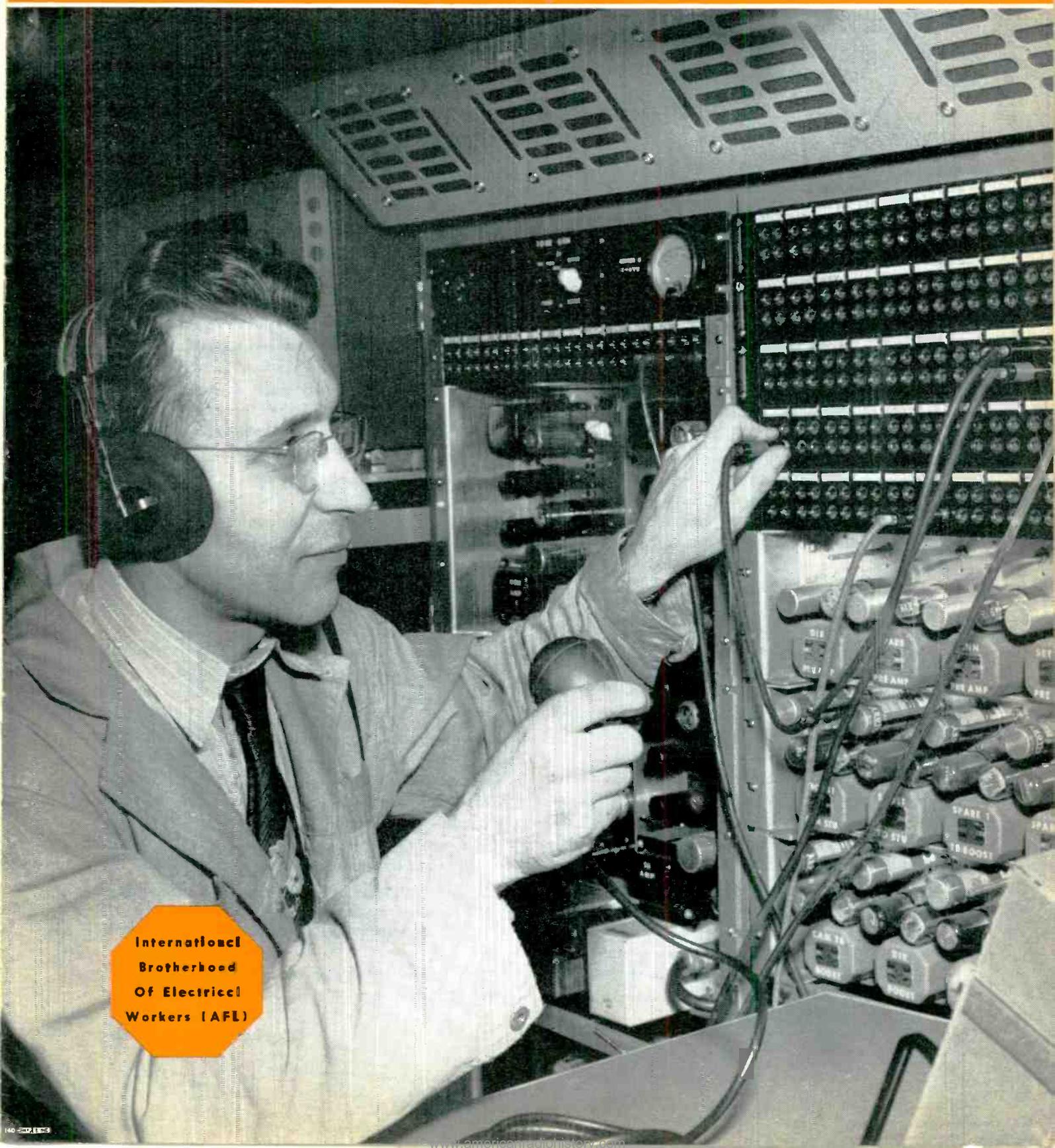


RADIO TV and RECORDING



# TECHNICIAN-ENGINEER

AUGUST, 1952



**International  
Brotherhood  
Of Electrical  
Workers (AFL)**

# Our Stand on the Proposed Changes of Operator Rules

In addition to the many letters of protest sent to the FCC by locals and individual members of the International Brotherhood of Electrical Workers, the following formal statement was filed with the Commission, August 4. To back up this statement, representatives of your IBEW will personally participate in any FCC hearing on this important matter.

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## FEDERAL COMMUNICATIONS COMMISSION Washington, D. C.

Docket No. 10214

*In the Matter of . . .*

***Amendment of Part 3 and Part 13 of the Rules and Regulations with respect to the license requirements of operators of certain Standard and FM Broadcasting Stations and for the remote control operation of such stations.***

**T**HE International Brotherhood of Electrical Workers, in common with the public, has a very substantial interest in the proposals set forth in the above-entitled proposed rule-making. On behalf of some 80 local unions of the IBEW which include more than 8,000 engineers and technicians employed in the radio broadcasting industry, we wish the following comments to be recorded and considered by the Commission.

While a number of the current Rules and Regulations are involved in the proposal, the main issues are (1) what is referred to as "remote" operation of commercial broadcasting transmitters and (2) operation of transmitters by personnel who hold licenses of lesser degree than Radio Telephone Operator, First Class. A careful appraisal of the first issue indicates quite clearly that the use of the phrase "remote operation" is not entirely accurate, by any means. The exponents of this proposal really mean "unattended operation" and, in effect, adoption of the proposal would result in the operation of broadcast transmitters by cursory supervision and unstable and undependable methods of control.

In evaluating the proposals which have been offered by the National Association of Radio and Television Broadcasters, it is necessary to take into account the overall Congressional instructions to the Federal Communications Commission as set forth in the Communications Act of 1934 which created the Commission.

Title 47, U. S. Code, Section 151, provides that:

"For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States a *rapid, efficient* Nation-wide and

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

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D. W. TRACY  
*President*

J. SCOTT MILNE  
*Secretary*

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world-wide wire and radio communication service with *adequate facilities* at reasonable charges, for the purpose of the *national defense*, for the purpose of *promoting safety of life and property* through the use of wire and radio communication and for the purpose of securing a more effective execution of this policy of centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication, there is created a commission to be known as the 'Federal Communications Commission,' which shall be constituted as hereinafter provided and which shall execute and enforce the provisions of this chapter." (Emphasis supplied.)

The objectives emphasized by the Congress in the statute are the maintenance of a rapid, efficient service with adequate facilities for the purpose of national defense and for the purpose of promoting safety of life and property through the use of wire and radio communication. It is entirely evident that the instant proposal is *not* intended to promote and advance any of the public interest objectives listed above. It *is* intended to relieve a part of the industry from those Governmental requirements which have been operating to accomplish the public interest objectives of the statutes. The proposal would call upon this Commission to assume the serious responsibility of endangering the national defense and the efficiency of the radio broadcasting system. The only purpose which would be achieved, if the Commission could be prevailed upon to take such risks, is the reduction of labor costs and the improvement of the profit position of the companies owning the stations which would be affected by the present proposal.

***FCC Inspection service records do not speak well for voluntary station compliance with regulations.***

**A** PARAMOUNT responsibility of the Federal Communications Commission is the maintenance of the effi-

ciency of the radio broadcasting system. To accomplish this end, the Commission issues regulations and the Congress has appropriated funds for the establishment of an inspection service to assure compliance with the regulations. The statistical picture shows a decreasing number of inspections of broadcasting stations for the period from 1948 to 1951. There were 2,176 inspections in 1948 and only 1,490 in 1951. These figures show a much greater decrease in the percentage of number of stations inspected in spite of a substantial increase in the number of stations during this period. The number of authorized AM stations increased from 2,034 in 1948 to 2,385 in 1951 and the number of FM stations increased from 142 in 1948 to 534 in 1951. The volume of violations or discrepancies remains constant, however, at a figure of over 59 per cent. The latest available figure (1951) is 59.4 per cent. This is not a satisfactory record nor does it speak well for the voluntary compliance of the industry with the regulations of the Commission which are designed to assure the efficiency and safety of the system.

