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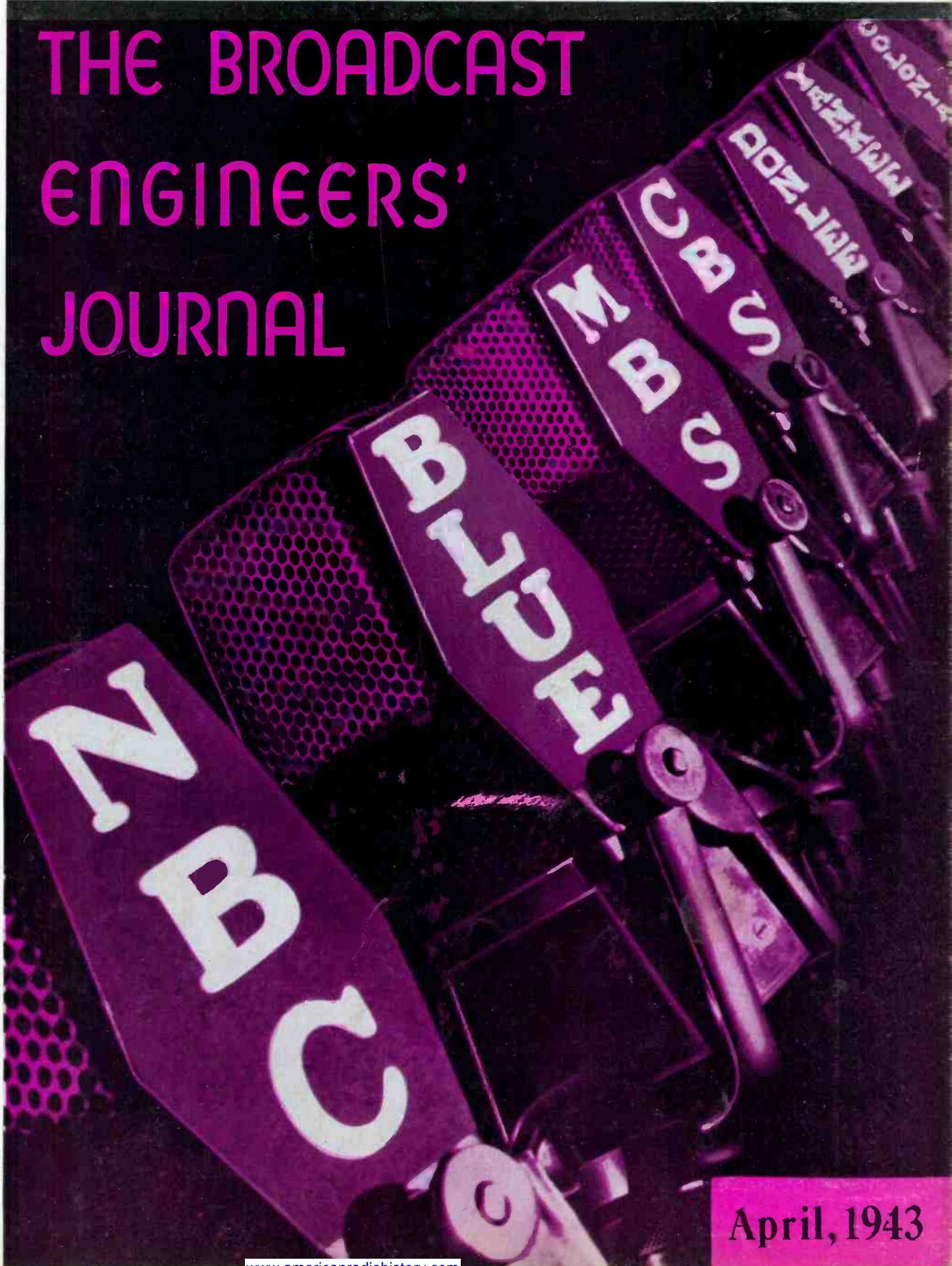
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*Line to Antenna
Matching Circuits*

THE BROADCAST ENGINEERS' JOURNAL



April, 1943



Wheezes, Wows, Squeaks, Noises,
are out because there are

NO GREMLINS

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"Black Seal" GLASS BASE
Instantaneous
RECORDING BLANKS

Gremlins are those pesky little pixies who annoy pilots of the RAF and the U. S. Air Force. They're also present in many recording blanks, causing wows and rumbles, squeaks and noises. But, there are no Gremlins in "Black Seal" Glass Base Instantaneous Recording Blanks. They're the talk of the industry... giving a wide frequency range, true and beautiful reproductive qualities, and absolute freedom from noises—you hear only the performance itself! Try these Gremlin-free "Black Seal" blanks at our expense — if they don't come up to your expectations, send them back and we'll stand the entire tariff.

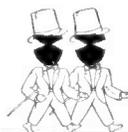
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THE BROADCAST ENGINEERS' JOURNAL

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This War . . .

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Line to Antenna Matching Circuits

By William S. Duttera

NBC Engineering Department, Radio Facilities Group

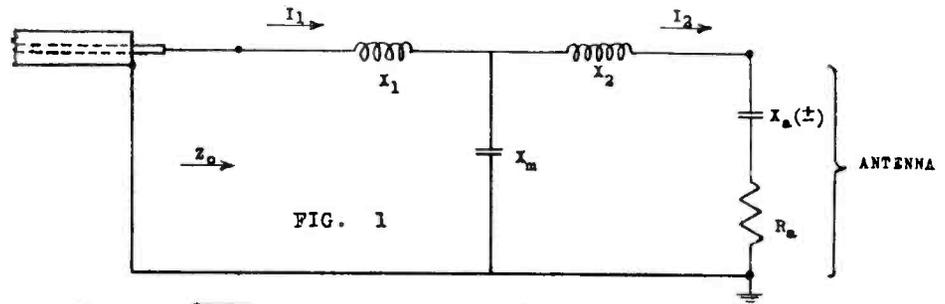
(See "Design of Phase Shifting Networks" which appeared in our October, 1942 issue.—Ed. S.)

IN TIMES of emergency it often becomes necessary for the broadcast station staff to retune the line antenna matching circuits. This may be necessary because the antenna electrical height has been changed or because of the failure of existing equipment which may not be exactly replaced. In the latter case, the substitution of equipment on hand may necessitate the use of another type of terminating network. Regardless of imminence of such a change or failure it is well to understand the basis of design and the adjustment of the various possible networks. Thru-out this article it will be assumed that (1) the antenna is to operate non-directional and therefore any phase shift that may occur in the matching circuit is of no consequence and (2) the graphs are computed on the assumption that the transmission line is a coaxial line with a surge impedance of 80 ohms. However, from the equations given, the various elements may be computed for any transmission line which has one side grounded.

Three Element Matching Circuit

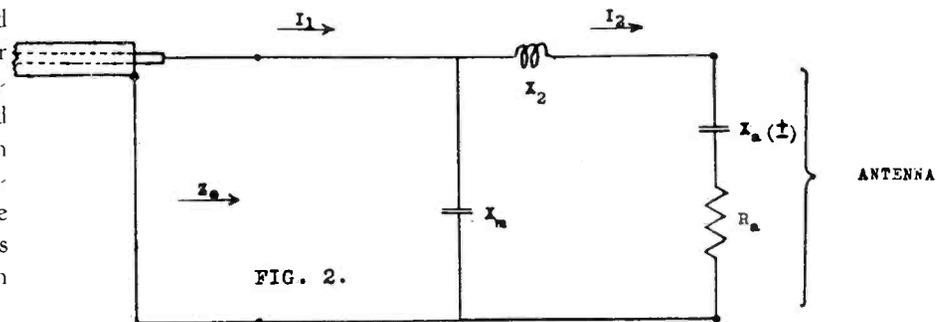
The most versatile and the easiest type of matching circuit to adjust, is the three element type. This circuit may be used regardless of the antenna resistance or line surge impedance. This is not the case with the other simpler types of circuits to be described. This circuit is shown in Fig. 1. In this figure X_a is the antenna reactance and may be either positive or negative. The antenna resistance is R_a . The equations given for the determination of, the line inductance, the shunting condenser, and the antenna inductance permit the easiest adjustment of the circuit. They are not the only values which will provide proper termination. In fact these normal values may be modified considerably if, for instance, it is desired to reduce an objectionable harmonic. The values of these elements are shown in Fig. 1A for normal design of this matching circuit. It should be

noted that, if the antenna resistance is any value between its normal value and less than the surge impedance of the zero. When this is done proper changes transmission line, the line coil may have have to be made in the values of the



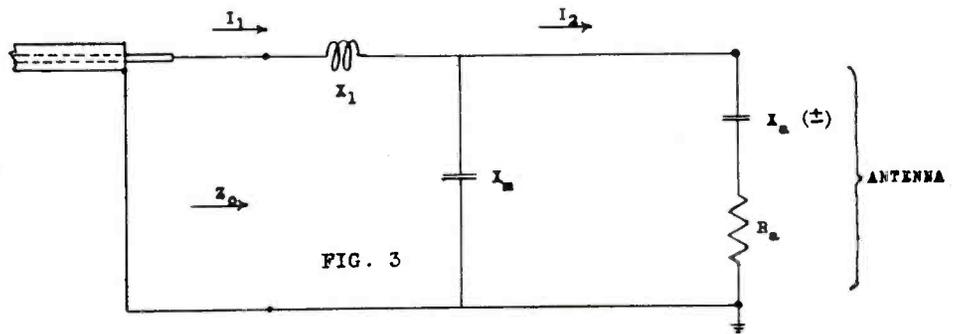
$$X_1 = X_m = \sqrt{Z_o R_a} \qquad X_2 - X_a \pm X_m = 0$$

A MATCHING CIRCUIT FOR ANY VALUE OF R_a



$$X_m = Z_o \sqrt{\frac{R_a}{Z_o - R_a}} \qquad X_2 = -X_m - X_a \pm X_m = -R_a \sqrt{\frac{R_a}{Z_o - R_a}}$$

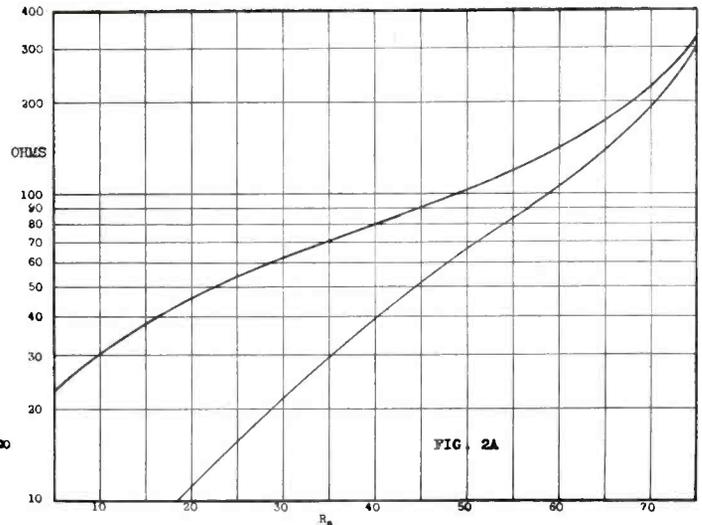
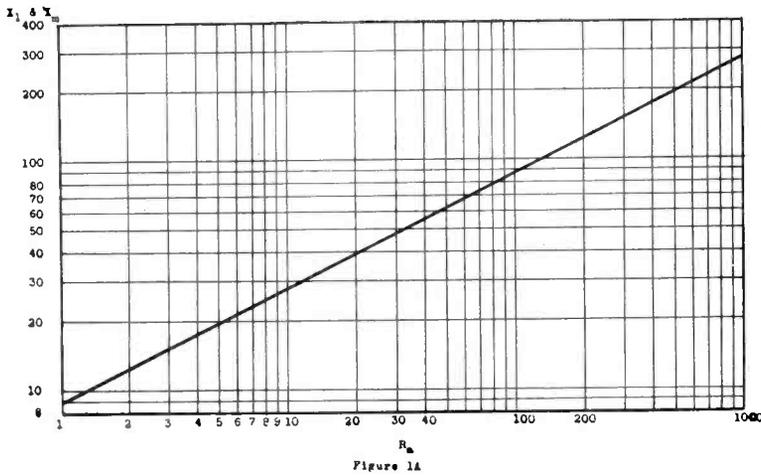
A MATCHING CIRCUIT WHEN R_a IS LESS THAN Z_o



$$X_m = \frac{\pm Z_o X_a - \sqrt{Z_o R_a (R_a + X_a^2 - Z_o R_a)}}{Z_o - R_a}$$

$$X_1 = \sqrt{\frac{Z_o^2 Z_o - Z_o^2}{R_a}}$$

A MATCHING CIRCUIT WHEN R_a IS GREATER THAN Z_o



shunting condenser (X_m) and the antenna inductance (X_2). Similarly, if the antenna resistance is greater than the surge impedance of the transmission line, the antenna inductance may have any smaller value than its normal value until it becomes zero. For any of these values, the proper changes have to be made in the values of the shunting condenser and the line inductance.

