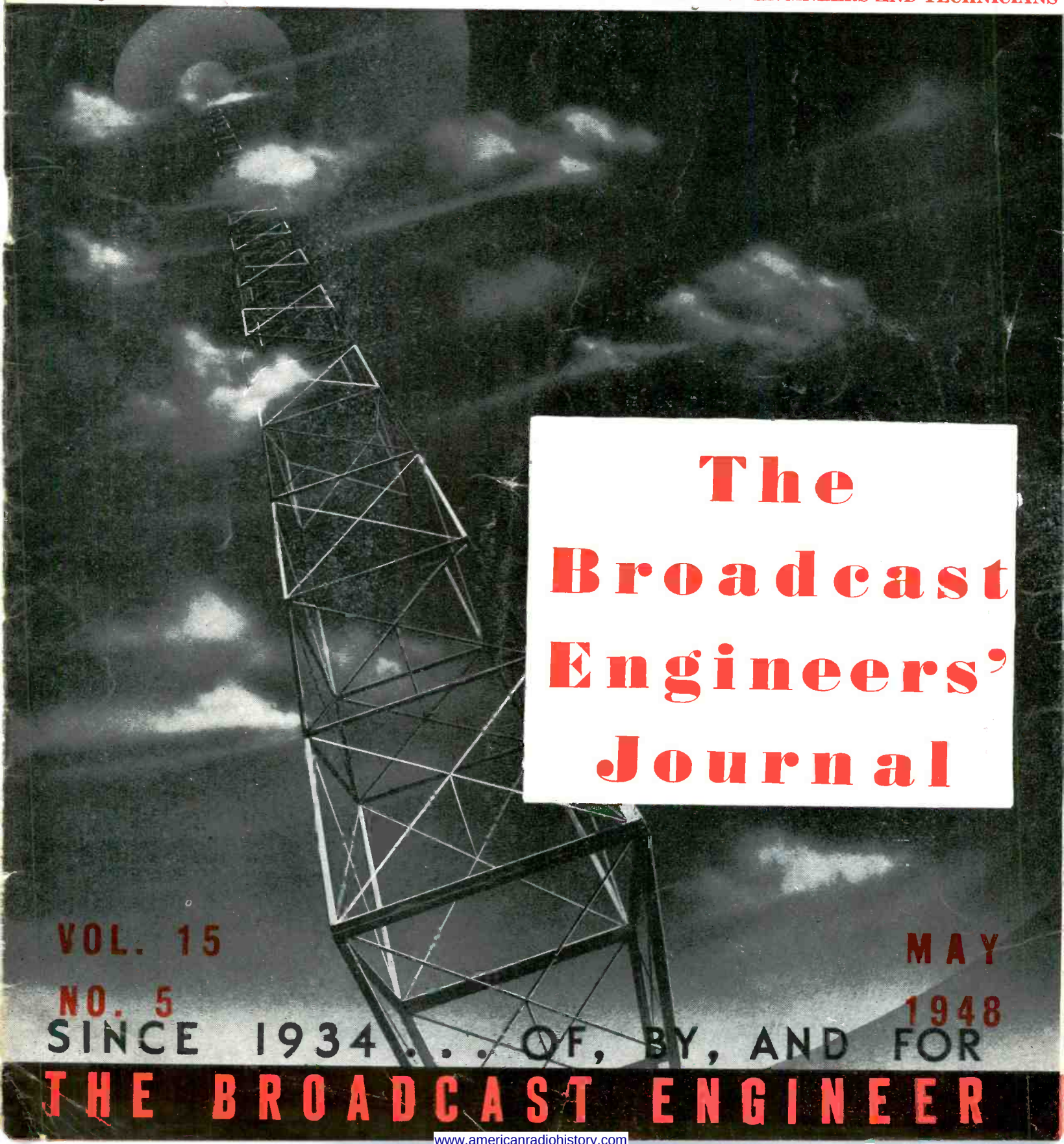
THE BROADCAST ENGINEERS' JOURNAL
Ed. Stolzenberger, Editor
116-63 91st Avenue Richmond Hill 18, N. Y.

Postmaster: If undeliverable for any reason, notify sender, stating reason, on form 3547, postage for which is guaranteed.

F A GENRES WGBF-WEOA
2232 E POWELL
EVANSVILLE 14 IND
5151

Sec. 562, P. L. & R.
U. S. POSTAGE
PAID
New York, N. Y.
Permit No. 2961

OFFICIAL PUBLICATION OF THE NATIONAL ASSOCIATION OF BROADCAST ENGINEERS AND TECHNICIANS



The Broadcast Engineers' Journal

VOL. 15
NO. 5
MAY
1948

SINCE 1934 . . . OF, BY, AND FOR

THE BROADCAST ENGINEER

THE BROADCAST ENGINEERS' JOURNAL

Ed. Stolzenberger — Editor and Business Mgr.

Editorial, Advertising and Circulation Offices:
116-03 91st Avenue, Richmond Hill 18, N. Y.
Telephone: VIrginia 9-5553

Volume 15, No. 5 — May, 1948

TABLE OF CONTENTS

The Broadcast Engineers' Journal is a privately printed monthly publication issued by NABET Publications. Address all communications to Publication office: E. Stolzenberger, 116-03 91st Avenue, Richmond Hill 18, L. I., N. Y. Telephone VIrginia 9-5553.

Advertising rates and information supplied on request. Subscription, $2.50 per year; $4.00 for two years. Single copies, except Christmas Yearbook, 35c; Christmas Yearbook, $1.00. All remittances in advance Foreign: add postage. Back copies 50c, back Yearbooks, $2.00.

NATIONAL N.A.B.E.T. OFFICE
Room 501, 66 Court Street, Brooklyn 2, N. Y.
H. E. Hiller, Executive Secretary — MAin 4-2855

Attention Broadcast Engineers!

National Association of Broadcast Engineers and Technicians

The only Union that is 100% Of, By and For the BROADCAST ENGINEER

- NABET is a dignified union *worthy* of your support.
- NABET is an *effective* union, Of, By, and For the Broadcast Engineer *exclusively*, operated upon and dedicated to the principle that every member has a *right* to know what is going on in the union's "front office."
- NABET is controlled by its *members*: they have the right to vote on all matters of union policy. As a NABET member, you would have the *right* to Okay any action which your President might take.

Contact any of the following officers for further information:

J. R. McDonnell, Pres.
375 O'Farrell St.
San Francisco 2, Calif.
Ordway 3-8484

H. E. Hiller, Executive Secy.

C. L. Gorsuch, Nat'l Rep.
66 Court St., Room 501
Brooklyn 2, N. Y.
MAin 4-2855

Arthur Hjorth, Vice-Pres.
Geo. Maher, National Rep.
80E. Jackson Blvd. Rm. 543
Chicago 4, Ill.

Chapter Chairmen

Baltimore:
John W. Lappe
804 Register Avenue
Baltimore 12, Md.

Boston:
Elmer M. Lantz
Concord Road
S. Lincoln, Mass.

Chicago:
Arthur Hjorth, Vice Pres.
404 W. Evergreen ,Apt. 51
Chicago 10, Ill.

Cleveland:
Harold V. Brandt
19 Elm St.
Brecksville, Ohio

Detroit:
Roger K. Ellis
820 University Pl.
Detroit 30, Mich.

Dixie:
J. Willard Dean
217 E. North St.
Raleigh, N. C.

Engineering:
Wm. L. States
92-05 Whitney Ave.
Elmhurst, N. Y.

Hollywood:
James H. Brown
6000 Sunset Blvd., Room 105
Hollywood 28, Calif.

Hudson:
Eugene Clark
17 Poplar St.
Ridgefield Park, N. J.

Mohawk:
Donald P. Morey
3 Circle Lane, Apt. 26-A
Albany 3, N. Y.

New York:
Clarence Westover
1 Charles St.
Oceanside, N. Y.

Omaha:
D. Roy Glanton
5500 Kansas Ave., Rt. 2
Omaha 12, Neb.

Philadelphia:
Walter S. Gilbert
Smith and Oak Streets
N. Wales, Pa.

Pittsburgh:
O. C. Beitel
118 Prospect St.
Avalon, Pgh. 2, Pa.

Rochester:
Edward Lynch
109 Wolcott Ave.
Rochester 11, N. Y.

Rocky Mountain:
George Poogue
2389 Birch St.
Denver 7, Colo.

San Francisco:
R. C. Butler
4433 Montgomery St.
Oakland 11, Calif.

St. Lawrence:
David H. Lane
119 Maple St.
Black River, N. Y.

Syracuse:
Donald Muir
1200 W. Colvin St.
Syracuse 7, N. Y.

Washington:
John H. Hogan
9312 Sudbury Rd.
Silver Spring, Md.

Section Chairmen

Atlanta:
Broughton W. Benning
2715 Stewart Ave.
Atlanta, Ga.

Connecticut Valley:
George R. Townsend
44 Lakeside St.
Springfield 9, Mass.

Fairmont:
Thomas Moore
209 1-2 Watson Ave.
Fairmont, W. Va.

Louisville:
Kermit B. Smith
1211 S. 6th St.
Louisville, Ky.

Richmond:
M. J. Dowd
1918 Grove Ave.
Richmond, Va.

A Message to the Members of NABET

from

JOHN R. McDONNELL
President, NABET

A survey of the broadcasting and television industry would indicate that the next few years will be very full ones—particularly in the fields covered by NABET jurisdiction. We will be well advised to increase the scope and intensity of our efforts in behalf of the Union and on the job in the industry.

In this latter connection it is interesting to note a statement in a recent New York Chapter *News Letter*, ". . . in the future, we will have to take upon ourselves the responsibility for a higher job performance." This statement applies to a greater or lesser degree to every member of the Union. If we are to continue to improve the conditions of our various contracts with management, we must—in the fact of the increased difficulty—and hazards—involved in contract negotiations—be sure that our standards of performance on the job are as high as it is possible to attain. This is the primary responsibility of the individual NABET member.

While enroute to the Coast, I had the pleasure of meeting with the Cleveland and Detroit Chapters and the Chicago Council. I was impressed in each instance with the activity and interest in NABET. New stations are joining our ranks and progressive steps are being taken to insure our representation in the field of Television. Local and National problems were discussed, and an opportunity was provided for us all to get acquainted. I wish to take this opportunity to express my appreciation to the three Chapters for the cordial hospitality and cooperation extended to me.

Sincerely,

(Signed) J. R. McDONNELL,
President

Heading Cuts for Chapter news columns. Chapters without regular heading cuts and desiring same, should send in photo, cartoon, or drawing of subject matter that they wish used to identify and distinguish their column.

P. T. Barnum Is Alleged to Have Made This Wise Observation:

If You Don't Advertise Your Business, the Sheriff Will

We Are Confident in the Future, Are You?

FOR ADVERTISING RATES AND DATA

Write: THE BROADCAST ENGINEERS' JOURNAL

116-03 91st Avenue Richmond Hill 18, N. Y.

SPACE DIVERSITY RECEPTION AT SUPER-HIGH FREQUENCIES*

By G. H. HUBER
Transmission Dep't—Bell Telephone Laboratories

In radio transmission, interference between waves traveling different paths often results in a continually shifting pattern of areas of good and poor reception. At any one receiving position, waves traveling two or more of these paths may add in phase to produce good reception, or they may add in various degrees out of phase to produce varying degrees of poor reception. Continually changing transmission over the various paths causes the space pattern of reception to shift. At any one point there may be good reception at one time and poor reception some time later.

