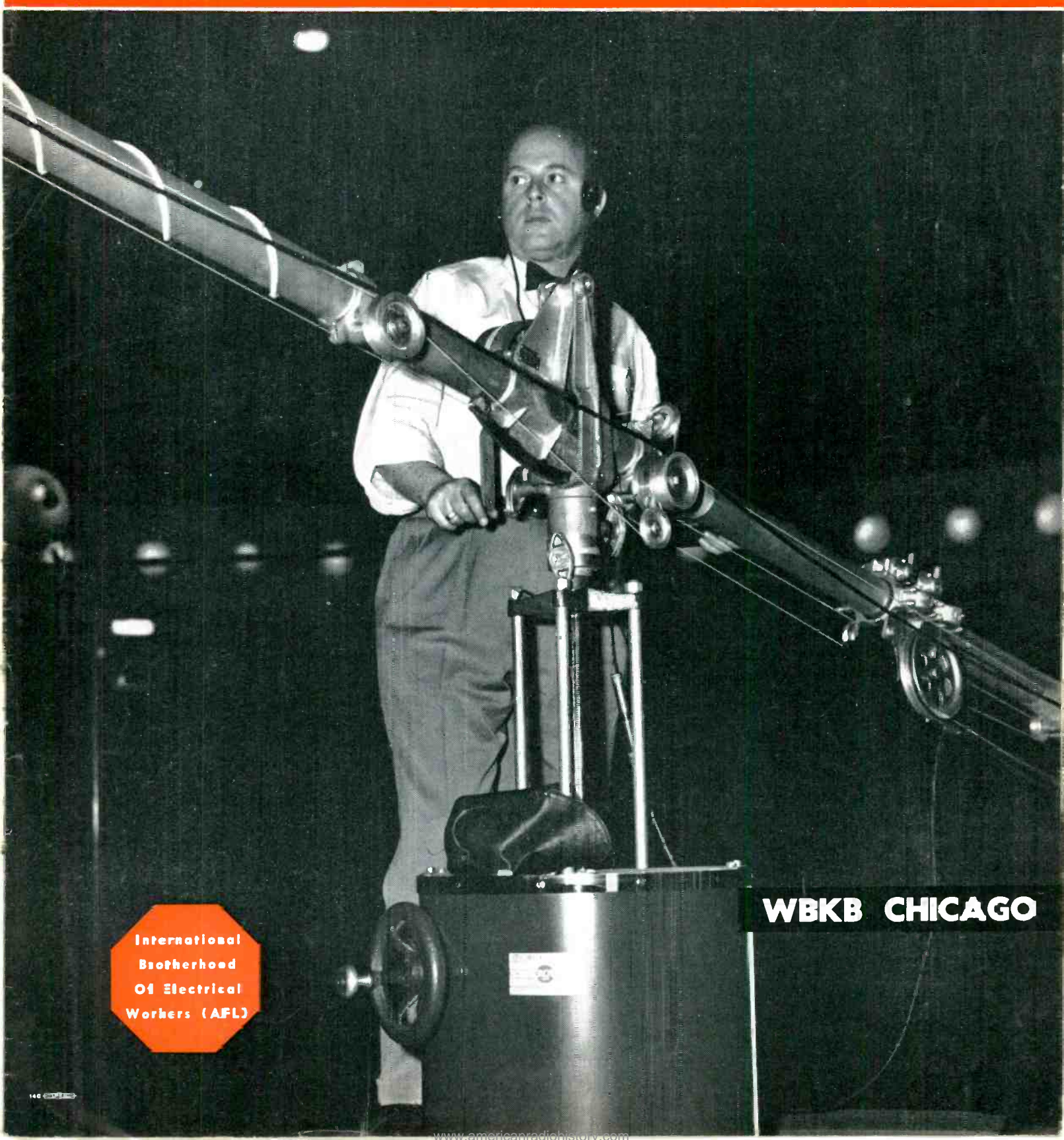


**RADIO, TV and RECORDING**



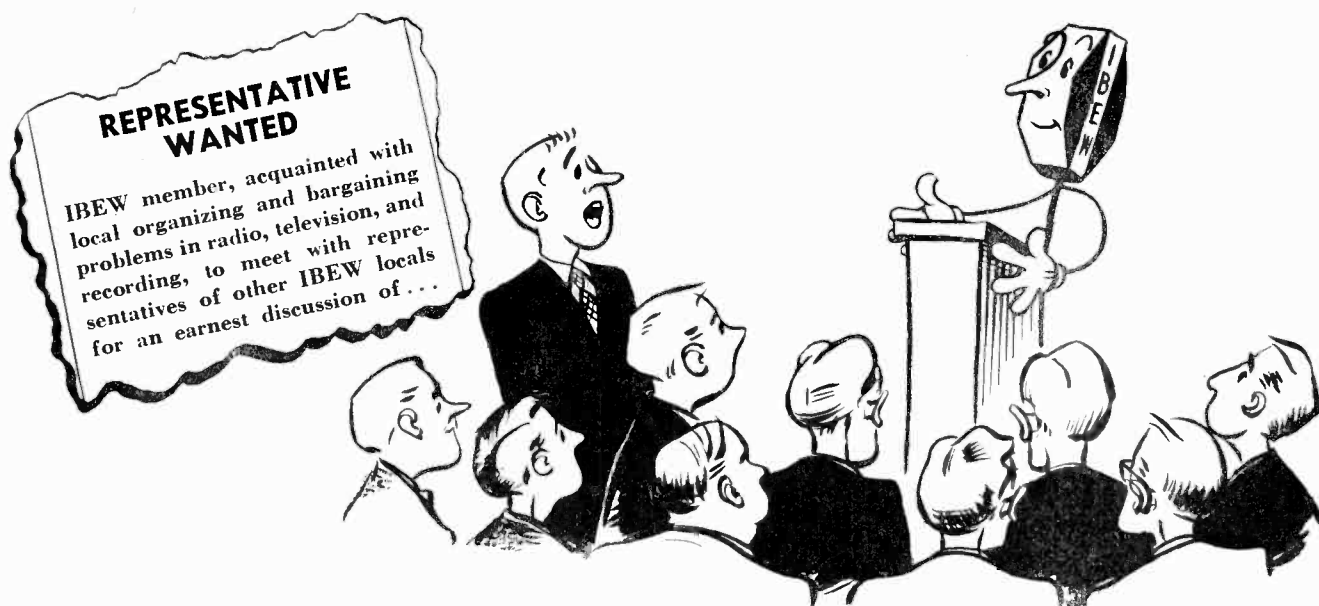
# **TECHNICIAN-ENGINEER**

MAY, 1952



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

**WBKB CHICAGO**



## **THE FIRST ANNUAL RADIO, TELEVISION and RECORDING DIVISION PROGRESS MEETING**

*will be held on June 5, 6 and 7 in Memphis, Tennessee. Each local union should make every effort to have a representative present to meet and confer with other representatives and the International staff.*

*All IBEW locals will be furnished with complete information about this big annual conclave. Cards for Hotel reservations will be sent to each local union.*

*Your International staff is still open for agenda suggestions. This important meeting can be an outstanding success, if your local representative joins the representatives from the other 78 local unions in an earnest discussion of industry problems.*

**JUNE 5, 6 and 7, HOTEL PEABODY, MEMPHIS, TENN.**

***It's Your Meeting. Mark It on the Calendar Now.***



# WBKB, Chicago

## The \$6,000,000 Station



If the FCC permits a merger of the American Broadcasting Company and United Paramount Theaters sometime soon, CBS would like to purchase TV Station WBKB, Chicago, for \$6,000,000.

During the past three months, FCC commissioners have been holding intense hearings at Washington with representatives of all concerned in order to decide whether or not the proposed merger of the network and the theater chain is monopolistic, whether or not such a merger would leave the Dumont network "the unmarried sister" of the big four TV networks, whether or not ABC would have a trade advantage on movie films, etc., if a ABC-UPT splice is accomplished, and much more.

Mixed up in all this confusion is big and booming WBKB, Chicago, a CBS affiliate owned by Balaban and Katz, a subsidiary of United Paramount. WBKB figures in the picture, because, UPT would like to put all its

financial eggs into the ABC basket, FCC permitting, and the \$6,000,000 offer for WBKB from CBS would be good lining for this basket. CBS, meanwhile, has a crying need for its own Chicago outlet; it has lost

two good sponsors because it couldn't clear Chicago.