When the normal design is used, the proper adjustment is rather easily obtained. After approximate adjustment of the circuit elements to the values shown in Fig. 1A the procedure is as follows, (a) the line inductance is disconnected from X_1 and X_m . (b) An rf milliammeter is connected in the antenna circuit. (c) R. F. energy is loosely coupled to the antenna circuit and the value of X_2 is varied until a maximum antenna current is obtained. (d) The antenna coil (X_2) is disconnected, in order to similarly resonate X_1 and X_m by varying X_1 . (e) All elements are properly connected and power is fed to the antenna in the normal manner. From the line current (I_1) and antenna current (I_2) it is possible to determine if the circuit adjustment is correct. The product of the line current squared times Z_0 should equal the product of the antenna current squared times the antenna resistance. If the line current squared times the surge impedance is less than the antenna current squared times the antenna resistance, it indicates the input resistance is too high. The

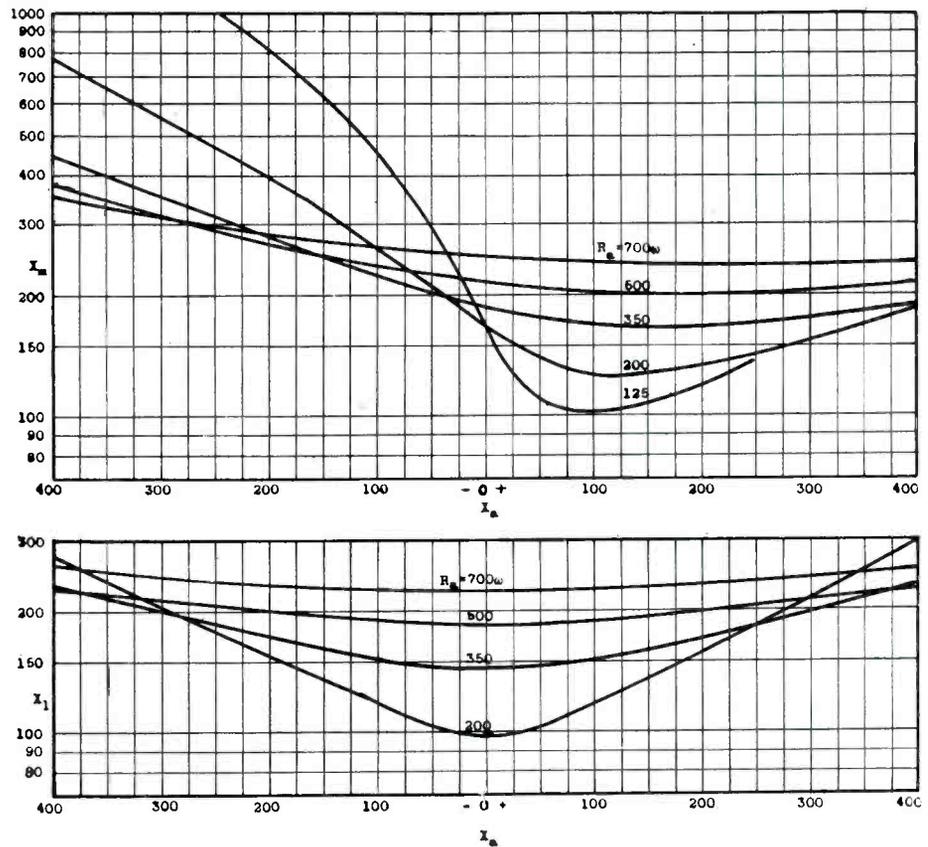
value of X_m should be decreased (capacity increased) and the above procedure repeated. If the line current squared times the surge impedance is greater than the antenna current squared times the antenna resistance, it indicates the input resistance is too low. The value of X_m should be increased (capacity de-

creased) and the above procedure repeated.

The Two Element Matching Circuit

This type of matching circuit is shown in Figures 2 and 3. It is not as adaptable as the three element circuit. It has the virtue of having the least number of

(Continued on Page Five)





Narcissus was no sissy

Who can say that Narcissus was effeminate? True, he did admire his own reflection. And, if we are to believe our mythology, he had ample reason to be pleased with the mirrored reproduction that he contemplated.

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Line to Antenna Matching Circuits

(Continued from Page Three)

elements and the minimum amount of volt-amperes, while performing the necessary matching. It is very difficult to adjust these circuits closely unless some means of measuring impedance is available.

The circuit of Fig. 2 may be used whenever the antenna resistance is less than the surge impedance of the transmission line. The values of the circuit elements are shown in Fig. 2A for the case of an 80 ohm line.

The circuit shown in Fig. 3 may be used when the antenna resistance is greater than the surge impedance of the transmission line. The values of the circuit elements are shown in Fig. 3A for the case of an 80 ohm line.

A Typical Antenna

The values of a two element network which will match antennas of various electrical heights into an 80 ohm line are shown in Fig. 4. These values assume an average guyed, constant cross section tower. The abscissa is hf where h is the height of the tower in thousands of feet and f is the frequency in megacycles. Thus if the height is 450 feet and the frequency is 1,000 kilocycles, the value of hf is $(.45)(1.0)$ which is $.45$. It will be noted that there is a break in the curves when hf is about $.27$. It is in this range that the antenna resistance is about equal to the surge impedance. When the antenna resistance is very nearly equal to the surge impedance a matching circuit may be unnecessary if the reactance of

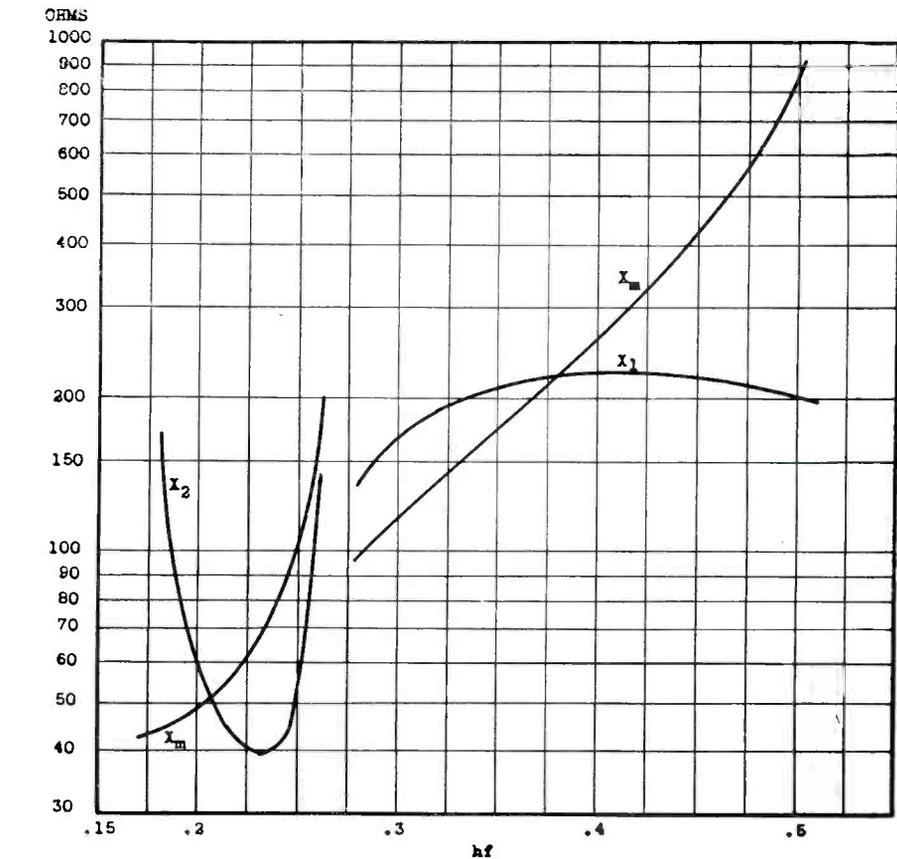


Figure 4

the antenna is tuned out. It is generally not desirable to do this and a three element circuit is used. On the left side of the break X_1 is zero and on the right side of the break X_2 is zero. In other words the type of matching circuit changes at the break.

Conclusion

The two element matching circuit may be used in place of the more adaptable three element circuit. It represents a saving of one circuit element and is more

difficult to adjust. For some modes of antenna operation the elements may become unduly large or impossible to obtain necessitating a three element network.

For some modes of antenna operation the antenna tuning reactance X_2 becomes capacitive. This is in general undesirable as excessive voltages and currents will endanger the condenser during the season of severe electrical storms. The circuit should be changed to one not requiring the series condenser.

Bert Pruitt Presents . . .

Nature of Program

Some day I hope to call a guy
Who doesn't say, "Quite true;
The level from New York is low—
There's nothing we can do!"

According to the Record Twirler

I wonder why they don't agree
To uniform ET's?
"Ins" and "Outs" and different speeds
Give me the heebie-gees!

The New Announcer Says:

I wonder why I heard that howl?
Can't New York switch 'em right?
It's funny that it stopped when I
Knocked down my Nemo light!

How Was I to Know?

The record didn't say what speed,
So how was I to know
Chinese would be the language if
I didn't play it slow?

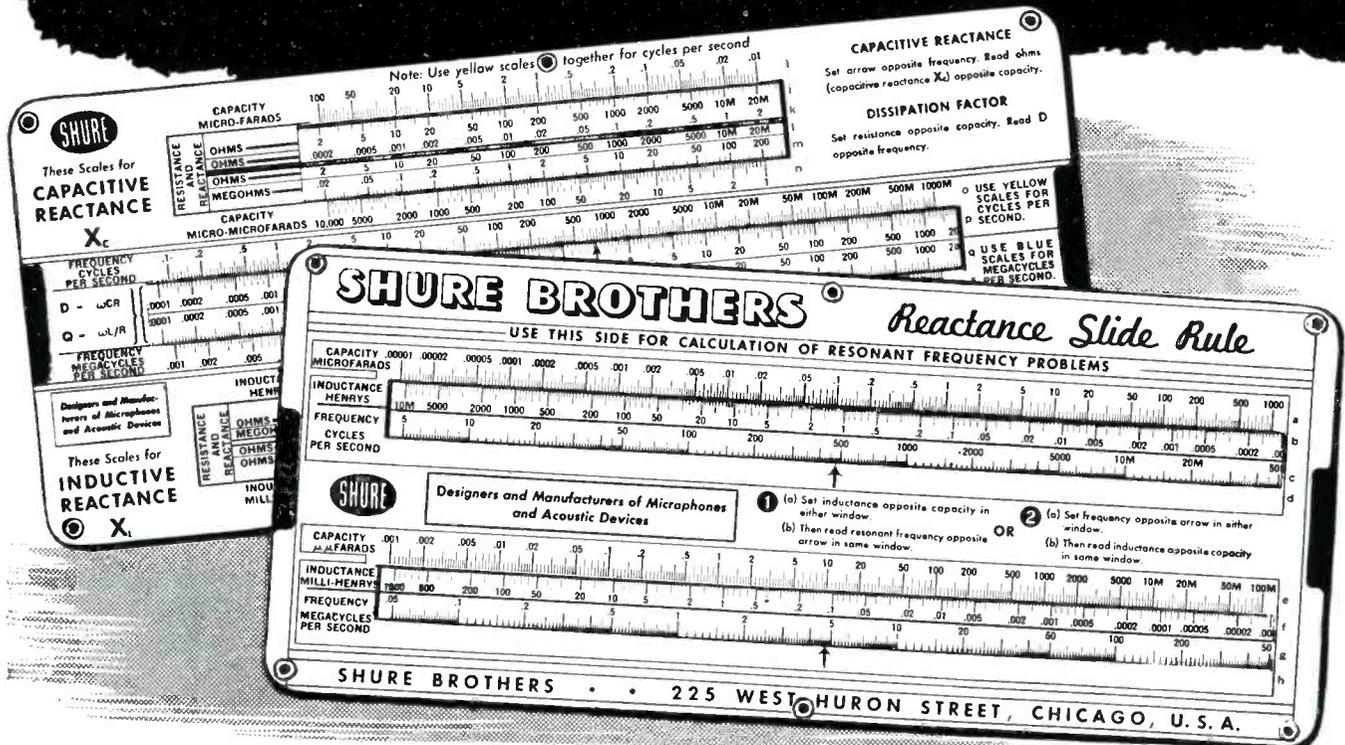
Return Side

I didn't give the proper cue
Because I'll swear I heard
A voice come back a second late,
Repeating word for word!