It should be emphasized that this poor record has been developed even though there has been a strict requirement for the attendance of radio broadcast transmitters by first class licensed operators. The NARTB now proposes, in the face of this record of violations and failures to comply with the standards of the Commission, to further relax the requirements on the quality of personnel assigned to the transmitters. Certainly, this record cannot reasonably be expected to improve in the future if the regulations are relaxed so as to permit operators less familiar with the Standards of Good Engineering Practice and who have a lesser competency and technical knowledge to operate broadcast transmitters. We do not believe there is any way of offering a justification for this relaxation on the above record of violations under the public interest standards of the Federal Communications Act.

***NARTB proposal concedes that certain types of transmitter operation need first class operator.***

**T**HE NARTB in its proposal has conceded and admitted that there are certain types of operation at a transmitter which can and should only be undertaken by a First Class Radio Telephone Operator. The proposal thus prohibits any other class of radio telephone operator from undertaking any internal tuning adjustments or major repairs or overhauls. The only substitute offered in the proposal for this admitted need for a First Class Telephone Operator at the transmitter is the provision that such operator "shall not be required to be in the full time employ of the broadcast station but shall be on call and reasonably available to fulfill his specified duties." It is the contention of the IBEW that even if the above quoted proviso were lived up to by every station which will enjoy the relaxation proposed by the

NARTB that nevertheless, there would be a substantial impairment in the efficiency of the radio broadcasting system. It is obvious that internal tuning adjustments and major repairs may have to be undertaken as emergency matters. For example, in connection with the Conelrad program it may be necessary on immediate notice to effect a change in the frequency upon which the station is being operated and that can only be accomplished by internal tuning adjustments. Yet, the First Class Radio Telephone Operator, who is the only authorized class of operator to perform such work may not be present at the transmitter when the emergency arises and action has to be taken.

The fact is that the proposed regulations with respect to first class operators are non-administrable. At the present time the broadcasting company knows that it must employ a first class operator and that he must attend the transmitter at all times during which it is in operation. The inspector can ascertain by direct observation when he visits the transmitter whether there is compliance with this requirement.

Under the proposed regulations each broadcasting station enjoying the relaxation can make its own interpretation of the requirement that the first class operator "shall be on call and reasonably available to fulfill his specified duties." These interpretations will vary depending on the attitude of the station owner and the conditions under which he is operating.

***Written or verbal assurances from management could become full inspection under proposed changes.***

**W**HEN the inspector visits the transmitter or other property of the radio station he will no longer be able to limit his inspection on this point to the question of whether a duly licensed first class operator is in attendance at the transmitter. The inspector must now inquire as to what arrangements have been made and whether such arrangements provide for reasonable availability. He must also determine whether the report of such arrangement is in accord with the actual facts and also whether there is compliance with the arrangement. It is our view that the "reasonableness" of the arrangement can be made the subject of considerable argument and that with the burden of work on the inspectors they will be unable to make any investigation of the actual facts, with respect to this point, beyond interrogation of the management. Written or verbal assurance of the management will therefore be the final result of the inspection and the basis of the inspector's report.

The record of discrepancy cited above does not give any support to the view that self-policing in this industry will be any more satisfactory than in any other industry. The experience of enforcement agencies shows that where it is not practicable to enforce a requirement,

there is generally wholesale violations. We believe that such will be the case here.

The presently proposed amendments will tend to destroy the initiative and ambition of those persons who would otherwise eventually become first-class operators, since many of the employment opportunities which require such licenses would be eliminated. Not only would this be detrimental to the industry and its operating standards but it would work a hardship on the owners and managements of broadcast stations. Equipment would deteriorate at a faster rate, maintenance problems and costs would be intensified and the interchangeability of employes would be eliminated to a great degree. Those who now or may later become licensees of television stations would be restricted as compared to their present ability to interchange operators between their AM-FM transmitters and their television operations, or even to effect any interchangeability of AM-FM transmitter operators and mobile unit transmitter operators.

***Lowering of operator standards would lead to depletion of first class men needed by reserve pool.***

**S**IMILARLY the prime need for first-class operators being lessened would lead to depletion of the numbers of operators proved to be essential to the reserve pool of manpower available to the nation in any time of national emergency and domestic crisis. Very little need be said here of the usefulness of the well-trained and well-proven (by examination and proof prior to World War II—not *after* the conflict began) men who were “borrowed” from the broadcast industry for a variety of jobs in electronics—psychological warfare, radar, design, operation and maintenance of a myriad of transmitters and related electronic equipment.

The Commission is well aware of the technical problems involved in transmitter operation by remote control devices. Various methods have been used and are presently authorized to be used by a few stations. Booster transmitter operation has been authorized in Washington, D. C., and Cincinnati, Ohio. More recent grants have been made by the Commission in Virginia, West Virginia and North Carolina. We submit that however well-intended these grants have been, the operation of stations in this fashion is not in the best interests of the public and is contrary to the public convenience and necessity as well as being a hazard to public safety.

Operation by “remote control” of transmitters from studio locations is completely impractical. Studio operators—in many cases, combination announcer-operators—are too busy and too occupied with program operations to be able to keep a proper log, much less make comprehensive and significant checks of transmitter operation. Two or three turntables, microphone switches and faders, records, transcriptions, spot announcements,

news, network and remote lines, disc, wire and tape recorders plus (in most cases) a program log, news machines and telephones—all these things, or combinations of them, preclude sufficient attention being given to transmitter operation. And the very stations which, by and large, are engaged in the type of operation for which the rule relaxation is proposed are the stations which have this most complicated and unwieldy studio operation, employing the smallest number of personnel.

***Constant attendance, preventive maintenance needed for safe and economical station operation.***

**A** SAFE, economical operation can be assured only by constant and conscientious attendance and well-planned preventive maintenance. This reliability of operation is also particularly important with respect to interference with other radio services—marine, police and fire and aviation, for example. Slight changes in component characteristics often lead to parasitic and harmonic radiation; thus, hazards to the public safety are presented which may lead to disastrous consequences. In this latter regard, it is possible to conceive of any broadcast station being designated as a “key” station, in the event of the failure of other stations involved in Conelrad operation. At the same time, reasons of strategy may dictate the unanticipated opening or closing of transmission by any station and there can be no substitute for trained and experienced personnel immediately on duty at broadcast transmitters. Remote control devices which depend upon either wire lines or even those which might involve radio relay or pulse systems are hazards which are too considerable. On the other hand, operators of less skill than is expected of a first-class licensee may learn to operate a given transmitter by rote and may do very well in ordinary day-to-day operation. But such an operator is quite restricted in his knowledge and only one of a number of possible difficulties which are new to him may leave him helpless to handle the situation.

The Conelrad program is a part of the national defense plan, a precautionary system to guard against the not at all unlikely possibility of another Pearl Harbor incident. The instant proposal sets forth conditions such that stations of 10 kilowatts or less power, using non-directional antennae would be the only stations affected. But stations in this classification are, by far, the majority of stations in the United States. Of course, the power with which a station operates is not an overwhelming factor in consideration of the Conelrad program because the program is primarily and basically concerned with the reception by aircraft of any and all electronic radiation. Thus, unfriendly aircraft may very well use a 250-watt station’s signal for “homing” and thereby present just as great a hazard to the national defense as aircraft which use a higher-power station for this purpose.

**Just one unqualified operator in wartime could spell disaster for most vital communications.**

IT should be noted that elaborate precautions were observed during World War II, with respect to receiver oscillator radiation which might lend assistance to enemy aircraft—the power involved being milliwatts or even microwatts. Further, the annual reports of the Commission contain many references to signals which have caused interference to aircraft communications—industrial heaters, re-radiated beat frequencies and even television receiver oscillators. Such interfering signals—some of them at astonishing distances—can constitute appreciable interference; thus, similar low-power signals can be used for hostile purposes. Hence, just one “small” station may well become an instrument of widespread destruction. Just one remote-control device failure, just one unqualified operator can make the difference between adequate defense of lives, homes and industry and a holocaust of national proportions.

