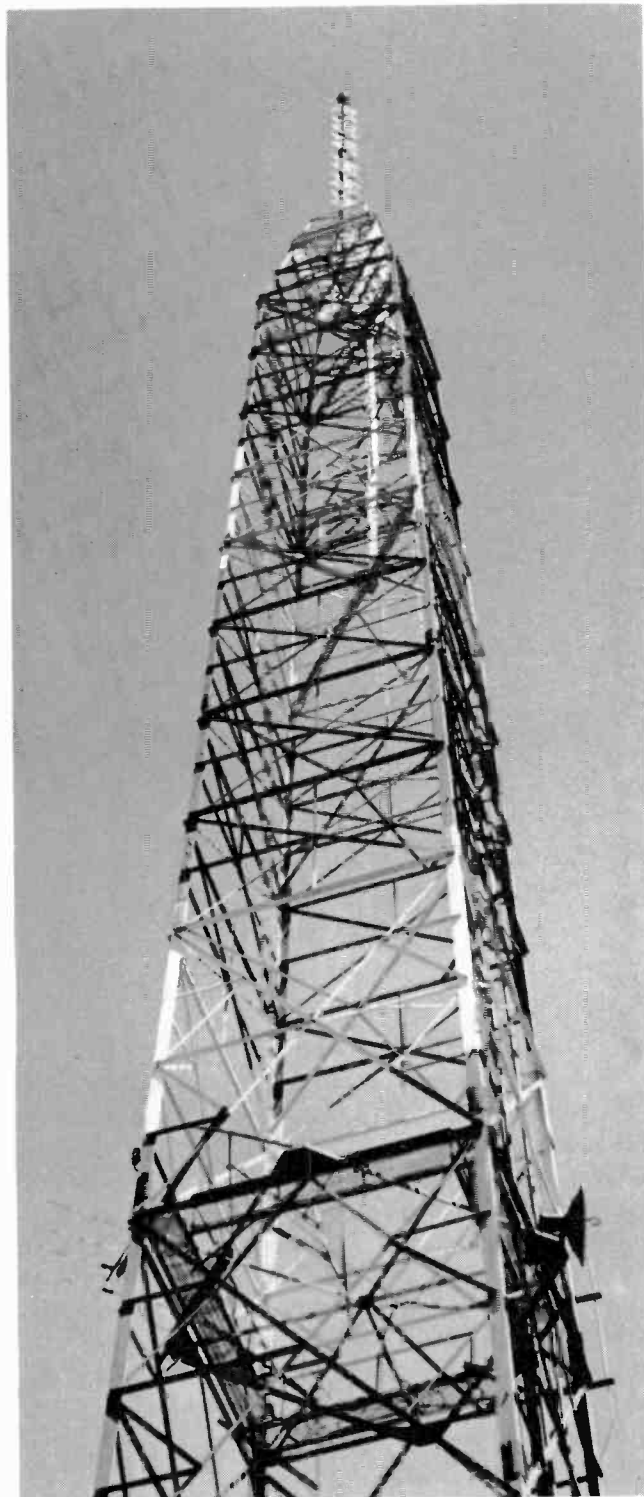
Query to Manufacturer

They asked the manufacturer if it wasn't possible to set the multi-V inside the tower and operate from that position. The manufacturer said that it hadn't been done, but that its technical staff felt it would work.

WTOP engineers decided to go ahead and try it. So the I-beam was mounted in the vertical plane of the tower on cross bars beneath the TV installation. Two beams, end to end, totaling about 48 feet, were bolted into position, with a pair of elements on each beam. The feed cable splits at the bottom of the antenna and separate lines go to each beam.

The big worry was the surrounding steel. Would it cause reradiation and distort the signal?

