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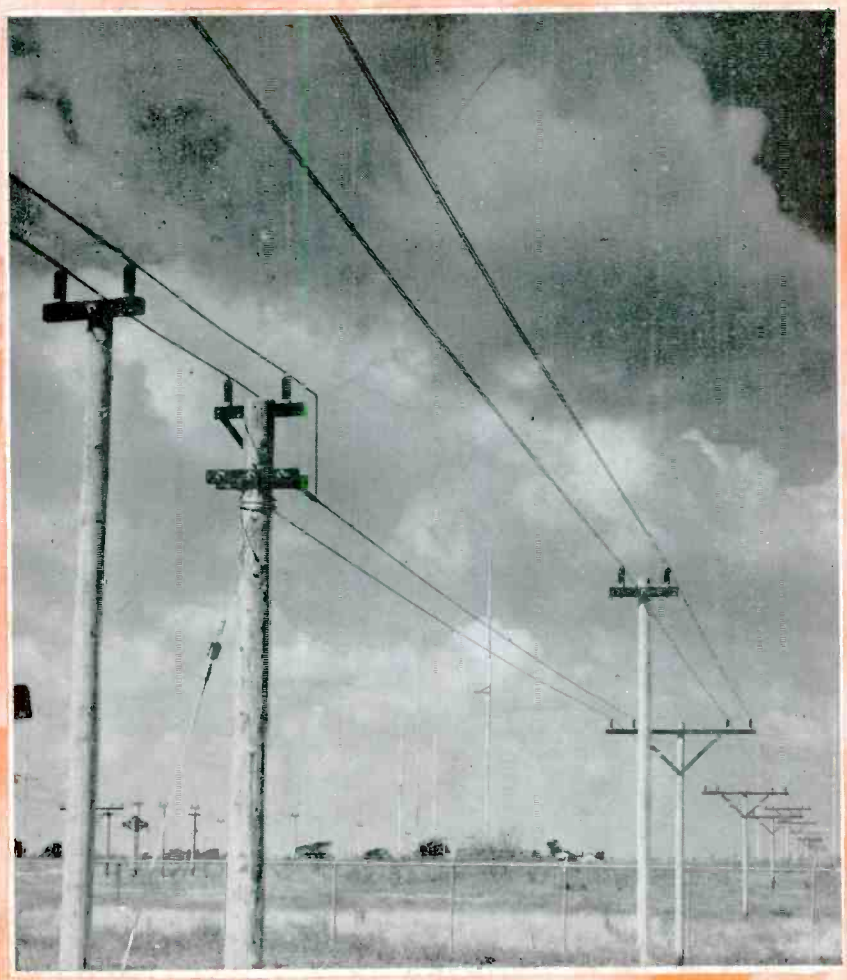

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—See Page 20

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THE BROADCAST ENGINEERS' JOURNAL

Ed. Stolzenberger
Editor

Coordinator ..... F. R. Rojas

Volume 11, No. 11 — 409 — November, 1944

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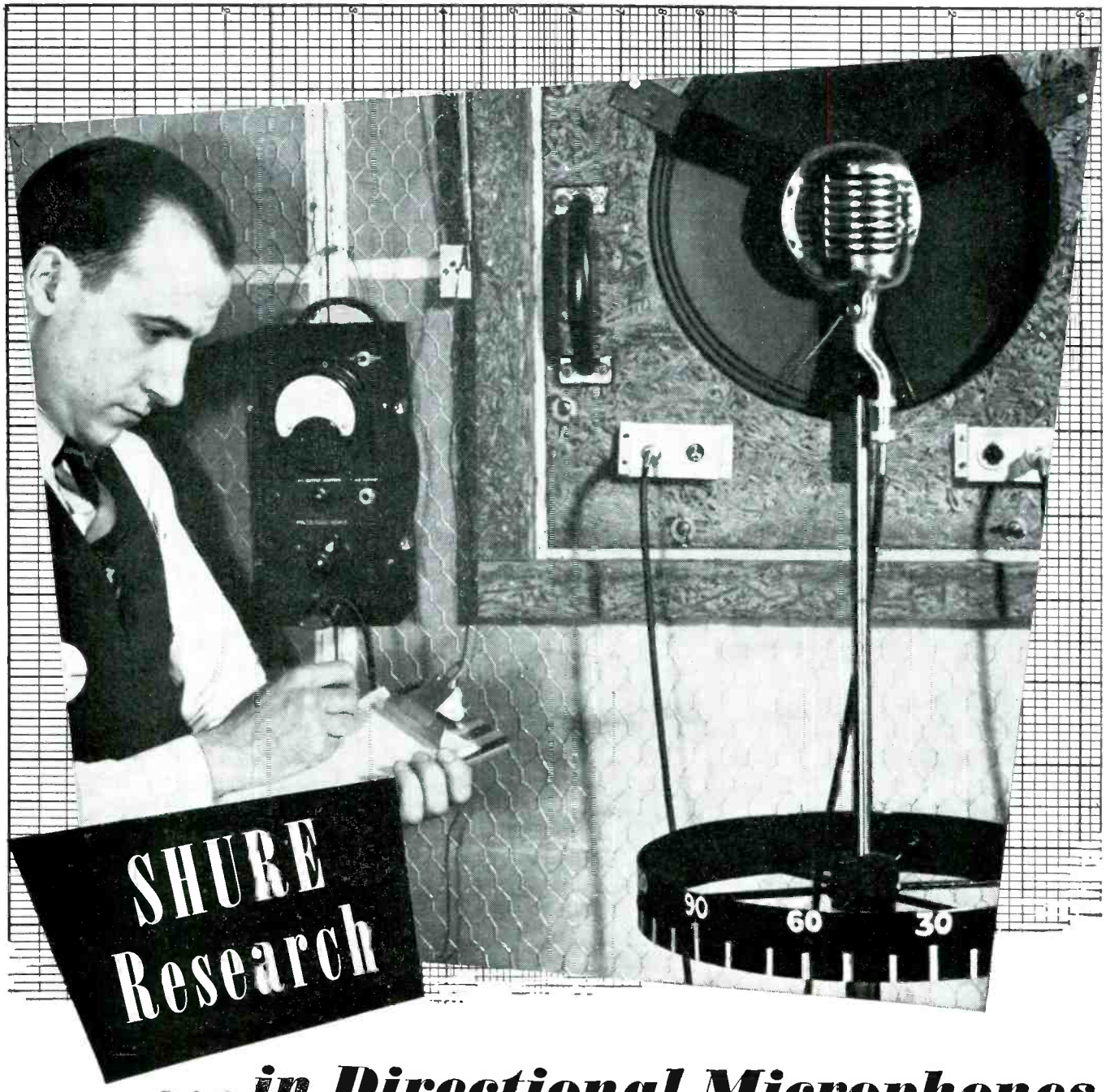

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Elemental Electronics Part X

Production of Square Waves and Pulses : By Jordan McQuay

IN THE study of non-sinusoidal waves (Part I, *B. E. Journal,* Jan. 1944) it was shown that specific wave shapes are necessary for the proper functioning of electronic circuits. Among these various kinds of waves, the square or rectangular wave is the most important because of the very broad usage of this particular shaped wave. While the wave is comparatively simple in geometric form, it is not easy to produce.

From the study of limiting and clipping circuits (Part IX, *B. E. Journal,* Oct. 1944) we learned that an amplifier can be purposely operated over a portion of its non-linear characteristic curve to produce irregularly shaped non-sinusoidal recurrent waves. The circuits employed for obtaining square and rectangular waves are merely modification of the basic triode limiter circuit.

It will be remembered, from the study of non-sinusoidal recurrent waves (Part I, this Series), that square and rectangular waves consist of basic sine waves with a very high order of harmonic distortion. In fact, a *perfect* square wave (having sharp vertical sides and precise square corners) would have to contain an *infinite* number of harmonics, which is impossible, of course, to obtain. But square and rectangular waves with very high order harmonics, while not absolutely perfect, are suitable for electronic operation. In any case, we are usually interested in either the leading or trailing edge of such a wave shape—and it is imperative that the edges or sides be abruptly vertical. Such a leading or trailing edge might, in some cases, trigger another piece of related electronic equipment—and with split-micro-second precision. For this reason it is desirable, in most cases, to obtain square or rectangular waves approaching absolute perfection, wherever possible.

At this point it may be stated that there is little differentiation between *square* waves and *rectangular* waves. So-called "rectangular" waves are merely slight variations of the basic square wave, and the two terms may be used synonymously. When the wave shape has a very high vertical dimension compared with the horizontal width-dimension—the wave form is generally called a *rectangular pulse,* or, a *pulse.*

We have talked about square waves in many of the past chapters in this Series. Now let's see how they are produced.

The *linear vacuum tube amplifier* is a familiar component of broadcasting and communication circuits. The adjective *linear* is important; it means that the amplifier is essentially a device in which current flowing in the external plate circuit is *directly proportional* to the magnitude of the voltage impressed on the grid of the tube. In broadcasting and voice communication work that direct proportion or linearity is important, since we want to reproduce voice and music *without distortion.*

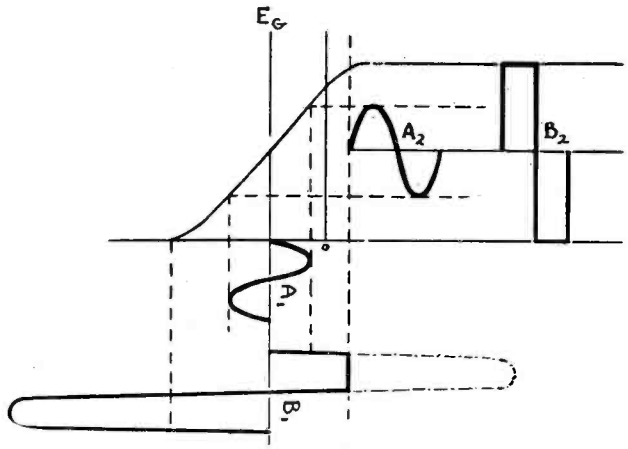


Figure 1
Illustrating the Squaring Action of an Overdriven Amplifier.

The familiar Eg-Ip characteristic curve for a typical triode amplifier is shown in figure 1. To operate this tube as a *linear* device, it is necessary to select a fixed grid bias Eg on the linear portion of the curve and to permit the grid input signal A_1 to vary about this Eg bias *only over the linear portions of the characteristic curve.* Operation only over this linear portion will insure that the output wave A_2 is a magnified version of the input wave A_1—with no appreciable distortion. In more familiar terms, this is known as Class A Amplification.

An examination of the characteristic curve (figure 1) will reveal that this linearity does not continue indefinitely. As the grid voltage is made more and more negative, there comes a point at which its effectiveness in decreasing the plate current decreases, as the tube characteristic curve assumes a gradually decreasing slope which becomes more or less asymptotic to the zero ordinate line. This region is known as "plate-current cut-off". Now, proceeding in the opposite direction on the characteristic curve, as the grid is made more and more positive, there comes a point at which the total quantity of emission from the cathode is reaching the plate, and no further increase if grid voltage will produce a further increase in plate current. This is the region known as "saturation".

Both the regions of "plate-current cut-off" and "saturation" are the curved portions of the tube characteristic, and therefore are decidedly *non*-linear. When the tube is operated over either or both of these regions, considerable distortion

can be expected—because in both cases, the curve undergoes a rapid change of slope.

This is the basic principle of distortion amplifiers used in electronics work.

Beyond a certain negative value of grid voltage, no plate current flows. But as the grid is made less negative, plate current flows when the linear part of the characteristic curve is reached—and further increase in plate current (over this linear portion) is, of course, directly proportional to the decrease in grid voltage, until the point of zero bias is reached.

The amplifier will generally be excited from a source which is incapable of providing appreciable current. But when the grid voltage reaches zero and then attempts to become positive, an attempt will be made by the amplifier to draw grid current from the driving stage. This being impossible, the input signal voltage will at once be attenuated or limited to such a point that no grid current is drawn. And any further attempts to drive the amplifier beyond this point in a positive direction, will not be successful.

Referring to figure 1 again, let us operate the triode amplifier with an extremely large input signal B_1 which will alternate around the bias voltage Eg. For purposes of this discussion, a sine wave input will be used. Operated in such a manner the amplifier will give *linear* amplification for all signals which fall between the region of "plate-current cut-off" and the region of "saturation" or "grid current". And the positive and negative extremities of the input wave which venture into either of these distortion regions will be attenuated or limited.

For example, assume that the input signal is 20 times the amplitude normally tolerated for linear operation; that is, instead of a grid input signal of perhaps 20 volts, the tube is purposely operated with an input of 400 volts. Then, as the grid first goes positive a condition of "saturation" will be reached quickly—and the plate current will rise to its greatest possible value. As the grid attempts to go more positive the influence of the input signal, grid current will be drawn by the amplifier tube and the high impedance driving source will be incapable of affecting a further increase in the grid voltage. The plate current will therefore remain constant at the maximum possible value, until the signal input wave has proceeded in its cycle and returns to the linear portion of the characteristic. Once this region is reached, the plate current will fall proportionately with the decrease in grid voltage, until it reaches the cut-off point. At the cut-off point, the plate current is actually at zero—and any further decrease in grid voltage will not alter this current condition, since it cannot be reduced below zero. The output wave or plate current will, therefore, be constant (at zero) until the input signal wave has continued in its cycle and enters the region of linearity again, when the entire process is repeated again. From this step-by-step procedure, it can be seen that the output wave B_2 will be a square wave and a clipped or limited copy of the original input signal B_1.

This form of amplifier, known as the "overdriven" or distortion amplifier in electronics work, is very similar to the "Class C" amplifier often encountered in radio communication circuits.

Referring again to figure 1, it will be noted that the fixed bias Eg was chosen, in this case, at a point about half-way between "plate-current cut-off" and "saturation". Now, if this fixed operating point were moved either positively or negatively to some new value of bias, the resulting output wave would *not* be a square wave—but would be a slight modification of a square wave: a *rectangular* wave, having unequal half-cycle alternations. The shape of such a wave would, of course, vary considerably; it would depend wholly upon the amount of grid bias Eg employed for the amplifier.

From this discussion of the distortion amplifier, it can be seen how square waves are produced in electronic circuits. This important information plus the methods of clipping and peaking already studied can now be combined to produce non-sinusoidal recurrent waves of almost any shape.

Very narrow pulses are often required to shock oscillators into action, to modulate radio frequencies into brief transmission pulses, or to drive the grid of a tube above cut-off or below saturation so that it may function for a micro-second interval. Squaring, clipping, and peaking circuits can be employed in combination to transform sine waves into square waves, square waves into peaked waves, and peaked waves into sharp pulses of very narrow width. In some circuits, alternately positive and negative pulses, obtained through a conbination of wave-shaping circuits, may be passed through a limiter or clipper to obtain pulses which are either positive or negative with respect to some reference level. Such a level may be zero, or any positive or negative value.

As a typical example, it might be required to transform a pure sine wave of given frequency into a series of extremely narrow positive-going pulses of the same periodicity. A circuit sequence for performing this function might consist of (1) a normal amplifier, to magnify the amplitude of the basic sine wave, (2) an over-driven amplifier, to obtain a square wave by action of the distortion characteristics of the tube, (3) a peaking circuit, to change the square wave into a succession of alternately positive and negative peaks, (4) a Diode Series Limiter, to remove all of the negative-going peaked waves—leaving only a series of positive peaks, (5) a Triode Clipper, to remove the sharp "points" of the peaky wave—leaving a thin narrow pulse, of any width determined by the various circuit constants.

Although the pulse is widely used in electronics work, it is not always necessary to obtain such a wave shape. Many industrial devices function with nothing more than a simple square wave, while television requires the use of many complex wave forms and precision synchronizing of many dif-

(Continued on Page Fourteen)

—Photos by David O. Alber Associates

(Left) Mr. Allen B. DuMont (standing) checking technical facilities in the control room. (Right) Left to right: Bennett Kolb, Service Executive, Marschalk & Pratt; the "Journal's" second girl Madeline Bigaouette (the "Journal's first girl Millie was closing the October issue and unable to be present); Editor Ed Stolzenberger, busy selling the "Journal" to Mr. DuMont by Television!—Anne Bergishagen, Secretary to Cmdr. Mort W. Loewi; and John Allen, Radio Director, Marschalk & Pratt.

DuMont Demonstrates Confidence in Television

New Facilities and Studio Opened in New York

By Ed Stolzenberger

DU MONT Television Station WABD in New York has donned its first long pants with the inauguration of a new studio and expanded facilities. In addition to the original studio on the 42nd floor of 515 Madison Avenue, alongside the transmitter, movie projection room, laboratory and other quarters, the station now occupies the second floor for its new large studio, two reviewing rooms, a theatre with projected screen images, general offices, dressing rooms, prop room and other accommodations. A sales department for television equipment will be on the third floor.

The new studio was officially opened on Sunday, September 17, followed by an informal reception or housewarming party on Thursday, the 21st, attended by representatives of the radio and television, advertising, theatrical, banking and other fields, not forgetting the gentlemen of the press.

Executive offices, viewing rooms, control room, and studio were all "open for inspection". Informal television entertainment was provided by the guests as they entered the studio. The pictures on the viewing room receivers were definitely good in all respects; about 8 by 10 inches in size, with good contrast and brightness, and free of objectionable spherical distortion at the edges. In the control booth, photo above, the present broadcast engineer will be interested in the number of cathode ray oscilloscopes, picture-monitors, and coaxial patch-cords that are typical to television engineering operations. In the studio photo, note that the cameraman appears to be looking down at the floor; this section of the electronic DuMont camera is the view-finder, which consists of a 3" picture tube; the advantage of this type of finder is that the camera man has precise knowledge of his "head-room" and other important factors of composition, together with the fact that in the presentation of night-scenes and other optically dark scenes, he can control his viewfinder brightness to a value sufficient to do his job properly. We started to point out that while the cameraman appeared to be looking down, the camera (that portion to the right of the sloping section) is looking straight ahead. This finder is made to slope for the convenience of the cameraman. You will also be interested in the one-way PL by means of which the cameraman receives his cues and other operating instructions from the control booth. Some of the required pre-amplifying and other equipment will be seen on the floor of the camera dolly; picture signal amplitude is increased to a value great enough to be transmitted by coaxial cable (seen leaving the camera unit) to the control booth without being lost in circuit noise. The boom-suspended microphone parallels movie

(Continued on Page Six)

Norman M. Drysdale

FIFTY years ago a doctor in London, England, held a husky looking youngster by his heels and gave him a spanking that brought forth an outburst that may or or may not have startled the gulls roosting on the White Cliffs of Dover. The smiling doctor handed **Norman M. Drysdale** to the nurse, and it is doubtful if either he or the nurse realized that this infant would someday be an Engineer at Radio Station WHK in Cleveland, Ohio. In fact, it's doubtful if they realized there'd ever be such a thing as radio in London, much less in Cleveland!