Transmitter Men

We shudder when we think what you
Could do to Opera Soap;
Just put your finger on the "OFF",
Then do we hear it? Nope!

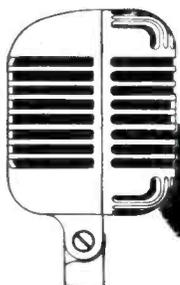
Engineers • Technicians • Teachers • Students Send for this NEW SHURE REACTANCE SLIDE RULE



Saves Time in Solving Resonant Frequency, Capacitive Reactance, Inductive Reactance, Coil "Q" and Dissipation Factor Problems

Here's how it works

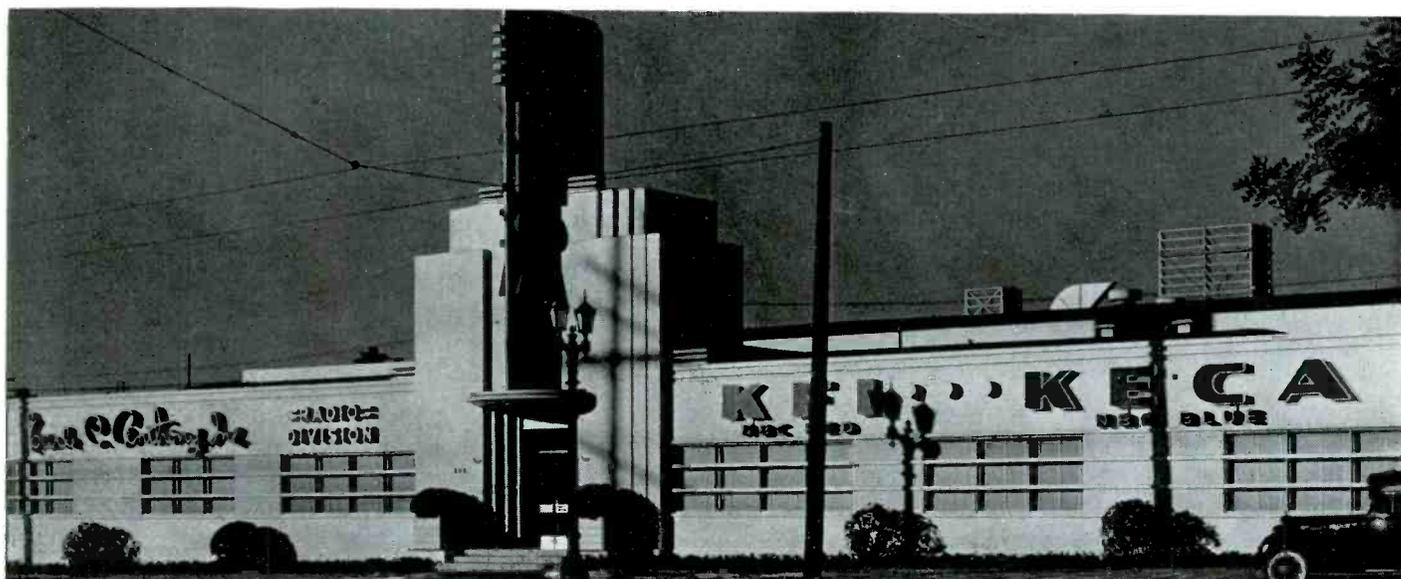
FRONT	EQUATION	SOLVES	RANGE
Resonant Frequency problems	$\omega^2 LC = 1$	1. Resonant Frequency if L and C are known 2. Various L and C values for desired resonant frequency	Frequency 5 cycles to 500 megacycles Capacitance .001 mmf. to 1,000 mf. Inductance .00001 mh. to 10,000 henrys
Reactance problems	$X_L = 2 \pi f L$ $X_C = \frac{1}{2 \pi f C}$ $Q = \frac{2 \pi f L}{R}$ $D = 2 \pi f C R$	Any single unknown variable, providing remaining variables are known in equations for Inductive Reactance, Capacitive Reactance, Coil "Q", Dissipation Factor	Frequency 0.1 cycle to 10,000 megacycles Capacitance 1 mmf. to 100 mf. Inductance .001 mh. to 100 henrys



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Los Angeles News By H. M. McDonald

EX-KFI-KECA SE Lloyd Fritzing, now Lt. (jg) USN, is moving right on up toward the White House. Late reports indicate he is only three blocks away, at the Navy Building, with the Radar Maintenance and Installation Section of the Ships Section of the Radio Division of the Bureau of Ships. Commander William Beltz, former manager of RCA broadcast transmitter sales here, is head of the Shore Section of the same Bureau, Lloyd informs us.

O. B. Hansen, Vice-President and Chief Engineer of NBC, was the guest speaker at a NABET dinner given at the Mayfair Hotel here on February 18. About forty-five Engineers attended and were entertained and enlightened by Mr. Hansen's informal talk on present and future conditions in the radio broadcast industry. Other guests included A. H. Saxton, Chief Engineer of the Western Division of NBC; Ralph Denechaud, ex-Chairman of Hollywood Chapter of NABET and now Managing Engineer of the Blue here; C. W. Mason and H. L. Blatterman, co-Chief Engineers of KFI-KECA.

Carl Estep is back in Los Angeles, teaching at L. A. City College, only a few blocks up the street from KFI-KECA Studios where he formerly twisted dials and spun platters.

The Annual Cruise of the Los Angeles-Hollywood Chapter of the V. W. O. A. was attended by about forty members and guests. FCC had the best representation, eleven men. Press Wireless was second with six. Broadcasting and FBQ tied for third. Among those present were: Chairman Hal Styles; Secretary Mack Schaefer; Bernard Linden (local R. I. in Charge); E. A. Jackson of RCA; Harry Austin of RCAC; NABET prexy Jimmy Brown; Mort Smith and Dick Stoddart.

If NABET had presented Charley Young, KFI-KECA studio ME, with that book on his hobby, woodcarving, before his recent appendectomy instead of after, he might have saved doctor's fees by doing his own cutting. (Ask the Doc to boost his bill so that you can make it an Income Tax deduction next year, Chas.) The operation was a complete success and Charley is looking better than in years.

Extra rations of coffee and sugar can be obtained for Engineers on late night watches, if the need is properly explained to the local ration board, reports Lyman Packard

of KFI. He secured an allowance of a pound of coffee a week for the men there. Men at nearby monitoring stations are also getting an extra ration.

Near record-breaking attendance at the March meeting of I. R. E. where Dr. E. U. Condon, of Westinghouse Research Labs, spoke on Microwave Electronics. Les Bowman, C.E. of KNX-CBS, is Chairman of the Los Angeles Section this year.

With 15 inches of rainfall to date, as compared to 7.5 inches at the same time last year, the boys at KFI Transmitter wish they had planted rice instead of green vegetables in their Victory gardens and perhaps tried raising ducks instead of chickens. Lloyd Roe is planting fruit trees, and including a couple of figs just in case the clothes shortage becomes acute. "Pete" Dilts believes in that old saw about a shoemaker sticking to his last and continues his experiments with high fidelity amplifiers and speaker cabinets.

Recent fan mail from Rochester (N.Y.) included a home recording of KFI rolling in there, despite QRN. Although the 50-KW transmitter is on the air continuously, except a six-hour service period once a week, it did not fail one second during February, reports Lyman Packard, E.I.C.

Wondered why Engineers Kennedy and Starr got away to the remote recording jobs at the Red Cross headquarters like firemen to a five alarm fire, until we learned they get free coffee and doughnuts, served by pretty nurses.

Dick Preece, Jr., ex-Navy Labs at San Diego, KFI-KECA Studios, and FCC Portland, is now sailing out of San Fran on a U. S. Lines ship.

Engineers visiting KFI-KECA recently included: Ted Reid, formerly of KHQ-KGA (NBC-Blue outlets at Spokane), and now a monitoring officer with FCC here; William Carberry of KFRC San Francisco; L. A. Gustafson, late of KBON Omaha, now with KIEV Glendale; R. P. McGaughey, Chief at KPRO Riverside; Leslie Vaught, ex-KIRO the 50-KW CBS outlet at Seattle; Verlon Clark, ex-KFBI Wichita, Kansas; Jaime Zavala, lately with XEAW Reynosa and previously at XENT Nuevo Laredo, 50 kilowatts just across the Rio Grande; Joe Tuft, from the Navy Labs at San Diego, once with Globe Wireless at Manila and Shanghai, and RCA at Bolinas.



By J. Willard Dean

WPTF just recently moved into their new quarters, displaying new equipment and furnishings throughout . . . furnished rather luxuriously, too, I must say. The studios

are located in Raleigh's new eighteen-story Insurance Building situated in the heart of the business district. When entering the Salisbury Street entrance, you take an elevator to the mezzanine floor which opens into a most elaborate looking reception room, done in soft shades of green and furnished with the most comfortable red leather chairs that make you want to forget about catching the next "trick" and slumber away, but the boss says no . . . Visitors only!



Control Room Console looking into transcription Studio "D"

The studios consist of two utility types, namely, B and C; also Transcription, Studio D, with built-in record cabinets and four turntables with, of course, necessary mike positions; then the large auditorium studio A, with a built-in stage, housing a Kimball three-manual pipe organ, concert grand piano and facilities for six microphones. This studio has a seating capacity for something over one hun-



Reception Room

dred. All studios are completely soundproofed with floating walls that are angle surfaced and look as though they might be the result of an architect's nightmare.

The control room is centrally located, with a full view into every studio, which total four in number. Equipment throughout has been designed by RCA to the specifications of WPTF, capable of a flat frequency response from 30 to 15 thousand cycles. The operating desk is of a horse shoe design, and all equipment racks easily accessible, being located just to the rear of the console. The building is well

(Continued on Page Ten)

Cleveland MAKES GOOD

By Bert Pruitt

MANY volumes have been written about the advantages to be gained from taking up an interesting hobby. Theorists claim that hobbies are to the human being what barometers are to the weather bureau. We try to make it a practice to agree with everyone, therefore we shall make this case no exception. In fact, we heartily endorse their statement, and we offer you Frank Whittam, Sec. Treas. of the Cleveland NABET Chapter, as Cleveland's gift to the theorists.

Frank went shopping before the Christmas holidays . . . He was looking for something extraordinary for his eight-year-old son, Pete. Frank finally decided, as most fathers do, that an elaborate printing press would be just the thing for a boy whose father would like nothing better than running a printing press as a hobby.

Pete soon decided, as most sons do, that it was a waste of time for him to hang around the shop watching his dad work his printing press, so Pete went back to his hobby of scooting down a nearby hill on a sled with the other boys of his age.

As time ticked forward Frank became more proficient in the art of running a printing machine. His reputation reached Brecksville, so Harold Brandt, Cleveland Chapter Chairman, made a contract with Frank to roll out 2,000 sheets of super-duper-letter-head paper. Frank nonchalantly turned out the 2,000 sheets in two hours!

