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No. 10

**The Broadcast
Engineers' Journal**
OCT. 1945

Video Amplifiers

— By J. H. PLATZ

British Radar

— By JORDAN McQUAY

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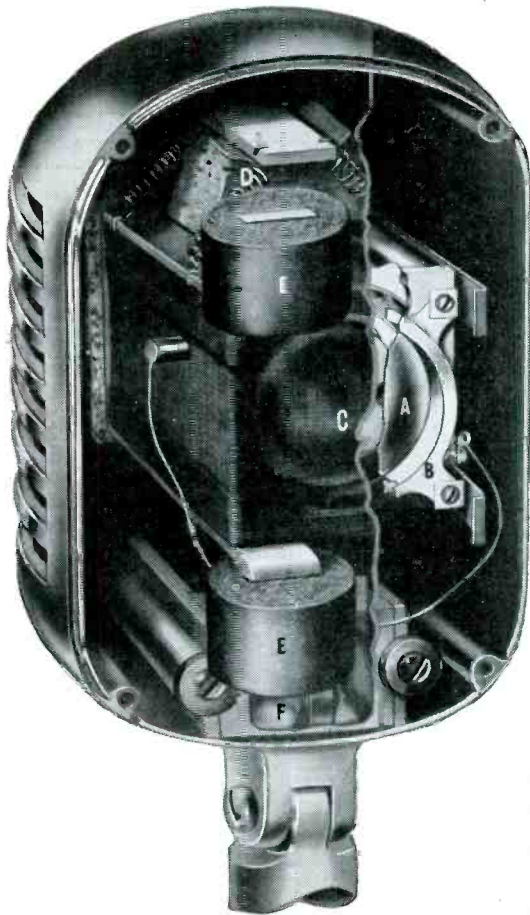
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AFFILIATE WITH NABET

By C. A. Allen
National Representative

NABET has taken the following steps to better represent the radio engineers and technicians. It has set up a governing body known as the National Council. The membership of the National Council is composed of the elected Chairman of the local Chapters. These men are all engaged in the radio industry as technicians the same as you. This body, in turn, has elected a President and a National Representative. The President appoints his Secretary-Treasurer. These men are all on full time, devoting their entire efforts to the best interests of the broadcast technicians.

In addition, provisions have been made by the National Council to divide the country into six regions with a full time representative in each. These representatives will be added as NABET expands and if conditions warrant. NABET representatives have been and always will be picked from the ranks of NABET.

NABET representatives are at present negotiating with another powerful independent union in an allied field to the end that an agreement to co-operate with one another will be reached. Such an agreement will strengthen both unions.

We first started with the theory that only a radio man who had been actively engaged in the broadcast industry could properly represent people engaged in the industry. This has been proved correct time after time in the history of NABET contracts over a period of twelve years. *Our contracts carry the highest wages and the best working conditions of any contracts in the broadcast industry.* Only a radio man having first hand knowledge of the extensive ramifications of the broadcast industry can negotiate and conclude a good contract. He must know from experience what it means to work long hours at inconvenient times, such as at night, and on Saturday and Sunday nights in particular. He must know from experience the long hours of study that he must constantly devote to keeping abreast of this fast moving industry. NABET officers have this experience.

NABET's growth is the result of its fair dealing and its honesty in representing the broadcast technician. Its path has not always been an easy one. To begin with, unions are very often opposed by employers and groups of employers who do not want their employees to organize although they themselves belong to various protective groups or "unions". Among these are the National Association of Broadcasters and the Chamber of Commerce. The National Labor Relations Act was passed by Congress to offset this employer opposition and it effectively protects the workers who want to organize. *NABET sees to it that you are protected by this law from the moment you make inquiry.*

Various publications of a confidential nature keep employers informed as to effective ways of keeping costs low. Unfortunately for the employee this usually means keeping wages down even when profits would justify higher wages. NABET and other unions very often have access to this "confidential" material. NABET uses this material and knowledge to good advantage by bringing to light, in negotiations, the true picture.

There are some employers who give their employees low cost insurance policies, etc.; or who raise wages slightly above that of other employers. These things would be commendable if it were not for the fact that this usually costs them only a fraction of the amount that wages would have to be increased were the employees to join a labor

union. It has the further advantage to employers that it can be withdrawn with little or no inconvenience once it has served its purpose of preventing employees from organizing.

Then there are some unions headed by people who are interested in securing power for themselves and who are constantly trying to increase that power by an invasion of the rights of other unions. NABET has had its share of this as most of you will know, to wit:—the Petrillo turntable grab and the deal Petrillo made with Brown of the IBEW. NABET prevented this not only for itself but also for IBEW members. Because of NABET'S opposition, the IBEW deal was halted, at least temporarily. Several charges that NABET is company dominated have been brought by one union which seeks to dominate the broadcast industry. NABET has proven in court in California and New York that *these charges are not true.* Through the untiring efforts of NABET'S officers, many of them unpaid, and the steadfast loyalty of a great majority of the members of NABET, NABET has been able to withstand these vicious and selfish onslaughts and has in every case come out stronger. Another thing to remember is that NABET makes no promises of outside help that it cannot or will not keep.

Another reason for NABET'S success has been the outstanding work of the law firm headed by Martin F. O'Donoghue and his associate, Thomas X. Dunn. They are among the leading labor lawyers of this country and are hard-working, clear-thinking and honest. In 1944 and 1945 they steered NABET to a successful conclusion of the NBC-ABC (Blue Network) contract violation (also known as the Petrillo turntable case). In 1945 as legal counsel for the Brewers Union, they defied the autocratic commands of the AFL and the notorious teamsters union. The AFL demanded that the Brewers Union turn over to the teamsters union a portion of the work being performed by members of the Brewers Union. Under advice from their able counsel, the Brewers Union withdrew from AFL and is now an independent union. Such are the men in whom the members of NABET have placed their trust. All broadcast technicians belong in one union and NABET'S record proves that NABET is that union. To summarize:—

1. NABET has an organization devoted to your interests exclusively.
2. NABET representatives have first hand knowledge of your problems.
3. NABET'S dealings have always been honest and fair. Fair with its members and employers and with other unions.
4. NABET devotes its entire energies to the problems of the Broadcast Technician and constantly watches employer groups who would frustrate the efforts of the Broadcast Technician to better himself.
5. NABET sees to it that the National Labor Relations Act is strictly enforced in its application to the Broadcast Engineer.
6. NABET'S power to bring economic pressure after all compromise has failed is already great and promises to be further enhanced by co-operation between NABET and other independent groups.
7. NABET, through its democratic organization, truly represents its members and prevents control and exploitation by undesirable persons or groups.
8. NABET, contrary to rumors started by unscrupulous people, is not dominated by any company, and has never made an agreement with any company to take a portion or all of the Broadcast Engineer's job from him.
9. NABET has expert and honest legal counsel.
10. NABET'S record of accomplishment is public proof that you belong in this union.

Video Amplifiers

Some Basic Considerations

By J. H. Platz*

IN THE first of this series, certain basic considerations regarding the use of resistance-coupled amplifiers at audio frequencies were considered. Noted particularly were increasing phase shift and reduced gain at the upper and lower limits of the audio frequency range. Thus far, discussion has been concerned with frequencies from about 100 cycles to around 15,000 cycles. This discussion will take up some of the special considerations in amplifiers to be used for frequencies from 20 cycles to 4 or 5 megacycles. Such amplifiers are used in television, and from that use, they have come to be known as "video amplifiers."

In video amplifiers used for television, wide-range oscillographs, and certain other devices, it is necessary to provide constant gain over the entire range and in addition phase shift must be held within close limits. An amplifier to be used for television signals must be able to reproduce complex wave shapes which are actually made up of a number of frequencies. In order to amplify such signals faithfully the gain must not only be constant over the entire range of component frequencies but furthermore the component frequencies must retain their original phase relationship. Putting it differently, the delay time must be the same for all frequencies. Since phase shift is normally measured in degrees or fractions of a cycle, it will be seen that the actual delay in time will not be equal at all frequencies if the phase shift is identical at all frequencies. This is true because a given number of degrees at a low frequency represents a much longer actual time than the same number of degrees at a higher frequency. For instance, one cycle of a 1,000 cycle signal lasts 1,000 microseconds. A delay of 10 microseconds would be a phase shift of 3.6 degrees at 1,000 cycles. At a frequency of 10,000 cycles, however, each cycle lasts only 100 microseconds and a delay of 10 microseconds would be a phase shift of 36 degrees. On the other hand the same 10 microsecond delay in a 100 cycle signal would represent a phase shift of only 0.36 degree. Thus it will be seen that to provide constant delay

at all frequencies it is necessary that the phase shift in degrees increase directly in proportion to the frequency.

GAIN DETERMINATION

In the previous discussion the fundamental formula for gain at the mid-frequencies was given as:

$$A = gm R_{par}$$

when R_{par} is the parallel combination of the plate resistance of the tube, the plate load resistance, and the grid coupling resistance. In other words, the gain is the product of the mutual conductance and the net plate load impedance.

Video amplifiers are normally operated with a plate load resistance of the order of 1,000 to 5,000 ohms. Determination of the exact value of the plate load resistance will be taken up in a subsequent paragraph. The tubes used in video amplifiers have very high plate resistance, the actual values being in the range above 0.5 megohm. Likewise, in order to prevent loss of gain at the low frequencies the grid coupling resistor is kept at a high value which will be in the vicinity of 0.5 megohm. It will be seen that when plate resistance and grid coupling resistance are so very great with respect to the plate load resistance, the net value of R_{par} will be essentially the value of the plate load resistance itself. For the purpose of the above gain formula the plate resistance and grid coupling resistance can be disregarded in the calculation of the value of load impedance placed in the plate circuit. If arrangements can be made for this plate load impedance to remain constant at a relatively low figure over the entire range of operating frequencies, the result should be an amplifier stage having constant gain over that range. The following paragraphs will show one method of accomplishing this desired result.

CALCULATION OF LOAD RESISTANCE FOR TOP FREQUENCY

The effect of parallel capacities in reducing gain at the high frequencies has previously been mentioned. This effect becomes more pronounced as the reactance of the parallel capacity becomes equal to or less than the value of

the plate load resistance R_l . Conversely, if the value of R_l is decreased, the frequency at which the reactance of the parallel capacity equals the value of the plate load resistance will be increased. That is, in fact, the first step in increasing the frequency range of a resistance-coupled amplifier. Since decreasing the value of R_l also decreases the gain of the stage it is important that the reduction of R_l be carried no further than necessary. It has been found that if R_l is set at a resistance value equal to the capacitive reactance of the parallel capacities at the top frequency the amplifier can then be compensated for essentially "flat" amplification up to the top frequency. When this condition exists ($R_l = X_c$ at top frequency) the net plate load impedance is the parallel vector sum of the coupling resistor R_l and the capacitive reactance. The net impedance value at the top frequency will be .707 times the value of the plate load resistor. This can be verified by solving for Z_t when

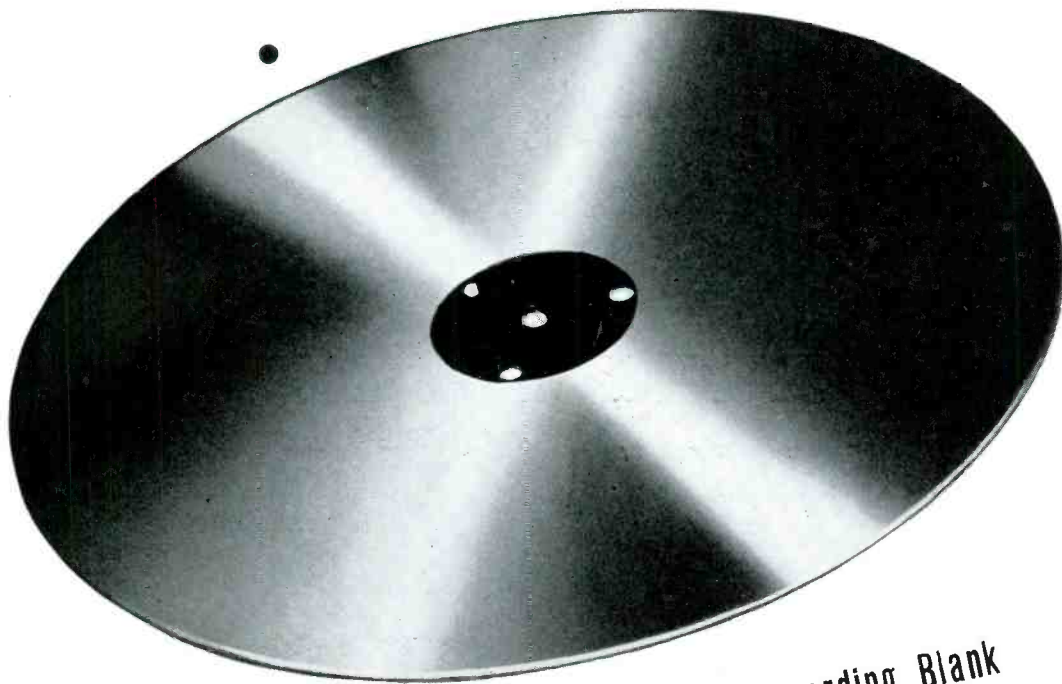
$$Z_t = Z_1 Z_2 / Z_1 + Z_2$$

Z_1 being the plate load resistance containing no reactive element, and Z_2 being the capacitive reactance which contains no resistive component.

In order to carry out this procedure it is necessary to know the value of the shunting capacities quite accurately. Direct measurement or calculation of this total capacity is quite difficult. In addition to the plate-cathode capacity of the first tube, the grid-cathode capacity of the second tube and the capacity of coupling condenser and other component parts to ground there is an additional capacity which can not be easily calculated or measured by ordinary means. This additional capacity is the control grid to plate capacity of the second tube multiplied by one plus the gain of the second tube. Since the grid and plate signal voltages are 180 degrees out of phase and since the AC plate voltage is many times the AC grid voltage, current flow through this small capacity can become appreciable. In tubes designed for video amplification the control grid to plate capacity is very low and the stage gain is relatively low so that this particular capacitive

(Continued on Page Six)

* Control Supervisor, NBC, Chicago.



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Video Amplifiers (Continued from Page Four)

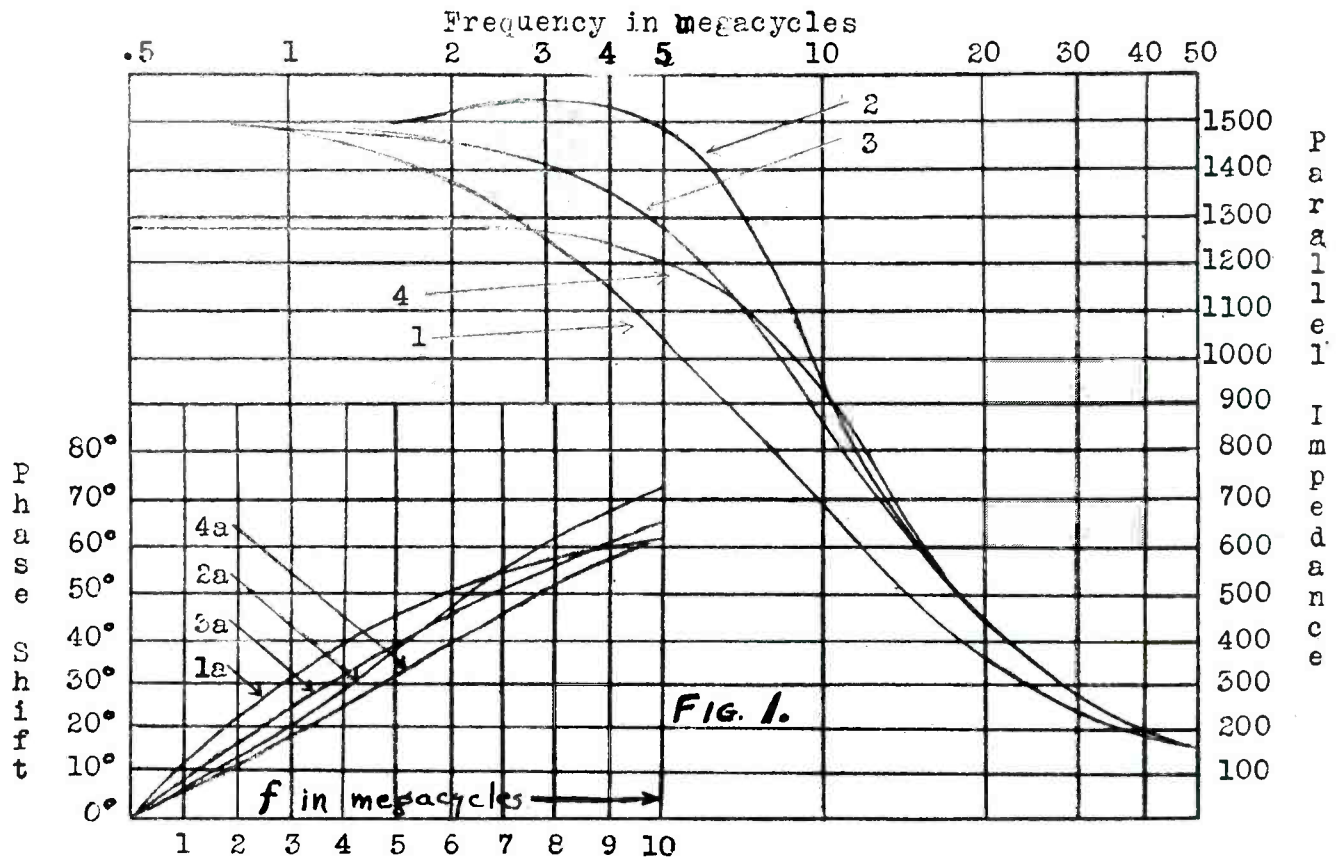


Figure 1, showing variation of load impedance vs. frequency and (inset) variation of phase shift vs. frequency for various plate circuit component values.

effect will still be quite low. For example, a video stage using a 6AC7 tube and showing a voltage gain of 20 would have an effective shunting capacity from this source of 0.015 mmfd multiplied by 20 or a total of 0.315 mmfd. This, of course, is in addition to the normal control grid to cathode shunting capacity. In normal tubes with less perfect shielding the shunting effect from this source would be more noticeable.

Instead of attempting to determine the effective total shunting capacity by direct means, an indirect method is used, the accuracy of which depends only on the care with which some simple measurements are taken. This indirect method makes use of the reduction of gain by 29.3% (3DB) which takes place when the capacitive reactance of the shunting capacity drops to a value equal to the load resistance.

