TECHNICIAN ENGINEER

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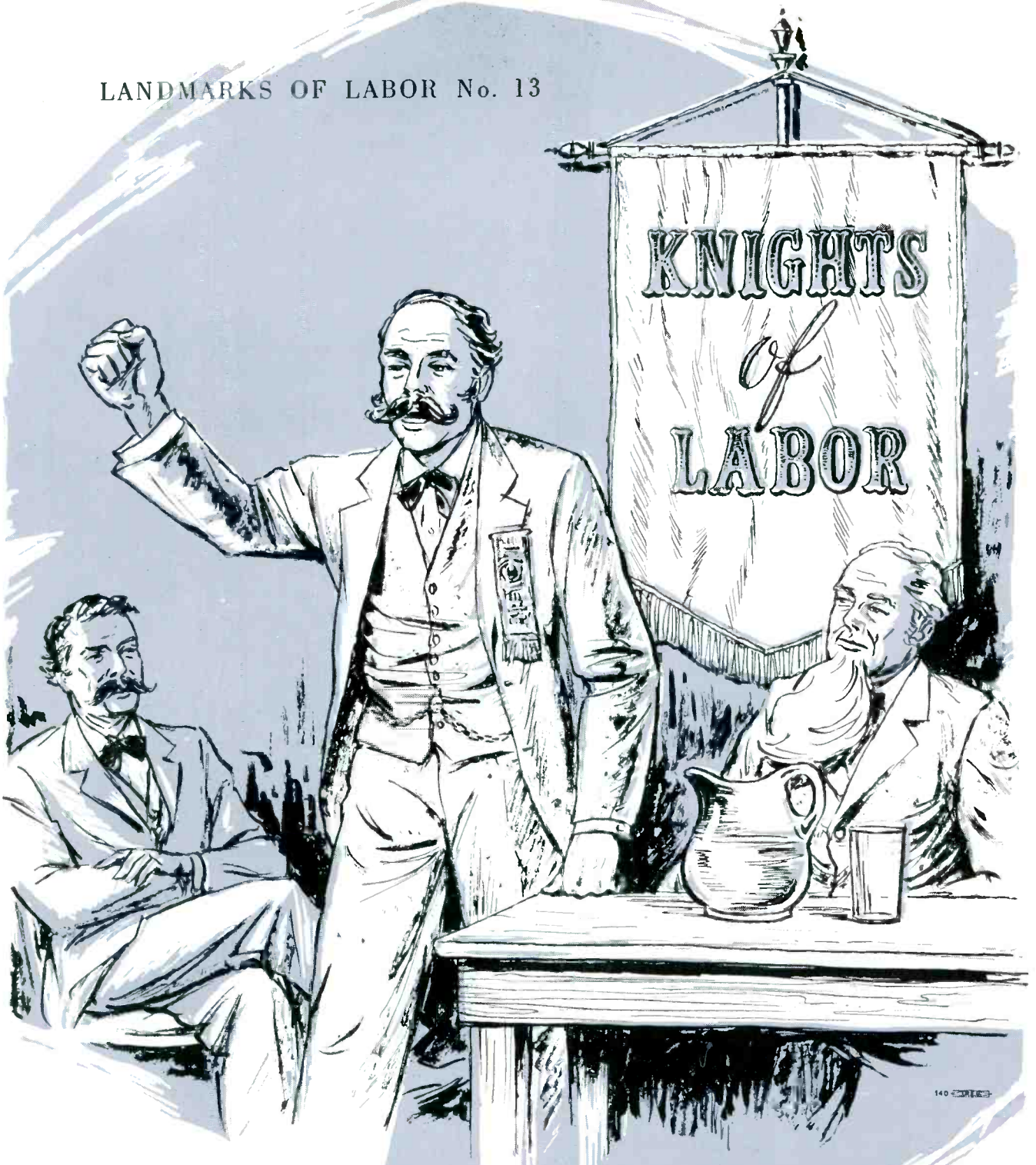
INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS — AFL-CIO

LANDMARKS OF LABOR No. 13



KNIGHTS OF LABOR—December 9, 1869

The era of the Noble and Holy Order of the Knights of Labor was a colorful one in the long story of the American labor movement. Founded on December 9, 1869 by nine tailors in Philadelphia, the organization was one which was largely reformist and was many years ahead of its time in many respects. The order demanded abolition of contract system for prison labor, abolition of child labor and endorsed a graduated income tax and called for the establishment of bureaus of labor statistics. Terence V. Powderly, (see illustration) for many years the Grand Master Workman, was one of America's most colorful early labor leaders. The Knights rose to 700,000 by 1886 but in the next few years industry's counter-attack and economic adversities caused its rolls to dwindle. The impetus given labor by the Knights was a real contribution to the long range efforts of the working people to better themselves and despite their failures and somewhat sad decline, the Knights of Labor deserve a place in the landmarks of labor.

Reprinted from THE LABORER; official publication of the International Hod Carriers', Building and Common Laborers' Union of America

The INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS
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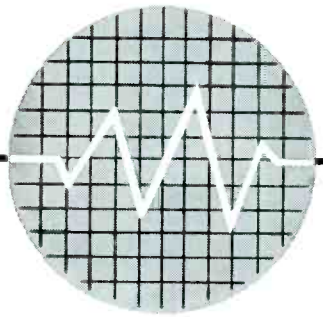

TECHNICIAN ENGINEER

VOL. 9 NO. 5
ALBERT O. HARDY, Editor

in this issue

the cover

In the span of a lifetime, broadcasting microphones have run the gamut from crude carbon-granule telephone transmitters to complex, yet streamlined, velocity mikes of today. Beginning on Page 4, this issue, we present a gallery of historic microphones. On our cover you'll recognize Will Rogers, Franklin D. Roosevelt and Bernard Baruch speaking into microphones from this gallery. You'll recognize too, the three mikes illustrated. Two of these are being used today in hundreds of public address systems.

index

For the benefit of local unions needing such information in negotiations and planning, here are the latest figures for the cost-of-living index, compared with 1959 figures: March, 1959—123.7; March, 1960—125.7.

COMMENTARY

It is one of the great ironies of political life that those who speak in such mellow tones about the family as the foundation of American life rarely are moved to decisive action to meet what is probably the greatest threat to family life—poor housing.

The results of the 1960 census will provide us with the latest information on the state of housing in America but earlier government and private surveys and studies provide us with some useful information at this time. It is not encouraging.

This is the picture:

- Some 15 million American families are still ill housed. This is about one-fourth the total of U. S. families.
- Some 13 million of these families live in homes that do not even meet the minimum requirements for family living.

Home construction has always had a direct relationship to the health of our economy. The current cutbacks in housing starts are reflected in other areas of the economy.

Annual rate of home construction in February was 1,115,000 units a year. The seasonally adjusted January rate was 1,210,000 starts. The February total was a drop of 19 per cent from last year.

Authorities estimate that it will take 35 million new housing units in the next 15 years—at least 2.25 million a year—to provide a decent home for every American by 1975.

Obviously, unless we get some meaningful, clear-cut federal programs operating we will lag far behind this most desirable goal.—Public Affairs Institute, Washington Window.