Changing power and changing from one frequency to another, for emergency operation in terms of the Conelrad program is ridiculously impractical with respect to remote control broadcast transmitters. Changes which might be made in the circuitry of standard broadcast transmitters to permit rapid, remote-control frequency shifts will lead to variations of the normal frequency assignments in excess of those permitted under Chapter I, Subpart A, par. 3.59 of the Rules of the Commission. While switching of crystals or crystal oscillators can be done (with the foregoing detrimental effects upon the normal frequency stability), tuning and neutralizing intermediate power amplifiers and power amplifiers, adjustments of driving power, antenna tuning and loading are items of such magnitude and are so interrelated as to be completely impossible by remote control. These same changes in operation, in terms of attendance by a first-class operator, are much more practical and possible of satisfactory accomplishment. Beginning with the physical substitution of a crystal (or in extreme emergency, a variable frequency oscillator), tuning and adjustment of the transmitter, stage by stage, and antenna loading adjustments are operations which demand very high skills and competent judgment. A guarantee of at least a basic knowledge of these adjustments is presented only by a first-class licensee. And the licensee should be on the premises, on duty at the transmitter—being “on call” is not sufficient insurance against the hazards offered to the public safety.

**Unattended transmitter operation attracts vandalism, robbery, and endangers civil defense program.**

UNATTENDED operation of broadcast transmitters also involves very considerable hazards of violations of

physical security, since no really foolproof safeguards against breaking and entering can be taken. Many state and local civil defense regulations prohibit anyone except authorized personnel from being admitted to broadcast transmitter properties. Aside from the concern of the owners for their property, there is an interest of the public concerned which does not need further elaboration.

That there is no shortage of technical personnel has already been established by comments filed with the Commission. A partial list of such persons in the San Francisco area, for instance, includes 63 names and addresses of men seeking employment during the past four and one-half months. It can be shown that similar numbers of qualified people in all areas of the country are available for employment in the industry—if wages are offered to them which are in keeping with their knowledge, experience and economic requirements.

The record indicates that on June 30, 1950, there were 38,049 radio telephone first-class operators licensed by the Commission and as of June 30, 1951, there were 39,000 such licenses outstanding. It is interesting to note that in 1949 (no later figure presently available) there were 50,996 licenses outstanding in the higher class radio telephone category. In view of these facts and the fact that the Commission has a related duty to perform, viz., encouraging a larger and more effective use of radio in the public interest, the Commission should likewise encourage the nation's radio operators to improve themselves and the industry in which they are employed.

**Present proposal is glossed-over picture of work by transmitter operators; the facts contradict.**

THE present proposal for rule-making is presented as a glossed-over picture, leading to the implication that transmitter operators merely record meter-readings on a log and the transmitters automatically take care of themselves. This implication is refuted by the very construction of the transmitters themselves—the complexity of meters and pilot-lamp indicators and control circuits which are set up by the manufacturers to assure reliable operation only under conditions of scrupulous supervision. Some indicators show outages or impending outages, not so that log entries may be made but to warn the operator so that trouble may be avoided and corrections expedited. Stepping relays and similar remote-control devices cannot begin to cope with the problems posed—occasional or routine checks likewise fail to supply information fast enough or continuously enough to prevent outages and equipment abuse due to abnormalities. Similarly, close tolerances in control are not practicable by remote control.

Just as preventive maintenance forestalls trouble and outages, so operation by experienced men better insures continuous and reliable service. Attention to minute

details of changes of meter readings and similar continuous attention by personal inspection assures continuous and economical use and service of tubes and transmitter components. Overload or underload relay failure, which is not at all unknown, leads to disastrous consequences—tubes and parts are unnecessarily subjected to abnormal conditions of voltage and current which lead to major maintenance problems. These same problems are eliminated or minimized by experienced and efficient operators in attendance.

**Defense Communications Board offers example for need for close control of transmitter circuits.**

**A** PUBLICATION of the Defense Communications Board\* will serve as a reference example of the need for close control of transmitter circuits with regard to economy and the conservation of strategic materials:

*“Vacuum tube replacements, in addition to being one of the three major cost items of operating a broadcasting transmitting station, also involve problems of availability. Because of this, and because of the importance of maintaining the best possible continuity of service, proper maintenance and operation of the water-cooled and air-cooled power tubes used in the transmitter contribute to the efficiency of station operation. This is a subject deserving close attention by all concerned.*

*It is possible to lengthen appreciably the life of water-cooled tubes (bright tungsten filaments) by operating the tube at a filament voltage slightly below the normal rating. These tubes, used in both amplifiers and rectifiers, should be operated at the lowest possible filament voltage consistent with satisfactory operating characteristics (power output, tolerable distortion and carrier shift). . . .*

*The following tabulation will indicate a general average relationship between filament voltage and useful life:*

	Filament voltage per cent	Relative useful life per cent
	90	16
	95	8
(Normal)	100	4
	105	2
	110	1

*Thoriated tungsten and oxide-coated filaments used in intermediate sized air-cooled amplifier tubes and mercury vapor rectifier tubes must be operated within the rather critical voltage range specified by the manufacturer. Short life usually results from the operation*

\* **Wartime Operation of Domestic Broadcast Stations, First Edition, Defense Communications Board, Washington, D. C.**

*of such tubes much below or above rated filament voltage.*

*It is very important that the filament voltmeters in use are accurate and that the meters are connected in the circuit to indicate the voltage at the filament terminals—not, as is sometimes done, at a point beyond which there is an appreciable voltage drop in the filament supply bus. It is recommended that these instruments be calibrated periodically.” (Emphasis supplied.)*

The above authoritative statement of the Defense Communications Board illustrates the point that “remote control” is inconsistent with safe, efficient and economical operations of transmitters.

Finally, it should be noted that the proposal for relaxation of operating standards has been made at a time when industry profits are running at an all-time high. The report of the Commission for the fiscal year ending June 30, 1951 states, “In the calendar year 1950, the grand total revenues of the broadcasting industry passed the half-billion mark for the first time. . . . Broadcasting industry profits of \$59 million in 1950 were more than double those of the previous year. Industry profits realized from AM-FM broadcasting operations were \$68.2 million, or approximately 30 per cent above 1949 while the industry’s overall loss from TV operations was reduced from \$25.3 million in 1949 to \$9.2 million in 1950 . . . .” At no time, however, could we concede that the profit or loss of the industry should be a factor in determining whether the safety, efficiency and public interest should be served. These goals should never be subservient to the profit status of the industry.

**Station operation is not much affected by television, as some station managements suggest.**

**T**HE industry has consistently pleaded that the impact of television operation upon the AM-FM stations has been responsible for great and unprecedented losses of revenue to their owners. A six-city survey recently completed by the B. A. B. has led to the conclusion that “radio advertising totals may reach an all-time high in 1952.” The survey revealed that for many of the stations surveyed, in markets where television penetration has been the most marked, 1951 was the best year in their (the AM-FM stations’) history. Indeed, the stations experienced a substantially better final quarter in 1951 than in 1950, with many also forecasting even greater improvement in business for the first quarter of 1952 than in 1951, based on business already contracted. And independent stations showed greater gains in 1951 than did the network affiliates, according to the survey.

Certain rules and regulations have been prescribed  
*Continued on page 15*

## MISTER CHAIRMAN! MISTER CHAIRMAN!

Don't guess any of us have completely forgotten the hubbub in Chicago last month . . . Technicians are still untangling cable from their hair . . . Mobile units are still vibrating from the strain of following nominees about the Windy City . . .

**N**O ONE can deny that the 1952 coverage of the Republican and Democratic conventions in Chicago was about the biggest thing that has happened to broadcast programming in a long time. Neither sun spots nor flying saucers have effected the airwaves so tremendously. During the two conclaves all program schedules were tossed aside while the avid American public watched big-time politics fenagle until the wee hours of the morning.

Video coverage of conventions has made great strides since 1940. Just take NBC coverage, for example.

In 1940 NBC telecast the Republican meeting in Philadelphia, the first to be seen live, in New York and Philadelphia only. One columnist commented: "Scenes both inside and outside the hall could be clearly seen."

