THE BROADCAST ENGINEERS' JOURNAL
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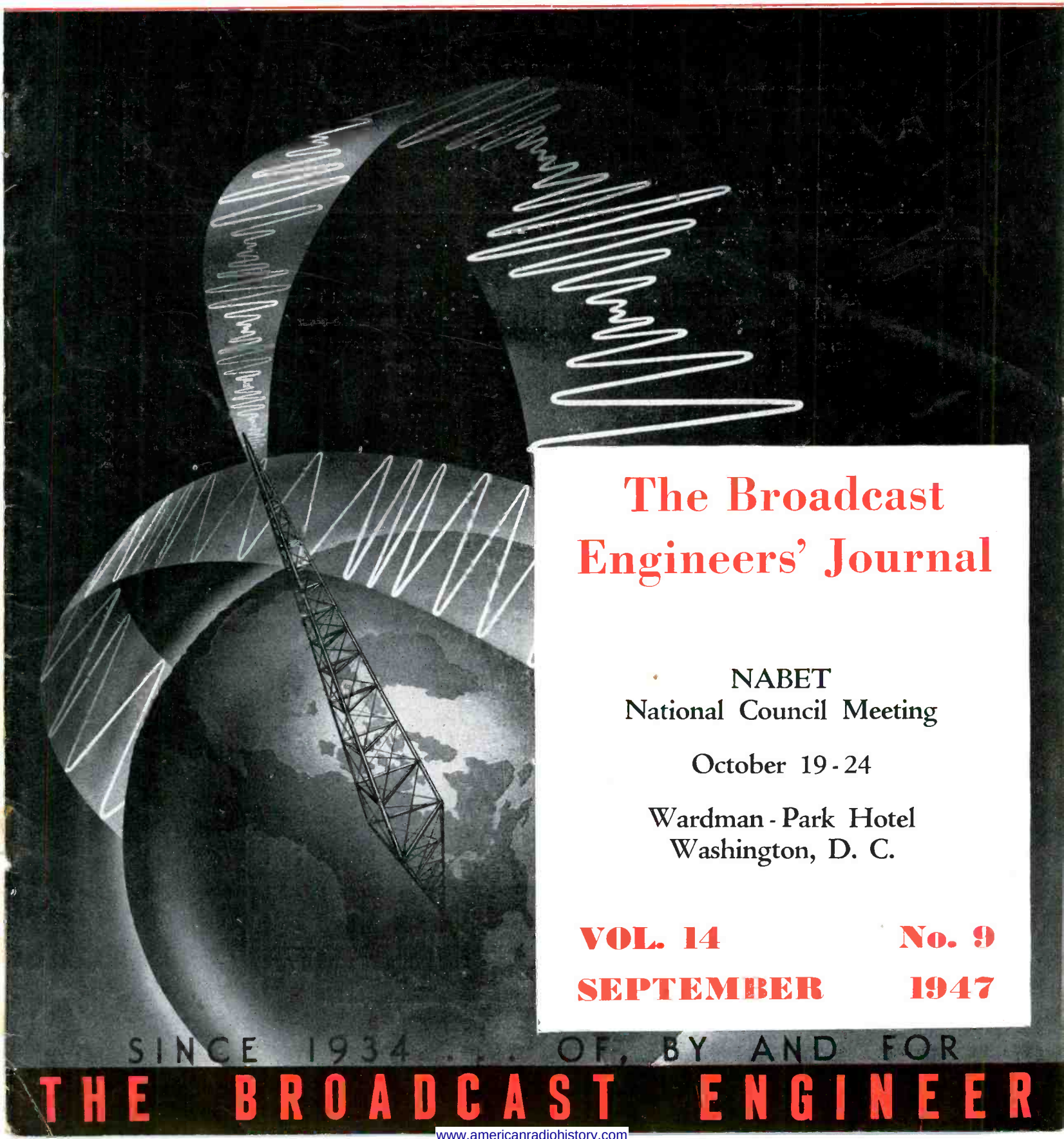

The Broadcast Engineers' Journal

NABET
National Council Meeting

October 19 - 24

Wardman - Park Hotel
Washington, D. C.

VOL. 14 No. 9
SEPTEMBER 1947

SINCE 1934 . . . . OF, BY AND FOR
THE BROADCAST ENGINEER

A Major Advancement in the Recording Blank Field . . .

10 Year Guarantee

GOULD-MOODY PROFESSIONAL QUALITY "BLACK SEAL" ALUMINUM INSTANTANEOUS RECORDING BLANKS . . . . AT NO INCREASE IN PRICES!

After prolonged research and experimentation, we have introduced technological improvements into "Black Seal" blanks that not only increase the life span, but materially enhance the other fine characteristics of these blanks. And so positive are we of the performance of these perfected "Black Seals" that we've placed an unconditional guarantee of ten years on each one of them.

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Whether you're a recording engineer in New York, Burbank or Witchita . . . no matter how well satisfied you are with your present blanks — you can't afford to be a recording isolationist now. Try these new Gould-Moody "Black Seal" blanks. Cut a few. If, for any reason whatsoever, you do not like them, you can return them at our expense.

GOULD-MOODY'S PREFERRED RESHARPENING SERVICE
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RECORDING BLANK DIVISION — 395 BROADWAY, NEW-YORK 13, N. Y.

THE BROADCAST ENGINEERS' JOURNAL

Ed. Stolzenberger Editor and Business Mgr.

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Volume 14, No. 9 September, 1947

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NATIONAL N.A.B.E.T. OFFICE
Room 501, 66 Court Street, Brooklyn 2, N. Y.
A. T. Powley, President

NABET Activity

* **President Powley** has recently returned from renegotiation of a new two year contract at **WGRC, Louisville,** with guaranteed increases; he has also renegotiated a new two year contract at **WLEE, Richmond,** with $6/week increases. A new contract was negotiated locally at**KFKA, Greeley, Colo.** The contract has been signed by Pres. Powley, and gives the KFKA NABET engineers increases up to $12/week. The 14th Annual NABET National Council Meeting will meet Sunday, Oct. 19th, at the Wardman-Park Hotel, Washington, and will be in session through Oct. 24th.

* **RCA reports** first half 1947 gross 52% higher than same period of 1946. Net income after taxes was 57% higher than 1946 period; and the earnings applicable to common stock dividends increased 77% to 52c, or 420% in excess of the half-year 10c dividend requirement.

* Veterans reemployment rights, and the rights of those now entering the armed services, are not affected by the Joint Resolution passed by Congress terminating the war and the national emergency; persons entering the Merchant Marine after July 25, 1947, are not so protected, however.

* Bouquet . . . the following letter is typical of "NABET Standard Service":

"Chairman, New York Chapter

On behalf of the members of the RCA Victor/NABET group of New York and Chicago, I wish to take this opportunity to extend to Mr. Allen Powley, our President, and Mr. Harry Hiller, our National Secretary-Treasurer, a vote of thanks for the wonderful help and assistance they gave us in negotiating our contract with the Company which was signed as of May 1st and continues to Sept. 1st, 1948.

They gave their time willingly and at unusual hours both day and evening to help us obtain a better wage setup and working conditions which our members are now enjoying.

Again thanking them and NABET from all our members,

Sincerely,

(signed) Fred A. Lynch, RCAV/NABET Councilman."

* **From the Labor Information Bulletin, June:**

Wage-Hour Field Set-Up is Reorganized
Regional Offices Cut From 13 to 9; 63 Other Stations

A reorganization of the Wage and Hour and Public Contracts Divisions necessitated by the recent budget cut shows 9 regional offices, 40 field offices, 22 itinerant stations, and a territorial office in Puerto Rico, William R. McComb, Administrator, has announced.

Before the reorganization, there were 13 regional offices, 56 field offices, and territorial headquarters in Pureto Rico.

Under the telescoped plan of operations, the 40 field offices will be staffed to give full time service to the public, but the itinerant stations, many of which were formerly full time offices, will serve primarily as headquarters for a limited staff of inspectors. The public will be served at these stations only by appointment, since it will be necessary for the men to be in the field most of the time. As under the previous set-up, individual inspectors will be stationed in highly industrialized cities in each State as a means of economizing on travel.

Regional offices in Richmond, Va., Atlanta, Ga., Nashville, Tenn., and Minneapolis, Minn., have been reduced to field offices.

The new field office organization follows:

Region I—Boston field offices: Hartford, Conn.; Portland, Maine; Providence, R. I. Itinerant stations: Springfield, Mass.; Rutland, Vt.

Region II—New York field offices: Syracuse, N. Y.; Buffalo, N. Y.; Newark, N. J.; Camden, N. J. Itinerant stations: Rochester, N. Y.; Albany, N. Y.

Region III—Philadelphia field offices: Baltimore, Md.; Pittsburgh, Pa.; Charleston, W. Va. Itinerant station: Wilmington, Del.

Region IV—Birmingham field offices: Jackson, Miss.; Richmond, Va.; Nashville, Tenn.; Atlanta, Ga.; Jacksonville, Fla.; Columbia, S. C.

Region V—Cleveland field offices: Toledo, Ohio; Louisville, Ky.; Columbus, Ohio; Cincinnati, Ohio; Detroit, Mich.; Grand Rapids, Mich. Itinerant station: Marquette, Mich.

Region VI—Chicago field offices: Indianapolis, Ind.; Minneapolis, Minn.; Milwaukee, Wis. Itinerant stations: Madison, Wis.; Peoria, Ill.

Region VII—Kansas City field offices: Des Moines, Iowa; Omaha, Neb.; St. Louis, Mo.; Denver, Colo. Itinerant stations: Fargo, N. Dak.; Huron, S. Dak.; Casper, Wyo.

Region VIII—Dallas field offices: Houston, Tex.; New Orleans, La.; Oklahoma City, Okla.; Little Rock, Ark.; Albuquerque, N. Mex.; San Antonio, Tex. Itinerant station: El Paso, Tex.

Region IX—San Francisco field offices: Los Angeles, Calif.; Seattle, Wash.; Portland, Oreg. Itinerant stations: Butte, Mont.; Spokane, Wash.; Salt Lake City, Utah; Boise, Idaho; Phoenix, Ariz.; Reno, Nev.

North Carolina—Raleigh.

Puerto Rico—Territorial office. Itinerant station: Mayaguez, P. R.

Washington, D. C. field office, Department of Labor Building, room 5414.

Major Wage Cases Settled Without Strikes

A number of significant settlements providing for overall pay increases equivalent to about 15 cents an hour have been made since April 24 in some vital industries, the Bureau of Labor Statistics reports. These major agreements were reached without work stoppages. Following the wage pattern set by the United States Steel Corp. and the United Steelworkers—CIO, other steel companies, including the Jones & Laughlin Steel Corp., the Bethlehem Steel Corp., and Republic Steel agreed upon an increase of 12½ cents per hour and 2½ cents additional for "fringe" adjustments.