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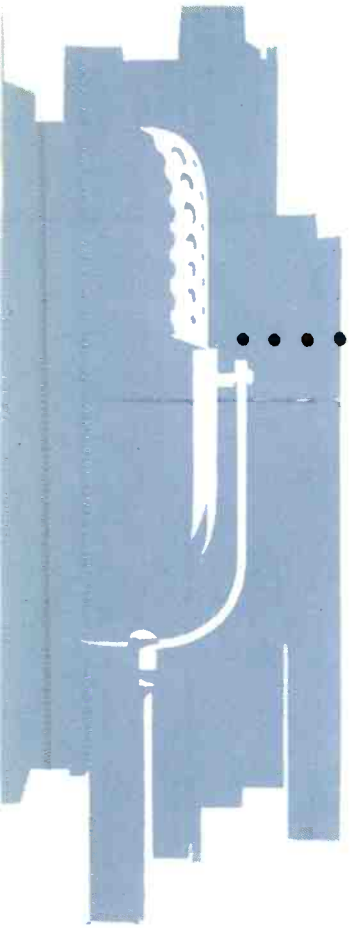
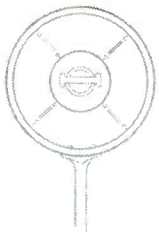
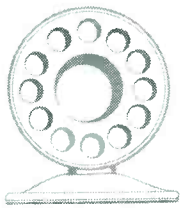
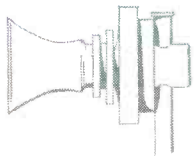






.... A GALLERY OF HISTORIC MICROPHONES



The ghost voices of Mr. Watson, The Street Singer, Amos and Andy, Kaltenborn, and countless more echo among the carbon granules of this Smithsonian collection of instruments.

ALEXANDER GRAHAM BELL developed the first instrument for converting sound waves into electrical vibrations and back into sound waves again. He was on a summer vacation trip to Canada when he described to his father a form of apparatus consisting of a strip of steel, attached to a membrane, which when actuated by the voice would vibrate in front of a magnet. It was just an idea, he said, and it wasn't until the following June, 1875, that he unintentionally heard the twang of a steel spring over an electric wire and realized immediately its significance.

He gave his laboratory assistant, Thomas A. Watson, instructions for making the first Bell telephone. Next day a device for transmitting sounds was operating. It wasn't until March 10, 1876, however, that Bell called, "Mr. Watson, come here, I want you," over a test instrument, thus producing electronics communications' first uninspired inaugural sentence.

The term "microphone" was first used by an experimenter named D. E. Hughes in connection with his discovery, two years later, that a loose contact in a circuit containing a battery and a telephone receiver may give rise to sounds in the telephone corresponding to the vibrations to which the contact is subject. Hughes constructed his microphone in the form of a horizontal carbon rod resting in grooves in two carbon blocks. A battery and telephone receiver was connected in series with these blocks.

From such modest beginnings America has produced a series of microphones of many shapes and sizes to transmit the vibrations of everything from rock and roll to the beep-beep of earth satellites.

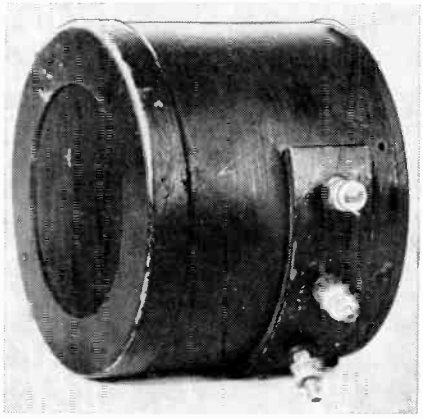
On the following pages is a gallery of historic microphones, which show, in sequence, their development. The pictures and data are from the electricity and electronics collection of the Smithsonian Institution in Washington, D. C. We are indebted to William King of Smithsonian for supplying us with them.

The Telephone Transmitter

The first type of microphone used in American radio telephony was simply an adaptation of the familiar telephone transmitter. In this instance, only a handle was added for the speaker's convenience. This type was used by Dr. Lee de Forest, one of radio's pioneers, in his early broadcasts in the New York City area. His laboratory and experimental transmitter were at that time (1916) located in the Woodbridge section of New York. His work, however, was interrupted by American entrance into World War I and further experimental broadcasting waited the coming of peace.

In operation, this microphone is identical with the telephone transmitter. It relies on the fact that the resistance to the flow of an electrical current through granules of carbon, varies in direct relation to the density with which the granules are packed. Sound frequencies impinging on the thin metallic diaphragm of the microphone cause it to compress minute particles of carbon (contained in a cup) and thus to hinder the passage of an electric current. Differences in pressure cause differences in the amount of current surging through the carbon conductor, thus creating an electrical pattern that is the counterpart of the various tones in speech or music. The familiar mouthpiece acted as an acoustical amplifier to concentrate the force of sound waves on the metallic diaphragm.

The Tomato Can



This microphone, known as the "Short Tomato Can," was the instrument used in the first announced radio broadcast, which took place from what is now station KDKA, Pittsburgh, on November 2, 1920. The microphone shown is the actual instrument used on this historic radio occasion. The program consisted of press bulletins of Harding's election as President of the United States. This event is generally recognized as the world's beginning of broadcasting. The station was operated by Dr. Frank Conrad, as 8XK for several years, on an experimental basis.

An adaptation of the ordinary telephone transmitter, this housing provided a suitable mounting for the microphone. It also incorporated a larger acoustical equalizer and certain other minor refinements. Another adaptation about this time was known as the "Long Tomato Can." All, however, suffered from the same deficiencies as the telephone transmitter, and the search went on for a microphone which would more faithfully transmit all frequencies without discrimination.

The Carbon Types

The carbon type microphone is the first of a series of microphones developed expressly for radio broadcasting. It was first used about 1923 at station WEAF, then located at 195 Broadway, New York City.

The carbon microphone used the operating principles of the telephone transmitter, but it was greatly improved in respect to frequency response and noise-to-signal ratio. The "single button" gave way to the "double button," but the inherent defects—its unreliability under changes in temperature and humidity, its noisy operation due to friction between carbon granules, carbon "packing" and so on—intensified the search for new and different microphones.

In the interest of protection, a number of cases were also provided for the carbon microphone. The "cage," "globe," "lyre" and other descriptive terms indicate the appearance of the cases. The carbon

A picture familiar to more people than can be counted. Dynamic and inductor microphones were the standards of the era. The Blue and NBC networks used inductors, Mutual and CBS used dynamics. Microphones, amplifiers and lines were always available in duplicate—just in case of any component failure.

A GALLERY OF HISTORIC MICROPHONES

Continued from preceding page

microphone was the first standard microphone used by the National Broadcasting Company, formed in 1926.

