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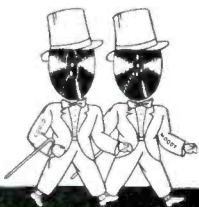
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The Ultra-High Frequencies

(NOTE: The term ULTRA HIGH FREQUENCIES is generally accepted as relating to those frequencies of the radio spectrum lying between 300 and 3000 megacycles. These radio waves, between 10 centimeters and 1 meter in length, are sometimes known as microwaves or centimeter waves.)

First in a Series of Articles on Microwave Transmission and Reception

By Jordan McQuay

POST-WAR development in the fields of radio communication, broadcasting and television will see a marked increase in the use of the ultra high frequencies.

This will be due to a number of reasons, chief of which will be the crowded condition of other (lower) frequency bands in the radio spectrum. The greatest problem facing the Federal Communications Commission upon the cessation of hostilities will be the allocation and *reallocation* of frequency bands to the various radio and related "air utilities". It will be necessary to find room "on-the-air" for countless thousands of electronic devices to be used for radiolocation purposes by airlines and the government, and for the many television and facsimile stations, high-speed point-to-point communication circuits, and airways communications and control devices—all of which will begin regularly scheduled transmissions. In the face of probable increased radio communication and broadcasting activities on the *present* (lower) operating frequencies, the problem of finding "room" for these many new radio developments will be a stupendous one.

However, one important fact should be noted.

A great many of these new radio and electronic devices and systems can be operated very efficiently at extremely high radio frequencies, using waves only a foot or so in length.

Extensive use of ultra high frequencies thus provides a simple and logical solution to our problem of a crowded radio spectrum. And this is exactly what can be expected when the war is over. Post-war radio and electronic operation will extend well into the microwave regions which, up until the last few years, seldom were used beyond experimental laboratories. U-h-f operation is no longer a complex mystery; it is a usable medium for a great many specialized types of radio transmission and reception.

The radio operator or engineer of today no longer looks upon microwaves with a detached interest of tolerance. Your future "bread-and-butter" may well depend upon your ability to work with radio waves only a centimeter or so in length!

It is a certainty that radio broadcasting stations and networks will use these short wave lengths for operation of nemo field equipment—such as "beermugs", portable "pack" transmitters, and other transportable short-distance pick-up equipment. Relay broadcast transmission will function on

frequencies in the u-h-f band. Some types of television apparatus will operate in or very near the microwave region, especially for installations in large cities.

Make no mistake about it! The ultra high frequencies are here to stay!

And aside from the important frequency-band consideration already mentioned, there are a number of other important reasons why centimeter wave lengths will be widely used after the war.

For one thing, under a new system and conception of radio transmission, huge amounts of power can be generated from physically small power units. It will be easily possible for certain pulsed transmitters to generate over a megawatt of output power at any of the ultra high frequencies. These large amounts of power (if required) can be directed in a thin, narrow beam of energy (much in the manner of a searchlight) for a further conservation of radio energy; in other words, a u-h-f transmitter can be pointed directly toward a target receiver or receivers to increase the power efficiency of the system.

But the chief attribute of u-h-f apparatus is the extremely small physical size of the components—as compared to those used at lower frequencies. This permits a conservation of space and materiel, allowing the use of u-h-f equipment under certain mobile conditions which would certainly not be possible with longer wave lengths. The comparatively small size of the u-h-f components, however, greatly increases the critical operation of many types of circuits—making them quite difficult to tune and adjust.

And there are other limitations to u-h-f operation, chief among these being that of distance: the maximum, usable range of transmission. The ultra high frequencies cannot supplant r-f systems of lower frequency which *blanket* large areas (such as broadcast stations, etc.), but u-h-f apparatus has some interesting ramifications which will be discussed shortly, and which make u-h-f ideally suited for *certain* kinds of directional service over short or long distances. The comparative limited range of u-h-f can be turned to an important advantage, as will be shown later.

All of the basic technical principles of radio operation at the lower frequencies serve equally well at the ultra high frequencies. *However*, u-h-f circuits *also* incorporate many techniques which differ radically from those of lower frequencies—some of which are more closely allied to light

wave lengths than to electrical wave lengths. Efficient work in the u-h-f region depends not only on a sound knowledge of specific u-h-f technique alone, but on the theory and techniques of almost all the frequency ranges up to the u-h-f range as well.

For the present, however, we are concerned only with *general* comparisons and considerations, and no attempt will be made here to treat the general subject of u-h-f in any great technical detail. That will come later, in succeeding articles. But these are a few of the things you should know about u-h-f operation, where radio waves are no longer than your fingers.

Being extremely short in length, u-h-f waves will oscillate at extremely high frequency, of course—actually billions of times per second. In fact, the frequencies of alternation are so fast that they are almost as high as the frequencies of light waves.

Which brings us to an interesting analogy.