Norman M. Drysdale

A lot of changes take place in fifty years. Take Norman as an example. If a doctor were to grab him by the heels and gave him a spanking today, the gulls at the White Cliffs of Dover would surely notice a decided change in the voice that could once hit high "C" at every breath. And what about the nurse? Would she tickle him under his chin like she did 50 years ago? And would Norman lie in her arms with the same innocent expression shining on his handsome face like the one that shone back there when Adolph Hitler was playing with his, not Norman's toes, in a crib?

Norman confesses to having entered the radio world in 1910. He further adds that this took place at the tender age of 18. From that statement we see that the good doctor spanked Norman in the year 1892. The three years following his entrance into radio were spent circumnavigating the globe . . . The Marconi Company footing the bill! He learned geography the pleasant way, and we dare say he learned a few things about life in such far away places as Africa, New Zealand, Egypt, India, and Australia.

By that time, Norman had gained lots of confidence and felt that he could return to London with little liklihood of some good doctor grabbing him by the heels again. As to whether he harbored a fear of being held in the arms of a smiling nurse, we are not qualified to say.

Norman settled down in England as an instructor of wireless during the following sixteen years. During those years he was instructor with the Northeastern School of Wireless, Newcastle on Tyne; the Birmingham Municipal Technical School, and the South Wales Wireless College in Cardiff, South Wales.

As time passed, Norman heard many complimentary remarks regarding the nurses in the United States. His imagination got the best of him so he came over in 1929. He began working immediately with the United Broadcasting Company, Cleveland, and he says he has not been grabbed by the heels by a doctor since he came over.

Next month, and during the months to follow, Norm will be the fellow who keeps the **Journal** readers informed as to what is taking place on Kilocycle Lane in Cleveland's fair, but smoky city. (Second Episode, Titled **American Nurses,** to appear soon!—Ed.). —Bert Pruitt.

DuMont Television

Continued from Page Five)

practice, requiring deftness in order to keep a whole cast "on mike," at the same time keeping the mike out of the picture; in addition, the usual sound engineer is required in the control booth, to control level, along with his other duties.

The television control room is raised three feet above the studio floor; this permits the television engineers and director to have an unobstructed view of the studio through a large plate glass window. A "live audience" of several dozen people is accommodated to one side of the studio.

Dumont engineers were beset by various problems during the construction of the new studio. Vibration from the subway under the building, for instance, had to be counteracted, and special shielding had to be introduced to prevent the picture shifting three-quarters of an inch whenever a magnetic field was set up by a passing subway train, far underground!

However, the new studio is now in operation, together with the original studio, so that the station now boasts two studios to handle rehearsals and actual telecasts, which is expected to further improve DuMont Television programs.

Metropolitan New York now enjoys seven-night-a-week television provided by New York's three commercial television stations: WABD-DuMont, on Channel No. 4, 78 to 84 mc; WCBW-CBS on Channel No. 2, 60 to 66 mc, and WNBT-NBC on Channel No. 1, 50 to 56 mc. Television has arrived!

New Television Stations

From FCC Report No. 1629
E. Anthony & Sons, Boston. Channel 2, 60-66 mc.

From FCC Report No. 1634
United Broadcasting, Cleveland. Channel 2, 60-66 mc.
J. W. Birdwell, Nashville, Tenn. Channel 1, 50-56 mc.

From FCC Report No. 1635
Maison Blanche Co., New Orleans. Channel 1, 50-56 mc.
Farnsworth Television, Ft. Wayne, Ind. Channel 3, 66-72 mc.

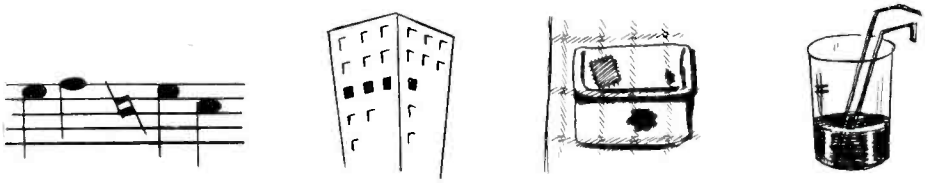
From FCC Report No. 1636
Blue Network, New York. Channel 15, 258-264 mc.
Yankee Network, Boston. Channel 2, 60-66 mc.
Blue Network, Chicago. Channel 8, 162-168 mc.
Blue Network, Los Angeles. Channel 8, 162-168 mc.

From FCC Report No. 1639
News Syndicate Co., New York. Channel 11, 204-210 mc.

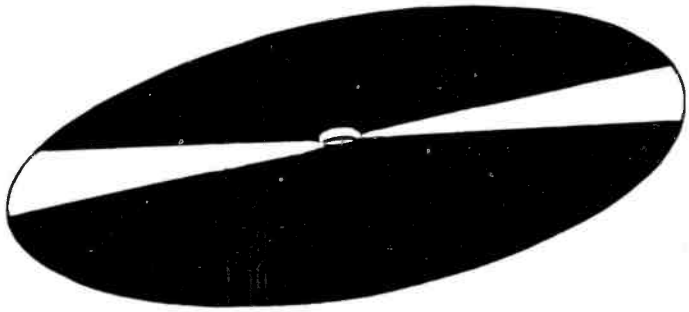
From FCC Report No. 1641
CBS, Boston. Experimental. 460-476 mc.
King Trendle Broadcasting, Detroit. Channel 2, 60-66 mc.
CBS, Chicago. Experimental. 460-476 mc.
CBS, St. Louis. Experimental. 460-476 mc.
CBS, Pasadena, Calif. Experimental. 460-476 mc.

From FCC Report No. 1644
Intermountain Broadcasting Corp., Salt Lake City. Experimental. Channel 1, 50-56 mc, and Channel 17, 282-288 mc.

FLAT *means a lot of things,*



but quality in only one —



The word *flat* can mean a lot of things. It can be a musical term, an apartment, a pocket with nothing but a hole in it, or an effervescent beverage that has lost its sparkle. But when you say "flat" in reference to a recording blank, it means only one thing — quality. Take ADVANCE RECORDING BLANKS, for example. They're really flatter than the proverbial pancake, and they have all the other desirable features of good recording blanks, as well. No surface noise; no trouble with threads because the threads are not statically charged; clear, natural reproduction; and long playing life. Furthermore, they're born flat, and they stay that way without warping or ageing. We are not boasting; we're just telling you why studio engineers of major networks from coast to coast prefer them. Try ADVANCE RECORDING BLANKS: you'll see their *flattery* has not been overdone.

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The Magnetically Focused Radial Beam Vacuum Tube

By
A. M. Skellett

[Reprinted by permission of The Bell System Technical Journal, Vol. XXIII, No. 2, April, 1944]

A new type of vacuum tube is described in which a flat radial beam of electrons in a cylindrical structure may be made to rotate about the axis. Features of the tube are its absence of an internal focusing structure and resultant simplicity of design, its small size, its low voltages, and its high beam currents. The focusing of the beams and their directional control are accomplished by the magnetic fields in small polyphase motor stators. A time division multiplex signaling system for 30 channels using these tubes is briefly described.

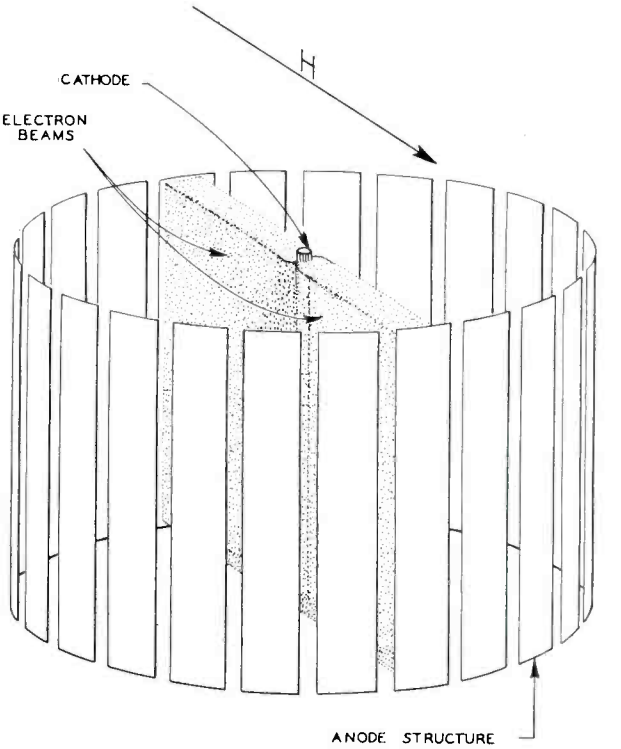


Figure 1 Elementary tube structure showing focussed beams.

IT HAS long been recognized that the substitution of electron beams for mechanical moving parts would offer decided advantages in many applications in the field of communications. The high voltages required for the usual cathode-ray type of tube and the very low currents obtainable therefrom prevent their use in most such proposals; their complicated guns and their large sizes are also undesirable features. The kind of tube described herein has no focusing structure, is small in size, requires only low voltages, utilizes the cathode power efficiently, and produces beam currents of the same order of magnitude as the space currents of ordinary vacuum tubes.

Figure 1 shows the elementary tube structure. It consists, in the simplest case, of a cylindrical cathode of the sort in common use in vacuum tubes, surrounded by a cylindrical anode structure. When this structure is made positive with respect to the cathode and there is no magnetic field in the tube, the electrons flow to the anode structure in all directions around the axis. When a uniform magnetic field is applied with its direction at right angles to the axis, the electrons are focused into two diametrically opposite beams as shown. The beams are parallel to the lines of force of the magnetic field so that if the field is rotated the beams move around with it. Thus the magnetic field serves both to focus the electrons and to direct the resulting beams to different elements of the anode structure.

If ordinary commercial cathodes are used with anode structures an inch or two in diameter, 100 volts or less on the anode will draw the full space current for which the cathode was designed. The application of the magnetic field will then focus from 85 to 90 per cent of this electron current into the two beams, the remaining 10 or 15 per cent being lost at the cathode due to an increase in the space charge which the magnetic field produces. Some of the smaller tubes produce beam currents of more than 5 milliamperes with only 50 volts on the anode structure, and in some of the tubes with larger cathodes beam currents of 50 millamperes or more are easily obtainable. The magnetic field strengths range from 50 to 300 gauss.

For some applications it is desirable to eliminate one of the two beams and this may be accomplished by substituting a uniform electrical field in the tube for the cylindrical one described above. The uniform field may be obtained by applying to the anode elements a series of potentials that vary according to the sine of the angle taken around the axis. The line joining the maximum potentials (+ and —) is maintained parallel to the magnetic field so that on one side of the cathode the potentials are all negative and the beam on that side is suppressed. The remaining beam will have somewhat less current than the corresponding one in the cylindrical field but the magnetic field-strength required for focus is reduced.

Cylindrical Electrical Field

For the case of the cylindrical electric field the focus is obtained by applying a magnetic field that is strong enough to reduce the radius of curvature of the spiral electron trajectories to a small value. There is not obtained an electron optical image of the cathode in the usual sense that for each point on the cathode there is a corresponding point on the image. The sharpness of the image may be increased by increasing the strength of the magnetic field and the field required for any degree of focus is not sharply critical.

Figure 2 shows a series of drawings of the various electron images that were obtained as the magnetic field-strength was increased in a tube having a flourescent coating on the inside cylinder. The cathode and anode diameters were 0.0625 and 2.5 inches, respectively, and the axial length was 2 inches. The anode was held at 150 volts. Only one-half inch of the cathode length, located centrally along the axis, was coated to emit electrons. The image at 340 gauss appeared to be one-half inch long. In attempting to interpret these patterns it should be remembered that on the two sides of the cathode at right angles to the plane of the beam the electrons follow cycloid-like paths along the cathode, moving up on one side and down on the other.

The photographs of Fig. 3 showing the trajectories were obtained by introducing argon at a pressure of about a micron into the tube. The electrons are emitted from only two spots of active material located at the opposite ends of a diameter on the cathode sleeve. In Fig. 3a the line joining the spots is lined up with the magnetic field and in 3b this line is at an angle of about 45° with respect to the field. This arrangement does not reproduce exactly the space charge conditions in the tube as actually used but does serve to give a picture of the electron paths in a qualitative sort of way.

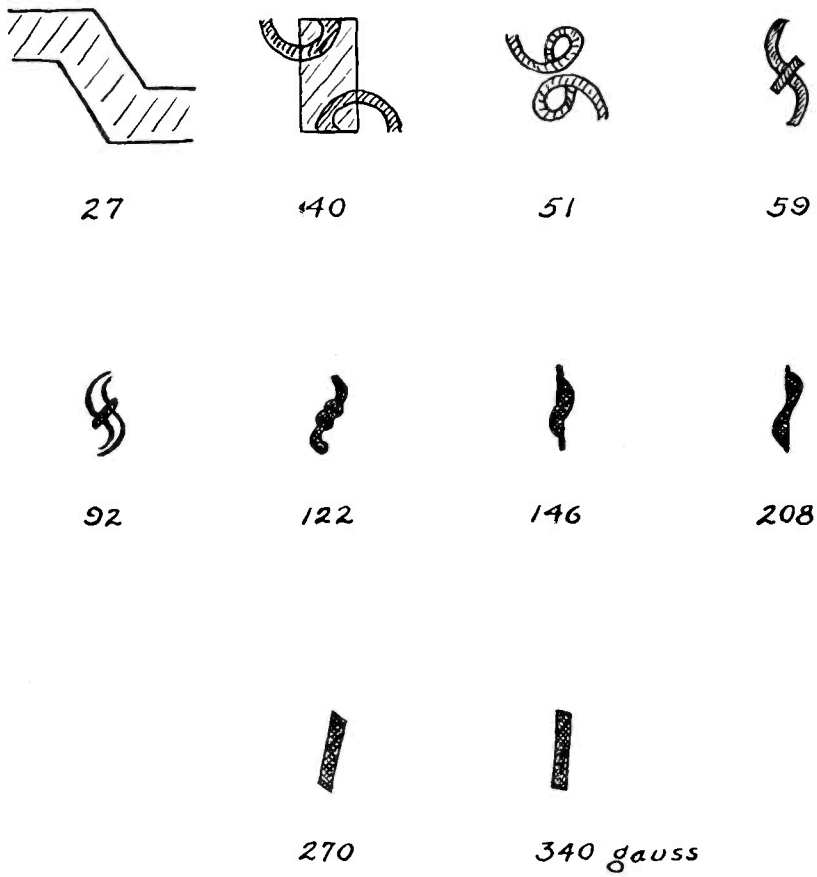


Figure 2 — Drawings of the patterns obtained with a flourescent coating on the inside of the anode when the magnetic field strength is increased from zero to the focus values.

As shown by the patterns of Fig. 2 above a minimum strength of magnetic field the shape of the focus does not change greatly. An approximate equation may be derived for the beam width in terms of the magnetic field above this minimum value that is useful for predicting the performance of new designs. The electrons that leave the cathode at right angles to the beam require the strongest magnetic field to keep them in focus. Now because of the cylindrical structure the electric field is concentrated near the cathode and we will assume that after leaving the vicinity of the cathode the velocity does not change appreciably. Setting v equal to the component of this velocity at right angles to the magnetic field we have that the radius r of the spiral path is given by the relation

$$r = \frac{mv}{eH}$$

where H is the magnetic field-strength and m and e are the mass and charge of an electron.

We also write

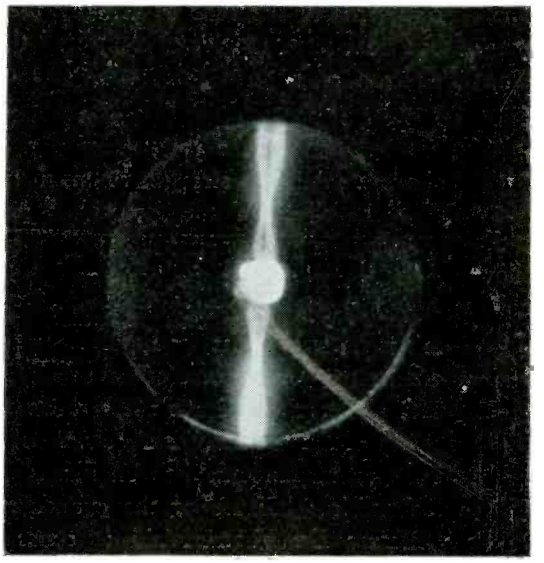
$$v = \sqrt{\frac{2eKV}{m}}$$

where K is the fraction of the anode voltage corresponding to v.