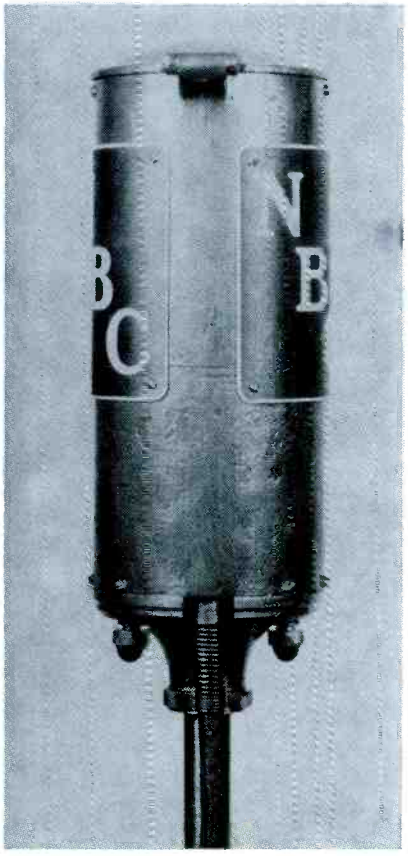
Notable broadcasts—Official opening program of NBC in November, 1926. Program originated in New York, Chicago and Independence, Kansas.

1928 presidential campaign, the first in which radio was used extensively. Herbert Hoover, Alfred E. Smith and Norman Thomas were heard over the networks.

1929—Program from Lakehurst, New Jersey, on the return of the dirigible Graf Zeppelin after completing its memorable round-the-world flight.

Because of the interference of the various types of containers with certain sound frequencies to be registered by the carbon microphone, it was eventually taken out of its case and suspended by springs in a metallic ring. This suspension was to prevent vibrations of the microphone stand from reaching the microphone itself and thereby being transformed into undesirable audio frequencies.

The Bullet



The search for a more sensitive and more reliable radio microphone led at last to the application of the condenser principle. Although the idea had been experimented with since early days of broadcasting the first successful condenser microphone, of the "bullet" type, was not used regularly until about 1925. In that year two stars of the musical stage, Ilse Marvenga and Howard Marsh of the "Student Prince," then playing in New York City, broadcast a program through a bullet microphone in the studios of station WJZ at Aeolian Hall.

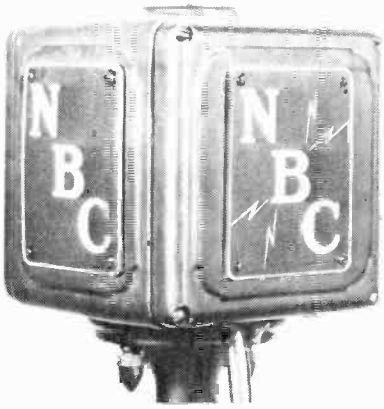
Regarded in some quarters as the ultimate radio microphone, the condenser registers faithfully a wider range of sound frequencies and was free of the hiss caused by the friction of carbon granules. Under studio conditions it was entirely reliable in operation.

The condenser microphone consists essentially of a very thin and tightly stretched diaphragm of aluminum alloy spaced approximately 2/1000 of an inch from a flat brass disc. These two form the plates of a condenser. The diaphragm is moved by sound frequencies, thus varying the capacity of the condenser. The other parts are chiefly for insulation, support, or protection of these two essential parts.

The condenser microphone's electrical output is quite feeble, relative to that of the older carbon microphone. For this reason, it requires an amplifier closely associated with the condenser. In the bullet type, this amplification was limited to two stages, because vacuum tubes free of microphonic characteristics had not yet been developed.

This large, heavy mike has its present-day counterpart in very slim, very compact mikes such as the Altec-Lansing 21-D.

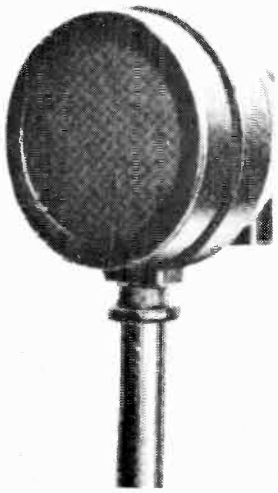
The Camera



Development of vacuum tubes free of operation noises permitted addition of a third stage of amplification to the condenser microphone. This made possible the transmission of all sound frequencies registered at the microphone diaphragm; the two-stage bullet microphone had been found wanting in this respect.

The three-stage condenser microphone, familiar in the "camera" case, was first introduced to broadcasting in 1927 at the studios of the National Broadcasting Company in New York City. The improvement in pick-up, both as to frequency range and fidelity, was marked and the "camera" soon replaced the older carbon type for practically all studio purposes.

The Dynamic



The dynamic microphone, first used in 1931 began to be used to a considerable extent throughout the industry in 1934. Also known as the "moving coil" microphone, it generates its voltage coil moving in a magnetic field. This principle was first used in the "phonotron," or "dish pan" microphone, used at station WJZ, New York City, shortly after it went on the air in 1921. The "dish pan" was never widely used, however. The operating principle is essentially the same as that of a dynamic loudspeaker in reverse.

This is a diaphragm type. To the diaphragm is attached a coil of fine metallic ribbon, the diaphragm vibrates in response to sound waves striking its surface, causing the coil to vibrate in like manner. The microphone functions as a generator whose electrical output, while very small, is proportionate to the magnitude of the sound vibrations which cause the movement of the diphragm. The method of vibration is substantially that of a plunger.

The Parabolic

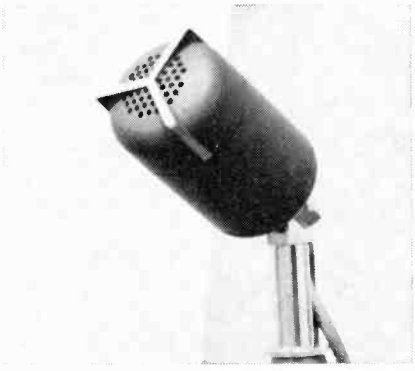
The parabolic microphone was designed to serve a special purpose. In broadcasting of great assemblages it is frequently desired to transmit an overall effect. In placing the microphone in such a position as to pick up an entire group it is frequently impossible to obtain sufficient intensity of sound frequencies to generate a satisfactory electrical output.

A means of amplifying sound frequencies was found in a large and scientifically designed parabola shell that reflects and focuses incoming sounds to the diaphragm of a microphone. The first microphone unit used was the camera condenser; in later broadcasts the inductor microphone, or the dynamic microphone, has come into use. The parabolic microphone, developed by engineers of the National Broadcasting Company in 1930, was first used to pick up broadcasts of large instrumental groups in the Times Square studio and performances of Chicago opera. Its first notable use in an outside broadcast was in the radio coverage of the Democratic National Convention at Chicago in 1932. Since that time it has frequently been used in broadcasts of football games and other outdoor events.

The Velocity

The search for a microphone responsive to a wide range of sound frequencies and registering all without discrimination as to direction led to the development of the velocity microphone. It was first used by the National Broadcasting Company in 1931 and has since become the standard for most types of studio broadcasts. It responds to frequencies from 30 to 15,000 cycles and has a response field over an area of 90 degrees in front and in back of the instrument. The velocity microphone is bi-directional; that is, it responds equally to sounds originating in front or in back of it.