The WBKB license is up for renewal, and CBS would like to add it to its freeze-frustrated expansion plans.

Six-million seems like a big offer for one outlet, but WBKB was a profitable operation in 1951. The Chicago facility is in a four-station market, but it netted \$1,227,100 before taxes during the first nine months of last year. This was a big jump over \$652,621 in 1950.

The Chicago station has paid back during the last two years \$1,554,486 of \$3,172,801 cash advances made by Balaban and Katz, the UPT-subsidary owners.

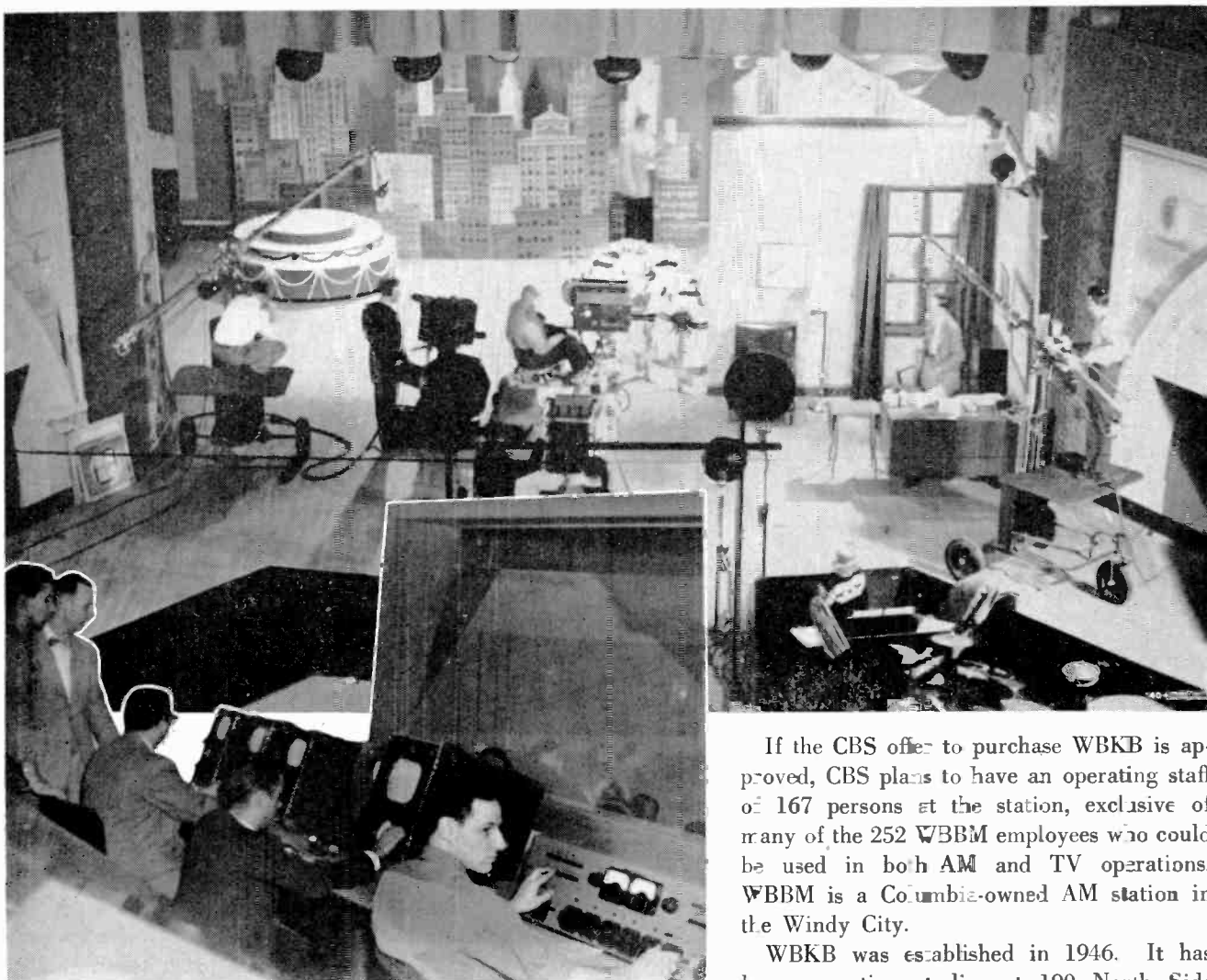
Should CBS acquire the WBKB facilities, it already has its expansion plans worked out.

It plans to set up large, one-story TV studios on the outskirts of the city, containing two or three studios for a possible 12-hours-weekly of network originations. The hugeness of the studio plans are indicated by H. Leslie Atlase, vice president of CBS's western division, when he explained that the company's plan was to make the installation so large that sets could be left standing from day to day and from week to week. He said that CBS has plans to build mammoth sound stages of a scale "that might well house the entire Chicago television industry."

CBS does not want to lose any more sponsors because it hasn't a Chicago outlet. It lost 15 minutes, three times a week, when Kellogg's "Space Cadet" went to ABC, CBS leaders said. They also contended that the Borden Company cancelled a similar time strip before it started, for the same reason. (Continued next page)



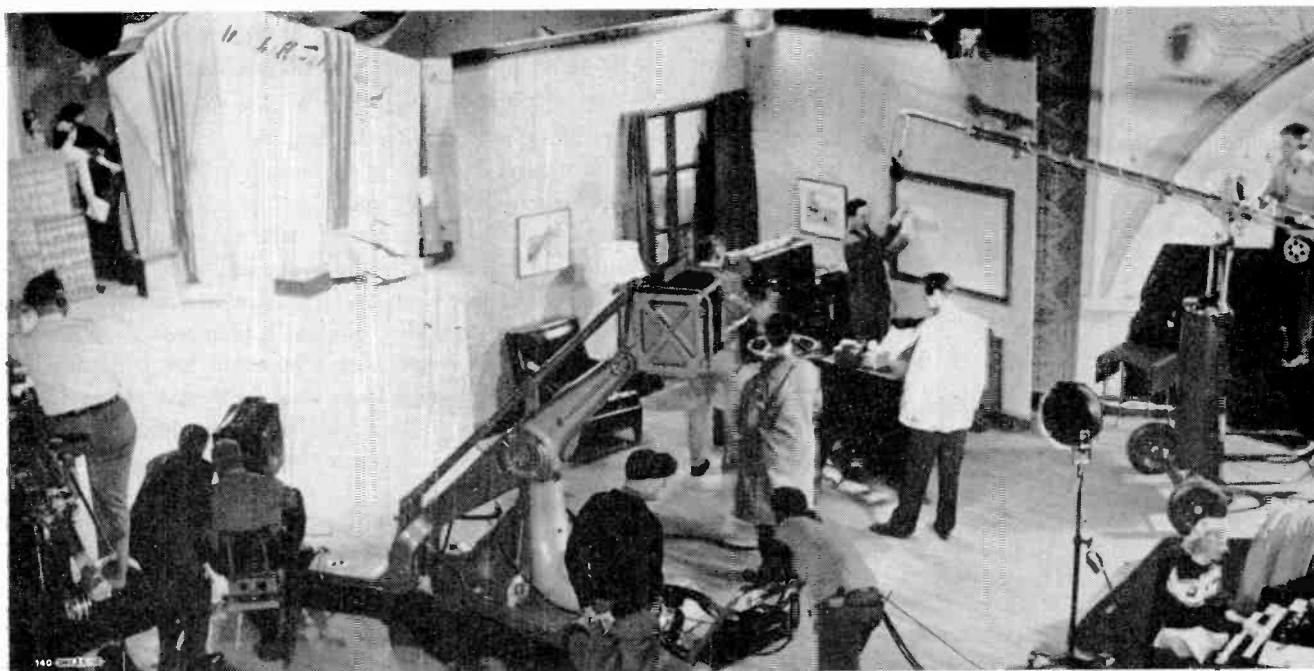
A busy WBKB control room. Director at the console is Santchi; Chief Engineer Kusack in the rear.