Brandt talked to someone in Twinsburg and an order came in for 1,000 sheets . . . This guy talked to a fellow in Medina who got together with a fellow in Strongsville and they pooled their order for a few thousand sheets. Etc., Etc., Etc.

Thus an innocent hobby turns out to be a money making project. We used to wonder where Horatio Alger got his inspiration, but we believe we're beginning to see light at last. "If at first your son says no, plead with him again!"

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2. Apply to your purchase order the AA2X preference rating which you have received under the revision of War Production Board order P-133 dated February 4, 1943, part 3037.
3. In ordering replacement parts or equipment renewals give your distributor the serial number of the equipment to be repaired or replaced and the part number as shown in your instruction book. Apply the AA2X priority to your order.

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World's Largest Manufacturers of Instantaneous Sound Recording Equipment and Discs

WPTF—Raleigh

(Continued from Page Eight)

covered with permanent loop installations, including all four of the outside corners. Underfloor ducts are used for separation of the high and low level circuits running from the racks to the three channel mixing console. All studio circuits to control room are run in completely isolated conduits in order to further facilitate the soundproofing of each studio. Then too, we have a three-inch conduit running from the control room to the roof top, awaiting the after-war results of you FM experts (and/or Television?—Ed.)

Transmitter

This modern radio transmitting plant is located seven and one-half miles west of Raleigh, adjacent to U. S. Highway No. 1, going south. The building is constructed of

steel, brick and concrete, making it completely fireproof. The transmitter, operating on 680 KC employing directional system protecting KPO, is a Westinghouse 50-HG, embodying such features as air cooling in all stages, metal rectifiers throughout, except main high voltage rectifier inductive neutralization of the power amplifier, equalized feedback, compressed gas condensers and capable of 100% modulation with frequency response uniform within plus or minus 1 db from 30 to 10,000 cycles and overall efficiency of 47.5% with better than 80% in the final stage. We also maintain the RCA 5B transmitter as an auxiliary. Incidentally, this has been modernized somewhat and fits in well with the streamlined effect of the rest of the plant.

Studio "A" which houses the Kimball Pipe Organ



Manager Richard H. Mason's office



Interior of transmitter building showing new Westinghouse 50-HG transmitter



Interior of new Control Room showing Console and Racks, designed by RCA

WOR News By A. W. Stanford

AT THE regular meeting of the A.T.E. of WOR, held on March 19, 1943, the following officers were elected for a one-year term: President, G. Campbell; Vice-President, George B. Riley; Secretary, John Cook; Treasurer, Sam Morse. Congratulations and best of luck, fellows.

If anybody wants proof that Radio Engineers are versatile, here it is. Jack Byrne, one of our SE, has been authoring the audience participating show, "The Better Half," for quite some time now. The program is a great success and is being commercially sponsored. Chances are good that it will go on network basis. Jack has been with WOR for eight years and is married. Has two lovely children. He attended Fordham University and is very reticent about his success. Everybody is plugging for you, Jack.

Will some one please page Ripley. Herman Berger, SE, in his spare time dissects H-U-M-A-N E-Y-E-S. It seems that Berger is an amateur bacteriologist. He owns an elaborate laboratory complete with microscopes and microprojectors. But hold on, folks, that's not all. He also has a well equipped machine shop and builds his own from pins to automobiles. Herman has been with us for nine years and is married. Has two children and his domicile is out Irvington, N.J., way.

One of the comparative new-comers to WOR is Francis C. Garufy. He came to us by way of WNLC, New London, Conn., where he chief engineered. New London, by the way, is his home town. Has been married for three years and says that he still thinks that marriage is the best thing ever happened to him. (Hey, Francis, don't forget to show this to the wife.) He is one of the boys that make WOR's 50 KW Transmitter tick smoothly. In his spare time he likes to play tennis, and best of all, to step out with his wife.

Ralph T. Willey, TE and one of the old-timers at WOR, has his chest way out these days. His son, Lt. (jg) Guy F. Willey, who is a graduate of the Pensacola Naval Aviation School, is now attached to Navy Patrol Squadron. Lt. Willey has been in service for a year and a half.

Dennis J. Connor, one of the latest additions to WOR's Engineering Staff, is Ireland born and put in a long service with the English Marconi Company. Among others, he made seven trips around the world. Comes to WOR by way of RCA Communications. He is married and when time permits it, he likes to chase little white balls with odd shaped sticks on the rolling green.

Herman Florez, who in the by-gone peaceful days owned his own airplane and is a flying enthusiast, has been with the WOR TE gang for about a year and a half. He hails from Colombia, S.A., and his schooling includes: La Salle Technical Institute in S.A., N. Y. Electrical School, an E.E. degree from Columbia and radio courses at RCA and CREI. Came to WOR via WFOX-WVFW. Married and lives out in Sunnyside, L. I. If you happen to see a white Packard roadster equipped with all the gadgets it can possibly carry, it's Florez.

Highlights from A.T.E. meeting . . . Shirley Davis objecting . . . Jerry Barton elected sergeant-at-arms, whether he liked it or not . . . Eric Herud electioneering . . . the boys looking for refreshments . . . By-laws explored and explained.

W71NY, WOR's FM station, has a revised schedule. The station is on the air from 1 p.m. to 7 p.m. daily, except Sunday.



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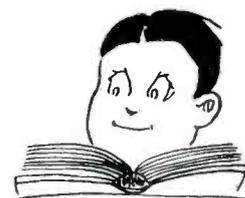
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TECHNICAL PRESS REVIEW



By Ed. Stolzenberger

A digest of leading technical articles in the current contemporary press.

[In these busy times few engineers can spare the time required to read all the current technical literature. It will be the purpose of this regular feature to provide an index of current technical articles on radio broadcasting and related subjects.—Ed.]

Proceedings of the IRE - (March, 1943)

Tuning Indicators and Circuits for Frequency-Modulation Receivers

By J. A. Rodgers

Frequency modulation provides good reception, but requires operation at resonance. The circuits described in these pages are applicable to standard receivers and provide effective means for accurate tuning. Some of these circuits include additional diodes, triodes, and combinations of diodes and triodes to produce sharp determination of the discriminator crossover point. A novel tuning eye employing two grids is suggested for a simplified tuning indicator.

Maintenance of Broadcast Operations in Wartime

By J. A. Ouimet

This paper deals with the technical measures which have been taken in Canada by the Canadian Broadcasting Corporation to meet the daily increasing difficulties of maintenance of broadcast operations in wartime. After a brief description of the facilities involved in these plans, the paper outlines the steps that have been taken in the physical protection and guarding of broadcast plants. The problem of conservation of equipment in the face of acute shortages is then discussed with the measures that have been applied to prolong the life of tubes, microphones, and other equipment.

A New Type of Practical Distortion Meter

By J. E. Hayes

This paper gives a description of a distortion meter embodying circuits which differ somewhat from the types previously employed for this type of instrument. It consists essentially of a bridged-T audio-frequency bridge circuit, in which the inductance element is replaced by a reactance-tube circuit. Because of the flexibility obtainable in vacuum tube circuits, it is a relatively simple matter to vary the effective inductance continuously over a fairly wide range, and thus allow the distortion meter to be used at any frequency in the audio range. Certain precautions must be taken in a circuit of this type in order to avoid difficulties due to non-linear action of the reactance tube circuit. Application of negative feedback to the reactance tube circuit effectively reduces the non-linearity, increases stability, and at the same time keeps tube noise and hum at a minimum level.

The Focusing View-Finder Problem in Television Cameras

By G. L. Beers

The technical excellence of a television program may frequently depend on the characteristics of the view-finder used in the television camera. Conditions peculiar to television make it desirable that television camera view-finders be of the focusing type. The requirements of an ideal view-finder of this type are discussed. During the past ten years, a number of view-finder arrangements have been investigated in con-

nection with the development of television cameras. Several of these are described and their relative merits indicated.

Mercury Lighting for Television Studios

By H. A. Breeding

This paper includes a brief history of the use of water-cooled Mazda H lamps, a light that is cooler than noon sunlight, for television studio lighting, with a detailed description of an installation of remote-controlled flood lights in the General Electric television broadcasting studio WRGB at Schenectady, N. Y. Results are shown by photographs of the line-monitor tube picture when the illumination of the set is provided by mercury lamps. Lamp performance is discussed and data on light maintenance presented.

Electronics - - - (March, 1943)

Physical Behavior of Wave Guides

By H. H. Skilling

This paper is a non-mathematical explanation of how waves travel through hollow metal structures or solid dielectric rods known as wave guides. It also contains a discussion of the conditions under which a wave will or will not be propagated along a wave guide.

Bell Laboratories Record (March, 1943)

Ultra-High Frequencies

A resume of Dr. G. C. Southworth's IRE and AIEE paper in simple language, stating some of the advantages of micro-wave transmission, such as transmitting antenna economy, for example. An interesting graph is presented showing the attenuation vs. frequency for $\frac{1}{2}$ " flexible coaxial cable, 3" rigid coaxial cable, and a 3" wave guide.

Relay - - - (March, 1943)

Secrecy of Radio and Cables

By Ray Hutchins

The author presents some convincing facts that explode the old bogey about the "inherent secrecy of the submarine cable." Cables are easily cut, and their positions are charted on maps available to all—including the enemy. As far back as 1920, the U. S. Army proved that submarine cables could be "tapped" electronically, and that the tapping could not be detected at either end of the cable! Present cryptographic and cryptophonic methods used on radio communication channels insure a degree of secrecy that greatly exceeds the dubious security of communication by submarine cable. This article should be read by all persons entrusted with the security of secret communications. Since the enemy is able to cut our cables and hasn't done so, we must assume that the enemy is tapping them.

Communications - (March, 1943)

Super-Regenerative Detectors in U-H-F

By A. H. Meyerson

The super-regenerative detector has recently been revived because of its ability to detect weak signals at ultra-high frequencies. The factors for optimum design can be followed on paper and closely approximated in construction. This paper seeks out these factors and to determine optimum values. A review of detectors in general is included.

The Synchronization of Oscilloscope Sweep Circuits

By W. R. MacLean

The gaseous discharge sweep circuit, although perhaps waning in importance as an object of research, is still growing with the number of oscilloscopes in use, as an instrument of research. Since the oscilloscope is coming more and more into new hands, it is well to popularize and possibly simplify the synchronization theory, so that the user may be able to interpret better some of the more important patterns that are observed.

Characteristic Functions of Transmission Lines

By S. Frankel

Interesting and useful tabulations are presented which list the characteristic impedance of various configurations of transmission lines.

Test-Flight Radio Recorder — Part II

By R. G. Peters

Part I discussed the need, advantages, and general discussion of the equipment and method of operation; this concluding Part II goes into the functional and construction details of various components. This complete paper should be carefully studied by all those concerned with the test of

similar equipment, where the receipt of performance records, over and above possible loss of personnel and equipment under test, is of paramount importance.

The Bell System Technical Journal - Quarterly - (January, 1943)

The Mathematics of the Physical Properties of Crystals

By W. L. Bond

The use of crystals as oscillating elements and as light valves in electric circuits has given the mathematics of crystalline media an engineering importance. Soon after the first simple quartz oscillators were made it was noticed that some ways of cutting the block from the natural crystal gave lower temperature coefficients of frequency than other ways. This led to studies of the change of elastic moduli with direction and temperature and finally the discovery that there are directions in quartz for which the shear modulus does not change with temperature. A thorough 72-page paper on the subject of crystals.

A Mathematical Theory of Linear Arrays

By S. A. Schelkunoff

A mathematical theory, suitable for appraising and controlling directive properties of linear antenna arrays, is based upon a modification of the usual expression for the radiation intensity of a system of radiating sources. An antenna array is a spatial distribution of antennas in which the individual antennas are geometrically identical, similarly orientated, and energized at similarly situated points; an array is said to be linear if points, similarly situated on the elements, are colinear. This paper deals mostly with linear arrays of equispaced sources.