It consists essentially of a narrow corrugated ribbon of aluminum alloy, fastened at either end in such a way as to permit it to vibrate freely in the magnetic field of a permanent magnet. Sound frequencies in its fields of response cause the ribbon to vibrate in sympathy, and in so vibrating it cuts the lines of force in the magnetic field. An alternating current is thus set up in the ribbon, corresponding exactly to the frequency and amplitude of the original sound.



LEFT: First built by WE, later by Altec, the 633 "Salt Shaker" Dynamic has now joined the gallery of microphones.

The Inductor

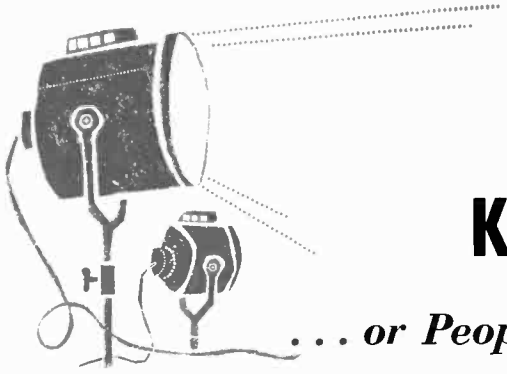
The inductor microphone, a contemporary of the dynamic, is also a pressure-operated instrument. It has an oval diaphragm, corrugated, to which is attached a single conductor. Pressure of sound waves causes the vibrating diaphragm to move the conductor through a magnetic field and thus to generate a voltage corresponding in strength and quality to the motivating sounds.

Small in size and rugged in construction, this microphone is favored for broadcasts originating outside the studio. Its size makes it convenient for radio pick-ups of addresses by speakers at public gatherings. Being a compromise between the ribbon velocity and the dynamic microphones, it permits a speaker to approach nearer than the three-foot minimum distance generally required of users of the velocity type microphone.

Where Are They

Most of the old-time microphones have gone the way of all good microphones, but a few remain as ornaments and relics of an historic past. Clyde Hunt, vice president in charge of engineering at WTOP-AM-FM-TV, Washington, D. C., converted one old carbon mike into a clock case, polished it up, and set it up in his office. It now proudly tells time, as the photograph shows.

Do you know of other conversions? Send us a picture or a paragraph of information, if you do. We'll pass them on to our readers. Send them to Editor, Technician-Engineer, International Brotherhood of Electrical Workers, 1200 Fifteenth Street, N. W., Washington 5, D. C.



KEEP THE RECORD STRAIGHT

. . . or People Who Live in Glass Houses Shouldn't

UNDER ordinary circumstances, we would not make any comment or note of the proceedings of a convention of another organization. When the official record of such a convention contains mis-statement of facts—deliberate or otherwise—about the IBEW, it becomes time to speak up and to correct the impression given by those who criticize.

Last fall, NABET held its Constitutional Convention in Chicago. As a part of the agenda of the convention, a report was made by the then executive vice president. In the course of his remarks and report, he mentioned that he has been working for NABET for approximately 13 years and then he went on to say:

> "The International Brotherhood of Electrical Workers with something like 400,000 or 500,000 members has approximately the same number of broadcasting members as we do, around 5000 or 6000, and they are in a department. In other words, they do not attend the convention and they do not participate in the affairs of the IBEW except as others decide they shall participate. The IATSE is even worse for a mere handful of members in this industry out of their total of 35,000, but these are the two unions who have the audacity to tell us that we do not deserve to exist and we are in their industry."

Of course, we must quarrel with the whole of this statement, insofar as it refers to the IBEW. In particular, ". . . they do not attend the convention and they do not participate in the affairs of the IBEW except as others decide they shall participate . . ." is a gross mis-statement and is a shocking statement from a man who has been wandering around the broadcasting union field for 13 years or more.

What is the fact? First, a Local Unon of the IBEW consists of ten or more members, according to the International Constitution. *Each and every* local union is entitled, *as a matter of constitutional law*, to be represented at International Conventions; that is, local unions with 10 to 375 members are entitled to have one delegate and local unions with more members are entitled to proportional representation. The most recent International Convention of the IBEW, held in Cleveland, Ohio in 1958, thus had delegates representing as few as 11 members—a broadcasting local union in Gadsden, Alabama. Another of note was our broadcasting local union delegate from Halifax, Nova Scotia who represented his 13 members. (This is in sharp contrast to NABET Conventions where, as we understand their constitution, a local union must have 25 members to be entitled to representation. There appears to have been 14 NABET locals not represented at their 1959 Chicago Convention, on that basis, of the total of some 52 in existence.)

Referring back to the Convention, the record shows, in 1946, a member of the Law Committee; in 1948, two members of the Law Committee and a member of the Resolutions Committee; in 1950, a member of the Law Committee, a member of the Committee on the I. E. C. Report, a member of the Committee on the International President's Report; in 1954, a member of the Committee on the International Secretary's Report, one on the I. E. C.'s Report, one on the Law Committee, one on the Grievance and Appeals Committee and one on the Resolutions Committee; and in 1958, a member of the Committee on the International Secretary's Report, one on the International President's Report, one on the I. E. C.'s Report, two on the Grievance and Appeals Committee and even two members of the Escort Committee for former U. S. President Truman. Additionally, when the 1959 AFL-CIO Convention was held in San Francisco one of the 13 delegates representing the entire IBEW was an officer and working member of an RBT local union.

The record thus shows that not only do our local unions "participate in the affairs of the IBEW" but they are doing so and have been doing so for many years—and on a more democratic basis with respect to small local unions than another organization which has the audacity to criticize, without the facts to sustain the criticism. In terms of the local unions represented at the last (1958) IBEW Convention, some 65 delegates who are employed in the broadcasting-recording industry or who are full-time officers (and as such were delegates) must surely recoil from such unwarranted and false statements.

FCC Denies IBEW Petition

"IBEW Made Only Response to Notice of Rule Making and FCC Issues Five Page Reply"

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of Amendment of Section 3.66 (Broadcast Service) of the Commission's Rules Relating to Remote Control Authorizations.	Docket No. 13084

REPORT AND ORDER

By the Commission: Commissioner Bartley absent.

1. Reference is made herein to: (a) the Commission's Order of April 25, 1958, modifying Section 3.66(c) (4) of the Rules; (b) Petition for Reconsideration thereof filed on May 26, 1958, by the International Brotherhood of Electrical Workers; (c) the Commission's Memorandum Opinion and Order adopted on July 29, 1959; (d) the Commission's Notice of Proposed Rule Making adopted on July 29, 1959; (e) Statement of International Brotherhood of Electrical Workers filed October 1, 1959.

2. Prior to the amendment of Section 3.66(c) (4) of the Commission's Rules by the above referenced Order of April 25, 1958, it was required that: "An authorization for remote control will be issued only after satisfactory showing has been made in regard to the following, among others:

(1) . . .
(2) . . .
(3) . . .
(4) The station, if authorized to operate with a directional antenna and/or with a power in excess of 10 kw, will be equipped so that it can be satisfactorily operated . . . on a CONELRAD frequency with a power of 5 kw or not less than 50 per cent of the maximum licensed power whichever is the lesser. . . ."