To do this, the amplifier is set up with a temporary plate coupling resistor of around 2,500 to 5,000 ohms. First the voltage gain of the amplifier is measured by whatever accurate

means are available at some relatively low frequency, say 10 KC. Then the input frequency is increased and the gain measured, continuing this process until a frequency is found at which the voltage gain drops to 70.7% of the gain at 10 KC. When this condition is obtained, it is known that at this frequency $X_c = R_l$. The value of C is then $1/6.28 fR$. Knowing the value of C, the value of X_c can be calculated for the desired top frequency and the plate load resistance R_l is made equal to X_c at the top frequency. The voltage gain of the amplifier at the top frequency will then be 3DB or 29.3% below mid-frequency gain.

CALCULATION OF COMPENSATING INDUCTANCE

At this stage the amplifier under consideration will have a voltage gain at the top frequency that is 70.7% of the mid-frequency gain by reason of its net plate load impedance at the top frequency being 70.7% of the plate load impedance at mid-frequencies. The variation of gain with frequency is as shown by Curve No. 1 of Figure 1. At the same time a rather serious phase

shift condition will exist. As shown by Curve No. 1a of Figure 1, the phase shift will definitely not vary linearly with frequency. The problem now is to straighten out the phase shift and increase the plate load impedance at the high frequencies.

It will be remembered that the impedance of a parallel resonant circuit increases as resonance is approached. In a high-Q resonant circuit (i.e., a resonant circuit having low resistance) the peak value of impedance is very high and the curve of impedance vs. frequency shows the peak to be very sharp such as Curve No. 1 of Figure 2. If resistance in the circuit is increased moderately the curve will be considerably broader and will not approach the peak of curve No. 1. A further increase of resistance will decrease the peak still further and the variation of impedance with frequency will be still more gradual. See Curves No. 2 and No. 3 of Figure 2.

It would appear that the high frequency gain of a resistance-coupled amplifier could be increased by insertion of a parallel resonant circuit—resonant

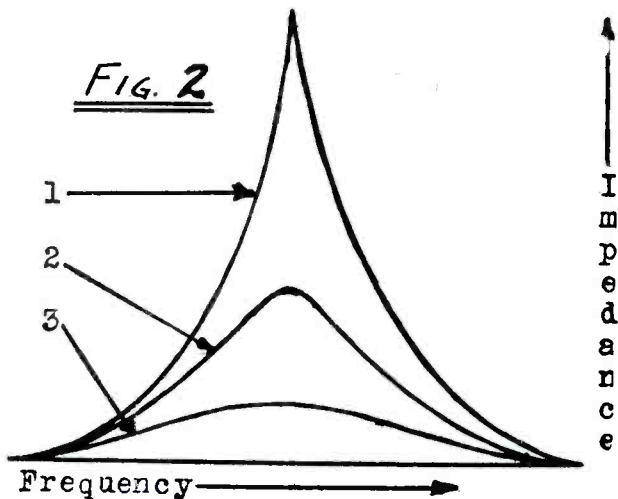


Figure 2. Variation of parallel impedance with resistance.

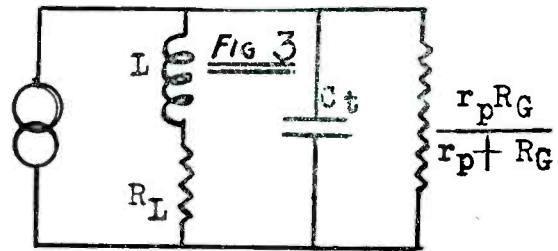


Figure 3. Equivalent circuit of compensated amplifier stage.

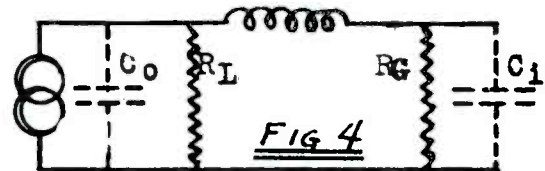


Figure 4. Equivalent circuit of series-compensated amplifier stage.

at the top frequency—in the plate circuit. This is, in effect, what is actually done except that resonance of the parallel resonant circuit is set at a frequency somewhat greater than the top frequency which it is desired to amplify. While it would be possible to insert a separate LC circuit in series with the load resistor, it is not necessary to do so. In practice, the parallel capacities existing in the plate circuit are used as the capacity for the tuned circuit. It is then merely necessary to insert an inductance of the proper value. The equivalent circuit is then that of Figure 3. The condenser C_t indicates the total parallel capacities existing in the plate circuit, the load resistor is R_L and the inserted inductance is shown as L . The grid coupling resistance and the plate resistance of the first tube can no longer be considered as being in parallel with R_L and the combination is shown separately. However, as mentioned before, they are both very large resistances and can be disregarded in calculation of the net parallel impedance.

There is a certain amount of judgment involved in arriving at the proper value for inductance L . If uniform gain is the only requirement it will be found that the proper inductance will be such that $X_L = .5 X_{C_t}$ at the top frequency to be amplified. The variation of plate load impedance with frequency is then as shown by Curve No. 2, Figure 1. A slight increase of impedance in the range from 1.7 to 4.9 megacycles is not serious, the maximum value of 1,545 ohms—an increase of 3% or about 0.3 DB—being obtained at 3

megacycles. Thus the gain will be substantially constant from mid-frequency up to the top frequency, in this case 5 megacycles. Examination will show that conditions of phase shift have been materially improved. Curve 2a of Figure 1 shows a variation of phase shift that more nearly approaches linearity although not perfect. Perfect balance between uniform gain and linear phase shift is not very practical in simple two-terminal networks but the conditions of Curves No. 2 and 2a can be improved somewhat—at the cost of either lower overall gain or considerable loss of gain at the high frequency end. Curves No. 3 and 3a show the variation of gain and phase shift when $X_L = .3 X_{C_t}$ at the top frequency. Considerable loss of gain is noted at the top frequency but phase shift conditions have been still further improved. About the ultimate in two-terminal filter performance is shown in Curves No. 4 and 4a which show results obtained with $R_L = .85 X_{C_t}$ and $X_L = .3 X_{C_t}$, where all measurements are taken at the top frequency. In this case the overall gain is reduced by 15% but varies only slightly more than 2% from the mid-frequency value and in addition the variation of phase shift is essentially linear with frequency.

The simple "shunt" method of high frequency compensation outlined thus far is somewhat limited in application if a relatively large overall gain is necessary or if uniform gain and linear phase shift are required over a wide band. The shunt method is quite practical for receivers where relatively low overall gain is required but in studio-

control room-transmitter application the additive effects of a large number of shunt compensated stages could well be disastrous. Other—but more complex—methods of compensation are in use for wide band amplification and through their use appreciably greater gain per stage is realized. At the same time, conditions of phase shift are also somewhat improved over the condition of Curve No. 2a of Figure 1. If—for example—the overall gain of a stage could be doubled with identical deficiencies in phase shift and gain, the additive effect of these individual stages built up to a required overall gain would be cut in half. If, in addition to increasing the gain we could also improve flatness of frequency response and/or phase shift characteristics, there would be further reduction of the additive effect from a number of stages. Actually, an increase in gain of about 80% is about the maximum that can be realized from more complex circuits but it is accompanied by flatter response and (in some cases) improved phase shift characteristics. The advantages of such improvement are obvious.

One of the improved methods of high frequency compensation—known as "series" compensation—is accomplished by inserting an inductance in series with the coupling condenser instead of in series with the load resistor. In so doing, the parallel capacities which were previously lumped into one unit are split into two separate condensers, C_o (Output capacity of the input tube) and C_i (Input capacity of the output tube). Since C_o —which is in parallel with R_L —is obviously less

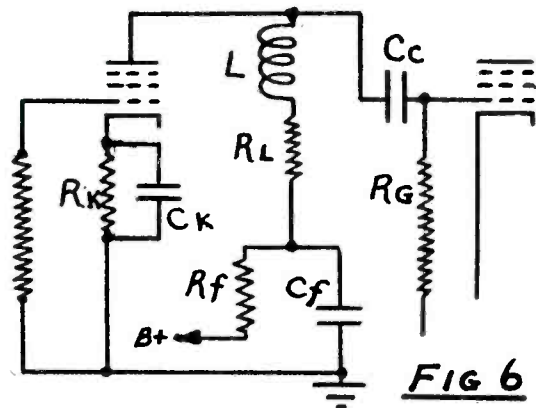
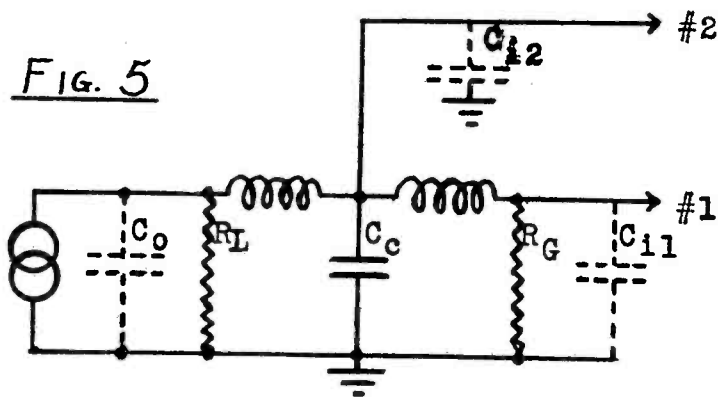


Figure 5. Two-section series compensation feeding multiple inputs. Figure 6. Video stage with shunt compensation at high frequencies and RC compensation at low frequencies.

than the capacity of C_0 and C_i in parallel, it follows that a somewhat larger load resistor can be used with consequent increase in gain. The equivalent circuit is shown in Figure 4 and will be recognized as a low-pass single section pi network. For proper operation C_0 must be approximately twice the capacity of C_i and if this condition is not met by the inherent capacities in the circuit it is necessary to add lumped capacity. In so doing, it may be necessary to reduce the load resistance somewhat, thus losing some of the advantages of this circuit. On the other hand, it is possible to feed the output of a single stage to several separate inputs without detrimental shunting effects that might be expected from simpler arrangements. To do this, two or more pi sections are connected in cascade (See Figure 5). The capacity C_c between sections is larger than C_0 or C_i and a relatively large shunting capacity for the second input (C_{i2}) can still be accepted as a part of C_c . A typical use of this arrangement might be in television receivers with Input No. 1 being applied to a video amplifier and Input No. 2 to synchronizing circuits.

Series compensation can be accomplished with a gain approximately 50% greater than shunt compensation and with about one-half the variation from linear phase shift. A combination of series and shunt compensation will give an 80% increase in gain over the simple shunt compensation but is no better than simple series compensation from the standpoint of phase shift. Readers interested in more detailed discussion of two, three and four terminal filters for high frequency compensation are referred to Terman's "Radio Engineers' Handbook" and Fink's "Principles of Television Engineering."

COMPENSATING RC NETWORK FOR LOW FREQUENCIES

There are four basic sources of low frequency distortion. They are—in approximate order of importance—(1) The grid-condenser-grid-resistor coupling network, (2) Cathode resistor and associated bypass condenser, (3) Screen grid dropping resistor and bypass condenser, (4) Output impedance of power supply. These will be taken up in order of ease of correction.

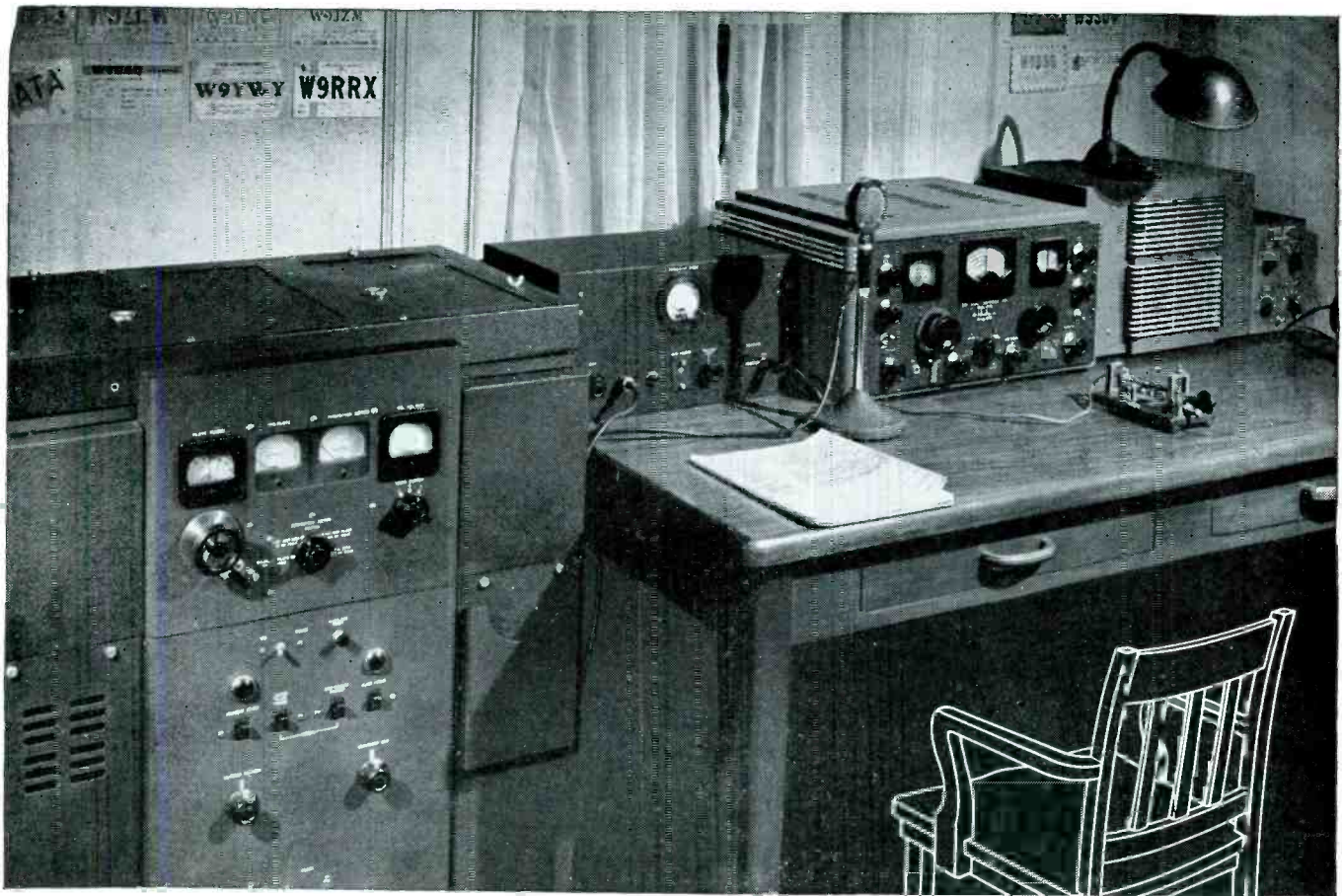
The output impedance of ordinary power supply units is essentially the reactance of the output filter condenser. This condenser must be very large in order to present a reactance at low frequencies that is negligible in comparison to the plate circuit load impedance. Any appreciable amount of impedance across the output terminals of the power supply will cause serious degenerative effects if the same power supply output terminal is used for more than one stage. The degeneration will become increasingly serious as frequency is reduced. The only practical solution is the use of electronic voltage regulators and this practice is almost universal.

The screen grid circuit presents no serious problem. In general it is safe to say that no appreciable low frequency distortion will develop at this point if the screen grid bypass condenser is made sufficiently large. A practical value is in the vicinity of 8 mfd which is a standard electrolytic value. However, one precaution must be taken when such condensers are used for screen grid bypassing in a wide-band amplifier. Large values of capacity generally have sufficient internal inductance to render them useless as bypass units for high frequency considerations. For that reason it is

wise to parallel a .01 mica unit across the high capacity required for screen grid bypass at the low frequencies. This in turn has occasionally led to another difficulty, namely resonance between the mica condenser and the inductance of the high capacity unit. A pronounced drop in gain over a relatively narrow band in the higher frequency range is an indication of this undesired resonance and can be quickly checked by substituting a different value of mica bypass. If the drop in gain moves to another frequency range, its a fairly safe assumption that this type of resonance is present and a different high-capacity bypass unit should be installed.

The cathode resistor-bypass condenser is a more serious source of low frequency distortion but the problems can be met in a number of ways. If the bypass condenser is removed, distortion from this source will be eliminated, but the overall gain is reduced due to negative feedback. Unless the cathode resistor is bypassed by a very large condenser there will still be some impedance present at the lowest frequencies and consequent negative feedback with reduction of gain at those frequencies. Under some circumstances it is possible to merely ground the cathode directly and operate the stage without bias but obviously this arrangement can be used only at very low level of input signal. Somewhat higher levels of input signal could be handled by inserting a relatively low value of cathode resistor without bypass. This is a compromise which will permit operation without low-frequency distortion from the cathode circuit but which is useful over a limited signal level and at some loss in overall gain. Another method which has not—for some reason—met

(Continued on Page Twenty-four)



Pull up a chair!

Get a ringside seat at the ideal ham shack of tomorrow. The above picture was made at Hallicrafters Ham Shack on the Boulevard, in Chicago. But no picture can represent, no artist can paint what Hallicrafters has in store for the amateurs when the demands of war production are relaxed. Rugged, dependable, sensitive high frequency transmitters and receivers — like the HT-4 which went to war as the famous mobile radio station SCR-299 and the SX-28A, the great communications receiver — belong in the postwar picture of your ideal ham shack. Hallicrafters

equipment has been constantly refined and developed under the fire of war. In peace it will come closer than ever to meeting the exacting requirements of the radio amateur who has played such a prominent part in the progress of all radio and who assumed such a valuable role in war communications.

Even now you can "pull up a chair" in your ideal ham shack by sending for Hallicrafters 1945 Catalog . . . a fascinating piece of ham literature . . . detailed specifications on more than 20 models that are helping to win the radio war. Specify Catalog S-36A.

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BRITISH RADAR

By
Jordan McQuay

Technical aspects of Radar, the Science of Radiolocation, were discussed in the July, 1945, issue of the **BROADCAST ENGINEERS' JOURNAL**.

RADAR's first and greatest triumph, which history has yet to evaluate fully, was in the Battle of Britain—during the darkest days of 1940. Without the secret but extensive operational radar system which was then in use in Britain, the mass attacks of the German Luftwaffe would have gone unchecked. Radar alone made it possible for the RAF to dispense with wasteful standing patrols, and to intercept the enemy at the right time and place.