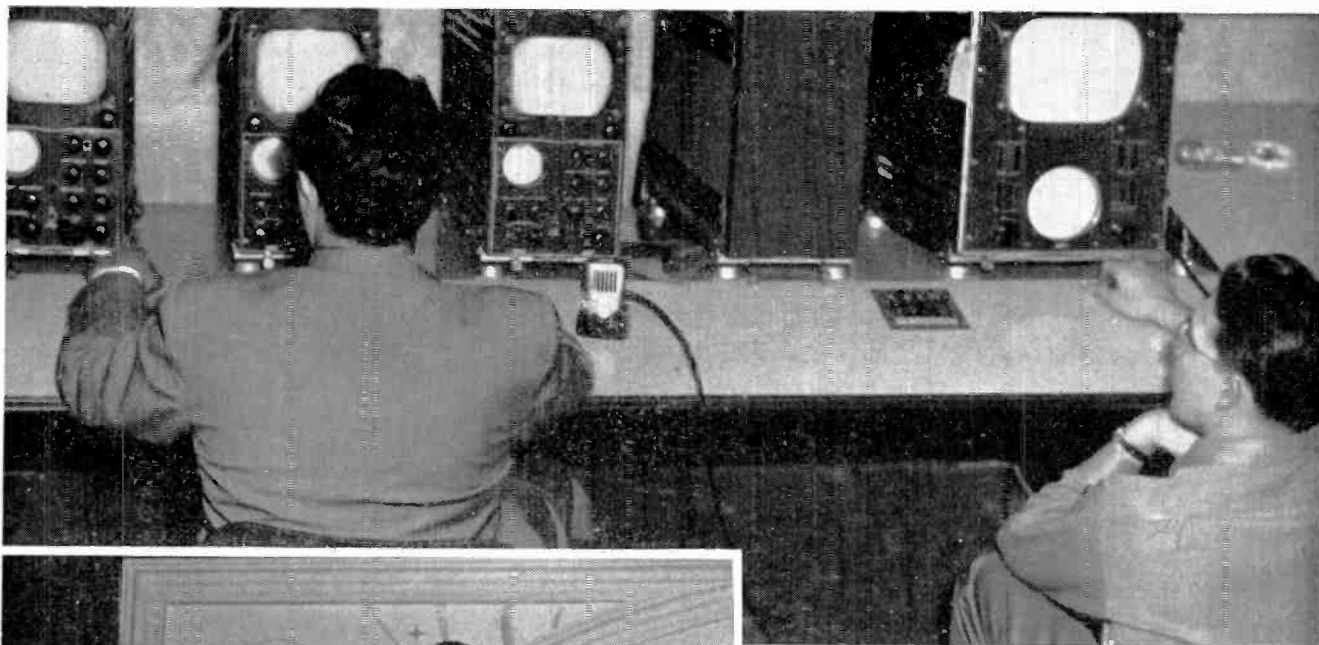
At the top: Working on the stage of the spacious theater studio.  
Middle: IBEW engineers Becker, Neltner, Grizanti, Buzzard, and Klinke.

If the CBS offer to purchase WBKB is approved, CBS plans to have an operating staff of 167 persons at the station, exclusive of many of the 252 WBBM employees who could be used in both AM and TV operations, WBBM is a Columbia-owned AM station in the Windy City.

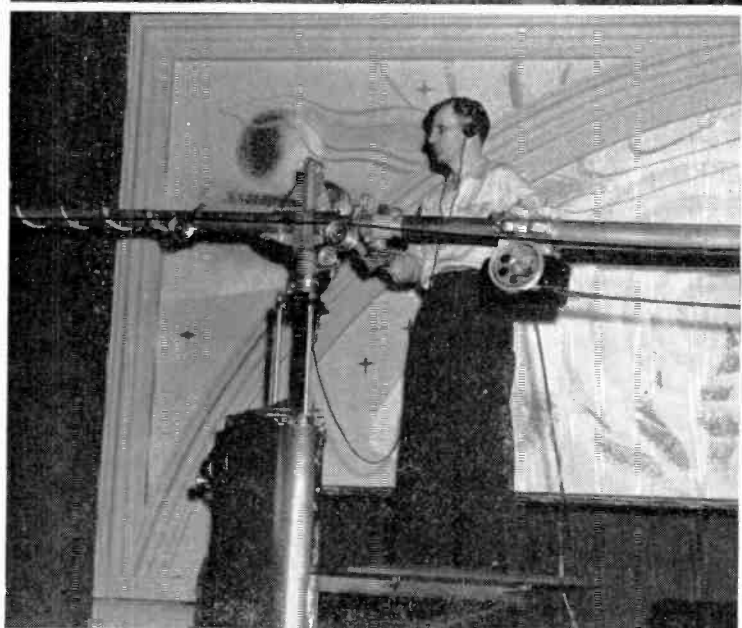
WBKB was established in 1946. It has been operating studios at 190 North Side Street in Chicago, and its transmitter is at



The stage is often crowded at the WBKB theater studio when two locally-produced shows are preparing to go on the air.



Above: Joe Grizanti, camera control, and Roy Becker, master video monitor.  
Left: Jm Zvolenek on the Television mike boom.



the top of the American National Bank Building in downtown Chicago

The station staff has an operating schedule beginning at 9 a. m. on weekdays and running until 1:30 a. m. On Sundays it operates from 10 a. m. until midnight.

The station is well equipped. IBEW engineers can handle remote pickups with microwave relays. There is a large theater studio for audience participation shows. Licensed to operate full time, WBKB broadcasts on Channel 4.

**OUR MAY COVER:** IBEW Engineer Perkins lowers the boom, as a WBKB home production gets ready to go on the air. (All photos of WBKB by Jack Jacobson of WGN-TV and Local 1220.)



A union engineer at the studio console, with all technicians on cue.

## Radio Scares Not Limited To American Broadcasters

Comic books, science fiction, and juvenile radio and television programs seem to have conditioned the American public against radio hoaxes since the "Men from Mars" scare of 1938, but citizens of other lands, lacking Captain Video and the like, may still be victimized.

Latest people to be alarmed by a "Men from Mars" scare were those of Thailand. A Bangkok radio program celebrating the birthday of the Thai Royal Air Force warned that the "world is faced by calamity by dangerous rays from another planet."

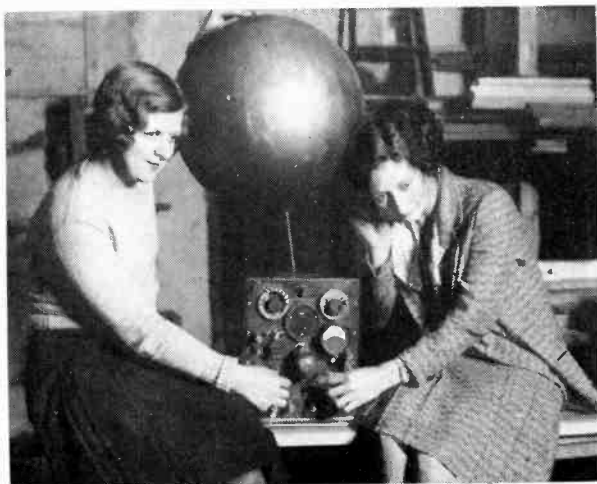
It was hours later before all listeners were reassured that the announcement was pure fiction, says the National Geographic Society.

Most famous U. S. radio hoax was Orson Welles stunt on Halloween eve, 1938. At that time Welles broadcast a network thriller adapted from H. G. Wells' "The War of the Worlds." The show was billed as a dramatic program and was explained at both beginning and end.

Nevertheless, the story of invasion of men from Mars, carried through interplanetary space in a cylinder that landed in New Jersey, started something closely akin to national hysteria.

Some listeners wrapped their faces in wet towels in lieu of gas masks; scientists set out to find the Martian cylinder; at least one big newspaper assembled its staff for an invasion extra, and newspaper and police tele-

Our Early Pioneers



On April 8 an imposing list of guests assembled at the Waldorf-Astoria in New York City for a testimonial dinner honoring Dr. Lee de Forest, the radio pioneer. The occasion marked the 50th anniversary of Dr. de Forest's work in radio and the 45th anniversary of his invention of the three-element vacuum tube.