General Motors and the United Automobile Workers—CIO announced on April 24 an agreement covering 220,000 production workers, which provided an 11½ cents hourly pay increase, 6 paid holidays (equivalent to 3½ cents an hour) an improved vacation program, and a liberalized "call-in-pay" system. Two days later about 85,000 production and salaried employees of the Chrysler Corp. were benefited when that corporation signed a similar contract with the UAW.

General Electric Corp. and the United Electrical, Radio and Machine Workers of America—CIO, agreed to a 15-cent wage "package" for 125,000 workers on April 26. This settlement was similar to the wage formula adopted earlier by the union and the two other large firms in the industry—Westinghouse and General Motors electrical divisions. The International Harvester Co. and the United Farm Equipment and Metal Workers Union—CIO, representing 32,000 members, settled for a wage increase totaling 15 cents an hour.

Laws Held Not Cure-Alls in Labor Relations
"You Cannot Legislate Maturity," Houston, of N. L. R. B., Declares

"Compulsion by Government decree is not the answer for American labor relations," said National Labor Relations Board member John M. Houston, before a joint meeting of unions affiliated with the American Federation of Labor, the Congress of Industrial Organizations, the International Association of Machinists and the railroad brotherhoods, in Wichita, Kans.

Houston described experiences with compulsion in Kansas, Australia, and New Zealand, and concluded: "A system of compulsory arbitration, by any name, is incompatible with our deep sense of freedom; it cannot live alongside or at the end of the collective bargaining process; it cannot arbitrarily or intelligently be imposed on certain areas of our economy, to the exclusion of others; and, finally, it stimulates rather than settles labor disputes."

Experience and Right Approach Needed

Discussing various considerations that should be all-important in approaching legislation in the field of labor relations, Houston stressed two points:

(1) Orderly adjustment of labor relations cannot be based on radical changes which either destroy established patterns or which impose techniques foreign to the parties involved. Orderly conduct of labor relations can be derived only from a maturity in which past experience has demonstrated to the parties the most desirable principles and techniques.

(2) If we advance labor relations proposals from the standpoint that we must be punitive, then our labor relations program is doomed to failure. Our entire program should be shaped by the philosophy that punishment is not what we are seeking; we are seeking a constructive and positive approach.

The most desirable role of Government in labor relations, he stated, is simple and direct: The Government should seek to strengthen the relationship between management and labor. It should foster cooperation and not rely on official edict. It should place its emphasis on the worth and promise of free collective bargaining.

Bargaining Not at Fault

Houston declared that our current difficulties do not derive from the fact that we have chosen collective bargaining as a national policy. Nor do we have labor problems today because we have too much collective bargaining. "On the contrary," he said, "where we do have difficulties they are usually due to the fact that we have not had enough experience with collective bargaining. In some areas, the techniques of collective bargaining are unknown; in others, too much is expected from collective bargaining; in some instances, either party is not contributing his share to the enterprise of collective bargaining; and, also, we still have with us those who wish to return to the 'good old days' when the employer had the unlimited right to fix the conditions of men's labor and to interfere with their rights."

As to the future of collective bargaining, he concluded, "We can expect more maturity in collective bargaining if it will be given a chance; we already see growing evidence of this in some of the recent and current negotiations. To the extent that this philosophy of self-government, leadership and responsibility develop in labor and industry, to that extent there will be less need for reliance upon laws. After all, you cannot legislate maturity; laws in themselves are not cure-alls for troubled human relations, whether they are labor relations or family relations. No matter how wisely

fashioned, laws may tend to substitute rigid controls for the realistic and good-faith proposal and counterproposal of collective bargaining.

Bargaining Requires Social Responsibility

"As to the parties to the collective bargaining process, they must bring sanity, moderation, and tolerance to the bargaining table. They must realize that even an imperfect collective bargain is better than one tendered by some governmental agency. Only in this way will they learn to bear full responsibility for their product. Only in this way can they secure the necessary sense of social responsibility and forebearance which collective bargaining requires. They must realize that collective bargaining can succeed only where labor and management want it to succeed."

Nearly 15,000,000 Work Under Union Contracts

Of the 31,000,000 workers in this country who are engaged in occupations in which the unions have been organizing and trying to obtain written collective-bargaining agreements, 14,800,000 workers were employed under such agreements in 1946, a Bureau of Labor Statistics study reveals.

The number of production workers in manufacturing who were covered by agreements declined from the previous year, but the number in non-manufacturing increased. This was partly due to a reduction in employment in industries well covered by union agreements. In non-manufacturing industries the increase was due to higher employment in well-organized industries.

The greatest change shown in the nature of contract coverage was in the automobile industry. In 1945 over half of the covered workers were under maintenance-of-membership provisions. In 1946 the proportion dropped to about 10 percent, and of these, one-third were covered by union-shop requirements, a fourth by sole-bargaining arrangements, and another fourth by maintenance-of-union-dues requirements.

NABET protests rumored "third-class" licenses . . . President Powley has sent the following letter to the FCC:

Dear Mr. Denny:

In a recent issue of Broadcasting Magazine, I note with alarm an item stating that the Federal Communications Commission is planning the revision of requirements for licensed operators. On behalf of the National Association of Broadcast Engineers and Technicians, I wish to enter a protest against the proposed rules governing the issuance of new telephone operators' licenses as outlined in the above mentioned magazine.

The action of the National Broadcasters' Association in attempting to influence the Commission in this instance is for one purpose only, — to lower the standard of radio telephone operators in order that they may be hired at a decreased salary rate.

An example of these methods practiced by independent stations was pointed out by me in a letter to Mr. Dallas Smythe, Chief Economist of the FCC, dated February 21, 1946. In this letter I cited a case at Radio Station KPHO, Phoenix, Arizona, where first class operators were discharged and third class operators were hired in their place. The manager of this station was taking advantage of the Commission's Order 91-C, which was then in effect. I have no doubt that if the new proposed requirements are put into effect, many first class operators will be replaced by third class license holders.

As a former holder of a first class, first grade license, I am, and always will be, proud of the profession as is every Radio Technician in our organization. We do not wish to see the present standards lowered, but suggest an upgrading which tends to improve Radio Broadcasting.

In conclusion, I wish to request that men directly affected, be heard in the matter of required license revisions.

Yours very truly,
(Signed) A. T. Powley
President

The following item was received by the New York Chapter Chairman and is published for the information and consideration of the membership:

NABET needs new ideas, fresh approaches to its problems and modern thinking along lines dictated by the progress of our industry. Streamline NABET — remove the hindrances of an out-moded constitution; rejuvenate a healthy national spirit (or create same if necessary); inspire individual sense of duty and responsibility among membership; establish aggressive policies on all matters and adopt a "moving forward" attitude; formulate nationally uniform policies in our industrial relationships; advertise and propagate ourselves; assume a position of prestige and weight in the industry — in the nation — and lead the way to dignified, high-level union and association activities among all professional and technical personnel — set the pattern so to speak.

Constitution — Prepare a new one — to the point, with authority and teeth — that will enable the association to function as it should.

Executive Board — should be created by all means. Essential to assist the president, advise him, and see that the business of the association is properly conducted — according to the constitution and the wishes of the membership. To act in national authority on major issues, crises, and all important business. Its proper functioning should eliminate National Council meetings except on a once-every-three-years basis — or to be called at the discretion of the Board or the membership.

Dues and Assessments — It would be greatly advantageous if the strike fund assessment (20%) were to be voted out and reestablished as a dues increase. NABET needs the funds for important service activity and a strike fund to properly serve an organization the size of ours would require years to establish — only to be swept away by **one** major strike. Hence — it is first come, first served and the rest of the membership has no strike fund left. Increases in all operating expenses — hotel rents, transportation fares, restaurant meals, legal fees, office rent, telephone bills, etc. — all add up to a need for increased National Office income. Our National Council meetings grow more expensive each year due partly to the above causes as well as increases in salaries of our councilmen and growth of the organization. In addition to converting the 20% strike fund over to regular dues, by holding the National Council meeting every three years a saving of at least sixteen to eighteen thousand dollars would be effected. This sum could well be used to support another National Representative. The 1946 National Council meeting cost NABET members roughly eight thousand dollars — and its work went for naught due to an inadequate constitution, plus a lack of general membership interest that resulted in a short vote. This points up the dire need of a new constitution and an executive board.

National Officers — With the new contract increases in

(Continued on Page Six)

force, it should be expected that at least the highest contract salaries should apply with respect to salaries received by National Officers of NABET. An employee of NABET is expected to be a qualified engineer to assure proper representation of the membership and a complete understanding of the problems of the industry. Such employees have no accrued company benefits, no low-rate insurance, no guaranteed vacations or regular days off — no regular five-day week, repeated interruption of normal home life, no travel allowances, no overtime, no severance pay, no night differential, plus the headaches of what often is a distasteful job. It should be very worthwhile to the membership to have sincere, capable men in these positions. The NABET officers should become professionals in their own right — following a career of service to the broadcast engineer — indefinitely. The proposition offered NABET employees will have to be attractive in order to guarantee continued, experienced service from qualified men willing to do the job.

Organization and Expansion — Unless the National Office receives increased funds to work with, we shall have to greatly diminish our plans to expand nationally. We shall find ourselves able only to carry on organizational activity within the immediate vicinity of our present chapters and sections. Our present funds will permit barely adequate service to the existing membership — with no, or little, reserve to combat lengthy grievance cases or face other expensive litigation. Shifting the present strike fund to dues and holding National Council meetings once every three years (or perhaps less often) — assuming an efficient Executive Board — should provide funds for moderate additional expansion activity as well as the establishment of another National Representative.

Policies and practices — We need to formulate national policies on such things as: job qualifications (experience, training, licenses), relations with other unions, part-time or temporary employees, unemployed members, national seniority, company seniority, "pay-for-experience" and other contract clauses, and many other items.

Education and Information — Our members need more information about NABET activities, National Officer activities, industry developments, employment trends, Chapter activities, National Office problems and their solutions, etc. The membership should be educated on the principles of unionism, labor laws, labor movement in general, activities that effect us in other industries.

The Journal — Here is our sharpest weapon, our biggest flag, our handiest tool, our propaganda vehicle, a tremendous potential source of news, information, education for the membership as well as a means of dissemination of the gospel of NABET to all others who may read it. We need to exploit its pages more than we are at present — use it as intended — make it serve us as it can so nobly and effectively. Few unions have such a "house organ" — we should take pride in it and make it the "hottest" thing in the industry. All this, of course, in the proper vein and with due dignity, sincerity, subtlety — but with vigor.