Not even the British public knew of the existence of the radar "chain" which linked and protected the coastline of England.

But the Battle of Britain was only the beginning of the history of radar.

Other stations were erected to guard the sea approaches to the British Isles—and to Europe. Not a ship or plane could move within a hundred miles of England without being detected immediately.

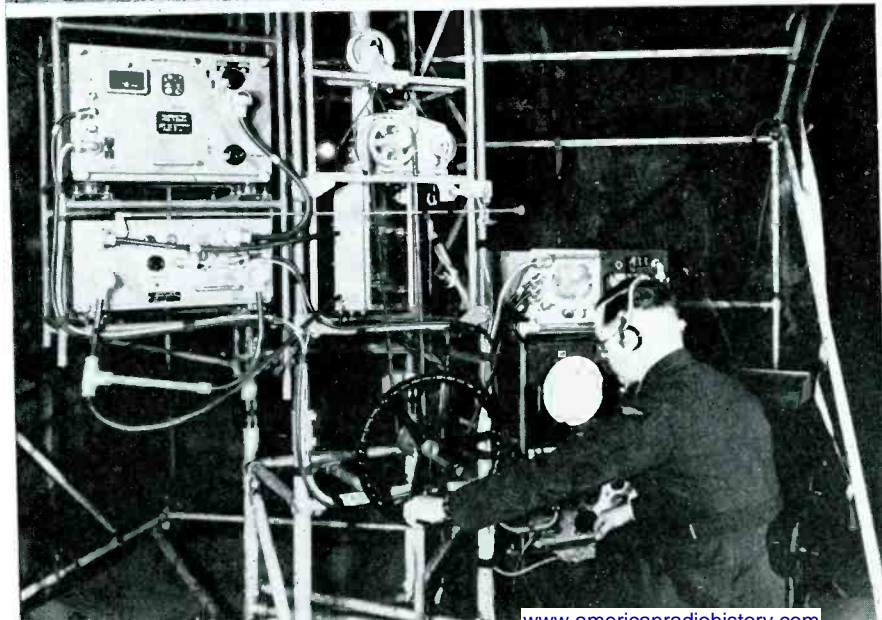
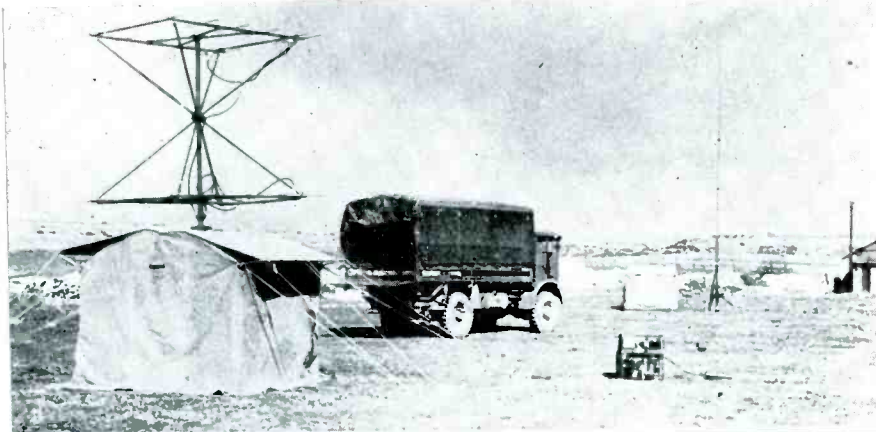
Then came further developments and improvements.

Added equipment made it possible for many reporting stations to determine the height of aircraft—with an accuracy of less than half of one percent.

A remarkable series of devices were designed to make friendly aircraft continuously exhibit a difference from enemy aircraft in their echo responses. This was done by causing coded altera-

RADAR ON THE DEFENSIVE

Exterior and interior view of a British Light Warning radar set. The equipment is of low power, but is highly mobile. With operating personnel the equipment can be transported in one three-ton truck, and the set can become operational within two hours of arrival on its site. The aerial system consists of four Yagi arrays, each composed of a full-wave folded dipole with a single reflector and four directors. This is one of the smallest types of radar equipment.



Sir Robert A. Watson-Watt, C.B., British scientist responsible for much of the early development of radar. His discoveries and inventions made it possible for Britain to have a working system of radar protection as early as 1938—in readiness for World War II. Later, when British radar proved itself in the Battle of Britain, Sir Watson-Watt came to America to advise Army and Air Force chiefs on the principles and operation of the new science: radio-location, or radar.

tions of returning echoes and was known as IFF equipment (Identification, Friend or Foe).

The problem of detecting low-flying aircraft was surmounted by the design and development of u-h-f equipment generating many kilowatts of high frequency energy at 200 megacycles—an electronic achievement.

Cathode ray tubes underwent improvements, as did all components of the radar sets—making the British equipment the greatest development of all times.

The technique was applied to anti-aircraft and coastal artillery, enabling precision gunnery in all types of weather. And radar was used to direct powerful searchlights.

Then radar became airborne—and an offensive weapon.

Installed in RAF fighter planes, a complete miniature radar set could seek out enemy planes at night or in heavy weather. Other types of radar sets were installed in medium and heavy bombers to identify contours of specified ground targets—permitting great accuracy in night bombings of enemy territory.

Fighter planes were often directed to specified areas where enemy planes were known to be flying, and direction was again accomplished by radar—large sets capable of operating over long ranges.

Radar was used to detect submarines

from moving airplanes, and was used to indicate the precise altitude of a plane above the earth's surface.

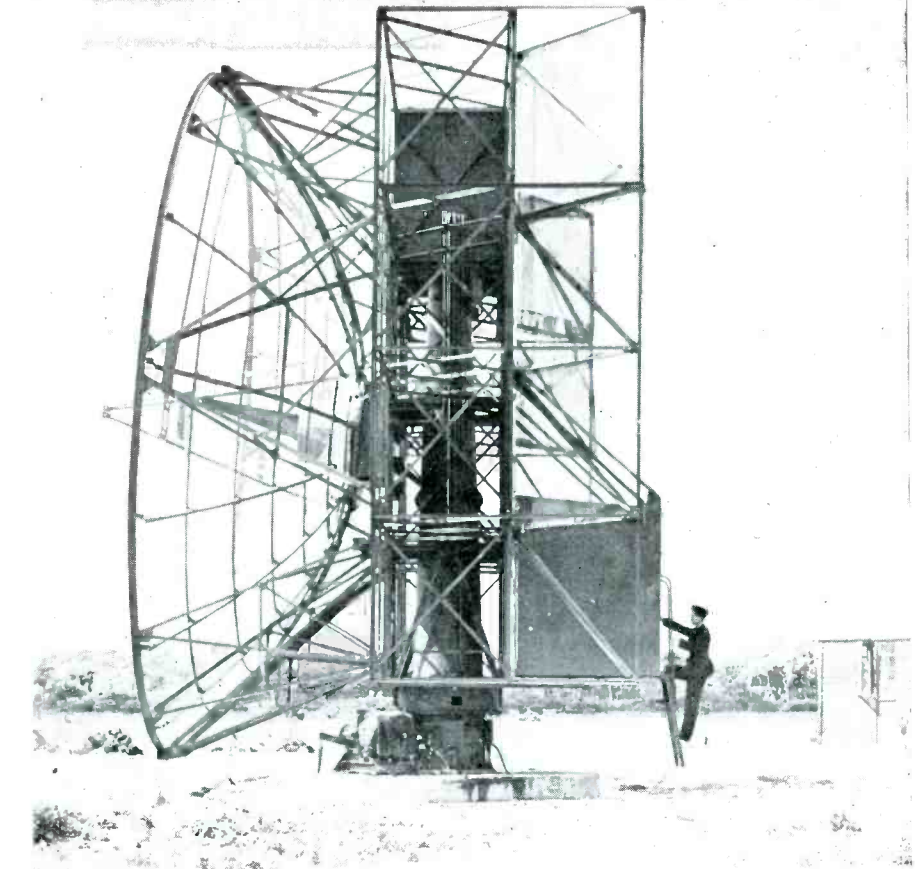
At sea, in the air, even on land: navigation was made possible by radar with an accuracy which made the finest achievements in stellar navigation seem grossly inaccurate by comparison.

After the United States entered the war, there was a pooling of all radar patents, inventions, discoveries. Considerable experimental work had been accomplished on this side of the Atlantic, but much of the early development of radar was done by British scientists and physicists—notably Sir Robert A. Watson-Watt.

Under the stimulus of war, the United States quickly built up a research organization and manufacturing facilities far larger than Britain's. It would be profitless to examine the claims of any one country to having originated this or that piece of radar technique or equipment. In time of war and in the face of the paramount need to produce urgently needed equipment for operations against the enemy, no one country could hope to develop all the numerous devices of radar simultaneously and at the same speed.

Wartime security measures—still in effect—do not permit the publication or illustration of American radar sets—the counterparts of those shown on these pages.

The major contribution of the United States to the Allied cause in the field of



RADAR ON THE OFFENSIVE

Exterior view of a Fighter Direction Radar Set—used by the British to guide long-range fighters over enemy territory. One of the largest types of Allied radar equipment, all technical components of the set are mounted on a single, large, rotating structure—including the antenna, transmitter, receiver, and operating room. The antenna system consists of a thirty-foot diameter parabolic reflector for greater discrimination and accuracy. Purpose of this type of radar station was to give RAF fighter planes tactical advantage over the enemy when employed on long-range, night-time, offensive operation.

radar, however, was our ready acceptance of the burden of quantity production. When the story can be told, our

achievements in this difficult task will be found to rival even our records in other spheres of production.

Tommy Cox Returns to Cleveland

TOMMY COX was an average citizen at 11 A. M. on January 5, 1943. He wasn't five minutes later; The War Department in Washington, D. C., gave the picture a different slant. Tommy, who at that time bivouacked in WTAM's Control Room F, received a telegram which advised him to regard himself as Captain T. C. Cox. In addition to this information, he was ordered to report in at San Francisco on the 7th of January. That gave him two days to get from Cleveland to San Francisco.

To say he got there on the 7th would be an insult to the Army. Tom began a tour of the West Coast Army Air Fields on the 8th. This tour consumed three weeks in a hurry . . . Tom says it seemed more like three days.

He then boarded a plane which lost no time in pointing its propellers toward Brisbane, Australia. Refueling stops were made at Hawaii, Canton Island, The Fig's and New Caledonia. Tom arrived in Brisbane, Australia, in less than a month from the time he left WTAM.

Tom's first assignment was a construction job near Brisbane. The put up a 40 KW.

Transmitter which was soon lovingly called "The 40 K. W. Outfit." He remained with "the 40 KW." till November of 1943 at



Ex-Capt. Cecil Bidlack gives the low-down to Capt. Tom Cox who just recently returned to Cleveland from Manila. Cecil Bidlack returned to WTAM in November, 1944, after seeing duty in Panama, North Africa and India.

which time he began a barnstorming tour which took him to Lae, New Guinea, where he remained till March, 1944 . . . the last two months being spent in a hospital.

Tom then went back to the "40 K. W. Outfit" in Brisbane where he remained till December, 1944. His next tour of duty took him to Hollandia, Dutch New Guinea. In March, 1945, he was transferred to Manila where he remained till July of this year. Tom says he enjoyed the next trip most of all . . . That trip took him from Manila to his wife and home here in Cleveland. Incidentally, Tom arrived in Cleveland on August 14th, which was the day the Japs decided they'd had enough.

Tom has a warm spot in his heart for the people between Cleveland and the West Coast. He came in from the coast on a hospital train and the good people along the way literally showered them with home-cooked food . . . which included fried chicken! That happened every time the train stopped. Tom says there'll always be a warm spot in his heart for those kind folks.

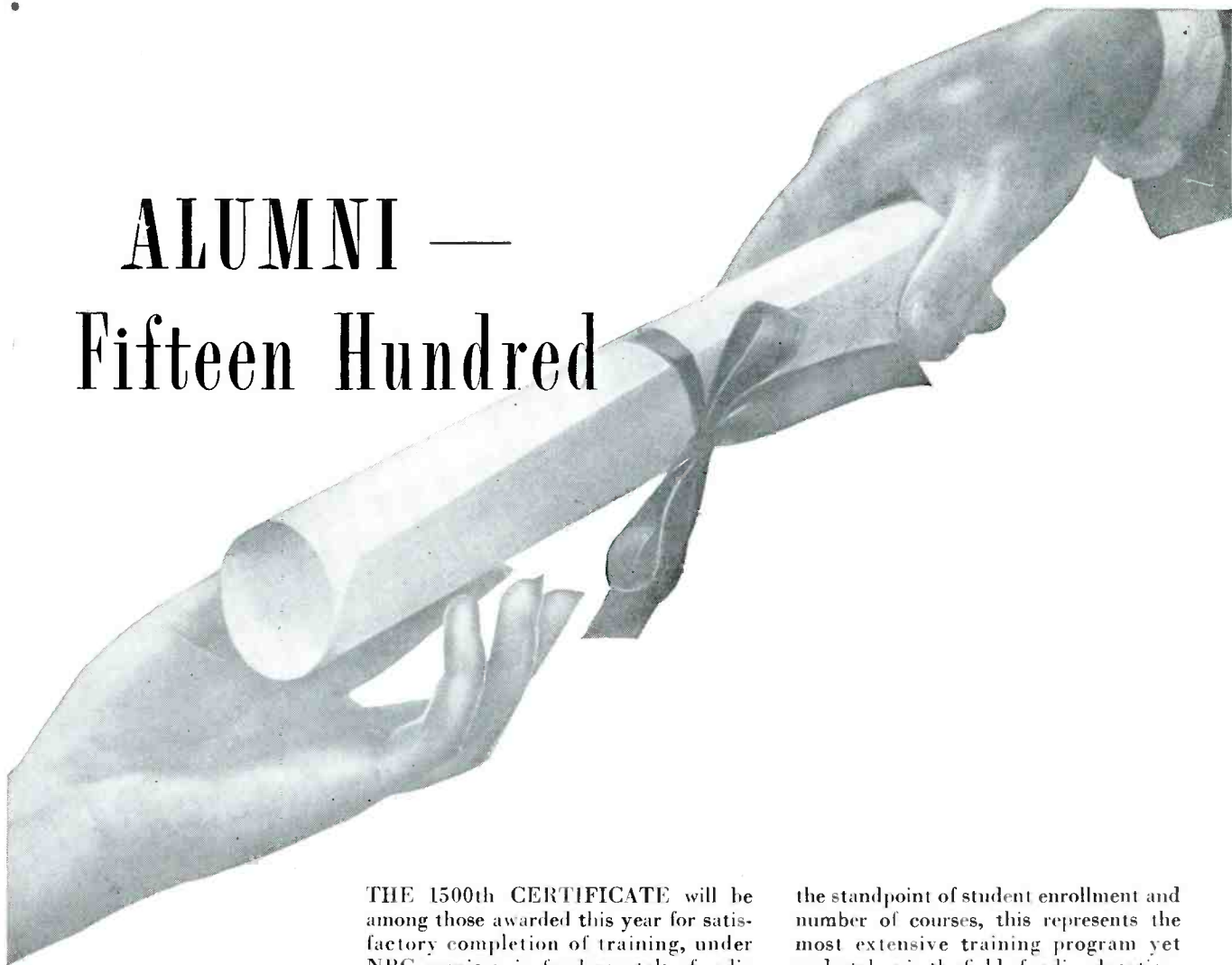
Eddie Leonard first signed Tom to the WTAM payrolls during the summer of 1929. You can see that Tom isn't what you'd call a stranger in our studios.

So, we say to Tom:

"WELCOME HOME!"

The Gang.

ALUMNI — Fifteen Hundred



THE 1500th CERTIFICATE will be among those awarded this year for satisfactory completion of training, under NBC auspices, in fundamentals of radio broadcasting procedure.

In the early months of 1942, war needs were draining trained personnel from radio faster than replacements could be found. Counter-measures were needed—urgently and quickly.

From that emergency came the NBC-Northwestern University Summer Radio Institute—an academically accredited organization offering intensive, practical training by experts under actual operating conditions. The Institute was supplemented in the following year by similar establishments with the co-operation of the University of California at Los Angeles and of Stanford University. And building further upon these successful foundations, NBC last winter joined with Columbia University to present accredited courses in practical radio subjects during the regular academic year. From

the standpoint of student enrollment and number of courses, this represents the most extensive training program yet undertaken in the field of radio education.

These four institutions will again have capacity enrollments for 1945. Selected for aptitude, experience, and the abilities to absorb and apply their training, students will receive instruction from NBC staff members and university faculties in continuity and dramatic writing . . . announcing . . . program planning and production . . . radio teaching . . . news editing and writing . . . utilization . . . control room operation . . . sales techniques . . . radio history and survey . . . music for radio.



Here again are examples of NBC's leadership in service . . . service to the radio industry, to sponsors, to listeners . . . and to education . . . a continuing service that helps maintain NBC's position as America's No. 1 Network.



A Service of Radio
Corporation of America

National Broadcasting Company

America's No. 1 Network

1945—RADIO'S 25th ANNIVERSARY—PLEGGED TO VICTORY!

CHICAGO ~ Corn from a Cob Reporter

By K. A. Slobb

HERE we are again. In the meantime, V-J Day has come and gone. You'd be surprised at the military language that was used on V-J Day in the Chicago Control Room. Such expressions as SNAFU, TARFU, and FUBAR were the order of the day. You'll have to ask a Navy man or a Marine about those expressions if you don't already know what they mean.

I wonder if you felt like a big load was lifted off your chest when V-J Day was announced by President Truman? I did, and others remarked about the same feeling. If you and I felt like that, the feeling of the boys in the combat zones must have been something akin to ecstasy. We'll never know that feeling, though, and they'll never be able to describe it to our satisfaction.

I'll start right off with the news by welcoming a new NBC Studio-Field engineer to Chicago. He is Alvin Johnson. Al is married, has a young son nineteen months old named Jimmy. His home is New Hampton, Iowa. He comes to us directly from a three-year stand at KBIZ, Ottumwa, Iowa, where he was Chief for the past two years. Before that he was with KHMO, Hannibal, Missouri; WHBY, Appleton, Wisconsin; WTAQ, Green Bay, Wisconsin; and WKBH, La-Crosse, Wisconsin. He is a ham W9REZ.

Frank Schnepfer is our Chairman here in Chicago now. Frank got 59 votes in the election held recently, with Balsley polling 16, Aldred 1 and Void 2. Who is this guy, Void? Never met him, I guess.