One of Dr. de Forest's early radio developments is shown above. Helen Pentrosch and Maralyn Laier, belles of 1930, listen to the first radio set used by the industry pioneer. Grotesque as it appears, it was, nevertheless, an advanced step in early radio research.

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

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

D. W. TRACY  
*President*

J. SCOTT MILNE  
*Secretary*

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**NUMBER 5**

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phones were hopelessly clogged by an apprehensive public that wanted to know the worst.

With explanations, the flurry soon passed but the technique for scaring the public via air waves remained. It came into play with new twists—mostly atomic—after World War II.

The general director of the French National Radio was replaced, because a 1946 program warned that a wave of disintegration set off by nuclear experiments was rolling east across the Atlantic. Like the Welles program, this one was announced as fiction but the French listening public did not appreciate the broadcast and troops had to be called to protect headquarters of the radio network from irate Parisians.

Not as fortunate as the French radio personnel were occupants of the building that housed station HCQRX in Quito, Ecuador, after a 1949 Martian invasion broadcast. An angry mob burned the building, killing 15 persons trapped inside, before troops restored order.

Even the traditionally placid Scandinavians were not immune. In September of 1950, a special program on the Swedish radio, announced as fictional, told of invasion of Sweden by a foreign power. In some places the home guard was mobilized, and thousands of persons prepared for trouble before they learned that the broadcast only recalled the Napoleonic invasion of 1812.

### Rebroadcast by Chicken Wire

Seems the FCC has encountered several installations of chicken wire "reflectors" on tops of hills, so oriented that they bounce TV signals into fringe-area valleys. Some of the FCC people are discouraging the practice on the grounds that it may be interpreted as illegal rebroadcast under terms of the Communications Act. Other Federal communications administrators encourage it, however, as a needed service.

**The Technician-Engineer**





# TELEVISION CITY

**C**BS press relations men are able to use their best superlatives when they describe "the world's first television city, an entire community designed especially for TV."

For at "lore-laden" Gilmore Island, at the intersection of Beverly Boulevard and Fairfax Avenue in Los Angeles, Columbia is constructing a 25-acre production facility which should be to TV what Radio City, New York, has been to radio.

Already, the initial unit—a 15-acre plant of sound stages and assembly-line shops—is more than 30 per cent completed. CBS leaders say that Television City will be ready to begin coast-to-coast broadcasting on October 1.

Designed by architects William L. Pereira and Charles Luckman, Television City is "as elastic as the new television medium itself, providing for the sorely needed elements of efficiency and stability today, as well as the invaluable advantage of complete flexibility tomorrow," according to CBS President J. L. Van Volkenburg.

## CORE OF FOUR STUDIOS

The initial plant is built around a core of four gigantic studios, each of which measures 12,100 square feet. In addition to being among the largest sound stages ever constructed in the Hollywood film empire, two of the new studios will also be equipped to seat audiences of 350 persons each.

The walls separating both the audience and non-audience studios can be easily moved, so that the size,

shape, and number of stages can be changed whenever required. Even the seating arrangements in the theaters are changeable. Audience facilities can be removed entirely, if necessary, and the area converted into stage space.

Flexibility is the keynote to the whole vast project. (It is reported that Messrs. Luckman and Pereira winced now everytime the word is mentioned.)

## EXPLORATORY WORK DONE

The Pereira and Luckman architectural organization was retained more than two and a half years ago to explore the possibility of converting any of the then available Hollywood studios to television use. Extensive study convinced the firm that, while the existing movie studios offered many fine facilities, the motion picture lots were not built to meet the rapid-fire problems of TV production. So it was decided to start from scratch and build new facilities.

Explaining the differences between movie and TV production discovered by his staff, Pereira said, "Costs of a motion picture are predicated on an operation that really sets an open end on profit. The revenues on a movie are elastic. Vast sums of money and huge lengths of time can be expanded on a single picture, and, depending on circumstances, the picture can still gross many times its cost.

"Television, on the other hand, though it has an unlimited horizon in the field of programming, is faced with producing quality entertainment at a relatively low fixed operating cost so that the medium may become increasingly efficient and affordable to advertisers. Unlike the revenues of a given movie, the revenues of a given TV program are predetermined.

*Thanks to Pat McDermott, of the CBS publicity staff, Hollywood, and members of IBEW Local Union 45 for supplying us with material for this article.*

"Therefore, in its production facilities TV must place greater stock in efficiency and time-saving devices than was necessary when existing motion picture studios were planned."

Pereira and Luckman's assignment was to deliver a completely new television plant, very large in scale, very complex in scope, but one which would have complete flexibility. CBS wanted to be able to move every wall in any direction.

The architects explored 93 different techniques and methods of handling audiences. They investigated all of the methods of lighting. Their artists drew up 50 experimental designs. The designers tried, among other things, octagon shaped buildings, pentagons, circles, and triangles. In the end they came up with "sandwich loaves."

#### FULL FLEXIBILITY ACHIEVED

In the "sandwich loaves" building finally decided upon, they achieved full flexibility by planning a group of long, relatively narrow buildings, approximately 150 feet wide. These could be subdivided into areas of any size. The building walls, some of them glass, hinged on iron connections at each supporting point on the structural frame, can be moved outward as much as 300 feet and more buildings added. Walls can then be anchored back in place.

Certain floors are described as "floating." Control rooms also can be shifted. Even the sponsors' booths are uninhibited glass bubbles which may, characteristically, turn up anywhere.

Geared to serve the most crucial production needs, the carpenter shops, paint shops, the set storage rooms, and the property room are arranged to bring all scenic construction closer to the stages. One innovation that should give the "grips" a sigh of relief is a large ramp which runs entirely around the four studios on the second floor. This ramp, plus large freight elevators, make it possible for entire sets to be moved about the stages.

The three rehearsal halls, above the studios, rank among the largest television studios now in use, being 4,550 square feet each. Star dressing rooms are available, as are a press room, a "green room" for actors, and a lounge for all employees.

In the 35,000 square feet of office space now in preparation there will be story conference rooms and other facilities for the writers, directors and producers. Within steps of the giant studios are the dressing rooms.

The world's largest stage-lighting control installation—and the only all-electronic system—will illuminate the CBS studios in Television City.

Known as the C-I system, the installation, which promises to revolutionize lighting effects in television, is named for Century Lighting, Inc., which built the system, and George C. Izenour, the inventor. A result of nine years' research by George C. Izenour, Associate Professor of Electro-mechanical techniques at the Yale School of Drama, the C-I system can control five and a half million watts and achieve the gradual, almost imperceptible, effect of a brilliant sunset. It extends "the ten human fingers many, many times," Mr. Izenour says, and its "Memory Board" enables the operator to remain at least ten light cues ahead of the performance at all times.

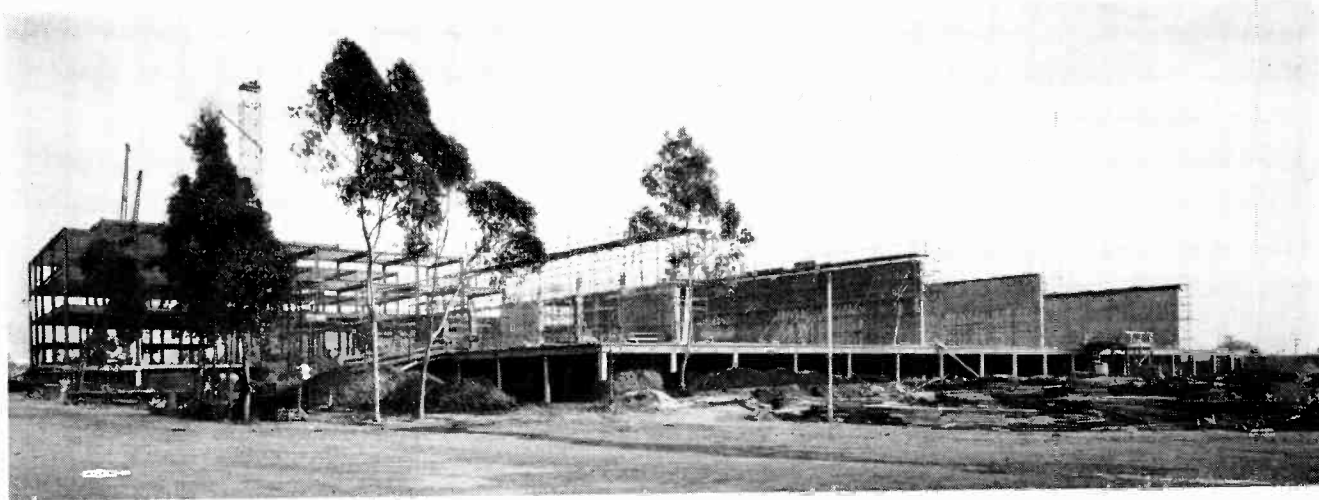
#### ELIMINATES HIT-AND-MISS

"It eliminates the hit and miss method of light cueing," the inventor says "and makes possible a system of light-cue notation equivalent to that of music cues in radio."