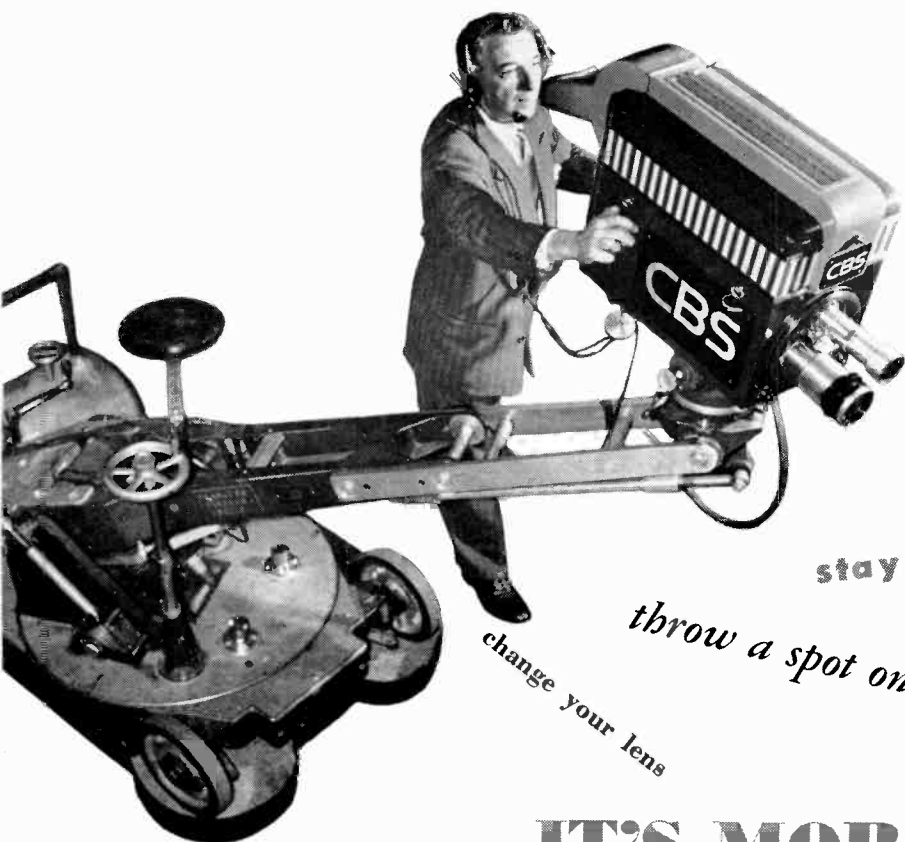
They guessed that the metal was so close that any effects would be localized and not affect the radiation pattern. Granville Klink, chief engineer, compares the principle to that of looking through a plain glass window



WTOP's Multi-V FM installation can be seen just below the TV rig at the top of the tower. The two diagonal beams inside the girders support two I-beams, end to end. Attached to these are the four V elements which broadcast the FM signal.

and then looking through a large, mesh screen. You still see the outside without difficulty.

When the coaxial cable was finally attached and the multi-V FM rig went on the air, the guess proved right. WTOP now has its TV antenna and FM antenna on one tower, and all is well.



don't trip over those cables

composition, composition

stay in focus

throw a spot on that close-up

change your lens

IT'S MORE THAN JUST POINTING A CAMERA

SURE, there are times when a TV cameraman's job is about as hard as that of a bird watcher eyeing sitting ducks. He's just standing there watching Miss Pennybacker "shop the town," or he's covering home plate and told to stay there.

But there are times, too, when the ducks either go under water or fly away . . . when his cues are coming fast and furious . . . when he has to rush across a stage to focus on an announcer pouring a glass of beer, and then must pan left to catch the suds blown away . . . then across the floor, dodging cable, twisting a wide-angle lens into position to catch a quartet of gangsters jimmying a safe in a propped-up alley.

All the while, he's behind the wheel facing an all-too-clear windshield and driving unpteen-million televiewers to diversion or distraction. To add to his troubles, the voice of the most vicious back-seat driver ever created—the director's—is crackling into his ears from a head-phone.

As many a cameraman has been moved to comment: Sometimes the pace drives you bats. The hours are miserable. To get a decent salary your union has to bargain like madmen. But, by Godfrey, for some reason you like it!