Because microwaves have frequencies *almost* as high as light waves, in *some respects* they can be considered and dealt with as light waves—while retaining all of their radio-frequency characteristics and idiosyncracies. For example: Centimeter radio waves may be directed by means of a paraboloid reflector in precisely the same way that light waves are reflected and directed.

Another propagation characteristic of microwaves is that these waves are deflected differently than radio waves of lower frequencies. Radio waves on the broadcast band, for instance, reach a receiving site by many reflected paths, involving the ground and various layers of the ionosphere—factors which are influenced by the time of day or night. Ultra high frequency waves, however, do not possess these “bouncing” characteristics which are normally associated with the sky waves of all lower frequency radio transmissions. At ultra high frequencies there is no ground wave. And the sky waves serves no useful purpose, because the waves are too high in frequency to be reflected back from the ionosphere; u-h-f sky waves pass directly through the ionosphere and are lost in space. This leaves only one component of propagation which can be used for u-h-f transmission: the direct wave or direct ray.

The direct wave travels in more-or-less of a straight line, following the physical laws governing light waves, and radiates in a direction determined by the type of transmitting array or antenna. This direct wave is the principal propagation component of centimeter waves, as just explained, and is not affected by time of day or night or other weather factors which influence radio transmission and reception at the lower frequencies. While there is a sky wave component, it is not of particular importance, and with suitable directive antennas ceases to exist. Under very unusual ionospheric conditions sky waves *may* be reflected back to earth—usually at great distances—but these reflections are extremely rare and unpredictable, and the sky wave component cannot be relied upon for reliable transmission at these high frequencies.

The *direct wave* is the important medium of u-h-f operation. But this does *not* necessarily imply that the transmitter and receiver must be within sight of one another! An early fallacy of u-h-f technique stated that microwaves were only useful to the horizon; that is, the transmitter and receiver must be in sight of one another, in order to effect satisfactory operation.

This is not true.

U-h-f waves certainly *do have limitations* as to extreme distances (when both transmitter and receiver are located on the ground), and they cannot ordinarily be employed to blanket large areas as do high-powered broadcasting stations of lower frequency. *But* u-h-f transmissions are *not* limited by so-called “line of sight”—as expostulated in many amateur radio periodicals and some magazines. Actually u-h-f transmissions (direct wave) are entirely usable 60% to 70% *beyond* the horizon, depending upon the type of terrain and other factors. A combination of diffraction and refraction of the direct wave produces this “bending” effect, enabling the production of u-h-f transmission up to 25 or 30 miles under normal, ordinary field operating conditions.

It is, of course, highly desirable that both transmitter and receiver be located within sight of one another if possible. But, as we have noted, this is not always absolutely necessary.

In any case, when the transmitter and receiver are both located on the ground, the usable range will be somewhat limited—compared to the huge distances possible (by ionospheric reflection) when so-called “short-wave” transmitters are used for continent-to-continent or round-the-world communication. However, if either the receiver or transmitter is located in an airplane—the path of the direct wave will be increased many times (depending upon the height of the aircraft). Thus, if a transmitter is located in a plane flying at a very great height, reception of the u-h-f direct wave (on the ground) might be possible up to distances of perhaps three or four hundred miles!

If *both* the transmitter and receiver are airborne, operated from separate aircraft, and the power is sufficient,—it is possible to establish reliable u-h-f communication over distances exceeding a thousand miles. Extreme ranges will depend, of course, on many factors.

From all of this it should be noted that u-h-f transmission is accomplished *solely* by the direct wave emanating from the transmitter and reaching the receiver without being reflected by either the ground or the ionosphere.

This technical point is extremely important.

Because it begins to unfold a new conception of the propagation characteristics and possibilities of ultra high frequencies.

When both receiver and transmitter are within sight of each other, regardless of the actual distance, the transmission of radio waves is extremely reliable.

Very little static interference is present in the u-h-f

(Continued on Page Eight)



"WHY THAT'S JOCK!"

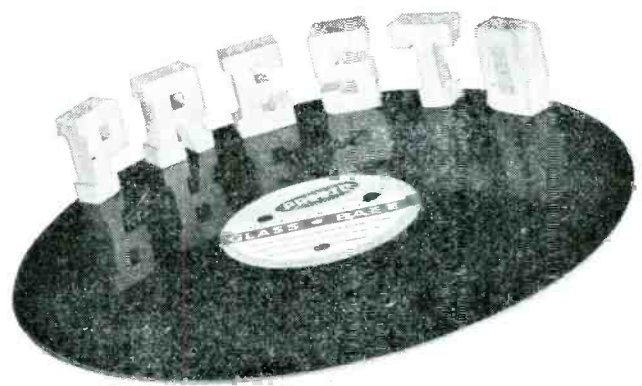


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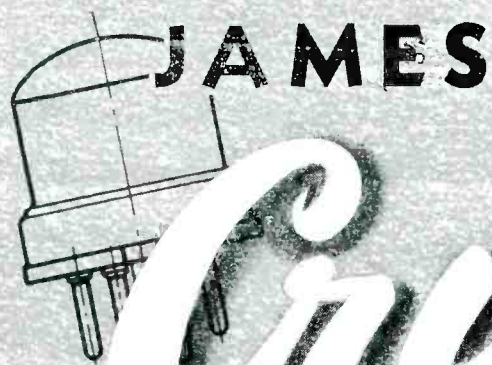