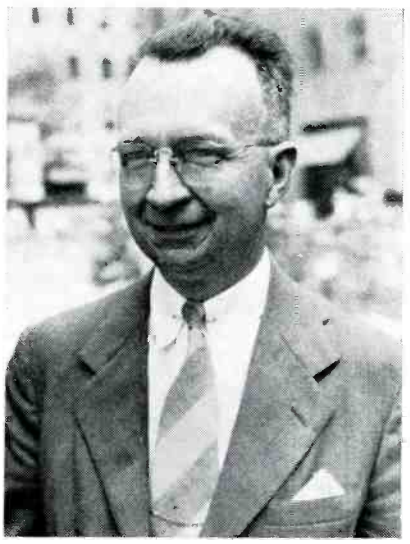
The Broadcast Engineer — Who is he? What is he like? What are his job qualifications, personality traits, facets of character, general attitude toward life and his profession? Nobody has ever answered these questions—and many others like them. Let NABET answer them. Publish and propagandize them. Let us officially examine the curricula being taught in our institutions of learning (including the short course radio schools). Let's voice our opinions, publicize our praises and criticisms, become the National Body recognized as the true authority, spirit, heart and life of the broadcast engineer (and technicians in all associated arts and sciences). Let us consult educators, representatives of management, the NAB, government and military leaders — **Establish** ourselves as a top-notch national group — with purpose, ambition, patriotism and a real job to do. We can do it! Who else can?

Eventually we could become THE national association, THE representative, THE voice, THE ALL, OF, BY and FOR ALL engineers and technicians in the broadcast and associated radio fields.

With our feet firmly planted and proper membership spirit established, we can build a solid, unified, proud organization with honor and prestige in our industry and serving a real national purpose.

Bob Johnston

Studio Engineer and Technical Director of the NBC Symphony Broadcasts



The following tribute was paid to our unsung studio engineers over NBC's coast-to-coast network, at the conclusion of the NBC Symphony broadcast, July 13, 1947:

"Behind the scenes of every broadcast—this afternoon's concert, for example—are people whom you never hear on the air, but whose work is responsible for what you do hear. Among these, one is regarded as each program's final critic. He is the studio engineer—the man who sits in a glass-enclosed booth controlling the tonal quality and volume of sound. If, as he sits at his dials, meters and switches, he applauds music . . . laughs at comedy . . . or approves commentary—then the program's success is assured.

For the engineer must be more than merely a technician with long training and experience. He must be a judge of sound, be able to develop the best of what our microphones pick up into what goes out over the air.

Robert G. Johnston, who has been working in radio for over thirty years, has been the engineer on these NBC Symphony broadcasts since 1940. His knowledge of the orchestra and his skill in transmitting its music add greatly to the listening pleasure of the NBC audience.

It is the contributions of such men as Bob Johnston which make up NBC's service: the best possible programs, presented with the highest technical skill for the greatest number of listeners."

Review of Current Technical Literature

With this issue, we are resuming our review of technical literature, which was dropped because of wartime security—EdS.

By L. W. Lockwood

Communications, June, 1947

U-H-F Propagation Surveys for Mobile Services
Ralph G. Peters

This article includes specific directions as to pieces of equipment necessary and methods of procedure to determine signal plus noise to noise ratio in order to determine useful range of transmission and dead areas. It also has a few sample data sheets and charts which correlate physical and electrical characteristics.

A V-H-F/U-H-F Noise and Field Intensity Meter
Lewis M. Martin

Here is a description (plus a photograph and circuit diagram) of a newly manufactured meter in the 88-400 mc range with a discussion of design and operation.

The Journal of the Acoustical Society of America, May, 1947

A Review of Criteria for Broadcast Studio Design
H. M. Gurin and G. M. Nixon

An explanation of some methods of modern broadcast studio design for "good acoustics." "Good acoustics" are defined and the necessary elements for consideration in design of a broadcast studio are discussed with various conclusions reached as to reflecting surfaces, relative dimensions of studios, etc., for the three general categories of broadcast studios, i.e., speakers' studios, speech and music studios and auditorium studios.

Recording Studio Acoustics
Lonsade Green, Jr., and James Y. Dunbar

A short discussion of recording studio acoustical requirements with "before" and "after" curves on several large recording studios after having been retreated to correct acoustical faults.

Electronics, July, 1947

Triplex Antenna for Television and F-M
L. J. Wolf

Short description of theory and use of a single four-bay Superturnstile antenna for simultaneous operation of an f-m transmitter and visual and aural transmitters of a television station, (WRC-FM, WNBW) with power gain of 6.4 for f-m and 5 for television. Coupling between transmitters is negligible.

Clipping and Clamping Circuits
Norman W. Mather

Performance characteristics of basic circuits for removing that portion of a signal which exceeds a predetermined level or for passing only signals exceeding the clip level, and for restoring or changing average values of signals having level portions.

Impedance Measurements at VHF
E. G. Hills

A slotted line, used in conjunction with a variable-reactance line that balances out resistive impedances, is readily adapted to measurements of impedance, antenna phasing and directivity comparisons. Equipment for unbalanced and balanced loads are described.

A New Approach to F-M/A-M Receiver Design

Complete description (with photographs and circuit diagram) of eight-tube double superheterodyne, with one of the local oscillators crystal controlled which the manufacturers claim achieves unusual selectivity, sensitivity and low noise on broadcast, shortwave and f-m bands, with a minimum of components.

Voltage-Regulated Power Supplies
Paul Koontz and Earle Dilatush

A nonmathematical solution is traced from simplified theory. Actual values of circuit elements necessary to build a power pack and three-tube control are computed. Practical suggestions are given for physical layout and elimination of ripple.

RCA Review, June, 1947

The Radio Mike
J. L. Hathaway and Ralph Kennedy

Redesign, using improved circuits and components has made possible a new transmitter called the "Radio Mike" which is half the physical size of the "Beermug," lighter in weight and gives superior performance. Various considerations leading to the present design are outlined and the present transmitter is described. Operating characteristics and a series of field tests are described.

Input Impedance of a Folded Dipole
W. Van B. Roberts

This paper presents an analysis which attempts to provide necessary formulas and a physical picture of the operation of the folded dipole. The presentation is in two parts —folded dipole with equal elements and folded dipole with unequal conductors.

Radiation Angle Variations From Ionosphere Measurements
H. E. Hallborg and S. Goldman

The heights of the F and FZ layers at Washington, D. C., and San Francisco, Cal., and their variability ranges are studied for the year 1945. These data are applied to determine the optimum radiation angle ranges for various

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Lawrence W. Lockwood was born in E. Windsor, Conn., May 9, 1925. He attended Amherst College, 1942-43, which was interrupted by a short tour in the Navy, followed by completion of his studies at Yale where he was graduated in 1945 with a BS in Physics — with honors. He did graduate work in physics at Yale, and tutored whole classes in physics and math.

Lockwood joined the NBC engineering staff in July, 1946, as television engineer, and has been assigned to the "live" and film television studios of WNBT. He is a member of the American Physical Society, the IRE, Gamma Alpha—honorary graduate scientific fraternity, holds a First Class Commercial License, and is a member of the Engineering Chapter of NABET.

hop modes on the N. Y.-San Francisco circuit. Wide diurnal and seasonal variations are indicated. Practical applications to effective antenna design are discussed.

The Ratio Detector
Stuart W. Seeley and Jack Avins

A new f-m detection circuit, the ratio detector, is described. The basic principles governing the operation and design of this circuit are discussed. The measurements necessary in the design of this type of detector and in checking its performance are also described.

Tele - Tech, July, 1947

Ratio Detector for FM Signals

Description with diagrams of fm detector whose AF component, obtained from ratio of two voltages from frequency sensitive circuit, is completely independent of input amplitude variations.

Design of FM Receiver Front Ends
Aldo R. Miccioli and Dale Pollack

Development of vane type tuner and reduction of drift through operation of local oscillator at half frequency give improvement.

Microphone Placement for Studio Liveness
J. P. Maxfield

Technics based on acoustic properties of studios and location of mikes are described which attempt to improve realistic reception.

Video Switching and Distribution System
R. D. Chipp

Technical details of method and equipment developed for Navy use in switching PPI indications to any or all of 20 remote repeaters.

Radiators for Centimeter Waves
Joseph E. Zentner

Tapered rods of circular cross-section consisting of solid dielectric material may be used as short wave radiators.

Design of Regulated Power Source
Leo I. Helterline, Jr.

Electronically reproducing desirable battery characteristics to give 0.5% regulation and recovery time of 2 and 3 cycles.

Pulse Code Modulation Method for Multi-Channel Telephony
Ralph R. Batcher

Instantaneous sampling of speech represented by multi-unit code of on-or-off pulses permits distortionless reconstruction without noise.

Proceedings of the IRE, July, 1947

Propagation Studios on 45.1, 474, and 2800 Megacycles Within and Beyond the Horizon
Gilbert S. Wickizer and Arthur M. Braaten

Continuous recordings of field strength on 474 and 2800 mc. over a period of 13 months with observations on refraction in different seasonal and weather conditions.

Generalized Theory of Multitone Amplitude and Frequency Modulation
L. J. Giacoletto

The frequency spectrum (including amplitude, symmetry, and energy of sidebands) produced by single-tone, two-tone, and multitone modulating signals as in the case of amplitude modulation, frequency modulation, and combined amplitude and frequency modulation are studied in turn.

Audio Engineering, June, 1947

Adapting Paper Tape Recorders for Broadcasting
Richard S. O'Brien

Describing the modification required for greater utility in broadcasting service.

Perfect vs. Pleasing Reproduction
J. Moir

Tests to determine whether perfect reproduction is pleasing were conducted with an audience of non-technical people.

Report on Dr. Harry F. Olson's Listener Preference Tests

Tests conducted with a concealed live orchestra whose frequency characteristic as heard by the audience could be changed by a hidden acoustical filter, result in some conclusions as to what the public really wants based on facts rather than theorizing.

Musical Acoustics
Benjamin F. Tillson

This is the first of a series of articles on music theory, written especially for sound engineers.

St. Lawrence

By Aleen A. Corbin

THIS is going to be hard to believe, I know, but, honestly, the reason we haven't written before is that we were going to send some pictures of the gang with our first report. "Well," you ask, and with good cause, we admit, "where are they?" That's why it's hard to believe. There aren't any pictures. Oh, we had them taken, in good faith and with honorable intentions, too. But you should have seen the results, or rather, it's a good thing you aren't going to. After all, the union is restricted to human beings. You can blame it all on George Gebhard, our chapter chairman. "We don't want any posed shots," he said. "They're so artificial looking. We'll just stand around and talk. Get some informal snaps." Informal, he said! That remark makes the proverbial understatement look like a slight miscalculation. I was going to send them anyway, but I just couldn't stand having my arm twisted like that any longer. And that was only a small sample of the physical violence everyone threatened. I finally had to agree to keep them until the Journal has a comic page. If you'll bear with us just a little longer, though, we solemnly promise to come across with 'em very shortly.