The width of the focus A is approximately equal to the cathode diameter D plus twice the maximum radius of curvature of the spiral paths

$$A \fallingdotseq D + \frac{6.7\sqrt{KV}}{H}$$

where A and D are in centimeters and V is in practical volts. By substitution in this formula we have found that the empirical constant K is about 0.7 for the tubes that have been made to date. A minimum value for H is obtained, again



Left,

Figure 3A

Right,

Figure 3B

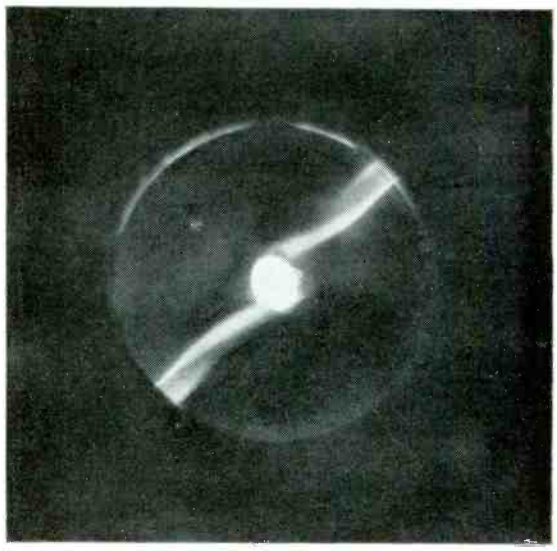


Figure 3 — Electron trajectories made visible with a small amount of gas. A.—Magnetic field lined up with active spots on the cathode. B.—Magnetic field at 45° with respect to the active spots.

approximately, by setting the last term in the equation equal to D.

Uniform Electric Field

As mentioned above the uniform field is obtained by imposing potentials around the anode periphery varying as the sine of the angle. The cathode is at a point of zero potential. In this case a real electron optical image of the cathode is obtained.

Neglecting the distortion of the field in the vicinity of the cathode, the force equation for the electrons is

$$m\frac{d^2x}{dt^2} = e\frac{V}{R}$$

where V is the maximum anode potential, R is the radius of the anode structure and x is measured in the direction of the fields. Since the acceleration is uniform the transit time t, neglecting space charge effects, may be obtained from the expression

$$\frac{1}{2}\left(\frac{d^2x}{dt^2}\right)t^2 = R$$

Combining these equations we get

$$t = \frac{R}{\sqrt{\frac{Ve}{2m}}}$$

The condition for focus is that the electrons make one revolution around the lines of force in time t. The angular velocity of the electrons is given by the well-known expression

$$\omega = \frac{He}{m}$$

Setting $\omega t = 2\pi$ we get

$$H = \frac{2\pi}{R}\sqrt{\frac{m}{2e}V}$$

or in practical units

$$H = \frac{10.6\sqrt{V}}{R}$$

Since the effect of the magnetic field on the space charge has not been evaluated, we can only estimate the order of magnitude of the increase of transit time due to the space charge. On the assumption that this increase introduces a factor of 3/2* the above expression with space charge is

$$H = \frac{7.1\sqrt{V}}{R}$$

This formula has been found to check well experimentally.

These last two formulae are for the first focus. Focii will also be obtained for values of H equal to nH where n is an integer and equal to the number of electronic revolutions. Actually as the field is increased beyond that necessary for the first focus the beam does not get very badly out of focus because the radius of curvature of the spiral path is small and for still higher fields the beam remains in approximate focus for all values of H.

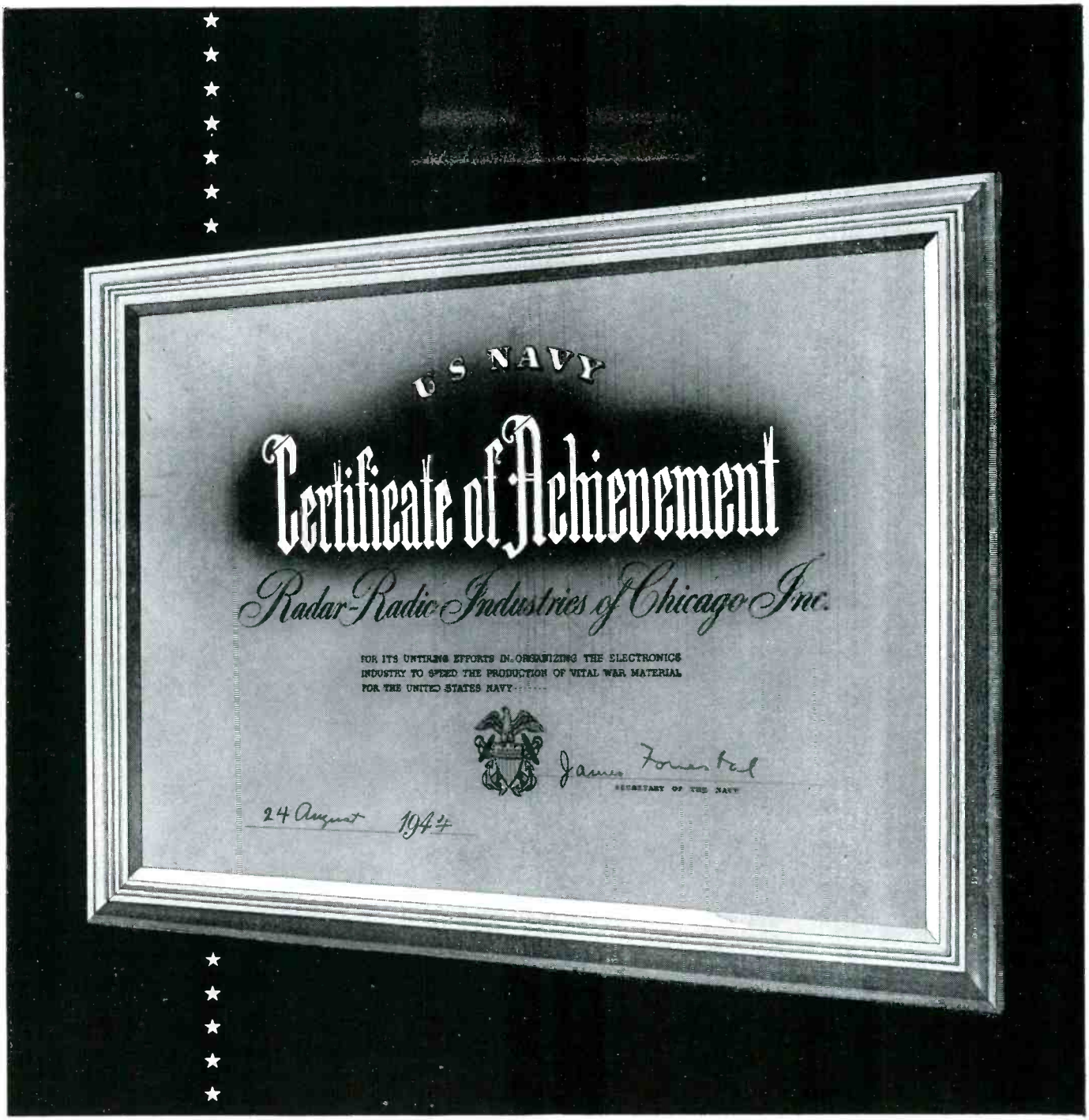
In applications where the beam is rotated by means of a rotating magnetic field this electrostatic field is made to turn by separating the anode structure into four or six elements (or groups thereof) and applying either two- or three-phase alternating potentials to them.

Magnetic Field Supply

The stator of a two-pole polyphase alternating-current motor furnishes an excellent magnetic field for use with these tubes. The tube is inserted in place of the armature and when the polyphase currents are applied the beams are formed and rotate at the cyclic frequency. For applications where the

* The factor of 3/2 is the ratio of the transit times in a plane parallel diode with and without space charge. See for example Millman and Seely, "Electronics," Chapt. 7, p. 231.

(Continued on Page Twelve)



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Radial Beam Tube

(Continued from Page Ten)

beams are not rotated continuously, a two-phase stator may be used in which the currents through the two windings are adjusted to be proportional to the sine and cosine of the desired direction angle of the beam. Permanent magnets of the horseshoe design have also been found to be suitable.

The power consumed by a stator depends on its size and the strength of the field it produces and on the cyclic frequency if it is used to rotate the beam. At low frequencies, e.g., 20 or 60 cycles, the power consumed is primarily that due to the copper loss. At higher frequencies the losses in the core material become important. For some of the smaller tubes operating at a low frequency, the power consumed by the stator is less than three watts. This stator has the regular motor windings which do not completely fill the slots.

Since a polyphase source of power is not always readily available, it is sometimes advantageous to split single-phase power in the stator itself to produce the rotating field. This may be done by inserting a condenser in series with each winding so that the current through one phase winding lags by 45° and that through the other leads by an equal angle. Polyphase potentials for producing a rotating electrostatic field in the tube may then be taken from the windings of the stator if desired.

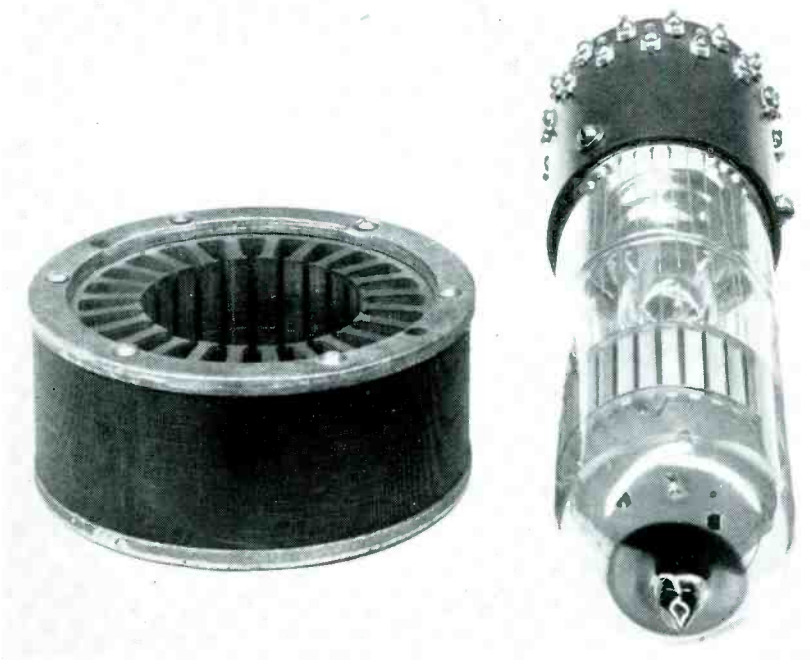

Figure 4 — Radial beam tube with 30 anodes and unwound stator used with it.

Tube Design

The particular design of tube depends on its application. The simple design shown in Fig. 1 has been found adequate for some purposes but more elaborate designs which increase the versatility of the tube are also needed.

Figure 4 shows a tube with 30 anodes that incorporates various auxiliary elements. This tube is 2.25 inches in diameter. Figure 5 shows the internal arrangements of the elements. Closely surrounding the cathode is a control grid that may be used for modulating the current density of the electron beams. Farther out is a cylindrical element with 30 windows that is maintained positive and which by virtue of its similarity in position to the third element of a tetrode is called a screen. Immediately behind each window there is a pair of paraxial wires which because of its similarity in function to the fourth element of a pentode is called a suppressor grid. In back of each suppressor grid there is an anode. In this particular tube there are projections like gear teeth on the back of the screen element to prevent electrons destined for one anode, from reaching an adjacent one.

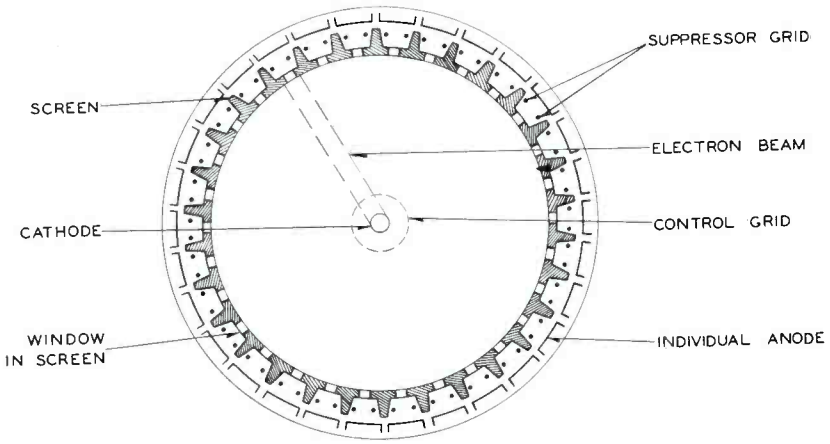

Figure 5 — Arrangement of elements in the tube shown in Figure 4. Only the operating beam is shown.

The control grid that is close to the cathode is biased negatively and controls the electron current in the same way that it would if the magnetic field were not present. The space current vs. grid potential curve is nearly identical for the two cases: with and without the magnetic field. The slight difference is due to the fact that the presence of the magnetic field increases the space charge near the cathode. Thus the tube may be used for amplification in the usual way when

the electrons are focused. The presence of this grid has no appreciable effect on the focusing of the electrons.

Since the screen element is in one piece there will be present two beams out to it. One of these may be suppressed after it has passed through the screen by the suppressor grids or by the anodes in the manner described below.

These suppressor grids are generally operated at cathode potential or at a potential that is negative with respect to the cathode. They may be used for three purposes: to suppress secondaries from the anodes, to modulate the beam current to their particular anode, and to suppress one of the two beams. For the first of these functions they are biased at cathode potential. For the second they are biased negatively and have a modulation curve similar to that of the suppressor grid in a pentode. Curve A of Fig. 6 shows the variation of beam current to one anode when the potential of the suppressor grid in front of it is varied. This curve is for a grid similar to the two paraxial wires in the tube shown in Fig. 5. For some applications a higher suppressor - anode transconductance or a lower cut-off is desirable and these may be obtained by welding lateral wires across this grid window to make the grid action more effective. Curve B of Fig. 6 was taken with the same size window across which laterals were welded. The table below gives the data for this suppressor grid with and without the lateral cross wires.

	Without Laterals	*With Laterals*
Transconductance (mho)	100	250
Anode Resistance (ohms)	30,000	64,000
Amplification Factor	3.5	16.0
Cut-Off Voltage	—80	—20

It is apparent from these data that amplification of the signals applied to the individual suppressors may be readily obtained.

If the screen element is split to give a uniform electrostatic field to suppress one beam, the beam current is only about half that of one beam of the cylindrical field case. This is because with the uniform electrostatic field the potential gradient at the cathode decreases with azimuthal angle away from the beam axis. If the unwanted beam is rejected by the suppressor grids, however, the beam current for the cylindrical case is obtained since the screen in this latter case supplies a cylindrical electrostatic field at the cathode and the unwanted beam is rejected between the screen and suppressor grids.

For this case the screen is maintained at the same positive potential required for the two-beam condition and the suppressors are so biased that they are beyond cut-off on one side of the tube and at or near cathode potential on the other side. If the beam is rotated the suppressors are connected to the polyphase supply in groups in the same way that the screen elements would be connected except that the d-c. bias above and below which the a-c. potentials swing is made negative at a value near cut-off for the suppressors.

When one beam is suppressed either by splitting the screen or by grouping the suppressors, the currents to the different anodes are not all exactly the same. For instance, maximum current will be received by an anode back of the center of one of the screen elements or one of the suppressor groups and a minimum current will be received by an anode back of the junction of two such elements or groups. If two-phase supply is used (4 elements or groups) the ratio of maximum to minimum anode current will be 0.707 and for three-phase supply this ratio will be 0.866. There will be 4 or 6 maxima, respectively, around the tube. This variation may be effectively eliminated by varying the individual anode load impedances or in other ways.

The anode characteristics are similar to those of a pentode if suppressor grids are used and to that of a tetrode if these grids are not used.

There is still another method of effectively eliminating one beam. This consists in using an odd number of anodes so that when one beam is focused on an anode the opposite one falls on the screen in between two anode positions. With this type of tube the effective rotational frequency is twice the cyclic frequency of the rotating field, that is, all of the anodes are contacted twice (once for each beam) per revolution of the field.

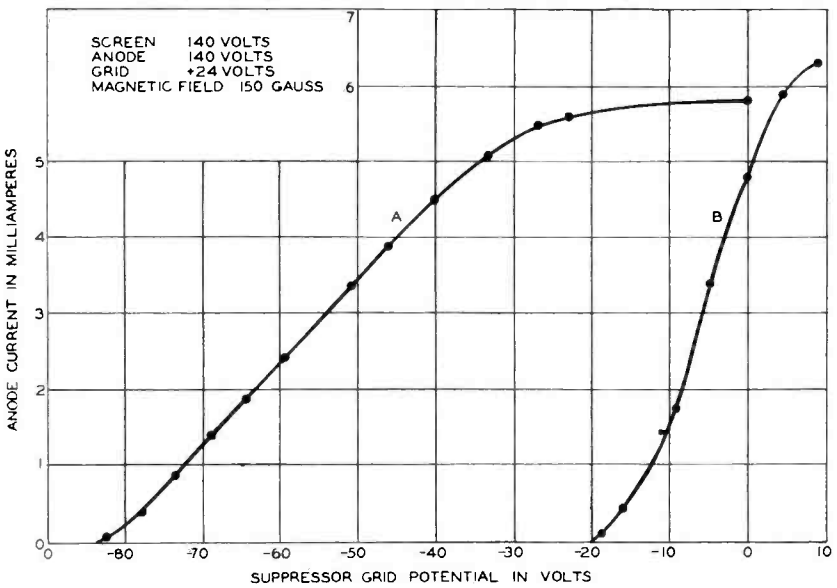

Figure 6 — Suppressor grid characteristics. A.—Without lateral wires. B.—With lateral wires.

Applications

The many possible combinations of the tube elements just described permit a variety of applications. One of the simplest and most obvious is that of an electronic commutator which has the advantages over the corresponding mechani-

cal device of speed and freedom from contact trouble. There is, however, a practical limitation to the speed of this electronic commutator that is set primarily by the alternating-current losses in the stator. This is estimated to be in the neighborhood of 10,000 cycles per second for ordinary stator and tube designs. The highest cyclic speed for a stator that has been used to date was 600 cycles per second which with utilization of both beams gave an effective cyclic frequency of 1200 cps.

One of the earliest systems of multiplex telegraphy was based on time division using mechanical rotating commutators. A small portion of the time of one cycle of the moving brush was allotted to each channel. The usefulness of this system is limited because of the faults of the mechnical commutators. The substitution of these electronic commutators eliminates these difficulties and puts the time division system on a more practical basis. It has an advantage over the frequency division multiplex system (carrier system) in that the elaborate filters of the latter are not required.