What makes a good TV cameraman? There are many replies.

Reid Davis, NBC operations supervisor, says the TV cameraman should be a combination of engineer, expert photographer, and musician. He must possess athletic ability, an understanding of show business, ambassadorial attributes, and willingness to perform any task that is asked of him.

According to some, CBS wants, first of all, a man who knows composition, knows what looks good in an image. He doesn't have to know too much theory, as long as he can master a camera.

NBC, however, wants a technician with electrical engineering and/or radio experience. If he is not ade-



Keep your picture

watch your cue

gimme a test pattern

CBS Cameramen Alexander Brown, top left; Phil Polonsky, lower left; and Everett Dunn, right, with the elaborate equipment which is the TV cameraman's stock in trade.

quately qualified in these fields of endeavor, but shows promise, he is put on NBC's payroll and sent to school for 90 days. During his schooling, the aspirant gets 40 hours of practice on the cameras, putting academic theory to use.

One former cameraman, now a technician, says, in rebuttal, that all the job requires is 20/20 vision and a pair of rubber-soled shoes.

Robert Montgomery, producer of the big NBC show, who prefers to train his own crew, says: "I want not an MIT graduate nor an artistic prima donna, but a man who moves fast, one to whom good composition is inherent. Give me a man who can correct human error; i.e., double chins, crow's-feet or unrehearsed movement. Above all, I want a man who doesn't lose his head."

Because he works in the present with a live show and can't make mistakes, the TV cameraman has fewer opportunities for exercising his initiative than does the movie cameraman, for example. But he is by no means a robot . . . or he doesn't stay on a camera dolly long. He works according to a script, but he has to be constantly on his toes when an image is on the monitor. In spite of much rehearsal, many an actor has made an unexpected shift of position which must not be lost, and when covering special events the unexpected can usually be expected.

The ordinary cameraman just waits for cues from the assistant director, who is watching his operation in the control room. But a good worker relies for cues only on himself. He remembers and anticipates every move, using the cue only as a check on himself.

Must Stay on His Toes

He must especially stay on his toes in close-ups. For this kind of shot a spotlight on his camera is trained on the subject. His dolly is moved quickly into position. If the actor suddenly decides to get up from a seated position, for example, the cameraman has to be ready to move swiftly with him and not let him get out of the picture. Any credit for good photography and blame for bad work must be shared by the director and the cameraman. However, if the latter lacks imagination, takes wrong cues, or uses a lens of the wrong focal length, for instance, the director is helpless.

When the show is on, the cues will come fast—"Ready Camera One." . . . "Take Camera One." . . . And as things progress—"Ready One." . . . "Take One." . . . "Ready One." . . . "Take One." . . .

That's when you eliminate the Brownie users from the cameramen. The good cameraman remembers every step he took as he walked through rehearsals. All of his compensating adjustments on the camera have been made properly, and he is rolling right along.

While the show is on, the cameraman is intently watching the 5-inch screen on the rear of his camera. This is the picture his camera is picking up, and when this picture is on the line monitor, this is the picture millions of viewers are seeing on their television sets. A cameraman can tell a story and create a mood just by tilting, focusing, and working his camera.

The editing must be done as he goes along. Not in a cutting room, as in movie production, but at the camera, while he is taking an average of eighty-odd shots per half-hour show.

Must Keep His Head

A cameraman must keep his head at all times. For instance, there was the night a distraught director belted: "Everybody keep a picture . . . any picture at all . . . even if it's a picture of other cameras." And there was another time when studio rain was supposed to fall on a boat's pilothouse, but instead it ricocheted and nearly drowned the cameraman inside.

Recently, a national magazine carried a full-page picture of a cameraman ogling a show girl doing a fast costume change in the wings when he should have been minding his camera. But who is to deny the cameraman this occasional distraction? Because of this occupational disease, cameramen on the Olson and Johnson show are credited with discovering Dagmar. The camera crew trained on her so regularly that eventually the directors noticed her and arranged for some bit parts on a variety show.