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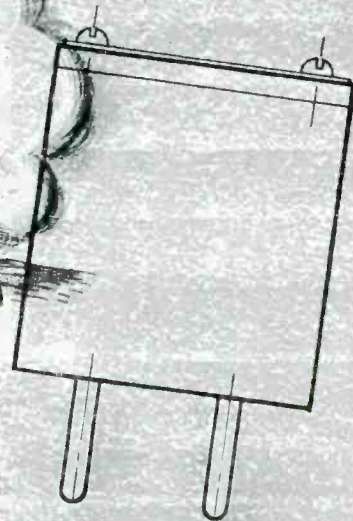
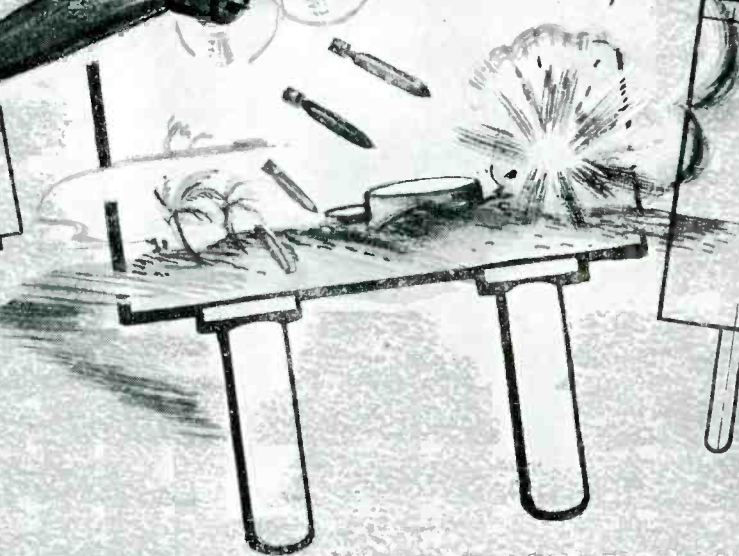
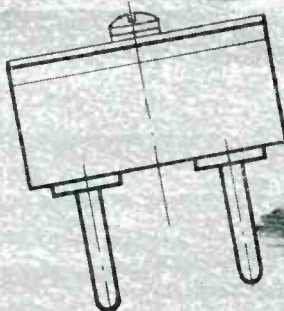
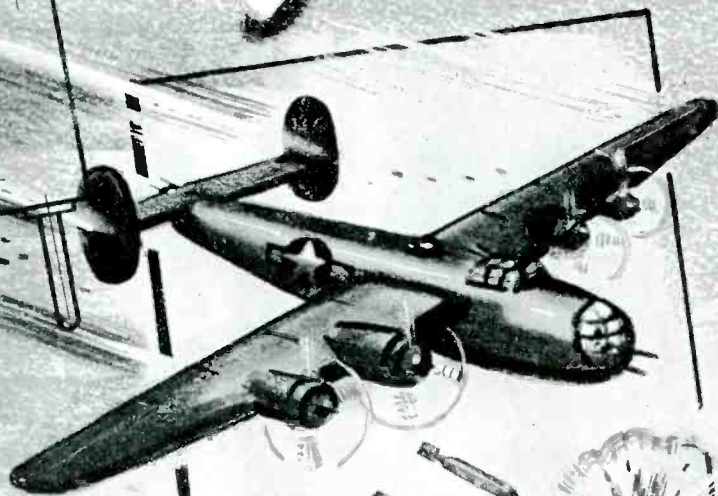
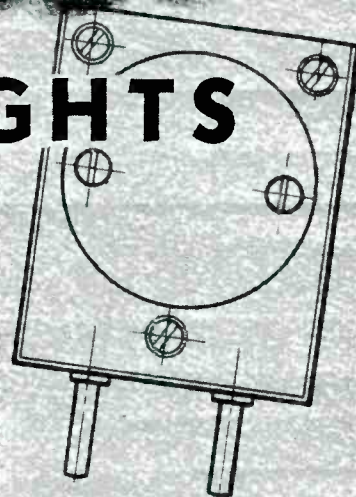
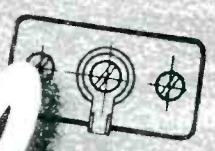
. . . Short-waved again, this time to CBC in Ottawa, the battle-recorded broadcast is then sent over wire lines to the stations on the CBC networks across the Dominion.