Along the same line, Vern Mills leaves Control to take over Bev Fredendall's old job as Transmission Engineer, and Minor Wilson leaves Recording to go into Master Control in Mills' place. Al Scarlett is taking Minor's place in Recording, but Al doesn't get any more money like the others, so I don't know why I mention it. Who wants more money? Me, daddy!

The boys at the WENR-WLS transmitter are busy these days. Short of help, they're working six days a week on a sort of rotating schedule, so that each man doesn't have to work six days every week. Also understand that R. W. Cory left the gang about a month ago to take a job with the Raytheon Company doing high frequency development work here in Chicago. Andy Forgach tells me that two of the transmitter group who went into the Navy, Lt. Art Johnson and Lt. "Thur" Bombaugh, have both asked for discharges and may be back soon.

Did I tell you about the M.D. who had a contest and gave a free appendectomy to the person who would select the best name for his resort home? The guy who won the contest picked the name . . . Bedside Manor.

Bill Knight, that gent who missed the bus because of transfer trouble, has bought a new home out in Crystal Lake.

Hams are back on the air on 112 MC as you well know. Talked to Charley Corliss, W9CTN, the other night, and he said he worked seven fellows in one hour, so rag-chewing must be flourishing again. When the other bands are opened up I'll get ambitious and make a list of the hams here in the Chicago Chapter. As far as I know, W9CTN is the only one around the Mart who has a

rig on 112 MC, but wait till 40, 20, 10, and that new 21 MC band open up. QRM. I hear you calling, and it doesn't sound like Chloe.

For the record, I want to tell you about Everett Janiss, who was stock-room clerk for NBC here. Everett didn't belong to NABET, but he tried his best to get a job with NBC as an engineer. He didn't make the grade. So now Janiss has left NBC, and has a fine job as buyer for Lear, Inc., of Grand Rapids, Michigan. I don't know whether Everett Janiss had the proper experience for a job as engineer with NBC or not. That isn't the point, and I'm NOT trying to tell anyone how to run their jobs. But I draw a conclusion from Janiss leaving, and from other fellows who have left NBC or ABC and gone to better paid, more responsible jobs. The conclusion is this: You and I are human, and we don't like to be shoved around like chessmen on a board. We can take only so much before we break, and the break usually comes in the form of getting another job.

The danger I see for NBC, ABC and other networks is that eventually they will lose every senior engineer they have. Sounds funny, doesn't it, but I think it is to the Company's advantage to have experienced, capable men on their payroll. **THE ONLY WAY THE COMPANIES WILL KEEP THESE MEN FOR THIRTY OR FORTY YEARS IS TO PAY THEM WELL AND TREAT THEM WITH A DIGNITY COMMENSURATE TO THEIR RESPONSIBILITIES!** And for your information and Company executives I quote the word "dignity" from my Webster dictionary. Dignity: Elevation of rank; degree of excellence; moral worth; qualities suited to inspire or command respect and reverence.

Chicago Chapter threw a cocktail party for Bev Fredendall at Allegretti's Friday, August 31. You will find a picture of same in this column, since one picture is worth a thousand words. Good luck, Bev!

You want a dictionary lesson? It took me two hours to find these new words in the "C" section of the dictionary. Should only take you about five minutes to look them up. Or try this on your maintenance card the next time you have relay trouble. "During the—program, I noticed some crepitation in the loudspeaker. Realizing it might be a contumacious case of trouble, I drew upon my great cognition of radio until suddenly I saw a coruscation. Upon checking the studio relay, I found that it needed coaptation, due to lack of proper contiguity." (It will probably make Stolzy mad as blazes to have to look up these words to see that I didn't use a naughty one. As Ralph Edwards would put it, "Ain't we devils?")

Outing time is here again. The NBC Athletic Association had their Outing Tuesday, August 28, at the Medinah Country Club. Reliable sources say that Al Scarlett, in a coat as brilliant as his name, and Don Fitch were the Life of the Party. Dick Wehrheim was the only engineer to receive a golf prize, the nature of which was not disclosed. The ABC Athletic Association will have their Outing Thursday, September 6, at the Knollwood Country Club. More about that, and pictures, I hope, in next month's issue. Incidentally, I want to thank Art



(Top) This picture was taken just after Bev Fredendall was presented with a \$100 bond as a token of appreciation from the Chicago Chapter. Among those present are Rife, Keller, Schreyer, Donnelley, Davis, Cole, M. Wilson, Scarlett, Holm, Major Washburn, Maule, Fitch, Lutgens, Newbauer, Mulatz, Elkins, Daugherty, Whitnah and Mills. Pick 'em out.

(Center) Here are a few of the engineers at the NBC Outing. (Left to right) Bill Beeson, Vern Mills, Frank Golder, Don Fitch, Art Hjorth, Harry Maule, Lou Heiden and Ralph Davis.

(Bottom) This picture was taken at the NBC Outing. It is Lou Heiden again, surrounded by a bevy of four (count 'em) charming young ladies. The girls are unidentified.

Hjorth for staying up all night to print the pictures on these pages for my deadline.

NABET activity has been interesting lately, although spotty. We were interested, of course, in the activities of the National Council. I think Chicago was generally behind all their actions, although I did hear a few gripes which I have forgotten now.

(Continued on Page Eighteen)

New York NBC News

By G. F. Anderson, Jr.



This Is ABC New York

By Gil McDonald

Photo by Joe Conn

V-J HAS come, and now thru-out the world peace has come to the many Nations that were fighting for the right to a decent, peaceful and happy life. In behalf of the New York Chapter of the National Association of Broadcast Engineers, we thank deeply every member of NABET, their families and friends who have given their bit towards the life that is rightfully theirs. No one can say that it has been in vain and all I can say is a heartfelt "Thank God" and "Thank You" each and every one.

We had many plans for this issue, intending it to be one crammed full with news-gossip and chatter and now comes September fourth and it sees that all that has been gathered is a meager bit of stuff and fluff. That is the reason for this paragraph—to fill up the page.

Under the heading of Studio, we find that no longer will the NBC and ABC scheduling be done by the NBC Operations supervisor, Paul Gallant. ABC has started to schedule their engineers for their own shows and perhaps now an NBC Engineer will only be on NBC shows and ABC personnel on ABC shows.

From Bob Johnston we find that the weather in Sunny Florida lived up to its Chamber of Commerce and gave Bob a lovely three weeks of sun on the beaches of Daytona. While in Florida Bob journeyed to Silver Springs and shot several hundred feet of 8 MM Kodachrome, both under water and above. He captured for later enjoyment many lovely scenes. Me, I'm looking for some 8 MM film magazine loads any color for something to be revealed later.

Williard "Red" DuBois, as reported earlier, has been enjoying Shawnee on the Delaware, on weekends, and to correct a mistake made last month, he is not there for a Friday and Monday Broadcast but for a Monday and Tuesday Broadcast.

In regard to V-J activity—here is some of the Studio Doings.

John Pawlek was sent to Washington to assist in the hectic four days and was relieved by Herb Reidell.

Johnnie, as Hollywood now knows, has been transferred to the "So-Called" Land of the Perpetual Sunshine. He flew out in a Stratoliner and his family will follow later.

Here in NY we will depend on Mr. Norman Dewes to keep us informed as to Johnnie's welfare. Incidentally, he is a Right Guy.

George Mathes was at the Astor for the V-J doings in Times Square and Jan King, Ralph Bennett, Herb Riedel, and Dudley Connolly, all Studio, stood by in the field shop for a pickup at Kings Point, L. I., which never materialized.

From the Department of Enjoyable Trips—Field V-J saw these chappies engaged in the following:—WM-Walter Mullaney, The Sorcerer, was to and fro from Pawling for Lowell Thomas and also The RCA ROOF for the cue channel to the Mobile Unit. Chi Chi, Felix Ghirlando, was at Shawnee on the Delaware with Red DuBois. Harry, M'Boy, Alexander, was one of the chappies that went to Washington and stayed at the Main Gate of the White House. Harry wishes to thank Don Cooper and Bob Terrell of Washington for the excellent cooperation that was shown him. James, Jaimee, Hackett, was on vacation and so missed all the excitement and overtime. Your reporter was with the Mobile Unit from Friday till Wednesday A.M. and after four days of standby put a couple of shows on from around town. Harold Campbell, ABC Field, was on the RCA Roof from 7 A.M. Tuesday till 1:30 A.M. Wednesday and all communications to and from NBC and ABC and the Mobile Unit were capably handled by him.

NBC Field Supervisor, Max Jacobson, who is on his annual

AFTER five hectic days of V-J operation, the gang can take a bow on practically flawless work during very trying conditions due to last minute program changes, rumors, and the general tenseness of the sudden wind-up of the Asiatic war. We might as well pat ourselves on the back because, as usual, the engineers who did such a swell job, received none of the credit they usually deserve during all such operations.

"Ham" Radio again is in the spotlight following the Jap surrender. Many of the boys are firing up on the 112 Mc. band pending the opening up of the other bands. If enough get going on this band, we plan to setup a little communication net among ourselves. Next month we will publish the calls of all the ABC men who are hams.

John Bourcier is spending the summer out at Long Beach and is now a commuter on that stellar railroad, the Long Island. One day he was reading his paper and holding out his commutation ticket to be punched when a conductor approached from the rear and hollered out, "Hey Frenchy, don't you recognize a guy?" It turned out to be Walter Miller, one of our former co-workers.

Gil McDonald says this is the third time he has worked for a company called The American Broadcasting Company. WNEW used to be called by that name and it used to be a holding corporation connected with the Bulova interests at WOV.

Ed. Watkins who used to be a studio engineer for Blue here in N. Y. C. gave up his job in Georgia and has come back. It is reported he may go to work for NBC as a studio man.

"Doc" Dougherty is Sammy Kaye's favorite engineer (if Sammy Kaye has a favorite engineer). Psssst. Hey, Doc, don't touch them dials.

Fred Walworth is once again a familiar figure around ABC after spending several years traveling clean up and down the east coast from Maine to Florida, visiting every army camp on the way. He was engineer with the Spotlight Bands. Congrats on a swell job Freddy.

Harold Campbell is back in the big city again. He was up in Boston all season with the Boston Symphony. He says he is going to have his hair cut short for the summer.

The gang unites in expressing its sincere condolences to Norbert C. O'Leary on the death of his mother last month.

vacation from the cares of taming the expense accounts of his field men, has been seen in Hollywood, or so his Postal Cards would indicate. Jake, as he is called, flew by Stratoliner to the Coast early in August and should be back in NYC by the time this appears in print.

The New York Chapter held a General Meeting Saturday, September 1, and a farewell address was given by our retiring Chairman, Harry Hiller, who is resigning his position as Chapter Chairman to take a full time position with NABET as National Secretary and Treasurer. So to Harry we wish the best of everything and may NABET prosper fourfold under his capable assistance.

Oh yes, must not leave this out, Kathleene B. Anderson arrived today, September fourth, and is an eight-pound, twelve-ounce young lady. Her mother, Gladys, is very pleased and her father, me, is up in the clouds!

THAT'S ENUF FOR NOW—NO?



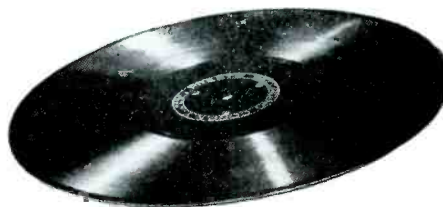
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a favorite critic**

... mine is a

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Omaha News

By Bob Rudd

MEET THE BOYS

AN OFFICER of the Omaha NABET Chapter gets the spotlight this month. He is Louis DeBoer Secretary-Treasurer of the Omaha Chapter. Louis became a member of NABET in September, 1944, and was elected Secretary-Treasurer in May, 1945.

Louis was born on a farm near Elwood, Neb., August 10, 1921. He lived there for four years and then the family moved to Chicago, Ill. After living there two years, his family returned to Nebraska and settled in Omaha. Louis attended grade and high school here and graduated from Omaha Technical High School in 1939. His main interests in high school were printing and football. He played on the Tech. High team during his sophomore year.

During his high school years he decided he would continue on to college and in order to get funds to finance his education, he worked as an usher at a downtown theater. During his last semester he quit the theater job and obtained evening work at Peony Park, one of Omaha's nicest swim and dance spots, where he was ticket taker and general handy man. While at Peony he ran the P.A. system and became quite interested in P.A. work. After his graduation he worked days in a print shop and nights at Peony Park. Most all of the older engineers at WOW remember Louis when he worked at Peony. WOW picked up a dance band from there several times a week and he was the courteous lad that helped with the mike cords and saw to it that the P.A. was turned low enough to prevent feedback during broadcast periods. None of us realized at that time that Louis would some day be with WOW.

He worked at both jobs for a year and then in the fall of 1941, he entered Omaha University as a pre medical student. He planned on becoming an optometrist. He had not been at the University very long when he realized that the funds he had saved from the print shop and Peony Park work, were insufficient to cover his studies for more than a short period. Having become quite familiar with P.A. systems and realizing their popularity for dances and outings, he decided to build one of his own that he could rent out. He obtained a diagram and set out to build something that many an experienced builder would hesitate to do. The P.A. was built as money became available. In three months time he had it finished and working. He and a friend went into partnership and one of them was always free to take the P.A. when and where it was needed. The P.A. served at many college dances and parties and Louis was able to continue his studies for a year from the rentals received.

During the summer vacation period of 1942 he continued working at Peony Park and then in the fall of that year he quit and enlisted in the U. S. Signal Corps. After his quarantine period was up he was sent to the Army Radio School at Millford, Nebr., for training. The course was very thorough and the training intensive. In December of 1942 he came home on a furlough and was married to Miss Beverly Smith, whom he met while working at Peony Park. Miss Smith was employed at Peony as a cashier.

After seven months in the army, all spent

at the Milford training school, he was given a medical discharge. The discharge came as the result of an injury he received while training there. After his discharge he went to work for the Martin bomber plant who, at that time, were manufacturing B26s. He worked for Martin one year, then in March of 1944, he went to Grand Island, Nebr., took the exam, and received his Telephone First license. Upon receiving his license he asked to be released from Martin, under the maximum skills law, and applied for a position at WOW. His first radio job came immediately after receiving his license. Louis has been with WOW a little over a year and a half now and has done an excellent job in the control room.

His hobbies are photography, boating and radio. He is not a ham but is working on his code so that he may obtain a ham ticket as soon as possible. He is a member of the Omaha WERS and his station was very active on the net the last year.

Louis and Beverly have a daughter, Diane, who will be two years old September 18. They have post war plans—but definitely. Ever since their marriage they have been looking forward to having a home of their own. With the lifting of priorities they plan on building. They have engaged a contractor and have the blue prints all ready. They have the lot, in fact everything is all set just as soon as the building trades get the green light. Best wishes from all of us and don't forget to invite us to the house warming.

WELCOME HOME

Note: We have all been looking forward to the day when our veterans would return home to take their places, once again, in civilian life. That time has arrived and feeling that these men should be recognized and introduced, we plan to present a brief sketch as they return to their jobs here at WOW. **EBENER RETURNS TO HEAD SALES DEPT**

Fred F. Ebener received a point discharge from the army in July of 1945, and returned to WOW August 3 to head the sales department. He was musical director of the station from 1938 until 1942 at which time he

entered the Air Corps. He was a reserve officer and entered with the rank of Lieutenant. He served in the Alaska theater and spent twenty-six months in the Aleutians with the 11th Air Force as Special Services officer. He was promoted to Captain in May, 1944.

THINGS AND STUFF

Roy Glanton got back from the NABET national council meeting tired but happy. He told this reporter of the courtesies received from all of the gang. The officers of NABET went to town and it looks like we are headed in the right direction.

After the work was all done, Roy and his family took a three-day vacation and visited several places of interest. Mr. Reid Davis of the New York Engineering Chapter took him on a tour of the NBC studios. A trip up the Hudson on the "Alexander Hamilton" thrilled him no end. Roy made this same trip in 1928 or 1929 but it was much more enjoyable this time with the family sharing it with him.

The Glantons took Television at Schenectady, and visited the mountaintop transmitting plant. The polished floors of the building in this isolated section along with the very modern television and sound transmitters were things that they will long remember. Mr. Hogg of GE drove them around and showed them places of interest in Schenectady. Mr. McLean of GE made the arrangements. They are very grateful to these two gentlemen. The visit to the Dumont Co.'s Television was very worthwhile and they are grateful to Mr. Stewart and Mr. Taylor of that Company for showing them around.

After the visits to GE and Dumont they took in Niagara Falls and went over into Canada. The customs officials caused no end of bother and so Canada is phuuuuuuut with Roy.

A recent visit to Chief Engineer Kotera's office found him mumbling and muttering over some very complicated looking formulas. An inquiry brought forth an explanation which covered directional antennas, phasing, etc., etc. Another station applying for

(Continued on Page Seventeen)



Louis DeBoer, Sec'y-Treas.,
Omaha Chapter NABET.



Capt. Fred Ebener

Washington News *By Van Beuren W. De Vries*

THE local chapter was dealt a severe blow last month when it received word from the NABET Council meeting in New York that Clarence A. Allen, Washington chairman, was resigning from NBC and taking the position of NABET National Representative.

Clarence has done a swell job in Washington and was most effective in diplomatically correcting differences of opinion between management and engineering relative to interpretation of the union contract.

He has been with NBC more than seven years, chapter chairman for almost two, and if he devotes as much energy to promoting NABET nationally as he did locally the organization will benefit.

Succeeding Allen as Washington Chairman is Dorson A. Ullman who returned to WRC from New York last July. Dorson originally came to work for NBC December 28, 1927, starting right here in the Nation's Capital and going to New York in June two years ago. He says he returned to Washington before New York fired him. Heh-heh, our new chairman sure is a card.

* * *

Another old timer welcomed back to the local studios is Walter Godwin who returned May 1 after serving more than three years with the United States Navy. For the benefit of posterity here, in his own words, is how Brother Godwin helped win the war.

"I was commissioned April 10, 1942, and called to active duty June 8, reporting to the Naval Research Lab at Bellevue, Washington, D. C., where I attended the radar school. Upon completing the course I was sent to Astoria, Oregon, and made Assistant Communications Officer, remaining until January, 1943. At that time I was transferred to the Navy's Aeronautical Test Laboratory at Anacostia, Washington, D. C. I stayed there until July, 1943, when I was moved to the new base at Patuxent River, Maryland. In March, 1944, I was again transferred, this time to the Bureau of Aeronautics Radio-Radar Materiel. Five months later I was drafted into the Aeronautical Communications Section of the Chief of Naval Operations having charge of communication facilities for all Naval Air Stations within the United States. I was placed on inactive duty April 27, 1945, and returned to NBC May 1.