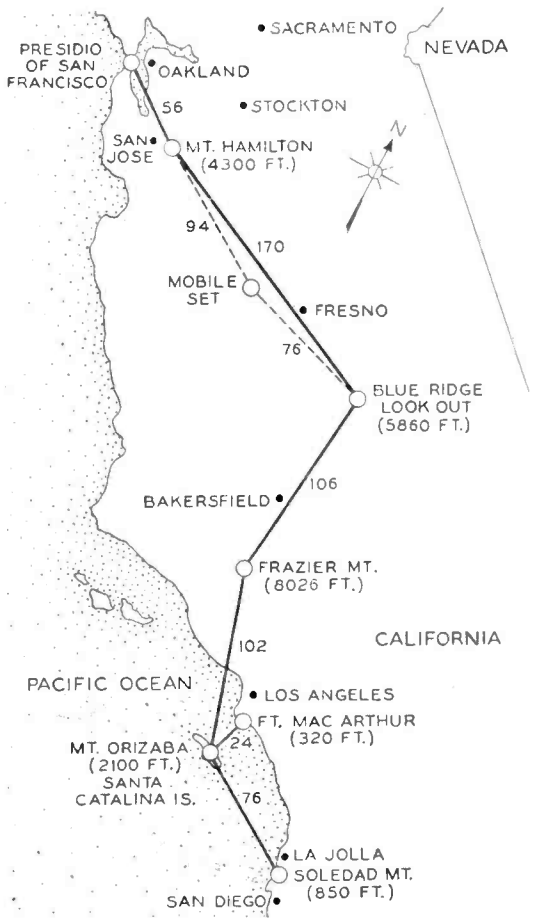


Fig. 1—Paths used for the California test of pulse transmission over a 510-mile path.

To prevent these variations from seriously interfering with reception, several methods have been employed that can be classified as diversity reception. In one form, two or more receivers are installed sufficiently far apart so that when there is poor reception at one, there will probably be good reception at one or more of the others. This is known as space diversity reception. Whereas commonly used space diversity arrangements involve displacement between antennas in the horizontal plane, the arrangement described here makes use of vertically displaced antennas in connection with the AN/TRC-6, which is a relay system working in the range 4350-4800 mc, employing pulse-position modulation. In tests* carried on in California during the summer of 1945, it was found diversity reception was necessary when transmission was over the sea or smooth land. In the form used, the two receiving antennas are separated vertically, and so placed that the reception at one is complementary to that at the other. This system, which may be called complementary vertical space diversity reception, gave excellent results.

California was selected by the Signal Corps as a testing area to evaluate performance of the AN/TRC-6 system because conditions there resemble more closely those of the Pacific islands and the Asiatic mainland than do other parts of this country. The test circuit traversed a 510-mile path from San Francisco to San Diego in five spans as shown in Figure 1, with one branch span from Catalina to Fort MacArthur on the mainland. This was the first time that many detailed observations of performance at super-high frequencies had been made on long paths with high antenna elevation. The

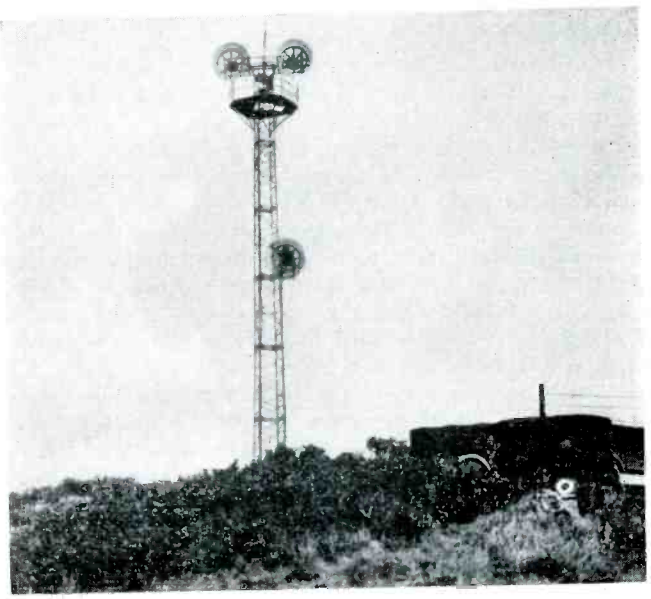


Fig. 2—Antenna site on Soledad Mountain showing a receiving antenna twenty-five feet below the regular set which was used in the studies of complementary space diversity reception.

*These experiments were made in collaboration with Dr. T. J. Carroll, Radio Propagation Section, Office of the Chief Signal Officer, Mr. Fred Morf and others of the Coles Signal Laboratory, and the officers and men of the New Equipment Introductory Division of the Signal Corps.

*Reprinted by permission from the Bell Laboratories Record of Sept. 1947.

sites were selected so that all paths were optically clear, and included three overwater paths of 24, 76 and 102 miles in length and three overland paths of 56, 106 and 170 miles. During part of the time, the 170-mile path was divided into 76 and 94-mile sections. During the course of the tests with the standard single-antenna method of reception, frequent

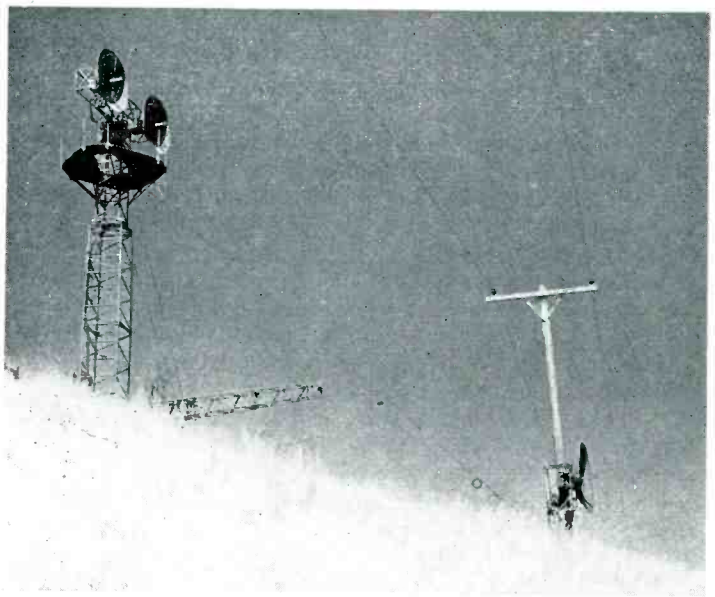


Fig. 3.—Antennas as used on Mount Orizaba, Catalina Island, for test over the path to Soledad Mountain. Second receiving antenna attached to pole fifty feet lower than others.

momentary circuit interruptions were noticed on all of the overwater paths and on the 170-mile overland path. These brief circuit outages were termed "hits" because of their similarity to the familiar circuit interruptions experienced on an open-wire line when two wires hit together.

These "hits" were apparently due to phasing of two received signals. A likely cause of failure seemed to be interference between the direct waves and waves reflected at or near the surface of the earth or sea. Radiation from a microwave transmitter using reflectors is in the form of a small-angle cone. Maximum radiation is in the direction of the axis, and the energy transmitted decreases rapidly with angular distance from the axis. With the microwave relay system, the antenna sites are selected as far apart as possible without bringing the line-of-sight path too close to the earth at some intervening point. As a result, there is an appreciable distance along the earth where the angle between the earth and the line-of-sight path is small, and thus the conditions for strong reflections are good, particularly with an oversea path. The length of the reflection path is slightly greater than that of the direct path, and thus transmission over it may not be in phase with the direct signal. Since the wavelength at the frequencies used is of the order of 6 centimeters, slight differences in length of path may have a considerable effect on phase.

Because the path between Catalina and Fort MacArthur was short and the transmitter sites comparatively high, the angle between direct and possible reflected path was large, about two degrees. It seemed, therefore, that any power traveling the reflected path could be greatly reduced relative to that following the direct path by tipping the antennas slightly upward. This was tried, and although there was a small loss in the direct signal, a good "hit-free" link was obtained.

From Catalina to Frazier Mountain, the 102-mile path is partly overland and partly overwater, but because Frazier Mountain is much higher than the Catalina antennas, the region of possible reflection is on the water section of the path, and thus this link was classified as an overwater path. Because of the much greater distance spanned, however, the angle between direct and reflected waves is much smaller—about half a degree. Tilting here, therefore, was not so effective. Although the total number of "hits" was reduced to about one-fourth of the former value, at times as many as twenty "hits" per hour were present.

Following these tests, one set of the Catalina antennas was moved so that an intervening mountain interrupted the reflected signals, and another set of antennas was directed toward Frazier Mountain. Reception at the shielded site was remarkably smooth, while simultaneous reception at the original site was often fluctuating.

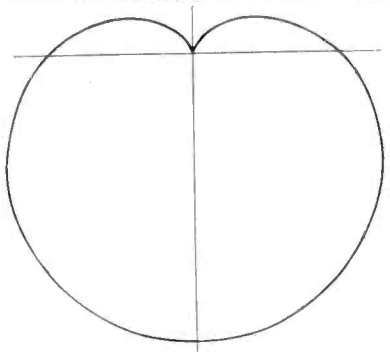
On the path between Catalina and Soledad Mountainn, the angle between direct and reflected signals was too small to make tilting offer a solution, and there is no convenient intervening mountain to intercept the reflected ray. A short trial was made of changing the polarization from the usual horizontal to vertical, but no improvement was noticeable.

Considering both direct and reflected waves, the signal strength along any vertical line may consist of a series of points of maximum reception with points of minimum reception in between—thus exhibiting the lobe structure encountered in other studies of super-high-frequency transmission and in radar. Because of varying atmospheric conditions, the effective length of the transmission paths varies. As a result, the

Fig. 4.—Second antenna installed on tower at Catalina for space diversity transmission with Frazier Mountain.

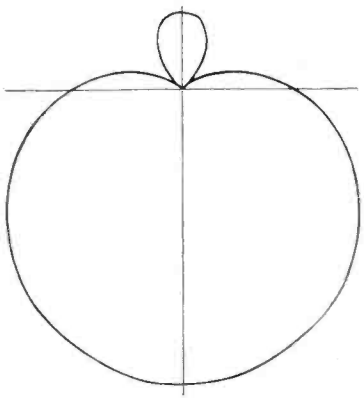
. . This is Cardioid

"Cardioid" means heart-shaped. It describes the pickup pattern of a microphone as illustrated in this diagram. Unwanted sounds approaching from the rear are cancelled out and the pickup of random noise energy is reduced by 66%. The actual front to back ratio of reproduction of random sound energy is 7 to 1.



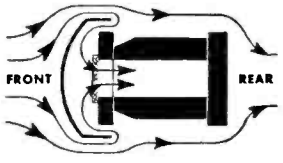
. . This is Super-Cardioid

"Super-Cardioid" also describes a pickup pattern and is a further improvement in directional microphones. The Super-Cardioid has a wide front-side pickup angle with greater exclusion of sounds arriving from the sides and the rear. The front to back random sound ratio is 14 to 1 which makes it twice as unidirectional as the "Cardioid." A 73% decrease in the pickup of random noise energy is accomplished.

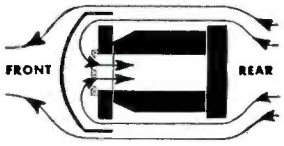


. . This is Uniphase

"Uniphase" describes the principle by which directional pickup is accomplished in a single Microphone unit. This is a patented Shure development and makes possible a single unit "Super-Cardioid" Directional Microphone eliminating the necessity of employing two microphone units in one case—it gives greater uniformity in production, greater ruggedness, lower cost for comparable quality and more uniform vertical pickup pattern.



Sounds entering from front.



Sounds entering from rear.

. . This is the result

The SHURE Super-Cardioid

A decrease in the pickup of random sound energy by 73%—reduction of feedback and background noise—simplification of sound pickup are among the many advantages offered by the Shure "Super-Cardioid" Dynamic. These, plus faithful reproduction, are the reasons why Shure "Super-Cardioid" Microphones are used by more than 750 Broadcast Stations in the United States alone, by our Armed Forces throughout the world, and on thousands of Public Address Systems everywhere.

SHURE BROTHERS, Inc.

Microphones and Acoustic Devices

SHURE

225 West Huron Street Chicago 10, Illinois

Cable Address: SHUREMICRO

SPACE DIVERSITY—from page 4

pattern of peaks and nodes of reception often shifts up and down so that a fixed receiver may at one moment be at a peak and a short time later at a node. It is possible to calculate the approximate distance between the points of maximum reception. If two antennas are separated by half the distance between maximums, then when one antenna is getting maximum reception, the other will be getting minimum, and thus when the pattern shifts up or down so that the first receiver is getting minimum reception, the second will be getting a maximum. Two receivers so located should therefore give complementary reception.