In 1944, with the war on and the Republicans meeting in Chicago (which was not yet within TV network range) delayed motion pictures were relayed by NBC from New York to Philadelphia and Schenectady.

In 1948 both the Republican and Democratic conventions were in Philadelphia, from which point the cameras could send to a 10-city eastern hookup extending from Boston to Richmond, Va.

### Will the Delegate Please State His Name!

This year, of course, the coaxial cables and microwave sent the convention to every corner of the nation. And what TV couldn't reach, radio did . . . and did well.

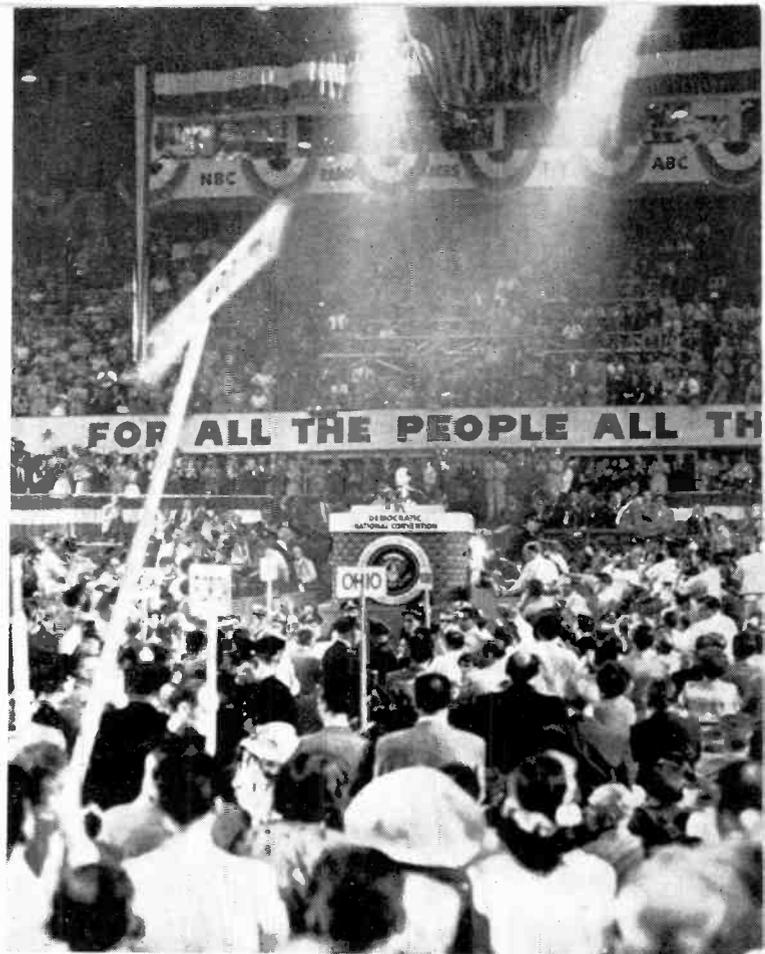
Among the engineering sidelights of the 1952 extravaganzas:

- RCA's "walkie-lookie" got its big shakedown. Dubbed the "creepie-peepie" by someone, and the "sneakie-peekie" by Commentator Bill Henry, it is a one-man camera and pack which could roam the convention floor for spot pick-ups. It turned out clear but darker than usual pictures.



Local 1212 engineers of CBS, New York, keeping a close watch on convention floor proceedings.

AUGUST, 1952



The dramatic moment in the Democratic convention when Gov. Adlai Stevenson accepted the nomination. Network broadcasting booths can be seen at the top of the picture.

However, it was not up to the standard of a regular camera and more work will have to be done on it. In place of such a device, the nets used the audio of men walking the floor with walkie-talkies and video via the zoomer lens and the camera platforms.

- An advancement on the split screen was used at Chicago too. Instead of cutting the picture in half for two screens of equal size, an improvement on the wedge wipe amplifier enabled engineers to squeeze the second image (usually the commentator) into one small corner.

### The Chair Recognizes . . .

- One fault in the coverage, quickly picked up at the Republican wing-ding, was the poor picture quality during speeches because the cameras were way over to

### The clerk will call the roll

the side and at a distance. To overcome this the Democrats acceded to a request from the networks and permitted a camera platform to be erected in the center of the amphitheater.

- Cameras in convention hall for the Democrats' sessions showed no red lights, indicating they were in use. That was to outsmart the delegates and the audience, who learned the red light trick during the GOP convention.

- The Hilton Hotel, a convention headquarters, charged heavily for AC lines and video cables. With

committees in session, campaign headquarters openings, and caucuses in many rooms, technicians were hard pressed to make "set-ups" for the unexpected events. As the hotel proper uses only DC current, broadcasting men paid \$25 for each AC line piped into a room. They also paid \$80 for hooking a TV set or monitor into the hotel's master antenna system.

- An engineer from NBC, George McElrath, was audio engineer for the Democratic National Committee. This entailed checking the sound levels and positions of the five mikes on the speaker's rostrum. (Two of the mikes were public address and three for the network. A small peanut mike was placed at the gavel sounding board.)

The big competition among the networks at the conventions was for special events. The pooling of facilities for floor coverage gave each net a chance to scramble for personalities and events on the side, while they monitored the floor schedule for anything unexpected there. ABC led the Big Three in special events, with 47 pick-ups. CBS had 28 and NBC 35. NBC gave a bit more coverage to President Truman's flight from Washington. As to total special events time, NBC led with three hours and 11 minutes, followed by ABC, two hours and 44 minutes, and CBS, two hours and seven minutes.

There were fewer pick-ups outside the convention site during the Democratic conclave, in contrast to the Republican meet, where much of the early action came from the Loop Hotels. Because of this fact, the nets could concentrate on more special events around the Amphitheatre.

One interesting facet of the conventions coverage was the work of the Voice of America in recording conven-

### Senator, would you say a few words . . .

tion highlights for foreign audiences. Each convention day Voice representatives from three different foreign areas made special recordings in Chicago. On Monday, recordings were made in the languages of Southeast Asia, German, and Turkish; Tuesday, in Hebrew, Japanese, and Polish; Wednesday, in Yugoslav, Hungarian, and Russian; and Thursday, in Spanish, Italian, and French.

Recordings of regular network broadcasts also were used, and straight reports of the proceedings were piped from New York in various languages.

In addition to the language specialists, Voice sent a supervisor and two engineers along with Raymond Graham Swing, for special commentaries. Also, a series of interviews with farm, labor, and business leaders showed how these groups participated in the conventions by appearing before platform committees. Voice

### Mistah Chairm'n!

officials reported an enthusiastic response from overseas audiences.

By the start of the first ballot at each convention, hopeful candidates were suffering bad cases of TV combat fatigue. Shows like "Meet the Press," "The Nation's Press Conference," "Youth Wants to Know," offered good publicity time for the men in the race, and plans for these shows started well; but, as the convention dragged on, somebody somewhere got the idea that all candidates should appear together on each show, and the man who couldn't make it was a dirty so-and-so. So, to appease the powers that be, the candidates were running two races—one at the convention and another from broadcasting studio to broadcasting studio, answering the same questions, fending off the same jibes on civil rights.

There were mixed reactions from convention participants to requests that they get right with television. In addition to the

cards about millions of eyes being upon their every action, there were make-up problems to be solved and VIPs to be instructed in mannerisms and gestures.