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Cleveland News

By Bert Pruitt

THIRTEEN of WTAM's employees have passed the fifteen-year mark. That's passing a lot of marks any way you figure it. We dislike to challenge fate by flirting with number thirteen, but it cannot be helped in this case. We sincerely hope our false bravado doesn't put the Bee of Hoodooism in your unrated (yet!) bonnet.

We do not believe in statistics, otherwise we could go through some pyramiding figures like a beaver going through a spruce log. Think of the number of locals an announcer would make during a span of fifteen years. Or the number of hitch-hikes a good salesman would have to his credit. We won't suggest what the galloping ponies might prove to the musicians during that time. But we never hother to muddle through statistics and we suspect you don't either, so let's change the subject and get acquainted with these Trusted Shellbacks of the Ether Fraternity.

Our humble thanks go to Frank Whittam (SE) for taking this picture. Frank is the kind of technician who can

WTAM'S 15-Year Men



(Back row, left to right) Alvam McMahon (CS), W. C. Pruitt (CS), Harold Gallagher, salesman; John Disbrow (OS), Don Stratton, National Spot Sales. (Front row, left to right) S. E. Leonard, division engineer; Robert Oatley, music librarian; C. C. Russell, station engineer, and J. J. Francis (CS).

Four of the 15-year men could not make the appointment for this picture: Tom Manning, Erwin Goetch, Charley Avelonne and Ben Silverberg.



Tommy Cox (SE) didn't waste much time in putting distance between himself and WTAM. We cannot say where Captain Cox is stationed, but we can say he saw a lot of the Pacific before he got his first glimpse of a kangaroo.

do most anything except the one thing technicians have never been able to do . . . Eat raw onions and keep it a secret.

Inasmuch as we have mentioned onions, there's no logical reason why we shouldn't speak of bananas . . . Charley Ames (SE) says he has seen enough cargoes of bananas to fill the Atlantic. This picture shows Charley making a run between North and South America. He seems to have that High-Strung-Over-Worked-Appearance, does he not? Which brand of vitamin would you suggest he take to get that Up-and-At-Em-Poise?



Charley Ames

The radio listeners' reaction to the recent earthquake, that shook Greater Cleveland, should be an argument in favor of commercializing after midnight. The quake came at 11:26 P. M., March 8. WTAM's telephone system began to function immediately. Incoming calls were answered by the hundreds. Engineers became "Hello Girls." Chester Zohn, Night Manager, did too. I wouldn't advise you to misunderstand that statement, however. Calls continued coming in at a furious pace until an announcement was made to the effect that an earthquake had caused the excitement. There weren't more than half a dozen calls after the announcement was made. Here's your chance to make a million with a cereal scientifically soaked with the health restoring vitamins obtained from the beams of a smiling midnight moon.

Clarence Rohrick, (TE) WADC, Akron, will do research work for the U. S. Navy when he graduates from Akron University in the near future.

The rampage of the Ohio River, some time ago, brought back memories of the '37 flood to WPAY, Portsmouth, Ohio, engineers. WPAY moved the entire station twice and only lost about twelve hours of operating time out of continuous broadcasting for thirteen days during the flood of '37. Nothing was handled but messages . . . Maintaining direct contact with the local police radio, State Highway, Coast Guard, and several amateurs. For quite some time WPAY was Portsmouth's only means of communication to the outside world and within Portsmouth.

In the flood the Ohio River reached 61.2 feet . . . The highest since the '37 flood when it hit 74.23 feet. The last flood lacked about one foot before going over the famed flood wall.

Maurice L. Myers, Chief Technician, WPAY, Portsmouth, Ohio, recently completed thirty-two weeks as in-

structor of one of the ESMWT classes. He has recently begun a new class.

The engineering department of WMRN, Marion, Ohio, took advantage of a series of programs which originated from Ohio Wesleyan University in nearby Delaware, Ohio.

Each program was closely observed by students who are interested in broadcast operation. These same students are now operating the equipment for the once-a-week program which emanates from the Ohio Wesleyan University Radio Workshop.

WMRN has for the past two years cooperated with the University in training the radio students in actual operation at the studios.

We suggest you contact the University nearest you for prospective engineers and operators.



Ernest L. Adams, Chief Engineer of WHIO Dayton, recently put on his hip boots to explore the "Briny Deep" at the WHIO transmitter. After heavy rains Ernie needed the boots to get to the Tuning House. Adams is now making negotiations in an attempt to get hold of a canoe or some kind of boat so that when this happens in the future he will be prepared.

RCA TUBE GUIDE NOW IN WAR EDITION

A new and completely revised edition of the RCA Guide for Transmitting Tubes, designed especially for radio engineers and technicians in the armed service and war industries, has just been published and is available through all RCA power tube distributors.

Written originally and carried through in the three earlier editions as a catalog for tube users, the present or fourth edition of the guide transforms the booklet into an effective instrument of war. In seventy-two pages of circuit designs, photographs and technical details it supplies a wealth of information invaluable to every engineer and experimenter.

To this end, the RCA Guide explains in a foreword, it is essential not only that engineers and technicians know how to choose the right tube for the specific job, but also that they get the maximum use from the tubes already in service.

Any further technical information on any of the tubes described in it may be obtained by writing to the Commercial Engineering Section, RCA, Harrison, N. J.

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From San Francisco

By E. L. Parkhurst

THE U. S. Navy gains a couple of good men at the expense of NBC. Lt. (jg) MacAulay, KPO M.E., is awaiting Radar orders, and will be gone from our midst when this reaches print. "Bobby" Woods, one of our up-and-coming apprentices, has convinced his draft board that the Navy needed him worse than any other branch of the services, so he, too, is under way.

THE Mort Brewers, KPO T.E., will be blessed evening, momentarily. KPO T.E.'s Stubbe and Dingle are doing their part in the war effort. Each stands a regular watch for the local OCD Aircraft Warning Service.

ED. POAGE, KPO's congenial and jovial Asst. S.E., announces the arrival of five pups, but won't go farther than that. A pup's a pup, sezze.

AND speaking of new arrivals, the BNC's latest addition, "Hizzoner" Toby Hamma, is the proud father of a baby daughter.

CHAIRMAN Rothery on a flier to Hollywood to confer with Prexy Brown and others. Prexy Brown on a flier to S.F. ditto ditto. Guess ditto was about all.

REC. SUPR. O'Niel back on the job after a short session with his "butterflies".

SCHUKNECHT "has the promise of a house". If he gets it, he's lucky. Houses for rent just aren't in this territory. Carl says it'll be worth waiting for, tho. He hopes he never sees another snow shovel or any anti-freeze as long as he lives.

THE BNC has gone overboard with interior decorations for the third floor lobby. Thick plush rugs, pastel furnishings, contrasting draperies, etc., make the lobby very attractive. Must be money in broadcasting, after all.

SPEAKING of the BLUE, the extra heavy field programs scheduled by them reminds us of the good old days when less than ten special events a week was considered a slow week. Such special events fell off considerably in recent years, but the ambitious BNC management has certainly revived what threatened to be a lost art hereabouts.

FROM KGO comes word that Jim Ball and Ken Martin, T.E.'s worked opposite runs on the L.A.-S.F. route in the days of SSs Yale and Harvard, and consequently when the two of 'em hit the same watch, most anything happens. Jim says he gets sea-sick just remembering how sea-sick he used to get on the Yale.

KGO STN ENGR "Shorty" Evans is also expecting a blessed event. A colt, and not the shooting kind. Better watch out, Shorty, there is a scarcity of meat hereabouts.

POP PERRY, the versatil janitor at KGO, has endeared himself to the rest of the staff by designing and building (of all things) an ANTI-ANT, a cupboard where-in jelly sandwiches and other toothsome delicacies can be stored for a couple of hours without danger of being carried away by hordes of East Oakland ants! These ants are rumored to be related to New Jersey mosquitoes. Anyhow, the ANTI-ANT is far too complicated to be described here, but full information can be obtained by writing direct to KGO.

AND SPEAKING again of special events, there is a great rivalry between those S.E.'s who cover the service jobs, since always a free square meal or two goes with the job—something that is daily becoming rarer and rarer. Even Chairman Rothery got a swell steak dinner (and for free) when he covered some sort of a Greek celebration a few

weeks back. Wonder how that fits in with section 5.16 of the N.A.B.E.T. agreement?

AND SPEAKING again of food and related items, the men on the midnight-to-morn tricks are wondering what happens to their 3 ayem snacks (?) under the point rationing system. Any suggestions, gang?

Behind the Mike

By Con Conrad

LT. T. E. GOOTEE, NBC engineer from the Chicago staff, has just been heard from. Our latest report has it that he has received four citations for work well done, in connection with air warning equipment.

Martha M. Smith, former control operator at WCSC, has joined the WAAC, and from latest reports is doing right well by herself.

Major P. H. Clark of the NBC engineering staff in Chicago, now in the South Pacific war theatre, has notified us that he has received the Asiatic South Pacific citation, for work well done.

L. M. Mulatz, Blue Network Chicago, announces the arrival of a son. Leo says not to follow in his father's footsteps as radio man.

Ralph L. Priest, new to the Blue Network in Hollywood; his former duties here were with KHJ.

T. E. Paelig, formerly of the Engineering Department of NBC Chicago, has just been heard from and is teaching radio for the Signal Corps at their Bancroft School in Chicago.

Scotty Monroe, engineer for WBT, and incidentally an old-timer to the radio field, suffered some severe injuries recently in an automobile accident.

Irvin Eney, engineer for the KYW staff, has been upped to studio supervisor, replacing George Hagerty, who has become a lieutenant in the Army.

James Matheny, long-time engineer for the WGN staff in Chicago, has been commissioned a first lieutenant in the Army Air Forces.

Bill Overstreet, also a long-time engineer for KYA, has taken military leave and is now a lieutenant with the Signal Corps.

D. R. Fitch, NBC Chicago engineer, suffered an injured ankle recently when hurrying to catch a train. Fitch does double duty, engineering at NBC and teaching Signal Corps radio at Illinois Institute.

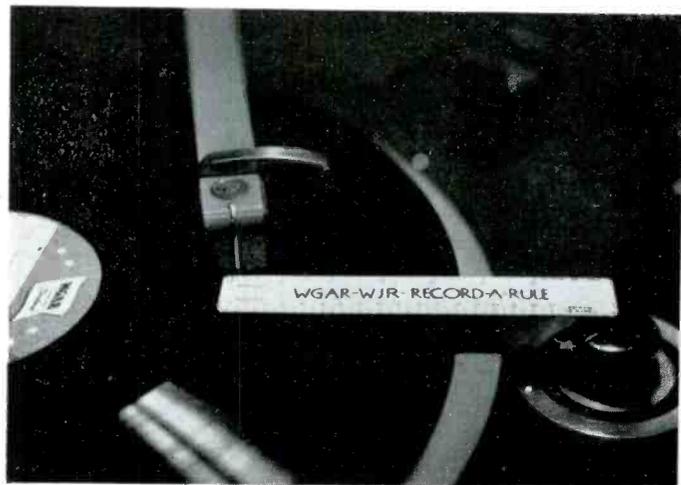
B. H. Spiers, Blue Network Chicago engineering staff, also enterprising farmer of West Chicago, has stocked up well on all types of seed; looks as though the Chicago gang will have plenty of fresh vegetables this summer!

R. B. Sturgis, on military leave from the NBC staff in Chicago and now a lieutenant with the Army Air Forces, as reported last month, has just been heard from. He notes that the breaking-in process is plenty tough, after not having done much exercise for many years.

Lt. George Maki, formerly of the NBC staff in Chicago and more recently of CBS and WIND, now on duty with the Signal Corps, has been transferred to research for the Signal Corps and has several patents now under consideration.

The WGAR—WJR Record-A-Rule By W. L. Widlar

THE above photograph shows the WGAR-WJR Record-A-Rule, produced through the combined efforts of the engineering and program departments.



This handy gadget is a vest pocket celluloid scale designed to measure the playing time of records and transcriptions. What this means to engineers, announcers and production

men can only be appreciated by those who have spent tire-some periods listening to records with stop watch in hand.