The installation in CBS Television City will be the first use of the C-I system in Television.

"The C-I electronic control system," according to Jo Mielzinger, noted stage designer, "is, in my opinion, the most important single development that has been made in the theater during the past 25 years."

In describing his new theory of lighting, Mr. Izenour said that "things are only what they seem. Television needed a system to make lighting as flexible as the



Construction on the initial unit of Television City is well under way. The walls of the huge production stages are to the right.



camera, to point up action and assist the artist in what he will express. A change of direction of illumination, a gradual dimming effect, instantaneous editing—all these are provided by the C-1 system and moreover the effects can be repeated as many times as wanted.”

This innovation and the others mentioned are only a few of the intriguing facilities with which IBEW engineers at Television City will work.

“The entire facility of the initial unit is really an experimental workshop,” Pereira said, “and we intend in the future, as the plant expands, to relocate many facilities. For example, the central technical area, which contains master control, recording, telecine equipment and film storage, will have to expand with it. The

scenery and prop areas also expand in direct proportion to the studios. This will be a very simple method for never getting ahead of ourselves with more studios than we have storage space and technical facilities to support.”

Actual construction of the initial unit of Television City began December 29, 1950. The first 15-acre unit, now under way may eventually be doubled in size, and the four-story administration building may be raised to the Los Angeles height limit of 13 stories. When completed, CBS Television City will cover 25 acres, and the 13-story administration building will offer 600,000 square feet of working space.

When this is done, CBS may well tag its new Hollywood TV home “the world’s first television city.”

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## Spring Comes to the Television Channels

FCC Action, April 14, Ends 43-Month-Old Television Freeze,  
Replaces It With Two and One-Half Month “Waiting Period”

**T**HE big news in broadcasting last month. . . and the big news still. . . is the lifting of the 43-month-old television freeze by the FCC.

On April 14 the Federal control agency released its thick and detailed “Sixth Report and Order,” establishing a national television policy for the United States and for several communities across the Canadian and Mexican borders.

The new allocations, providing over 2,000 stations in nearly 1300 communities, came by a divided FCC vote, with four of the seven commissioners giving it unqualified endorsement and three still worried. Comr. Robert F. Jones bitterly dissented on all counts, and Comr. Frieda B. Hennock, victorious in her demands for educational reservations, concurring in part and dissenting in part. The seventh commissioner—Robert T. Bartley, new member of the group—did not participate in the final vote.

The momentous report does not become effective until July 1, but already it has set off a mad scramble for land, construction equipment, and the like, such as has never been seen before in broadcasting. Biggest scramble is among the schools and colleges which find themselves quite eligible for television facilities, re-

gardless of many commercial channels nearby.

Until July 1 there is a busy “waiting period” during which applications can be perfected.

Cities with no TV service will be processed first. In the report the Commission establishes a zone system with varying spacings between stations to fit engineering or geographical conditions.

On July 1, the processing actually resumed. There will be some grants—where channels are uncontested—but most applications will go to hearing. The current station population of 108 will not increase by more than a couple of dozen this year.

The FCC provided no additional channels to such major “trouble” areas as Boston, Chicago, Philadelphia, San Francisco, and Pittsburgh. It did, however, provide additional VHF channels in 21 cities. This was partly offset, however, by the deletion of one VHF channel each in 15 cities. Most of these losses were in the Gulf Coast region, where wide separations are specified because of interference factors.

The facts and figures from the report are as follows:

- There are 2,053 channel assignments to 1,291 communities.

- This includes 51 assignments to 17 cities in the territories of Alaska, Hawaii, etc.

- Of the total, 617 are VHF and 1,436 are UHF.

- All assignments to cities in the territories were VHF.

- There were 242 non-commercial, educational reservations made in as many cities, including nine to territories.

- Of these 242 reserved channels, 80 are VHF frequencies.

- Maximum power assignments are 100 kw for Channels 2-6, 316 kw for Channels 7-13, 1,000 kw for Channels 14-83. Minimum power for all stations is one kw.

- Maximum antenna height permitted with maximum power is 2,000 feet above average terrain, except in FCC’s Zone I (the northern part of the country to the Mississippi River) where VHF antenna maximum is limited to 1,000 feet.

- Only 30 of the existing 108 U. S. stations are required to change frequencies.

- A plan to reserve 18 UHF channels for future assignment on request was abandoned. Instead, some of the so-called flexibility channels were used to add UHF frequencies to some cities.

# OPERATOR PAY Should Come of Age, TOO!

by O. E. Johnson, International Representative, 5th Vice Presidential District

**H**AVING succeeded in persuading the FCC to adopt an amendment to its rules permitting broadcast stations to use other than first class licensed operators for periods up to 120 days *where first class licensed men were not available*, the faction in the NARTB which promoted the above is now encouraged to go further. They now aim to induce the Commission to eliminate licensed technician requirements for certain types of stations entirely!

Let's analyze the facts, stripped of the high sounding but meaningless generalities with which the advocates of this measure strive to cloak their real aims. For years broadcasters have enjoyed the unique position of being able to employ technicians at grocery clerks' wages. This precedent was established when the industry was pioneering and the young men interested in broadcasting were often attracted by the "glamor and fascination" and the local prestige they achieved by being connected with the local broadcast station. Pay was a minor consideration. However, the industry has grown up and come of age just as the young men who worked in it. The glamor is gone. Decent living wages and future security are now the paramount factors with the employees.

## MAINTAINING 'LAISSEZ FAIRE'

Some progressive broadcasters, recognizing that broadcast technicians' pay scale was sub-standard compared with that of the same class of workers in other fields, have tried to correct this inequity in recent years. In other stations employees have organized and thus obtained better conditions of employment. In yet other stations management still goes on hiring technicians at anywhere from \$35 to \$50 a week, complacently dreaming of maintaining "laissez faire" This is the faction that is foremost in the ranks of those who would like to per-



'Some would like to hire part-time high school boys . . .'

"With the smoke screen removed, this is the true picture of what is really behind the movement to have the FCC change requirements with regard to licensed personnel. . . . In promoting this movement only vague claims are made . . . with no specific facts offered in support."

suade the Commission to strike our licensing requirements with their true objective solely that they may hire cheap labor. Some would like to hire part-time high school boys whose enthusiasm for radio might make them unconcerned as to the pay involved—if any. Others would hope to arrange for one-man operation with some lowly paid announcer handling everything from the disc spinning to transmitter operation. Their publicly avowed claim is that easing the licensed operator requirement will enable them "better to

serve the public" and make for "efficiency and improvement in operation." By striking coincidence, those who make these claims most loudly run stations that are foremost in the percentage of time devoted to platter programs with a rate of one spot announcement per minute during the program. Is this "serving the public"? Is it even fair to the advertisers? And just how will freedom on the part of the management to hire unskilled school-boys for pocket money instead of licensed technicians improve these conditions or have any benefit whatsoever to the public? Bluntly the only benefit will be to the profit side of the ledger of the respective station owners.

With the smoke screen removed, this, then, is the true picture of what is really behind the movement to have the FCC change the requirements with regard to licensed personnel. In promoting this movement only the vague claims are made that it will be of benefit to the stations *and the public*—only broad and too general claims with no specific facts offered in support.