"While at the radio test laboratory I was in charge of prototype installations of aero radar aboard 27 different carriers. This work took me to every navy yard as well as several shipbuilding yards throughout the country. Later I participated in prototype installation and radar aboard the original Mars built by Glenn Martin, going to Bermuda and other foreign ports.

"I am extremely happy to be back with NBC and feel that while I gained valuable experience in the Navy I would not want it again."

* * *

V-J DAY . . . Jim Weaver spending practically all day from Friday through Monday in a non-airconditioned room waiting for a pick-up from the mobile unit and then getting all of a two minute shot Tuesday evening . . . a blonde wandering around the WRC studios . . . Sam Newman sweating it out, and I mean sweating, in the mobile unit and, while on the air, trying to prevent a



sailor from swiping the truck's fog light . . . he did . . . Walter Godwin in front of the White House along with Jim Meline telling the girls, including that blonde, they were doing a man-in-the-street show thereby collecting names and telephone numbers as they put them "on the air" . . . Bill Chew trying to handle the desk with about six other guys from any office but engineering telling him what to do . . . Wally Ward, the luckiest engineer, being on vacation . . . Keith Williams and Gordon Henry spending their time at the White House with Gordon unhappy over having to pass up the track for four days . . . Speed Clark with those so very white shoes that didn't even get spotted . . . Dan Hunter patching up Studio D so that nobody else could figure out who was going to do what to who . . . that blonde still wandering about the studios . . . everyone letting his hair down Tuesday night but the engineers, who still had to keep their feet on the ground . . . John Rogers walking into Studio E's control booth and finding that blonde . . . John MacCollum bringing down his six months old son and asking Bob Terrell if he needed another engineer . . . Frank Fugazy piling up the overtime by merely sitting down waiting for something to happen.

* * *

Sincere thanks were extended to the engineering department by Carleton Smith, WRC General Manager, for the "remarkably fine job on the Eisenhower reception. I am delighted with the overall coverage," Mr. Smith said, "The engineering part of the show was superb."

This, plus the form letters from Niles Trammell and David Sarnoff, (or should Sarnoff's name come first?) congratulating everybody on the V-J day show makes us all happy. However, a more concrete example of appreciation would be an NBC okay of the Chicago proposal for the new NABET Contract. How about that?

* * *

One of this station's oldest employees returned to his job as Chief Engineer September 1, after serving three years in the Navy. He is A. E. Johnson who has been with WRC since November 24, 1924—that's a span of 21 years! He is a charter member of the ten-year club and there are

very few people around here who can remember when he put his first studio on the air. Don Cooper who has been acting Chief Engineer for the three years Mr. Johnson was in the service, has returned to his former duties as Operations Supervisor and, RING THAT FOURTH CHIME, Bob Terrell who held that post during the war period has taken up his old duties as Senior Control Supervisor.

OMAHA

(Continued from Page Sixteen)

directional operation on our frequency had brought forth the information which Chief Kotera had to go over and check step by step. A hasty departure was made from the Chief's office because it only takes a very short time to confuse us beyond all measure.

Louis DeBoer and Cy Hagrman both visited Lake Okoboji during August. They went there on consecutive Sundays to run the program originating from the Gospel Tabernacle Summer Church conducted by Rev. R. R. Brown. Cy had a bit of bad luck on his program. The program was on the air only fifteen minutes when a coupling condenser in the line amplifier blew making further broadcast impossible. It's the Gremlins, Cy.

Al Maller now has six hours of solo flying to his credit. Gad, sir, you will be a pilot before you know it.

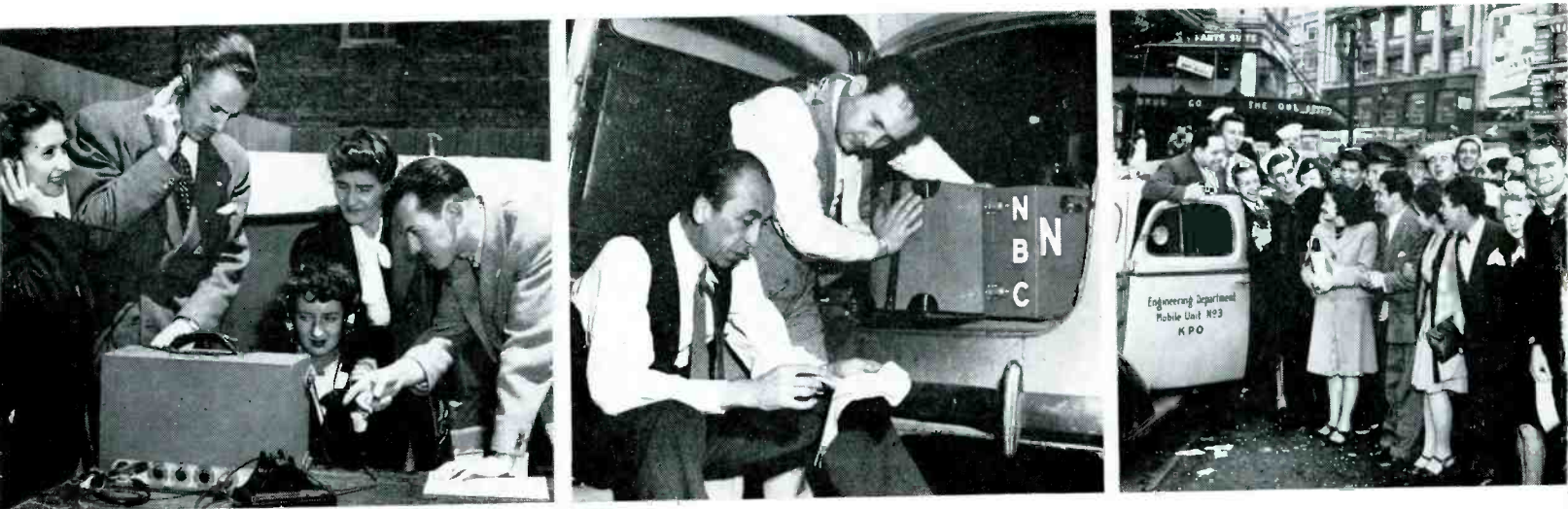
G. Flynn (Studio Super) has his troubles. He runs the sound effects on the Union Pacific's show "Your America." A recent script had him running train and airplane sound effects in such close sequence that it was necessary to dub them off on one record so that they could be brought in on cue. Cheer up G. Run 'em at 78 that gets them over faster.

VITAL STATIC

Congratulations to G. Flynn on completing ten years of service with WOW this month. G. receives the ten-year award pin.



This beautiful cabin is Lt. Bill Dunbar's "Lazy Lodge" located on the Platt River near Fremont, Nebr. The Lodge was designed by Bill and built by "Sam," his father. The cabin is complete with electric stove, electric pumping system for the water supply, built in bunks for four and a huge fireplace eight feet wide. Fireplace is lined with iron and has openings in the side for heat radiation. The mantle of the fireplace is made from a cedar tree that stood on the very spot the cabin now occupies. Bill plans on getting into Ham radio when he returns from the wars and will use the cabin as his "ham shack".



(Left) Don Hall, right, instructing an NBC-Stanford Institute class in the operation of the ND-10 remote amplifier atop the NBC studios in San Francisco. (Center) KPO field supervisor George McElwain and field engineer Russ Butler check the list of portable equipment being put into the station's mobile unit at the crack of dawn the day of Japan's surrender. Truck subsequently was taken three times to the busiest thoroughfare of San Francisco's famous Market Street, to the heart of Chinatown and to Mills Field, just outside the city, where the first Pan American peace flight started. (Right) Engineer Sam Melnicoe and special events announcer Bill Baldwin took KPO's Mobile Unit through the jam-packed traffic on San Francisco's Market Street a few minutes after President Truman's V-J announcement on August 14, to bring to NBC listeners from coast to coast a blow-by-blow description of the mob celebration.

This Report Comes to You By Way of San Francisco

By Jack Van Wart

GAS rationing is over and the fellows who were fortunate enough to have selected periods which came due now are enjoying their time off. Charlie Kilgore is back after a trip to Oregon where he and his family, together with Cliff Engle, former NBC Announcer, and his family, did a lot of serious fishing in a "Private" lake. Tommy Watson went to Carmel for his vacation but was unable to find lodging and had to commute every day from Monterey. We didn't realize that Tom had not given up his membership in the Boy Scouts until we heard his story of how, in spite of the fact that he was making the trip every day from Monterey to Carmel in an attempt to find a place to stay, he found a place for two young ladies and spent the rest of his stay commuting. It seems that while waiting for the bus in the Monterey depot he noticed these two young ladies struggling with their luggage and offered his assistance. They accepted gratefully and upon arrival in Carmel he removed the luggage from the bus and only then did he discover that they were in Carmel for the first time and had no reservations and no friends. Well what else could a gentleman do but to help these ladies in distress? After canvassing every hostelry in town they were able to locate one double room which Tommy insisted that the ladies take. Cliff Rothery sent a card from Robles Del Rio Lodge near Monterey and assured everyone that he was "Thinking of you boys these days. My sympathy." The other side of the card showed a view of the swimming pool. We also received a card from Sam Melnicoe from Rawlins, Wyoming. Seems as though Sam is taking his post-war vacation in pre-war style.

The recording department received a letter from Jack Morris of New York Recording

in which he enclosed a page from the NBC Chimes. Your correspondent, being assigned to the recording room, would like to remove any doubt that might be in anyone's mind as to whether or not the six San Francisco engineers assigned to recording also put in many long hours during the Conference.

San Francisco engineering welcomes Ema Sue Hutson who has recently joined the staff as a group two studio engineer. Ema Sue was formerly employed at the O.W.I. studios here in San Francisco. She is a Navy wife and is waiting for that day when she and her husband can resume a normal life together. Ernest "Shorty" Moore, who has been working as a studio engineer for the ABC in San Francisco, will transfer to the KGO transmitter on September 1 when Harry Jacobs returns to his old job as group two studio engineer for ABC. Harry has been on leave while working at Columbia University in the radio laboratory. It is rumored also that "Buddie" Proctor Sugg will soon return to his job as Studio engineer for NBC. J. Wallace Downs visited the studios recently to bid his farewell. J. Wallace resigned his post on the KGO transmitter staff to take a job in Alaska.

Don Hall, CR, repeated his assignment as technical instructor for the NBC-Stanford Institute this summer. His schedule of instruction included such subjects as operation of the transcription turntable; placement of mikes; operation of the studio console; response of playback filters and pickup patterns of the various microphones used at NBC.

V-J Day was the occasion for much activity on the part of the Field department. Russ Butler and Sam Melnicoe packed the portable gear to San Francisco's Chinatown

and to Market St. for network pickups. Russ narrowly escaped injury from the mobs on Market St. when he was setting up the gear. George McElwain was also kept busy. He was rousted out of bed at 1:00 in the morning and when he arrived at the studios he was confronted with all sorts of remote assignments. He had to check all gear on the way out to make sure that everything that would be needed was taken. At that hour of the morning and after having, he said, "about 20 seconds of sleep," that was no easy chore.

That political poster urging the election of Tom Watson to Congress has finally appeared. The complete story and pix will appear in this article next issue.

OFF-THE-BEAM-DEPARTMENT — See "VARIETY" of August 15, page 24, last paragraph, which reads "When Petrillo starts bucking NABET, it will again feel the acute need for affiliation. When it tries to affiliate, its leaders are likely to propel it toward IATSE." We find it difficult indeed to believe that NABET's leaders, having rejected IATSE, having strengthened NABET through the new regional set-up, are interested in the "propulsion" spoken of.

CHICAGO

(Continued from Page Thirteen)

All the boys in Groups 4, 5 and 6 were figuring how much their dues would be next year. We hope and trust that income taxes will be lowered next year, which would help no end.

Naturally, we here in Chicago have the very keenest interest in the forthcoming negotiations with the Companies. Hardly need to comment further, as those meetings will make or break us. My fingers are crossed. 73.



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Professor O. Hoffendeffe Demonstrates

By Bert Pruitt

OUR curiosity knew no bounds when we received post-cards advising us that a special August meeting had been called by our local NABET Big-Wigs. Frank Whittam is our SecTreas so we assumed he would know what it was all about. With that assumption playing I.Q. with our imagination, we cornered Frank.

"Frank," we said, "what's stirring; What's this special meeting stuff all about?"

"Don't ask me," he answered, "I'm only the SecTreas. Brandt told me to tell you fellows there's to be a special meeting out at Prof. O. Hoffendeffe's home on the evening of August 16th . . . at 8 P. M."

We wanted to know who Professor O. Hoffendeffe is and what his subject would be. Frank said Harold told him Prof. O. Hoffendeffe is associated with Platter University and specializes in Shavings and Acetate. We hadn't the slightest idea as to the location of Platter U. and we'd never heard of their football team and neither had anyone else we talked to. That in itself would indicate that Prof. O. Hoffendeffe was associated with a University that hasn't received the usual amount of free publicity from radio and the thriving dailies.

Well, the rumors continued to fly around like bats in a deserted barn. Just what was in the wind? Had Brandt found someone who had helped develop the atomic bomb? If so, would Prof. O. Hoffendeffe demonstrate its devastating effect? And if he should, what would happen to the Cleveland Chapter

of NABET? That, naturally, makes one think about those new jobs which were created at the New York Convention; would Hiller and Allen receive their monthly pay if Cleveland should disappear like Nagasaki?

Well, the evening of August 16th finally arrived and no one seemed to have the answer when we parked our cars in front of Prof. O. Hoffendeffe's home at 181818 Whippoowill Ave., NS.

"Jeepers," exclaimed Hugh Okenson, as we climbed the steps leading to Prof. O. Hoffendeffe's front porch, "I thought my

had a striking resemblance to a broadcast studio.

Professor O. Hoffendeffe told us to be seated. We followed his instructions like all obedient students should.

"Photographer," barked the Prof., "take their pictures!"

Pictures were taken . . . one of which appears in the near vicinity of this paragraph. The photographer left the room.

"Men," began Prof. O. Hoffendeffe, "Mr. Brandt requested that I appear here tonight to give a demonstration of timely interest.



Front, Left to Right, John Wilhelm, Harold Brandt, Hugh Okeson, Jim Sturtevant. Center, Cecil Bidlack, John Disbrow, Jerry Jerome, Bert Berg. Rear, George Molner, Howard Spiller, Mills Bennett, Bert Pruitt.



The "Prof"

yard had plenty of crab-grass . . . The Professor's has mine beat . . . They say . . ."

Hugh Okenson didn't finish his last sentence. Prof. O. Hoffendeffe opened his front door and smiled us a greeting. It would be appropriate now to fill three or four pages with a detailed description of Prof. O. Hoffendeffe. That's what most fiction writers do . . . That isn't necessary in this case, however. We are not being paid so much per word, so let's use a picture we have of Prof. O. Hoffendeffe; the reader can then do his own describing.

Prof. O. Hoffendeffe gave us a hearty welcome, turned on his heels and motioned for us to follow. He lead us through some revolving doors. This brought us into a deserted lobby . . . a lobby which gave one the feeling that unseen eyes were peering at one from mysterious closets and sound chambers. Looking neither to his right nor left the Prof. passed through the lobby, entered a hall, walked twenty-seven steps due north then turned abruptly to his right. This lead us through a sound chamber, which in turn brought us into a room that

My time is valuable so let's proceed without further ado!"

Everyone's eyes were sticking out like warts on a toad. Therefore it isn't surprising that an exclamation of surprise surged through the room when Prof. Hoffendeffe turned and lifted a sheet that had been covering something on a medium sized table. There in front of us sat a complete miniature Broadcasting Plant. Studios, Transmitter and all! A radio receiver sat on a table about twenty feet from the studios and transmitter. The receiver was tuned to the frequency of the transmitter . . . and I might add that the miniature receiver was no bigger than one of those cubes of butter they put on your plate at the nearby restaurant. The dials on the set reminded one of mosquito faces.

"There seems to be some argument," began Prof. O. Hoffendeffe, "as to whether you engineers or Petrillo's musicians have the legal right to run records in certain Broadcast Stations. Mr. Brandt informs me that the musicians claim they are best quali-

(Continued on Page Twenty-one)

Harold Brandt

THE impossible has happened; Harold Brandt got shot! Not half shot, nor two thirds shot, mind you, but an even 100 per cent shot. But don't misconstrue the meaning of such a statement. I didn't shoot him. We have no intention of competing with the Kilocycle Whodoneit and our greatest ambition in life is not the one of facing a judge and jury for having been guilty of breaking one of the Ten Commandments. That being the case, we'll attempt to clarify our statement before some ambitious policeman tries to get a promotion by chucking us into the cooler.

Harold Brandt has been Cleveland Chapter Chairman ever since way back in 1940. He has attended a number of NABET conventions at several of our far-flung convention centers during that time. Speaking of conventions reminds us of the time the American Legion held their convention here in Cleveland . . . But that isn't why they shot Brandt.

Five years, we decided, as Chapter Chairman in any city, sufficiently qualifies one to have his mug appear in Stolzenberger's Classic.

And now let's amplify one point before we resharpen our pencil. Some people are mercenarily inclined. You may know some one who's description fits that statement. If so, I would be guilty of wasting your time by saying such a parsimonious gander at life is apt to give such a person a biased opinion when it comes to Webster's definition of "money" and "honor". Money invariably gets this fellow's nod of approval . . . Webster notwithstanding! Brandt isn't like that. Money is secondary to him . . . Honor is paramount! The entire Cleveland Chapter, for that matter, puts money ahead of honor in some respects. Otherwise, how explain the fact that Harold Brandt has worked as Chapter Chairman for the past five years for free?

Well, the cameraman drew a bead on Harold and pulled the trigger. This was



followed by a blinding flash that made one wonder if the cameraman had ever heard of the smokeless powder that replaced black powder twenty or thirty years ago when rabbit hunters took to the woods each fall.

The photographer developed the pictures. Fortunately, there were no bee-bee holes in them, so Harold Brandt may get his pix in the Journal. That depends on the Journal's Ed.