Apart from the foregoing, which related only to authorization for remote control, the Commission's Rules nowhere specify minimum transmitter power for CONELRAD operation. The power to be employed for CONELRAD use is, instead, determined by CONELRAD Field Supervisors on a case-to-case basis and is, in some instances, less than 50 per cent of the licensed power. Such a station seeking authorization for remote control under the aforequoted portion of the Rules might be required to install a new transmitter for operation on a CONELRAD frequency with 50 per cent of maximum licensed power, simply to qualify for operation by remote control.

3. The above-referenced Order of April 25, 1958, modified Section 3.66(c) (4), quoted in part above, to the extent of adding a provision that the requirement thereof regarding power for CONELRAD operation would not apply in instances where the CONELRAD Field Supervisor certifies that power of less than 50 per cent of maximum licensed power will provide satisfactory service under CONELRAD. In this Order, the amendment was considered procedural in nature, and prior publication of the Notice of Proposed Rule Making was, accordingly, omitted as unnecessary.

4. In the Memorandum Opinion and Order adopted on July 29, 1959 the Commission granted the above-referenced International Brotherhood of Electrical Workers petition for reconsideration of the Order of April 25, 1958 on the basis that the amendment effected thereby was, in fact, substantive and not procedural in nature, and that the rule making procedure provided by the Administrative Procedure Act had not been followed, although there was no finding that such procedure would have been either impracticable, unnecessary, or contrary to the public interest in this particular instance. The Order of April 25, 1958 was vacated, with the effective date stayed, pending Commission action on the above-referenced Notice of Proposed Rule Making adopted on July 29, 1959, wherein it is proposed that Section 3.66(c) (4) of the Rules, quoted in part in paragraph 2 above, be amended by the addition of:

"*Provided*, however, that the power may be less than 50 per cent upon certification by the CONELRAD Field Supervisor that such a power will provide satisfactory service under CONELRAD."

5. In the statement filed with the Commission on October 1, 1959, the International Brotherhood of Electrical Workers contends that the proposed amendment would: (a) reduce the minimum power required for CONELRAD operation of remote control stations and in effect eliminate any requirement of an objectively determinable minimum; (b) redelegate to field supervisors responsibilities with respect to national defense which the President has delegated to the Commission; (c) overemphasize the importance of denying navigational aid to an enemy and neglect the increased importance of transmitting civil defense information to the public, with particular regard to evacuation and the dangers associated with radioactive fallout; (d) weaken the "framework for CONELRAD operations" which depends upon the total number of participating stations and their operating power which would thereby be reduced. The International Brotherhood of Electrical Workers is of the opinion that minimum CONELRAD power should be increased rather than decreased in view of "the necessities of Civil Defense." The International Brotherhood of Electrical Workers would allow the Commission to take cognizance of the special situation of licensees authorized for remote control operation prior to July 29, 1959 and, in individual cases, allow continued operation in accordance with the CONELRAD field supervisors' certifications. The International Brotherhood of Electrical Workers submits, however, that the Order of April 25, 1958 should be vacated.

6. The Commission has carefully considered the IBEW statement which was the only response to the Notice of Proposed Rule Making of July 29, 1959. CONELRAD Field Supervisors, both before and after the amendment of April 25, 1958, have had the task of determining on a case by case basis with what power stations must operate to provide the needed CONELRAD coverage to the area. The CONELRAD Rules, which have been coordinated with the North American Air Defense Command (NORAD), specify a maximum power of 10 kw for CONELRAD operation but do not specify minimum power. The amendment would eliminate the disparity between CONELRAD power capabilities as required by the remote control rules and those established individually by the CONELRAD Field Supervisors.

7. In accordance with Sections 3.920 and 3.921 of the Commission's Rules: "CONELRAD activities under the authority of FCC are under the immediate supervision of three FCC Zone Supervisors whose respective zones are coextensive with the three Air Defense Force Areas. . . . Each zone is divided into several divisions corresponding to USAF Air Divisions. An FCC Coordinating Engineer is assigned to each Air Division and has responsibility under the Zone Supervisor for all CONELRAD activities under the authority of FCC in his division." In accordance with one of the provisions of NORAD Regulation No. 55-7: "FCC NORAD Region Supervisor personnel are under the direct supervision of the U. S. Supervisor (CONELRAD) FCC, Washington, for the purpose of effecting rapid coordination on all matters relative to CONELRAD, and are responsible for directing the implementation of non-government CONELRAD plans for the NORAD Regions." Accordingly, while case-to-case decisions are made by field supervisors, the FCC and NORAD have indicated, apart from the proposed amendment, that there is every confidence in the

ability of these supervisors to make the necessary determinations in the interest of national defense.

8. With regard to the importance of denying navigational aid to the enemy and of furnishing civil defense information to the public, Defense Commissioner Robert E. Lee has stated on a Special CONELRAD program of December 3, 1959:

> "You may be interested in knowing that the CONELRAD requirement has recently been reevaluated by the Defense Department, and we have been advised that for the aforeseeable future, perhaps ten years, CONELRAD is a military as well as a Civil Defense requirement. This is not only to deny navigational aid but to deny intelligence to the enemy, and to deny interference to our own sophisticated offensive and defensive guided missiles."

At the same time, Mr. John A. McLaughlin, Administrative Secretary to the Secretary of the Air Force stated:

> "The denial of navigational aid to the enemy in the event of an attack is a most important part of CONELRAD. But of equal importance is the strict control of all radiation devices which do not directly contribute to continental defense and necessary national operation."

It is further noted that evacuation and dangers associated with radioactive fallout are matters beyond the cognizance and jurisdiction of the FCC and neither can nor need be commented upon in the present context, except to the extent of noting that CONELRAD activities are properly coordinated with the Department of Defense, the Office of Civil and Defense Mobilization, Atomic Energy Commission, and other government organizations.

9. Operation on a CONELRAD basis is voluntary and the Commission has no control over the number of CONELRAD stations. In accordance with Section 3.951 of the Commission's Rules, the station desiring to participate in the CONELRAD system indicates its willingness and receives Commission authorization; any participating station may withdraw from the CONELRAD system simply by giving 30 days' notice and submitting its authorization for cancellation. This procedure would not be affected by the proposed amendment and, accordingly, the "framework for CONELRAD operations" will not be weakened by any reduction in the number of participating stations resulting from this amendment. As to weakening of CONELRAD by reducing the operating power of CONELRAD stations, in accordance with paragraph 7 above, there has been no reduction of any required minimum power for CONELRAD operation, and, in accordance with the Commission's records, there has not been a single instance of reduction in power by CONELRAD station authorized for remote control under the above-referenced Order of April 25, 1958. Instead, prior to this amendment of Section 3.66(c)(4) of the Commission's Rules, there were instances of stations satisfactorily equipped for normal and CONELRAD operations which were required to provide a third set of facilities for CONELRAD operation at high power in order to qualify for operation by remote control for normal operation. The Order of April 25 was adopted, albeit without a rule making procedure, in order to rectify this situation which had resulted in instances of undue hardship imposed upon station operators desiring remote control authorization. The presently proposed amendment, like its predecessor, would eliminate this situation and would not result in a reduction in power below CONELRAD operating practices in any instance. Accordingly, the Commission does not agree that the "framework of CONELRAD operations" would be weakened in any way by the proposed amendment.