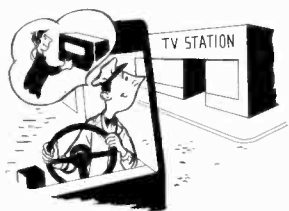
## LOWER WAGES WON'T HELP

Let's consider another of their claims, namely, that the smaller stations must be relieved of the financial hardship with which the present licensed technician requirement "burdens" them. Many of these stations are now paying a top of \$50 a week. How much cheaper do they expect to hire labor? Is it perhaps the knowledge that they cannot continue much longer to obtain men at such rates that makes them eager supporters of this proposed change in the rules. There is a cynical old saying that "a business which can't afford to pay a living wage to its workers had better fold away." This advice

is most apt in the broadcast field. Channels have long been overcrowded and the FCC is still troubled with a huge backlog of applications. In most cities and larger towns there exists a surfeit of broadcasting stations competing for every advertising dollar and inflicting their blatant spot advertisements of patent medicines and credit clothing interspersed with short snatches of juke organ type "music" upon the suffering public. Sampling of public opinion—at least in this southeastern section of the country—indicates that Mister and Missus John Q Public are in general agreed that two or three of the better class stations in their town would be preferable to the half a dozen now cluttering their receiver dials. Many do not even know the dial settings for some of their local stations.

#### FIELD IS LUCRATIVE

Despite the obvious oversupply of broadcast stations, all evidence indicates that it must be a lucrative field for the fortunate ones whom the FCC has seen fit to grant a station license. Legally an FCC broadcast station



'There are broadcast licensed technicians working on laundry trucks . . .'

license or C. P. cannot be rated of monetary value. Yet every license issued today represents an investment of many thousands of dollars in attorney and radio consultant fees. Why

then do experienced broadcasters—all hardheaded business men—so willingly gamble almost as much, and in some instances more than the physical broadcast plant will cost, just to obtain the C. P.?

Let us now take up another of the fallacious arguments put forth by the advocates of cheap, unlicensed personnel for broadcast stations. The NARTB's petition to the FCC labels the first class licensed operator requirement as "obsolete and unnecessary." They claim improvements in modern station equipment make anyone capable of operating it, as it is foolproof. Apparently the FCC's engineering staff have not heretofore shared this view nor based their actions thereon. On the contrary, from year to year they have stiffened the technicians' license examination to keep in step with the increasing intricacy and complexity of broadcast plants as the art has developed.

#### CANNOT JUDGE ABILITY

It would appear to us that any sincere station owner, interested in obtaining the best qualified personnel rather than the cheapest, would welcome the licensing feature as a valuable aid to him. In most cases these station owners or their managers are strictly business men without technical knowledge. In hiring technicians it would be difficult for them to judge an applicant's technical knowledge and ability. Possession of the

license at least assures the prospective employer that the applicant has the minimum knowledge deemed necessary by the FCC.

Referring again to the amendment to the rules already granted the broadcasters to permit stations to use other than first class

licensed operators for period up to 120 days where first class operators were not available. The only complaint we have against this ruling is that the FCC relied too strongly upon the integrity of station management and failed to include any safeguards against abuse of the privilege. In our constant travels throughout this southeastern section we have found a number of flagrant misuses of this privilege which we are preparing to bring to the attention of the Commission. In some cases these station owners have persuaded the Commission to grant renewals of their 120 day dispensation three times successively for a total of one year! At the same time we know of qualified first class licensed operators personally known to us who have applied for employment with these stations. To evade hiring these men the management have deliberately discouraged the applicant by offering impossibly low wages or part-time employment knowing that the men could not accept such terms.

#### SIMPLE REASON FOR LACK

##### LICENSED BROADCAST MEN ARE AVAILABLE.

Let us not be misled by the claims of some station owners to the contrary. Working with and for broadcast technicians constantly, we are in a position to know the facts. Defense industries and the desperate need for ship operators has not absorbed as many broadcast licensed men as some factions would have you believe. We do know, however, there are broadcast licensed technicians working on laundry trucks and as bus drivers and other non-radio work for the simple reason that they cannot support their families on the wages offered by the local broadcast stations. If these station owners would put aside their reluctance to pay living wage scales on a par with comparable industries, many men would be attracted back to radio broadcasting.

Broadcasting has come of age. It is "big business" and nobody's step-child. Its sales and promotion staff make good salaries, so do its managerial personnel and even the owners have their headaches over their income tax—why then must technicians be employed at grocer clerks pay—or less? After all it must be quite apparent to anyone and the Commission will not be misled from understanding that this movement to abolish licensed personnel from some stations is only a thinly veiled effort to perpetuate the shamefully low wage standards that have so long prevailed at so many stations.



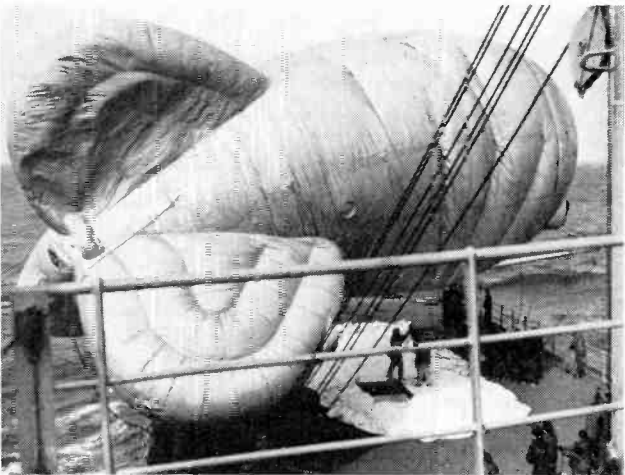
'How much cheaper do they expect to hire labor? . . .'



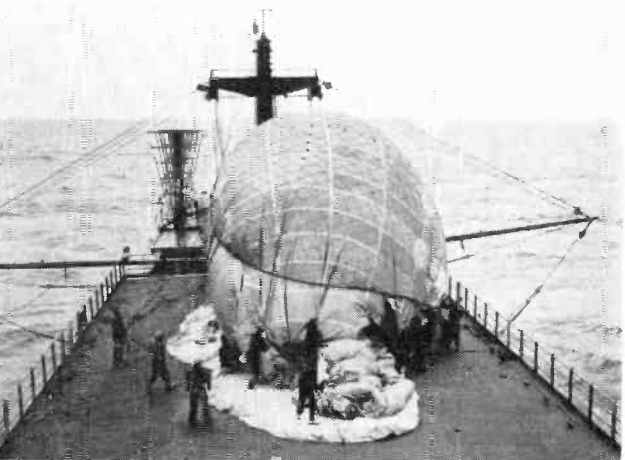
## Balloon Supports 'Voice of America' Antenna



Almost 900 feet above its moorings, the balloon floats.



Inflated with helium, the big bag spans the "Courier."



Busy crew members hold down the inflating balloon with a net. (Note the inverted pyramid antenna in the rear.)

**T**HE US Coast Guard cutter *Courier* set out to sea a few weeks ago amid much fanfare and many bon voyages. Its noble purpose was to get past the jamming radio signals of Soviet broadcasting stations and bring the "Voice of America" to the Reds' vast captive audience.

Heretofore, the Voice had been stymied time and again with its landbased signals toward the Iron Curtain. Powerful Soviet jammers, cut out the American programs.

Then the State Department hit upon the idea of a floating transmitter, changing its position often enough to prevent jamming, but conforming to all international agreements regarding broadcasting power and sites.

The *Courier* was fitted out with the latest transmitting equipment and manned by U. S. Coast Guard personnel. It carries a crew of nine officers and 80 men, plus several "Voice of America" engineers to supervise operation of the transmitting equipment.

Production studios are still land-based in the United States. The *Courier* pulls into a foreign port, runs up its captive balloon antenna, warms up its transmitting equipment, and begins picking up and beaming Voice broadcasts toward Russia and the Soviet satellites.

To send up the balloon, crew members first unfold a white canvas sheet over a flight deck, where the balloon is to be inflated, and then they begin carefully unfolding the balloon. All men on this detail wear tennis shoes to prevent damage to the fabric.

Next step is inflating the big bag with helium gas. In the helium storage compartment below decks helium cylinders are attached to an inflation hose, and an ensign times the flow of gas from each cylinder. It takes 20 seconds to empty one cylinder and 100 cylinders in all.