If he is a member of a mobile unit, the cameraman has many more jobs to handle. He swings cable and cares for equipment while attending to the regular duties of his job. He becomes master of lighting facilities, microphone booms, and the dollies which move his camera around. If he's covering an outdoor event from atop a truck or van, he must handle or direct all these tasks in very limited space.

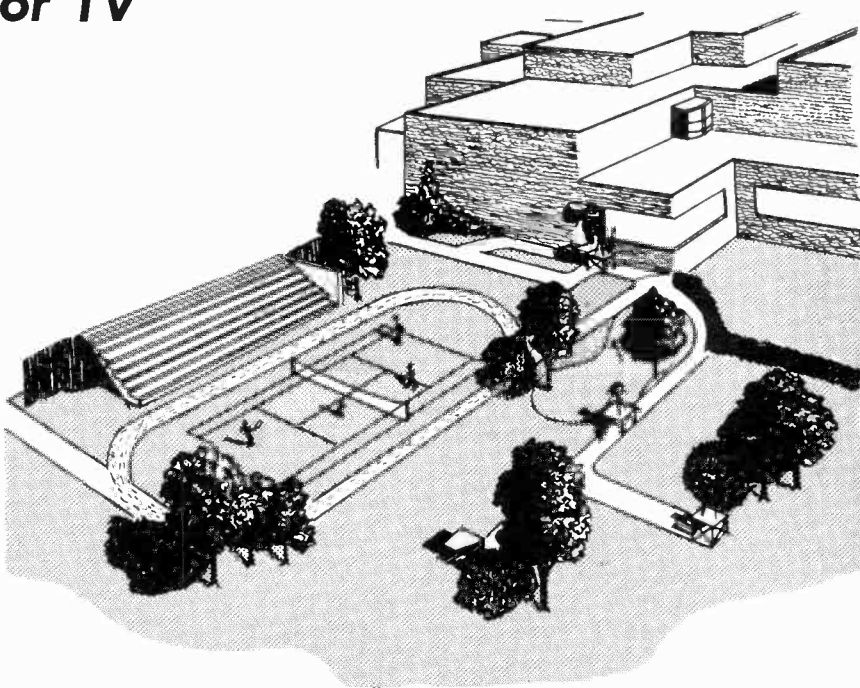
From the start of his job the television cameraman's
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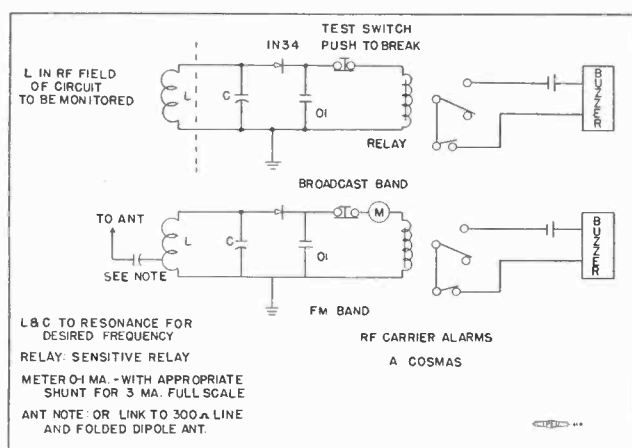
TECHNICAL NOTES

Outdoor Studios for TV

Something new and promising in broadcasting facilities is in preparation at WTMJ's Radio City in Milwaukee. Earmarked for completion this summer is a \$25,000 outdoor, year-round studio. With a main outdoor studio area of 80 by 165 feet, it can be expanded to handle larger activities. Among the programs the station engineering staff (IBEW Local 715) expects to be able to telecast from this fresh-air stage are sports events, women's shows, children at play, nature studies, summer fashions, and evening gardening demonstrations. The opening of the studios will coincide with WTMJ's 25th anniversary and WTMJ-TV's fifth.



RF CARRIER ALARMS



There are many obvious reasons why an RF Carrier Alarm is a useful device for any transmitter plant. Construction is simple, parts are few and the cost is low.