A 30-channel multiplex system for signaling using two of the 30 anode tubes described above has been successfully tested over short distances in the metropolitan area in New York City. The tube at the transmitter had all of the anodes tied together and the signal from them was sent over the line. The 30 input channels terminated on the suppressor grids of this tube. At the receiver, the input was fed to the negative grid surrounding the cathode and each of the anodes was connected in series with a small neon lamp for an indicator. A signal on any one or signals on any group of the 30 input channels would actuate the corresponding lamp or lamps at the receiver. No amplification other than that provided by the receiver tube was needed.

A single beam was used in each tube, the other one being rendered ineffective in the transmitter by means of two-phase potentials applied to the suppressors in the manner described above and in the receiver by means of a combination of d-c. and two-phase a-c. potentials applied to the individual anodes. The potential of an anode was zero when the unwanted beam arrived and at or near 200 volts at the time of passage of the operating beam. The rotational frequency of the beam was sixty cycles and since both stators were tied into the same source of power, no separate synchronizing means was necessary.

Figure 7 is a photograph of the cathode ray trace of the output of the transmitter tube when signals were being sent over three channels. A circular sweep circuit was used which distorted the signals somewhat. The shape of the pulses is shown better in Fig. 8 for which a linear sweep was employed. Signals were put on three channels, two of which were adjacent. The double-humped top of the pulse is caused by the window in the screen being slightly narrower than the beam width so that as the beam crosses the window, the greater densities in the edges relative to the center give this shape. A flat-topped pulse may be obtained by making the windows wider than the beam.

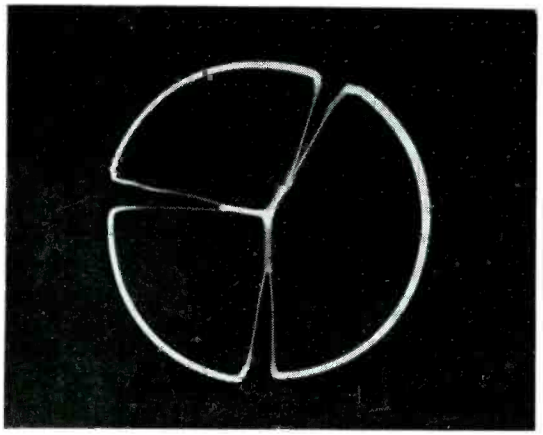

Figure 7 — Circular trace oscillograph of transmitted signal when 3 out of 30 channels are in operation.

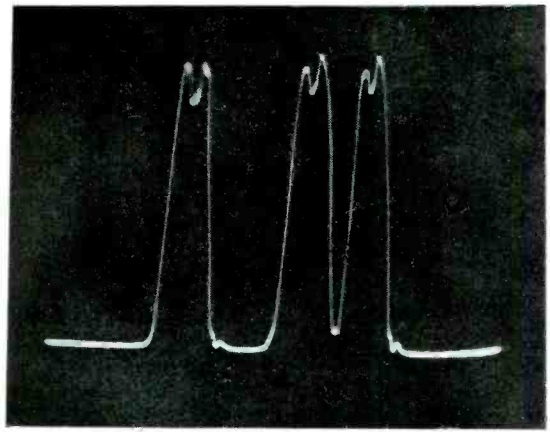

Figure 8 — Linear trace oscillograph showing transmitted signal with 3 channels in operation 2 of which are adjacent.

In conclusion the writer wishes to acknowledge his indebtedness to a number of his colleagues in the Laboratories for aid in the development of the tube. The 30-channel multiplex system was set up with the aid of Mr. W. H. T. Holden.

Electronics

(Continued from Page Four)

ferent units. Certain radiolocation apparatus may require steep-sided pulses of widths less than a micro-second, while other industrial counting devices may employ slow-moving circuits which reverse themselves only once or twice every twenty-four hours, or for every million pieces of manufacture being counted. But the elemental electronic principles presented in this series are applicable to any of these electronic devices.

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Summary of NABET-Petrillo Dispute

THE long-awaited jurisdictional hearings in the turnable dispute are over. The decision now rests with the NLRB in Washington. I was impressed with the fair and square way in which the hearing was conducted under the direction of Mr. James Paradise, Examiner for NLRB. It occurs to me that statements made and facts left out of the record might be clarified for the benefit of the NABET membership and their friends.

At the outset of the hearing, Mr. Padway, Counsel for the A. F. of M., challenged the contention of NABET as a Union within the meaning of the Act. For the record, let me say that NABET was certified as a Union before the NLRB in the City of Los Angeles, on July 7, 1942. The membership has long been confronted with that old refrain, "NABET is a company-dominated Union". This record, or should I say pancake, as Mr. Petrillo likes to call them, has long since worn out and it's time for one or those segues which the musicians claim so difficult. If we are a company-Dominated Union, I ask the question, what company dominates us? Surely not NBC or Blue. Remember the strike vote? Neither can it be our independent stations, which outnumber our network stations. To this date we have the following independent stations affiliated with us: KFI, KECA, KFSD, WOW, WPTF, WOR, WLS, WMAL, KQW, WHAM, WHEC, WSAY, WWJ, WHK, WCLE, WGY, WRGB, WGFM, KODY, WHFM, and WSJS. I think we can agree that no one of these stations dominates NABET. I, as President, do not dominate NABET either. If I had male a deal with the A. F. of M., such as was suggested on the second morning of the turntable hearing, I would not be writing this piece today. The NABET membership would not be hesitant about righting a wrong, and no amount of double-talk would have kept me in office.

Mr. Padway stated at the hearing that the A. F. of M. did not intend to take any jobs away from engineers. Well, let's take a look at the questionnaire circulated among the IBEW Locals, by IBEW radio Engineers. Question Number Four reads, "If you are now playing et's in any stations in your local, in the event musicians were to take over this phase of your work, how many men would be forced out of work." Local 1139 answered, 30 percent; Local 1215, 25 percent; Local 1218, 35 percent; Local 48, 25 men; Local 46, 62 men; Local 1221, 20 men. These are not my figures, they are IBEW figures. Not only does A. F. of M. intend to take jobs away from engineers, but it is their purpose to give these jobs to people that are already employed. For example, let's take the case of one Dr. Baum in Chicago, a turntable operator for the A. F. of M. This case was mentioned at the hearing but objected to by Padway and never was put in the record. For 25 hours a week Dr. Baum plays records for NBC. The rest of the time he is a foot doctor, operating on corns, not records. Now the question is: Does the knowledge of chiropody help to make a good musician, or is the fine art of corn-snatching necessary to become a turntable operator?

We learned at the hearing that NBC has signed another 3-year contract with the A. F. of M. at $90.00 per week, for a 25-hour week. Now if a musician is worth $3.60 an hour for doing a part of a job, and a small part at that, surely it is not out of reason to ask that the radio engineer should be reimbursed in like manner, if not at a higher rate.

It is the contention of the musicians to claim jurisdiction over records because of music on the record. Every engineer knows that there is no music on a record, or for that matter, sound or voice either. But for the benefit of the musicians let me explain that a record or transcription contains a series of grooves at different frequencies and they do not become music until they have reached the voice coil of the loudspeaker. The Institute of Radio Engineers defines a phonograph pickup as "an electro-mechanical transducer actuated by a phonograph record and delivering energy to an electrical system, the electrical current having frequency components corresponding to those of the wave in the record." The action of the pickup head may be compared to the action in an RCA 44-B microphone. When a person's voice tones are impressed upon the ribbon of a 44-B microphone, causing the ribbon to vibrate in cadence with the voice, these vibrations are picked up by the permanent magnet in the microphone, due to the movement of the ribbon in the magnetic field. So, also in the case of the pickup head the needle travelling in the groove of the record, is caused to vibrate, transmitting the audio frequencies from the record to the magnetic field of the pickup head, which in turn transmits electrical energy into the studio system, and ultimately is changed into music in the voice coil of the loudspeaker.

Other testimony not allowed in the record was Mr. Petrillo's statement before the subcommittee of Interstate commerce. I submit it here for your observation:

TESTIMONY OF JAMES C. PETRILLO BEFORE THE SUBCOMMITTEE ON INTERSTATE COMMERCE, JANUARY 13, 1943

Mr. Petrillo. Well, I can only say this to you. In Chicago I happened to negotiate the contract myself, and when I made the demands for the pancake turners, there was no opposition to it. They gave them to me, so I took them.

Senator Tobey. But, the principle you believe in. You believe in the principle regardless. It all depends on the size and power of the labor union.

Mr. Petrillo. Oh, yes.

Senator Tobey. You are not speaking of the principle

as a just principle, except inasmuch as it is something that you have the power to do, that is all.

Mr. Petrillo. Well, you might put it this way.

Senator Tobey. Now, that raises a question not of metaphysics, but something higher than that, perhaps. How long can we go along in this country with anything that is not sound? How long is it going to endure, whether it applies to music or anything else, provided it is not sound and is not economically feasible and with an expenditure that is not justified by the facts, just because you are powerful enough to do it? How long would you expect to continue in this country by that method?

Mr. Petrillo. Senator, I agree with you, in this particular case it is not sound. I try to be fair, but sometimes I make a mistake.

Senator Tobey. Yes; we all do.

Mr. Petrillo. But, in this case I made a mistake but they O.K.'d it.

This testimony, together with the fact that most honest-thinking musicians want, or claim, no part of turntable operations, gives this whole deal a bad odor.

In closing this article, I wish to answer a suggestion which appeared in the Electronics Division Reporter, August, 1944, published by IBEW Local B-1245, and I quote: "If and when the IBEW situation is cleared up, NABET might well consider IBEW again." It is my opinion that the situation will never be cleared up. This thought is in the minds of most broadcast engineers, also. To substantiate this thought I quote again: From the same publication, dated July, 1944, and I quote—"The IBEW has given away jurisdiction on horse-trades in the past and always came out at the small end. We had thought that those sad experiences had taught a lesson to the organization; but here we are, right back at the same old tricks." Speaking of horse trades, I add, You can't teach an old horse new tricks. I ask you also to consider the Petrillo-Brown contract, giving away IBEW jurisdiction on turntable operations. This contract is still very much in existence. Mr. Padway submitted it as an exhibit at the hearings, stating it was proof that IBEW was not objecting to a musician's jurisdiction of turntables. Let us consider again what this means. Since our case with the NLRB is against NBC and Blue, the outcome will have no effect on the Brown- Petrillo IBEW deal whatsoever. The contract can be put in force and the broadcast members of IBEW will be holding the Bag. Why then, should NABET consider joining IBEW after having waged a long and hard fight to keep Petrillo out, only to have it to do all over again, should we be so foolish as to join IBEW?

A. T. POWLEY, President NABET.

New York News of NBC

By George F. Anderson, Jr.

SEPTEMBER 14TH: Hurrican warnings; Field Department on the alert. **Max Jacobson,** Field Supervisor, is on vacation so **Al Wies** assumes a worried expression and calls all the field engineers in for duty. Equipment checked and rechecked and packed into the NBC Mobile unit and the Blue Station wagon. **Harold Campbell,** FE, and **Lou Canauari,** Apprentice, go up to the Roof of the RCA Building and start setting up the antennas for the reception of signals from the mobile unit and the station wagon. Some fun up there with the wind causing the tower to sway some six to ten inches and only sixty-five floors to go to reach the ground. **George Butler** and **Jimmie Hackett** leave in the mobile unit to go to Riverhead, Long Island, in the event that the tip of Long Island is blown into the ocean again. On the way out there, they pass thru or over several roads covered with water. GB finds a pair of hip boots in the truck and Jimmie puts them on and starts walking ahead of the truck to find out how deep the water is. The water is only about twelve to fifteen inches deep and then it starts to get deeper. GB notices that Jimmie is motioning him to either come ahead or go back, sooo going ahead slowly he causes Jimmie to start running, of course, it is easy to run with hip boots on and in two feet of water. However, GB does not achieve his objective which was to cause the seat of Mr. Hackett's pants to immerse themselves in two feet of chilly water. Riverhead is finally reached and contact made with Radio City. Everything is rather calm and peaceful and the expected trouble does not occur. The hurricane passes over the center and lower end of Long Island and very little damage occurs where GB and Jimmie are.

During the height of the hurricane the authorities would allow no one to leave the building or walk the streets as the danger from broken glass was very great. The damage to **Hollis Young's** SE summer home on Cape Cod was quite extensive due to water seeping in and being driven in from the high velicity winds.

Dorson Ullman, MCD, back from his vacation and again on the prowl for a place for he and his family to put their belongings down. Success in New Rochelle, and Dorson moves in sometime in October.

Sergei DeSomov's boat was badly damaged and Sergei reports that he does not expect to be able to use it for anything resembling what its original purpose was, as it now is excellent kindling wood. **Bob Johnson** fared much better. He sustained no damage to his boat, in fact he had no boat at the time as he had sold it four days previous. Well, other than that, and that anyone living outside NEW YORK was without lights and telephones for

(Continued on Page Eighteen)

New York News

(Continued from Page Seventeen)

periods ranging from one day to a week. Things are OK now. Oh, yes, I walked home from the RR Station, four miles, and found my car in a hole alongside the road—cost ten bucks for a wrecker to tow it out.

Fred Frutchey, Rec, who was recently in England for the invasion and as reported last month was back in the states, has again shoved off and is reported to be in Haiwaii.

John Pawlek, Joseph Silva, Arthur Holub, Ernest Barber, Donald Abbott and **Henry Meyer,** attempting to get a golf tournament started, but either it rains or their days off are changed whenever they get a date set. They have not given up yet and perhaps before next year we will be able to announce the results.

Irving Grabo, FE BNC, who recently did a Coca Cola pickup at Grenier Field, Manchester, New Hampshire, was asked if he knew a chap by the name of **Charles Grey;** of course, the reply was "Why, sure," and then he was introduced to "Major" Charles Grey. Charlie is a former NBC SE and is now Tech Officer for the AACS at Grenier Field.

Arthur Poppele is the latest Mtce engineer to transfer and on the sixteenth of October he will become a television engineer. Be careful of these Synch impulses, Art.

Posted in a very conspicuous spot in Mtce are some pictures of **Carlos Clarke** and **Pat Haynes.** Carlos is in the uniform of a Captain in the Fire Department of Rockville Center, Long Island, and Pat is seen in a parade of American Legion Veterans.

Can You Imagine Department. Gil Markle has finally completed a combination Volt - Ohm - Milliammeter and **George Vose** volunteered to bring over some calibrated meters so that Gil could check to accuracy of his instrument. They connect the meters in parallel and throw the switch, Gil's meter reads fifty mils but George's stays at zero. Vose remarks, "Oh, yes, Gil, I forgot to tell you. You have to put a Dime in the slot to get a reading." It Cost Markle $2.60 to check his meter.

Department of Life and Taxes. Master William Barry Dymock Drayton formally notified his parents, **Lionel A.** and **Beryl Drayton** that on September 3, 1945, he will be one year old. Master William was born on September 3, 1944, and at his arrival he weighed eight pounds seven ounces.

Our senior master control supervisor, **P. D. Herold** and our Chapter Chairman, **Harry Hiller,** are both out sick this week of October 9. **Paul Herold** is in bed with a very bad cold, and Harry is out because of a case of poison sumac on both feet and his legs as far south as his knees. A remark was made by a personage known to many as **Ed. S.,** as follows: "What the H—— was our Chapter Chairman doing running around in his bare feet in the brush?"

James Flynn, WEAF, reports that everything is back to normal at WEAF following the hurricane, and that the weather is lovely at Port Washington.

Henry Meyer, SE, had "Der Bingle's" end of the Kraft Music Hall on October 12, and Henry reports that Der Bingle is in fine voice after his trip to England and France.

Thissa and Thatta—Coffee is still being brewed—**Ray Swannecamp,** SE, wandering around with a half dozen assorted-type saws, he says they are to be used to cut wood at his camp in Jersey, but why carry them into the studios that contain these fifteen minute shows, sometimes called S—— Operas?

C. Westover, SE, reporting that it is not difficult to get hold of some 50L6 tubes if you have several five dollar bills—**Louise Fogarty,** Rec, falling asleep on the NYNH& HRR and getting off at Greenwich instead of Portchester at 2:15 AM, and taxis are so easy to find. Do engineers have to wear a costume when they have a show where the actors wear costumes and drink Bordens Milk? Hand me my Cap and Gown, Jeeves, the Vanderbilt Theater awaits. Well the type in the typewriter is running dry and so am I. Happy Thanksgiving Day to all. This is the NATIONAL BROADCASTING COMPANY.

DOINGS IN DENVER

By George Pogue

AUTUMN has come to Denver, and with autumn the harvesting of crops. (What crops?) The transmitter gang who had Victory gardens this summer tried, but two heavy hailstorms left little except the weeds and the bugs. **Gene Carpenter** (SE) our gentleman farmer, also got hailed out, so turned to sanding his floors as his favorite indoor sport! The transmitter gang has turned to golf. **Blaire Dobbins (Dobby)** has gotten so he plays in the forties when he goes alone to practice, and in the eighties when he plays with the gang. Pretty good for a new addict, eh?

Those winding up their vacations are **Aubrey Blake** (SE) and **Joe Turre** (TE). Aubrey spent his vacation in the mountains and on a ranch near Cheyenne Wells, Colo. He said it was a pretty wet vacation, just rain, rain, rain; but he installed a 32-volt plant while there—just a busman's holiday—trying to get away from it all! Joe has been spending his time getting acquainted around home.

Douglass "Pinky" Kahle (SE) is next on the vacation list. He has been working on a hunting knife in anticipation of deer hunting. The knife was made from a file—for the latest in tempering and hardening see Pinky. **B. Dobbins** is next on the transmitter vacation list—to date, destination unknown.

Commodore Stan Neal (SS) is this year's number one yachtsman. The collection on his mantel is growing—he won the fleet cup for winning the most races in the season; the speed trophy for the fastest recorded time, and the commodore cup for winning the commodore race. Stan's boat is a class Y boat. He and **Aubrey Blake** built and launched the boat last year. For real sailing, stop in Denver and contact Neal.