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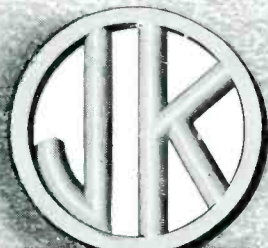
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Elemental Electronics — Part VII

Cathode Followers : : By Jordan McQuay

THE science of Electronics is a study of strange technical paradoxes, involving all possible and many seemingly impossible interpretations of technical laws and theories concerning radio- and audio-frequency circuit operation. Earlier it has been shown that the grids of normal vacuum tubes may often be overdriven with grid-voltage swings far exceeding the actual plate voltage on the tube; it has also been shown that almost any kind of wave shape may be obtained by application of a little technical ingenuity to certain stages of electronic circuits. But one of the most amazing paradoxes of electronics is a circuit which is a derivative of a degenerative feed-back amplifier with cathode coupling—designed to act as a unique, distortionless impedance-matching device. This device is the *cathode follower* circuit which actually *does not amplify at all*.

Degeneration is the process whereby a part of the output energy of an amplifying device is returned to its input circuit in such a manner that the introduced signal tends to cancel the input signal.

If a resistor is connected in the cathode circuit of a degenerative amplifier *without* the conventional bypass condenser, inverse feedback can be obtained. If the output of such a circuit is taken from across this cathode resistor, the circuit is known as a *cathode follower*. The procedure is sometimes referred to as *cathode loading*. In such a circuit, the plate load resistor (if present) is bypassed; in some cases, the plate is connected directly to the plate supply voltage. All of the output voltage from such a device as this, is developed across the cathode resistor.

However, it should be noted that all of the output voltage is in the grid-to-cathode circuit, resulting in 100 per cent voltage feedback. This voltage opposes the original signal voltage in the grid circuit so that the resultant gain of such a degenerative circuit is less than 1. In some cases, the cathode-loaded circuit may actually introduce a slight amount of *loss* in the electronic circuit.

So much for the amplification characteristics of the cathode follower. Now, let's investigate its impedance matching characteristics.

To achieve maximum power transfer from one part of any radio, audio or electronic circuit to another part, impedances must be matched—either exactly (for ideal conditions), or approximately (for most practical conditions). That is, the output impedance of one electronic circuit should be matched to the input impedance of the circuit following. In most radio and audio applications, this matching of impedances is easily accomplished by means of transformers—requiring either a step-up or a step-down voltage. Such

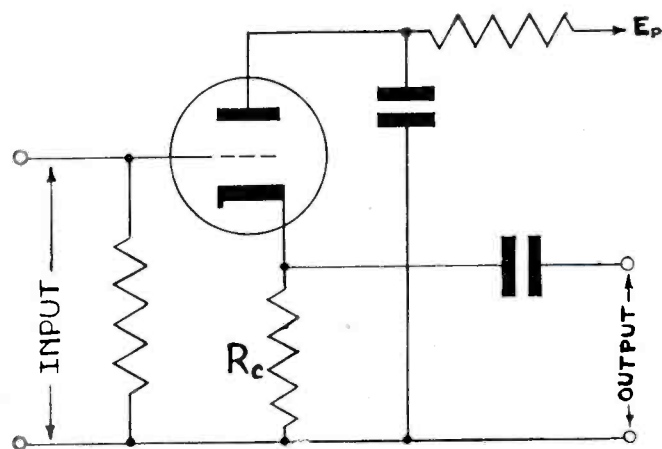


Fig. 1 — A typical Cathode Follower circuit

transformers will not pass a very wide band of frequencies, such as those encountered in electronics work, without introducing serious distortion.

Impedance matching is very important in electronic circuits, and no appreciable distortion of the many complex non-sinusoidal wave shapes can be permitted.

For example, impedance matching may be used to feed ultra-high-frequency energy from a transmitter into transmission lines,—to connect transmission lines to radiating antenna arrays,—and for all general applications requiring the connection of high impedance lines to low impedance lines, or vice versa.

The complex output wave form of one piece of electronic apparatus often may be fed through a coaxial cable to another piece of equipment many yards distant. Distributed capacitance between outer and inner conductors of the coaxial line may present an impedance which varies according to the frequency of the wave shape passing through the line. This impedance variation is, of course, due to changing resonant conditions due, in turn, to variations in effective capacitance. This capacitance may be charged each time a wave shape passes through the coaxial cable. Thus, there may be a loss of power, in addition to considerable distortion of the complex wave shape.

The output impedance of most amplifiers is generally rather high. If such an amplifier fed a coaxial cable (of low impedance) into a low impedance circuit, there would be considerable loss of power and appreciable distortion due to this mismatch of impedance.

All of these difficulties are overcome by the cathode follower, which permits the transfer of power with very little or no appreciable distortion. When an electronic

(Continued on Page Eight)

Ultra-High Frequencies

(Continued from Page Four)

region. Magnetic storms occasionally give rise to "hissing" or "rushing" noises, but the storm must be exceptionally violent in order to produce such an effect. There is no "crackling" static interference at u-h-f, of the type common to lower frequency operation.