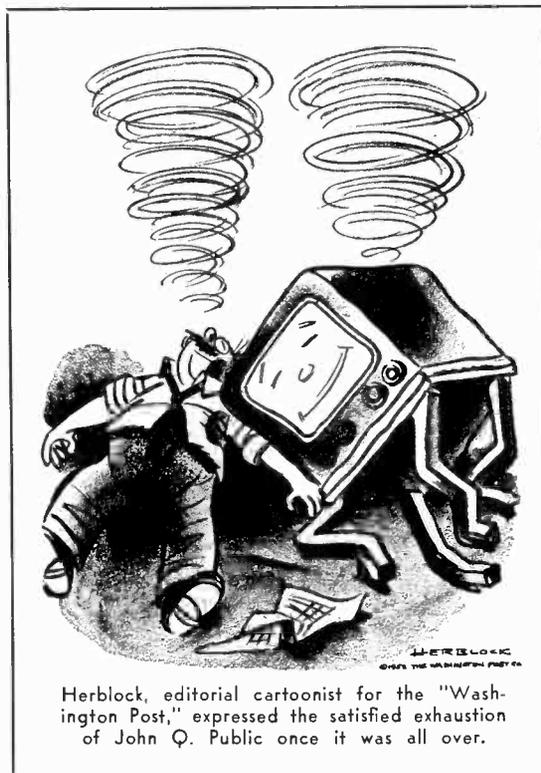
House Speaker Sam Rayburn managed, with the air of a network make-up expert, to almost eliminate the glare from his bald head, and, following the advice of other experts, he reluctantly agreed to give up his favorite white suit in order to knock the gavel for the Democrats in a dark coat, trousers, and ties. He balked at giving up his white shirt for the sake of television, however.

"I can't do that," he said. "I've always worn white shirts!"

### Young Man, Get That Thing Out of My Face!

The veteran chairman, with nearly 10 years' experience in presiding over the House of Representatives, still got a lesson in gestures and mannerisms. He was

*Continued on page 15*



Herblock, editorial cartoonist for the "Washington Post," expressed the satisfied exhaustion of John Q. Public once it was all over.

# The Machine Must Talk!

**E**DISON had just developed a new automatic repeater telegraph, a gadget with a revolving disk of paper which could repeat messages over and over.

One day he connected the instrument with Western Union wires which ran into his laboratory, and he accidentally threw too much current into the motor. The disk of paper on the repeater began to whirl, and the metal point which picked up messages began to pass in and out of the indentions on the disk so fast that a peculiar vibrating sound came from it.

## There Is No Doubt

That was on July 18, 1877. The inventor wrote in his notebook at the time: "Just tried experiment with a diaphragm having an embossed point and held against paraffin paper moving rapidly. The speaking vibrations are indented nicely and there is no doubt that I shall be able to store up and reproduce automatically at any future time the human voice perfectly."

Long after midnight Edison was still puzzling over the strange sounds on his automatic repeater. Could a machine be constructed on which sound might be reproduced?

Determined to find out, he experimented with a diaphragm and a small blunt pin. The results were so good that he soon sent for John Kruesi, an assistant and handed to him a rough sketch of a crude-looking instrument. On it was marked the price of eighteen dollars, in accordance with Edison's custom of indicating the amount he was willing to pay for a job and allowing the workman to keep whatever saving he could make under the figure.

Kruesi was told to make a working model as soon as possible.

The sketch called for a metal cylinder spirally grooved and mounted on a long shaft, one end of which was

August 12, 75 years ago, Thomas Edison took out a patent for the first phonograph, an instrument, "discovered by accident" which became the foundation of a thriving industry.



to be tapped with a screw-thread of the same pitch as the grooves on the cylinder. The shaft was to run in two upright bearings, one having an internal thread fitting the thread on one end of the shaft so the cylinder could be turned and mounted laterally by a crank. A metal arm was to be attached to the side of the machine, carrying at its upper free end an old round, wooden telephone transmitter case. This was to be fitted with a diaphragm having a blunt pin in its center.

While he was working on the project, Kruesi tried to figure it out. Most of the gear he had built for Edison had been electrical. Here was something that had no coils, magnets or wires. When it was completed and he took it back upstairs to the inventor, he asked what it was to do.

"The machine must talk, Kruesi," was the reply.

## Handful of Cigars

The little Swiss artisan smiled skeptically and shook his head. Bookkeeper Carman, another assistant, happened to be standing nearby, and what he heard made him gasp. He laughed and offered to bet a handful of cigars that the machine would not talk. Thus encouraged, Kruesi

plunged also, wagering two dollars.

Edison replied: "I haven't got a dollar, Kruesi, but I'll put up a barrel of apples."

He examined the model Kruesi had made, tried the cylinder and metal arm, and then called for a sheet of tin-foil to wrap around the grooved cylinder. He turned the crank. Suddenly there was a loud scratch as the tin-foil tore.

## The Chief's Gone Mad

Thinking of the free cigars he would smoke, Carman winked at Kruesi. And the model maker tapped his head in mock seriousness as if to suggest that his poor chief had gone mad.

Another worker for Edison, Charles Batchelor was standing by, and he remarked, "Keep your shirts on, boys."

They fitted the next sheet of tinfoil more carefully to the cylinder, gluing ends together carefully to hold it taut. Then Edison ran the cylinder back and forth until he was sure the instrument was in order.

Again he turned the crank, and in a loud voice he recited: "Mary had a little lamb . . ."

The mouthpiece was flipped back, the cylinder restored to starting posi-

tion, and the mouthpiece replaced. Edison turned the crank, suddenly the machine began to talk, echoing the back "Mary had a little lamb . . ."

The joking round about was hushed. The auditors were spell-bound. It was supernatural. Kruesi nearly fell over in his fright. Edison himself admitted that he was "a little scared."

That day, seventy-five years ago this month, a great discovery had again been made in the Edison laboratory at Menlo Park. This strange, crude device invented in the midst of other experiments was an inspiration from the rolling clouds of genius. Down through the years it has gone on and on, perfected over and over, and still a prime example of Edison's genius.

From Edison's first tinfoil-covered cylinder to a machine which can turn out hundreds of magnetic tape duplicates without losing a syllable or musical note, three-quarters of a century of engineering wizardry has made recorded sound today virtually indistinguishable from the original.

#### First Wax Records

Alexander Graham Bell, father of the telephone, led his Volta Laboratory associates to the invention of wax records and the first flat phonograph disk. In 1886, Bell received patents for a system of "Reproducing Sounds from Phonograph Records," and another for "Transmitting and Recording Sounds by Radiant Energy."

Meanwhile, Emile Berliner, an early associate of Bell's, discovered the advantage of side-to-side rather than up-and-down engraving of the record groove. He invented the modern system of duplicating records. His "Gramophone," patented in 1887, was later purchased by the young Victor Talking Machine Co.

Disk records have evolved today into the slow-turning, microgroove "lp" records. So true is their fidelity, in relation to the human ear, that the major recording companies are now reissuing their musical libraries on the new plastic disks.

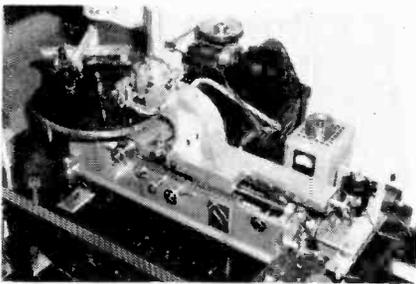
While Edison, Bell and Berliner were pioneering in this country, a



- Remember the old ERPI equipment (Western Electric Company)? First used for synchronizing sound in motion picture theaters, most of these machines have long since been retired. With separate arms for vertical and lateral transcription, it recorded many hours and even years for our veteran broadcasting stations. Old timers will remember when this was de luxe equipment.



- The result of years of progress and streamlining, modern playback equipment, such as this example manufactured by RCA, obtains a fidelity never expected by early designers. (Picture courtesy Local 1217.)



- The Scully Lathe—the ultimate in disc recorders and yet the workhorse of the recording industry—comes complete with electrically-heated stylus. More recordings have been made, which have been heard by more people all over the world, upon the Scully Lathe than on any comparable machine. (Picture courtesy Columbia Records, Inc.)

young Danish engineer named Valdemar Poulsen was developing a machine which could catch and reproduce sound with a magnetized steel wire. At the Paris Exposition in 1900, Poulsen's crude wire-winding "Telegraphone" won the Grand Prix.

The electronic amplifying tube had not yet been invented, however. Both mechanical and magnetic recorders had to wait until the 1920's, and early

1930's for the dawn of the modern age of "electroacoustics."

Germany gave magnetic recording its second major impetus. Gestapo telephone-tapping required thousands of portable recorders. Wire and various types of tape were used.