Among the visitors to see the Denver gang were **Lieut. Comm. J. A. Slusser,** chief transmitter engineer, BPH (before Pearl Harbor). "Sluss" still has that congenial smile of his. Also a lady engineer from our Schenectady chapter, **Miss Frye.** It was her first visit to our wild and wooly west and we were glad to welcome her to our midst.

Can some one please tell **Milt Hall** (SE) what to do, come winter, with two duck eggs grown up to Donald and Daisy? Especially when the kids say—quote—But Daddy, that's like eating one of our family!—unquote.

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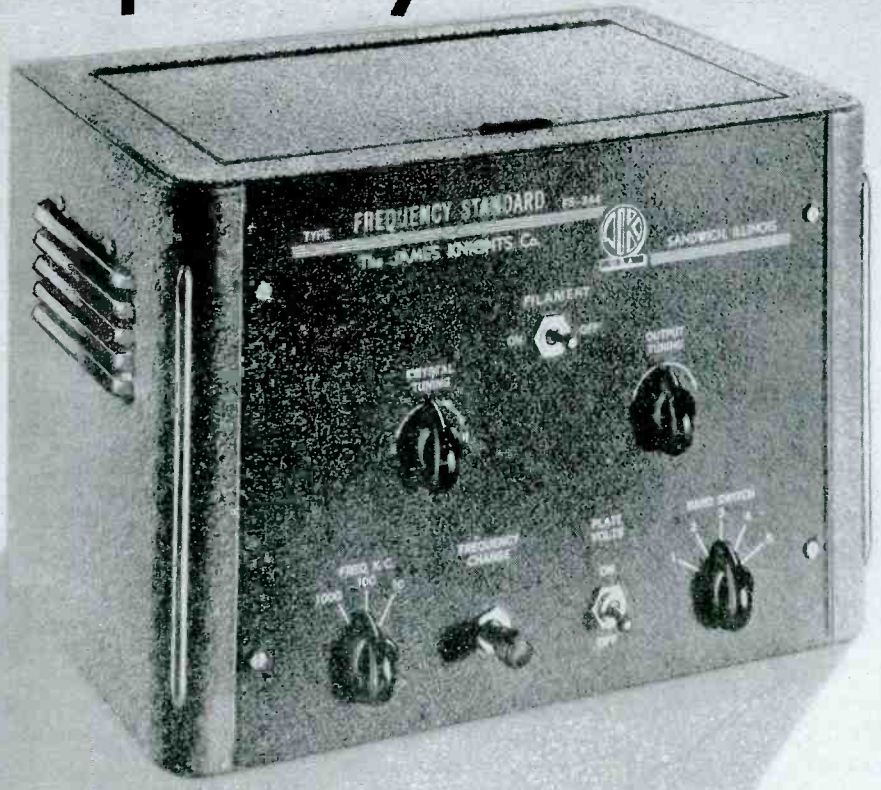

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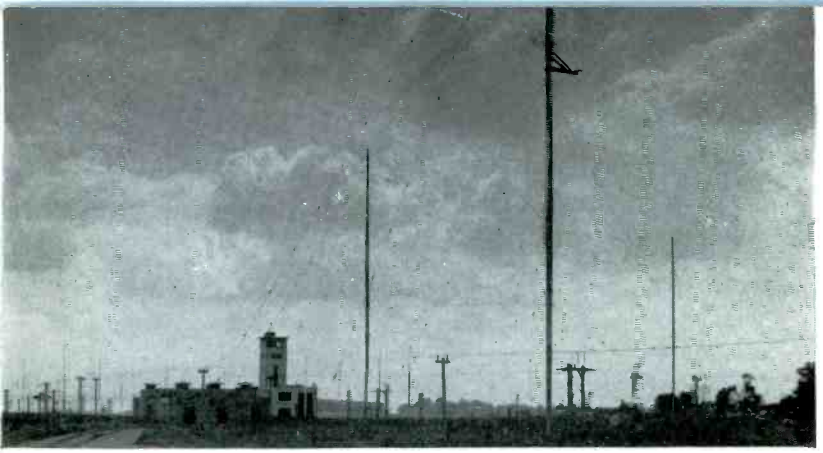
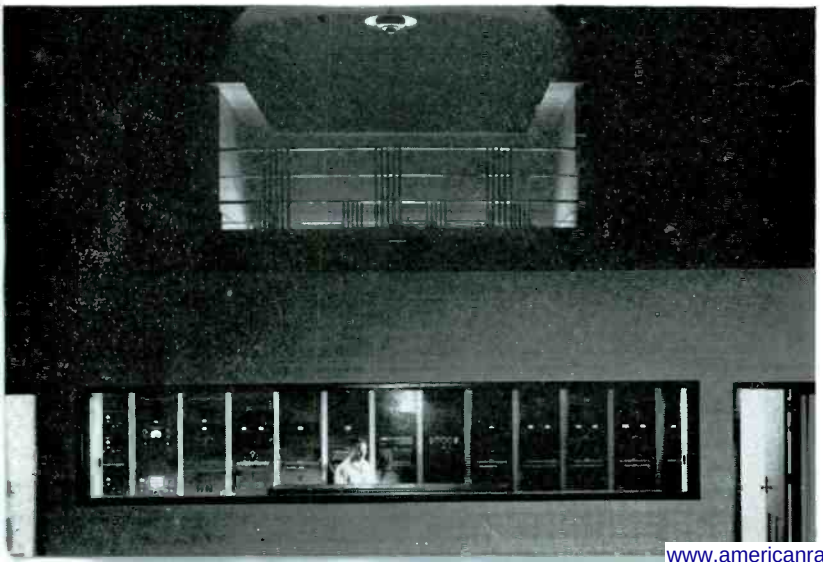




Bethany 200 kw Transmitters *and* Notes *from the* Nation's Station

By Bob Brockway

ARRIVALS AND DEPARTURES.—Recently, the Crosley Corporation sold one of its Cincinnati broadcast stations, WSAI, to Mr. Marshall Field, of Chicago. More recently, Mr. Field assumed operation of WSAI. At the present writing, the same engineering staff is servicing both stations and WSAI is continuing to use the Crosley Square Studios until such time as equipment and materials become available for WSAI to have her own studios. I speak of WSAI as "her" because, because WSAI was affectionately referred to as "WLW's Little Sister," and now, practically overnight, the little sister has become a full-fledged competitor of big-brother WLW, albeit a very friendly competitor, for such is Cincinnati radio in general.

★

PHOTOS TOP TO BOTTOM:

Close-up of some of the eight hundred 165-ft poles supporting the antennae of WLWL, WLWR, and WLWS. At the left is the side of the transmitter building.

The attractive new transmitter building at Bethany Transmitters, near Cincinnati, from where "The Voice of America" is broadcast to foreign lands over Shortwave Stations WLWR, WLWS and WLWL, believed to be the most powerful in the world.

View of one side of the main transmitter hall at Bethany shortwave station showing three of the six 200 KW. final amplifiers. Three identical units are on opposite side of the room from which this picture was taken.

Thick forest of massive poles supporting antennas switch gear and, at either side, pipes leading to antennas at Bethany Transmitters, near Cincinnati, operated by The Crosley Corporation. At the rear is the transmitter building, housing Shortwave Stations WLWR, WLWL and WLWS.

View of the transmitter master control room and balcony in transmitter building at Bethany Transmitters, WLWL, WLWS and WLWR.

★

Front Cover Photo

Heavy copper wires carry the 200,000 watt "Voice of America" from transmitter building at Bethany Transmitters, near Cincinnati, to surrounding antennas, from where the "Voice" is shortwaved to listeners in many foreign countries over Shortwave Stations WLWS, WLWR and WLWL, operated by The Crosley Corporation for the Office of War Information and Office of the Coordinator of Inter-American Affairs.

Our best wishes go to Mr. Field and the management and personnel of WSAI. May WSAI continue to be a station of which Cincinnati is proud. WSAI operates with 5,000 watts full time on 1360 kc and is a member of the Blue Network.

About the time that the Crosley Corporation disposed of WSAI, it announced to the world that the Bethany Transmitters were on the air. On a square mile of farm land located about twenty miles from Cincinnati, there stands the most modern, most powerful short wave stations in the world. So closely guarded was the secret of these stations' existance that the neighboring farmers had no idea what was being constructed behind the high barbed-wire fences. The general concensus was that it was "some kind of an airport". The sign on the RFD mailbox simply read, "Bethany Transmitters". The story of this radio giant was released to the public the latter part of September. Now the story can be told.

Bethany Transmitters has been renamed, and aptly so, "The Voice of America". Now in partial operation and nearing completion, Bethany houses three, 200,000 watt short wave transmitters, WLWL, WLWR, and WLWS. Actually the first transmitter went on the air on July first with reduced power, on August fourth, it was broadcasting with 100 kw, and now at 200 kw. Actually, instead of three transmitters, there are six, 200 kw final amplifiers at Bethany. Preceding a frequency and/or antenna change, a spare final amplifier can be tuned up and connected to its antenna, while another final amplifier is in operation, and the scheduled shift consists only of transferring the modulators from one to the other.

The transmitter Master Control Room is at the end of the Main Transmitter Hall, and flanking both sides of the room are the six 200 kw amplifiers. Behind the building is a veritible forest of wooden poles, supporting the 216 switches for the many antennas which cover the square mile of property. The beam antennae are supported on over 800, 165 foot wooden poles. Similar type antennae are used by WLWO and WLWK located at the nearby WLW transmitter at Mason, Ohio.

All the equipment for WLWL, WLWR, and WLWS was constructed by the Engineering Department of the Broadcasting Division of the Crosley Corporation, under the supervision of R. J. Rockwell, Director of Engineering. The stations are programmed by the Office of War Information, and the Coordinator of Inter-American Affairs, and are operated by the Broadcasting Division of the Crosley Corporation.

On Saturday night, September 23d, the transmitters were dedicated to the service of the American people by a special program on the NBC Network, originating in Cincinnati and Washington. On that program, kind words were said of the engineers who made this super-power installation possible. One speaker referred to the stations as "The Heavy Artillery in the Battle of Overseas Radio". Truer words were never spoken.

SPEAKING OF ARRIVALS, ye olde storque was working overtime during the months that this column did not grace the pages of this publication. No doubt, this wonderful Cincinnati climate had something to do with it, or perhaps it is the natural **prolific-ness** of radio engineers in general. Crosley Square families were blessed by gurgling bundles thusly: **Dave Wheeler** started the ball rolling with a son; likewise, **Charley Hamilton,** a son, and **Leonard Clift,** a daughter. **Don Hoge** and **Gilbert Earp** deserve some mention in this paragraph because Don's cocker-spaniel "Freckles" gave birth to a litter of six fine puppies, while Earp's cat "Fluff" had four kittens. Our heartiest congratulations.

NOTES OFF THE CUFF.—Recent visitor to Crosley Square was **Raymond,** "The Imperial **Murphy.** Ray is currently on leave from WLW, working with the National Defense Council of Columbia University . . . Departed on leave to the Navy are **Bill Codding** and **Jack Chenoweth** of the studio staff . . . Now that football season is here, WLW's traveling man, **Dave Conlon** is the lucky guy that carries a couple-hundred pounds of remote gear to the top of various gridiron stadia (plural for stadium, you know). This season the play-by-play is fed to WLW, WJR, and WJJD . . . Former WLW transmitterman, **Homer (Bud) Ray, Jr.,** is now Chief Engineer at **WHBC,** Canton, Ohio. Bud drew those hilarious cartoons printed in these pages last winter. We wish him luck and hope he has enough spare time to run off a batch of drawings now and then . . . **Randy Baer** has transferred from studios to Bethany short-wave station. We mourn his departure because ye author inherited his "Boystown" opry . . . **Russ Hoff** and **Charley Butler** deserve a lot of praise for their unselfish use of their spare time writing to our gang who are in service. The rest of us have good intentions. Why don't YOU practice what we preach and write to YOUR boys in service . . . Local 1224, International Brotherhood of Electrical Workers, representing engineers at all five Cincinnati stations held not one, but TWO picnics this summer. It seems that after the first shin-dig, there was a surplus in the picnic committee's account, but not enough to throw another picnic, so we voted additional funds to pitch another one. We hope the committee spent all their dough this time or we'll have to continue the process until we break even and this might go on forever. Needless to state, our picnics are whoppers and you just about recover from one, when up pops another one . . .

Newest member of the studio staff (and six months "old" at that) is **Milt Heidt** from nearby Cheviot, Ohio. Milt is a well-known "ham" around these parts—**W8SDD** . . . Studio engineer **Herby Crawford** busy entertaining his two brothers home on furlough from the Navy. One brother is a Seabee and the other a meteorologist . . . October 2nd, **Jo Heiser** celebrated his birthday and the boys threw a little informal soiree for him with a cake and everything. We don't throw parties for all the engineers on their birthdays—but we do for Heiser because he's the man who makes the engineers' assignments! We know on which side our bread is buttered even though we do eat both sides . . .

. . . Well, so long now; and as they say just before we drop the channel—"this is the Nation's Station".

Adolph Gross—Terminal Radio Corp.

The withdrawal of Adolph L. Gross as treasurer and stockholder of Terminal Radio Corporation, 85 Cortlandt Street, New York, distributors, has been announced. His future personal plans undecided, Mr. Gross is continuing his association with the government's Electronic Research Supply Agency at 460 Fourth Avenue, New York, with which he has been affiliated since May, 1943.

OMAHA NEWS

By Bob Rudd

MARK McGOWAN is itching to go squirrel hunting. The season opened here September 20. If it keeps on raining he will have to go hunting in a boat.

WOW staff picnic September 11 was a complete success. Thirty-eight of the sixty-two-member staff turned out. Even **President John Gillin** and **Manager Harry Burke** were there, to say nothing of **Lyle De Moss** and **Ray Olson.** Every one enjoyed the ball game that preceded the "grab what you want" dinner. The team was selected at random among the staff members. **Umpire Soren Munkhof** was put on the spot when his decisions were booed down and outs or strikes were arranged to suit the side that was ahead at the time. It occurs to me, now that I think it over, that that was pure and simple cheating. Oh, well, he should have had more will power.

Roy Glanton brought a 42 lb. watermelon that he raised on the WOW Farm. He has about a dozen on the vines that he hasn't touched. He keeps such a watchful eye on them that the operators don't have a chance to hook one. He's got some kind of an infernal machine hooked up in such a manner that a photo cell scans the patch and when the beam is broken by an operator on the prowl, the trigger of a 12 gage shotgun is actuated. Said Operator receives a charge of rock salt in just the right place. Needless to say, all watermelons are still intact. Roy must think the boys want to steal them. Tsk, tsk!

Tuesday, September 12, Chief Engineer **Bill Kotera** "popped" for steaks at our favorite steak house: Marchios. After much gaiety and bantering the Chief was presented with the symbol of the "Dead-Beat" club (WOW Original), a real dead-beet. The beet was really dead, having been pulled from Bob's Garden earlier that day. The Chief wore said dead-beet in his button hole. **Tom Dailey** (WOW sports announcer) and **Ed Messenger** (Ex-KMBC Transmitter super) were there as guests. Dailey tried to conduct our meeting and attempted to move into the dead-beat club without paying the usual dues; i. e., steaks and accouterments with the bill being paid by him. He was booed down in short order and advised to hold his tongue or the wrath of the engineers would descend upon him. **Cy Hagrman** bought a bottle of fine old Brandy and if I am not mistaken, I noticed one or two of the boys sampling it. Isn't it awful?

Asst. Chief **Joe Herold** is going to set 'em up for the gang sometime in November. Joe attended the NBC short course in television in New York and was unable to take care of this important function during October. **Glenn Flynn** Se took over Joe's duties while he was gone. **Cy Hagrman** TE took over a control shift at the studios so as to relieve Glenn. **Louis De Boer** (new NABET member) is getting the heat put on him to buy for the dear brothers or forever hold his peace. **Cy Hagrman** has taken over the duties of Chief Heater with the idea in mind to beat **DeBoer** into submission. **DeBoer** has made a favorable statement to the effect that he will set the boys up to steaks soon. Hurrah. The heat is gradually working around to **Rudd** but so far he has been able to sidestep such pressure. **Rudd** intends

to pop at a later date and guarantees to make all the boys happy.

The last **Union Pacific** show, "Your America," was presented on NBC October 1. It moves to Mutual Sunday, October 8, but WOW engineers and announcers will carry on the work. During October **Glenn Flynn** ran the controls on the show while Joe was in New York. **Louis De Boer** ran sound effects. **Fred Fry** (new to radio) took over Cy's shift at the transmitter, while Cy was at studio helping out.

Ray Olson (announcer) departed for NBC and Chicago September 23, Thursday, September 21, the entire male membership of the WOW staff attended a dinner and party for Ray at Marchios' (as mentioned previously—our favorite steak house). Every one toasted Ray with everything from water to milk. How did milk and water get into a WOW party? The festive board was groaning with steaks and condiments, and of course the ever present wine. Every one had something to say, and though there was much merriment and bantering, everyone wished him well. Ray is one of those individuals that everyone likes and to show the affection that all hold for Ray, he was presented with a pure wool hunting shirt. A recorded tribute was paid him via portable playback. The skit was written by Tom Dailey and Joe Herold and the control work and sound effects was done by Glenn. The record presented Ray's life from birth to present day. It was a scream and congratulations are in order to Tom, Joe and Glenn for their fine work on it. You Chicago boys should have Ray play it for you.

Tom Dailey (Sports Announcer) "popped" for steaks September 26 at you know where. He furnished brandy and wine, and—Oh, heck, why go on. He popped for the whole works. All engineers that were not required to be on the job, were there. Tom was presented with a membership in the "Dead-Beat" club and now has the privilege of beating his creditors.

Tex Glanton has his new teeth and says that he is now out of the meat-ball class and can eat steaks with the best of them. Roy has been suffering with sciatic rheumatism for the last few months but is recovering. Were very happy to hear that, Roy.