Since this is our first article, introductions to this section of the country, the stations, and the NABET gang here are in order. The Chapter has two stations, however, and, in order to give them both adequate coverage, I'll confine my description to WWNY this month and present WMSA next month. Watertown, New York, about 35,000 inhabitants, is in the northwestern part of the state, about 300 miles from New York City. Right now the climate is ideal, although rather warm (about 95 at midday), and the humidity is very high. Of course, it rains five days out of every seven, but who cares about a small trifle like that. We don't complain too much, since Watertown, as a rule, only experiences two seasons a year, Winter and the Fourth of July. At this time of year we have a considerable influx of tourists trying to escape the even hotter weather of the large cities. Naturally, the people here all go to New York City on their vacations where the temperature is about 105.

(Continued on Page Ten)

The RCA Metal Detector "blows the whistle" on any particle of metal that may have crept into the package.

RCA Electronic Metal Detector—
arrests "stowaways" in packaged products!

It stands guard over everything from breakfast cereals to after-dinner mints, from cigarettes to cough drops . . . eliminating the chance that a bit of foreign metal might slip by. It helps American industry—that employs every precaution to assure product purity—to protect automatically the foods you buy.

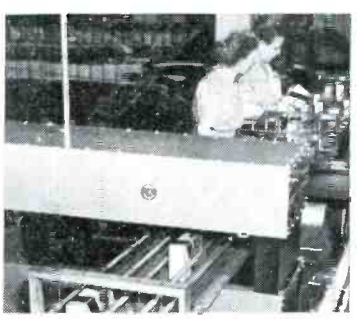
High-frequency radio waves form an invisible wall—sound the alarm, if any metal is accidentally present. Even metallic flakes with a diameter of 70-thousandths of an inch cause rejection by this amazing RCA achievement.

The RCA Metal Detector was developed by RCA product engineers in cooperation with RCA Laboratories—world center of radio and electronic research. The same pioneering and research that produced this Metal Detector keep *all* RCA products at the top in their fields.

So when you buy anything made by RCA—an RCA Victor radio, television receiver, Victrola radio-phonograph, phonograph record or radio tube, you get one of the finest instruments of its kind science has achieved.

When you're in New York, don't miss seeing the radio and electronic wonders at RCA Exhibition Hall, 36 West 49th Street, across from Radio City. Free admission. *Radio Corporation of America, RCA Building, Radio City, New York 20.*

"Victrola" T. M. Reg. U. S. Pat. Off.



The RCA Metal Detector operates through a rejection device, or by stopping the conveyor belt or by giving an alarm. The RCA Metal Detector also saves machinery from damage by "tramp" metal. For details, write to RCA, RCA Bldg., Radio City, New York 20.

RADIO CORPORATION of AMERICA

Microwave Line-Balancer Converter

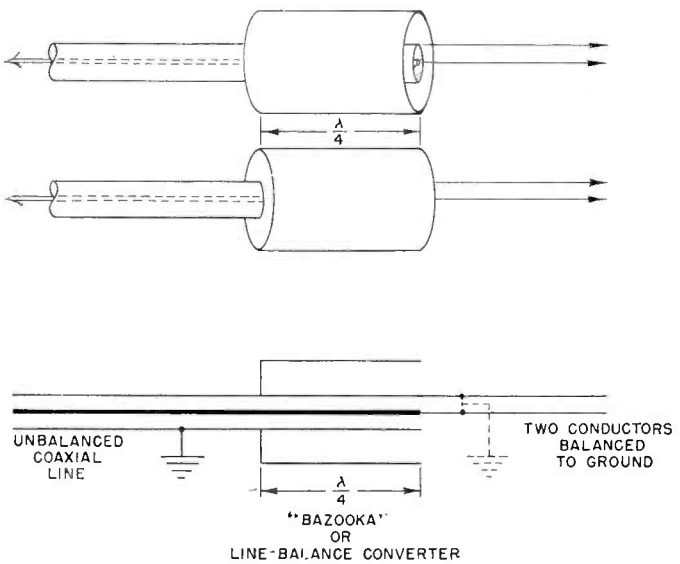
By Jordan McQuay

CONNECTING a balanced transmission line to an unbalanced system, or vice versa, presents a problem in microwave technique—where minor power losses cannot be tolerated.

The problem is solved by a unique type of line-balance converter, sometimes known as a *bazooka*†.

A coaxial line, being unbalanced to ground, cannot feed directly into a balanced transmission-line system—such as parallel-conductor rods, shielded pair, or center-fed centimeter antenna dipoles. To do so would cause unbalance in line currents resulting in standing waves and undesired radiation. The junction must be effected by a device permitting an efficient transfer of energy with no leakage to ground.

The outer surface of the inner conductor of a coaxial line is well above ground potential, and the outer surface of the outer conductor is at ground potential. *Both* conductors of the balanced transmision lines are above ground. Thus: the inner conductor of the coaxial line can be connected to one rod or wire of the balanced pair, and the



outer (ground) conductor connected to the other rod or wire. But at this point of connection, a high impedance must be created between the outside surface of the outer coaxial conductor and ground—to prevent power loss, and to establish the required line-balance condition.

This is the function of the line-balance converter or *bazooka*. Its action is somewhat similar to that of an r-f choke. But in no way does it assist in matching impedances.

The converter consists of a quarter-wave shield mounted concentrically around the caoxial line. The sleeve end of the converter shield is flush with the cable end of the coaxial line. The converter is connected directly to the outer surface of the concentric line at a point one-quarter wave from the end of the line, and must be bonded firmly to the outer conductor. The opposite end of the shield is unconnected.

Mounted in this manner (see illustration), the shield and the enclosed portion of the coaxial's outer conductor effectively form a quarter-wave section of transmission line. Since the quarter-wave section is shorted at one end, the unshorted end displays a very high impedance—and there will be no leakage of energy back through the outer conductor to ground.

Circuit action of the line-balance converter may be compared to the action of a one-to-one transformer, in which the primary is grounded at one side and the secondary grounded at a mid-point of the winding.

The converter can be constructed easily. Very thin sheet copper is the best material. The length of the converter will depend upon the operating wavelength of the microwave system. The diameter of the converter should be approximately twice the diameter of the coaxial transmission line.

†The term *bazooka* was borrowed from Army-Navy wartime radar and electronic applications.

St. Lawrence

(Continued from Page Eight)

We're no fools. However, this city is generally by-passed in favor of the Thousand Islands, and Clayton and Alexandria Bay (where, incidentally, there is a straw hat theatre this season), two small, but very attractive resort towns right on the St. Lawrence. If you go for the kind of vacations where you just relax, gaze at beautiful scenery, and exercise by swimming and fishing, I can highly recommend this area (although, living but twenty miles from there, I naturally have never visited it at any length. Do New Yorkers ever climb the Statue of Liberty?)

Although not very impressive looking, our city has had some claim to a small degree of fame. The very first Woolworth store is located on the busiest corner of the Square (unlike most towns this size, we don't have a main street, but a Public Square with a half dozen main streets leading out from it), and every year the board of directors hold a conference in our town. We once contributed a governor, Roswell P. Flower, to the state. He in turn donated a public library to us, which everyone who sees it declares is one of the best they have ever seen for a town this size. Another political celebrity who made his home here was Stephen Lansing, Secretary of State under Woodrow Wilson. Incidentally, although less imposing than our other claims to fame, we are quite proud of the fact that for more years than I can recall we have been selected as the cleanest city for our size in the state.

WWNY, in Watertown, has both its studios and its offices in the Hotel Woodruff (on the Square), and its transmitter is located on Ives Street Extension, one mile from the city limits (confidentially, no one except the boys who work out there are able to find the road . . . the three towers can be seen clearly from several miles away, but it takes something comparable to a homing pigeon to find where the dirt road branches off from the main road). We go FM this fall sometime and are now constructing another

transmitter on State Street for that purpose. The station has 1,000 watts and operates on 790 kilocycles. We are affiliated with CBS, and although we don't have much net days, we carry most of its evening programs.

Now to meet some of the guys and gals. George (WARZU) Gebhard, as I've already mentioned in passing, is our chapter chairman. George came here from his home town of Rochester about two and a half years ago (the station is six years old). A family man, George and his lovely wife, Helen, have two small children. Gail is a blond little miss of four, and Johnny is a heller, aged two. "Gebbie" got his training in Rochester, and he also did some radio work in the Merchant Marine during the war. He and the family just got back from a vacation in his home town and in Canada. Details about vacations at some later date.

Maynard "Pappy" Davis, our studio counselor, hailed originally from around Fulton. He came to the station, however, from WMBO, Auburn, shortly after the station opened. His and Thelma's (Pap's very nice wife) pride and joy is their nine months old Junior Miss, Marsha by name. The family just finished a vacation visiting Thelma's people in Auburn. Pap studied radio down Texas way.

IMPORTANT! Write the F.C.C. at once, protesting the degradation of broadcast engineers license requirements—and the subsequent lowering of salary standards. Your future earnings are worth a 3-cent stamp and the time to write a letter.

NABET Employment Service

Due to the day-to-day changes in status and availability of unemployed NABET members, President Powley has deemed it impractcial 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.

WASHINGTON

By L. A. McClelland

WNBW, the local NBC television outlet, has several men new to the Company, on its staff. They are, William "Mike" Vossler, Frank Gaskins, Warren Deeme, and "Bill" Wells. Vossler comes to the station from the Army Air Forces wherein he served as Radar Mechanic, Gaskins is formerly of the Navy and Naval Research Labs, Deeme is from television service work while Wells recently severed connections with Air Track to move over into the video game.

Congratulations are in order for Mr. and Mrs. Frank Gaskins. They have recently been blessed with a new arrival, a boy.

Some time ago S. E. Newman was elected councilman for the NBC Television Group, however, due to the work load imposed by the operation of three stations (WRC-FM, WNBW, & W3HN) Sam was forced to resign. In the absence of a duly elected councilman, "Wally" Ward of the Television Field Group has kindly offered his services.

Recent advancements include Jim Weaver and Bill Simmons, both of whom were "upped" from Group 12 to Group 13. Congratulations.

It is rumored that Dumont Television is planning the relocation of their transmitting facilities from atop the Hotel Harrington to a location geographically more favorable. Their present site is not too good "altitude-wise" hence the proposed move.