Fading of the u-h-f signal at the receiver is quite rare. Any fading which may occur will be very slow in nature, often varying over a period of hours. This is due to variations of humidity and temperature of the lower atmosphere. Rapid fading does not occur at the ultra high frequencies.

Thus far we have considered the general characteristics of u-h-f systems. Now let us consider some of the actual u-h-f circuit characteristics and idiosyncracies, as applied to all types and kinds of microwave apparatus—both receiver and transmitter.

In working with ultra high frequencies it is desirable to have a visual conception of the actual length of the wave being transmitted or received. While this is not necessary in low frequency operation, it is extremely necessary in u-h-f operation. Because the physical size of the u-h-f circuits are inevitably of the same order as the actual wave length.

Every piece of connecting wire—no matter how short—acts as a portion of a transmission line at these high frequencies. Lumped inductance and capacitance are of less importance than distributed inductance and capacitance. For this reason u-h-f circuits are usually analyzed and designed from the standpoint of Transmission Lines.

Tuned sections of transmission lines are often used as oscillatory or "tank" circuits. But coaxial cable is generally used in u-h-f transmission (within the circuits) to prevent losses due to radiation.

When very high Q circuits are desired a special type of component is employed: a hollow-sphere or hollow-space oscillator. This type of oscillatory circuit, in its basic form, is a hollow metal cavity within which oscillations are produced.

Ordinary vacuum tubes cannot be operated successfully at ultra high frequencies, because the electron transit time and interelectrode capacitance become troublesome factors. For these reasons special types of tubes must be used at short wave lengths. In receivers, where no great amount of actual power is involved, "acorn" and "doorknob" high frequency tubes may be employed (such as the types 954, 955, 956, 316A, 368A, et al). In transmitters, where the tubes must handle high power, special u-h-f tubes are necessary. Vacuum tubes such as the Rhumbatron, the Klystron, the Magnetron, and many other types have been designed for this purpose.

The extremely high frequency waves generated in a u-h-f circuit cannot be transported by wires or transmission lines in the normal manner of radio circuits. Instead, special devices known as wave guides are used for the transmission of u-h-f electromagnetic energy. Wave guides are physically

similar to thin, metallic, rectangular piping. The u-h-f waves are shot into these devices and directed to any desired location in the circuit—with very little loss of power due to radiation. The cross-sectional dimension of these wave guides is of the order of half a wave length, so that their physical size is reasonable when used for centimeter transmission purposes.

This article has dealt with only the surface concepts of ultra high frequency operation; it is obviously impossible to condense so broad a subject into one brief article.

For this reason, a number of specialized articles concerning the more important phases of u-h-f design and operation will appear in the *Journal* from time to time in the near future. These occasional articles will deal more fully with the technical aspects of the more important u-h-f circuit components, and it should be noted that much of the information has never before appeared in public print.

Cathode Followers

(Continued from Page Seven)

device requires the transfer of large amounts of power, a number of cathode followers can be connected in cascade.

A typical cathode follower circuit is shown in Figure 1, and the principle of cathode loading can be explained by reference to that diagram. As a positive signal is applied to the grid of the tube, the rise in plate current through the cathode resistor R_c causes a greater IR drop—making the cathode more positive. When a negative input signal is applied to the grid of the tube, there is an adverse effect and the cathode becomes less positive. This produces a degeneration effect, and the wave shape output (taken from across the cathode resistor) tends to follow the exact wave shape of the input circuit.

The cathode follower is an excellent coupling device. The usual coupling condenser, used to connect stages, permits only the passage of the a-c component of the wave shape. The cathode follower, on the other hand, permits the passage of both the d-c and the a-c components of the wave shape.

When a low output impedance is desired with a high voltage output, a number of tubes can be connected in parallel—all of these then functioning as a single tube. Such a large number of parallel cathode followers, operating as one stage, do not present any appreciable load increase over that of a single tube.

Universal Microphone Company, Inglewood, Cal., has fashioned a set of salon pictures of its "History of Communications" advertising series at the request of the Army Chicago Signal Corps Supply Depot for display in their permanent exhibit of electronics production and sources of supply. They may also be included in the signal corps projected traveling educational exhibit. The series is currently running in *Broadcast Engineers' Journal* and other trade and technical publications. Dr. Ralph L. Power, Los Angeles radio counsellor, places copy and the Keith Thomas Studios, Los Angeles, is responsible for the art work.

Francis and Morr

Cleveland Engineers

Join Merchant Marine

By Bert Pruitt

ONE becomes accustomed to personnel changes during these days of reclassification and sudden inductions. You work with someone today, have a day off, return to work and are advised that so and so left for Fort Benjamin Harrison or The Great Lakes Naval Training Station while you were catching up on your sleep. That has happened repeatedly in all radio stations, so the normal departure of two WTAM's engineers would not have been too startling . . . But this departure wasn't normal. Far from it.