On the heels of V-J Day, American engineers quickly improved on the German wartime tapes. Wire was used widely for a time and it still has many satisfactory applications, but its tendency to snarl, and the difficulty in editing it, soon brought tape to the fore. It was actor Bing Crosby, in 1948, who touched off today's widespread tape recording of network radio shows, hours or even days in advance of broadcast time.

#### Tape Disadvantage

One major disadvantage of tape remained, compared with disk recordings: There was no way to produce copies in quantity without sacrificing the high-fidelity quality of the original.

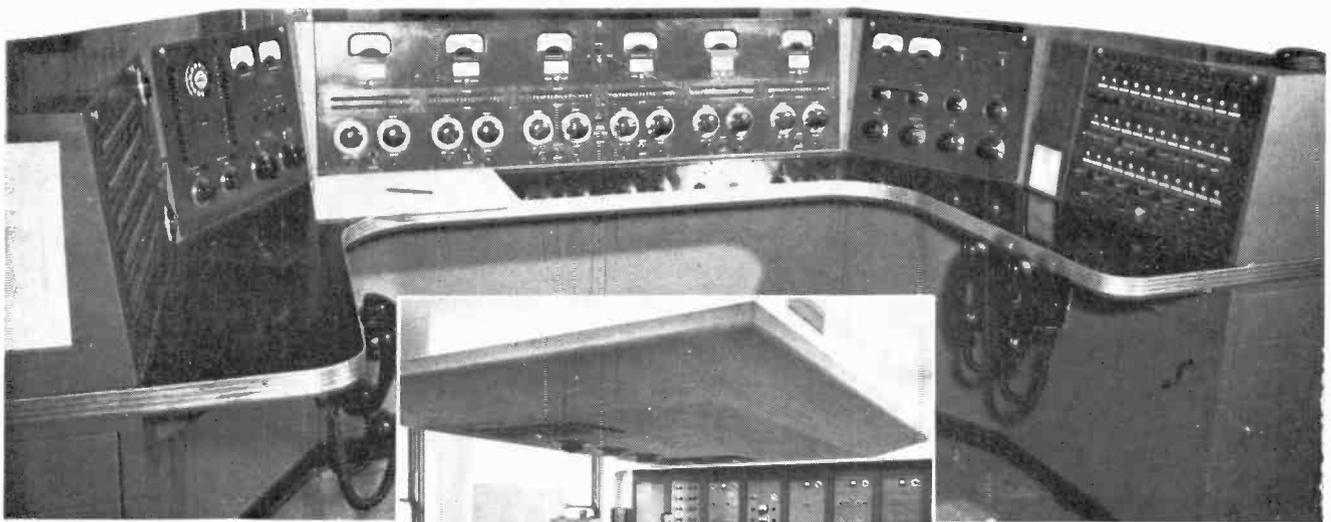
Late in 1951, however, Dr. Rawdon Smith, Washington, D. C., physicist, demonstrated to the recording industry a new machine which can make unlimited numbers of copies equal or superior to the master tape. The invention, developed jointly with a Chicago engineer, L. S. Toogood, was called "Multitape."

(Toogood, incidentally, runs a recording company in the Windy City, with which IBEW Local 1220 has had an agreement for many years.)

The recording industry has expanded greatly in recent years. Approximately 200 million records were sold over the counter in the United States last year. This was in addition to special recordings by broadcasting and recording studios.

Since the majority of the popular music is on old-type records, the 78s are still the mainstay of the industry. Long playing records have been on the market for about four years, and 45 rpms have been available for three. But the old shellacs remain in the lead and may continue for a few years more to be the most popular descendant of Edison's tinfoil cylinder.

# Across the Board at WGN, Chicago



ABOVE: The WGN Master Control—designed to meet every requirement.

**C**OVERING the recent political conventions was not a new or novel adventure for WGN, Mutual in Chicago. This experienced old mike runner of the Windy City has been covering political brawls since June, 1924.

During its 28 years of broadcasting, it has covered 16 national political conventions, to be exact. And, in addition, it was parading a series of historical "firsts" before its microphones which would do any station's log up proud.

To name a few:

- In May, 1924, WGN inaugurated the first broadcast of the great 500-mile Indianapolis automobile race with a program that lasted nearly seven hours. With a sound-proofed broadcasting booth beside the track and, with mikes at the turn of the last lap, in the back stretch, all over the grandstands, and in the pits, the station delivered a well-planned and exciting story of the spectacle.

- Credit is given to WGN for the first play-by-play broadcast of a baseball game.

- For the first time in the history of national elections, WGN broadcast the returns as they flowed in. This was in 1924.

- The Sunday morning reading of the "funnies" to the children—a feature which is dying out today—was originated at the Chicago station.

- Amos and Andy began broadcasting to their many devoted followers from the station



**A clear channel station with an impressive record, WGN is staffed by LU 1220 engineers**

LEFT: Robert Baird, supervisor, at jack panel; Mark Ruisard at MC desk.

in the early part of 1926.

The genealogy of WGN extends back to May 19, 1922. On that date, Station WDAP in the Windy City (then owned by Midwest Radio Central, Inc.) was licensed to operate with the highest power then allowed—1,000 watts. A year later, WDAP was purchased by the Chicago Board of Trade and

subsequently by the Whitestone Company, owners of the Drake Hotel.

The thriving Chicago *Tribune*, "The World's Greatest Newspaper," acquired WDAP in 1924, and the call letters were changed to WGN. (The call letters, WGN, had been owned by a lake freighter, but the owner relinquished them when he learned that the *Tribune* wanted these particular letters because they stood for the newspaper's encompassing slogan—"The World's Greatest Newspaper.")

There was much more business negotiations and settlements before the WGN of today evolved. The station is actually a merger of five separate broadcasting facilities—WDAP (later WGN), WLIB, WTAS, WCEE, and WJAZ. WTAS, until its consolidation with WGN in the summer of 1928, had operated on two separate wave lengths.

Highlights of the evolution include:

The Tribune Company, after changing the call letters of WDAP to WGN, operated WGN from the Drake Hotel until 1926, at which time it purchased the physical apparatus for \$16,290.55.

*Thanks to H. Walter Thompson, President of IBEW Local 1220, for supplying the material for this article. Pictures by Dickinson and Igoe are from the WGN Publicity Department.*



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1. STUDIO 5-A is WGN's large "band-shell" AM-TV studio on the fifth floor of the WGN Building. Like most of the station's studios, it is completely floated on air-cushions.

2. STUDIO 5-A CONTROL, with four WGN staffers on duty. Left to right, Beth Schmidt; Claude Buster, now with Motorola; Ed Kolberg; and Don Srenaski, who has since been called to Army service.

3. CAMERA ON A GOLFER—Arthur Jaeger of Local 1220 covering the 1951 National Open Golf Tournament at Tam o' Shanter Country Club.

7. 'FOTO-TEST' STUDIO 6-A was the first of WGN's television studios to be used by Local 1220 engineers. Robert Janney at the camera runs a test on a program plan.

8. IN STUDIO 1-A a regular WGN feature—"Faith of Our Fathers" goes on the air. IBEW Cameraman Bill Butler ready for a picture.

9. A MOBILE UNIT on duty at Tam o'Shanter Country Club during the 1951 National Open Golf Tournament. A couple of golfing enthusiasts take time out to peer into the versatile, efficient unit.

10. JOHN CLAUDE working on the back of a rack containing the tone generator, audio patching facilities, monitor amplifiers, and power supplies. This rack is large mounted so that it may be swung out to provide easy access for maintenance.