Not to be outdone by New York and San Francisco, the Washington Chapter submits the following list of amateurs:

Zoltan Bogar	WOL	W3CJM
Walter Bostwick	WNBW T.E.	Ex W2GW
Nick Close	NBC Recording	W4KNF
Frank Fugazzi	NBC S.E.	W3CEJ
W. L. Godwin	NBC S.E.	W3ANJ
Arthur Hallam	WOL S.E.	W3JUL
John Knight	WNBW Sta. Eng.	W2JJ
Victor Leisner	WRC T.E.	W3JLV
Clyde Mengle	WOL T.E.	W2CP/3
L. A. McClelland	NBC Telev.	W4GK
John McCollom	NBC S.E.	W3CNZ
E. McGinley	NBC Recording	W4GKW
Sam Newman	WNBW T.E.	W3HN
Al Sears	NBC Maintenance	W3HLH
Bob Shenton	NBC Recording	W3LFN
W. L. Simmons	NBC Telev.	W3CKH
Barton Stahl	WRC Sta. Eng.	W3BST
Wally Ward	NBC Telev.	W3IQU
James Weaver	NNC Telev.	W4IGF

By this time next month we hope to hear of some of the above named "Hams" going into action on the air. Washington's summer weather has, as always, slowed down amateur activity more than elsewhere in the Nation. Jim Weaver has been heard to mumble something about a new transmitter and Johnny Rogers is building one. Newman, McGinley, Shenton and Close, all ardent advocates of the game, have kept going through the hot WX. If any of the NABET Brass pounders in the West are interested in Skeds on any of the frequencies, let's hear from you. Several of the fellows hereabouts are revamping surplus gear such as the BC-645 and APN-1 for use on the VHF's and would welcome an opportunity to try at some DX with the modified gear.

The annual NBC-CBS Golf Championship match was won by CBS, by the score of 10½ to 7½. No alibis, but why can't our putts drop? WE NEEDED WILLIAMS, WE NEEDED WILLIAMS! Butch would have fixed them! —73, —L. A. McClelland.

Chicago Chapter News . . .

By Minor Wilson

I DON'T know whether it is just summer laziness or vacations, but no one has any news or seems to be making much news; getting a column together this month was sheer work. Thanks to **Ed Bernheim,** who sometimes has a better nose for news than your editor, we did get something or other.

Ham radio still holds as much interest as anything and the best story of the month is **Harold Royston's** rotary beam (10 meters). It is a mechanical arrangement rotated by ropes run into the basement just above ground level. It works swell, but when Harold's wife, **Lois,** saw it, she said, "my gosh, holes through the wall." Beam, ropes, holes and all, are still there, though!

Saturday in the engineers' lounge, **Herb Wyers** said quote tonight I am going to win a new 1947 Packard unquote. Sunday in the same place **Herb Wyers** quote something went wrong unquote. Apparently he didn't win.

Now comes word that **Don Wilson** makes it four engineers who soon expect to become fathers. And still **Clark Lonie** says the NBC-furnished vitamins have nothing to do with it.

A new combination had been organized, **Bernheim & Wyers.** On a recent ABC transcribed net show, Ed Bernheim, NBC studio engineer, was at the controls and ABC engineer Herb Wyers running the turntables. Naturally the show went quite smoothly and ended right on time. We still have not figured out who was engineer, who production, and who would have been responsible in case everything hadn't run OK.

Aryl Aldred is on vacation and according to his plans, he is going to just stay home and do nothing at all except a few small chores. Smart guy, just getting a good rest.

Andy Forgach, Harvey Kohnitz, Jim Mehren and **Ed Bernheim** are currently engaged in the present day popular pastime of house hunting. Jim, however, says he isn't too unhappy, he and family are living in a trailer in the country, "Just like living on a country estate," says Jim. **Rawson** has taken his wife to the hospital; we hope by the time this appears in print she will be much improved.

Odds and ends: Bob Whitnah looking for an expert to stop parasitics in an ART 13. **Herb Wyers** getting fat on a diet of cream, every hour on the hour and now and then recklessly eating a banana. **Ralph Davis** and wife, **Katherine,** back from their second honeymoon, the boys have grown up, so they went east on vacation alone, for the first time in years.

Pete Cavanah going fishing every week but not catching enough fish to pay for his expensive equipment. **Harold Jackson** letting a whole day go by without a single gag, must have been off his feed; poor Harold, when he feels bad, everything gets suddenly dull around the recording room. **Mary Trottner** standing on tiptoe to look through the microscopes in recording. **Art Cunningham** says he never does anything exciting so there isn't much reason for mentioning his name. **Al Scarlett** seems to need some lessons in driving, gets a borrowed car out on the drive and then can't get it into gear!

A. W. HJORTH
Chicago Chapter Chairman

Brief Hjorth Autobiography

BORN Arthur William Hjorth at Philadelphia, Penn., September 18, 1905, of Swedish parents. First job at age of 14 as jewelry messenger at six bucks a week including a monkey suit!

Attended Philadelphia School of Wireless Telegraphy 1922 and 1923. First "ham" license issued November 10, 1922. Call, 3SK. Worked part time at WIP, 100 watt broadcast station located in toy department of department store in Philly during 1922. First Commercial ticket issued March 9, 1923. Shipped as 'Sparks' on SS Roanoke, April, 1923. Spent three years, intermittently on Roanoke and other ships getting off at Texas City, Texas, in 1926, to open radio store. Photographer for Houston Chronicle, April to October, 1926.

Built, operated, and partially owned KFVI broadcast station in Houston, Texas, February, 1926 to March, 1927. (Didn't make enough money; that was why Chronicle photo job concurrently.) KFVI operated on license 5 watts except when radio inspector out of town, then 50 watts! Verification cards with dimes sent in by listeners for verification stamps were used for coffee by staff and listener sent a penny post card of verification.

Studio and later transmitter engineer for KPRC at Houston, Texas, (NBC affiliate) from July, 1927 to June, 1934. Fired for organizing IBEW radio chapter of IBEW Local No. 716. This during days of NRA. After nearly a year, reinstated by regional board at New Orleans. Of course, I didn't go back.

Machinist's helper (day laborer) at $20 per week for Imperial Sugar Company at Sugarland, Texas, May, 1934 to September, 1935. Ascended to assistant to accountant. Also plugged the dogs over a P.A. at a local illegal greyhound race track at nites.

June, 1935, to March, 1941, built and maintained sound equipment, booked pictures, kept books, ran the Bank Nites, hired and fired personnel, publicized pictures and worked twelve hours a day, seven days a week for thirty-five bucks a week. No future, so joined Halliburton Oil Well Cementing Company electric well logging on a JEEP from March, 1941 to May, 1942. Joined NBC Chicago May, 1942, and still there.

Hobbies are commercial photography (a paying sideline sssh!!) magic, (member Society of American Magicians), music (started first piano lessons at age of forty, two years ago.

Wife's name Carmen (was Kelley) a Texas school teacher. Live in four room apartment crowded with piano, radio equipment, photo paraphernalia, magic tricks, and tropical fish that insist on being prolific.

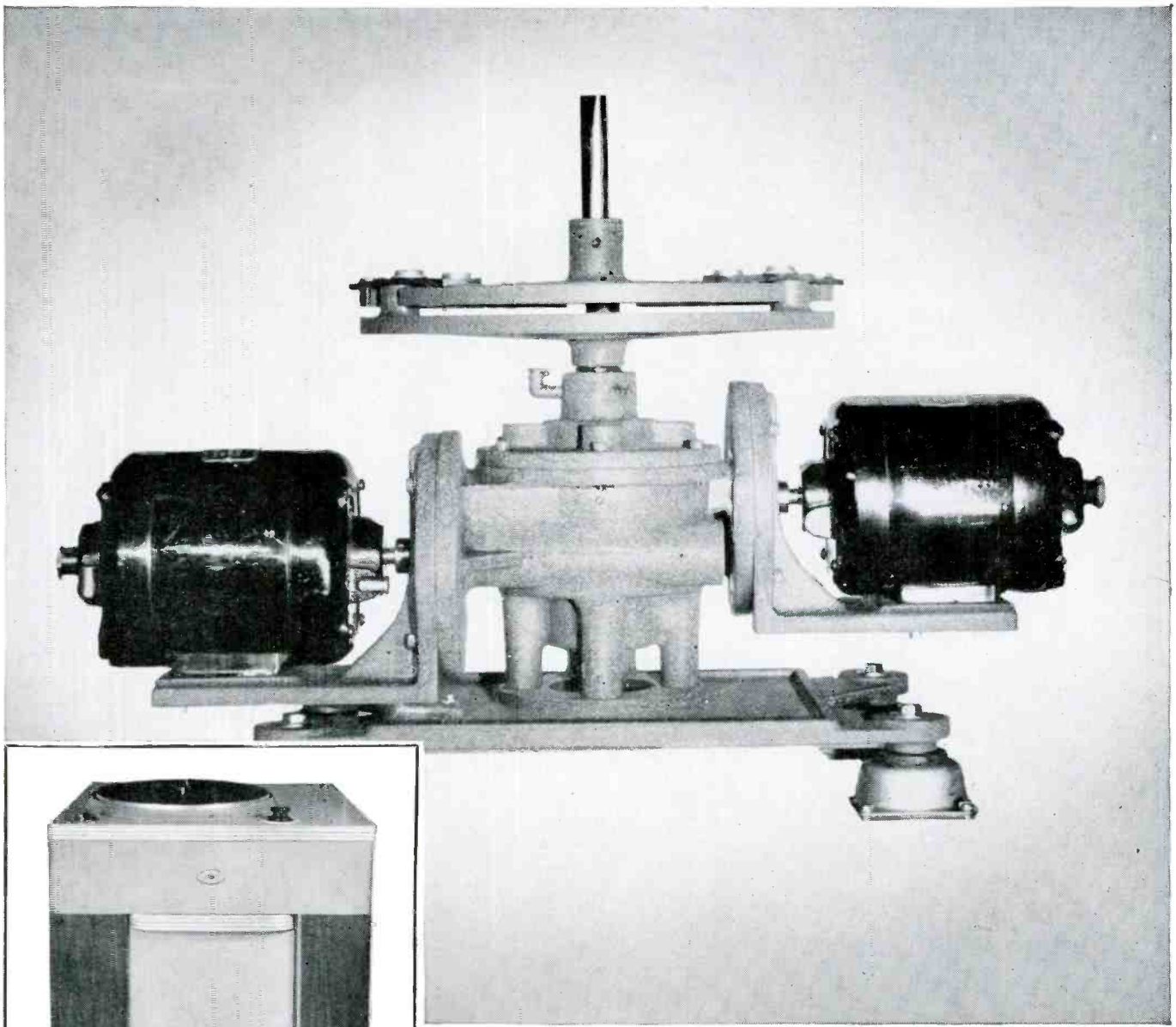
Taught high frequency techniques and math at Illinois Institute of Technology for nearly three years during the war.

NEW!
Presto's Dual-Motor, Direct Drive!

▶ The new Presto 64-A transcription unit combines a number of radical improvements which are of first importance to broadcast stations, recording studios, and industrial and wired music operators.