Complementary vertical space diversity reception was first tried over the link between Catalina and Soledad Mountain. As shown in Figure 2, a second receiving parabolic antenna was fastened 25 feet below the regular receiving antenna on the tower at the site on Soledad Mountain. The position chosen was the calculated difference between a maximum and a minimum of the lobe pattern for this path. The outputs of both receivers were recorded continuously. Fades in the received signal were never observed to occur simultaneously on both receivers. In a one-hour period, seven fades deep enough to cause circuit interruption occurred in the signal received with the upper antenna, while at slightly different times ten equally intense fades occurred in the signal received with the lower antenna. This alternation of signal strength occurred not only for fades a fraction of a second long, but also for fluctuations over many minutes.

After this verification of the presence of complementary space diversity, the two receiving circuits were parallel after the first video amplifier stages to feed in common the remainder of the video and audiio circuits. The selectioin of this point for paralleling the receivers avoids many difficulties involved in other diversity receivers, since at this point the signals consist of pulses, and thus always add in phase regardless of the phase of the received radio signals. The automatic volume-control voltages, which vary the grid-bias voltage on the intermediate frequency amplifier stages, were connected together and fed back to both receivers. The shift of control from one signal to the other was smooth. The stronger signal always regulates the gain, and since all fades are out of phase, the result is a very quiet "hit-free" circuit. By this simple means, "hits" were absent on this circuit during the next month's test. Excellent communication was likewise achieved in the opposite direction by installing a second receiving antenna 50 feet below the original antenna on Mount Orizaba, Catalina Island, as shown in Figure 3. This spacing was also about the computed half lobe spacing.

Following this success, the Mount Orizaba set associated with the 102-mile overwater path to Frazier Mountain was also arranged for complementary space diversity reception by placing a second antenna 6 feet below the original, as shown in Figure 4, and a second receiving antenna was added 20 feet below the regular antenna on Frazier Mountain. As before, these spacings were approximate half lobe separations for their respective transmitters over the path involved. Here, also, all propagation hits were removed by this procedure, whereas without diversity, the original circuit from the summit had proved too unreliable for radio relay service.

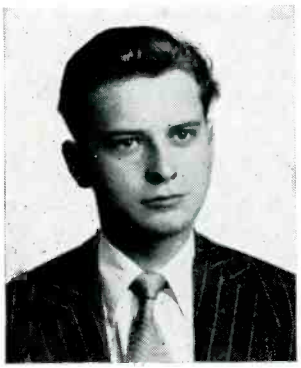
Records made of the 170-mile overland path, the longest optical radio-relay link ever tried at super-high frequencies, almost always showed varying signal strength, with frequent fades deep enough to cause communication failures. Because of this, a new relay station had been installed in the San Joaquin Valley, breaking the path into two sections of 76 and 94 miles each. Satisfactory circuits were then obtained.

Inspection of the recordings made of the single link 170-mile path, however, revealed that the fades appeared to be caused by typical interference between two components with broad peaks and deep narrow fades. A second antenna was therefore installed at Blue Ridge Lookout 43 feet below the regular antenna, and records were taken of the output of both receivers. Simultaneous fades sufficient to cause circuit failure or serious noise are not to be found on the record, although each antenna individually is subject to many such fades. Inspection of the records during deep fades showed that they were to a large extent complementary in that very deep fades on one antenna corresponded to peaks on the other. The possible reflection area lies in the San Joaquin Valley about five miles east of Firebough. For many miles in either direction the land is semi-arid and exceedingly flat with almost no vegetation. The unusual flatness of the land and the small grazing angle were probably favorable to the production of a strong reflected signal. Complementary vertical space diversity reception was added to this path, which then operated satisfactorily and did not require the extra relay station in the San Joaquin Valley, which had been found necessary with single-antenna reception.

Since these experiments, two Bell System installations of overwater AN/TRC-6 systems have been made, one from Los Angeles to Catalina, and the other from Hyannis, Mass., to Nantucket. The performance of both of these systems is satisfactory. Vertical space diversity arrangements were included on a trial basis, and have been found very helpful during periods of excessive fading. All of these experiments demonstrate that the complementary vertical space diversity method is of great value in improving performance of super-high-frequency relay paths operating over the sea or smooth land.

NABET EMPLOYMENT SERVICE

Due to the day-to-day changes in status and availability of unemployed NABET members, it has not been deemed practical to publish such a list of names in each issue of the Journal. Instead, each available member should immediately notify the National Office, with copies to his Chapter Chairman, of availability together with brief resume of experience, etc., and notify them immediately of any change in status or availability. The Chapter Chairman for the area, and the National Office, each of whom are called upon to fill vacancies, will thus be kept up-to-date to the mutual advantage of all concerned.



Review of Current Technical Literature

By Lawrence W. Lockwood

Journal of Applied Physics—Jan. 1948

The Conical Dipole of Wide Angle—P. Smith

This report deals with a method of calculating the admittance of dipoles that consist of complete cones of wide angle.

Theory of Slots in Rectangular Wave Guides—A. Stevenson

A basic theory of slots in rectangular wave guides is given. The analogy with a transmission line is developed and established and detailed formulae for the reflection and transmission coefficients and for the "voltage amplitude" in the slot generated by a given incident wave are given. In particular the "resistance" or "conductance" of slots which are equivalent to series or shunt elements in a transmission line are given by fairly simple closed expressions. Guide-to-guide coupling by slots and slot arrays are also considered.

Bell Laboratories Reecord—Feb. 1948

High Freuency Oscilloscopes for Pulses and Other Transients—W. Gaines

History of development and theory of operation of various radar scopes developed by Bell Laboratories.

Communications—Jan. 1948

The Cincinnati Times FM Station—J. Ledbetter

WCTS-FM, sister station of 5 KW AM WKRC now on the air with a 101.9 mc FM transmitter with an effective radiated power of 12.6 KW.

International Broadcast H-F Transmitter with Continuously Tunable Plate System—D. Miller

Tuned circuit of final stage of 2.85 to 22.5 mc transmitter is continuously tunable from front panel. Power output is 20 kw for cw, or 15 kw for phone.

TV Lens Consideration for Image Orthicon Cameras—L. Mautner

Numerical evaluation of factors involved in the choice of lenses, particularly for the image orthicon camera. Graphical interpretation of equations offered to facilitate pickup applications in field and studio.

FM and TV Transmission Line Installation Problems—J. Brown

Part II of discussion of materials, components, accessories, and methods used in installation of coaxial transmission lines from transmitter to antenna. Assortment includes special gas barriers, inner conductors and supports, elbows, mounting fittings, clamp connectors, flanges, reducers, pressure controls, isolators, etc.

Cathode-Follower TV Antenna System—E. Hills

Antenna array operates in the 44 to 88 mc., and 175 to 216 mc bands with a standing-wave ratio on transmission line always less than 2:1 and with a gain at all frequencies.

Proceedings of the IRE—Feb. 1948

Results of Microwave Propagation Tests on a 40-Mile Overland Path—A. Durkee

The purpose of the tests was to investigate the transmission characteristics of such a path at centimeter wavelengths over a long period of time. Statistics on the transmission results at wavelengths ranging from 1.25 to 42 centimeters are given.

A Method of Determining and Monitoring Power and Impedance at High Frequencies—J. Morrison and E. Younker

A method and newly developed devices for determining and monitoring power and impedance levels in transmission lines at high frequencies are explained. Practical considerations influencing accurate determination of power and impedance levels are analyzed and the previous and newly developed methods of monitoring these important quantities under changing conditions of load are compared.

Developments in Radio Sky Wave Propagation Research and Applications During the War—J. Dellinger and N. Smith

This paper discusses the work done by the Interservice Radio Propagation Laboratory during World War II. The circumstances leading to the establishment of IRPL are described and the solutions of these problems are outlined and some of the results are presented. Specific services performed by IRPL during the war for the armed forces and commercial companies are recounted.

The Degenerative Positive-Bias Multivibrator—S. Bertram

The operation of a multivibrator with positive grid supply and cathode degeneration is described. It is shown that for suitable circuit parameters, the frequency of the multivibrator is very nearly a linear function of the applied grid voltage. Since the grid voltage can be controlled with relatively simple auxiliary circuits, the positive bias multivibrator becomes a useful variable-frequency source.

Radio & Electronics (New Zealand)—Jan. 1948

A Practical Analysis of Ultra High Frequency Transmission Lines, Resonant Sections, Resonant Cavities and Wave Guides (Part 6)—J. Meagher and H. Markle

Practical approach to these problems with simple explanations and diagrams.

Tele-Tech—Feb. 1948

Eliminating Spurious Radiations From BC Transmitters—Dr. V. Andrew

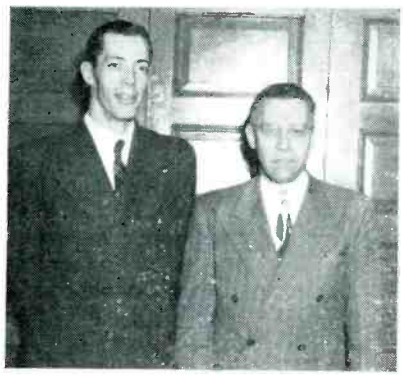
Practical methods for determining existence and extent of harmonic generation and of designing and applying corrective filters.

The Design of Audio Compensation Networks (Part 2)—W. Savory

Application of the correct equalization for various commercial phonograph recordings has an important effect on character of reproduction.

(To page 9)

NABET PRES. McDONNELL VISITS CLEVELAND CHAPTER



NABET President McDonnell and Cleveland Chairman Brandt.

He came, he saw, and he answered a helluva lot of questions. We're speaking of NABET's new Prez J. R. McDonnell. The geographic location of his appearance on this little old hunk of rotating sand, loam, clay, and radio stations, happened to be the Hotel Hollenden here in Cleveland, O. The city of smoke, smog, and smugness, gave his Royal Highness a royal reception.

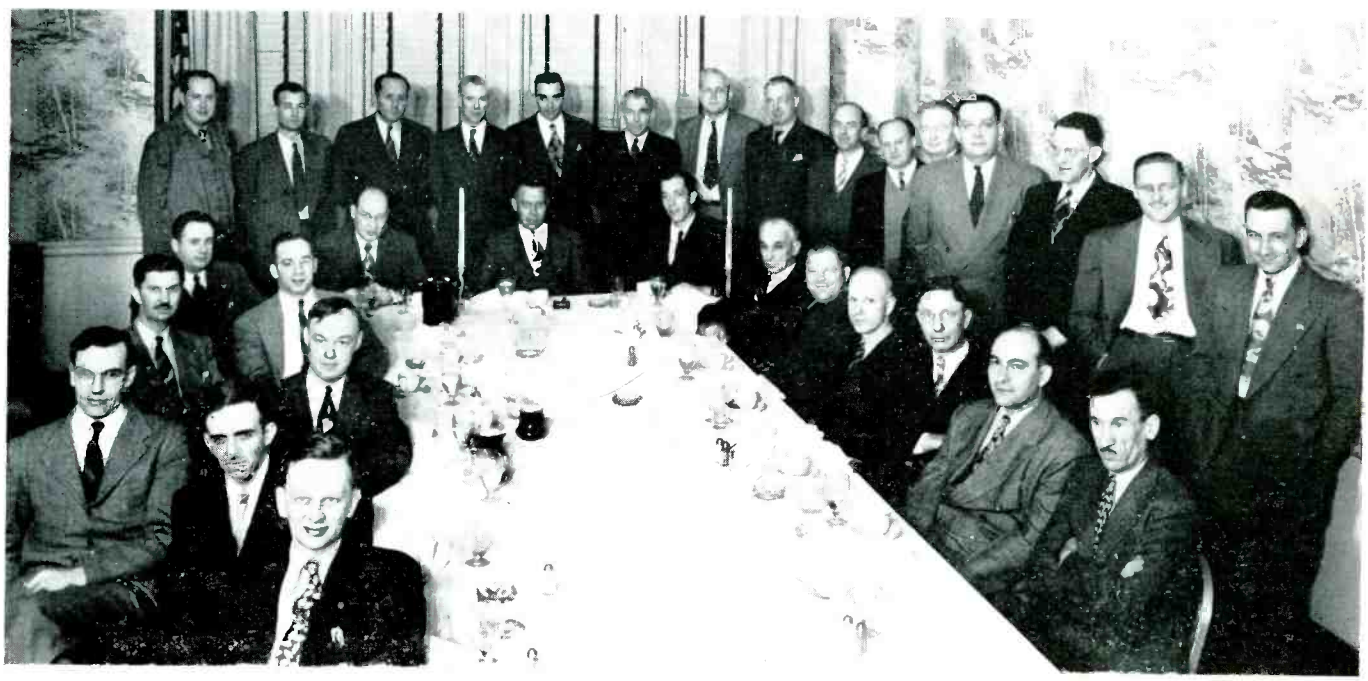
President McDonnell, as we said, answered a lot of questions. The nature of said questions being none of your d—business. (The last sentence is written to satisfy the digestive juices of any Economic Royalists, company spy, or Free Enterprizer, who might happen to scan the sacred pages of our dear, dear Journal.) Common forty-hour-a-weeker-peasants need not heed the implications implied.