The Record-A-Rule has four scales—96 lines per inch for 78 R. P. M. recordings, and 112, 128, and 136 lines per inch for 33 1/3 R.P.M. transcriptions. The scales were fixed after exhaustive tests with recordings and after long study of information supplied by record and equipment manufacturers.

The tests proved that lateral or vertical cut transcriptions, or any portion of them, can be accurately measured to within five seconds with this pocket rule. It is of particular value in determining the playing time of partial cuts on instantaneous recording blanks, and in dubbing portions of several recordings to a single master disc. The rule may even be used with good results while the transcription is revolving on a turntable.

As the above picture shows, the Record-A-Rule is simple to use. Having first selected the proper scale, the rule is merely laid on the record with the zero marking even with the first modulated groove and the scale is read to the last modulated groove. The reading can be made in seconds, since the scales are graduated in fractions of minutes playing time.

Samples of the Record-A-Rule were first distributed to delegates at the 1942 Convention of the National Association of Broadcasters. So immediate and wide-spread was the interest that requests are still being received for extra rules.

What Is It? — and How Was It Done?

An X-Ray of a wrist watch has originally been made, a positive on a



Photo by Sergei de Somov

transparent film made from the latter, same size.

The two films were put together and brought slightly out of register in order to show the third-dimensional effect.

— Sergei de Somov.




RUGGED



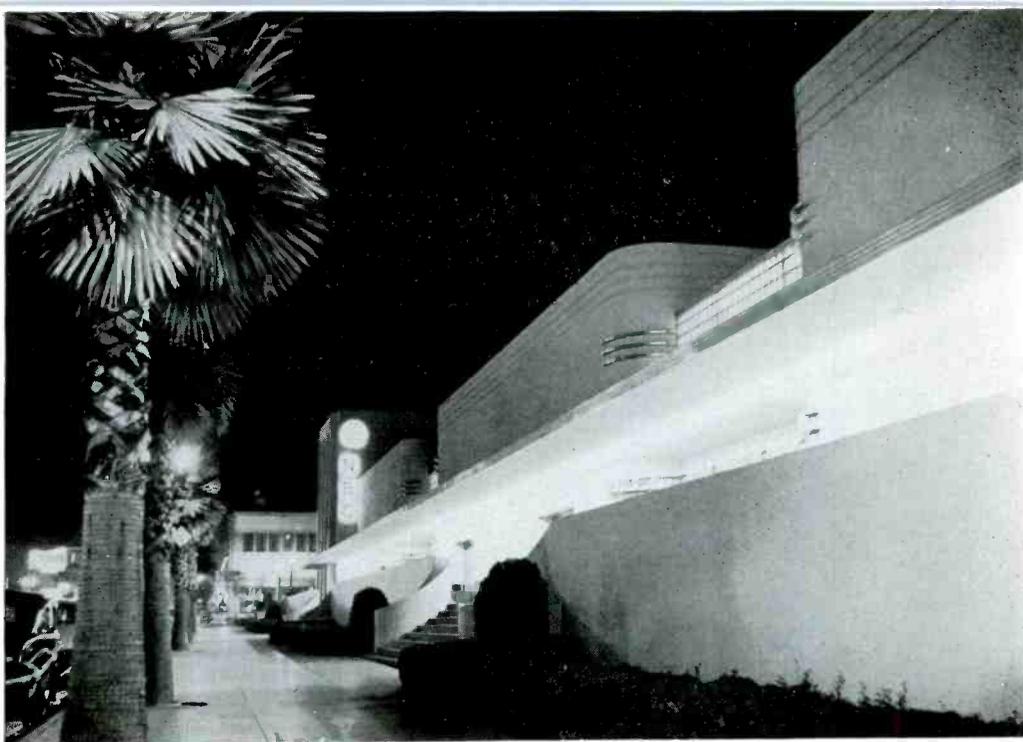

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H O L L Y W O O D

By Bob Brooke



Oh, I'm 1A in the Army . . . It's Been a Delightful CALIFORNIA Winter . . . Welcome Back Jake O'Kelly . . . Joe Kay's Baby a Girl . . . OB and NBC Execs Visit . . . Katie Phelan Marries . . . Shows Go East and Shows Come West . . . Adams Reports from the Marines

SUN . . . It was the fine California weather that caused us to be late for the February and March Journal issues . . . And it was the *terrible* Eastern weather that caused the trains and planes to be so late that the copy didn't reach Editor Stolzenberger until after the Journals had been put to bed . . . However, despite the lack of the Hollywood column, those Journals were terrific, especially the new New York column by C. A. Younger . . . And his column would be *much* better if he didn't take cracks at the Los Angeles Chamber of Commerce and our very accurate Hollywood thermometers . . . Our methods are simple, we simply wrap our thermometers up with a Hollywood blonde and then they never get below 220 degrees . . . As for Ralph Reid, our beachmover boulevardier, we are happy to advise the wild Indians of the New York Chapters that we have satisfactorily civilized Mr. Reid and that he is now one of us and in complete agreement on all Hollywood items of weather, clothing, blondes, brunettes, victory gardens, and yachts . . . And why shouldn't he be happy, with a wonderful California girl for a wife and two of the top radio programs on the air . . .

BLUE . . . Blue Hollywood Chief Denechaud reports

the leasing of a theater at Highland and Sunset for Blue overflow shows . . . It is expected, as soon as minor acoustic changes have been made, that the five-a-week Gracie Fields show will originate from there . . . Denny also tells us that Jake O'Kelly has been released by the Army on the over-age law and comes to work April 1st for the Hollywood Blue . . . Welcome home, Jake . . . Gosh, we're glad to have you back with us . . . And to answer WOR's query about Carl Lorenz, we're happy to report that Carl loves California, has a beautiful new home, plenty of fishing tackle ready for trout May 1st, works some of the toughest Blue studio shows, and says hello to A. W. Stanford of WOR . . . Incidentally, Denny's studio staff will shortly equal the eleven-man studio group of NBC Hollywood . . . Ralph Priest, formerly with Mutual, is a recent newcomer to the Hollywood Blue . . . Welcome, Ralph . . .

MISC . . . NBC Chief Saxton on the sick list a few days due to badly wrenched back sustained while working on the community victory garden . . . Sax reports no heavy lifting for a year, on doctor's orders . . . Was amazed to drive into Palm Springs the other night and see neon signs and street lights for the first time in a year . . . Hardly

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realize the darkness of our coastal cities after living in their darkness for so long Luckily, Los Angeles is far enough inland and the sub menace is sufficiently remote to enable use of more street light than New York which is directly on the ocean However, our beach towns are nearly blacked out and our NBC mobile unit "Blackout Lights" have been used many times on important pickups Eastern papers probably all mentioned our thirty-minute daylight air raid alarm that proved such a fiasco recently Since then we have passed several laws pertaining to traffic control and civilian protection during air raid alerts Considerable air raid warden reorganization was also necessary to provide wardens in downtown areas and in residential areas where most menfolk were away at work We still live and learn Our leatherneck lieutenant, Miv Adams, has written a couple of brief postals telling of the trials and tribulations of a new Marine Corps officer He has apparently gone through a boot camp similar to that given Marine Raiders Reports that he stalks imaginary Japs all day with a Garand rifle and spends all night taking the sand and sagebrush out of rifle and hair Plus intensive organizational study Sez Miv quote, "There were no waivers on my physical and I'm not as young as I used to be" We hear now that Miv is in Florida studying Radar and finding food, lodging, and work much more to his liking Katie Phelan, our engineering secretary for many years, has gone and married a flyer and NBC ex-producer She left her flock of engineers for married life and an Army camp early in February We all wish Mrs. Max Hutto (and husband Max) long life and much happiness

VISITORS Hollywood NABET threw a sizeable dinner party (Do I have to come out and take the pix?—Ed. S.) for O. B. Hanson during his West Coast visit as a member of the NBC executive group touring the country to conduct NBC War Clinics in various cities NABET President Brown served as toastmaster at the event Honored guest in addition to OB was Captain Frank Figgins, home for his first visit since leaving for the Army Signal Corps The dinner was good, OB was in fine voice, Frank Figgins offered many sage and humorous comments,
(Continued on Page Twenty-four)



Blue Engineering Chief "Cupid" Denechaud greeting Miss Bowen and Marine PFC Jack Martin as they tour Hollywood Radio City during their "Day With the Blue". The couple had just made radio history by ad libbing a proposal and acceptance while being interviewed during the Blue's "Breakfast at Sardi's" broadcast.

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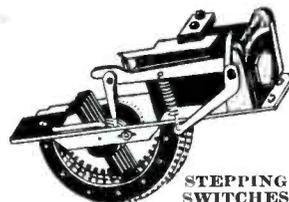
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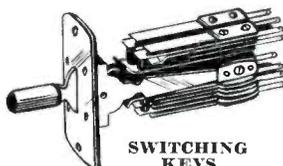
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Notes From the Nation's Station WLW-WSAI-WLWO

By Bob Brockway

THE life of a correspondent to the Broadcast Engineers' Journal isn't all a bed of roses, especially when a deadline must be met and there are things troubling the correspondent's so-called mind. For instance, the close of yesterday's Dick Tracey show left Tess Trueheart and Junior locked in an abandoned refrigerator in an abandoned warehouse on the abandoned waterfront. They were incarcerated therein by a wicked member of the equally wicked "black-market" gang. Tess said that Dick Tracey and Junior's dog had better pick up their trail pretty darn quick or they would run out of oxygen, or nitrogen, or whatever it is that occupies the empty space in an abandoned refrigerator in an abandoned warehouse on the etc. Poor Tess. Poor Junior. I just hope that Dick and the dog are hot on the trail right now, and not playing gin-rummy over at the Elks club. This isn't all, either; fifteen minutes later Jack Armstrong was in a pretty mess. It seems that Jackson, Uncle Jim, Billy, Betty, and Ramono were guests at a little shooting-match; i.e., they were facing the fring-squad composed of a bunch of gypsies with trick names led by the fearless Ali Bondandlillared or some such name. Ever since I heard the roll-call of those gypsies, I've a good idea who the bird is who names Pullman cars. I'll be willing to bet a big howful of those crispy, crunchy, golden-brown, delicious Wheaties with plenty of milk or cream and topped with a poached egg (The latter due to sliced peaches being 16 points these days) that John will come through OK, so that isn't too big a worry—but what really bothers this writer is, we made a grave error in last month's copy and wrote Murphy in the Army. Our apologies to Raymond for this mixup, so for the present, will the readers of these words please change Murphy's status to that of a civilian, until you hear to the contrary? In the meantime, if you should hear the old ballad, "Who Put the Dungarees in Mrs. Murphy's Chowder," just tell 'em I did.

* * *

The stork, whose route includes Crosley Square, left us two bundles

since the last issue. The proud papas this time are Bill Nungesser, who has a son, and Don Hoge, who acquired Miss Vicki Hoge. Colonel Hoge (yes, he is; he received his commission from the Governor of Kentucky) is the Dick Tracy of our outfit as he is a full-fledged deputy sheriff of Hamilton County. He admits that outside of the Boone County Jamboree, his favorite program is "Gangbusters."

* * *

The Crosley Square engineers are quite proud of their record of aiding the war effort. Almost the entire staff is participating in the payroll-savings plan by investing 10% of their earnings in War Bonds. Quite a few of the boys are displaying the bronze and silver buttons that signify that the wearer has donated blood to the Red Cross. We are all part-owners of a \$1,000 War Bond. This bond was purchased by Local Union 1224 of the I.B.E.W., which is the Cincinnati Broadcast Technicians Local, and whose membership includes, besides the WLW-WSAI engineers, the engineers of other Cincinnati stations, WCKY, WKRC, and WCPO.