▶ The turntable is directly gear-driven at both 33⅓ and 78.26 rpm and two separate motors are employed — one for each speed. Speed may be changed instantly at any time by turning a mercury switch, without damage to the mechanism. *No frictional, planetary, or belt operated elements are used in this new drive mechanism.*

▶ The following points are of interest: *Motors*—Two 1800 rpm synchronous. *Speed*—Total speed error is zero. *Noise*—At least 50 db below program. *Starting*—Table on speed in less than one-eighth revolution at 33⅓ rpm. *Adjustment*—Construction is very rugged and no attention whatsoever is required—except lubrication.



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from San Francisco . . .

Dear Ed,

I think that you will agree that the following is the surplus story to end all of the surplus stories about surplus. Here in San Francisco, the most avid surplus collector is Jim Summers, of the MCD crew. Jim has at least one of every surplus item offered for sale, not only those of World War II, but dating way back to Number 1. Jim's 'pipelines' recently brought up information on complete B-29 bombers, available at a ridiculous figure, (something like $129.50, complete, I think). Naturally, Jim 'bit.' The disposal of the thing after delivery never occurred to Jim—he never disposes of anything like that —, but the fly-in-the-soup was that the B-29's had to be FLOWN away from the Arizona depot to some remote spot. Such a flight could be made only by a qualified 5-man crew, and for some reason, THAT stopped the whole deal!

Shucks, Ed, if Jim had of stopped to think, or had made inquiries from the right people, he could of gotten such a crew together right here in San Francisco Radio City, and a goodly portion of such a crew would be NABET. For example, as Chief-of-staff of the whole expedition, who is better qualified than Major R. T. 'Dick' Parks, an old-time pilot, who spent most of his time in the last fracus organizing and executing just such affairs, on a somewhat larger scale, of course, first in the Ferry Command and later for the ATC.

Next in line would, of course, be the pilot and Flight Officer, I suppose. Here we have to leave NABET, not because NABET COULDN'T provide a qualified man, but I am sure the person I have in mind would be a NABET man if the opportunity presented itself. I refer to Capt. Ed Brady, 0-666231, 1503rd A.A.F.B.U. Capt. Brady flew 4-engine transports over the Pacific for 3 years, covering an estimated 300,000 miles, and feels that an added 300 or 400 miles wouldn't hurt him a bit.

Next on my list is that of radioman, engineer, waist-gunner, etc. S/Sgt. R. W. Wood, 39043906, 560th A.A.F.B.U. 'Bobbie' put in 14 months in ITO and ETO, flying out of northern Italy and southern France, and really knows his air-borne radio. He's NABET, too, SF Studio.

As assistant radioman, (is there such a thing?), we have Phil Ryder, of SF studio group. Phil's background includes both flying and radio experience, but he's kinda reticent about supplying any definite information.

The post of NAVIGATOR can be filled by one of several ex-fighter pilots, none of which are NABET, but any of which would LIKE to be. Take your choice between First Lts. Lon King, of SF Sales, Joe Gillespie, NBC announcing, or Bill Cothran, of the News Room staff. They all had several hundred hours of combat flight in single-place fighters, and hence know how to get there, and what's more important, how to get home again.

Want a hostess for this safari, Jim? OK, here's a couple—better take 'em both, what with the gang of wolves that'll be along—to do your flying. WAC Corpl. Shirley Radston, A903765, CADRE, of ABC Traffic, (NABET, of course), and WAC Capt. Clare Patrick, AAF, of Music Rights. I understand Capt. Patrick did a lot of actual flying for the old Ferry Command, so probably could spell Capt. Brady as co-pilot, if the rest of the crew kept their eyes on Brady.

Well, there's your 5-person crew, all tried and true, with military flight background and experience. But here are names of a few alternates,—men with armed forces and/or flying experience, and you'd better take a couple of 'em along, just in case. First is Hal Ashby, a former NABET member, now of NABET Sales, Hal missed the pleasures of military life, but has had many hours flight time in all kinds of aircraft, and would be invaluable in case you had to sell something en route.

Then there is Bill Roddy, of the USMS, who put in many an hour as radio operator aboard C3 cargo ships, and also Russ Snow, of the USMC, who did just plenty of work with the AFRS. Both Bill and Russ have obtained their pilots' licenses, and are rarin' to go.

So, Ed, you see, Jim has no excuse to not go through with the deal, and I hope to be able to advise you in the near future, that the B-29 has been delivered to Jim's back yard.

I finally heard from the gang at Dixon, via Ed Dold. Ed says he just returned from his vacation, spent doing 'combo' work at a 250 watt 'tea-pot' up there in the valley someplace. What a relief that that must of been, from the struggles with the 200 kwr. at Dixon! Roy Fell went fishin' in Oregon, and Ira Gardener went bargain hunting in Los Angeles. (B-29s, Ira?) Vic Paradis is going or has gone to Nevada, and a tussle with the one-armed bandits. He has a round-trip ticket, too. Tom Curtis is Boy-scouting, whatever that means. Geo. Shields, ex-w2VY is now w6VY, and he and Bob Southwell (call ?) keeping Dixon-NBC on the ham-world map, via 75 & 20 m 'fone, Bob Nelson, the vacation reliefer (so Dold could work for competition, eh?) is an ex-MM op. A list of topics of conversation on the long night shifts is supplies, and I am going out on a limb and see if I can guess who supplies most of the pertinent information on each item.

1. Women. (Young). Ed Dold.
2. Airplanes. Gardener.
3. Women. (Old). (No such thing) Vic Paradis.
4. Boats. Bob Nelson.
5. Dogs. (Animals) Roy Fell.
6. Dogs. (Feet) Tom Curtis.
7. NABET. Everyone.

Carl Dietsch, the Dixon chief, leaves soon for NY and greener pastures. 73s, Carl, and let's hear from you.

SF vacationeers returning are Jefferson, O'Neil, Dewing, and Dunnigan. Gone are Kilgore, Berg, McElwain, Cassidy and Rothery. Going are Watson, Barron, Sanders and yours truly. In fact, today winds up my duties for the year, and until the middle of August, don't look for me, I'm not available! So long, Ed. P.S. Add visitors to SF MCD,—Glenn Glasscock from Denver, and Jerry Sellar, from you-know-where, both very welcome visitors.

More Ham Calls

KFI Hollywood

W6KIP	W. H. Alexander (14.1)
W6OTB	L. Benvenuto
W6RXI	R. W. Bull (29.0)
W6ERC	C. C. Caves (52.0)
W6VHD	V. L. Clark (52.1)
W6BH	K. V. Dilts
W6IX	F. W. Everett (52.0)
W6PBU	L. E. Fritzinger (144)
W6KKZ	R. W. Grammes
W6YMD	W. B. Guimont (28.55)
W6DOB	L. M. Jones(3.95)
W6KYV	D. W. Kennedy (7.15; 14.05)
W6KL	H. M. McDonald
W6PC	L. W. Packard
W6GP	C. W. Seamans
W6LXS	W. G. Tokar
W6OMN	R. B. Walling
W6WGC	W. H. Wileman (14 and 28)
W6GSZ	Ed Wood (30, 14, 3.5 fone)

About Rochester

By Dan Anderson and George Wilson

WELL, gentlemen, Rochester and its NABET chapter is still here, despite the possible doubt engendered by the dearth of published news in the last few issues of the Journal.

As to Rochester news: the most important, naturally, is the election of officers at which **Ed Lynch** of WHEC was elected Chapter Chairman, succeeding our hardy perennial, **Charles Snyder,** who has been "It" since our organization. Charlie was happy (and who can blame him?) at being relieved of the responsibility that Ed now assumes, but has earned a most hearty vote of thanks for the able efforts and long hours that he has put in on our behalf. Much to his surprise, **Fred Ambrose,** of WHAM, was elected Sec.-Treas. ("You'll pay or else, fellas!") succeeding **Howard Mouatt** of WHEC, who has also turned in a splendid performance of a thankless job. Councilmen are as follows:

WHEC—CR—**Craig Williams**
Trans.—**Leo Enright**

WRNY—**M. L. (Ed) Cole**

WHAM—CR—**Birdsall (Bum) Holly**
Trans.—**Ed Stiles**

WHFM—**Anthony DeLucia**

WENY, Elmira—**Leroy Hartman**

Finally, **Walter Malone** was re-appointed Social Chairman and **Donald Anderson** and **George Wilson** were re-appointed Ye Scribes. There were many huzzahs, etc. ("They ganged up on me,—**Ed Stiles:** "They can't do this to me!"—**Fred Ambrose**), but by and large, everyone was satisfied, especially so with the job that has been done to date.

Elections out of the way, we can report briefly of the satisfactory progress of the final WRNY negotiations. In strict reportorial accuracy, they are not yet concluded because of illness but are expected to be on the morrow, when this epistle will be in the mail. **Cliff Gorsuch,** our friend and able representative, has been here the last few days ironing out wrinkles, and a very smooth job he does, too.

In the personal news department, the usual vacation season is in full swing, with what seems like half the stations' personnel out of town or painting up the old homestead. Witness

(Continued on Page Sixteen)

Rochester

(Continued from Page Fifteen)

Fred Ambrose; he offered this scribe a bucket of suds to come down and watch him ascend the painting ladder. Gosh! Comedy and refreshments on the same bill! Ye scribe was too smart, though: he knew that there was another brush down cellar! The WHAM transmitter welcomes two new men to the payroll as vacation relief. They are **Charles Long** and **Michael Greco.** We hope that it turns out that they stay longer than their expected stint. The idea of two reliefers is that when the new transmitter is installed late this summer (weather and stuff permitting) there just might be a bit of extra work for the Cattle's Companions and it would be well if their vacations were things of the past. WHEC has its transmitter installed and working well these many moons now, so they can sit back and relax while the WHAM men struggle. . . . **Yoe Seiler** is still dividing his time (spare, that is) about equally between ham radio (call, W2EB) and his Junior, which seems to leave no time for the wife at all, at all?????? **Walt Malone** is on vacation in Youngstown, Oh Hoh. **Al Bailing** has his yearly visit to the mountains all done until next year and is now keeping Bachelor's Hall while his family still enjoys those evergreen breezes. . . . Thought for the day: jever see a green breeze?

At WHEC, **Howie Mouatt** has finally given up and gone back to hamdom after a long enough pause to allow his license to lapse. After duly satisfying the RI as to his knowledge of radio he was granted a new call, W2VVO, which is pretty strong stuff if you ask me, no matter whether you take it with soda or———ahem. Pardon me; dreaming a moment. . . . To resume, he's on 80, 40, and 20, men, so sic 'im! With such a choice someone should work him. **Ed Lynch,** our new Chairman, is on his way back from a vacation on the west coast. **Craig Williams** has given up his teaching and we'll bet he's a puzzled feller figuring out how to occupy all his newly-acquired spare time. **Ray Jobes** is now an expectant father, so the black satchel tells us; how long he has yet to suffer we don't know. **George Wilson** leaves on vacation the first of August, flying to New York and other points he doesn't tell about.