Seriously—and sanely. Prez McDonnell dropped Harold Brandt, our chapter chairman, a letter saying he'd be in Cleveland Monday, March 4th. Brandt dropped his saw and hammer (he's building himself an Igloo) and began making elaborate preparations for a royal reception for his highness. He, Brandt, called the manager over at the Hollenden and requested reservations for approximately 40 NABET members. The manager said his memory was notoriously bad, but not bad enough to ever forget the last NABET meeting which resulted in his ordering his architect to immediately proceed on plans for a sound proof ballroom. "The room," he said to Brandt, "has been completed. We shall be delighted to tolerate you again."

Getting Cleveland NABET members to attend a meeting is like trying to catch fish during dog days. Nevertheless, there's more than one way to hook fish.

Brandt decided to dangle some bait in front of the Chapter members. This bait turned out to be a turkey dinner. Members went for it like the carp went for the doughball. The accompanying pictures testify to that. The pixs were taken after dinner. You should have seen them fanning their fins around the portable bar before dinner. You'd have thought it was spanning season. I'll swear it's a downright crime the way these fellows down that stuff without blowing a fuse.

Prez McDonnell spoke to the group after dinner. There's a man who calls a spade a spade. None of this hokum about being greatly impressed by the bril-



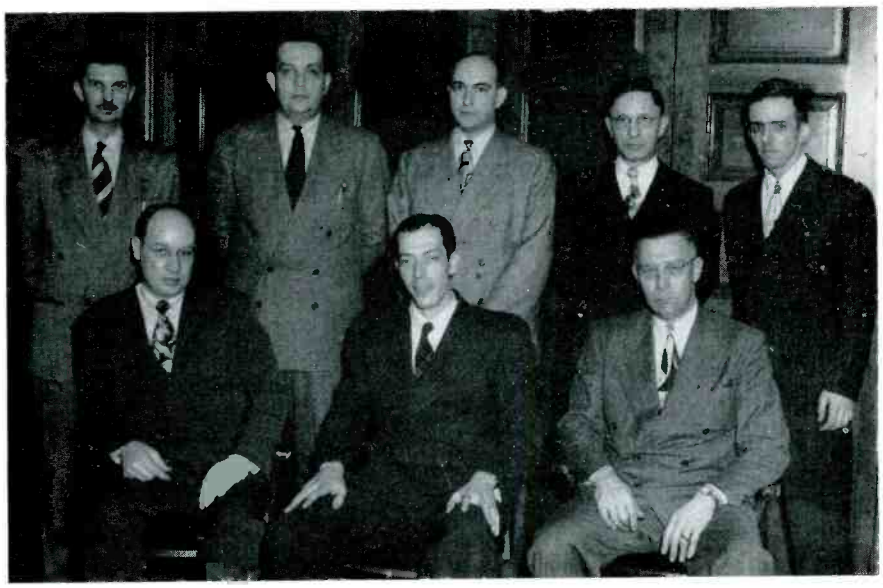
They say television's peepin' around the corner. That being the case, common sense says we ought to get television-minded. Just think of the opportunity offered by television; take this pix for instance. One look at those mugs inspires a million ideas. We can slap a pix like that on the home receiver and offer a prize of $50,000 or so to the first person who identifies each engineer represented. But that's just the beginning. In 25 words (or less) the potential prize winner must finish the sentence "Why are Radio Engineers Underpaid?" The winner of this baffling question could then compete with the fourth quarter finalists on the Horace Heidt show. Then we'd stack them up against winners over at CBS, MBS, ABC, and XYZ. This could go on forever and the idea would be a family affair handed down from generation to generation and, in all probability, would continue successfully until the next Ice Age came along and shoved every radio station clean to hell over in the next state.

liance of his audience—and not even a hint of that old overbaked chestnut about being honored to appear in the cleanest city in the world. No air, Prez McDonnell rubbed the smoke and smog from his eyes, brushed the coal dust and clinkers from his face, and rode the verbal steed of facts straight down the stretch to Midnight.

The speech was followed by a question period. Midnight tiptoed in without warning. Quite a few fellows had to "open up" so we called it "quits" along about 12:30.

The Cleveland Chapter would like to wish Prezz McDonnell smooth sailing as skipper of the schooner NABET. And, we believe the NABET powers-what-be are to be congratulated for placing the future problems of NABET under the steady hand of Mr. McDonnell.

—Bert Pruitt.



Seated left to right: Frank Whittam, Secy-Treas. Cleveland Chapter; Pres. J. R. McDonnell; Harold Brandt, Chairman Cleveland Chapter. Standing left to right: Cecil Bidlack, WTAM Councilman; Howard Spiller, WTAM Councilman; Fred Barrett, WHK Councilman; Jim Sturtevant, WHK Councilman; John Smith, WHKK Councilman.

TECH. PRESS—from page 7

Antenna Design for Low-Angle FM Propagation—O. Fiet

"Pylon" sections are stackable for suppression of high angle radiation; horizontal coverage pattern is nearly circular.

Will Clear Channel Broadcast Plan Be Changed?—A. Francis

CCBS proponents would divide the country into 5 parts, put 4 high power stations in each, emphasize need for 750 kw for better coverage.

Pulse Rise Time Response Chart—A. Baracket

Design aids for single stage video amplifiers to meet high frequency response and rise time requirements.

Graphical Analysis of Speakers and Microphones—A. Sanial

Manual-electronic curve tracer eliminates need for making tedious point-by-point plots of frequency characteristics.

Frequency and Modulation Monitor for TV and FM—C. Cady

Pulse count detection circuit used for high-quality demodulation of FM signal—frequency ranges from 30 to 162 mc, and 160 to 220 mc.

Circuit Design for Gas-Discharge Regulator Tubes—W. Hoyle

Graphic presentation of formulas derived to insure that all types of tubes are operated within their prescribed ratings.

Electronics—Feb. 1948

Underwater Television—C. Engleman

A camera, enclosed in a watertight cylinder and remotely controlled from the surface, was tested at depths to 180 feet in Bikini lagoon. Future military, scientific, and commercial applications of the system are explored.

Superregenerative Circuit Applications—H. Stockman

Survey of equipment utilizing superregenerative circuits includes IFF gear, telemetering systems, radar beacons, remote-controlled devices, and FM receivers. Difficulies in analyzing basic circuit performance necessitate the empirical design considerations outlined here.

FM Transmitter Performance Measurements—H. Thomas and L. Leeds

Frequency response, harmonic distortion, AM and FM noise in FM broadcast transmitters must be held within legal limits. Techniques of using standard test equipment in meeting FCC requirements for proper performance are described in detail.

2000 Mc Television Program Chain—F. Deerhake

Circuit details and preliminary operational results of the 143 mile New York-Schenectady television relay using three unattended intermediate stations. Present two staggered RF channels each 25 mc wide provide one-way transmission. Klystrons are used in transmitters and receivers to obtain frequency modulated signal with 14 mc swing.

Low Frequency Compensation for Amplifiers—K. Schlesinger

Two unconventional interstage coupling networks for low-frequency amplifiers are developed. One has a grounded load resistor, thus providing a low impedance output; the other requires very little capacitance, thus decreasing size and cost. Design requirements of the networks are analyzed.

Propagation of Very Short Waves—D. Kerr

This concluding installment treats the effect of surface reflections, two way propagation typical of radar applications, and variations caused by atmospheric refraction.

Design of Loudspeaker Dividing Networks—E. Schuler

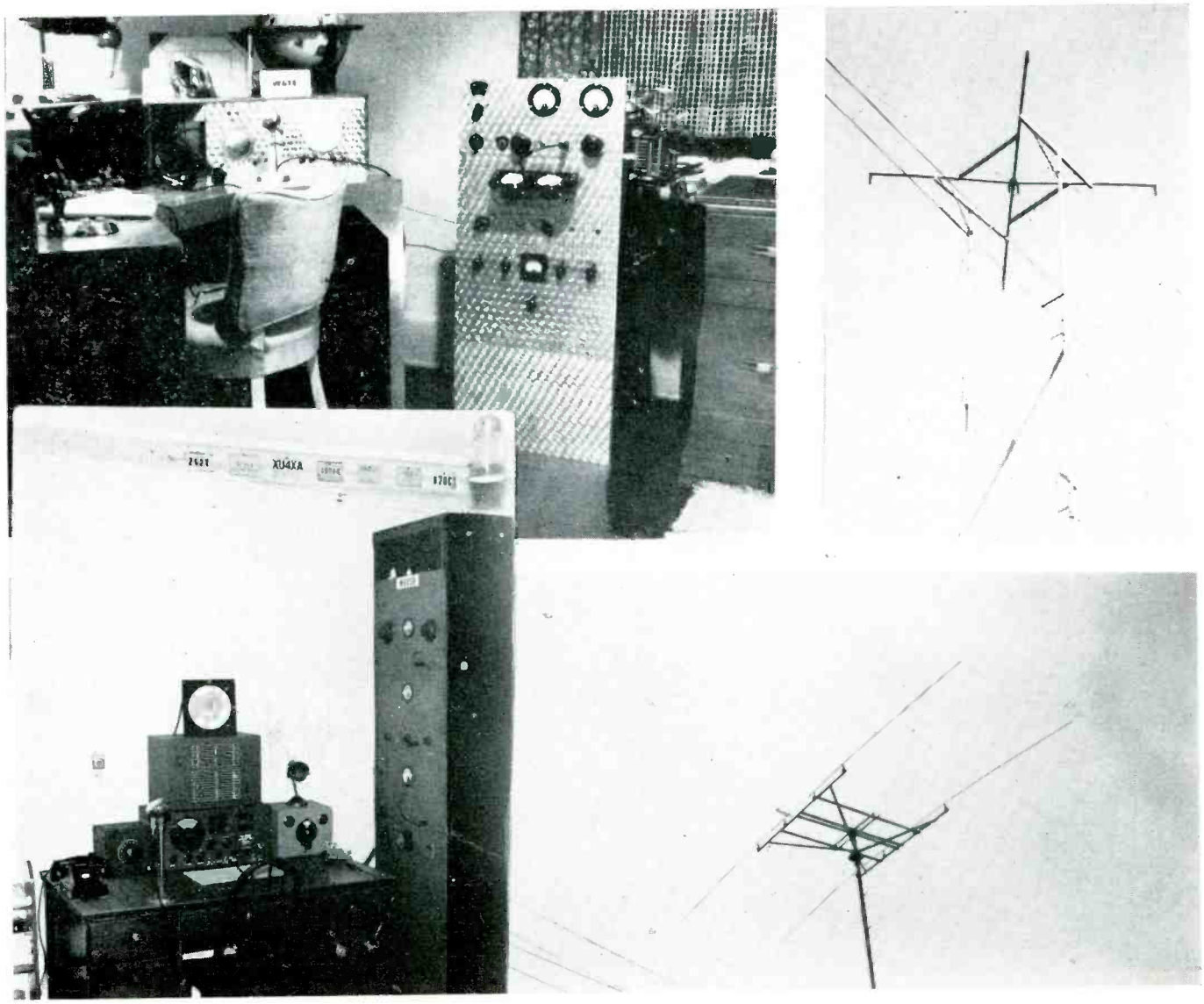
Four-parameter chart gives directly the required values of L and C for a parallel connected constant-resistance dividing network, at any desired crossover frequency and line impedance, when separate low and high frequency loud speakers are employed.