There was one Cleveland Station paying NABET dues back in 1940 when Harold was given the key to NABET's Pilot House. Since then he has steered a steady course through the waves that reach mountainous proportions in the Sea of Manager Resistance. Skipper Brandt has encountered a few Typhoons that are always potentially possible when any Chief Engineer begins to chew his cigar a little faster. But such things as that made Harold more determined to plow straight ahead through the churning sea. This perseverance paid dividends. Harold reached port and he had hardly dropped anchor when two other Cleveland radio stations were paying dues to NABET each month. Harold is responsible for having sold

NABET to WHKK Akron, and WHK Cleveland. Selling the idea to a technician is one thing. Selling the same idea to a station manager is a horse that nibbles hay in a different stall! Labor laws, human cussidness, legal loopholes and mulish stubbornness eat up time like a jalopy used to go through that precious little old "A" book. Consequently, Harold spends most of his days off ironing out the numerous complications that face a Chapter Chairman when he attempts to enlarge a Chapter.

Harold has some more ideas up his sleeve. We don't know exactly who reads the Journal, so we'll not go into details on that score. That would be like a big-league pitcher advising the batter what to get set for before each pitch. You know, as well as does Joe McCarthy, that big-league flippers aren't in the habit of doing that before flinging one at the plate. MacArthur and Halsey used to tell the Japs which cities they were going to use the American Eraser on next, but a Chapter Chairman can't do that . . . He can't back up such a statement with an atomic bomb.

Harold returned from the N. Y. convention a few days ago. We held a meeting and he gave us the low-down on what took place at the convention. Everyone out here seems to be pretty well pleased with the results. We'll have to dig a little deeper into our pockets each month in order to meet the monthly dues . . . but you either have a union or you don't. If you don't, you might well dig into your pocket until you tickle your knee-cap without coming up with enough money to purchase that two-pound porterhouse you've longed for ever since red points became deadly ammunition in the hands of those who insist that a vegetable dinner adds to health and prosperity.

As I was saying before I got a whiff of that porterhouse . . . We're pretty well satisfied out here on the southern shore of Lake Erie. I might add, however, that one cautious peep at Chicago's proposed wage scale satisfies one to the extent that the first line in this paragraph could be amplified several DB without any danger of distorting the truth!

—Bert Pruitt.

PROF. HOFF (Continued from Page Twenty)

fied for the job. As to whether there is sense or logic to such a statement I am not qualified to say. But I am a very good friend of Prof. G. Scale who teaches music at Platter U. I have been a visitor to his class upon numerous occasions but never once have I heard him even suggest to his students that their yearly tuition should be considered as a down payment on the first rung of the ladder that leans against the record library in your radio station. But it is not my intention to take sides in this argument. That isn't my way of making a living . . . I merely intend to give a demonstration that should make certain facts obvious even to Micky Mouse and his Hollywood friend, Donald Duck!"

Professor O. Hoffendeffler picked up a platter. "This," he said, "is a platter . . . at least that's what Brandt calls it. I recall having read something about Petrillo having referred to record players as 'Pancake Turners'. According to that, this record should be a pancake. Well, regardless of what

Petrillo says, I maintain a pancake isn't a pancake unless you have a pitcher of maple syrup and a chunk of butter to go with it. And if you put a pancake, soaked in butter and syrup, on a turntable, logic tells us that the fellow at the turntable could not truthfully tell the fellow in the M.C.R.; 'It's leaving here OK!'"

Professor O. Hoffendeffler placed the platter on the turntable, sat the pickup arm, turned the switch then smiled. The miniature radio picked the signal from the air with the ease of a frog lifting a fly from a lily leaf.

"Boys," said the Prof., "you hear what Petrillo's musicians put on this piece of wax!"

We agreed that he had made a truthful statement. He then turned a miniature fader to the left. "Do you hear it now?"

We strained our ears and admitted to Prof. O. Hoffendeffler that we couldn't hear a peep.

"Men," he said, "I'm not exaggerating when I say there are approximately 5,000 gadgets between this pickup arm and our transmitter's antenna . . . any one of which has the potential possibility of creating the

same amount of silence that was noted when I turned this fader to my left. That is important to remember. Take a saxophone . . . You force some air in one end, the air in turn turns a couple of elbow-curves then out comes some noise. Are there 5,000 ways to prevent that noise from coming out? If there were, you can rest assured you would not have to lie awake half the night while some ambitious youngster desecrates Mother Nature's air waves with a noise that sounds like a grunting porker eating acorns in Fairmont, West Virginia. Off hand I can think of only three ways to stop the noise at the source. Hit the tooter over the head with a ribbon microphone, fill his saxophone full of solder, or call the police. That shows the odds are against the musician. He has three chances to your 5,000. I make no pretense of being an authority on jurisdictional labor squabbles, but when I think about the saxophone player I cannot help but feel that five thousand gadgets between the turntable and the antenna are capable of turning the best of solos into the same amount of silence you heard when I turned this fader to the left."

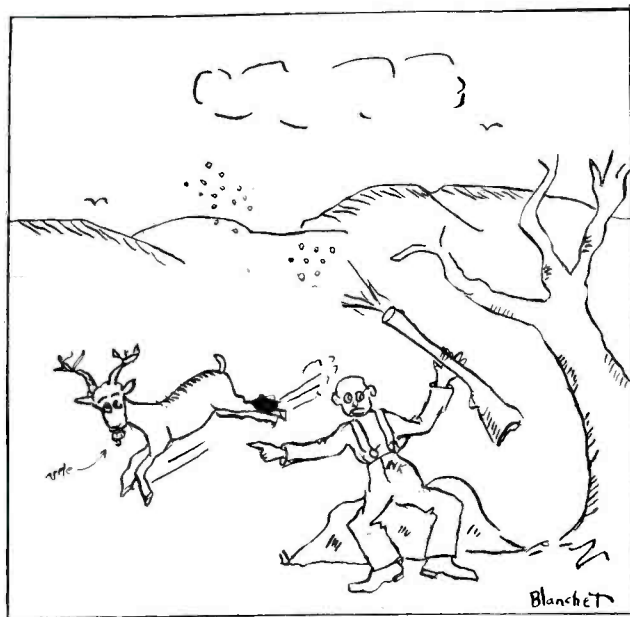
Ia de KGO Transmitter

By
Ken Martin

THIS guy Jim Blanchet strolls in from his vacation with a rather pained expression—seems in the third week of his vacation the gasoline ban was lifted and as Jim dolefully wails—"There was I, without my horseless carriage—stranded in Chico, Butte County." Anyway, Jim got a look at some jet propelled planes up there and put in some good licks at swimming.

Pop Perry, our Janitor, wiggles from his mountain stronghold that he'll be back on the job as of September the first after several months sick leave. This automatically releases John Winters who has been pinch-hitting. Incidentally, that tuneless, apparently innocuous ditty John persists in whistling in the wee small hours has been identified as none other than his private version of that naughty refrain—Tra La La Boom Deay—and don't think John doesn't know the words! Which just goes to prove that he hasn't spent ALL his time at transmitters out in the sticks. John says that song was the hughle call of the can-can patrol.

Herb Kramer, the "youngberry kid" is vacationing at present up in Lake County where it seems he has an option on about half the catfish. The latter part of his vacation he will drain the clean-



ing fluid out of his Studebaker, replace it with honest to gosh gasoline and motor to Salt Lake City, Utah, to revisit. When originally queried about his vacation plans, Herb was exceedingly coy. Lifting of that gasoline ban affected his volubility most curiously!

We can only guess but inasmuch as this is deer hunting season, we surmise Herb will come dragging back to the job with another "stretch-your-imagination" story about the 8-pointer that got away. Last year Herb related a fantastic tale wherein he hunted until exhausted, sat down on a rock and concentrated on eating an apple. When next he looked up the trail he was practically staring down the nostrils of the biggest orneriest buck in 7 counties. Utterly paralyzed by this unorthodox conduct, Herb sat there astonished while the deer calmly lifted the apple right out of his hand and ate it. As a matter of fact, the buck could have taken the rifle away from him but being a sportsmanlike animal, the buck sneered, contemptuously turned tail on the would-be hunter and stalked down the trail. About this time, our mighty hunter bethought himself of his unused deer tags, unlimbered his trusty

blunderbuss, carefully steadied it within an arc of 60 degrees and let go a broadside that brushed all the moss from those prize antlers—but that's all, brother! Doubtless, this year it will be a tiresome repetition of that "Yotta seen the one that got away" routine but he is going to have to hump to top last years saga!

J. Wallace Downs—he of the feet—has departed. His loss is keenly felt, once again there is room for two pairs of feet under the desk. J. Wallace could no longer ignore the call of the wild—and I mean wild! Departing August 25th for Seattle for transshipment to Alaska, "Jack London" Downs will do his TE act for Edward Kraft Broadcasting Agency at either KINY, Juneau or KTKN, Ketchikan. Toting an awe-inspiring arsenal, Downs headed for the tall timber to hunt bear, mountain goat or just plain ordinary Councilman (always open season!) on a one year contract.

The most remarkable quality about Wallace during his 7-month sojourn with KGO is that he was never known to let off "steam." He could, fortunately for us, take any amount of ribbing—good natured or otherwise. We predict that this, more than anything else will stand him in good stead as Arctic Representative for NABET and KGO. On withdrawing from NABET, Downs applied for inactive membership, expressing his intention of continuing his subscription to the Journal. Okay, Wally—how you like them long winter nights and blubber? Give us the lowdown on web feet and long-handled lingerie. Over.

Wallact is being replaced by Ernest Moore, displaced from ABC-SF studios. More about Mr. Moore next issue, perhaps.

By now—I suppose it is NOT news to all and sundry that KGO is finally on the ways for a new 50 KW rig. Or is it? Anyway, to our Group, it is great stuff. We have been looking forward to it—so they tell me—for a matter of ten years. CP forthcoming, the site will be on the east side of the Dumbarton Bridge, 8 miles from Newark or 6 miles from Palo Alto as the Ford flies. We are praying that the tide-flats thereabouts will be a trifle less odoriferous than these we leave at the 12th Street and 55th Avenue location.

Having digested the entire contents of the August issue of our Journal from cover to cover and most especially, the luscious pic on page 19, speculation has run riot. Genial Gene Nickels, he of the discerning eye has put his stamp of approval on the curvesome subject, vowing it's an R9—no less—and they don't come any better.

Verily, that Wallace youngster is enough to make any lowly engineers' red, white and blue corpuscles Beryl. Murdered that one, didn't we!

Myron Case has wrinkled his brow considerably trying to make out the tantalizing dedication inconsiderately censored from that picture. Can't you give us a hand here, Ed.

George Irwin insists that we be supplied the full measurements of this modern venus whilst the staff in general was astonished to remark that Beryl, of all things, has no appendectomy scar.

Just a few ayems ago the antenna polishing crew was mobilized and the flattop gently lowered for refurbishing and removal of barnacles. To the skeptics inre the barnacles let me say, when we have fog it really fogs. We regularly remove starfish from the insulators. In lowering the antenna a wench got out of John Winters hands and gave him a cut above the left eye that was taken up with two stitches at the Emergency hospital and resulted in a beaut of a shiner. To forestall any wisecracks let's have it understood this WENCH is the mechanical variety. No other casualties reported.

Will the gentleman (?) who accused this reporter of smoking opium kindly step forward. One at a time please. And by the time you read this I'll be cooling my heels at Lake Tenaya and Tuolumne Meadows—how many know whereat is it? Not Africa. 73's.

Introducing Baltimore

By
William Hoos

FELLOWS, let's introduce ourselves. This is Baltimore Chapter's first appearance on these pages, although we've been NABETized since the fall of 1944, when we were signed up with the organization. We were certified by the NLRB in October, and our charter granted April 15, 1945. Our contract has been ably negotiated by Pres. Powley and at present is awaiting a final decision of the WLB, before the final signatures are attached thereto.

At the recent election, the original Chapter officers were continued in office. These are:

Chairman, Harry Boone; Secretary-Treasurer, William D. Kelly; Councilman (Studios), Robert D. Briele; Councilman (Transmitter), Edward Jung.

Baltimore Chapter is made up at present of the entire engineering staff of WFBR in Baltimore. We have 5 KW on 1300 KC here at WFBR, put out by an RCA 5-D, with the two tower antenna system atop Baltimore harbor. This station was the first to build its towers above salt water, with the ground radials having been paid out the stern of a rowboat instead of laboriously dug into the dirt, which is one of the several advantages of the system if you happen to be one of the gang doing the work. The layout of the Xmitter at Westport is ably handled by Transmitter Supervisor Bill Kelly, along with TE's Howard O'Day, Ed Jung, and Bill Doster, and Rhett the alleged watchdog. We'll give Rhett the first personal plug with the story sworn to by all the gang but Bill Kelly his owner, that whenever a rabbit happens along in the neighborhood, Rhett comes scampering indoors chased very closely by said bunny. Supervisor Kelly is one of the old-timers with the company, having been

with WFBR for nearly 20 years, before which he pounded brass at sea. TE O'Day is also a former sea-going wireless op, having also served at NSS for the Navy during World War number 1. Howard likes exercise and occasionally pedals his bike the seven or eight miles from his home to work. It's even rumored that he has walked the same miles at times. TE Ed Jung is Councilman from the transmitter. He and yours truly made up two-thirds of the entire night class at the local radio institute back about 1934, and eventually wound up at WFBR. Although all the transmitter gang have spouses, Ed has the distinction of being the only TE with progeny. TE Bill Doster is the junior member of the transmitter crew having been with the company only eight years. Those guys really stay put.

That's the story of the transmitter. Here at WFBR's studios we hitch onto the ABC. Until June 15 of this year we had been affiliated with Mutual. Baltimore's Radio Centre is located at North Avenue and Charles Street in uptown Baltimore. We have six studios, along with the availability of the Centre Theater for large audience shows in the same building. These are all RCA equipped with the company's de-luxe line of equipment—40 Ds, 41Cs, 55Bs, etc. Maybe some of you fellows have seen pictures of our set-up in the various RCA publications. The studio setup, recording, and remotes are handled by Control Room Supervisor Paul Ruckert, along with SEs Edward Stover, Robert Briele, Harry Boone, William Hoos, Robert Sherrer and Fred Himes. Supervisor Paul Ruckert came to WFBR about fifteen years ago after starting in radio at WBAL. Paul's pet hobby is flying and prior to the war he owned his

own Cub. The only member of the staff who has a separate contract with the company is SE Ed Stover. As sole owner, manager, cleaner-upper, et-al of the High Q (where did he get that name?) Rabbitry, he has been supplying three Bunnies weekly to the Hobby Club program which is aired locally every Saturday morning. These are used as door prizes for the studio audience. Eddie is also one of those who knew what 600 meters sounded like on a crystal and cat whisker. By way of salt water, later WTOP when it was then WJSV, Council Chairman Harry Boone came to WFBR. Harry's other reason for being sore at the Japs is that the war halted the broadcasts of the numerous boat races and Fishing Fair, which provided him with many summer weekend assignments at various resorts around Chesapeake Bay. He has been busy lately providing us with the dope concerning the National Council meeting which he recently attended in New York. Bob Sherrer saw some of the doings in the Nation's Capitol when he worked at WOL. He also put in some time with Westinghouse and Bendix Companies' local plants. Bob boasts one of those two-letter ham calls from way back—W3ME. We've finally acquired some youthful, masculine glamour in the control room when Freddie Himes joined us after his discharge from the service. Unlike the rest of us Fred has yet to acquire a spouse and the senile 30s. It's not unusual how many of the girls from the front end find business in the control room when he's on watch. RT 3/C Julian Smith is on military leave from the station.

That's us. We're all mighty happy to be associated with such a swell organization as NABET and hope that association will be a long and prosperous one.

INTRODUCING

By Ken Martin

GEORGE ARMEN IRWIN, 47, TE at KGO, was born at Toronto, Canada, and is a four-year veteran of the Canadian Signal Corps in World War I. Wounded in 1915 and again in 1918.



George can tell some fancy tales about his experiences in that long ago war — have him tell you the one about the "blighty" some time. I doubt that World War II has developed anything to equal his version of the "blighty!"

Back home again in Toronto, 1920, George took up radio work with the McCarthy

Brothers, manufacturers of radios, until 1924 when he headed the Canadian equivalent of Horace Greeley's: "Go West Young Man" and landed in Vancouver servicing radios and thence, in 1926 to San Francisco where he worked in the electrical contracting busi-

ness, applying for Citizenship papers on entry and achieving Citizenship status in 1932.

George went to KYA as TE in 1931 for NBC at the time the transmitter was located in the Whitcomb Hotel on Market Street until 1933 when he transferred to the studios for a year. Late in 1934 George shifted to KGO transmitter where he has established an enviable record of good service from that time.

George is past Councilman for our Group and a Charter Member of NABET from the days way back when the first meeting, as he recalls it, was ultra secret. Now married, George resides in San Leandro, the proud father of a nine-year-old daughter, Shirley.

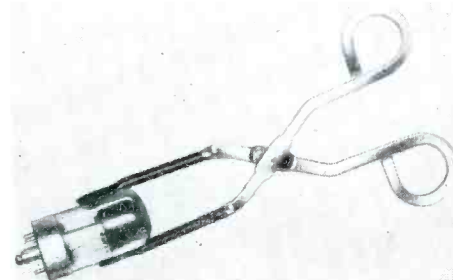
Quiet, unassuming and a good mixer, George is a hail fellow well met. In closing tribute to the man and his record, let me say that we can use all the men of like calibre that Canada can spare.

The BMP Company of Boonton, N. J., announces a new addition to its well-established family of "Sure-Grip" Tube Extractors, thousands of which are now in use throughout the electronic industry.

This new tube extractor finds application in the inserting and extracting of delicate miniature and straight-side glass radio received tubes, manufactured in the following standard bulb sizes:

Bulb Size	Tube Types
T5½	1A3, 6AG5, 9001, 1645 and 26 similar types.
T7	OZ4G, 921, 922, 926, 936, etc.
T8	1P9, 917, 8012, 1640, 868, etc.
T9	6E5, 7A4, 35A5, 1629, 50A5 and 140 similar types.

The gripping surface of this tube extractor is rubber-covered. The prongs are of a wide enough opening radius to fit all tube sizes. The construction of the extractor reduces breakage of thin tube walls, prevents burnt fingers and saves valuable time.



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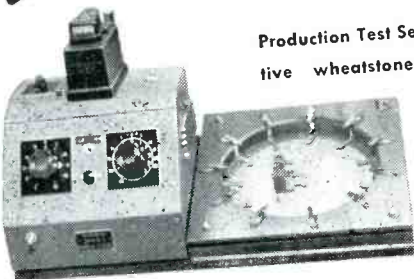
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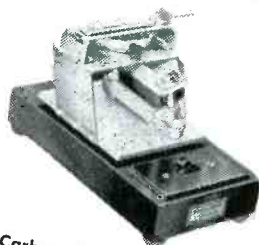


Development of special
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Production Test Set to test varistors. A sensi-
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switching means for
quickly checking a
number of varistors
in rapid sequence.