10. Any consideration of increasing the power required for CONELRAD operations, as suggested by the International Brotherhood of Electrical Workers, is beyond the scope of this proceeding, and, in fact, would require coordination with government agencies other than the Federal Communications Commission.

11. In summation, the Commission has determined that the proposed amendment would not: (a) reduce the "minimum power requirement" for CONELRAD operations; (b) have the effect of reducing the power of any CONELRAD station; (c) decrease the total number of CONELRAD stations; (d) delegate new and unusual responsibilities to CONELRAD field supervisors; (e) have the effect of a misinterpretation of the purpose of CONELRAD on the part of the Commission; or (f) weaken the "framework for CONELRAD operations." The Commission further finds that the primary effect of the amendment would be to eliminate a situation where the minimum power established by CONELRAD Field Supervisors on a case by case basis is different from the power which the remote control rules require that stations be equipped to use on a CONELRAD frequency.

12. Authority for the action taken herein is contained in Sections 4(i) and 303(r) of the Communications Act of 1934, as amended.

13. In view of the foregoing, IT IS ORDERED, that effective May 16, 1960: (a) Section 3.66 of the Commission's Rules IS HEREBY AMENDED as set forth in the attached Appendix; (b) the Stay of the Commission's Order of July 29, 1959, vacating the Commission's Order of April 25, 1958 IS HEREBY REMOVED and this Order rendered permanently vacated; and (c) the proceeding in the Matter of Amendment of Section 3.66 (Broadcast Service) of the Commission's Rules Relating to Remote Control Authorization is HEREBY TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE,
Acting Secretary.

Attachment
Adopted: April 8, 1960.

Appendix

§ 3.66(c)(4) of the Commission's Rules is amended to read as follows: § 3.66 Remote control authorization.

* * * * * * *

(c) * * *

(4) The station, if authorized to operate with a directional antenna and/or with a power in excess of 10 kw will be equipped so that it can be satisfactorily operated in accordance with Subpart G of this part, on a CONELRAD frequency with a power of 5 kw or not less than 50 per cent of the maximum licensed power, whichever is the lesser, and that the necessary switching can be accomplished from the remote control position: *Provided, however,* That the power may be less than 50 per cent upon certification by the CONELRAD Field Supervisor that such power will provide satisfactory service under CONELRAD.

Anti-Union Law Blasted as 'Albatross'

From "LABOR," the weekly newspaper of 18 Standard Railroad Labor Organizations—May 7, 1960.

"The right-to-work law does not help labor, management or the public and it is an albatross around the neck of those (political candidates) who support it," Indiana's former Republican Governor George N. Craig declared last week.

In his statement, sent out through the National Council for Industrial Peace, a non-partisan group promoting better labor-management relations, Craig went on to warn Hoosier GOP candidates that they would be defeated if they supported the law banning union shop agreements, instead of advocating its repeal.

Furthermore, Craig said, the Indiana GOP would "become and remain a minority party unless it liberalizes its policies."

Although Craig's statement came with surprising suddenness, Indiana's recent political history appears to bear him out: In 1958 elections, the Chamber of Commerce made the state's "wreck" law a big issue, and campaigned for candidates pledged to retain that law.

The result: GOP Governor Harold Handley, who let the law go on the books a year earlier, was trounced in his race for the Senate by the present Democratic Senator Vance Hartke. The Democrats swept into control of the House and very nearly took the Senate.

Then, last year, the Indiana House repealed "right to work" by a whopping 79 to 23 vote. However, after the Senate had also voted for repeal, a group of GOP senators got the repealer killed in a last-minute parliamentary maneuver.

At that time, Indiana AFL-CIO President Dallas Sells vowed, "We are starting our 1960 political action program right now. We found out the hard way who were our friends and who would double-cross us."

Meanwhile, former Republican Governor Fred Hall of Kansas, commended Craig for issuing his warning and said he agreed with him 100 per cent.

Hall declared: "Governor Craig is telling the party exactly what I told it in 1955 when I vetoed a Kansas right-to-work bill."

"It is a mistake for either party to nominate or elect candidates who support right-to-work laws," Hall added. "Such laws are morally and legally wrong . . . they destroy the right of labor to organize and the right of labor and management to bargain collectively."