HOLLYWOOD NEWS

By Norman Dewes

HOLLYWOOD HAMS ... out where the Sun sets a little LATER ... and the watts are a little GREATER ... and the DX is simply PEACHY, amatyours are rather DESULTORY with infromation regarding their rigs and workings, but here are what statistics could be gleaned, and two pix of the rig and sky-lines of W6OSH ("Onions, Spinach, Horseradish ..."), o&o by near-champeen DX'er *Al Korb* who works the fellows via LAND LINES daytimes from NBC MCD ... Coast amachoors can HARDLY be appellated LACKADAISICAL however, since MOST of us proudly pound out and/or purr forth DAISY CALLS, an up-to-this-issue-list of which may be found nearby ... and we HOPE it's complete and correct, for ONCE ... *Al's* layout puts 250 HW (Honest Watts ...) into an 8JK rotary for 10 'n 20 CW and fone, and he is ALSO on 75 fone with a Signal Corpse BC-654 for some 12 watts and twenty-five DOLLARS ... *Al* has worked nearly everything that can be heard out here and his DX list would fill up this whole column, precluding the printing of it ... has a nice LOCATION too, up in the hills of Burbank ...

ANOTHER fine spot is that of another DX'er of note (USUALLY T-9 ...) W6LN and *Thor La Croix*, who has just acquired it as per last issue and can BEST be described as an amateur semi-Shangri-La ... *La Croix Acres* is located up in La Canada, nestled in the foothills at the foot of Mt. Wilson and 328 feet on one side and 190 on another ... LN sez he's gonna stick up at least two Lazy H's and mebbe a coupla rhombics ... rig is 800 watts into a single 304-TL from a surplus radar set (304-TL's are now 59c, but DON'T ask *Thor* what he paid for HIS ...) and his DX at the old location with a Triplex antenna was 38 zones and some 86 countries ... sez from all INDICATIONS, new spot should be even BETTER ... TOPS in DX seems to be vied for by *Bill Breuer*, W6TE and *Bob McGaughey*, W6HDF at this writing ... TE (old "Tin Ears" ...) *Breuer* is quite an old timer, having had his first ticket in '21, but still THINKS youngly with some 500 watts into a pair of VT-127-A's on ten ... location is right in TOWN, but antenna is quite elaborate, we hear ... *Bill* is reputed to have worked some 90 plus countries and 37 zones ... and CLOSELY BEHIND or maybe vice versa is *Bob McGaughey* with some 70 countries and 36 zones, wit' a PAIR of those 304-TL's in the final and running (they HAVE to ! ...) what he claims to be a "fifth" ... WE suspect that he must be pouring a full QUART into those poor tubes, AT LEAST, for when he presses the key yer HAIR rises straight up and FLAMES shoot out atcha and the air is filled with fumes and sounds like that big arc NPG used to have down at Chollas Heights in San Diego ... what the kid should do is to immerse the whole rig AND himself in OIL maybe ... OTHER of the more active-type yammerters who may be found pounding their keys and grasping their mikes in the wee sma' hours after shutting down K6ECA (ABC believes it to be KECA ...) and NBC include *Ted Crosby*, W6TC & *Ray Baird*, W6VUJ & *Bob Jensen*, W6VGQ & *Ralph Reid*, W6VY & *Syl Hefternan*, W6OJ & *Ken Grinde*, W6WJC ... AC who lives in Roscoe has hung up some 55 countries with 300 watts into a V-70-D on 20, 40 & 75 ... *Ted switches* the 70-D for a T-55 occassionally, to save wear 'n tear on BOTH of them, he sez ... (?) ... VUJ has 500 HW into an 810 on 20 and has managed to snare 18 countries and 15 zones between re-construction periods ... it seems that *McGaughey* comes out and HELPS him, which is FINE except for the fact that the rig SELDOM actually gets on the air ... but *Bob Jensen* has the INSANEST approach of ALL, having purchased one of those BC-654's at a VERY modest price, and of ALL things is using this surplus item JUST as the Signal Corp did ... thing has a 6/12v dynamotor and *Bob* simply runs some wires out thru a window and clips on to his six volt battery in the car and he's ON ... we'd rather not TALK about this anymore, for it is so STRICTLY unamateurish ... especially with a SURPLUS rig ... dang part about it is that he GETS OUT, having recently worked a round-robin with *Al Korb* and KL7AH in Anchorage, Alaska with 12 watts on 75 fone ... had the QSL to PROVE it too, but posted it on the Lounge bulletin board from which it was immediately REMOVED by some TRUE HAM ... these 654's seem to be really FB however, and many were snapped up around Radio City, including by *Hal Platt*, *Charlie Norman*, (who never WILL get on ...) *Rick Riekeberg*, *George Foster*, et al ... wish WE hadn't passed that one up ... and then there's the CLIFF DWELLERS, W6VY 'n W6OJ who live on the top and in the basement of the St. George Apts ... *Reid* and *"Heff"* are among the REAL Old Timers in ham radio, having had rigs on in New York and points EAST for many years before coming to the Coast ... we wesh there was space to tell about *Ralph's* & *Heff's* ham history, for it dates 'way back beyond the days of soup rectifiers and loop modulation to rotary gops 'n pancake coils, and Ralph STILL has some of his original gear to prove it ... which makes us wonder what ever happened to OUR collection of DeForest audions 'n phone condensers 'n Acme filters 'n "S" tubes 'n pole pegs 'n those primary rheostats made out of carbon, which used to get RED HOT ... and those UV tubes which used to get WHITE hot ... and we'll NEVER forget the first time we worked an Aussie with a Cunningham UX-210 with 1000 volts on the plate, in our Hi-C Hartley ... we were keying the HIGH VOLTAGE with a key which had two dimes soldered in for contacts and our old call was W6DJC and every time we'd send the "J" the plate of the poor 210 would get white ALL OVER and bulge out and threaten to run down the supports—and there was a friend of ours with a DeForest "H" tube who knew a guy in the movie studios who would give him the old "B" batts from the sound trucks and at ONE time this friend (W6AOE) had 2000 volts of "B" batteries and when HE pushed the key the plate of the "H" tube would get so hot you could see the filament thru it ... he REALLY had PDC ... for about two nights—and then there was the fellow up in the next block who had a pair of 204-A's in a self-excited Hartley, with 4000 volts on 'em ... he had the rig out in the garage and the whole floor was covered with the soup rectifier, which had more jars than you could COUNT ... and you should have been there the night it BLEW UP ... ham radio was REALLY ham radio in those days, and you couldn't buy a custom built rig or receiver because there WEREN'T any ... you couldn't even buy PARTS, and we bet *Ralph* 'n *Heff*



Top left, W6TE's shack; top right, W6TE's beam. Bottom left, W6OSH's shack; bottom right, W6OSH's beam.

still have in a box under the bed, some of their copper tubing coils and glass plate and tin foil condensers... *Heff* has no problem today, except that his antenna is in the BASEMENT, but we don't see how *Ralph* stays MARRIED, for the front room of the *Reid* apartment looks like the lab the guy made FRANKENSTEIN in....

WELL... there must be a LOT of you fellows around the country who recall similar times and tribulations... and for whom ham radio will never lose its fascination... so why don't we get *Stolzie* to run a monthly Ham page, where we could swap stories, ideas and parts... and brag about our DX and look at pictures of the other guy's rig... this could be a very PERSONAL page, for QST and other mags carry plenty of the technical stuff... and if *Stolzie* yells "Who would WRITE it...." why WE might volunteer, if YOU guys would send in the STUFF —then we would like to re-submit the idee of a TC NABET net, which we think would be a fine way to exchange news of the various Chapters BESIDES ham news... so HOW ABOUT it... let your Chapter Chairman and/or Journal Associate Editor know ifg YOU are interested, and he will forward the dope to *Bro. Stolzenberger*... and if some night soon you should hear somebody calling "CQ NABET," why ANSWER him and give him the HI and the GA... MEANWHILE, 73's to all ships and stations from W6TW—BCNU.

Detroit News

By Harry Lewis

CREATIVE GENIUS ... The fact that engineers are infallible ... they are born outside the world of errors is generally accepted ... by engineers, that is ... yet they are often pressed to preserve this theory ... ALEX DORAN in collaboration with ROGER (the bean) ELLIS, both of WWJ AM studio came up with a gem that will go down in the infamous annals of studio history ... and it happened this way ... Not long ago ... one of the local studio shots hit the air with the announcer sounding as though he had his head in an empty pickle barrel ... and old barrel ... Obviously he was so far off mike he could have asked for and received travel pay ... The upshot of the situation ... and the officially logged report read ... "ANNOUNCER TALKED INTO WRONG MICROPHONE. ... This could be the reason an obese ... that means slightly large engineer now always marks the announce gain control in a violent red pencil. ... It is further rumored one studio supervisor blew three gaskets and a connecting rod when he read the official writeup I read a good book recently ... title ... They Were Expendable.

PEP TALK ... Detroit has been extremely lax in contributing to this here now column but ... we ain't alone ... from all appearances for various and sundry of our fellow chapters are too too conspicuous by their absence. [Amen!—Ed. S.] ... How about the rest of the chapter chairmen ... appointing ... delegating ... or even bludgeoning some of their less lethargic free verse advocates into some semblance of life and movement ... ad infinitum ad nausaum ... Latin, so I'm told.

CRITIQUE ... Did something a little out of the ordinary this month ... read ... with care and extreme interest the contributions of WARREN DEEM and MINOR WILSON of Washington and Chicago respectively if not respectfully ... Intend perusing them regularly hereafter ... might find some good stuff to steal ... when gabby gossip material around these parts runs a little to the lean side ... Incidentally, DEEM your tip on checking the lounges ... couches ... and overstuffed chairs around the building proved slightly more than lucrative ... one of our engineers picked up enough to buy a tube for his final ... and just in time ... the darned thing was going soft on me.

THE END IN SIGHT ... Being a lowly AM Studio man ... quote TV unquote ... it is not within my knowledge to comment knowingly on the ramifications of TV studio operation I wouldn't know a good picture from one slightly on the aromatic side however ... one year ago ... when TV was sprawling all around ... in every studio on all floors when orders and counter orders and even frantic counter counter orders were flying like the new look on a windy corner ... and when no one knew a thing about TV and admitted it ... one of TV's most aired or viewed pics was a derriere ... that's a polite French noun ... used only in the highest circles meaning posterior and this noun was firmly fastened to one JIM EBERLE then TV producer but now ... what with all the promotions in the year gone by ... he is a TV producer It is rumored that this centrally located area appeared suddenly and in several widely diversified programs ... First it shockingly materialized between the processional march and the offeratory hymn during a Lenten service pickup ... it was later superimposed on a fashion show describing the new look ... The last appearance of this derriere to stop all derriere's was on the Mother Murphy Macaroni show ... where and when to the chagrin of the staff and hilarious guffaws of the viewing audience the announcer said with saccarine vacuity ... "And it comes in such a BIG BIG package."

HAM NOTE ... The word butcher for the Detroit chapter operates through the courtesy and eternal vigilance of the FCC on the south side of the seventy five meter band between 3850 kcs and 3900 kcs ... and signs W8IIA ... Hear a gang of Chi stations throughout the afternoon ... could be some of them are NABETians ... if so give a call ... let's get better acquainted.