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precision filling of carbon
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MANUFACTURERS OF PRECISION
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Video Amplifiers

(Continued from Page Eight)

with general adoption is the use of separate bias voltage in series with the grid resistor. Because this is a very high impedance circuit, the bias source can be relatively high impedance without serious effect. A 1 mfd. condenser having a reactance of a little over 5,000 ohms at 30 cycles will have practically no effect on grid-to-ground impedance if inserted in series with a .5 megohm grid resistor. Thus a separate bias supply with taps for providing various bias voltages and series RC filters for isolation would meet the problem of bias supply without distortion. Since the voltage required is low, it could be obtained from a series resistor in the negative side of the power supply ahead of the bleeder. This method has been used in certain laboratory installations with apparent complete success.

The effect of the cathode resistor and bypass condenser can also be countered by means of an RC filter in the plate circuit which is to be described in the next paragraph but when this is done there is no remaining method of compensation for the distortion in the grid condenser-grid resistor circuit. Often the cathode bypass condenser is made as large as possible—1,000 mfd. or more—and whatever distortion results is accepted as a more or less necessary evil.

The correction of low frequency distortion resulting from the grid condenser-grid resistor circuit is quite simple. The basic idea is the compensation of the increasing loss of low frequencies and increasing positive phase shift which takes place in the coupling condenser C_c (see Figure 6), by a corresponding increase of gain and negative phase shift of the signal applied to the coupling condenser. Increase of signal level at the low frequency end is accomplished by increasing the impedance of the load circuit at the low frequencies. This is done by inserting an additional load resistor between the positive power supply terminal and the normal load resistor. The additional load resistor is bypassed to ground by a large condenser. Values are so adjusted that at mid-frequencies the bypass capacity effectively "short circuits" the compensating resistor. As frequency is reduced, the reactance of the bypass increase and the "short" is removed from the compensating resistor. Consequently the effective load impedance increases as frequency is

reduced and gain at low frequencies is increased, thus counteracting the loss in the coupling capacity. It is generally necessary to do a certain amount of experimental adjustment in order to get the best possible low frequency compensation but the initial choice of values can be chosen such that $R_1 C_f = R_g C_c$. Theoretically this will result in perfect compensation only if the low frequency compensating resistor R_f is infinitely high but in practice good results will be obtained if $R_f > 10 R_1$.

In addition to increasing gain at the low frequency end, $R_f C_f$ also serves to provide phase shift correction. Phase shift across this combination will be negative thus compensating for the positive phase shift in the $C_c R_g$ coupling circuit.

When $R_f C_f$ is used for compensation of cathode circuit deficiencies, values are so chosen that $R_f = R_k$ (gm R_1) and $R_f C_f = R_k C_k$.

Double-Beam Cathode-Ray Tube

THE double-beam cathode-ray tube marks another milestone in the progress of the cathode-ray art particularly by way of expanding applications. The Du Mont Type 5SP now made available by Allen B. Du Mont Laboratories, Inc., of Passaic, N. J., provides two complete "guns" in a single glass envelope, both aimed at or converging on the single screen for simultaneous and superimposed traces.

Heretofore the simultaneous comparison of two phenomena could be accomplished either by using two separate tubes or oscillographs placed side by side, or by using an electronic switch in order to present first one phenomenon and then the other on the same tube screen in rapid succession. However, the former method is obviously unwieldy and does not permit the superimposing of traces for accurate comparison, while the latter has limitations caused by the frequency response and the switching rate of the electronic switch, as well as the inability to use independent time bases or sweeps.

With the Du Mont Type 5SP double-beam cathode-ray tube the previous limitations are removed. The two independent "guns" are contained in a 5-inch envelope. There is complete and independent control of the X, Y and Z axis functions for each beam. Adequate shielding between "guns" and "plates" minimizes "cross-talk" particularly at high frequencies. Deflection plate leads are brought out through the glass envelope wall, minimizing shunt-input deflection-plate capacitance and lead inductance, and also preventing interaction between signals caused by coupling between long leads. Second-anode leads are also brought out through the envelope wall in order to provide better insulation and longer leakage paths. A standard Army-Navy diheptal 12-pin base fits the standard socket. The electrode voltage ratings are similar to those of the Army-Navy preferred Type 5CP1. Contact connectors for electrode leads are supplied with the tube.

A

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- NABET is controlled by its *members*; they have the right to vote on all matters of union policy. As a NABET member, you would have the *right* to Okay any actions which your President might take.

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DIXIE CHAPTER NEWS

By Rex Coston

FOR the past few weeks studio operation around WPTF has been a little out of the ordinary to say the least. Studio D, which ordinarily houses the turntables, has been enlarged for more convenient operation, and during the period of reconversion the TT's were pulled around into studio A where the Kimball pipe organ is located. Operation was not terrifically complicated by the move, but everyone was confused by the conglomeration of noises not usually heard in the new localities. Mildred Alexander, WPTF's new Music Director replacing Charles Keaton who has gone with WOL to direct music, was continually being interrupted by a stray announcer who just wanted to get into the studio long enough to say "WPTF Raleigh a transcription." The studio engineer, working in the control booth next to studio D, was used to all kinds of noises coming out of speakers, but he couldn't decide who was making more noise—the people rehearsing in studio A or the carpenters banging in studio D. But we must not be one sided in our viewpoint, after all, the poor carpenters must be considered. Between the blaring speaker near by and a hurried announcer running by saying, "Say, can you hold it for about five minutes while I read this newscast in the next studio," the obedient hammer and saw men were confused a lot. But what amazed me was, when did these men sleep? They would be working all day long and then the first thing you knew they were back working all night. Anyhoo, everybody (including the disc jockeys) is glad to get back to normal—we like a little order in our chaos.

Since the lifting of the WLB control on wages, the Dixie Chapter is happy to announce that the wage scales agreed on in negotiation of recent NABET contracts with both WDNC and WPTF have been brought up to date in full.

From WDNC we hear that Gilmore Bowers has left to join the Merchant Marine. We all wish him the best of luck in his new venture. We also wish to thank Bowers for the swell job he has done these past few months on this strip.

We were thumbing through the September 3 issue of BROADCASTING the other day and ran across a picture of our chief, Henry Hulick, on page 63. I notice he sent a picture with hair—no he isn't bald, but you should see him when he has it all cut off except about one-half inch.

Fay Biggs, until recently head of WPTF publicity department, is now writing for WMCA in the big city. Don't know why they should put her in continuity when she's a natural for television. Well, anyhow, we can say we knew her when . . .

**DEWES'
DAFFY
DICTIONARY**

- Grid:** A smile by a man with a cold . . .
- Cathode:** An ode to a cath . . .
- Cycle:** Half of a bicycle . . .
- Coulohm:** An ohm with air-conditioning . . .
- Farad:** Progeny of a Pharaoh and Pharass . . .

HISTORIC FIRSTS: Copper-Oxide Modulators

(Reprinted from the Bell Laboratories Record, June 1945, by permission of the Bell Telephone Laboratories)

IN THE earlier carrier systems, vacuum tubes were used as modulators and demodulators. The variation in instantaneous loss or gain with changing amplitude of the carrier or signals, which is essential to modulation, was achieved by biasing the tubes nearly to the plate-current cut-off point. Where carrier suppression was desired, balanced tube arrangements were employed. This commonly used vacuum-tube modulator required, in addition to the two tubes, a balanced input transformer, a similar output transformer, and power sources for the A, B, and C voltages. In addition, variation in tube characteristics required selection of tubes to obtain adequate balance, and tests and adjustments to maintain the balance.

Because of this complexity, searches for something simpler, yet dependable and stable, were made from time to time. Crystal detectors, magnetic modu-

lators and numerous other things were explored but found wanting. C. R. Keith, who had worked with Dr. E. Peterson on studies of copper-oxide rectifiers, saw that they could be employed simply and effectively as modulators for carrier systems. He built a number of copper-oxide modulators and employed them experimentally in a carrier system. In April, 1929, he applied for a patent, and in April, 1932, Patent No. 1,855,576 was granted him for circuit arrangements that utilized copper-oxide rectifiers as modulators.

In the meantime, Frank A. Cowan, of the American Telephone and Telegraph Company, without knowledge of the previous work but aware of the difficulties with vacuum-tube modulators, became interested in the possibility of using non-linear resistances. He explored the characteristics of the newly available thyrite, as well as copper-oxide, and demonstrated the operation of a copper-oxide modulator on a Type-C carrier system. On May 22, 1934, Patent No. 1,959,459 was issued to him on the bridge-type modulator employing non-linear elements such as copper-oxide. On December 24, 1935, Patent No. 2,025,158 was also issued to him covering the ring-type modulator. These two modulator circuits, simpler in form than the Keith circuit, have found a wide field of use in this country and throughout the world. The simpler bridge arrangement, which suppresses the carrier but permits the modulating signal to pass, is used principally for individual channel modulation and demodulation. The ring type is used where suppression of the modulating signal as well as of the carrier is desired, such as in group modulators.

The copper-oxide units originally available were not well suited to use as modulators, and W. F. Kennenberg spent the better part of a year in intensive research to determine how to make satisfactory copper-oxide units. Still further improvements were made in the Research Department under the direction of Dr. J. A. Becker. As a result of these extensive efforts, the copper-oxide modulator was made not only acceptable, but also very simple, stable and dependable. It has displaced vacuum-tube modulators in practically all new carrier systems in the Long

Lines Department and in the Associated Companies, and is used at frequencies from zero up to several million cycles per second. Over 50,000 such modulators are now in use in the Bell System.

Direct-Viewing Cathode-Ray Tube Receiver

The merits of direct-viewing television systems were set forth by Allen B. Du Mont, who heads his own company engaged in the development and manufacture of cathode-ray tubes and equipment, including television receivers and transmitters, before a recent meeting of The Institute of Radio Engineers, in New York. Stated Dr. Du Mont:

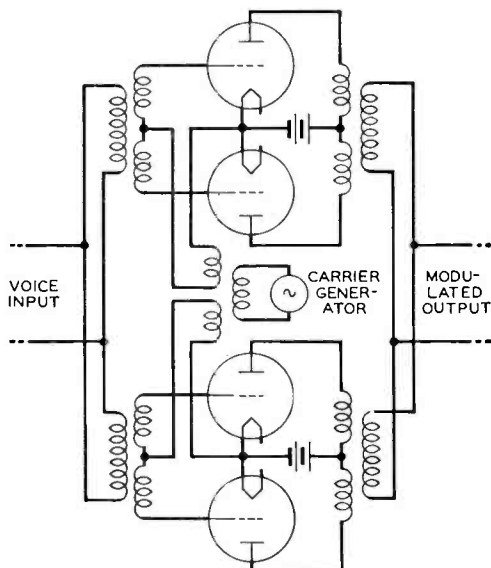
"In the past, and also at the present time, the direct-viewing cathode-ray tube has been used almost universally in all oscillograph, television and radar applications with very satisfactory results. The tubes that have been used previously for television ranged in size from 5" in diameter to 14" in diameter. Because of the desire on the part of television viewers for a larger picture, a 20" tube has been developed with a reasonably flat face. This tube utilizes a pressed face in order to economize on manufacture and insure uniformity of product. It is possible with this tube to obtain a picture 13½" x 18", which our experience has shown is of a satisfactory size for any ordinary home living room.

The principal advantages obtained with the direct-viewing cathode-ray tube are: high light brilliance, better contrast range, wide angle viewing, lower accelerating voltage, longer life, better resolution, less alignment difficulty, and simplicity of the focusing system. It would seem from this list of advantages of the direct-viewing cathode-ray tube as compared with projection systems, that there should be very little question as to which is the most satisfactory providing any picture larger than 13½" x 18" is not desired.

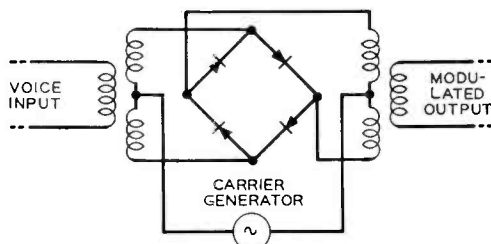
"The disadvantage of the direct-viewing cathode-ray system is a slight curvature of the screen and the need for a special mounting arrangement to reduce the depth of the television receiver in the larger bulb sizes. For instance, the length of the 20" tube is 31", but by using a mechanical arrangement so that the tube is only in a horizontal position when being used, the depth of the cabinet can be held to 24".

"Taking up the various characteristics of the direct-viewing cathode-ray tube television receiver in detail, we find that the high light brightness of the 20" tube is in the order of 20 foot lamberts as compared with approximately 3.5 foot lamberts for the most efficient projection system now in use. In both cases the size of the picture is considered to be 13½" x 18".

"One of the big advantages of the higher



VACUUM-TUBE MODULATOR



COPPER-OXIDE MODULATOR

light brilliance is the fact that the 20" tube receiver can be used satisfactorily in a quite brilliantly illuminated room and an ambient light level as high as 5 foot lamberts can be tolerated without seriously impairing the picture quality. On the other hand, with the projection system only about .5 foot lamberts average ambient light can be tolerated. It is interesting to compare the brilliance of the 20" picture with that of the normal commercial 35 mm screen, which averages between 6 and 10 foot lamberts.

"As regards the brightness ratio, or contrast range, the 20" tube has a contrast range of approximately 35 as compared with a contrast range of 17 for the projection system. This is an extremely important characteristic of the television picture and in many cases the lack of contrast range gives people the impression of poor resolution.

"As to directivity (maximum viewing angle from the normal—angle at which the apparent brightness decreases to 50% of its value in normal direction) we find that the 20" tube can be viewed from $\pm 80^\circ$ whereas the projection system screen can only be viewed from $\pm 15^\circ$. It of course is possible to widen this angle somewhat in the projection system but in so doing the high light brightness will decrease from its already low value.

"In making these comparisons we have assumed an accelerating voltage on the 20" tube of 15 kilovolts, and 30 kilovolts on the 5" flat face tube of the projection system. It is obvious that the lower accelerating voltage of the direct-viewing tube effects certain economies in the manufacture of the receiver.

"The anticipated life of the 20" direct-viewing tube should run considerably above 1,000 hours, whereas with the present tubes used in the projection system the anticipated life is from one-half to one-third that of the direct-viewing tube. This is because of the higher accelerating voltage as well as the much greater concentration of energy per unit of area in the projection tube.

"With the 20" direct-viewing tube, the spot size is sufficiently small to resolve any 525 line television pattern or even higher with a well-designed deflection yoke, whereas care must be taken with the 5" tube used in the projection system to obtain full 525 line resolution.

"Forgetting about the size of the spot for the moment, we have noticed that the resolution on the 5" projection tube is considerably reduced by light scattering on the fluorescent surface as well as on the translucent projection screen. With the direct-viewing tube, all the elements are aligned within the glass envelope, whereas with the projection system the tube and optical system have to be very carefully lined up and any slight inaccuracy of this line-up will seriously interfere with the resolution of the picture.

"In order to focus the picture on the direct-viewing tube, it is only necessary to make an electrical adjustment, whereas with the projection system both electrical and optical adjustment are necessary. Furthermore, the lenses and translucent screen of the optical system, and in some cases a mirror, are not encased in vacuum and the picture is subject to deterioration with age unless the mirror, translucent screen, and lens surfaces are carefully kept clean.

"As regards the cost between the two systems, at the present time there seems to be very little to choose between. In the one case we have the cost of the 20" tube and

its special mechanical arrangement for putting it in the horizontal position during use, and in the other case we have the cost of the 5" projection tube, its optical system, usually a mirror, and a translucent screen.

"As previously mentioned, the voltage on the direct-viewing tube is 15 kilovolts as against 30 kilovolts with the projection system, so that there is a saving here in the case of the direct-viewing tube.

"As regards the design of the cabinet, with the 20" tube it can be somewhat lower than with the projection system although the maximum depth is slightly greater as compared with the projection receiver.

"This comparison has been made mainly taking into consideration the actual results obtained to date with the two systems. Undoubtedly improvements will be made in the projection system but it is also reasonable to assume that improvements will be made in the direct-viewing tube. If we desire to go to a larger picture than $13\frac{1}{2}'' \times 18''$, as previously pointed out, some type of projection system is imperative."

FCC News Release No. 84374

August 24, 1945

The Federal Communications Commission today issued a summary of the rules it is now formulating for FM broadcasting to enable manufacturers, licensees and applicants to proceed immediately with development plans.

In the more populous Northeastern section of the country (Area I) with its heavier frequency needs, the Commission will increase the number of channels originally allocated to FM from 70 to 80. This will be done by taking over the two megacycles between 106 and 108 Mc initially reserved for facsimile. These two megacycles, however, will continue to be available for facsimile in the rest of the country and facsimile will also have 10 Mc between 470 and 480 Mc.

The Northeastern section will be able to have at least as many Metropolitan FM stations as there are existing stations (whether high or low power) plus as many as 50 per cent more in most communities. Sixty channels are allocated for Metropolitan stations having, in general, 20,000 watts power and a 500-foot antenna. In addition, this section will have 20 channels for community stations, with main studio located in the center of the city served and limited to 250 watts power and a 250-foot antenna.

Preliminary studies by the Commission indicate that under this plan all listeners in the Northeastern area, whether urban or rural, will have the opportunity of a choice of at least several FM stations, with many listeners a choice of a dozen or more. The Commission intends to scrutinize closely the licensing of stations in this area to make sure that this result is achieved. If it should develop that some listeners in this region do not receive satisfactory service, the Commission will take appropriate remedial action either by the licensing of Community stations or by adjusting service areas of Metropolitan stations in an appropriate manner.

Since it is not possible to allocate rural stations in Area I, the type of service to be rendered by the Metropolitan stations will have to meet the needs of the rural listeners residing in this area as well as the urban listeners.

The remainder of the nation will have

70 FM channels, 10 for Community stations and 60 for Metropolitan and Rural stations. The Metropolitan stations in this area are designed primarily to render service to a single Metropolitan district or a principal city, and to the surrounding rural area.

It will be the policy of the Commission to take all appropriate steps to insure rural coverage.

Other rules reported on by the Commission today:

1. All FM stations will be licensed for unlimited time operation and initially will be required to operate a minimum of six hours per day.