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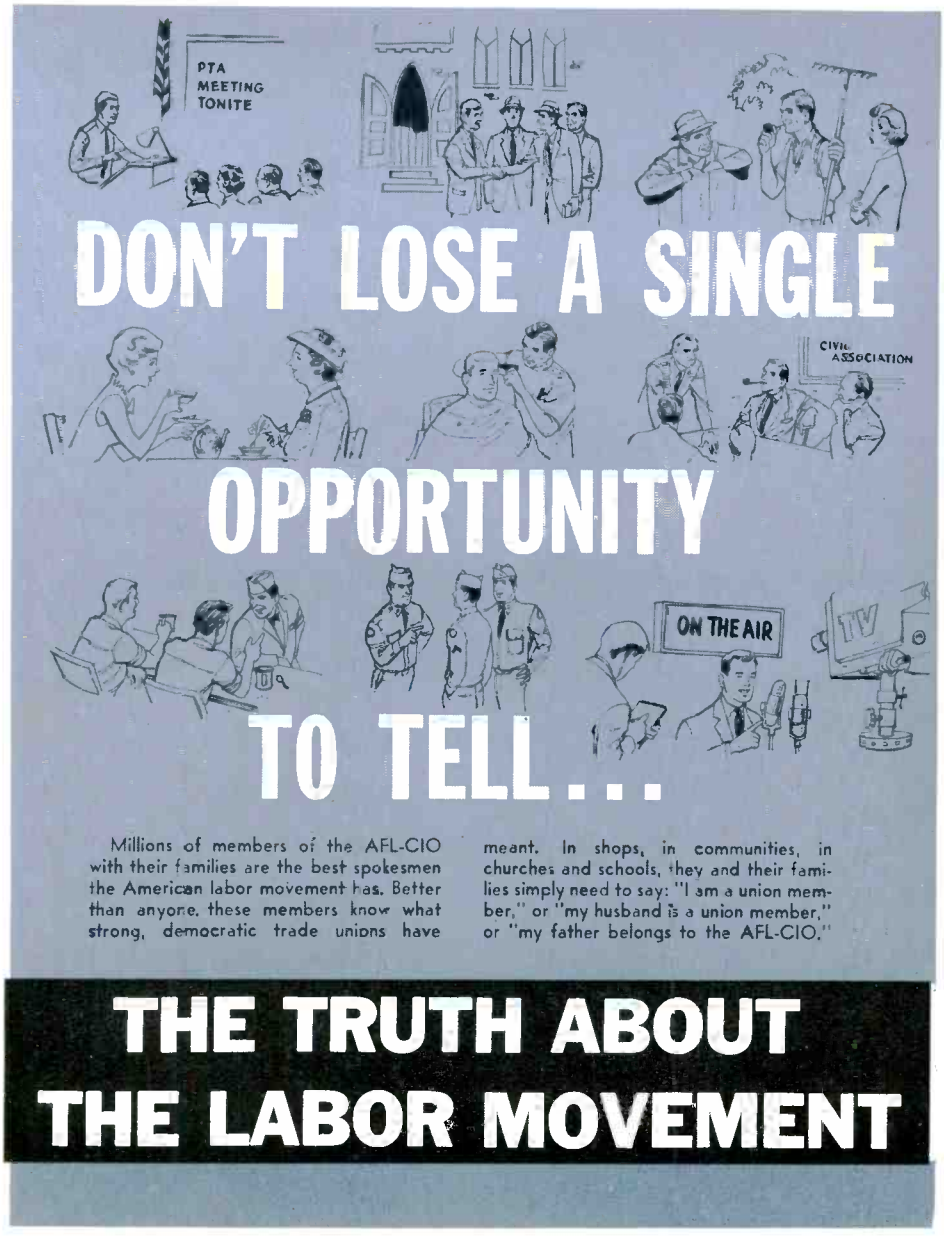
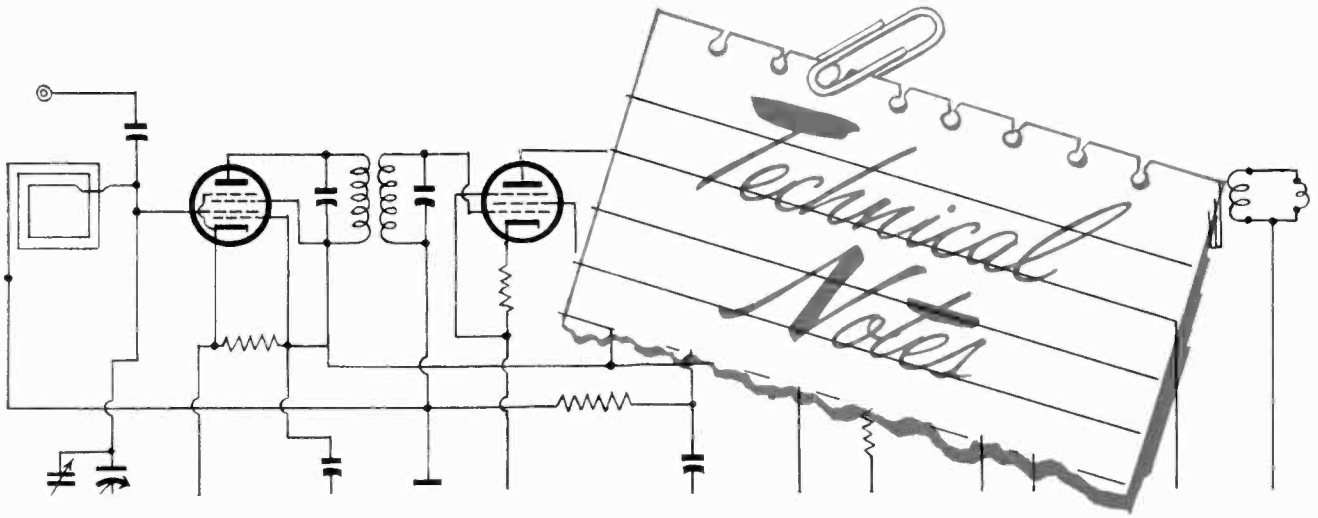
1960 Progress Meeting, Colorado Springs, August 12, 13, 14.





Speaker's Dream

Democrats speaking at the party's National Convention in Los Angeles will be able to take advantage of a specially-built rostrum described as a speaker's dream.

The host committee announced that the 63-by-20 foot podium designed by the Teleprompter Corp. for use at sessions starting July 14 in Los Angeles includes such refinements as:

—A raising and lowering device making all speakers appear equal in height.

—A special spotlight which in addition to the customary television makeup will "erase shadows on the face."

—A special TV camera built in so even speakers who read their speeches can look at their texts and appear to be gazing directly into the camera.

—A special air conditioner pointed directly at each speaker to keep him cool.

Output Check Unit

Zenith Radio Corporation has announced the development of a six-transistor check unit to determine the accuracy of output calibration of audiometers.

Portable, and weighing only 3 lbs. 12 oz. with its power supply of four Z-9 mercury batteries, the unit is now being used in the field to check calibration of Zenith's new Diagnostic Audio Analyzer, a hearing testing device for hospitals, clinics, schools, hearing and speech centers, as well as competitive audiometers.

Servicemen can now check an audiometer at the following frequencies: 125, 250, 500, 1000, 2000, 4000, and 8000 cycles per second.

Stereo Radio Tests

The world of two-dimensional radio sound stepped closer this month with announcement by the Electronic Industries Association of a target date for initiating field testing of stereophonic radio-broadcasting equipment.

EIA said that only FM stereo radio transmission systems would be field-tested at this time and that the testing is being conducted at the request of the Federal Communications Commission. The tests are to start the week of Sunday, June 5. Results thereafter will be submitted to the FCC which in time will establish transmission standards for FM stereophonic broadcasting.

The tests will be supervised by the National Stereophonic Radio Committee, established by EIA, and will constitute the committee's first official field experiments with stereo radio on behalf of broadcasters and equipment manufacturers.

The National Stereophonic Radio Committee, to date, has selected one test site. This is a Pittsburgh FM station—KDKA.

The NSRC tentatively has selected two additional test sites. These are WCRB-FM and WBZ-FM. Both are in Boston, Mass.

French Color TV Band

A French color television system, which takes up much less valuable air space than American and British systems, has achieved the first successful color transmission between Paris and London.

An official of the Institution of Electrical Engineers, at whose headquarters in London the pictures were received on special sets, said the French method was "an ingenious variation" on the system used in the United States.

As with the U. S. system, sets not equipped for color could receive the pictures in black and white. The main advantage claimed for the French system is that it requires a band width only slightly wider than that used to transmit black and white television.

●

Thomas Edison at Work

One invention every 15 days. That was Thomas A. Edison's average! From the time he was 30 until he died at the age of 84 in 1931, he was granted 1,093 patents, including the electric light, the phonograph, the motion picture, the stock ticker and many more things we take for granted today.

●

Progress Meeting Reminder

Announcement and reservation forms for the annual progress meeting have gone out to all local unions. Reservation forms must be returned to the Antlers Hotel in Colorado Springs, Colo., by June 1. Dates of the Progress Meeting: August 12, 13, 14.

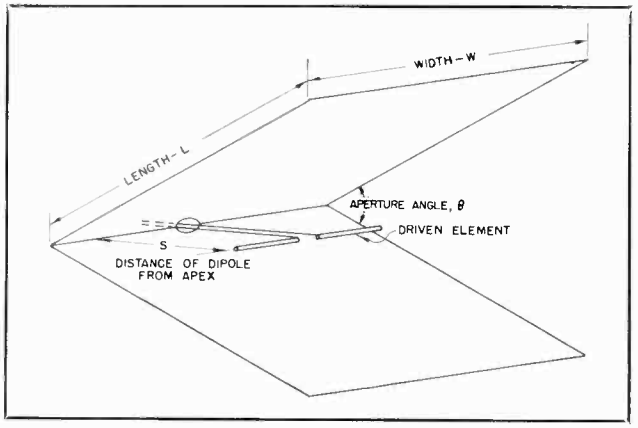


DIAGRAM OF CORNER-REFLECTOR ANTENNA.