J. J. Francis (supervisor) enlisted in the Navy during World War I. During the post-war period he shipped on a tramp steamer as radio operator and saw the world the slow way. Whether he saw it from a port hole or from a deckchair on the poop-deck has no direct bearing on this collection of unusual facts.

All jobs gets boring at times, so J. J. decided to come to Cleveland before his job had a chance to get in that shape. He arrived in town way back in 1924 and immediately arranged an appointment with WTAM's Chief, Eddie Leonard. The appointment evidently went to everyone's satisfaction. J. J. got a job, thus becoming the third engineer to sign the payroll that had not reached the stage where a peep at it was sure to give the station the kind of headache that our present manager, Vernon Pribble, must get when he glances at the yearly overhead.

We signed J. J. to the WTAM payroll in the above paragraph before we gave Mr. Pribble a headache. We had intended to explain that Eddie Leonard and Russ Russell were the two main reasons why J. J. became WTAM's third engineer instead of the first or second.

Several thousand station calls went out over WTAM. The years went by and I walked into the MCR the other day. Supervisor Alvin McMahon pointed his finger at me like a cocker spaniel putting the bee on a pheasant. "Pruitt," says he, "have you heard about J. J. Francis joining the Merchant Marines?"

"Alvin," we answered, wondering if our hearing could be deceiving us, "J. J. was a radio operator in the Navy during the last war and his daughter is a Spar in this one, so why should he join the Merchant Marines?"

"That," answered the Irishman, "is strictly his business and shouldn't concern you in the least!"

Glenn Morr (standing)
J. J. Francis (sitting)



Which lead me to wonder why he had mentioned J. J. in the first place. Was it merely to start the machinery clanging in my inquisitive chamber? If so, his verbal thrust had struck pay dirt. I decided to investigate the rumor.

"Yes," verified Chief Engineer Leonard, "that's true. He and Glenn Morr are leaving for the East Coast next week!"

"Boss," said I, "the only thing that could surprise me now would be to have someone tell me Dorothy Crandall or Nell Steck had enlisted in the Waac's."

"Pruitt," answered he, "even that would fail to surprise me . . . who's leaving next?"

The boss rubbed his head like someone who can't quite decide whether he should call in a Crystal Gazer or go and purchase himself an ouija board to solve his labor difficulties. I decided to depart from his office before his headache got worse.

I ran into Russ Carter on the way out. "Russ," I said, "have you heard the latest?"

"No," came back the SOHIO salesman, "has the second front started?"

"Not that I know of . . . J. J. Francis and Glenn Morr have enlisted in the Marines . . . Merchant Marines!"

"You don't say! When did they decide to do that?"

"I suspected it last January."

"When they leaving?"

"Middle of next week."

"I'll drop by the control room and see them."

J. J. Francis wanted to get in the Navy when the war still looked rosy to the goose-steppers in Naziland. He went over to the recruiting office to see what could be done about getting himself a commission. J. J. is slightly less than five feet tall so the recruiting officer's face beamed with a kind look like the ones often seen when elderly people are in the presence of children.

"What," thinks the recruiting officer, "could have possibly lead this infant to think we want 10-year-olds in the Navy?" But that isn't what he said to J. J. He said with

fatherly affection: "Well, son, what can we do for you to-day?"

"I," began J. J. standing straighter than a Cigar Store Indian in front of a barber shop in Marion, Ohio, "I came over to see what you have to offer a first class radioman . . . I'm primarily interested in a commission."

"What," thundered his highness with the gold braid, "did I understand you to say you want a commission in the Navy? . . . Well, son, you'd better run along and advise your father he cannot get a commission by sending his son down here!"

"Captain," said J. J. recognizing the fact that two full stripes denotes the wearer to be a Senior Lt., "my daughter is a Spar and I'm here to get a commission for myself!"

The surprised Lt. took a closer look at J. J. and soon came to the conclusion that he had depended entirely too

much on size. They went into a military pow-wow and J. J. got as far as the physical. They decided there was insufficient distance between his feet and shoulders to make him a likely prospect for a future admiral. J. J. was disappointed so he tried to get in the Army Signal Corps. The Army advised him that he had voted too many times to make him a good investment for the Army.

The months went by and J. J. heard that Glenn Morr (SE) was joining the Merchant Marines. Morr got a commission as Ensign so J. J. followed suit.

They left for New York on May 4th. And with these two fellows went two of the best liked men in the Cleveland Technical Department. And with them went the cartoonist who has been doing some fine work for the Journal in the last two or three issues. And with them went the best wishes of the entire Cleveland Staff.