* * *

Now that the Ohio River and Mill Creek are back in their respective normal channels, and the first balmy days of Spring have arrived, the Luther Burbanks of the engineering force are already swapping lies about their gardens. We hate to go on record at this time by naming the champion gardener, but we feel that it is safe to list a few of the likely contenders for the honors. After consulting last year's records and listening in on technical office conversations, we feel that Earl "Buck" Herzog will be well up in the running. Jim Leonard might make the above mentioned "Shumway" look closely to his laurels. Walt Rogers has an advantage on these two inasmuch as Walt handles the "Everybody's Farm" pickups which are short-waved direct from the fields and hog-houses of Everybody's Farm out at Mason, Ohio. Dave Wheeler has ploughed up a vacant lot next door to his place and Vernon Madill is planning to have his victory garden on the lot he bought out on the Cincinnati-Louisville pike. This list is far from

complete and future issues will disclose the names of others who are "growing their own."

* * *

This next piece might be entitled "The Price Hill Spy Scare" or "Ed Gleason Sells His Transmitter to the Signal Corps, Not Without Pomp and Fanfare." It happened several months ago, but is worth repeating due to its moral. Ed sold his ham transmitter to the Signal Corps and it seems that the Army chose a day to take possession when Ed was at work and wasn't on hand to make explanations to his neighbors. On the eventful afternoon in question, there were parked in front of Gleason's house, a couple of big Army transport trucks, and assorted jeeps and reconnaissance cars. (My Rosemont Avenue conferee reports that there was every type of Army vehicle there but an M-4 tank). Out of this convoy came officers and men, both in uniform and "civvies". When they carried out the wireless set, it was too much for the children of the neighborhood who have been seeing too many spy dramas at the local cinema. The kids ran home and told their folks that the F.B.I. and the Army had seized an "underground" radio station at Gleason's. This suspicion could be easily confirmed by looking out the window at the assembly of men and materiel. The next few days were spent by Ed running around squaring himself to the neighbors by explaining just what had happened. The reason for the vast array of rolling-stock needed just to collect Ed's transmitter, is still a mystery but maybe this will clear it up: The Government had no doubt heard of Gleason's prowess as the "demon engineer" and they figured that any set that Edward had built was similar in scale to an RCA 50-DX. The moral to the story is this: Spike That Rumor.

* * *

The IT-COULD-HAPPEN-ONLY-TO-AN-ENGINEER Dept. The scene is the cigar counter of the Patio, one of Cincinnati's better night-spots. The cast of characters are: an engineer whom we shall call "Homer" for obvious reasons; Homer's wife, Sally Thompson, Crosley Square's night telephone operator; and

(Continued on Page Twenty-one)

Stewart's Harem, or Life in N.Y. Recording Room



George Stewart, High Mogul of New York's incomparable Recording Dep't and long standing friend of this Journal, has submitted this cartoon for publication. While at first glance the "woiking goil" appears to be the victim of five (count 'em—five!) drooling wooolves, it was pointed out to us that careful scrutiny will reveal that the cartoon actually portrays five views of a single (one) woolf. Some effort has been made to learn the identity of the currrr, but we are assured by Mr. Stewart that the frequent visitor to his department will readily recognize himself, and give his girls some peace.

The Nation's Station

(Continued from Page Twenty)

Russell "Chief" Hoff, Master Control man on duty at the time. Any similarity to people, places, and events is not only coincidental, but is intentional, because this actually took place. Homer arrived at the Patio to do a pickup of the orchestra, but he was unable to check-in to the studios because a floor-show was in progress, and if you know the set-up at the Patio, 'nuff said. Homer, being a conscientious engineer, knew that he should contact Hoff some way or Russ would worry about his whereabouts, and, if you know us, you know we don't go around causing Hoff to worry. Homer spotted a public-phone at the cigar counter and vowed that he would explain his situation via that. He picked up the instrument and dialed the number. While he was thus engaged, his thoughts were elsewhere because instead of dial-

ing C-H-1-8-2-2, which is the studio, he automatically dialed his home number. Since it was rather late at night, the call aroused Mrs. Homer from her slumbers and she answered with a very inaudible "hello". Homer had caught one of Alexander Graham Bell's poorer connections, and what with the din of the night-club floor show, music, laughter, and the tinkling of ice in high-balls, he had trouble hearing the party on the other end of the line and his reply to his wife's "hello" was, "Hello, Sally, this is—(Homer). How'r you doin', dear. Gimme Master Control." This was followed by some classy repartee that only an engineer could dig up. By now, either the connection had improved or else the clamour of the Patio had subsided, because Homer heard a very familiar voice on the phone say "(Homer), is that you?" To which, Homer answered, "Yes, dear, I just called you to tell you that I'd be home after a while." To which we can only add: We bet he was!

(OS)

You make the work sheet out each day,
But life is not a song;
Program has a change of mind,
Therefore, OS, you're wrong?

What's Cookin'?

I wonder if my ND-10
Will ever be the same?
I didn't know a power cord
And mike-input would flame!

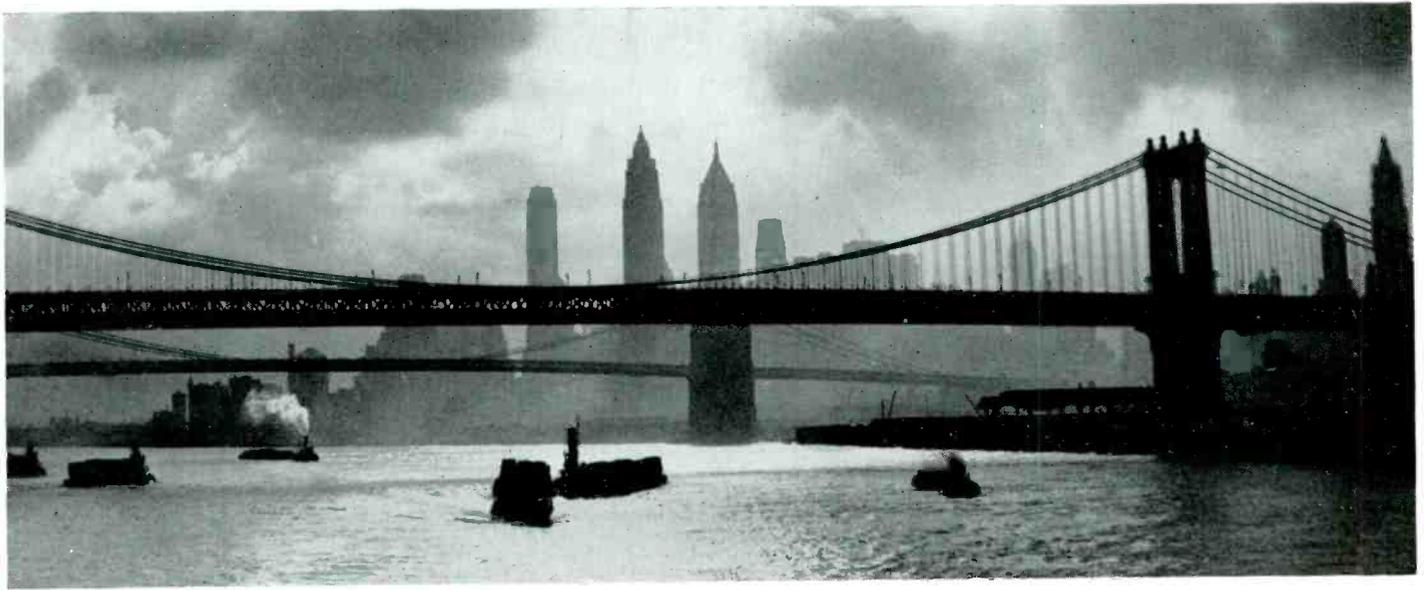
Production Men

Oh Stop Watch Kings we engineers
Would like to have your fame—
Your second hand can put the bee
On any dame you name!

Sound Effect Men

Nero plucked and bowed the strings
While Rome went up in smoke;
You men can rattle Cellophane
And make that fire a joke!

—Bert Pruitt.



Photos by Joe Conn

New York News By C. A. Younger

THE FLASH at the end of this column last month should have included the name of SE Jack Stoodly whose commission as first lieutenant, U. S. Army Signal Corps actually came through a week ahead of Charley Dickson's appointment as captain in the Air Force. To date there has been no word from Jack but Charley has sent us a few cards and Chapter Chairman Harry Hiller received a long letter from him. It seems that "Dick" is in the Officers Training School at Miami Beach, Florida, and is getting a terrific workout. All we know about Jack Stoodly is that he reported to the Chief Signal Officer at Fort Monmouth, N. J.

Charley Dickson's entrance into the Army marks another high spot in a colorful and versatile history. Educated at Union College and for a time a student of osteopathy, Charley decided to follow an engineering career and entered the employ of the General Electric Company at Schenectady more than twenty years ago. While there he became interested in the development work they were doing on sound picture recording. As the project progressed from the laboratory to actual usage in the entertainment field, "Dick" went along with it and turned in a creditable job. He was sent to Europe around 1929 and there supervised the installation of equipment in movie studios in England and France. When his work over there was completed, Charley returned to the States and became a studio engineer for NBC. During his stay with the company he has handled many of the best shows. His absence will be felt by many, because his knowledge of osteopathy, which earned him the nickname "Doc," was put to good use by those of us who occasionally twisted a muscle or suffered a "crick in the back."

Jack Stoodly joined NBC in June, 1941, and became a studio engineer for the Blue Network at the time that company was organized. Educated at the Radio Institute of America and the University of Wisconsin, Jack had heavy experience in the Marine

Operating and Police Radio Fields. To date he is the only NABET member known to have received a cash award for new suggestions to improve NBC service. A further measure of his resourcefulness and initiative is the fact that he is the absentee manager of a successful poultry farm in Ohio which he established over two years ago.

UPSTAIRS AND DOWN: Maintenance Supervisor Charley Phelan tears his hair while MS "Chris" Christopher wrings his hands wondering how they can augment their dwindling supply of carbon tetrachloride. Outside the entrances to the RCA Building the janitors pour copious quantities of the stuff on the sidewalk from five gallon bottles in order to loosen chewing gum deposited there by the more indifferent pedestrians . . . **BLUE TO YOU** is the title of a new mimeo pamphlet issued by the Blue Network and sent to the men and women who have left for duty in the military services. The first copy was swell, containing excerpts from letters written "back home" by those who had left and including names and addresses of those who are now in the Army or Navy . . . George Hicks, Blue announcer in London, interviewed George Hicks, M. P., on a recent program . . . Ken Smith, ex-International announcer, has left us to take a position in Mexico City as Director of Radio Advertising for the Grant Agency . . . Ray Knight now heads the Blue Production Department . . . Wynn Wright, NBC production chief, conducts a class for those who aspire to become radio actors and producers. Engineer Apprentice Leighton is one of his students . . . CBS is uncovering engineering manpower by teaching selected members of its personnel who are interested and can pass a preliminary aptitude test.

AMONG THE BOYS: Matt Connes and "Red" DuBois have been elevated from apprentice to full engineering state . . . Blue SE Joe Decker has left us to join the staff of an Albany, N. Y., station . . . Bob Ward, recently reclassified to 1-A, but more concerned about the plumbing for his darkroom . . . Bob Massell now in 1-A but more concerned than Ward . . . New applicants for Navy commis-



sions include SE's Harry Grelk and Herb Florance. Both hope for lieutenant (jg) appointments . . . Ex-SE Captain Charley Grey a more frequent visitor now that he is stationed near New York with the Army Air Force. He was formerly with the Service of Supply in Washington, D. C. . . . Messrs. Weisman, Ross, Bennett and Carpenter are four recent additions to the New York studio staff . . . New men assigned to Maintenance include Messrs. Gebhart, Alexander, Lynch and Ramsey . . . One of the newer apprentices was recently overheard telling SE Gill McDonald how to make a Marconi antenna give until it Hertz.

HERE AND THERE: Rumor has it that Jerry Sellar will be back at his old post in Master Control shortly . . . Equipment shortage now so acute that NBC Operations Engineer George McElrath has sent around a memo soliciting gear which can be used for broadcast purposes . . . New men are being added to the Engineering Staff so frequently that many of us do not get a chance to meet them until they have been here for a relatively long time. Division Engineer Wankel has initiated a "Get Acquainted" bulletin which is sent to the Lounge whenever a new man comes in. Bulletin contains brief biography of the new employee . . . Night men whose dinner hour falls after 7:30 p.m. find the acquisition of an evening meal a more and more difficult problem as many restaurants are "sold out" by that time . . . Blue Chief Engineer Milne now organizing WERS in his home town of Wood Ridge, N. J., at the request of that community's government . . . ME "Archie" Cooper back with us after several months' absence covering special N.D.R.C. assignment at Harvard.