At WHFM, **Tony DeLucia** has finally finished the pride of his life, a radio-controlled model airplane, wingspread, seven feet. He says everything works on the ground but the acid-test is yet to come, putting it in the air and from **here** controlling it **there!** Hmmm. That we want to see, and we're not kidding. **Bob Brethen,** the magic-feller, has returned from a sojourn in the Catskills, finding out anew that it's tough to go back to work, as did **Anderson** who had a week left over from last year and so was able to April in Florida. You know, by gosh, those travel posters are right!

That's all this reporter knows at the moment—tain't much, is it? Maybe there'll be more next time. Definitely, we'll have a full list of ham calls for the CQ'ers.

Polar Co-Ordinate Cathode-Ray Indicator

DESIGNED for studying all types of rotating machinery and for plotting phenomena on a circular time base, the new Type 275-A Polar Co-ordinate Cathode-Ray Indicator is announced by Allen B. Du Mont Laboratories, Inc., Clifton, N. J.

The use of a circular time base for the presentation of data has certain distinct advantages, such as:

(1) Continuous time base (no time lost on retraces). (2) A given spot position along the time base always corresponds to the same space phase, or rotation angle, regardless of speed. (3) Presentation on a circular (or angular) time base corresponds to methods used customarily in the study of rotating machinery.

Detonation or "knock" in internal combustion engines may be studied with this new instrument. The detection of such rapid, undesirable combustion is of great importance for the evaluation of motor and fuel performance.

A standard Du Mont Type 5CP-A Cathode-ray Tube used as the indicator, operates at a total accelerating potential of 3000 volts, producing a brilliant pattern for easy observation even in bright daylight. For convenience in observing the screen from various positions, the tube is set at a 55° angle. Intensity and focus controls are mounted on the panel. Also the power switch, radial-amplitude and circle-amplitude controls, the pilot light, and the input terminals for x, y, z and radial signals. Other controls are grouped behind a door in the top of the instrument. These include AN-type connectors in parallel with the front panel terminals for the circle (x and y) and radial signals, and power input connector. A panel cover protects the panel in transportation.

Radial deflection is obtained by modulation of two 90° out-of-phase sine-wave signals which produce the circle. The circle signals are applied to the control grids of pentode tubes. By applying the modulating signal to the screen grids of these tubes, their transconductance is varied according to the instantaneous signal amplitude. Push-pull (or balanced) deflection is used.

Frequency response of the radial amplifier is essentially flat from less than 2 cps to 30 kc. Approximately .5 volt is required to provide deflection to the center of the circle. The circle amplitude is constant from 60 cps to ½ cps without phase shift. The instrument is free from drift and instability.

An external two-phase generator with 10-ft. leads and connectors is furnished to provide the two sine-wave signals of equal amplitude and 90° phase difference which produce the circle. This generator is coupled to the shaft of the apparatus from which the signal is taken. Hence in the Type 275-A Indicator, the signal under examination is always synchronized with the circular sweep on the cathode-ray tube, since the sweep is controlled directly by the speed of the rotating machine.

This instrument is designed for use in the laboratory or in the field, and is readily transportable by car. Its weight is approximately 65 pounds. The dimensions are 17" h. x 19½" d. x 10½" w.

Book Review

Television—Vol. III (1938-1941). Published 1947 by RCA Review, Princeton, N. J. 6 x 9 inches, approximately 500 pages. Hard cover edition, $2.50; paper cover edition, $1.50.

Television Vol. I was published in 1936, followed by Vol. II in 1937. Wartime security made it necessary to postpone further publication. It was not possible to bridge the gap between 1937 and 1946 in a single volume, and Vol. III, therefore, covers the period 1938 to 1941.

This text is a "must" for the broadcast and television technician. The titles of the major items among the contents are listed herein as an indication of the wide scope and importance of this work:

Pickup: The Image Iconoscope; The Orthicon; Determination of Optimum Number of Lines in a Television System.

Transmission: Analysis and Design of Video Amplifiers; Wide-Band Inductive Output Amplifier; Selective Side-Band Transmission in Television; Precision Television Synchronizing Generator.

Reception: Direct-Viewing Type Cathode-Ray Tube for Large Television Images; Effect of Receiving Antenna on Television Reception Fidelity; Contrast in Kinescopes; Video Output Systems.

Summaries: New Television Receiving Tubes; Simple Television Antennas; Simplified Television IF Systems; Low Cost Television Receiver; Simplified Television System for Radio Amateurs.

Appendix: Summaries of **Television Vol I,** and **Television Vol. 2.**

Television—Vol. IV—1942-1946. Published 1947 by RCA Review, Princeton, N. J. 6 x 9 inches, approximately 500 pages. Hard cover edition, $2.50; paper cover edition, $1.50.

Television Vol. IV is a continuation of Vol. III, and covers the period 1942 to 1946. Included are the very latest television developments. The titles of the major items among the contents are listed herein as an indication of the wide scope and importance of this work:

Pickup: Contemporary Problems in Television Sound; Image Orthicon Camera; The Image Orthicon; A Unified Approach to the Performance of Photographic Film, Television Pickup Tubes, and the Human Eye.

Transmission: Transmission of Television Sound on the Picture Carrier; A

(Continued on Page Eighteen)

Announcing the purchase of a new five-kilowatt television transmitter, WFIL officials study its operation under the guidance of representatives of the Engineering Products Department of RCA. Seated at the supervisory control console is Louis E. Littlejohn, WFIL's chief engineer. Grouped about the console (left to right) are Kenneth W. Stowman, television director of WFIL; T. A. Smith, general sales manager for RCA Engineering Products Dept., and M. A. Trainer, manager of RCA's television equipment sales.

WFIL Television

PURCHASE of a five kilowatt television transmitter and complete studio and field television equipment from RCA was announced today by Kenneth W. Stowman, television director for Radio Station WFIL. Delivery of the equipment is expected during the Summer. It is impossible to announce "T-Day" for the station at this time, but it is expected to open sometime in the Fall.

The construction permit for a television station to be operated in Philadelphia on Channel No. 6 has been granted by the FCC to the Philadelphia Inquirer Division of Triangle Publications, Inc., owners of WFIL. Stowman said that the station already has started construction at its Central City site for the installation of the television transmitter.

The RCA television transmitter is a Model TT-5A, complete with a three-bay super turnstile antenna and a supervisory control console. The television studio equipment includes two Type TK-30A Image Orthicon Camera chains, one iconoscope film camera chain, and two film projectors. Field equipment includes an RCA mobile television unit with two Image Orthicon Cameras for remote telecasts.

The WFIL purchase includes microwave link equipment (Transmitter Model TTR-1A and Receiver Model TRR-1A) for the relay of television pictures from remote pick-up points to the Widener Building studios. Likewise, the relay apparatus will link the mobile unit with the studios in WFIL's on-the-scene coverage of news events. All relevant sound equipment for both studio and field use will be standard RCA.

Installation of the new transmitter and studio construction will be under the supervision of WFIL's chief engineer, Louis E. Littlejohn. Littlejohn's experience in the field dates back more than a decade when he was a member of RCA's television department. David J. Miller, Jr., is assistant chief engineer in charge of television for the station.

Book Review

(Continued from Page Seventeen)

Method of Measuring the Degree of Modulation of a Television Signal.

Reception: Television Reception with Built-in Antennas for Horizontally and Vertically Polarized Waves; Automatic Frequency and Phase Control of Synchronization in Television Receivers; R-F High Voltage Power Supplies; A Type of Light Valve for Television Reproduction; Reflective Optics in Projection Television; Improved Cathode-Ray Tubes with Metal-Backed Luminescent Screens.

Color Television: An Experimental Color Television System; Simultaneous All-Electronic Color Television.

Military Television: Flying Torpedo with an Electric Eye; Naval Airborne Television Reconnaissance System (Project "Ring"); Miniature Airborne Television Equipment; MIMO—Miniature Image Orthicon; Television Equipment for Aircraft ("Block" Equipment).

Summaries: Measurement of the Slope and Duration of Television Synchronizing Impulses; The Relative Sensitivities of Television Pickup Tubes, Photographic Film, and the Human Eye; Cathode-Ray Control of Television Light Valves.

Appendix: A Bibliography of technical papers by RCA authors, 1929-1946.

Index to RCA Technical Papers Available

The RCA Laboratories Division of RCA announces the availability, without charge, of:

Television—A Bibliography of Technical Papers by RCA Authors 1929-1946. This ten page, 6″ x 9″ booklet lists some 275 technical papers on television and closely related subjects. The papers are listed chronologically, and constitute a valuable reference on the subject.

RCA Technical Papers Vol. 1 (1919-1945) *and Vol. II* (*a*) (1946). Vol. I supersedes Index—Technical Papers by RCA Engineers (1919-1939) published in 1940. This index lists 1778 papers, substantially all published English-language technical papers on subjects in the radio, electronics and related fields. The chronological index section is followed by an alphabetical listing of papers by exact titles, a section arranged alphabetically by authors, and a subject classification section. This index covers the period to the end of 1945 and constitutes Vol. I of a series. It is planned that subsequent volumes will cover successive five-year periods, consolidating under one cover the yearly indexes which were issued shortly after the end of each year. The first of these covering 1946 has been designated Vol. II (a) and covers 202 papers during the year 1946.

New York Notes

By Dud Connolly and Pat Simpson

WITH this issue, New York Notes will be covered by Pat (ABC) Simpson and Dud (NBC) Connolly. An honest effort will be made to keep the New York membership informed as to doings around NBC-ABC-Muzak, Traffic, RCA-Victor, etc., which are in the NABET fold.

During the past month, several important changes took place within the New York Chapter. Clarence Westover (Westy to you) assumed the position as Chapter Chairman. The membership also decided on changes in representation and quite a few new faces are to be seen at the regular Council meetings.

The first Council meeting of the new regime was held recently, during which considerable new business was transacted including a motion to set up a local office for the New York Chapter. From this office, all Chapter affairs will be handled including regular news releases for the membership and publicity releases for radio and trade publications.

Every angle that will assist in building up the profession will be exploited to the fullest extent. A campaign of this type which is already 20 years late, requires the cooperation of every member, so please do your part by supplying items you think newsworthy. Too many of our members are prone to assume a schoolboy type of bashfulness when asked for personal items, and then there are those who resent anyone else getting personal publicity. We are in the show business, and unless we conduct ourselves as showmen we might as well apply for jobs in the Dep't of Sanitation. Sure—most of the publicity you read is a lot of hokum, but it pays off in dollars—and that's what we are all after. Deadline date for all column news (from the various groups within New York for this column) is the 15th of every month. Don't just sit back and let George do it. George, Pat, and Dud already have too much to do. Leave items in the mail box in the Engineers' Lounge, or address to Pat Simpson or Dud Connolly—Room 558.

Ideas for the makeup of this column are very welcome. Just name your type—and the majority rules. The minority will also get a break.