2. No rules or regulations are being adopted at this time concerning program duplication (Commissioner Durr dissenting).

3. No person may own more than one FM station in the same community. No person may own more than one station anywhere except upon proper showing. In no case may he own more than six.

4. No rule is being adopted regarding ownership of FM stations by present AM licensees.

5. The chain rules will apply to FM.

6. Sharing of antenna sites will be required, under certain conditions.

7. No rules are being adopted regarding booster stations but applications will be considered on their individual merits.

8. The Commission does not propose to reserve any FM channels from assignment at the present time (Commissioner Durr dissenting).

9. FM stations will be permitted to transmit simplex facsimile (images only—without sound) during the hours not required to be devoted to FM aural broadcasting. Provision will be made for experimentation with multiplex transmission of facsimile and the aural broadcast programs.

Instructions will be issued to all FM licensees and applicants in the near future concerning the procedure to be followed in bringing their applications up to date.

The 20 channels from 88 Mc to 92 Mc allocated by the Commission to Non-Commercial Educational broadcasting are not affected by the report issued today. Rules governing that service will be announced later.

(Commissioner Durr dissented in Items 2 and 8, above).

Plans for the construction of a modern single story building in which it will center its activities were announced by the Hallcrafters company, producers of high frequency radio equipment. Ground was broken for the structure on Thursday (Sept. 6). Cost of the building, which will be erected at Kostner and 5th Avenues, will be \$600,000, according to William J. Halligan, Hallcrafters president. The site, comprising 175,000 square feet, was purchased from the Reconstruction Finance Corporation in August, 1944, for \$65,000.

WHIO's Dayton, Ohio, trailer is 25 feet long and is equipped with a short wave transmitter and a General Electric wire recorder as well as an audio amplifier. It is powered by a 1,500 watt gasoline generator. The purpose of the trailer is to broaden the station's opportunities for direct broadcasting of important events.

Recordgraph Proven as a Valuable Aid to News Broadcasters

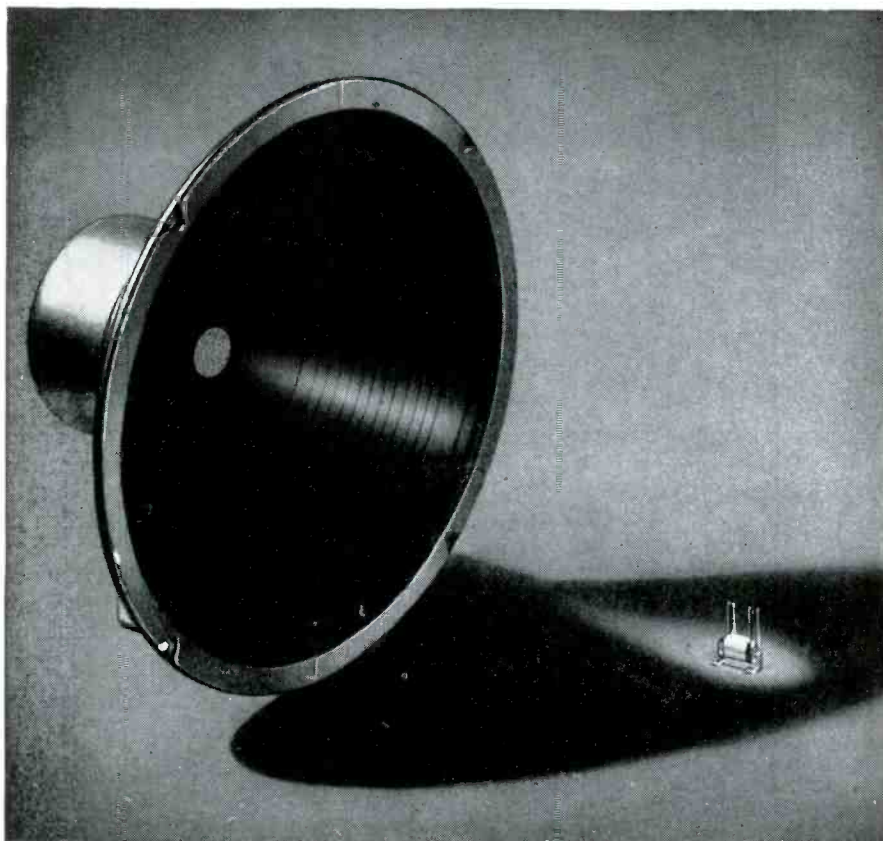
The importance of the Recordgraph film recorder as a means of "capturing" on-the-spot news situations which would otherwise be lost was graphically displayed just prior to and during the recent V-J Day activities. Within a few minutes of the time Russia entered the war against Japan, Florence Warner, director of education and public service for Station WOL in Washington, appeared at the Chinese Embassy with a Recordgraph, and as a result obtained an exclusive recorded interview with Dr. Wei Tao Ming, which was broadcast over the full Mutual Network that evening. Again taking her Recordgraph film with her, Mrs. Warner went to the White House gates and obtained a number of interviews from people waiting through the night for the good news. The same evening, after the official surrender proclamation by the President, Mrs. Warner was in the lobbies of the Hotels Statler and Mayflower, obtaining a number of recorded interviews, one being an exclusive statement from J. A. Krug, chairman of WPB, which was broadcast within a few minutes of its recording.

In New York Dale Morgan, Harold McCambridge, George Ellis and Stan Hall of WHOM were busy with their Recordgraph film recorder gathering interviews with their "Inquiring Mike" throughout the night which were aired shortly after being recorded. The next day Dale Morgan took a Recordgraph to a service station on Long Island, getting comments from attendants, owners and customers on the lifting of gasoline rationing.

Harold Henig of WKIP's Poughkeepsie, New York, special events staff, used a Recordgraph film recorder when he covered the 100th Anniversary of the Dutchess County Fair at Rhinebeck, New York. With his recorder he gave a running commentary on the fair and interviewed a number of spectators. The recording was worked into a 15-minute show which was broadcast at 7:30 P. M. and repeated at 9:30 that evening.

First Lieut. Robert Corenthal has returned to the Terminal Radio Corp., 85 Cortlandt Street, New York City, to resume his position as advertising and sales manager, after three years as a pilot in the Army Air Forces. Lieut. Corenthal joined the Air Forces on June 4th, 1942, and was stationed at various Army airfields in this country until sent overseas in February, 1944, as pilot of a Flying Fortress. He served in Africa and Italy in this capacity and participated in the first shuttle bombing missions to Russia. On his 42nd mission, the heavy bomber he was piloting was shot down August 28, 1944, over Austria. After parachuting to safety, he and his crew were captured and imprisoned in Germany, until liberated on April 29, 1945, by General Patton's 3rd Army. Lieut. Corenthal has been awarded the Distinguished Flying Cross, Air Medal with three Oak Clusters, Presidential Unit Citation and wears five Battle Stars on his European Theater campaign ribbon. Previous to joining the Air Forces, Lieut. Corenthal had been advertising manager of the Terminal Radio Corp., one of New York's largest radio supply houses, for four years. During this time, "Corey"—as he is known to his many friends in the radio field—was well-known in amateur radio and private flying circles.

Broadcast Engineers' Journal - October, 1945 **29**



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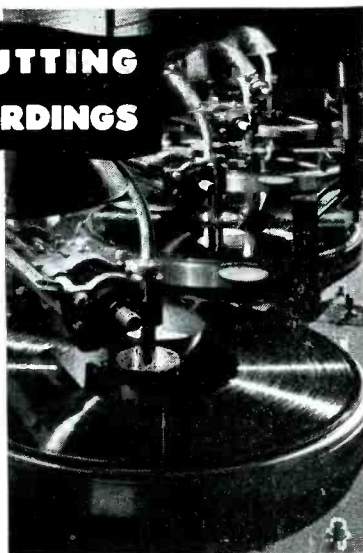
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What's new?

by
**JORDAN
MCQUAY**



PEACE brings many questions to the attention of the radio world—questions that industry has been putting off, unanswered. Questions that industry has tried to forget about, believing the war to last at least another year. Now—when it's later than most people think—these questions become agonizing, annoying. To name a few: What about the new receivers? Will they incorporate FM? What about television? Is TV and FM really ready for nationwide marketing?

* * *

As predicted in this column some months ago, the new sets—due on the market within sixty days—will be new in name only. Their technical design, at least, will stem from prewar days. Even in new cabinets they won't be hard to recognize. All this will change, of course, as manufacturers concentrate on the future instead of the present. A year from now radio sets will resemble glorified neon-lit jukeboxes complete with many "extras". By that time the circuits will have undergone considerable improvement. Console models will include f-m and a-m, and phonograph combinations will be prolific. The accent will be on larger sets. Market for small radios will be limited.

* * *

Radio manufacturers—like everyone else—intend to "cash in" on big sales during America's forthcoming prosperity era. Present depression trends will continue not longer than six months, and then surge upward into an era of unequalled prosperity. Radio-electronics-television industries are expected to lead all other industries in scientific advancement, rapid changeover to new designs, and, most important of all: sales. Particularly, watch television. Advertising agencies, holding the purse-strings of many, many radio sponsors, say that television is the greatest advertising medium of all time. They have millions of dollars to back up their statements. They can easily outdistance the networks—and make no secret of that ambition.

* * *

First post-war designed radio receivers are expected to reach retail stores during the first week in December. A new year of peace will see the beginning of unprecedented competition in this radio field. One hundred new radio manufacturers are now preparing to enter the radio receiver market.

* * *

First news color picture ever transmitted by radio reached America during Potsdam conference. Special one-shot camera was used at the initiating, German end. Camera exposed three negatives simultaneously, each with basic color filters. Three black and white prints were then made from each filtered negative, and transmitted by radiotelephoto to Washington. Combination of the three prints resulted in full color shot of the "Big Three" at Potsdam—the first of its kind ever transmitted by radio.

Sun Valley Lodge, Near Kechum, Utah

WOW's Chief Engineer, Bill Kotera, and Chief Newscaster, Ray Clark, spent several days at this beauty spot recently. They went there to interview the men resting up after the horrors of Tarawa, Bougainville, Leyte, and other Pacific hot spots.



Thirty-two recordings were made and twenty-eight of them were sent to the home towns of the men for broadcast over a station in their community. The other four were used on Clark's own program "The Noonday Forum." Clark left Sun Valley for San Francisco and then Guam where he is now covering events in that theater.

WHAT'S NEW?

(Continued from
Page Thirty)

Seventy percent of the intercept operators employed by the FCC's Radio Intelligence Division during the war were radio hams. Their job was keeping watch on the entire radio spectrum, locating illegal transmitters in the U. S., monitoring enemy broadcasts, and other radio intercept duties. A good job well done by radio-amateur professionals.

* * *

Ten more FM channels were allocated to broadcasters in the Northeastern states, opening the way for the establishment of as many FM stations as AM stations now exist. Total of seventy bands will be allocated by FCC to remainder of U. S. But the problem of rural coverage is still unsolved, unanswered. Can never be satisfactorily attained by use of frequencies at and around 100 megacycles.

* * *

Pocket-sized radiotelephones for civilian use will be on the market within four months, manufactured, in almost every case, by concerns previously engaged in radio war work of one kind or another. Sets will cost about 25 dollars apiece, and will be effective up to distances of three miles. They'll operate in the unlicensed u-h-f band set aside by the FCC for such local purposes. One line of radio telephones will operate on frequencies between 460 and 470 megacycles; set will be less than six inches high, and weigh about a half pound.

* * *

Most phonographs—particularly automatic ones—suffer some degree of tracking error—due to the tracking angle of the pick-up head. Distortion is only one of the bad effects. There's often considerable side-thrust on the record grooves, causing unnecessary wear on the grooves of the record. Solution: Tracking error can often be eliminated or at least minimized by bending the pick-up arm to change the off-set angle. Overhang of the needle will also help to kill unwanted distortion.

* * *

More than 52,900 separate radar sets—of 64 different

types—were supplied the government by Western Electric during the war. This equipment was valued at about \$800,000,000. Some idea of the magnitude of the radar industry can be realized from the fact that this represented only a fraction of the total radar contracts, that there are more than 100 different kinds and types of radar equipment used by the Army and Navy.

* * *

First piece of radio equipment landed on the soil of Japan by our C-54's was the world's biggest "portable" radio set, the Signal Corps' Flying Circus. The set is housed in seventeen large trailers, is a "fixed" station pumping sixty kilowatts of power into a rhombic—in this case beamed at our nearest island base: Okinawa. Station carries its own power supply, and can be made completely mobile in less than 24 hours.

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ROCHESTER NEWS . . . By Art Kelly

OCTOBER has rolled 'round again and up here in Western New York State we ops are thinking about football, getting the coal bins filled, checking the car over for cold weather driving and thoroughly enjoying the experience of seeing our familiar landscape transformed into the beautiful colors of autumn. Rochester, you know, is located in the Genesee Valley which has been so well written of by Carl Carmer and Walter Edmonds. It is flanked also by the Finger Lakes Region and on the west by the plains of the Niagara Frontier. These regions are conceded by many to be among the most picturesque in the world. Now, with gasoline for the asking, the operators of the Rochester Chapter will be spending days off riding through back-hills roads and soaking in the grandeur of a magnificent panorama accented with the flaming colors of fall.

You technical minded guys may be thinking "so what" at this point, but don't be hasty. Drive through our primary area some time and you'll agree that this countryside is something to write home about.

Our local Chairman, Charlie Snyder, returned home from the National meeting a mighty tired guy but feeling that plenty of good had come from the meeting.

For several years all the WHAM technical men have been married. The only hold-out of the old gang was Alex Gressens. I say "was" 'cause ol' Alex has weakened and joined us family men. The news, overshadowed only by the end of the war, left us breathless because we all thought Alex would retain the honored position of the WHAM bachelor. After meeting the bride,

however, we immediately see why Alex changed his mind. Mrs. Gressens is indeed charming, and I, in behalf of the Rochester gang, extend to Alex and Valencia our best wishes for happiness and good fortune.

One of the newer ops at WHFM



Bob Brethen (Right!)

(Stromberg-Carlson's FM station) is Bob Brethen. It turns out that Bob has been hiding his light under a bushel, at least from us. We've discovered that Bob is a veteran of the footlights. He is an accomplished ventriloquist with years of professional ex-

perience. He started his career when 12 years old. Bob left high school when 17 to serve with the Canadian 136th Battalion in the First World War. He was wounded, hospitalized and finally released with a three-month leave of absence. Bob spent that three months touring France with his act. He has played vaudeville circuits, nightclubs, private clubs and his constant companion was Tommy, the dummy pictured above with Bob. And incidentally, Tommy was made by the same craftsman who made Charlie McCarthy. Edgar Bergen is a personal friend of Bob's and has visited him many times at his home. You can just bet your last dollar that the Rochester Chapter will ask Bob to bring Tommy to the next Chapter meeting. In fact we're thinking of making Tommy an honorary member of our gang. Imagine a dummy in NABET!!

Bert Allis of WHEC had the living day-lights scared out of him recently. While standing watch at the transmitter he thought his career had ended when a husky bolt of lightning hit the tower.

Fran Sherwood, chief transmitter op at WHEC, is all hopped up at the prospects of the "ham" bands opening again. For that matter so are the guys here at WHAM. Let's start a NABET roundrobin on the "ham" bands!!

Craig Williams, control op at WHEC, went fishing recently. On the way home he broke three spring leaves on his car. Naturally, he says the weight of the fish in the back of the car did it!!

John Vrindten is a new Transmitter op at WHAM. He comes from WMFF at Plattsburgh and takes the place of Les Minor who has headed for Florida. 73—Kelly.

DOINGS IN DENVER . . . By George Pogue

DENVER, along with the rest of the world, has been in a turmoil of excitement over some of the greatest events in history since the beginning of time.

When President Truman announced that Japan would accept our peace terms at 5:00 P. M. MWT, the crowd out in front of the NBC building went wild. Vern Andrews went down to the shop and got a pac set ready to take out with Cecil Seavey (Special Events) into the crowds that poured into the streets from everywhere. There seemed to be a feeling of necessity for people to gather and share their jubilation with everyone else. Many were interviewed on the cross country pick-up of NBC. Vern and Cec were pushed from one end of Sixteenth Street to the other, and both said they had never seen such mobs as that.

On that same momentous day we had a bit of comedy in our Newsroom. There had been a great deal over the net and much was repetitious so the program manager decided that we should carry our regular local newscast. Liz (Elizabeth) Mellor came tearing into the control room with the most tragic look on her face looking for Seavey. The announcer had just added the news copy for this program to the rest of the litter of papers that came floating out of windows of offices onto the street. Good old teletype!—

They finally collected enough news for the program but we doubt that any critical people were interested just about that time. Later other engineers tried to go out with the pack set with the special events department but the crowd really took toll as all came back with a "beat down" look on their faces.

KOA had its second annual picnic for personnel and wives, families, and sweethearts. It was held at Genessee Mountain again this year. The menu included fried chicken, sandwiches, beer, coffee, cake, pop, and watermelon along with potato salad and pickles and olives and other trimmings. A softball game was one of the main attractions with almost all participating and the beer barrel at home plate to revive the runners as they scored. There were also races and contests of various kinds with very worthwhile prizes for the winners. The transmitter gang was there in almost full force with an unexpected guest whom we were all glad to see. He was Lt. Comm. Jesse A. Slusser, who has been stationed in England. He came home without a scratch but was wounded when he broke a ball bat on a hit in the softball game. "Sluggo Slusser" he was known—as in the old days! Every one went home satisfied and declared it a good party though there was only one

barrel of beer this year so the picnic couldn't continue at one of the fellow's house as it did last year when some one copped the extra barrel.

The fellows on vacation now can take real ones since the gas rationing has ended. Joe Rohrer and Aubrey Blake from the studio are taking nice trips. Aubrey is over on the western slope getting in some good fishing and a lot of peaches to can from the fruit belt over there. Clarence Peregrine just returned from vacation and spent most of his mountain climbing. Russ Thompson also has just returned. He spent his vacation on the Thompson Canyon (no similarity, etc., etc.) fishing. His cabin was just out of Estes Park. Joe Turre, now on his vacation, has of course, also left the city since he can get gas.

Another VJ break is the return of Hams on the air on the 112 mc. band. The first to get on the air are Milt Hall (W9QSR) and Garland Dutton (W9FKR). Francis Nelson (W9CZR) is busy getting his rig in shape so that he can be the next one. Russ Thompson and Carl Nesbitt hope they will make it soon too.

Well, there seems to be no news from up Greeley way this month so guess this had better be 73 from Denver so we can get this in the mail and meet Stoltzy's dead line. So long.



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