QUESTIONS AND ANSWERS ... Whatever happened to that conclave of unions idea? ... to discuss ways and means of bettering everything for everybody on BOTH sides of the paycheck ... But just like the proverbial March day ... it began interestingly warm before the temperature dropped ... (See NY Column, April/48 Journal, with item on ABUG, CBGU, CRAC, etc.—Ed. S.)

FORCE OF HABIT ... This tale concerns ALEX (log log decitrig) DORAN ... amply proportioned and genial Irisher with not even a trace of the Sligo brogue you would expect ... and who smokes something he calls tobacco in a pipe ... but which we, who suffer in anything but silence refer to in a manner much less complimentary ... ALEX completed a long tour of signoff ... then came the revolution and he went to days ... completing his trick in the middle of the afternoon ... for a change ALEX first day on the new trick added several dozen white hairs to the rapidly paling noggin of the studio super not to mention the chief engineer's blood pressure attaining a new and astronomical high ... This is what happened 3:30 PM rolled around as it usually does, and with it quitting time ... Mr. DORAN popped out of his chair with more alacrity than he had shown earlier in the day ... and he nonchalantly went through his shut down routine ... this at 3:30 P.M. Needless to say the reaction was immediate and loud fifteen secretaries in fifteen offices were rightfully shocked as fifteen wheels roared fifteen words all of them different and all frowned upon by the authors of the Blue Book for broadcasting With extreme presence of mind Mr. DORAN who by this time realized the carnage he had caused turned the switches back on ... and with his trusty pencil flourishing wrote that greatest of all panaceas in the log ... "West of Denver" even as you and I. ... Amen.

JEKYL AND HYDE TED PENNEBAKER ... bulbously pugnacious ex-WWJ'er and still a stalwart NABETian ... is between the horns of a After leaving the station TED connected with a local radio school as chief instructor ... and it couldn't happen to a better guy ... but here is where he gets into trouble ... As a member of management he hires help ... and when necessary reverses the process ... he decided who and how much is to be paid ... and he must do this with an eye toward profit Trouble trouble ... double trouble ... his union training and tendencies are at constant loggerheads with his position He can be seen almost any clear day ... sparring his way down the street in front of the school ... devising plot and counter plot ... one of his double chins sneering at the other ... His wife reports that in one night's sleep ... TED negotiated thirteen NABET contracts ... and broke an even dozen strikes ... Shall we pity the lad? ... In cadence now ... It's all in fun, TED ... Stop waving that copy of the Taft-Hartly bill embossed with the skull and cross bones ... it's bad for my blood pressure.

AFRA TID BIT ... Actually ... the next few lines have nothing to do with NABET ... but they do exemplify the good that organized labor can do when called upon to fill the breach ... This squib concerns an announcer one of the really good guys that are few and far between ... He was summoned ... one not-so-fine

BALTIMORE

This month marks the seventh anniversary of WITH. The station first went on the air in March 1941. The company celebrated the occasion by presenting the employees with individual birthday cakes decorated with the station's call letters, emblem, and seven candles.

March is also the month the WITH technicians choose their places in the vacation lineup. We work it out on a seniority basis with one man at a time on vacation. The choices went along pretty smooth until Al Rhine and Bob Parks names came up. It seems that they were both hired on the same date but later Parks was temporarily laid off for a few weeks to allow a returning veteran to get his job back. We had a seniority problem over which we had much heated discussion. John Lappe, Chapter Chairman, presented the problem to the National Office for their decision. They ruled that Parks had lost his equal seniority with Rhine at the time of lay-off.

WITH filed an application with the FCC for a TV station on channel No. 6 with an effective radiated power of 1.702 kw vis, 0.851 kw aur. A week later WCAO placed an application for the same channel with a power of 16 kw vis, 8 kw aur. Work has been resumed on WITH's FM location after a delay of a few months of winter weather. WFBR is putting up their antenna for their FM outlet. As soon as the tower crew is finished there they will erect WITH's antenna.

—Royce I. Heintz.

DETROIT—from Page 13

day through the little green door and was told, in effect his services were no longer considered indispensible to the station at large to we who knew him and well this action raised the question of a future our future to be explicit and to put it bluntly it was a Hell of an outlook. The AFRA boys felt strongly enough about the situation to make an issue of it said issue and said question were decided legally Let it suffice to say the announcer returned to work post haste and red faces were the order of the day they were becoming, too.

MORE WARM BODIES ROG ELLIS, chapter chairman and pride and joy of Boston's leading bean eaters recently did a fine job the results of which will materialize in a few short weeks at which time we optomistically and with extreme pleasure contemplate the addition to our chapter of two stations WJLB Detroit and its brother WBBC Bay City two low powered stations but with high powered ideas all of them good However premature this may seem WELCOME, gents.

HOLLYWOOD SPEAKS In the wee hours of March 24, 1948 ye scribe pulled the last switch shoved the last cigar butt under the MCR bay and took off for the tall timber home to me and my three females of assorted sizes and ages There I sat me down besides my hundred watter and after determining that all my spurious frequencies and harmonics were in the band proceeded to yell out a long CQ on a very dopey 20 meter band Imagine my surprise to hear a commanding voice calling W8IIA "Well for goodness sakes, that's me" I scream hilariously to the picture of Pres Mac which I have hung in front of the hole in the wall and in front of which I bow three times whenever I enter the room Because I couldn't think of anything else to do I answered this character calling me and it turned out to be W6TC of Roscoe, Cal., and who by his own admission weekly and with no thought of the hereafter accepts a check from ABC Hollywood he answered to the name of TED mayhap some of you western gentlemen who haven't a single scruple in the world will admit knowing him We had a nice little gabfest merely enough to whet the appetites of two NABETians and then good old twenty meters lowered the boom on us we both started making like a wispy cloud fading in and out like a peeping Tom at the boudoir window of the village belle as it was gently peeling (I think there's something incorrect with that spelling) In any event chewing with a brother union man over the span of the country approached in thrill the working of a new and rare country certainly wish a whole gang of chapters could get together on one frequency to exchange ideas telephone numbers insults or anything else that might pop into our cute mercenary little heads Anyone with an idea on this deal that stands a chance of being practical step forward bow your three times to Mac's picture and expound but good.

CALIFORNIA QSL (PINK VERSION) An unusual thrill awaited W8IIA that's me in yesterday's mail It came in the form of an official envelope the kind you get slugged five hundred iron stove lids for using without government permission Well its writer had permission he was none other than GET THIS Radio Engineer In Charge Santa Ana FCC Monitoring Station, California In substance the letter said Dear Mr. Lewis what the Hell you doing on 13999.037 calling KV4AA answer within three days A good reason was conjured up and sent but actually fellers when I heard the KV4 calling CQ I just whipped the VFO down there so fast I coasted right past the edge of the band but could I tell the FCC that story Oh, Brother!

POST MORTEM All for this month see you in thirty days.

DETROIT HAM CALLS

W8NKJ	Al Furget
W8UVH	Hal Heatly
W8ICM	Roy Miller
W8SX	Jim Norton
W8LNU	Mac Macausland
W8CAT	Dick McNutt
W8YKC	Vince Bartell
W8VOQ	Bill Ward
W8GTZ	Alex Doran
W8HFQ	Roy Bridgeman
W8FWT	True Oliver
W8IIA	Harry Lewis
W8FXA	Jack Strubank
W8NOH	Larry Heath
W8MDH	Wib Bruckner
W8DNT	Joe Brendel
W8WA	Al Allen
W8RRB	Dave Stewart
W8FPK	Al Sanderson
W8OHG	Bob Lynch
W8KJ	Ken Robinson
W8RTZ	Cliff Ries
W8ZMB	Gil Rix
W8OLK	Hal Dushane
W8TMS	Art Iverson
W8MCD	Morry LaBarre
W8KGW	Ted Pennybaker

There may be hams in our staff of forty-five or fifty most of the bodies warm who we've missed to these neglected gentlemen we apologize but it's a matter of speak up or forever hold your you know what We have a large party in our Detroit aggregation in fact most of the members are large parties but this boy is a LARGE large party and he recently took the fatal leap and took to himself an income tax deduction upon being asked was he or was he not active still referring to the ham list he responded that he was semi-active we assume that he, too, refers to the ham listings.

CHICAGO

By Minor J. Wilson

HERB WYERS has taken a six month leave of absence to nurse his ulcers in San Diego, Calif.

HUGH ABFALTER has been suffering from a badly infected eye where one of his youngsters scratched his eyeball with a fingernail. HUGH has been forced to resign as chapter secretary-treasurer; he is being replaced by LES WASHBURN. LES, there is a rule that all new secretary-treasurers must buy a drink for all ex-secretary-treasurers. The list is getting longer too, it now includes STURGIS, MILLS, CUMMINGS, WILSON, GOLDER and now ABFALTER. And perhaps another one or so I failed to recall.

Construction work on the television quarters in the Civic Opera building is well under way. Every one wonders about the details: Who will be in television, when and in what capacity. If anyone anywhere knows the information will be welcome.

We welcome two more new members of the ABC engineering staff, they are: R. S. BENNINGHOFF and H. L. Hale.

ROGER PARKER just returned from an out of town pick-up during which some one unknown picked up his suitcase. He is complaining about the dishonesty of some people while wondering how much of a claim he can get away with, since it was insured.

The North Shore Railroad is on strike and various engineers are getting to work as best they can by dog sled or otherwise.

DON FITCH is sporting a new Studebaker. ART HJORTH is still expecting a new Pontiac before vacation time. KERMIT SLOBB has a new Buick, while I am wondering if I can afford a new buggy for my baby.

THE NIGHT SHIFT

by W. J. McDONNELL, WLS/WENR Transmitter

It's midnight and the family has long since been in bed
When that doggone old alarm clock sounds off to wake the dead
I hurry to the dresser to still that hymn of hate
And stub my toe, bump my head, while both my shins I grate
My slumbering wife stirs restlessly and mumbles "awkward ox"
While I fumble around in the dark to find my shoes and sox
A cup of coffee wakes me up and I start out with the car
Wondering why the heck the company built the station out so far
Twenty-five miles from home to work on a highway rough and bumpy
By the time the station hoves in sight we're feeling awful grumpy
We look the schedule over for work that must be done
It's blow out, clean and dust, gosh aint we got fun!
We blow the dust from here to there and back to here again
The same thing happens every night, it seems so all in vain
When cleaning is done for another night and tools put away
We fire up the transmitter to start another day
The farmer, up since dawn, knows we will soon be with him
His cows won't let him have their milk unless he uses rhythm
We send them hoedowns, polkas, and folk songs from the hills
And soon the milk starts flowing and the pail quickly fills
Just think of all the starving kids if we had stayed in bed
And let the stinking dusting go and the radio stay dead
And so we'll keep on dusting to earn our 4-b pay
And dust each part, though dust returneth until the judgment day.

ROCHESTER

By Geo. Wilson and Don Anderson

Official, calendar Spring finds Rochester in the grip of a small snow flurry, one that just lets us know that Winter doesn't give up easily.

Walt Malone has opened up the old gravel pit and is resuming the sale of its contents in his spare time. As for Hank Boyce: he has a place now where he can rest up, having just completed the purchase of a whole point on one of the Finger Lakes. Hank being a bachelor, we can't help but wonder what he'll do with it now he has it. Ed Stiles, former part-time electrical contractor, has retired from such endeavors and is a simple radio man again. The other day the top blew off the truck he drove to work (don't ask *me* why he drove that) and he brought it in the transmitter house for protection. Looks very unusual, to say the least, like a voting booth without the levers. Alex Gresens and the above-mentioned Boyce have deserted the lads at the old transmitter in favor of installing the new one, which is nearly ready to go. These two are getting lots of practice for dog-house tenantry by crawling about the confines of the blower ducts installing high-voltage busses to the final amplifier. The last I saw of them they appeared to be doubling for Sitting Bull.