During the past month, studios 5X and 5B were placed in operation. Located in what was studio 2E, 5X and 5B represent the last word in something or other. Announcers are not too happy about the whole thing as they feel 5X and 5B will mean a reduction in staff. Practically all studios in Radio City have been changed over to the new type of operation. "New Type" meaning that the studio engineer now assumes all responsibility as to setting up channels, and mike switching (known as pushing the buttons). The latest studio to be changed over is 2C—home of the NBC International programs. The studio engineer with two turntables, channels, mike and studio buttons to push, acetates to spot, etc., is really in a position to prove his worth.

If it concerns the Broadcast Engineer—
he will read about it in the
Broadcast Engineers' Journal

The 1947 Winter IRE Meeting

Summaries of Technical Papers — Continued From Last Issue

By Ed. Stolzenberger

No papers are available in preprint or reprint form nor is there any assurance that any of them will be published in the "proceedings of the I.R.E.," although it is hoped that many of them will appear in the subsequent issues.

WAVE PROPAGATION AND ANTENNAS

Chairman, H. R. SKIFTER
(Airborne Instruments Laboratory, Inc., Mineola, N. Y.)

90. A Study of Tropospheric Reception at 42.8 Megacycles and Meteorolgoical Conditions.

G. W. Pickard and H. T. Stetson
(Massachusetts Institute of Technology, Cambridge, Massachusetts)

Field-intensity measurements of W2XMN, 42.8 megacycles, at a distance of 167 miles closely follow surface refraction. Frontal passages affect reception least when the front parallels the transmission path. Fields correlate with surface temperatures along the path. Low wind velocities with wind direction parallel to the path favor high fields.

91. Results of Microwave Propagation Tests on a 40-Mile Overland Path.

A. L. Durkee
(Bell Telephone Laboratories, Inc., New York, N. Y.)

This paper gives the results of a series of microwave radio propagation tests over an unobstructed 40-mile overland path. The purpose of the tests was to investigate the transmission characteristics of such a path at centimeter wave-lengths over a long period of time. Statistics on the transmission results at wavelengths ranging from 1.25 to 42 centimeters are given. The tests extended over a period of about two years.

92. A Method of Rapid Continuous Measurement of Antenna Impedance Over a Wide Frequency Range.

H. V. Cottony
(National Bureau of Standards, Washington, D. C.)

An electrically driven recording milliammeter is mechanically coupled to the tuning shaft of a wide-band, constant-current, balanced-output generator. An antenna or any other two-terminal network, when connected to the terminals of the generator, will develop a voltage proportional to the absolute value of its impedance. A vacuum-tube voltmeter records continuously the impedance versus frequency.

93. A Phase-Front Plotter for Centimeter Waves.

H. Iams
(RCA Laboratories Division, Radio Corporation of America, Princeton, New Jersey)

In the centimeter-wave region it is not unusual to have an antenna, dish, or horn across which the phase of the radiation should be constant or should vary in some pre-determined manner. To test such behavior a device including several lengths of wave guide, some rotary joints, a crystal detector, and a plotting probe was evolved. This material is used to compare a signal tapped off the wave guide leading to the antenna with one picked up by the probe moved in the field of the antenna.

94. Rapidly Moving Ionospheric Clouds.

H. W. Wells
(Carnegie Institute of Washington, Washington, D. C.)

Rapidly moving ionospheric clouds and other unusual ionospheric movements which occur in very short periods of time have been detected during magnetic and ionospheric storms. The application of a new moving picture technique has led to the detection of these rapid movements which have been hitherto unrecorded. These phenomena will be demonstrated in the motion picture films to be presented as a part of the paper.

RELAY AND PULSE-TIME SYSTEMS OF COMMUNICATION

Chairman, W. O. SWINYARD
(Hazeltine Electronics Corporation, Chicago, Ill.)

95. Considerations of Moon - Relay Communications.

D. D. Grieg, S. Metzger and E. Waer
(Federal Telecommunication Laboratories, Inc., New York, N. Y.)

The use of the moon as a passive repeater for high-frequency radio transmission is discussed. Consideration is given to the various factors entering in establishing communication via moon echoes. These factors include problems such as cosmic noise, doppler shift, and special astronomical effects. The bandwidth, power, and signal-to-noise considerations are given for two cases: one, idealizing smooth moon, and two, rough moon.

96. Experimental Studies of a Remodulating-Repeater System.

W. M. Goodall
(Bell Telephone Laboratories, Inc., New York, N. Y.)

This paper describes tests made on an experimental microwave frequency-modulation system suitable for broadband relay communication. A microwave reflex oscillator is used for the transmitting unit and a superheterodyne is used for the receiving unit. A repeater consists of a receiver and a transmitter connected together at base band or video frequency. Experiments with a recirculating loop are described.

97. Experiences with Multipath Transmissions at Very-High Frequency, Ultra-High Frequency, and Super-High Frequency.

F. P. Morf
(Coles Signal Laboratory, Red Bank, New Jersey)

Microwave radio relay equipment was operated in California from San Francisco to San Diego. Severe fading was encountered. Evidence was obtained that this fading was due to cancellation of transmitted signals arriving over paths of different lengths. Methods of operation were found which minimize this type of fading.

98. Multiplex Employing Pulse-Time and Pulsed Frequency Modulation.

H. Goldberg and C. C. Bath
(Bendix Radio, Baltimore, Maryland)

An investigation of the simultaneous transmission of two channels over a single carrier by means of multiplex employing pulse-time and pulsed frequency modulation shows such multiplex to be practicable. Cross modulation can be kept down to acceptable limits. Such operation doubles the number of channels possible on a single carrier using time-division multiplexing.

99. Multiplex Microwave Radio Applied to Telephone Systems.

T. H. Clark
(Federal Telecommunication Laboratories, Inc., Nutley, New Jersey)

Recent developments in microwave radio as applied to telephone systems are discussed. Ultra-high and super-high frequencies show promise of great utility for routine toll circuits, short over-water carries, island hopping, and routes over difficult terrain. Various types of microwave multiplex systems are emerging, and their advantages and disadvantages will be presented together with their applications to telephone operating systems.

(Continued Next Month)

NOW Soundcraft

EACH A POTENTIAL RECORDING
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Soundcraft discs are the culmination of a five-year engineering search for wider dynamic range, lower surface noise, freedom from "grey-cut" and "swish" in disc recording.

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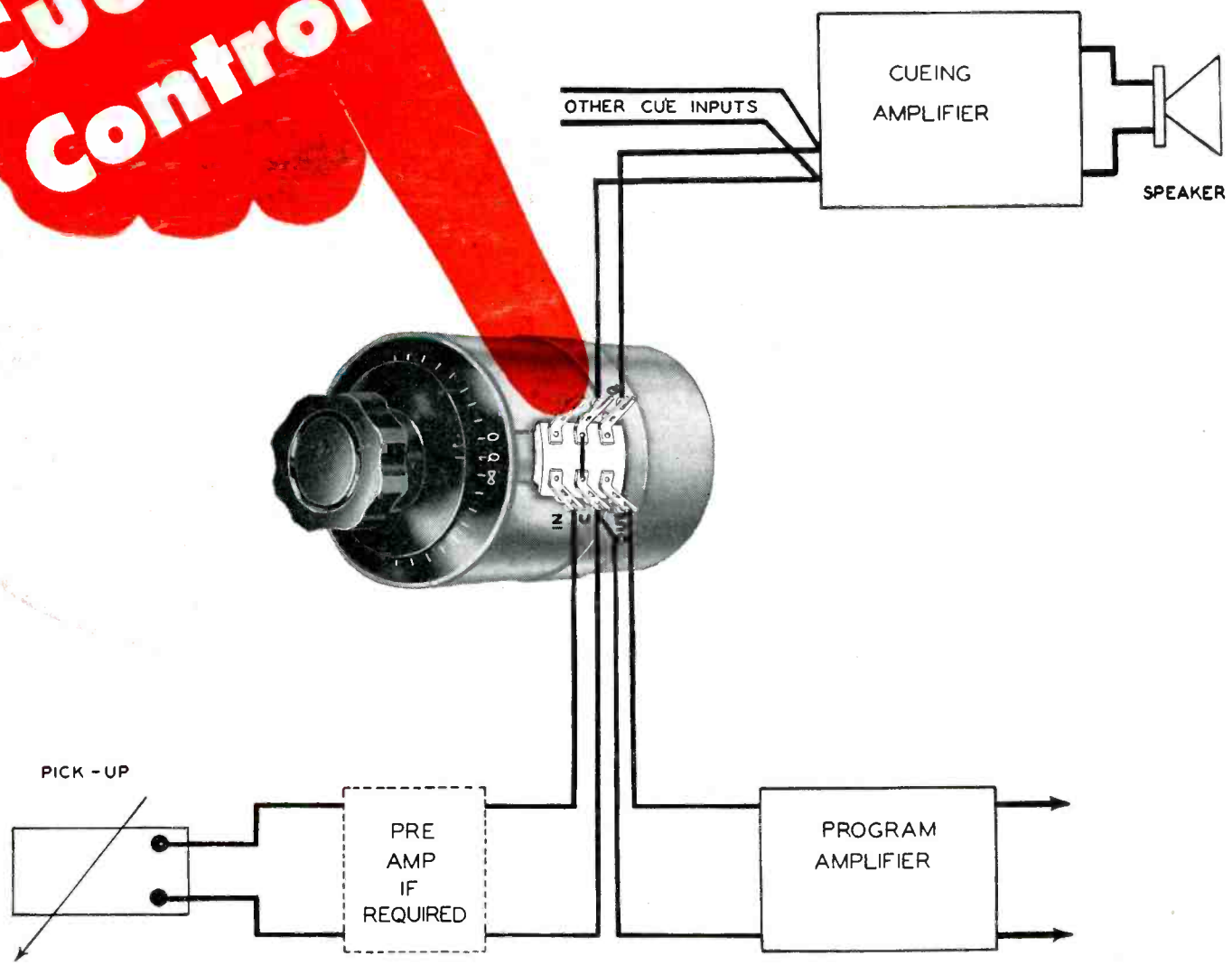

DAVEN ATTENUATORS *with Built-in cueing controls* are now available . . .

DAVEN attenuators may now be obtained with a cueing control. Auxiliary switching mechanisms are no longer required to cue recordings, transcriptions and remote or network programs.

The control itself will serve to transfer the program material to a separate cueing amplifier. Provision is made at the extreme attenuation position for connecting the incoming signal to a cue circuit before "fading in" the signal. As a result, a program can be smoothly "brought in" at the right time without the operation of any additional switches. A lug on the terminal board is provided for connection to the cueing system.

The cueing feature may be supplied on any type of Daven attenuator. However, it is primarily recommended on those controls used for mixing, which are provided with a taper to infinity. For further details write to our Sales Department.

APPLICATIONS

- **Broadcast Stations**
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