Units designed for the AM band can be installed in the RF field of the circuit to be monitors, while the alarm buzzer can be mounted at any convenient place.

The use of a meter, shown in the FM unit, is an optional refinement which can be used as a remote visual carrier monitor.

—Athan Cosmas, 251 Ocean Ave., Amityville, L. I., N. Y.

Latest on the TV Color Feud

Laboratory tests with the RCA tri-color tube as part of a color receiver for telecasts by the CBS field sequential system have shown it to perform far less satisfactorily than the color disc developed by CBS, according to Dr. Peter Goldmark of the CBS Laboratory Division.

He called the tri-color tube inferior to the CBS disc "in every respect—color, contrast and detail."

Furthermore, he announced, the Hytron Radio and Electronics Co., tube manufacturing division of CBS, have found the RCA tube impractical from the manufacturing standpoint. He expressed disappointment at the latter, *Broadcasting-Telecasting* magazine reported, because "after all we're in the tube business now, and we'd as soon manufacture RCA's tubes as anyone else's."

Fifty-Million Frenchmen Wrong

The question of how many lines should form an image on the TV screen came in for discussion at a recent Radio Engineers color symposium.

TV standards with more lines and greater bandwidth were advocated for UHF by a member of the audience, who asked why such standards aren't being pushed.

Hazeltine Vice President Arthur Loughren answered: "Above 525 lines and 6 mc you get into diminishing

returns very rapidly. In my opinion, the French are wasting their time with 819 lines. It just isn't worth it. If we fully utilized the bandwidth we have now, you'd see a tremendous improvement."

Wasn't Only TV That Did It!

The movies were hitting a slump before TV came along, says an article in a recent issue of *Boxoffice*, motion picture industry magazine.

The article is based on findings by Albert E. Sindlinger, Philadelphia, whose research firm has been conducting investigations into the impact of video on motion pictures.

According to the Sindlinger survey, the average family in 1941 was spending 23.9 per cent of its recreation budget for movies. In 1951 this percentage had dropped to 7.4.

Sindlinger says the movies can be encouraged by three things:

- population is on the increase (!!)
- family income is rising
- recreation budgets are up

Tubular Assist to UHF Reported

A TV receiving tube permitting construction of television tuning units for both present VHF channels and the ultra high frequency channels now in the FCC mill has been reported by the GE tube department.

The tube makes possible a combined tuning system for both bands of TV channels, according to GE engineers, who said a combined tuner should include an oscillator tube, a radio-frequency amplifier and mixer tube—which is the type GE is announcing.

Hams on 21 mc Causes Furor

At the beginning of May the FCC authorized the use of the 21 mc band by amateur radio operators, thereby causing what one TV set manufacturer called a "potentially serious" problem.

There are an estimated 17-million TV sets in use today which have 21 mc intermediate frequency circuits—liable to interference from near-by ham operators. Set manufacturers fear that 80 to 90 per cent of these sets will be affected.

Use of 21-21.45 mc band by hams began May 1. Authorized is continuous wave radio-telegraphy. Radio telephone use, which would make the interference worse, was proposed by the FCC, with comments required by August 1.

Most manufacturers have already vacated the 21 mc band. Major manufacturers like GE, Zenith, DuMont, and Crosley switched shortly after the Radio and Television Manufacturers Assn. recommended a new IF band

of 45.25 mc in the middle of 1949. RCA changed in 1951. Philco switched about three months ago. Emerson moved out of 21 a month ago. Admiral and Motorola are still riding the 21 mc waves, RTMA reports, but Motorola is planning a change before the end of the year and Admiral is waiting for "an urgent need to do so."

Amateur radio use of 21 mc has been on the FCC "books" since 1945, when allocations below 30 mc were made.

One Moment Please . . .



During a recent benefit show on a Detroit TV station, a night club entertainer was instructed to be sure to watch the lights on the cameras, so that he would face them properly during switching. His act started off well, but in a few moments the two cameras covering him began switching back and forth to break the monotony and liven the act. The entertainer was turning this way and that to keep his face in the lights. Finally, in desperation, he looked up toward the control room and the director and shouted plainly below a live mike: "Hey, I didn't come here to watch a tennis game!"