The men at Radio City are having their troubles getting used to their new set-up and are making the normal number of bulls that might be expected from such education. They certainly haven't the excuse of poor surroundings for any errors: for once, advertising brochures are not wrong. The place is really beautiful, as they will be the first to admit, and is most unique for Rochester, outstandingly fine for any city.

. . . All cannot be beer and skittles, however, for Gerry Hall has become the host for a pet ulcer. Rumor doesn't tell me what he has named it nor yet whether it's a girl or boy—or do those things have gender? Elmer Grabb has returned from a nemo trip to Fort Wayne, where he covered the Rochester Royals basketball games. Father, are nemo men taking the place of the old-fashioned traveling salesmen? Charlie Snyder, walking through a sporting goods department, found that a fish hook had attached itself to his coat. Well, a hook is no good without a line, which is no good without a pole, which is no good without a reel, which is no good without a boat, which is no good without—but why go on? He ended

HUDSON NEWS

By Al King

Flash! Jeff Smith, production supervisor, really lives up to his title—suddenly springing the news that he and Jane have a new off-spring. Can you imagine Smith keep a secret so long! Jeff is an ex-engineer.

The 1440 Club, W2WUM, is well under way on 20 meter c.w. Several contacts have been worked with good results. The rig was loaned by Jim Shannon (SE) and is capable of nigh on to a kilowatt. Receiver is an HRO. It's always easy to find an engineer now when we need one.

Al April (SE) recently made history when he was featured as "himself" on a mystery show called "Quiet Please."

Jack Geagan (building service manager) is lining up a golf tournament—if interested contact him.

Dennis Connor back from a vacation in Florida. Oh, well, the weather isn't too bad here now.

Glad to see Bob Bergen back on the job after a short illness —a few rounds of golf will be all Bob needs for the finishing touches.

WOR welcomes two new engineers, namely, Gene Walter (studio engineer) and James Long (who will be at our Transmitter). Might also add that John Paul Jones has been transferred from our recording department to the studios.

ROCHESTER—from Page 15

up by buying the whole outfit and, come summer, (happy word!) will find out whether he likes or hates fishing. Seems an expensive way to learn, no?

At WRNY a couple of new men have been added to the fold, Alderig Maraio and Doug Carveth. Can't report much on their personal life and habits, but welcome to Rochester and NABET anyway. (Did we or didn't we give that last man, Carveth, some publicity in a former issue? Aw, what's the use; you wouldn't know.) Ken Henderson, we are told, is another man with a business on the side, having opened a radio store. Just what he includes in his stock or how the venture is going hasn't been mentioned. The WRNY men have a rotating schedule that puts a man in the control room a while, where he quietly goes nuts, as all of us do at one time or another. When he's thoroughly pickled he goes to the transmitter for a rest, recovers, and resumes the CR tint and the process repeats. Seems like quite a good system. That way you don't have to be nuts all the time. Charlie Leniak was "taking the cure" at the transmitter when we called there last. Mr. Louis Whele, the owner of the station, sent each man on the staff a fifty-pound sack of Florida oranges, which were received with as much appreciation as there were orange-juice drips and you can figger out the mathematics of that for yourself. That gift would seem to take the boys out of the little squirt class.

Still haven't heard from WENY so can't give any news from there. None of those boys were able to make the last meeting, either.

At WHEC things have been both quiet and noisy during the last several months. The winter storms have done considerable damage to ham antennas; most of us can be now found climbing all over roofs and up trees and tall poles to set stuff right, and in many cases to rebuild, with improvements. Hence, 'ere long we'll be putting out with renewed vigor on our assorted meters with, we hope, more answers to our CQ's.

Leo Enright has purchased a new house near the shores of Lake Ontario. Naturally we wonder what gives, 'cause Leo is a bachelor—but Leo siz he isn't buying the house for the reason we think. On the other hand, there's Walt Lynch, who has given a ring to a YL in Elmira, and who spends all of his off-time in the Southern Tier City, and who drives the 100 miles between here and there like mad and tangles with all the speed cops en route. That's a lot of distance to travel to see a YL, but on the other hand, Wilson should talk, 'cause he seemed to find it worth while to fly 500 miles to Cincinnati. Since we're on the subject of transportation it might be interesting to note that during the past year four new Mercurys have appeared in the engineering department—sounds like reduced rates for mass buying. The owners are Enright, Ed and Walt Lynch, and Chief Engineer Bern O'Brien. The rest of us just drive cars, period, although Fran Sherwood put a new motor in his Mercury for the trip to Florida to record stuff for the sports department at various spring baseball training camps.

If we have any more nemo jobs we might as well rent out our studios to relieve the GI housing shortage, or convert them into radio repair shops, or even install a suds fountain.

HAPPY THOUGHT DEP'T: it's nearing time for our summer vacation weeks: and 73 from WHEC.

The WHFM men are happy lads these days. After lo, these many years of using both hands, both feet, the head AND a broom all at the same time, they have finally lost all programming facilities to Radio City and have become Transmitter Men, pure and simple. The last part comes from their previous occupations as mentioned above. Tony DeLucia is hiding his head just a little after *not* winning the prize for his model aircraft. He hasn't flown the doggone thing yet, radio controls or not. Wonder if he doesn't think it's the best plane in the United States, either? Bob Brethen and Anderson are having some merry times deciphering the instruction book for the new Western 10 Kw. FM transmitter, which last has arrived in town but as yet has no home. Though all legal details for putting the FM and TV transmitters on Pinnacle Hill are in the past, the actuality of a building to house them has not been accomplished as yet. Well, *them* days *will* come: look at Radio City and the time it took to build that!

Seems like that's all from here with the exception of saying we're dawgone glad to see that Hollywooden man, Dewes, is back in these pages. 'Member when we wondered, in print, what had happened to him (and Mabel)? Ya spose that was what brought him back?

The Rochester Chapter was saddened by the death March 29th of John Vrindten, due to virus pneumonia; his capable work and wholehearted friendship will be missed by all who knew him.

WASHINGTON

By Warren Deem

Five new men are welcomed into WNBW engineering staff. Jim Butts is one of the men and comes to us from the WRC studios. Jim is from Iowa—way out West there. Next is Ed. McCaul, a new Group 10 Student. Ed is 23 and was in the Navy during the war and formerly was with WBCC. He is married and congratulations will be in order next August for the expected new heir in the family. Gene Beall is from South Carolina and is a newly appointed Group 12 engineer. He was previously with WFIG and was 22 on the 22nd of February. Bertram Schatz, an ardent camera fan is now at the Mastercontrol of WNBW. He was with WSAM in Michigan previously. He originally hails from Philadelphia. Bertram is a former CREI student and is a Group 12 engineer, and Carroll Balstad, a CREI Television graduate and formerly with the WRC Studios, is now working at WNBW.

Vern Sweiger is now on his way to Group 12 after being appointed as a Group 10 student. Hope you make it soon, Vern.

WPIK Engineers are getting primed for their vacations that are going to start the first of May and continue until the fellows all have their Florida tans even if they are obtained in their own backyards here in town.

Things are shaping up for WPIK's new 20 KW FM Transmitter. All the men working at WPIK are anxious to see it in operation.

Charlie Kasmir, a former WPIK engineer, is doing nicely in his new position with Abby Radio.

(To page 18)

BOOK REVIEWS

Broadcast Operator's Handbook, by Ennes of WIRE, published by John F. Rider, 288 pages, $3.30.

This text is the first of its kind we have seen, describing some of the actual mechanics of broadcast engineering operations. His discussion of piano pickups in particular, was found to be interesting and helpful. The entire text bridges the usual gap in the literature covering the engineering design and development of broadcast equipment, and its practical operation and use.

The text covers studio control room and master control operation, and transmitter operation. A good part of the text is devoted to maintenance and transmission engineering functions. The most pertinent book on "broadcasting for the broadcaster" that we have seen, and obviously worth $3.30.

FM Transmission and Reception, by Rider & Ulsan, published by John F. Rider, 416 pages. Cloth binding $2.70; paper, $1.80.

This Rider text on FM covers the principles underlying the operation of the complete FM transmitter and receiver. The first section discusses both the narrow-band and wide-band transmitters for service in TV, ham, aviation, police, etc. Both direct and indirect FM theory is explained as well as a complete coverage of transmitting and receiving antennas.

The second section of the text covers each stage of an FM receiver in terms of its counterpart in the AM receiver. Special attention is given the four different types of FM detectors as well as the FM tuners marketed today. Various phases of the servicing problem is gone into. The recent FreModyne circuit is briefly discussed. FM is here to stay, it appears, and this text will ease the transition for the AM technician. Worth the money.

WASHINGTON—from Page 17

Charlie Meng is now working for the WMAL television station. He was formerly a WPIK Engineer.

Herschel Stark from WOL transmitter is a contest fiend it all started when he won a "speed iron" in the John Rider contest. Now he has the contest fever and has more clippings than Carter has pills.

Lewis Parrish enjoyed his vacation last March. He saw most of Virginia and North and South Carolinas.

Bill Cornnell is the proud owner of a new Fleetline '48 Chev. His spare time is "shine, shine, shine." Bill is no poker player and so on Presidential trips he takes the upper bunk-leaving the lower one to Keith Williams.

The reason that this column is so short this month is because I am enjoying a two week vacation. More next month!!

Excerpts from FCC Chairman Coy's Speech at the I. R. E. Banquet, New York — 1948.

The IRE Annual Convention was held at the Commodore and Grand Central Palace, New York, March 22nd thru 25th.

Always important, are the comments made by the FCC Chairman in his address before the banquet. Chairman Wayne Coy said, "Your own future as members of the radio engineering profession is bound up with the way we decide radio's fundamental problems." Further, "Radio has always been an international problem but in these days of expanded use, varied application and more powerful beaming, planning on a global scale has become paramount. This year, for example, there are 15 international radio conferences." And, "Heretofore, nations have staked a claim to frequencies on a first come, first served basis. The method was haphazard, wasteful and unfair. The Atlantic City conferees junked it. They agreed instead to allot frequencies to their stations by means of engineering principles. That step was a triumph for the engineering profession." "Many new uses of radio were provided for in the Commission's 1945 frequency plan. One of these new uses, for example, was the Citizens Radio Service—a personal short range two-way radio service in the 460 to 470 mc band for use by the general public. The Commission has just given its type approval to the first transceiver for this new service. This means that as soon as this first type-

(To page 20)

NEW YORK NEWS

First father-and-son combination in NABET has been brought to our attention. Pop Durkin, ABC-New York SE; Son Durkin has been employed by NBC-New York Television! Are there others we haven't heard about???

Some discussion of check-off system of collecting our dues in lieu of present tooth-pulling system; advise your councilmen of your preference.

Hank Kenny, NYMC, getting set to get back on the air; already has SX-42, ARC-5 transmitter; will advise his call as soon as issued.

Jerry Sellar doing a bit of original research at his ham shack (W2ALB) with TVI; definite signs of useful results; more later. Neighbor-TVI reduced to the point where he installed a TV set *in the shack* for the final refinements.

Much talk of ABC television starting up; where and when unknown.

The three New York NABET Chairmen (Clark, States, Westover) and Exec. Sec'y Hiller in 4-way exploratory talks on NABET unification in the New York metropolitan area. ABUG in New York doing excellent job of cooperation on common problems (notably the recent FCC-Mayflower hearings). These NY-ABUG meetings are participated in by Messrs. Hiller, States, Clark, and Westover, as time permits. We hope to be able to inaugurate an ABUG-CRAC-CBGU Activity column, as a means of getting the results, if not all the operational details, on to the membership.

—o—

Labor History — VI

(*From the Labor Information Bulletin*)

Most of the gains made by organized labor in the mass-production industries during World War I were lost in the rapid decline of union strength which started with the recession of 1921-22 and the movement for wage reductions which a wave of strikes failed to check.

Because of the success of large-scale attacks by antiunion employers in many industries, the 20's became known as the "open shop era." Antiunion techniques ranged from welfare measures to repression and the widespread use of spies and strikebreakers.

From 1920 to 1923, union membership fell from about five million to about 3½ million. The decline continued after industry entered a period of rapid and unprecetented expansion. In 1929, at the height of "prosperity," union membership was only 3,625,000.