A net has been spread above the deflated balloon, with sandbags attached to its edges. In this way the balloon is controlled as it is being filled.

When the balloon begins to take shape Coast Guardsmen gradually remove the restraining net. The fins are not yet inflated, as they will automatically fill with air as the balloon rises, through a wind tunnel which runs the length of the balloon from the nose to the fins.

The antenna wire has been attached, and the balloon is now ready to go aloft. The Coast Guardsmen control the ascension with guide lines until the big bag has cleared the superstructure of the ship. The balloon is 69 feet by 35 feet and is tough to handle on a windy day.

It will be held captive by means of a winch-operated line which runs down through a hatch opening on the flight deck to a powerful winch, which spools the line in and out. As the winch pays out the line, the balloon rises about 900 feet above the ship carrying a medium frequency range antenna.

# Gremlins in the Coaxial Cable

Federal Agency Scientists 'Run Test Cables Through The Wringer' to Eliminate the Cause of Noise Signals

**A**NY broadcasting engineer who has ever stretched cable over the side of a football stadium, above and out of a boxing arena, or across a theater stage crowded with children, has at some time wondered how much punishment this cable will take. And the master control engineer frequently suspects that the poor pick-up at the console is caused by a technician skipping rope with the mike lead or a child chewing heartily on a cable stretched across the floor.

Under such conditions a standard microphone or phonograph pick-up cable gives noise signals as high as 500 millivolts peak to peak, laboratory tests have shown.

How can these gremlins in the coaxial be eliminated?

The Department of Defense, the Atomic Energy Commission, and the National Bureau of Standards recently united their efforts to find out.

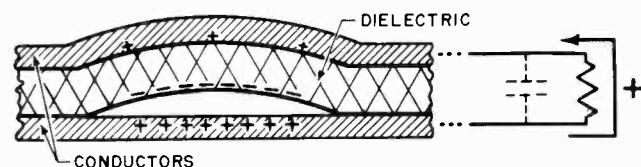
As a result, a Bureau of Standards scientist, Dr. T. A. Perls, has come up with an instrument cable "free of spurious electrical signals due to mechanical shock and vibration."

Before this cable was developed, the NBS lab men put standard cables through the mill, so to speak. Test cables were connected between a small piezoelectric accelerometer and a cathode follower, and the output of the cathode follower recorded through a d-c amplifier on a direct-inking oscillograph.

Then the lab men grabbed short sections of cable and twisted it and bent it as though they were determined to pull it apart. All the while, they were careful that no strains or motion were transmitted to the accelerometer itself. They didn't want to play pop-the-whip with the test-recording box.

Then for another test, they took a pair of pliers and began alternately compressing and releasing short sections of the cable.

They reproduced almost every kind of vibration or mechanical punishment a cable can take to see how

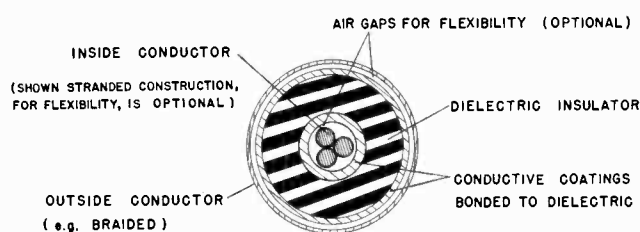


Schematic diagram showing how a noise current is produced in a coaxial cable by the relative motion of the conductors and the dielectric. When a temporary separation occurs between a small region on the surface of the dielectric and either conductor, a separation of charge takes place, resulting in a surface charge on the dielectric and an opposite "bound" charge on the conductor.

the noise gremlins got under the braid and the rubber insulation.

Soon after tests began, the experimenters found that noise signals were definitely lowered (to about 60 mv peak to peak) by tightening the braided shield over the dielectric insulation, thus improving the contact between the dielectric and the shield.

A colloidal suspension of graphite in benzene was then applied, first to the outside of the dielectric only and then to the inside of the dielectric only. While no further reduction in noise was obtained by coating the outside only, the cable signal due to mechanical flexing was reduced quite a bit by the inside coating, provided the shield remained tight over the dielectric. The residual noise was reduced to less than 3 mv peak to peak. By coating both inside and outside with the graphite suspension, the noise was almost completely eliminated.



Cross section of the newly-developed noise-free coaxial cable. An insulating overall protective jacket is optional and does not require a conductive coating. This cable will soon be on the market.

The researchers concluded that the noise signals were due to currents set up in the cable when static charges are separated at the surfaces of the dielectric. To free the cable of these unwanted signals, it is only necessary that the inside and outside surfaces of the dielectric be entirely covered by a well-bonded conductive coating.

With this conclusion reached, the Bureau listed several types of conductive paints, suspensions of graphite, and conductive rubbers that might be used for the conductive coating and which are available commercially. Several patents have been issued on methods of bonding such coatings to a cable insulator. And the new noise-free cable can soon be commercially produced.

Its value will be great in scientific work, where close, accurate measurements must be taken. Atomic energy research should find it particularly valuable. But the cable will prove useful to the broadcasting industry too—taking one more kink out of the line between radio and TV production and the ever restless audience.

# TECHNICAL NOTES

## MORE R VALUES FOR PADS

The table of R values for pads as published in the April issue brought some friendly criticism: "Good, but not enough—How do we find the R values for pads in a line other than 600 ohms?"

The point is well taken. For those of you who want to do it the hard way there are formulas:

$$\left. \begin{array}{l} R_1 \text{ equals } Z \tanh o/2 \\ R_2 \text{ equals } Z / \sinh o \end{array} \right\} \begin{array}{l} \text{Symmetrical T and H} \\ \text{Pads} \end{array}$$

Where: Z equals terminal impedance in ohms  
o equals attenuation in decibels multiplies by 0.1151

R<sub>1</sub> equals series arm resistance in ohms

R<sub>2</sub> equals shunt arm resistance in ohms.

I can hear the screams now: "What in heck is tanh and sinh?" They are the hyperbolic tangents and sines and can be found in Hyperbolic sine tables in Engineering Handbooks: for example pages 632 to 634 of the third edition of F.T.&R. Engineering Handbook.

If this method of solution is too time consuming, then the problem can be met by simple arithmetic.

All the attenuator values of resistance given in the April notes were computed for 600 ohm circuits. Attenuator values for other like impedances can be figured out very easily from the values given by multiplying all the resistances by the ratio of the desired impedance to six hundred ohms.

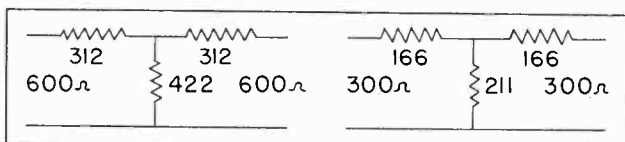
For example: The table as published in the April issue, (Or the pages of them in the Daven and other manufacturer's catalogs) show that a symmetrical T pad for 10 DB attenuation at 600 ohms should have 312 ohms in the series arms and 422 ohms for the shunt arm. If it was desired to make a similar pad having a 10 DB attenuation for a 300 ohm line, the values would be found as follows:

Ratio:

$$300/600 \text{ equals } .5$$

$$R_1 \text{ equals } 312 \times .5 \text{ equals } 166 \text{ ohms}$$

$$R_2 \text{ equals } 422 \times .5 \text{ equals } 211 \text{ ohms}$$

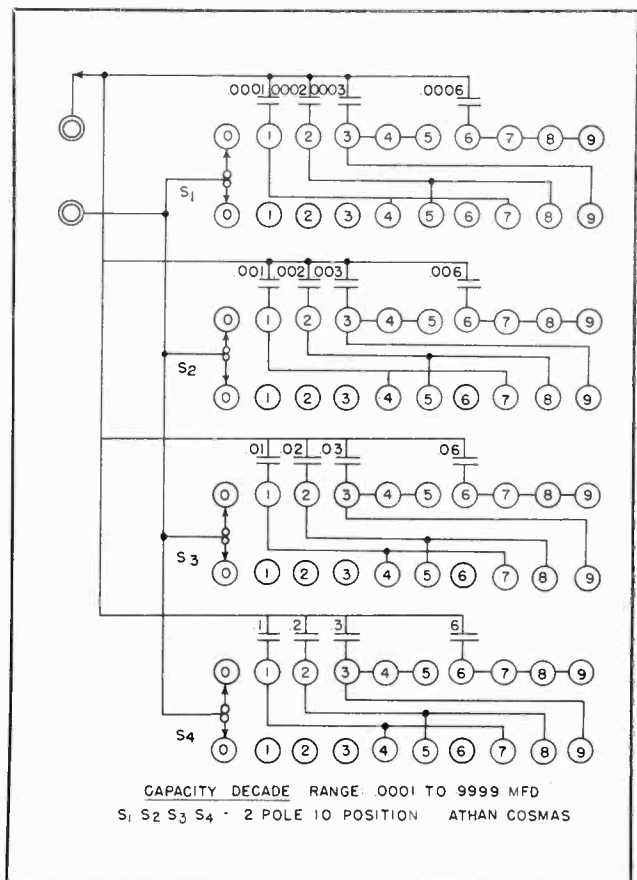


According to one authority a discrepancy of five per cent in any one resistance will cause an impedance mismatch of not more than that amount and a loss variation of only a half of a DB.