Al Maller, who has been in and out of love several times in the last year, is now in love again. He loves running the Palmolive Et's because his new girl has a palmolive complexion, you know—"Omaha Reports 97 per cent of all cases tried had a beautiful complexion in just fourteen days———". Harrumph. In case you might think that Al is nothing but a Casinova, he does have his serious moments. Some months ago he devised a very clever method of examining saphire recording needles. The device is so arranged that the needle can be placed in a holder in such a position that it can be observed from all angles by a microscopic lens that he has placed over the needle holder. A light can be placed to shine its rays on the needle point, and then the facets of the point may be examined for wear and chips. It's a good idea and it works fine!

Here is a little thing about Roy that perhaps he won't appreciate seeing in this column but its too good to keep. It seems that Roy has been hiding his light under a bushel. Its time to tell all. Its time to bring things out into the open. Roy the engineer is now Roy the after-dinner speaker and legitimate stage actor. The facts are these: At a recent church dinner, Roy was called upon to say a few words in behalf of the Sunday school treasury. He wasn't satisfied with giving the facts and figures relating to the financial condition of the treasury, but gave other interesting and to the point, anecdotes and wove them around the treasury report in such an entertaining style, that he brought down the house. His talk was hailed as the best of the evening. His only comment to this reporter—"Why can't I learn to keep my big mouth shut, now they will be wanting me to talk all the time—oh, me". Ha. Now the part about the actor: We have at this time (1st week in October) the Black Hills Passion play with a cast of professional actors and prop men. Its a beautiful thing and well worth seeing. Now, as we have been reminded time after time, there is a war on. This has brought about a shortage of actors so—oooooo—oooooo, what does the Passion play director do but ask Roy if he will accept a bit part as one of the twelve desciples in the play. This he does and upon arriving at the auditorium is made up to look like a desciple and is garbed in the raiment suitable to men of that time. He is covered with makeup, beard and wig, and is seated at a table with the other eleven desciples. During the play, and according to the Bible story, Jesus washes the feet of the desciples and then they partake of bread and wine. Roy carried out his part to perfection. Later in the play he donned the garments of one of the judges of King Herods Court that condemned Jesus to death on the cross. His work was liked so well, that he was asked to help out again before the play left Omaha. He is taking friends to see the play tonight (October 3) but tomorrow night he will be in it again as one of the desciples and later as one of the judges. As I've always said—you can't tell what a man can do by looking at him.

Detroit Chapter News

By Dave Stewart

WELL—our hat's in the ring! On September 21, 1944, **the Detroit Chapter of NABET** was granted a charter, and as a starter is comprised of employees of **WWJ-WENA**, the **Detroit News** stations. Prospects are bright for our expanding in the very near future—but more on that later.

No election has been held here, as yet and, for purposes of conducting business, temporary officers are functioning until such a time as an election can be held. **Alex J. Doran** is carrying on as temporary Chairman, and **Dave Stewart** as secretary.

It is with deep regret that we report the death of **Carlysle C. Jinks,** aged 35, on September 21. Carl has been with WJR in Detroit for the last 10 years and his passing is a loss to all of us here in Detroit.

On September 9 the combined engineering staffs of WWJ, WJR, WXYZ, WBCM, WSPD, and WENA, in company with their wives, assembled at the Italian Garden, of the Book-Cadillac Hotel here, and carried on the tradition of the Annual Bust and Banquet of radio engineers of the Detroit area. We had a fine turn-out, a goodly spread, entertainment, foaming refreshments, and dancing till 2:00 A.M. **Bev Fredendall** of the Chicago Chapter accompanied by **Mrs. Fredendall,** were welcome guests. The only kick-back we have heard so far on the affair was the

following squib in Elmer C. Adams "Random Shots" column in the Detroit News—and are our faces red.

Random Shots

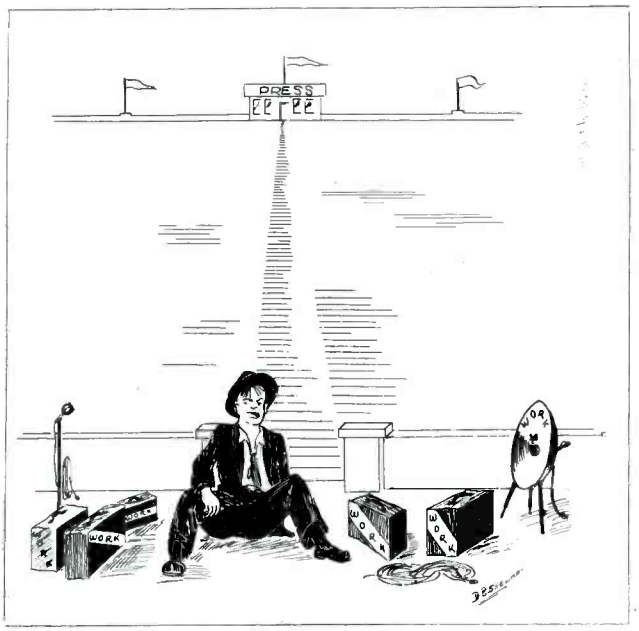
By ELMER C. ADAMS

Detroit News of Oct. 5

'Twas Ever Thus

Detroit's radio engineers, those mysterious men behind the mikes whose job it is to see that programs come through with the minimum of distortion and who tear their hair and nearly die of grief if the distortion exceeds a hundredth of one per cent, assembled recently for a dinner and conference. And the public address apparatus they used was so ineffective that hardly a note of the music could be recognized or a word of the speakers understood.

I am nominating these engineers for membership in the Society of Dairy Farmers Who Eat Oleo and Shoemakers Whose Children Always Have Bare Feet.



"T' HELL WITH IT"

Well, some people just don't understand the troubles we had with that P. A.—the ecoustics in that room were "wonderful"—having a marble floor and a high glassed-in roof.

Here's some of the latest dope gleaned from our No. 1 grapevine:

Charlie Kocher, formerly of WWJ-WCAR, and more recently with the FCC office in Cleveland, is the new Chief at WXYZ and the Michigan Radio Network. Charlie replaces **Vern Alston** who departed for sunny California a month ago.

Bill Walker of WXYZ is leaving Detroit to work for CBS in New York.

Herb Tank, Capt. Freidenthal and **Merrill Mitchell,** chiefs at WWJ and WJR, are up in Chicago at an Electronics Conference, sponsored by Armour Tech—we often wondered just what cooked at one of these conferences!

Ole Lapham, SE at WWJ, is getting that wander-lust gleam in his eye as he is wont to do about this time of year. He's about to make his annual trip up into the wilds of northern Michigan where, as usual, he will stalk deer and generally live a rugged uncomfortable ten days in the north woods, and as usual come back to work and tell us how he is going to get that deer next season. We've been waiting for venison steak around these parts for months, particularly with the present meat shortage.

Alex Doran, our acting chairman, fairly drools at the mention of venison. Alex is probably the "eatingest" man in radio. He packs a terrific lunch to work every day and besides this he usually finds room to devour a couple of hamburger steaks. One day last week Alex was very much put out when someone stole his lunch—all but eight sandwiches.

Conducting a column such as this has always been a secret passion of ours and, as in all radio stations we have a few characters who make excellent copy. Probably the outstanding character around Detroit is our own **Roger Kneeland Ellis.** Roger is a long, angular, good natured soul who hails from the Boston Back Bay district. He talks almost incessantly, with a beautiful New England twang, and we have yet to find him at loss for an answer or failing to get in the last word. This anecdote on Roger dates back several years, but we always get it out and dust it off for visiting firemen or on other state occasions. Several years ago when WWJ was carrying baseball games, we used to record several of the soap shows off the network during the period we were airing the BB game, and, play these soap shows back later in the day. On the first day of the season, the ball game had been going on all afternoon and our Roger was seated comfortably with his feet on the table in MCR, taking life easy. The game came to an end and in the transcription room, just off MCR one of the other boys was standing by, all set to put the transcribed edition of **Back Stage Wife** on the air. Suddenly the phone shakes Roger loose from his dreams—he picks up the horn and, in his inimitable New England drawl, sez, "Good afternoon, this is the Main Control Room of WWJ, the Detroit News, Roger Ellis speaking." There is a pause, and Roger holds the receiver back from his ear a bit, permitting us to hear a female voice rattling the diaphragm like mad. "What's that, Madam," drawls Roger. "You say you didn't hear Back Stage Wife today?" The receiver cackles madly again, as Roger eyes the clock which is slowly approaching program time for the show under discussion. With about thirty seconds to stall, Roger then sez, "Madam, are you sure you have your radio turned on?" The receiver cackles some more. "Are you listening to WWJ?" More cackles. "Mmmmmmm——" sez Roger, "well I'll check into it". He then holds the phone back and hollers in a loud voice, "Rigby!" "Yes, sir," comes an off mike voice from the TT room. "Put Back Stage Wife on right away," hollers Roger. Out of the speaker floats the first few bars of the theme of Back Stage Wife. "Are you getting it now," sez Roger into the fone. The receiver cackles very gently and melodiously. "Oh, don't mention it, Madam," sez our Roger, "that's just some more of that good WWJ service". Whereupon he hung up the receiver and stretched back to his comfortable position, happy in the knowledge that WWJ had another contented listener.

A player of records named Joe,
Whose co-ordination was slow,
Got all in a stew,
By missing a cue,
And royally fouled up the show.
Nuff sed, Dave Stewart.

BELIEVE IT OR NOT

Come, gather near me, one and all,
While I recite the ditty
That tells about the engineer
Who hops gain in the city.

This engineer had twisted knobs
Until the entire nation
As one agreed his twisting fame
Deserved their admiration.

But any road that leads to fame
Is often long and winding,
And on this road the engineer
Had done some two-bit grinding.

He'd twisted knobs in stations where
The whole darned place was twisted
By owners who were either Scotch
Or mercinary fisted.

And though proclaimed a grand success
From coast to coast, this fellow
Not long ago gazed at his check
And gave a mighty bellow.

For there, right on the dotted line,
The figures stood as beacons
To testify that hunger leads
To stages where one weakens.

And when one's ribs stick out and show
There is no well fed lining
It's time to find a dotted line
And do a bit of signing.

And that's precisely what he did.
He signed with dear old NABET
And though he's lost a lot of fame
He's gained the eating habit.

—By Mho Rhymer

The Universal Microphone Co., Inglewood, Cal., in the October jobber issue of its Micro Topics, announced that when authorization is given to resume the manufacture of goods for civilian consumption, the company will return to the recording field in addition to its continuance of microphone manufacture. The firm had previously made its own complete professional recorders, but discontinued this production some five years ago.. The new Universal recording activity, however, will not include complete sets. They will manufacture all recording components for firms making their own radio chassis for assembly in their own complete recorders and combinations. The line will include cutting heads, recording mechanisms, assemblies and other parts and assemblies.

CLEVELAND *Shoots . . .*

By Bert Pruitt and

MEMBERS of the Cleveland Chapter of NABET decided to throw a party for the men who struggle to make their living on Kilocycle Lane. This Lane, as everyone knows, runs through the land of Discrepancy Reports. Most of you have no doubt bent your elbows in the famous Voucher Tavern that lies just inside the horse-shoe bend over there in the County of Pass the Buck. For those who do not believe in bending their elbows we continue by saying that Chairman Harold Brandt wanted to spend in the neighborhood of $500.00 to thoroughly convince our fellow-technicians that there is nothing cheap when it comes to the Cleveland Nabet Chapter.

Treasurer Frank Whittam took one peep into the toe of the sock that holds our monthly dues, then informed his Majesty that we could do it with ease and still have exactly thirty-seven cents left. Brandt said: "Good grief! We can't do that . . . that'd be desecrating the Cleveland sock . . . And the National Convention'll be here in Cleveland this October and it'll take more than thirty-seven cents to convince those metropolitan Councilmen, and Potentate Powley, that Cleveland is a fair city that did not stop growing when the American Indians taught the pioneers how to make clam chowder that will make your eyeteeth sit up and take notice."

Barney Pruitt, Studio Councilman, had been listening to the above conversation without saying a word. If you knew him as well as we do, you'd recognize the fact that this display of silence could be placed in the category of the display of silence that has been coming from Berlin and Tokyo recently. His stand-up strike against tradition lasted only about 47 seconds, however. "Boys," said he, "do you fellows remember that famous little ditty that told how four and twenty blackbirds were placed in a pie and set before the King?"

"Alfonso?" questioned Whittam.

"And what do Kings and blackbirds have to do with a Nabet party over at the Statler Hotel?" Brandt was irked.

"Well," continued Barney, "it's like this . . . we can't afford to spend 500 bucks for this party . . . let's see . . . water and the stuff to counteract the chlorine in it will cost in the neighborhood of 75 dollars . . . Why!!" exclaimed he, "we can throw it for 80 bucks flat!"

Harold wanted to know what the extra 5 bucks were for. Barney said that was for 12-gauge shotgun shells. Harold gave Barney a peculiar look, then asked him if he had said shotgun shells. Barney said that he had heard correctly. Harold then wanted to know what they'd do with shotgun shells over at the Statler Hotel where they haven't issued hunting licenses or allowed pheasant hunting in many a moon.

"It's like this . . . Al Stewart, out at the transmitter, is an expert shot with any kind of gun . . . one time, years ago before we joined NABET, I was walking through the woods with Al and the first thing I knew, he whipped his 22 to his shoulder and drew bead on a crow which was flying about 85 feet above an old oak tree that had a

CHAPTER *the Works*

Norman Drysdale

knot on its north side down about ten feet from the top, where a woodpecker . . ."

"I," interrupted Frank, "have to go to work at 1 A. M."

"That," continued Barney, "leaves us three hours and I should finish this story by then . . . Al pulled the trigger and the crow dropped in a haystack that sat about one hundred feet south of an old log cabin that is reported to be haunted, and . . ."

Frank wanted to know what a dead crow and haunted log cabin had to do with a NABET party.

"Well," continued Barney, "it's like this . . . Al could go hunting with a shotgun and he'd soon have enough blackbirds to make a pie big enough to feed all the radiomen in northern Ohio."

"Barney," said Harold, "we might insult these radiomen if we were to shove a blackbird pie at them."

"Well," says Barney, "since when do radiomen think they are better than Kings?"

Frank said he wasn't sure when it had happened but he was under the impression that radiomen began thinking along that line way back in 1934 when NABET got them a raise and the 40-hour week.

They talked the situation over and eventually came to an agreement that brought us all to the Statler Hotel on Monday evening September 18th.

And now that we are at the Hotel Statler we take great pleasure in turning our typewriter over to Norman Drysdale, WHK Engineer, who will do the Cleveland reporting, beginning with this issue of the Journal.

In taking up the flaming torch of publicity from the capable hands of Bert Pruitt, I do so with no illusions that I can attain the high standards he has maintained for so many years. It speaks volumes for his fine spirit of cooperation that instead of just dropping this assignment into my lap, he comes up with a neatly typed preamble and introduction. In consequence the rest of this article will sound like an old friend of mine who belonged to a debating group I once attended. It was his first effort at a public speech. Everyone marvelled at the eloquence and polished phrases of his introduction . . . then came the let-down when he relapsed into his own vernacular. He had very carefully copied out and learned by heart the introduction, and when this ran out, Alex was strictly on his own!

The Statler party was a great success, and Cleveland NABET Chapter really did shoot the works. I still drool

"IT CAN BE DONE"

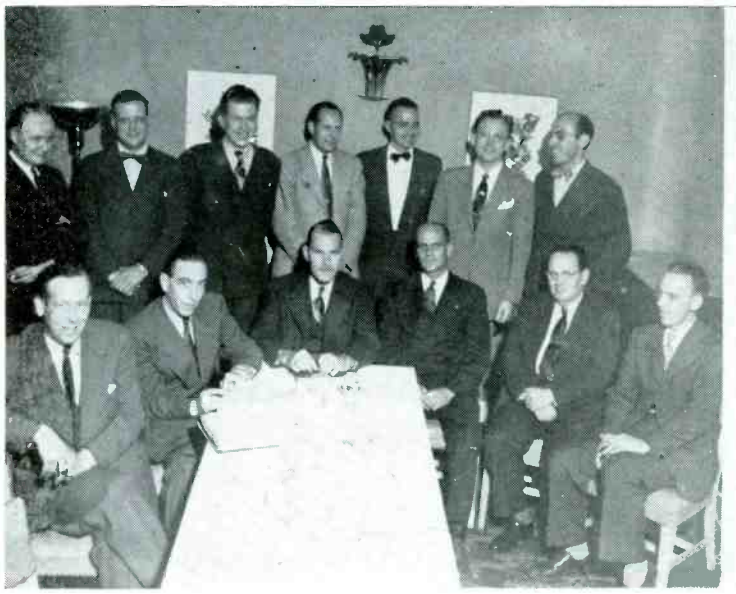
as I recollect the succulent golden browness of the fried chicken which even highly discriminatory gourmands like Jim Carment and Hugh Okeson voted the best they had ever tasted. (Blackbird pie my eye!) As for the aforementioned dechlorinated water, like the beverages at Abie's vedding, the vater flowed like vine!!

The celebration marked the entry into NABET from the fold of the International Brotherhood of Electrical Workers of the entire Engineering Staff, twenty-four in all, of Cleveland's Mutual outlets, the twin stations WHK and WCLE of the United Broadcasting Co. Of course all twenty-four could not attend the banquet. Stations have to be kept on the air, party or no party. Thirteen were able to come—together with thirteen more from WTAM and three guests from WJW, Cleveland's newest outlet affiliated with Blue. Chairman Brandt and the other Councilmen responsible for organizing the party earned the undying gratitude of everyone by cutting out all speech-making during the dinner.

After the feast, photographs were taken by treasurer Frank Whittam. Unfortunately for the archives I regret to chronicle that the high speed focal plane shutter which was Frank's pride and joy was off frequency with the result that Cleveland Chapter was libeled by appearing to be in a bit of a fog! In consequence we have asked Carl Hanson, Studio Engineer of WHK who has had considerable artistic experience, to record for posterity this historic occasion.