DEADLINE DISPATCH: SE Ray Swannekamp just received a letter from Captain W. R. Brown saying that Lieutenant "Bill" Perry, ex-studio, and Lieutenant Vic Tervola, ex-recording, were now in his outfit.

The Grass Is Greener

By Bert Pruitt

It has often been said that the other fellow's job looks the easiest. The basic reason for this peculiar human quirk seems to come under the heading of envy. I used to envy a supervisor until he pushed a patch cord into a jack by mistake. This luckless fellow made the mistake of sending a Wheaties audition to a room crowded with Quaker Oats salesmen. The battle that followed convinced me that I was well hidden up there in one of the control rooms where I could grow a House of David beard without the Gillette people using me as an example.

Back in the early years of broadcasting I used to sit and pine by the hour. My greatest ambition then was to become an announcer. I could visualize being an announcer, standing there barking into a carbon mike, with countless millions rolling on their living room floors when I did my stuff. I had read magazines and I had a good idea of what autograph seekers do. Some day they'll flock after my autograph like they do out there in Hollywood, I thought, while cleaning patch cords.

I dreamed about this glamorous future until one of our announcers made the mistake of introducing President McHill

WANTED Manager for Test Department

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of McQuill University as Resident Nill of McPill Intercity.

After these illusions were shattered I had visions of becoming a program director. The authority that these men wield was right down my alley. I had done a hitch in the Navy and I could visualize announcers and engineers standing at attention before me like tars lined up before an admiral on the quarterdeck of a super-dreadnaught! I carried this envy in my heart until I heard of a program director dying from lack of exercise. I immediately wanted to become a dentist. After having three wisdom teeth pulled I changed my mind again.

I then envied the men who are retired on a life's pension. I thought this a good idea until the company asked me to agree to a deduction of 4 per cent monthly for a retirement fund. That idea went down the drain of disillusionment.

After the battle of the Solomon Islands I had visions of being an Admiral in the U. S. Navy. I went over to the recruiting office to sign up as Admiral, but was surprised to learn that I qualified as apprentice seaman instead!

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Denver News

By
By V. E. Andrews

THINGS do happen here in Denver, but it sure takes a long time to put them in print. Since the last Denver insertion "Pinky" Kahle couldn't stand the Washington atmosphere and had to return to his home base for work. With Kahle's addition it gave Carl Schuknecht a long awaited opportunity to get a transfer to KPO's studio. The Denver gang sure misses you, Carl, and good luck in your new job. This change prompted the newest addition, "Web" Jones, to get roaming feet—who left for a destination unknown. Now the studio gang is left with a man short and we are getting to see what San Francisco means when help gets short.

With Harold Austin as chief gardener, the transmitter gang is using their spare time to grow a victory garden. Guess spare time and rf will turn the tide to many a problem! The "Pelican" will keep the RATS away—although a guard at the transmitter killed a muskrat!

Please note—"Grasshoppers" Thompson and Pogue are studying the effects of short circuits, tisk, tisk.

If Walt Morrissey doesn't stop flying over Gene Carpenter's house and slowing down his egg production the C.A.P. will have to be consulted. Gene can't supply his customers with enough eggs any more, which could also be contributed to overworking his hens.

"Perry" Peregrine has been quite worried about his daughter Patsy who has been in the hospital. Our good wishes are with you, Perry.

Stan Neal and Aubrey Blake are sure proud fellows with their sailboat. Gas rationing won't affect their "freepower" navy.

We finally got even with Joe Rohrer and his numerous tricks. The other day a fluxammeter was around the control room and Joe thought he would take some measurements himself. So, he proceeded to check the load on the MCD buss. When the clamp was placed around the incoming

wire, I was given the high sign to set off the AC alarm. Boy, we had to get some patch plaster for the hole in the wall where Joe pushed his arm through. A little exaggerated, but you get the point.

An embarrassing moment was experienced by Kahle the other day when he was going to check the gravity of the new glass storage batteries for the clock system. It so happened that the batteries were left on charge all night and when he touched the top of one of the jars it exploded all over the room—and especially all over Pinky. Guess it was quite a sight to see an engineer running around with record boxes instead of an empty barrel!

Roy Fell is still looking for a trailer. Can't imagine anyone with such a desire with gas rationing. Still he may have other ideas.

Do you remember when George Anderson politely razzed me for buying a house? Well, you have a new example. George bought a house, a new Studebaker, had his tonsils out—and last but not least, bought a new hat! It's sure swell to be rich!

Since there is no hamming, everyone seems to be building bass reflex speaker cabinets. Anderson started the deal, with Nesbitt, Thompson, Rohrer, Neal, and Andrews following suit.

Milt Hall spends all his spare time painting his new fence. On his vacation he plans to paint the house.

Our latest report from Lt. Commr. Glen Glasscock is that he received his orders for active duty under the Southern Cross. Glen was formerly stationed at San Francisco.

Aubrey took a plane ride recently for a Red Cross s.w. pickup over Denver. His remarks in the log were "was introduced to St. Peter on the take-off." A crazy remark just because the wind changed direction when the Fairchild was only about twenty feet off the ground!

Hollywood News

(Continued from Page Nineteen)

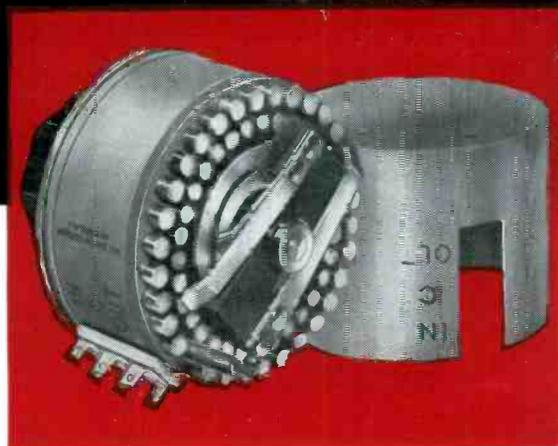
many friendships were renewed, and after it was all over Pres. Jim advised that it was on the house . . . Other visitors of recent weeks included Major Fred Shidel who paused for a fleeting glimpse on his way to new assignments . . . Captain Tom Cox of WTAM and Lt. Pilcher of CBS, Washington, who stopped in for a session with Jim Brown and a visit to the Gildersleeve show . . .

NEW MEN . . . We are happy to welcome several new men to the ranks of NBC Hollywood . . . Harold Platt has transferred down from San Francisco NBC and goes to work in our recording department . . . Lew Winkler and Louis Benvenuto, former instructors at National Schools, have joined us and are at present getting their indoctrination under Johnny Morris and his maintenance department . . . I don't believe we have mentioned heretofore our three excellent apprentices drafted from other departments in the company and all with backgrounds that tie into technical operations . . . The boys have spent months in maintenance and recording and are now assigned to studio training alongside senior studio men . . . From all indications they

are just about ready to doff their fledgling garments and take over about any assignment we can give them . . . They are Bob Morris, Al Gage and Louis Onofrio . . . Good work, fellas, and good luck with the knobs . . .

RATIONING . . . Still plenty of gas out here . . . But not so with meat, butter, eggs or food in general . . . Hence many victory gardens are starting and quite a few poultry coops are violating city ordinances . . . Families living in the Valley have even purchased a bovine or two . . . Meat situation in particular will probably get worse before it gets better . . . Southern California and its war industries have attracted nearly a million extra workers and their families, not to mention the military establishments and organizations that require food supplies from normal civilian sources . . . It was estimated late in March that less than 15% of the normal meat supply was available for civilians . . . Guess we'll have to sample some of the cornflakes and kid cereals sold by our sponsors . . . Anyway we don't need fuel oil for heat and we can grow vegetables all the year around on our front lawns . . . So as many a true Californian has said, "I'd rather starve in California than be a millionaire back East" . . .

From sunny old Hollywood we wish you all good vacationing in your victory garden, and thumbs up . . . 73.



Long-Lasting

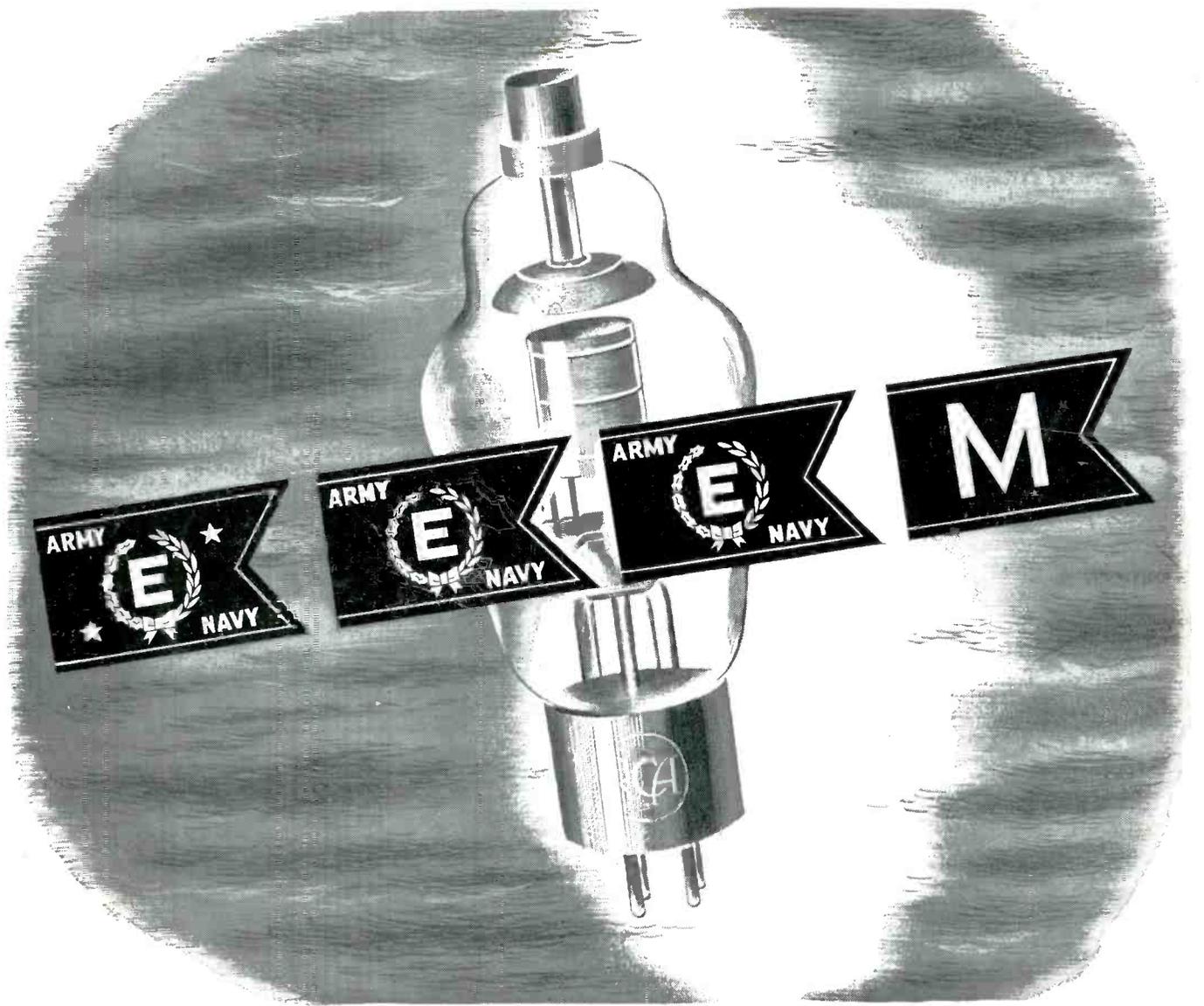
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these four flags by their outstanding achievement in the production of radio-electronic equipment vital to victory.

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