Lieutenant Limberg Votes Republican in Georgia

NBC Field engineer - on - leave RAY LIMBERG, a farmer's son born in Wisconsin during '08, won several ribbons for high jump while in high school which proficiency became useful in catching trains and "things"

while in the Field Department. Started in radio during '21 with the proverbial Quaker Oats box and a crystal. Later, acquired a commercial ticket and spent some time on the Lakes and the high seas. Gave up Marine radio in '29 to go with KTNT and then WOMT in the broadcast field. Came with Chicago NBC Field Department in '30. Accepted a commission as 2nd Lt. in the Signal Corps during late '42 and at present a radio officer with the 2nd Signal



Lt. R. A. Limberg

Unit Survey Group with field office in Atlanta, but most of the time spent on the road. Member of ARRL since '24 and an associate of IRE since '27. Claims to be a great northwoods fisherman and asks that Rife vouch for him, which ain't good!!

"Micro Topics", bi-weekly house organ of the Universal Microphone Co., Inglewood, Cal., is reprinting the history of communications ad series that is appearing currently in the Broadcast Engineers' Journal. The Army Cavalry School, Fort Riley, Kans., recently asked permission to use the illustrations and copy for instructional purposes. Lieut. Colonel Cecil Himes is chief of the department of communications at the post.

Raymond C. Bierman has recently been appointed to the post of Chief Engineer of the Permoflux Corporation of Chicago, manufacturers of high fidelity acoustical equipment.

Mr. Bierman (B.S.E.E. Purdue, 1932), was for 7 years associated with NBC Blue Network as studio field engineer and previously with WLW.

His 11 years of practical experience in the broadcast field will undoubtedly prove a valuable aid in designing and building essential broadcast quality into Permoflux products.

As Chief Engineer of Permoflux, his activities embrace the improvement of all forms of acoustic transducers, par-

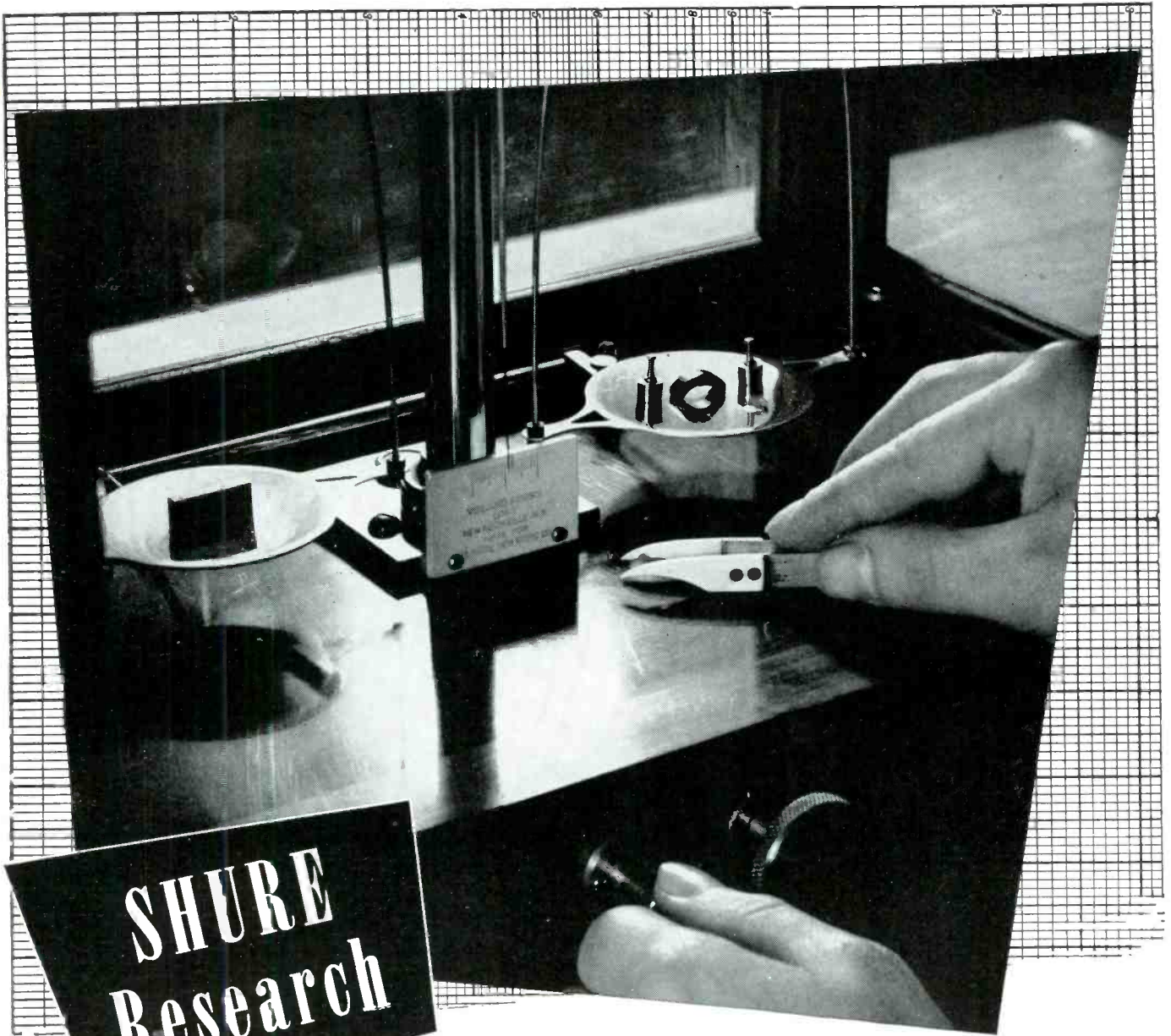


Raymond C. Bierman

ticularly those operating on the dynamic principle using permanent magnetic materials.