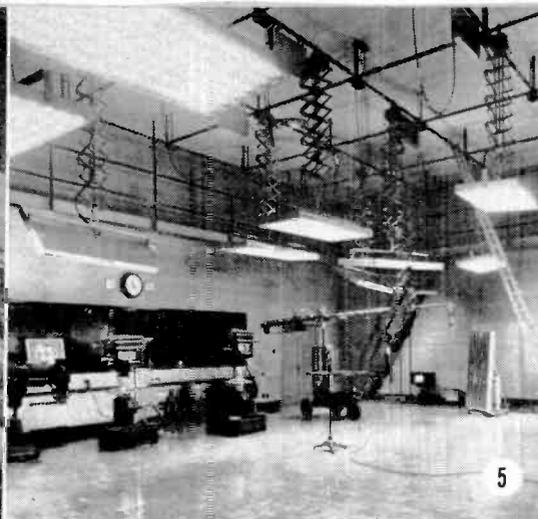
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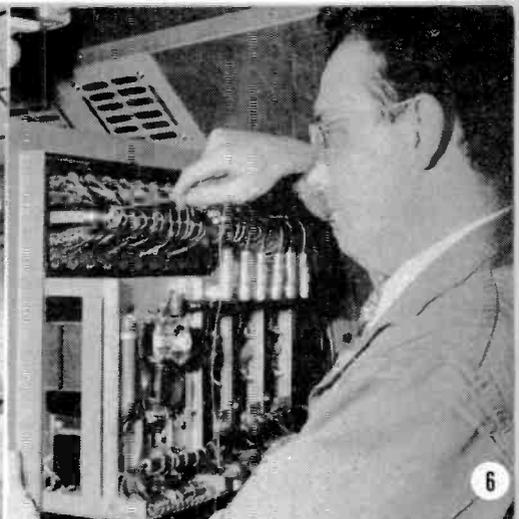
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4. DAVE BREISTER talking on the LB set used for emergency communications. This unit is at the rear of the mobile truck. Power outlets are visible at the lower right. Each group is on a different phase.

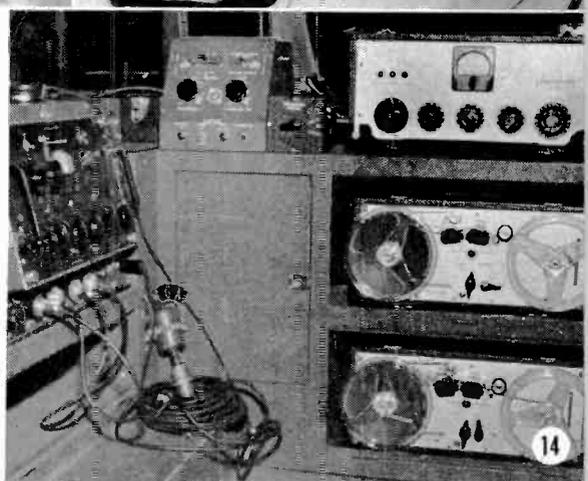


5. STUDIO 6-A has a full array of extension lights offering full lighting from wall to wall. This studio, too, floats on air cushions to prevent vibrations and cut out outside noises.



6. GEORGE CERNY facing the coaxial cables behind the video patch panel. The units just below the patch panel are the video distribution amplifiers and power supplies.

11. ADOLPH RAMAS installing decals on the track termination box. All of the cables going into the remote truck connect here, except camera and power cables. The top unit at this spot (out of view at top left) is an RCA Master Monitor. The field camera control is just below, and below that is the RCA Field Camera Power Supply. Note method of running cables in Curtis Strip and bringing them out through busing.

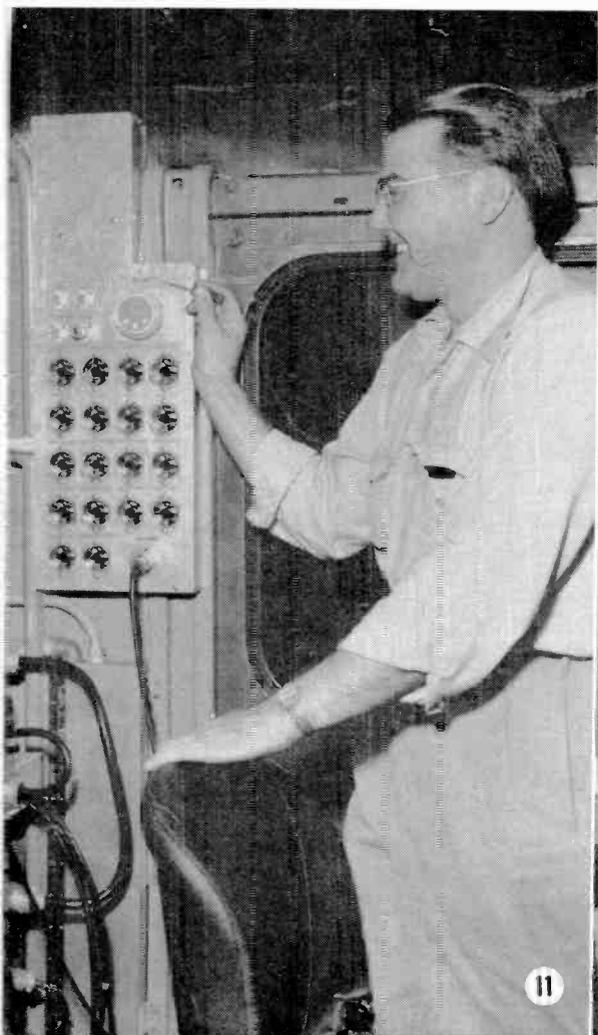


12. JOHNNY RAY SHOW—Another WGN origination in Studio 1-A, with William Strickland on the boom and Steve Wagner on camera.



13. MOBILE UNIT 3, as seen from the rear of the truck. The microwave transmitter control unit can be seen above the patch cords. Monitor speakers are at upper left.

14. FOR RECORDING—Housed in each WGN mobile unit is a complete recording set-up. Two Magnecorders, a mike, and other equipment are shown.



Two stations near Elgin, Ill., approximately 25 miles from Chicago, WTAS and WCEE, were purchased in 1925 for about \$200,000. The following year WGN began construction of a new transmitter at Elgin.

In 1927 the *Tribune* stations became clear channel, at their own request, operating on 720 kilocycles. (The station still operates at this spot.)

The major wheeling and dealing was completed in 1928 when WTAS was consolidated with WGN and WLIB. In that year WGN installed automatic crystal control for about \$8,000, and on May 16, 1930, the license of WGN was modified to permit use of 100 per cent modulation. Equipment cost about \$30,000.

With the beginning of the turbulent 30's, WGN was authorized 50,000 watt and became the Chicago outlet for NBC. In March, 1934, the 50,000 watts transmitter went into operation. The following October, the station joined the Mutual Broadcasting System.

During 1934, WGN engineers became affiliated with Local No. 134 of the International Brotherhood of Electrical Workers. They were the first broadcast technicians of a major Chicago station to become identified with the American Federation of Labor.

For 18 years, the union's relations with the station have been an excellent example of effective collective bargaining in the industry. The WGN staff boasts a long list of experienced union men, who have helped to make the WGN clear channel a dominant factor in the Mid-West.

For instance, Carl J. Meyers became chief engineer for WGN-Chicago *Tribune* in October, 1925; he's still with the company as director of engineering. Clyde J. White, senior supervisor, started in July, 1925. Robert L. Sibold, supervisor, began work for WGN in March, 1926. James A. Turner, transmitter supervisor, hit the payroll in March, 1929. Other old timers are Edward Carstens, 1926; Everett Blackman, 1928; and Marshall Jewell, 1928. These men, are all still with WGN and all, excepting Meyers, of course, are members of Local 1220, IBEW.



#### THE COVER

Jay Ferree checking out the talkback system of a WGN mobile unit. Just behind his head is the relay transmitter control unit. The rack to the right of the control unit contains program and talkback monitor amplifiers, talkback power supply, W.E.22 D power supply, and tone generator.

A new WGN studio building, just north of Tribune Tower, was completed in 1935. It was produced from the winning drawings of a \$5,000 competition.

In 1937 the FCC authorized WGN to move its transmitter and power station from Elgin to a site 15 miles northwest of Chicago. A 750-foot tower was erected the following year. In 1939 a mobile transmitter unit went into service.

One year before Pearl Harbor a permit for an FM station was granted, and in September, 1941, W59C (WGNB) went on the air.

Today, WGN is a broadcast engineer's utopia. Fourteen radio and TV studios house the stations long list of originations. Nine of these, the finest that acoustic, radio and TV engineers have been able to design, literally float on air.