Before some good brother asks for a simple solution for pads to be used where the impedances do not match—I refer him to the many good texts on the subject. I'll name two; there are more: F. T. & R. Reference Data for Radio Engineers; Academy of Motion Picture Arts and Sciences: Motion Picture Sound Engineering.

—ATHAN COSMAS, Vice President, Local Union 1212.

## A CAPACITY DECADE



A capacity decade is a useful device for the rapid selection of values in the empirical design of filters, equalizers, amplifier response experiments, etc.

By means of a number of two-deck ten-position switches and four condensers per switch, it is easily possible to assemble a wide range instrument. The diagram shows one with a minimum value of .0001 mfd to a maximum of .9999 mfd.

The accuracy of the instrument will depend upon the care used in selecting the various condensers. If they are "bridge-selected" on the minus side, padded with appropriate trimmers, a very high degree of accuracy can be achieved.

—ATHAN COSMAS, Vice President, Local Union 1212.



## Now They Claim Television

It was only a matter of time, and last month it happened. The Soviet newspaper, *Trud*, claims that the Soviet Union is the birthplace of television and that Soviet television standards are the world's highest.

The Soviet official trade union organ said the radius of Russian television broadcasts from Moscow was more than 62 miles, while the capitalistic American television had a radius of only about 50 miles. The Moscow TV studio was broadcasting 625 lines compared with America's 525 lines, the newspaper added.

Moscow's television center specializes in programs of concerts and plays direct from the theater, *Trud* said. The station carries programs three or four hours daily, six days a week.

Other press reports said 60,000 TV sets now were in use in Moscow alone. The newspaper said 35,000 of these sets have been acquired in the past year.

## Brush Up on Your Geometry

Will you shine in your engineering job?

You stand a better chance if you're good at solving geometry problems, declares Dr. E. F. W. Alexanderson, General Electric radio and television pioneer. Algebra's routine stuff, he says, but geometry really takes imagination.

## Bumper Crop of Receivers

During the past five years American manufacturers have produced almost enough radio receivers for every other citizen to have his own set. Between 1947 and 1951, the manufacturers produced 75,117,262 radio receivers.

Meanwhile, they were producing 17,002,169 television sets.

Some of the radio set production was for the export trade, and an increasing amount of auto radios are being manufactured. Home sets, however, are dropping constantly.

## 'Shop Talk' Needed

TECHNICAL NOTES is intended as a section of "shop talk" by and for the readers of THE TECHNICIAN-ENGINEER. It is open to your diagrams and your own solutions to engineering problems. In recent issues the editors have used items of general interest, but they are anxious that you take over. Send us your own technical articles. Share your solutions and ideas with brother engineers. The mailing address for manuscripts and illustrations: THE TECHNICIAN-ENGINEER, IBEW Building, 1200 Fifteenth Street, N. W., Washington 5, D. C.

## One Moment Please . . .



Back in the late 20's the CBS studios in New York City were just about ready to go on the air with their regular broadcast for the Wana-maker Store when the announcer discovered that no announce mike was available. There was a mad scramble. The musicians were ready. The engineer was signaling. The only mikes were two "pick-ups" 20 feet from the floor. . . . A ladder was rushed in; the announcer scampered up; and, teetering on the rungs, he began his spiel . . . just one moment late.

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

## Film Editing Via Camera Control

A new and automatic camera control system which can control eight motion picture cameras at once, so that one technician can start and stop all of them from one control room, has been announced by Filmcraft Productions, Hollywood. Isidore Lindenbaum, president, has revealed that the new system can reduce cutting time from five days to one day. He estimates that editing and synchronizing time can be cut as much as 80 per cent. The patented system, invented and developed by Ferenz Fodor, has completed eight weeks of tests.

# Station Breaks



## Open House for Engineers at WRFD

A bumper crop of shows, prizes, tours, and festivities highlighted an open house staged by AM Station WRFD, Worthington, Ohio, recently. Members of IBEW Local 1300 joined the station administrative staff in a week-long welcoming of hundreds of Ohio visitors.

Rural Ohio came from all the state's 88 counties for the dedication ceremonies, it was reported. A total of 18,471 Ohioans was tabulated.

The new WRFD studios are located on 260-acre Radio Farm at Powell Road on Route 23 in Delaware County. The building has the appearance of an aristocratic farm home—a high-ceilinged porch running the length of the building, tall columns, chimneys at each end. The antenna tower is directly behind the building.

Herbert E. Evans, vice president and general manager of the Peoples Broadcasting Corp., station's owner and operator, dedicated WRFD at the opening day ceremonies. Murray D. Lincoln, president of the firm and of Farm Bureau Insurance companies, Columbus, spoke on the occasion.

## More TV Network Cities Soon

AT and T has announced that microwave facilities will reach eight more cities by July 1, bringing the network shows to Miami, Houston, New Orleans, Dallas, Fort Worth, Oklahoma City, San Antonio, and Tulsa. This new interconnected service is good news, not only to TV network sponsors and the growing TV audience, but also broadcast engineers in the many cities awaiting commitments. Only one channel will be available to each of the eight new cities until permanent installations are made later in the year.

## CBS Charity Donation Announced

CBS has donated offices in recently leased Earl Carroll Theatre, Hollywood, to Radio-Television-Recording Charities, Inc.

## Directional Antenna for KRON-TV

FCC has authorized a directional antenna for KRON-TV, San Francisco, to concentrate the station's signal in the densely populated area, rather than dissipating it over the ocean. Local 202 was certified by NLRB as bargaining agent for the station, March 6.

## Latest in Studio Insulation

A Hollywood columnist reports the following: In a recent conversation with newsmen, Charles Luckman, the ex-fair-haired boy of Lever Bros., was explaining the plans which he and William L. Pereira did for the new CBS Television City.

"The new studios will be insulated against the noise of jet aircraft," Luckman said with an air of authority.

Insulating against the sounds of jet aircraft is no different from insulating against other noises, of course, but it sounded more up to date.

## Saddle Up Ma Camera, Boy!

IBEW engineers at CBS may soon be riding herd on a weekly rodeo show, if auditions now underway by Columbia pass the test. CBS-TV has announced plans for a weekly hour-long telecast of its own rodeo featuring top talent, if kinescopes being filmed in California pan out.

## TV Fight Fans Can Take Heart

If testimony in a recent FCC hearing is any indication, "captive" theater-TV sports events are on the way out, and once again home TV viewers will be able to see boxing fests such as the Robinson-Turpin return bout, which several theater owners once denied them.

In FCC hearings regarding the Paramount Theater chain, David Wallerstein, vice president and general manager of a United Paramount subsidiary, testified that the theater owners involved suffered consistent theater-TV losses. Of 20 events booked in any of the subsidiary's five-TV-equipped theaters during 1949-51, only one showed profit in two or three theaters carrying it—the Robinson-Turpin fight.

IN GIVING CREDIT for the story on Toledo, Ohio, stations in the April issue, we didn't acknowledge the valuable aid given by Harry Prue, Ass't. Bus. Mgr. of Local 1215. Many thanks, Brother Prue.

**The Technician-Engineer**