Of the 105 international and national unions in the AFL in 1929, only 44 had held their own or expanded after 1925. The depression and widespread unemployment which followed the October 1929 stock market crash further reduced union membership to 3 1/4 million by 1932.

Trade-unionism began to revive after enactment of the National Industrial Recovery Act in the spring of 1933. Section 7 (a) guaranteed the right of employees to organize into unions of their own choosing and to bargain collectively with employers. The revival brought a tremendous influx of new members from the mass-production industries. Workers in the automobile, rubber, cement, and aluminum industries were

FCC CHAIRMAN COY
from Page 18

approved set gets into production, the public can start enjoying this new type of radio service. Having given type approval, the Commission will make it very simple to get a station license." And at another point, in essence, Coy pointed out that radio services must be reasonably assured that their frequency assignments are secure. "We know the American public accepts television, and it is the duty of the Commission to provide allocations so all the people may receive this service. I can be more explicit. A solution of the present sharing arrangements will not serve to make the available television frequencies any more adequate for 'a truly nation-wide and competitive system of television' than they are now. If my predictions come true, I expect to see all television channels in the nation's 140 metropolitan areas assigned within the next 12 months. Can we be satisfied with a metropolitan television system in the United States? I cannot conceive that anyone can answer that question in the affirmative. If we cannot devise plans for 'a truly nation-wide, competitive system' of television for the next generation, we are not worth our salt." Further, "In the first place, the Commission has pointed out the present inadequacy of channels. Secondly, it has pointed out the importance of adequate experimentation in the high band. And I now want to point out that the Commission has not had made available to it adequate information as to the characteristics of the 'so-called high-band televisoin' (475 to 890 mc) to enable it to write detailed standards for such a service. We at the Commission must look to the industry for more rapid developments in this area. It is an urgent matter. Soon, all presently available frequencies will be assigned. Even then, many people who want television service and who should have it, will not be able to get it. Hundreds of broadcasters who want to get into the television business will not be able to do so. Are you and we going to sit heavily while this happens?" And in Chairman Coy's discussion of spurious emissions and unwanted harmonic radiations, he said, "I should like to impress upon you the seriousness of this problem, and ask you as engineers to consider as incomplete, any transmitter design which fails to include adequate provision for such suppression. As to receiver design, it is evident that many present broadcast receivers in particular, are deficient in regard to the suppression of oscillator radiations and in selectivity. Perhaps your efforts and ingenuity will result in simpler and more effective methods than are now available, . . ."

o

I. R. E. Inaugurates Professional Group System

Plans are now going forward for the inauguration of several professional groups within the I.R.E. as a result of action taken by its Board of Directors during its recent National Convention. Groups whose organizations are now being promoted include an Audio, Video and Acoustic group and one for the Broadcast Engineering field. Other groups are anticipated to provide a further integration of the vastly expanded fields of communications and electronics into areas of special technical interests.

LABOR HISTORY—from Page 19

rapidly organized on an industrial basis and taken into directly chartered Federal labor unions.

During 1933 and 1934, many national and international unions of the AFL also made substantial gains in membership. The International Ladies' Garment Workers' Union increased its membership from 40,000 to more than 150,000; the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers from 94,000 to 130,000; the International Association of Machinists from 75,000 to 90,000; and the United Mine Workers from 300,000 to nearly 500,000.

These gains were temporarily halted by Supreme Court invalidation of the NIRA in May 1935, the rapid spread of empleyee representation plans established primarily to combat the spread of unionism, and employer hostility to the National Labor Relations Act of 1935.

However, after the Supreme Court validated the NLRA in April 1937, organized labor made even more phenomenal advances. By the end of 1937, the Teamsters reported a membership of 210,000, or three times that of 1933. The Machinists and the Brotherhood of Electrical Workers doubled their 1933 membership. The Hotel and Restaurant Employees' union expanded from about 25,000 members in 1933 to 107,000 in 1937.

Meanwhile, the issue of industrial versus craft unionism brought about an internal struggle in the AFL.

The 1934 convention at San Francisco unanimously adopted a resolution declaring that in the mass-production industries new methods had been developed for organizing workers whom it had been "most difficult or impossible to organize into craft unions."

The executive council was directed to issue charters to national and international unions in the automobile, cement, aluminum, and other mass-production industries "as in the judgment of the council may be necessary to meet the situation." It was indicated that the rights of existing trade-unions would be recognized and that organization along craft lines would be retained in those industries where the lines of demarcation between crafts were distinguishable.

During the following year, the AFL granted charters to unions in the automobile and rubber industries. In defining their jurisdiction the council specifically excluded certain skilled craftsmen and maintenance employees coming under the jurisdiction of other unions.

WHAT MAKES A GOOD RECORDING BLANK GOOD*?

PREPARATION OF RECORDING LACQUER

Quite apart from the chemistry of good recording lacquer are the mechanics of tailoring it to the coating process and to the requirements of the disc itself.

Control of coating uniformity and elimination of objectionable outer-edge ridge demand, among other things, laboratory-accurate viscosity control. The correct amounts of solvent must be mixed into daily supplies of new lacquer. Electric agitators then so thoroughly stir this mixture that uniform viscosity is assured throughout the entire system. There is thus no possibility of hard or soft spots on any Soundcraft disc.

Because the high viscosity of fine-grain lacquer retards natural dispersal of air bubbles, *forced* debubbling methods are necessary. Soundcraft combines two methods, each of which alone is usually considered adequate. First, the lacquer is subjected to vacuum; second, it is allowed to rest. This double debubbling removes not only the visible bubbles, but also the noise-making *invisible* ones.

Commercial lacquer ingredients often contain hard foreign particles dangerous to styli. While the larger of such particles are commonly removed by conventional cloth and paper filter presses, Soundcraft uses two additional stages of filtering—first, coarse porous stone filters, then fine ones right at the point of coating—to trap microscopic particles even as small as one micron.

Elaborate preparation to be sure, but what better way to assure a good recording every time?

**No. 5 of a series *Watch this space for succeeding ads on how Soundcraft discs are made.*

REEVES Soundcraft CORP.

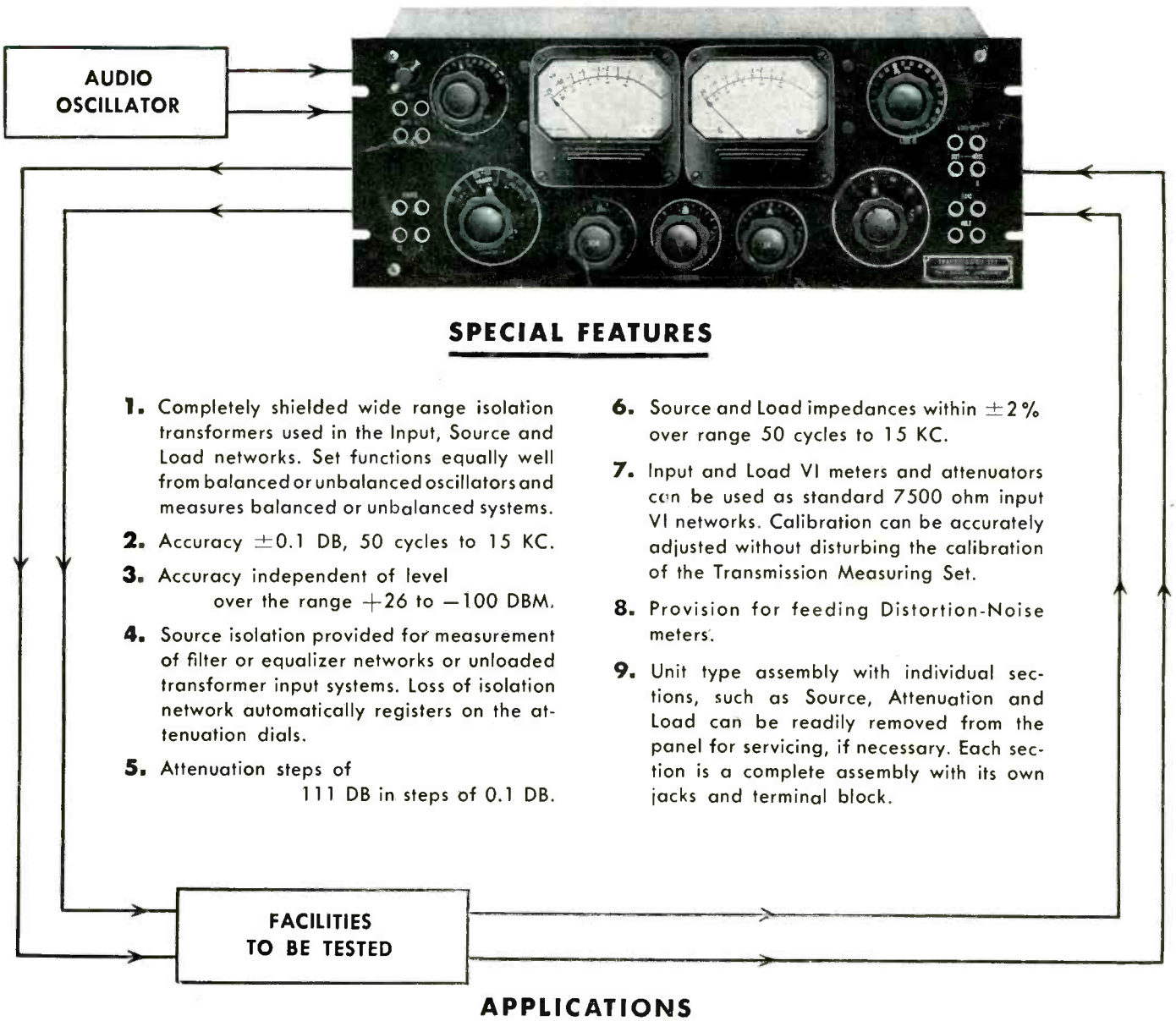
10 EAST 52nd STREET • NEW YORK 22, N. Y.

The 'Broadcaster' The 'Playback' The 'Audition' The 'Maestro'

VERSATILE *New* TRANSMISSION MEASURING SET*

Frequency Range 30 CY to 17 KC

This gain set has been designed for the accurate and rapid measurement of the transmission characteristics of audio systems and their components. It is a direct reading instrument, entirely eliminating laborious calculations and complex set-ups. This unit is arranged so that the meters and their associated range controls can be independently used as VU meters in program monitoring.



SPECIAL FEATURES

1. Completely shielded wide range isolation transformers used in the Input, Source and Load networks. Set functions equally well from balanced or unbalanced oscillators and measures balanced or unbalanced systems.
2. Accuracy ±0.1 DB, 50 cycles to 15 KC.
3. Accuracy independent of level over the range +26 to −100 DBM.
4. Source isolation provided for measurement of filter or equalizer networks or unloaded transformer input systems. Loss of isolation network automatically registers on the attenuation dials.
5. Attenuation steps of 111 DB in steps of 0.1 DB.
6. Source and Load impedances within ±2% over range 50 cycles to 15 KC.
7. Input and Load VI meters and attenuators can be used as standard 7500 ohm input VI networks. Calibration can be accurately adjusted without disturbing the calibration of the Transmission Measuring Set.
8. Provision for feeding Distortion-Noise meters.
9. Unit type assembly with individual sections, such as Source, Attenuation and Load can be readily removed from the panel for servicing, if necessary. Each section is a complete assembly with its own jacks and terminal block.

APPLICATIONS

1. Audio Gain Measurements.
2. Audio Loss Measurements.
3. Complex Circuit Measurements.
4. Measurements of matching and bridging devices.
5. Measuring Mismatch Loss.
6. Frequency Response Measurements.
7. May be used as two Volume Level Indicators.
8. Provision for feeding Distortion-Noise meters.

***Always Specify Daven* For Precision Equipment**

*Patent Pending

THE DAVEN CO.
191 CENTRAL AVENUE
NEWARK 4, NEW JERSEY

This unit was developed in cooperation with the General Engineering Department of the Columbia Broadcasting System.