#### The 'Floating' Studios

They "float" by an amazing perfection of architectural engineering. Their floors rest on a series of oblong air cushions  $2\frac{1}{2} \times 14 \times 30$  inches in size which are inflated to 40 pounds of pressure per square inch. These pneumatic shock absorbers lift an entire studio one-quarter inch from its base. Sensitive electronic controls automatically maintain this gap to within  $1/32$  of an inch. All electrical and air conditioning connections between the building and the floating studios are flexible.

The floating technique insulates each studio from all outside vibrations and noise. The unique and expensive construction method employed, which separates the walls and ceilings from the building proper by a two-inch air space, is employed to cope with the problem of housing the station in the same structure as the huge *Tribune* presses, the largest in the world.

WGN's Studio One, recently completed, seats 400 persons. It is the pride of the company. Like other WGN studios it features portable seats to accommodate production problems.

Doors to all studios are of special construction to eliminate sound transmission, with door panels imbedded in soft rubber. The larger studios have client booths.

The WGN installations are spread through seven floors of the WGN Building. The seventh floor houses the engineers' workshop. On the floor below is the station's extensive farm department and its programming and public relations staff. Studios and other facilities are arranged on the lower floors.

WGN added the most recent member of the family—WGN-TV—in April, 1948. Identified as "Chicagoland's Family Television Station," the channel 9 facility operated for about six months as a no-cable, independent station, until it presented its first network show via teletranscription in the following fall. With the advent of the coaxial cable in January, 1949, it began using DuMont and CBS shows. Today, WGN-TV is well known nationally, feeding a large complement of programs to the DuMont network.

## Operator Rules

*Continued from page 6*

by the Commission as a result of its experience and that of its predecessor, the Federal Radio Commission over many years. These very broadcasters who now petition for relaxation of the rules were very glad to accept the rules as parts of the conditions which were attached to the purchase or construction of their stations. We submit that the rules of the "game" should not be changed simply because the players wish them changed and certainly not simply because the few who are privileged to use the public domain for profit wish to accrue further profit at the expense of the public interest, convenience, necessity and safety.

Respectfully submitted,  
International Brotherhood of  
Electrical Workers, AFL  
1200 Fifteenth Street, N. W.  
Washington 5, D. C.

August 4, 1952

## Political Convention

*Continued from page 8*

told to use vigorous, but not widesweeping, gestures.

The two conventions were television's heyday, but radio was still there and did a wonderful job. CBS's Bob Trout was deluged with wires from people who said they were looking at the picture on TV but following the audio on radio. Radio seemed to be able to stick with the story longer and interpret a little more completely. This year, radio stuck with the convention where in previous years it would have cut back to regularly-scheduled programs.

Will convention coverage show much change when the big hassle comes up again in 1956? Some professional spectators of the broadcasting medium wonder.

John Crosby, the New York *Herald Tribune* syndicated columnist, commented after watching the Republican hubbub: "There has been a lot of malarky written—some of it by me—to the effect that the searching eye of the camera would drastically revise convention procedures, that it would shorten the speeches, restrict the amount of oratory, and modify the demonstrations. Well, it hasn't. A good many of the speeches were just as dull as they were in 1948, conceivably duller, and they certainly weren't any shorter. The fact is that conventions are traditional affairs as resistant to change as human nature."

Time, a few enlightened political leaders, and Congress may prove Crosby wrong. Political leaders have already seen the handwriting in the picture tube and are trying to devise methods of eliminating those time-consuming polls of the delegations and those paid and reptitious demonstrations. Congress may eventually

AUGUST, 1952

### One Moment Please . . .



Two technicians were faced with the problem of disconnecting and changing six mikes in a large audience-participation studio. One of the men, by a careful manipulation of long ladders, managed to get to the framework at the top of the studio, and he called down to the other technician that he was cutting a mike cable loose.

"Catch it when it comes down!"

He cut the cable next to one of the viddy-veddy expensive mikes, and . . . WHAM, BAM! . . . another mike some 30 feet away dropped to the floor.

Seems that the mikes were cabled so that they could all be maintained and removed from one spot.

In the mad rush of mike-collecting that followed, the very nervous technicians handled the remaining mikes like so many high explosives.

take action on a bill calling for universal party primaries, thereby ridding the smoke-filled rooms of their contested delegations and credential fights.

It's the amateurishness, the rowdiness, the sin and confusion of such events which makes them such an American diversion, however; take away all this, streamline every speech, every procedure, and you streamline the radio and TV audience to friends of the family and bartenders too tired to turn the blasted thing off.

All things considered, the political conventions every fourth year will probably continue to be as popular as leap year to a frustrated spinster.

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# Station Breaks



## **CBS Names Labor Relations Head**

Most labor leaders will tell you that "labor relations experts" hired by management are just so many stumbling blocks to honest-to-goodness collective bargaining. With their Taft-Hartley angles, their public relations fears, and their fine print, they sometimes take the town-meeting spirit out of a labor-management meeting and substitute courtroom procedure.

We'd like to take momentary exception to this rule and commend CBS for appointing William C. Fitts, Jr., a former assistant general attorney for the network, as director of labor relations for CBS, Inc., CBS-TV, CBS Radio and CBS Lab.

Mr. Fitts, who will be responsible for union negotiations, grievances, and contract interpretations, has been with CBS for the past 20 months, handling labor law problems. In his dealings with IBEW broadcasting locals we have found him to be a sincere and objective arbiter, worthy of his new title.

## **NLRB Slaps Down Harding College**

Harding College of Searcy, Ark., notorious as the source of vicious anti-labor propaganda, has been found guilty of some unfair labor practices of its own.

The NLRB issued an order June 28, telling the college to stop third-degreeing employes at its radio station WHBQ, Memphis, for their union opinions, to stop interfering with their organization, to stop making threats and promises to discourage union membership and to reinstate, with full back pay, its senior transmitter engineer, Frank T. Edwards, whom it fired November 2, 1950, for having led the organizational activities of the AFL International Brotherhood of Electrical Workers there.

Edwards was fired for "economy" the day after the chief engineer gave a fellow employe a written list of 10 questions about Edwards' activities and demanded answers. New employes were being quizzed about their union attitudes, and threats were being made about would happen to a proposed pension plan if the union got in. The effect of Edwards' discharge was to cause all other members to withdraw from the union.

The college's chief defense was that notice of the charges had been served on "Radio Station WHBQ," which it argued was a mythical and nonexistent entity," instead of the college which owns and runs it. Both

the trial examiner and the board found the objection frivolous.

Harding College is headed by President George S. Benson, who makes captive-audience speeches against labor, the administration, social legislation and every other form of progress, before groups of workers assembled in various factories around the country. (LPA)

## **Local 1234 Members Greet the Cable**

Technician members of IBEW Local 1234, Fort Worth, were busy a few weeks ago, installing a 6' x 8' reflector screen some 275 feet above the ground on Station WPAB-TV's 502-foot antenna. The screen was part of the station's temporary signal channeling arrangement to meet the AT and T cable and the joys of live network TV shows.

## **KPIX Signal Stick Goes Higher**

Up goes the antenna height for San Francisco Television Station KPIX. Technicians at the West Coast station now send a signal from 1350 above sea level, adding 1680 square land miles to their Channel 5 viewing area over and above the coverage obtained by their former 630-foot level. KPIX completed a new studio building last February.

## **For News of Radio Men at Sea**

The maritime counterpart of your *IBEW Technician-Engineer* is *The Radio Officers' News*, issued by the Radio Officers' Union of the Commercial Telegraphers Union, AFL. Published bi-monthly, the magazine goes to ship's radio officers throughout the nation and overseas as well. It contains news of radio men employed by all the major shipping lines and contains features about the joys and problems of radio engineering afloat on the briny deep. If you'd like to read the publication, its address is Suite 1568, 1440 Broadway, Dept. R-6, New York 18, N. Y. Price is \$2.00 a year.

The ROU, incidentally, has filed a brief with the FCC, supporting the IBEW position on operator rules.

**Technician-Engineer**