Chairman Brandt sporting a torpedo-sized cigar proceeded in his capable way to transact the business of the Chapter, welcoming the boys from WHK—WCLE into the greener pastures of NABET fold, which brought a cordial response from their newly-elected Studio Councilman Larry Shipley. Mills Bennett is a popular choice for the post of Transmitter Councilman.

Cleveland Chapter looks forward to the privilege of serving as host on the occasion of NABET Convention, when it will again shoot the works!



(LEFT) Chicago's old and new councilmen finally get together. Seated left to right: A. ALDRED (new) WMAQ transmitter, FRANK GOLDER new secretary-treasurer, BEV. FREDENDAHL (new) Chairman, R. S. DAVIS (new) Supervisory, BURR WHYLAND (new) WLS studio, ANDY FORGACH (departing) WENR-WLS transmitter. Standing, left to right: MAUREY DONNELLY (departing) WLS studio, MARTY MARTIN (alternate for new) Maintenance, DON FITCH (departing) Nite Studio, FRANK SCHNEPPER (departing) Chairman, BILL CUMMINGS (departing) Field, GEORGE MAHER (new??) Nite Studio and CARL CABASIN (new) Field. (RIGHT) With only Mart Martin and Dick Wehrheim available to install new Scully Recording Lathes for Supervisor R. S. Davis at Chicago, Miss Grace Matheson inspires the workers to complete the installation more rapidly.

Chicago Chapter Chatter

By Arthur Hjorth

THE arrival of a bouncing baby, one or the other, by NBC Recording Supervisor **Davis** couldn't have caused caused more excitemen than when "Dave" breathlessly announced that, after fifteen months of procrastination the **Scully** family had actually delivered two of their recording lates to Chicago. These latest models are not the ordinary run-of-mill recorders but have many superlative features. For the benefit of the Recordio experts in Maywood, Elmhurst, and points as far west as Hollywood, let us enumerate a few of the remarkable improvements incorporated in these two recorders, keeping in mind that they have been welded to the steel beams of the Merchandise Mart and armed guards are posted on the premises thru day and nite.

1. FLUFF ERADICATOR: To be used when cutting one minute spots and political speakers.
2. TIME LIMITER: This new and unusual device is present at the start of each cutting to the time set by the copy which is scanned by two orthicon tubes, one controlling an additive oscillator and the other a subtractive oscillator. The outputs of these two circuits thru a bridge, control the variable speed turntables, thus compensating for the time variance of the copy reader also known as announcers).
3. REVOLVING TYPEWRITER: Used to speed up production by making it possible to type the labels previously placed on the disc while the record is turning. Other startling improvements cannot be divulged until "V" day plus four years.

Apologies to **Hugh Townsend White** of NBC Maintenance for referring to him as Harry last month.

A. D. Aldred, Councilman for the WMAQ transmitter, has purchased **Jim Platz's** concrete mixer, according to busy Professor of Radar Training and Elmhurst's candidate for Mayor, **Platz.**

Flash . . . Did you register for voting? It is imperative that you do so this year because Supervisor **J. Ralston Miller** is a candidate for Congressman from the first district of Indiana. You will find his name on the **Prohibition Ticket.** His battle slogan is **Vote for Miller and have an empty bottle in every home.**

Roger H. Parker, a flash of the BLUE, is rumored to be teaching radio to a bevy of beautiful damsels for the Signal Corps at Illinois Tech. It is understood he is also being paid cash for his services.

Welcome to new men on **WLS** studio staff. **Harry W. Shumacker** from Zenith Radio, and **Norman Kindlund** from the U. S. Coast Guard, and **Bell** and **Howell.**

The third or seventh run-off ballot for Councilman at the WENR-WLS transmitter group is in the process of completion. We may have two Councilmen from there yet.

"Pete" Cavanaugh, married this past summer, when recently interviewed, advised "nothing further to report".

When **RCAI Radius** completes the first year of television school next July, Control Supervisor **Bill Cole** will probably, . . . well, possibly . . . well, then . . . maybe . . . teach the second year.

Dean of Commentators, **H. V. Kaltenborn,** recently on

his network show in commenting on **Jimmy Petrillo's** (not a member of NABET (refusal to bow to FDR's request that he abide by a WLB ruling, said, **"It must be very lonely these days, to be a dictator"**.

Big Bill Beeson of NBC Maintenance, postcarded from his hometown at Lexington, Kentucky, recently, where he was vacationing, **"Boy! Kentucky is not for me any more. I'll be glad when I get back to civilization"**.

George Maher, wife **Frances,** and three sons vacationed. While there, George also visited Waukeegan.

Marty Martin of Maintenance announced at a recent Council meeting the arrival of forty pounds of honey at his home. Knew from the weight it just couldn't be an addition to the family and forty pounds isn't quite enough for a "Hollywood Honey," so finally deducted this was the result of his bees productive efforts for the season of 1944.

Mary Trottner (single) NBC Recording, and **H. R. Maule** (single), NBC Field, were overheard wishing each other "Good Morning" recently.

Burr Whyland of WLS studio wishes to advise his many friends that he has disposed of the famed waltzing mice menagerie.

R. B. Whitnah of Blue Field has such a burning desire for . . . early American music, that he has asked for and received the weekly assignment taking him to Detroit and that Ford program.

Lieut. Colonel Paul Clark flew into Chicago in HIS B-25 bomber for a few days.

A. J. (Jack) Hall has been appointed production and research engineer for the Universal Microphone Co., Inglewood, Cal., according to announcement from James L. Fouch, president of that organization.

New York Blue Notes

By Gil McDonald

BY NOW summer vacations are just pleasant thoughts, sun tans are now replaced by that New York pale look and all Blue men are hard at work again turning out a new fall crop of new and better shows.

Did you ever feel like the world was turning upside down even though you never had a drink? Well, **John MacDonald** was just about to go on the air from a local hot spot one night when he signaled the electrician to douse the neon lights. The lights didn't go out but the band stand, which moves in and out by means of a motor, started to go backwards, chairs and musical instruments were thrown down, and musicians started running for safety. Mac stayed with it, however, and got the show off to a rather rocky but good start!

Lookie-Lookie. We heard about a certain Blue Studio Engineer on a certain Blue Cow show who has to wear a certain costume while on the air, although he swears it ain't so. So one night we sneaked over to the repeat show with our trusty camera and came away with the photo. In case you don't recognize him in his horns, look at the "cow-catcher" in the upper right hand corner for the clue!

Ed. Watkins (SE) got back from that Florida trip OK and takes exception to our remark that he had never been further south than 42nd Street. Well, mebbe . . . but we know that every time he goes west of 10th Avenue, he starts looking for Buffaloes!

Al Bradley back on the job and greatly improved in health after quite a session in Polyclinic.

Bob Massel (Ex-SE) flew with the air-borne invasion to Arnhem and made recordings up in a transport plane. He has an airmail letter in the mail so mebbe next time we'll have some more definite news from him. He's doing a great job interviewing service men for the Coca Cola Spotlight Band Show and can be heard a few nights a week between 9:30 and 9:55 PM EWT.

Bill Glasscock flew out to Cleveland to do the Milton Berle show. That's about all for this month so cul-73.

HUDSON CHAPTER NEWS

N. A. B. E. T.

By Richard H. Davis

HURRICANE

LITTLE did we realize that when we mentioned the lamps swinging due to the wind at WBAM that it was only a sample of what was coming the next week. Yes, the 14th of September was the day of the big wind around WOR and WBAM. Since we had plenty of warning there was time to tie down all the tuning house doors and antenna equipment. As the storm approached the wind and rain got heavier and heavier until it was necessary to put the tower lights on although we couldn't see them. All spare engineers had arrived at the transmitter "fitten fer anythin'" by six pm. At 7 pm., the Rahway 2200 volt overhead feeders were swinging so much that they shorted at each blast. However, this supply was the emergency feed so the transmitter was putting out 50 KW without a wobble. Twenty-five minutes later things began to happen. The Rahway overhead feeders went dead short and blew up in a final flash of blue flame. Thirty minutes later WEAF called to say that they had lost power and to QRX on our 5 KW emergency transmitter. At 8:13 pm. we went on with 5 KW on 660 KC for WEAF, using our emergency antenna. Forty minutes later the Carteret feeder, our remaining supply, failed and both WEAF and WOR went off. A quick change in frequency for the 5KW transmitter and over to the Engine Driven Generator. This took seven minutes and WOR went back on the air at 9 pm. No regular power all night, with no extra lights on and, of course, no electric stove for fear of overloading the generator, so no coffee. This lack was remedied after a few hours by the use of a blow torch and a pair of asbestos gloves. The boys claim that this was the best tasting coffee that was ever brewed. Then at 3 am. WJZ called to ask if we could take over while they made some emergency repairs to their emergency generator. We wondered who we could call if ours started to act up.

Well, as the night wore on, we wondered if the gas guage was correct, and hoped that water wouldn't get in the line. The regular power went on at about 9 am. the fifteenth, and WOR went on with 50 kw. WEAF still had no power so the 5 KW Transmitter went back on 660 and carried NBC programs until 4 pm. when their power was restored. WOR engineers, **Robinson,** Acting Supervisor, **Gamblin, Riley, Ruckstuhl, Garuffy** and **Tackach** stood the hurricane watch.

During the height of the storm, the cars parked at the rear of the transmitter building actually leaned over as the wind hit.

The next day a mobile unit was sent up the coast to survey damage and broadcasts were made from Bridgeport, New Haven and New London, Conn. **Garuffy** and **Riley,** TE's, made the trip with **Paul Killiam** doing the commentary. One of the sidelights is that they had to carry as much gas as possible from NY since most gas stations had electric pumps and there was no juice.

At WBAM a wind of 97 miles an hour swung the lamps a good two feet. **Al Stanford** said it was like old times at sea. WBAM stood by until the storm was over to provide a channel in case the land wires went out.

TRIVIA

Bequist, FE, who has been doing the Belmont races, seen with a very bright jacket. Guess he expects to pick up a few "hot tips?"

John Ryan, formerly TE, left to go with WISH, Indianapolis, Ind. This is a 5 KW station and John writes that the place to buy a trailer, if you're interested, is out there, as every one seems to have one for sale.

Howard Donniez, MC, vacationed at Lake Oquaga (or something like that) near Deposit, NY. He was up there during the big wind and said that it was hard to believe the radio reports, then look at lake with only a few ripples in it.

Sam Morse takes over in charge of Sound effects in place of **Bill Hoffman,** who resigned to enter the American Field Service. Bill probably wants to check on the battle sound effects in real.

Dick Davis, FM, around with a broken toe, the result of hurricane wood chopping.

Paul Baldwin, Recording, reports that the politicos are recording like anything. Also from Recording we hear that **Dick Connell** passed out seegars recently due to the arrival of a 7-pound daughter in September . . . That the painting and expansion is about complete which will just about double the office and shipping space . . . That **Miss Biso,** the order gal, has left and is missed . . . That **Ray McEntee** vacationed at Corea, Maine, with the avowed purpose to do some fishing, but the ocean being so rough, his activities were confined to elbow bending . . . Cul. 30.

from San Francisco

By S. A. Melnicoe

THE San Francisco Chapter of N. A. B. E. T. elected Mark Dunnigan, Blue SE, as chairman of the chapter in an almost unaimous vote. R. C. Butler, NBC SE, was selected as Chapter Secretary, succeeding C. F. Rothery. Councilmen elected include: NBC Studios, E. L. Parkhurst; Blue Studios (acting) J. McDonnell; Supervisors, E. E. Jefferson; KGO transmitter, H. Kraemer; KPO transmitter, Ralph Stubbe.

Dunningan is heading for the Cleveland Convention with a whole list of San Francisco ideas to submit. Mark hopes they'll get a hearing and favorable consideration as does the chapter.

Biggest Blue news of the month in San Francisco was the series of appointments in the engineering department. First, Chief Engineer T. "Bev" Palmer, who has been in that position ever since the Blue separated from NBC,

A. E. Evans

was appointed to the position of station manager of KGO by R. Searle, new Western manager of the Blue. "Bev" has the best wishes of the entire San Francisco chapter for success in his new career.

Palmer, in turn, appointed A. E. "Shorty" Evans, station engineer at KGO, to the position he had just vacated. "Shorty," who has spent all of his time at the Oakland transmitter, has been geting acquainted with his new job. He has been in radio 31 years, 21 of them at KGO. His hobby is training and raising two prize race horses. Unlike Bing Crosby, Shorty's horses are being raised to win once in a while.

Henry "Hank" Dutton, KGO TE, has been appointed station engineer at KGO, taking "Shorty's" place there.

San Francisco now has an entry in the glamorous engineer contest that somebody was talking about in past issues of the Journal. We ask you to gaze upon the bewitching Miss Elma Oddstad, one time engineering secretary, now a real up-and-at-'em apprentice engineer. Elma, who has been taking care of all engineering department woes for lo, these many years, finally decided to take the daring leap, and, catching Chief Engineer Greaves at a weak moment, got him to agree to make her the next gal apprentice engineer in the department. When "Gentle Annie" Dunnaway (see September issue) left us precipitantly, Elma's opportunity came. She grasped it and is now learning the gentle art of counting turns on the transcriptions and how to be one jump ahead of the trumpets, now that we have three of 'em. Don't raise your hopes too high, guys, and try to transfer to San Francisco. She's true to the Coast Guard, one of 'em at any rate, and she's wearing his ring.

Elma Oddstad

from HOLLYWOOD

By Norman Dewes

Hollywood gets first TE's . . . New Year celebrated . . . more shows less studios . . . Aimee . . . Television . . . Black Widows . . . personnel shifts . . . dogs . . . draft . . . V-E day . . . ABC . . . Etc.

A QUIET month in Hollywood . . . vacationing about over, except for the LOW MEN on the Totem poles . . . Red and Blue hued, reading left to right . . . mustn't say RED tho, and pretty soon mustn't say BLUE either, when it gets to be the ABC . . . THIS will be the **American Broadcasting Company** according to what we hear, and probably IS by the time this stint gets in print . . . on the Blue it will look good . . . but official proclamation notwithstanding, it will be a LONG TIME before the associations are forgotten . . . we wuz PALS once, REMEMBER???

Under the Red and the Blue,
Many the happy day . . .
Then we were pals, good and true,
But now (censured, censured, censured, censured!!!)

BEFORE . . . we go any farther, there's a SLIGHT correction on the Duck story, Sept. issue . . . it seems that your reporter, who is ALWAYS getting things backwards . . . misquoted the gender of the **Joe Kay** infant . . . his little son is a DAUGHTER and very INDIGNANT about the whole thing . . . we're SORRY . . . and here's a LOLLIPOP, Judy . . .

HERE'S . . . something which used to puzzle US and which we bet has been furrowing the brows of some of YOU guys up and down the line . . . in fact, we've had some QUERIES regarding same, so here's the dope on those letters which you see attached to engineer names-in-the-news such as SE, TE and ME . . . they're NOT degrees of some sort or anything like that, but simply abbreviations for engineering groups or job classifications . . . ME means Maintenance Engineer, a TE is a transmitter man and SE's aren't Sound Effects guys BUT Studio Engineers . . . get it? . . . likewise an FE is a Field Engineer, RE's are the fellows who cut the waxes and MC or MCD equals the Master Control Desk. There's one that WE don't know what is tho, and that's an MTCE . . . they seem to run around LOOSE in NY (New York) . . . maybe it means "Men That Come Early" . . . if so, we have THOSE out here, too . . . yes, it's the age of abbreviations, as ANY phool can plainly SEE by just gandering the gals breezing along the boulevards . . . WE can plainly see . . . and then too, where would we be in describing situations without SNAFU and TARFU . . . Speaking of abbreviations, have you heard what L.S.M.F.T. stands for?? . . . it AIN'T what they say on the radio! Yak, yak, yak.

TE's . . . now that we know what a TE is, Hlyd has acquired FOUR of 'em . . . the first fellows we've had working in the classification of Transmitter Engineers, since up

to a short time ago neither net had an O. & E. outlet down here (See story on Blue's KECA elsewhere in this issue). The boys are officially under **Mr. Denechaud's** wing and have boosted the Blue staff up to fifteen men . . . more TE's will probably be along soon . . . as soon as Television and FM gear can be got . . . also it's rumored that NBC is seeking an AM station to purchase too . . .

CHANGES . . . several shifts in Studio and other groups have taken place . . . **Riekeberg** from the Scully Gully to Studio, with **Korngold,** app. departed and **Don Baker** from Maint. to Recording apprentice. **McWhinney** becomes a full RE and **Fred Jamison** a Maintenance apprentice. **Fred,** as we call him, is from the Navy and another chessman . . . two new Recording Clerks too, or rather one clerk and one clerkess (QSA 5, R-9) . . . **Wally Crockett** the clerk is a chessman TOO and **Patricia Gormley,** the OTHER one is from the Mail Room . . . she becomes the Recording Room's FIRST LADY and has already been dubbed by **Sil Caranchini** . . . "Lady of the Labeling" . . . **Hal Lee** has taken over de-naturing duties in Re-Recording, wherein commercials are delicately deleted from the big shows before they are transcribed for overseas release by the AFRS . . . the Army men aren't too particular about what they fill the cavity with and right in the middle of a show with a moderate 12 piece ork you may suddenly hear a burst of symphonic stuff by 80 pieces or so . . . guess the fellows overseas aren't too fussy either, as long as they can hear **Bing** and **Dinah** and **Bob,** and the others . . .