Design of Corner Reflector Antennas

Experimental corner-reflector antenna analyzed by the National Bureau of Standards. Length and width of reflecting surfaces, position of dipole, and aperture can all be varied to determine effect on gain. This assembly is located at the NBS Table Mesa field station, near the Bureau's Boulder (Colo.) Laboratories.

A DESIGN analysis of corner-reflector antennas has been carried out by the National Bureau of Standards Boulder (Colo.) Laboratories under the sponsorship of the US Air Force. The results of this evaluation by H. V. Cottony and A. C. Wilson of the Bureau's Central Radio Propagation Laboratory provide comprehensive and detailed information on designing high-performance, economical corner reflectors.

A corner-reflector antenna consists simply of two plane reflecting surfaces joined edge to edge to form a corner, which is usually parallel to the ground. The driven element is placed in the aperture between the two planes. This type of antenna has the advantages of high gain, broad frequency response, narrow beam width, low back radiation, low cost, and ease of construction.

Therefore, as part of its propagation research program, the Bureau undertook an investigation of corner reflectors to determine how gain varies with changes in width and length of reflecting surfaces, angle of aperture, and position of driven element.

The experimental corner-reflector antenna used for this investigation consisted of two lattice-type wooden frames, each 12.3 feet (five wavelengths at 400 mc) wide by 12.3 feet long, supporting the reflecting surfaces. The reflectors were of overlapping strips of sheet aluminum fastened to the frames so that removal of one strip would subtract 0.2 wavelength from the surface. Width could be varied by trimming the lengths of the strips. The two frames were pivoted along the same axis, and the angle of aperture could be varied from 20 to 180°.

The driven element was a folded half-wave dipole. Its position could be varied from 0.07 to 2.5 wavelengths from the apex of the reflecting surfaces. The dipole's support also served as a balun to transform the impedance of the system to about 50 ohm. Fine adjustment, for an exact match to a 50-ohm line, was provided by a two-stub tuning unit. Gain was measured at 400 mc by comparing the system with a known antenna.

Results of the measurements indicate that minimum reflector width is 0.5 wavelength for the smallest usable value of gain. With an increase in width up to 2 wavelengths, gain increases. However, beyond this, there is little or no increase in gain, and under some circumstances it may actually decrease.

Ionospheric scatter antennas designed for the lowest portion of the VFH band should have especially low secondary lobes and minimal radiation to the rear, as radiation in these undesired directions is likely to result in self-interference from multi-path propagation. An important advantage of the corner reflector over other types of antennas is that it can be designed to have extremely low back radiation. The small amount that does occur results from diffraction around the edges and from penetration through small openings in the reflector surfaces.

STATION BREAKS

Press-Time Flash

The Supreme Court of New York has just issued its opinion in the CBS-IBEW case. CBS asked for an order to stay arbitration requested by the union on the subject of video tape jurisdiction.

The court denied the company's motion to stay and granted the union's cross-motion to compel arbitration.

The Double Standard

When it comes to running the affairs of labor unions, Big Business always insists on the secret ballot by union members. The secret ballot is standard operating procedure in virtually every union. But Big Business likes to give the impression that this is not the case.

But how about the secret ballot among stockholders in business? A very revealing case came to light recently when it was disclosed that United States Steel opposes a secret ballot for its stockholders.

But thanks to the persistence of Mrs. Wilma Soss of the Federation of Women Shareholders in American Business, stockholders of U. S. Steel were allowed to get the chance at a recent meeting to vote on the question of a secret ballot.

This is how she succeeded: When U. S. Steel refused her request to put the secret ballot question before the stockholders meeting on the grounds that her proposition was "not an appropriate subject for action by security holders," she went to the Securities and Exchange Commission (SEC). The SEC approved her request. And so the question went before the stockholders.

A revealing sidelight in the U. S. Steel story is the disclosure that similar efforts by Mrs. Soss to win the secret ballot for stockholders of Republic Steel Corp., the New York Central Railroad and the American Telephone and Telegraph Company were also rejected by those managements!

Apparently the Big Business viewpoint on voting can be summed up this way: Democracy in unions is a fine thing but democracy in management would only mess things up!

More Double Standard

The President's budget recommendation to Congress, includes an appropriation of $8,100,000 to enforce the Landrum-Griffin Act. Most of this would go to the new Bureau of Labor-Management Reports. But he asks only $3,049,000 for the Federal Trade Commission to protect consumers against false and misleading advertising, misbranding and other unfair or deceptive business practices.

Union Label Parade

As a unique trade-union service to consumers and the fashion industries in which its members work, the Union Label Department of the International Ladies' Garment Workers' Union brought New York City's famed Easter Parade to millions of TV viewers in the Greater Metropolitan Area last month. The hundreds of thousands of Easter "paraders" on New York's Fifth Avenue were shown on WPIX-TV, a station operated by men of Local 1212, Bronx. Julius Hochman, ILGWU Union Label director, said that sponsoring the unique TV program on an experimental basis was so successful that similar efforts are being considered.

Point Well Taken

Labor disgraces no man; unfortunately, you occasionally find men who disgrace labor.—Ulysses S. Grant.

'Despicable' Applies

Three cheers for the editor of the Park Region Echo, a rural newspaper in Minnesota, for calling a spade a spade in the recent strike against the Wilson & Co. plant in Albert Lea, Minn. The paper is published in Alexandria, Minn.

When a reader took issue with the editor's description of the strike breaking scabs as "despicable" and asked what was wrong with non-union workers taking the jobs of strikers, the editor replied in an editorial:

". . . the unions have fought long and hard, and at great sacrifice, to gain the right to strike. And when the unthinking, the selfish, the misled cross a picket line to steal jobs at cutthroat prices away from men who are suffering to win what they believe are just conditions of employment—we can only resort to the word despicable.

"Give a moment's thought to the ultimate result of unlimited scabbing. What would happen to wage standards? What would happen to safe and healthy conditions of work? What would happen to job security?

"Who would negotiate for these things? Scabs? How? The moment they started negotiating, they'd be replaced by other scabs who were willing to work for even less than the first group of job stealers."

Personally, we think the editor showed great restraint in referring to the scabs only as "despicable."

Use These ORGANIZING LEAFLETS

The field of electronics is mushrooming into all phases of modern life. Once limited to broadcasting and recording, it has branched out into instrumentation, automatic devices, testing equipment, and scores of other uses. Under the broad heading "electronics" are thousands of engineers and technicians needing union representation. Here are two new leaflets for your use—good material for workers in all fields of electronics. Order a supply through your local secretary today . . . for distribution to technicians in local stations, recording studios, and electronics facilities.

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