He stayed on one camera for a long time after that.

—Thanks to Kurt Schmeisser, Local Union 1218.

EDITOR'S NOTE: Every station has its tales of last-minute woe . . . unexpected breaks of silence . . . listener complaints. . . . Send them to the **TECHNICIAN-ENGINEER**. We'd like to have the best ones illustrated and passed on to the membership. Mail them to **The TECHNICIAN-ENGINEER**, International Brotherhood of Electrical Workers, 1200 Fifteenth Street, N. W., Washington, D. C.

Station Breaks



Two AFL Groups Join NABET Fight

The Hollywood, Calif., AFL Film Council has received new support in its "stop NABET" campaign. The California State Federation of Labor and California State Theatrical Federation voted at their respective conventions to support the Council's resolution to prevent further NABET "invasion" into amusement fields.

The Film Council has resolved that it would take all necessary steps to defeat the attempted industry-wide invasion by the National Association of Broadcast Engineers and Technicians. NABET, since joining CIO, has attempted to go far beyond the engineering craft and has contested bargaining rights in many amusement crafts about which it has little or no experience and no previous membership. The TV industry has been warned that any yielding to "further encroachments" by NABET would bring the united resistance of AFL unions.

Welcome to Union Broadcasting

Two additions to IBEW facilities:

Frank Delle, former chief engineer at WFAI, Fayetteville, N. C., has joined the all-IBEW engineering staff of CBS Radio, New York City.

George Krutilek has been appointed technical supervisor at WFAA-TV, Dallas.

Youngstown Applies for UHF

Station WKBN, Youngstown, Ohio, has refiled its application with the FCC, asking for UHF Channel 27, with 203 kw and a 509 ft. antenna height above average terrain. WKBN plans to spend \$353,000 to build a television station, it was reported, and plans to budget \$250,000 for first year's operating costs. The station expects \$225,000 in first year's revenue. WKBN has been under IBEW contract with Local 1219 since 1940.

Goodwill Seeks 4-Station Net

Goodwill Stations, Inc. (which owns WJR, Detroit; WGAR, Cleveland; and KMPC, Los Angeles), plans to build a four-station regional network around its Detroit station.

John F. Patt, President of Goodwill, said WJR will apply for UHF Channel 50 for Detroit; Channel 11 for Toledo, Ohio; Channel 12 for Flint, Mich.; and Channel 5 for Bay City, Mich.

All four of these proposed stations are in cities now covered by WJR radio. Programs for the regional network will originate from all four stations.

Tentative location for the WJR-TV transmitter and tower is the Fisher Building, with studios in the same building or in the New Center area.

Pointing A Camera

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life comes in for revision. Ordinarily he works, say, from 2 to 10 p. m., but he may have to start earlier or later and sometimes work overtime when rehearsals run past the regular quitting time. Men at the West Coast network studios often have to get up long before day-break to begin work for an origination which comes out of New York in a three-hour-later time belt.

Rehearsal hours are sometimes long and frequently irregular right up to the time the show goes on the air.

The average TV cameraman today is a man who got into TV through AM broadcasting. Especially on a local basis is this true. When his home station got a construction permit for TV and an allocation from FCC, there was much shifting around in the engineering crew, and two or three men wound up as

cameramen. In some cases the manufacturer gave them the basic instruction. RCA, for instance, offers an orientation course for cameramen and technicians. Frequently, too, a movie cameraman applied for and got a TV job.

Later, as the need arose, other members of the engineering crew got practice time on the cameras and became full-fledged operators. Sometimes he starts out as an AT, or assistant technician, at about \$70 a week. Later, after he's on a camera and sticks to it, in about four years or five he is up to \$150 a week. It takes union bargaining to get that, though.

All in all, the guy who's in the driver's seat of a TV camera dolly deserves the coin . . . and the plaudits, too.

Technician-Engineer