TELEVISION . . . in Hlyd is progressingly slowly, with the purchase of one site atop Mt. Wilson by Don Lee/Mutual/KHJ and options being taken on the mountain top by several other nets and local stations. Mt. Wilson has been well-known for years as the location of one of the country's prominent observatories, and is probably one of the most favorable spots in this part of the country. According to local publicity, **Frank M. Kennedy** Don Lee/KHJ Chief Engineer sez that a tower height of 5900 feet will be obtained . . . the site is easily accessible over a toll road and power is already available . . . most of the space up there has been optioned for and ONE network is said to have been caught NAPPING. The Air Corps show "Winged Victory" opened here October 9th at Philharmonic

(Continued on Page Thirty-four)

HOLLYWOOD

(Continued from Page Thirty-three)

and the premier was to have been televised from the stage . . . had it happened, it would have been a "first" for out here, but due to circumstances or something, it didn't come off . . . just heard that the I.A.T.S.E. here will start a Television School shortly . . . didn't say whether for cameramen, juicers or ENGINEERS . . . to TAG the Television News for this month, we attended a broadcast at ONE of the local video studios and were watching a ventriloquist act where the guy was seated at a piano with the dummy on his knee . . . WELL, the guy turned away to play the piano and the dummy started to sing, so the fellow on the mike boom proceeded to carefully re-adjust his mike to make a PERFECT pick-up . . . on the DUMMY . . .

AROUND THE BUILDING . . . all studio control booths are now enhanced by a work of ART, or rather **Oscar** . . . a nicely framed pen and ink drawing by **Oscar Wick,** ME, which depicts in simplified schematic the program circuits of the booth equipment . . . a larger view of same hangs in the Lounge and inasmuch as each booth is identical, becoming familiar with the picture should enable the Studio men to make patches and set-ups with more alacrity and LESS advice from MCD . . . also the newer fellows will find it of great value in becoming familiar with the board. Newscaster **Sam Hayes** has married . . . blushing bride is former **Rosamond Francis Drake,** film editor from Universal . . . saw 'em motoring out in the Valley, with **Rosamond** in the DRIVER'S seat . . . **Bob Jensen** auditioning a SPECIAL ET show . . . won't sell, tho . . . no laffs. Studio congestion is getting worse day by day . . . recently the Set-up Men had scheduled 38 show changes in ONE day . . . the Dinah Shore show had to be shifted FIVE times, alternating with Abbott and Costello in the same studio and each having two broadcasts complete with orchestra, sound and all the accessories . . . you shoulda SEEN the activity . . . NOTHING had a chance to cool off. Athletic Association has installed a nifty electronic ice cream machine next to the candy and cigge dispensers . . . (yes, we know . . . WHAT cigarettes?) . . . anyway, you puts in your nickle, takes a 5 second pause, stands back and pulls the handle and out comes a DEElicious ice cream bar, all wrapped up sanitary like . . . we STILL remember the electronic Coke machine they had last year . . . and the time the wires got crossed and the thing kept giving out cokes in cups and you couldn't STOP it . . . it was wonderful . . . everybody in the building got a coke jag . . . maybe this ice cream gadget will do the same thing . . . we're all waiting and HOPING . . .

BLUEVENTS . . . lots of new Blue shows starting, with no relief for manpower or studio shortages . . . even the ET booths get jammed up and playbacks are made from the Recording Room which is amoozin' . . . but sorta confoozin' . . . producer and crew assignments have been made for V-E Day spot broadcasts and everybody is at the "Three to Make Ready" stage . . . **La Croix** the man on "The Man Called 'X'" for Lockheed and has it fixed so that HE gives cues to the PRODUCER . . . the prod works the stage with headphones and takes signals from **La Croix,** who sits at the dials in the booth with a special SPOTLIGHT shining down on him for visibility . . . trouble is, the audience watches the **La Croix** instead of the show . . . **Eilers** the proud possessor of a new Rolex Oyster . . . it's a wristwatch which keeps VERY good time . . . **Heffernan** back from a nice ride on the choo-choos to Denver and return for "Town Meeting" . . . **Ragsdale** gifted with an alarum clock set for a very EARLY hour, to be sure and get him up for one of our earlies . . . **Rags** recently got back from a ROUGH trip in an Army bomber from a Tucson, Ariz., Coke show . . . related trying times trying to MAKE CONNECTIONS with the rest-room facilities, while in FULL FLIGHT . . . you hafta HANG ON to one thing or another with both hands, and endeavor to catch it on the WAY BY . . . **Tom Baxter** got his order to report the 14th . . . his vacation started shortly before, so it will be a SEGUE . . . **Tom** being TALL and all, should make a good Sniper Snagger, pulling 'em out of trees with ease . . . GOOD LUCK, old man . . . **Johnny Eilers** maintains that all Hollywood announcers are from Africa . . . sez they sit around all day on their AFRA-CANS, don't they? Hup, hup, hup.

KECA . . . **Joe Dessert,** TE, selling out his camera gear, anticipating buying some bigger stuff when war supplies are released . . . **Rex Bettis,** Transmitter Chief busy taking inventory of Blue sale items . . . sez he has a plentitude of 872-A's . . . anybody wanna trade? . . . the rest of the boys busy getting used to being Blue Boys. A HUMOROUS twist went with the transfer of the station to the Blue . . . it SEEMS that there was a DOG in the deal too . . . the pooch's name is **Fred, TD** (Transmitter Dog) and he had been a resident watchdog who lived on the property and barked at burglers, etc. ANYHOW, shortly after the KECA purchase goes thru, **Denechaud** receives a BILL for dog food from the station's former owner, retroactive for several months back. The Blue decides that such an item comes under the head of needless expense, for they've hired a HUMAN watchman, so they give the mastiff to KFI . . . **Joe** sez SOMEBODY came out SHORT, 'cause

the mutt cost $150 new, but never was worth it, being sick most of the time and refusing to bark at ANYTHING. Sez the boys on watch had to go out and feed him a PILL every hour or so and keep a log on the RESULTS, which got to be a d—— nuisance. **Fred** was a friendly dog tho, even if he DID have worms . . . and the fellows will kinda miss him . . .

CHIPS . . . **Charlie Norman** back from Toronto with Hope show . . . caught a bad cold in a canyon or SOMETHING and is now known as "The Voice" because he hasn't any . . . **Hal Platt,** FE, and **Reikeberg,** SE, go flying in a Black Widow for Army Hour pick-up . . . boys worked out a special mike deal to overcome terrific noise in the cabin or cockpit or whatever the place IS where the radio op sits . . . **Hal** NEARLY lost his enthusiasm and OTHER things during a couple of slow rolls . . . **Jensen** taking apart an old ham rig in the shop for parts and out fall two READRITE meters . . . Oh, NO! . . . KFI has a deal where they feed a two-minute newscast over a line to a local Hollywood theater during each show . . . nice publicity for the mikers, who get name credits on a nice colored screen effect . . . **Freddy Martin's** army call cooled due to his maturing to 38 before induction, so goes back in the Grove after a stage stint and a TC tour . . . **Oscar Wick** figuring a rhombic down to the nearest RHOM . . . goes on roof for Television experimental . . . **Jensen** and **Cravens** out at March Field on Cantor show and kill the test at cue time and then open up on the GA but nothing comes out . . . a TelCo repeater had decided to call it a day in the interim and had GONE OUT . . . **Sister Aimee,** one of California's most colorful radio performers has passed on to her reward . . . we ALL get our reward . . . in the end . . . **Sax** back from Annual Division Engineers' meeting in NY and reports it was CHILLY back there . . . since our Western Division stretches from Mexican Border clear up the Coast for a 1000 miles or so, does that make us a LONG Division??? . . . San Fernando Valley citizens fixing to dedicate a statchoo or something to **Gordie Jenkins** for writing "San Fernando Valley" and bringing all that NICE publicity to the place . . . here's an ad which appeared recently in the Valley gazette . . . "Underwear Upholsterers . . . Your lingerie converted into a bathing suit to fit you personally. Send for information." Ah, these Californians . . . BCNU.

KFI - KECA - Los Angeles News

By Ernest F. Wilmshurst

AFTER over a month of absence, those men of the mountains, **Moore, Young, Darling** and **Johnson,** have come striding back to us. All bronzed, or sunkist, depending on your point-of-view, they barged into the studios the other day talking loud-like and actin' indecently out-doorish . . . they made us feel a bit pale and timid (after years of "John's Other Wife" and "Young Widder Brown," who wouldn't be timid . . . and pale?) . . . Well, anyway, were glad to see them back even if it does chop our overtime in half. I suppose it wasn't all roses. A big part of those weeks were probably spent in tedious hours of sitting and waiting in a hot sun . . . all-in-all it was probably what they refer to out in Hollywood as "pretty rugged".

The boys did not lack for some excitement tho . . . like the day **Charles Young** had dragged his equipment to a new mountain peak and had just gotten it set up . . . It was a sizzling hot day and as Charlie simmered on a hot rock he heard the roars of airplane motors in the haze below him. The noise grew to a roar and there, right smack below him a P-38 Lightning Interceptor crashed into the mountainside! The plane exploded and the fire started roaring up the mountainside to circle his lone mountain peak. Charlies went on the air pronto and soon raised the studios and by a three-way hookup we were able to direct forest fire-fighter crews to the fire.

Then there were the rattle snakes . . . **Tom Darling** used to turn on his transmitter and let us listen while he clipped off snake heads with his automatic. We confess to a little doubt, but a trip up there soon dispelled our doubt. Those rattlers are big, bold, and nosier than "Just Plain Bill" . . . one buzzed close to me and I can assure you the paper shortage became much more acute.

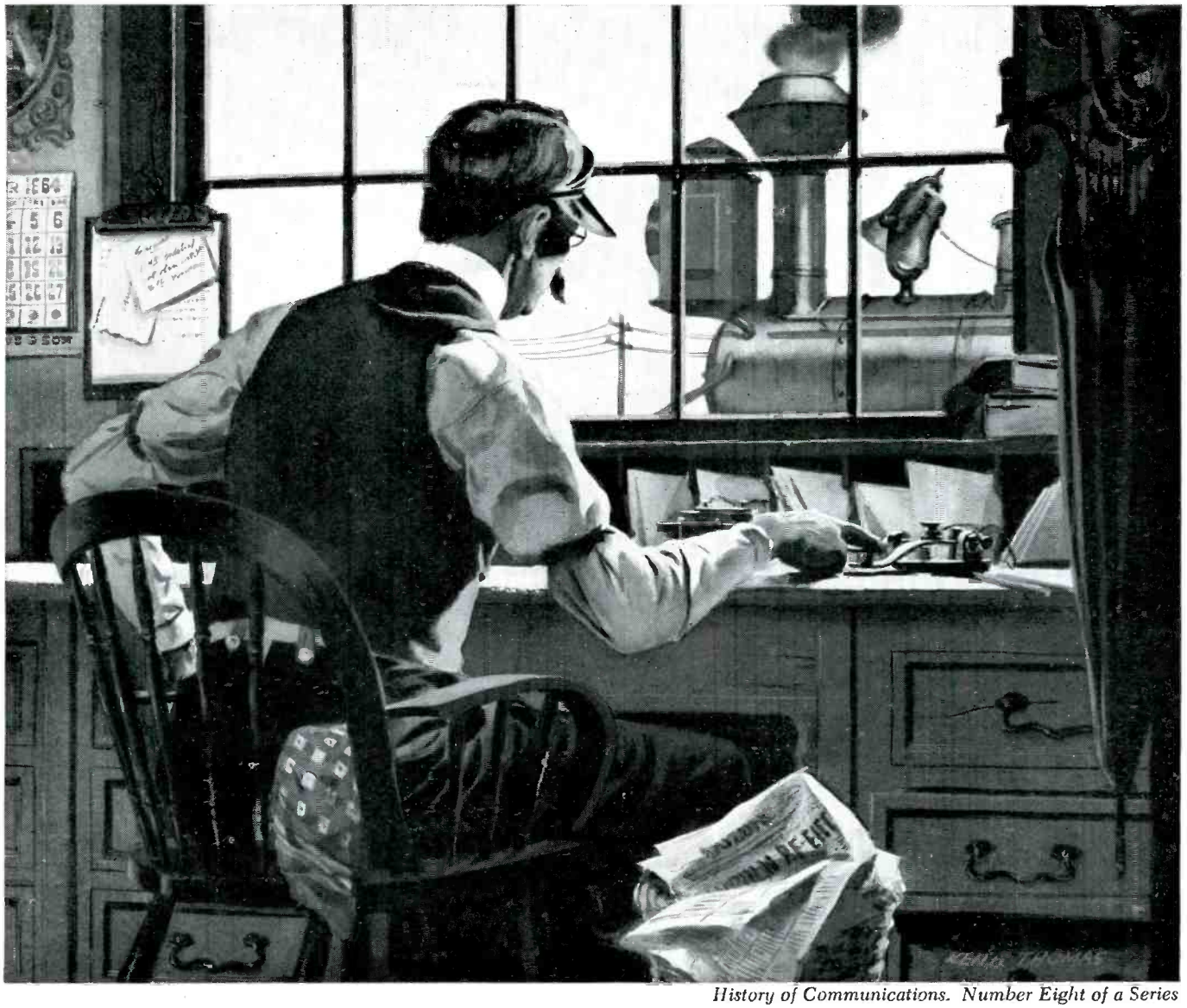
We're still wondering which of our mountaineers left the bottled live tarantula on the shelf with the bottles of miscellaneous bolts and nuts. **Chuck Bruere** is a bit near-sighted and it didn't help his nerves a bit when he peered into the bottle and it peered coldly back at him. The studios were extra still that morning, I guess that's why his yell sounded so loud . . . and the amazing thing is that the bottle didn't break. After we get the hinges straightened out, we're going to start looking for the shop door.

And while on the subject of Chuck Bruere we should explain that battered look. You see, he got out of bed the other morning at 4:30 and headed for San Pedro and the ocean to do a bit of deep-sea fishing. He was out after yellowtail . . . (shaded of the exclusion act) . . . well, anyway . . . to make a long story longer, Chuck was booming along on the highroad at about 0530 when his radar headlights started flashing a warning . . . alas Chuck was thinking of fish . . . he glanced out at the fog which was swirling by, probably debating whether it was getting deep enough to warrant bating his hook (or whatever one does when out after yellowtail). Up there in front is a heavy oil truck and trailer . . . if you have Bee-bee eyes you can see it . . . Charlie ain't got Bee-bee eyes . . . Crash! It was a beauty . . . Well, after Charlie had filled his cigarette lighter (we got gas-rationing out here and the lighter was about the only thing left that wasn't full of holes) . . . Chuck shook the glass outta his lap, he tossed aside a dangling tooth, straightened out his fingers and crawled out of the wreckage to take stock. His car is home now, on the shelf in the form of slightly used spare parts, and Chuck can be found these mornings sitting in C studio happily reading Sportsman's Magazine.

WE OBSERVE: That the New York Engineers' lounge has a new rug . . . Lessee is it room No. 589? . . . and a COFFEE percolator! . . . Jeest! With **De Somov** and **Lorenz** having an argument we used to never need coffee to keep us awake. The **rug** is probably so **Gallant** won't make too much noise.

AND WE OBSERVE: Vic and Sade aren't on the air any more . . . After cutting hour long blocks of soap operas, Vic and Sade was the only thing that stood between us and paper dollies . . . and now it's off the air!

Adv.: To KFI KECA members. SEE YOUR NAME IN PRINT. Send ten cents (one dime) and have your name printed in the NABET journal . . . Only ONE dime . . . More! But no less! . . . (Why didn't I think of this before . . . Gosh!) (Adv.). 73.



History of Communications. Number Eight of a Series

EARLY RAILROAD COMMUNICATIONS BY TELEGRAPH

Communication by telegraph was probably one of the first of the electronic arts which met with commercial success in America. Of constant interest to every boy in a small town, the telegrapher down at the depot was a hero – a man of great science. With the advent of faster locomotives, telegraphy was a speedy method of traffic control.

Today, and for the postwar period, the picture will include electronic voice communications for the streamlined trains which travel one hundred miles per hour. There must be a more flexible control via electronics, plus the added possibility of passenger luxury in radio telephones. Universal stands ready as an electronic manufacturer to serve in the era of applied electronics.

< Model 1700-UB, illustrated at left, is but one of several military type microphones now available to priority users through local radio jobbers.

UNIVERSAL MICROPHONE COMPANY

INGLEWOOD, CALIFORNIA

FOREIGN DIVISION: 301 CLAY STREET, SAN FRANCISCO 11, CALIFORNIA ·· CANADIAN DIVISION: 560 KING STREET WEST, TORONTO 1, ONTARIO, CANADA

DAVEN

ANNOUNCES A NEWLY-IMPROVED MODEL for DUAL-UNIT* ATTENUATORS

DAVEN dual-unit construction finds most important application in Balanced "H" attenuators, as well as in special multiple-circuit controls of the Potentiometer "T", Ladder, "L" and Rheostat types.

DAVEN engineers have incorporated into the improved dual-unit all the important new features recently announced for DAVEN standard single-unit attenuators. A noteworthy addition in the dual-unit is the improved method of coupling front and rear attenuators. The respective shafts of each meet in a lap joint within a long, snug collar, providing quick and complete access to either unit. By loosening a knurled nut and releasing a snap-on fitting, the front or rear switch may be reached without dismounting the front unit from the instrument panel.

*Patent Pending

Features of DAVEN Dual-Unit Attenuators

SEPARABLE COUPLING—Front and rear units now easily separated: gives quick access to either unit. Simple, durable, foolproof construction illustrated at left.

IMPROVED SHIELDING—Sturdy, snug fitting, 3 piece steel cover offords superb electrical and dust shielding, as well as greater all around ruggedness.

NEW DETENT DEVICE—Large gear and roller mounted in recessed front end of front unit, separate from resistive network, gives accurate indexing. (Illustrated.)

GREATER COMPACTNESS — Rear - of - panel depth only 3⅞"; 9/16" less than former models.

CERTAIN STOP—Extrusion of detent gear and steel attenuator cover form sturdy stop to rotation, eliminating rotor-hub strain of previous method.

CAPTIVE TERMINAL BOARD—Solder-lugs eyeletted to bakelite boards, which ore grooved to fit securely into slots in their respective can sectors.

ANTI-FUNGUS TREATED—Bakelite parts and resistive windings treated to resist fungus and mildew.

SILVER ALLOY—Contacts, switch arms and returns of tarnish-resisting silver alloy lower internal resistance. Other metals optional.

DON'T LET UP UNTIL OUR BOYS REACH TOKYO

THE DAVEN COMPANY

191 CENTRAL AVENUE
NEWARK 4, NEW JERSEY