An interesting feature of Mr. Bierman's work is the design of factory testing equipment assuring extreme uniformity of all Permoflux production units.

Aside from his radio engineering management activities, Mr. Bierman's chief hobby is flying; he is an enthusiastic amateur pilot.



**SHURE
Research**

...in Magnetic Structures

By the time we finish our present contract for headphones, Shure Engineers will have effected a 3½ ton saving in critical magnetic alloys. Redesign of the magnetic structure effected a saving of three-quarters—so that, today, the magnetic material generally required for one headphone is now enough for four headphones. This has been accomplished with full maintenance of the operating characteristics with the added advantage of decrease in weight. Shure Engineering continues to lead the way to better microphones and headphones for your postwar needs.

SHURE BROTHERS, 225 West Huron Street, Chicago
Designers and Manufacturers of Microphones and Acoustic Devices



FIELD AND SCREAM

By Upsnerk Sassafra

THE Manpower Situation being what it is, there is a definite possibility that you may be called away from your control booth, transmitter, workbench or recorders and assigned, on short notice, to handle an out-of-town broadcast several hundred miles away from the scenes of your usual activities. Chum, this is IT! Latch on while Uncle Sass eases you over the rough spots.

There is no cause for alarm. Put your business and personal affairs in order, pack a bag—a well-greased ouija board dictates the choice of garments and accessories—kiss the kiddies and the Little Woman farewell, and tell them to place a lighted 6SQ7 in the window to guide your way home.

Your arrival at the dungeon wherein your organization stores its field paraphernalia is coincident with the departure of four other guys fully equipped for action—on a grand scale. You are left with an extremely restricted choice of portable equipment (portable equipment: loose term denoting anything that is not an integral part of the building; anything to which a handle can be attached) including one prehistoric monstrosity-type remote amplifier, two battered mikes, one mike cord, no extensions, no mike stands and no headphones. Your outbound colleagues, who are headed for a five-minute sustaining show that could be covered adequately with a magnetophone, have hauled away enough “spares” to cover the broadcast of the political conventions.

Your amplifier is a hybrid, a cross between an uninhibited calliope and an asthmatic outboard motor. Regardless of your frenzied ministrations, every movement of the fader knobs will produce a sound as of coal sliding down a sheet iron chute. The V.I. needle flutters and feints, jumps like a frightened gazelle, and jams hard to starboard. Las Cucarachas, left over from a nightclub nemo, crawl across microphonic tubes and make like Swiss bellringers.

The accompanying accessories are in as pitiful a condition as the state of the art permits. Pack plenty of tools and spare parts; empty all the shelves and drawers; sweep the floor and sift the dust, and throw anything you find into your cases. Anything that rattles or is breakable should be wrapped in old prayer rugs. Now, despite the fact that train time is rapidly approaching and the nearest cab stand is six rainswept blocks distant, you're only half packed.

There is still no cause for alarm. Miraculously, effortlessly, a few minutes later you are going to find yourself tucked snugly into a lower berth, your four cases of equipment stowed around you, on a train purring away into the night. You'll begin to doze, with the reflection that the Field man's life is practically all beer and skittles.

This is a Snare and a Delusion, hatched by a diabolical conspiracy among the broadcasting, taxi and railway com-

panies. Our usually reliable sources report the discovery of hashish burners, adjusted to start cooking one hour before train times, secreted in the airconditioning ducts leading to the Field Department limbo. This fiendish device is responsible for the hallucinations accompanying your departure—the shower of lotus blossom petals, the tinkling of tiny bells, and the fanfares of golden trumpets. The cold, bitter, miserable truth is that if you had as much trouble leaving town as you're going to have immediately thereafter and from then on, you'd never leave.

So now you're hooked, chum. Stuff begins to happen. The train apparently leaves the tracks and churns its way through a succession of abandoned stone quarries. Babies—dozens of 'em—awaken, and bare their tonsils to the moon. Two vociferous drunks experiment with various noisy but unsuccessful methods of pouring a third drunk into the upper above you. However, you eventually lapse into a coma, otherwise you'd escape the discomfort of awakening twenty minutes before the train reaches your station.

Time to rise and shine. Hie yourself to that abode of sunshine and laughter, amity and comaraderie—the wash-room—wherein you discover ten characters enveloped in preprandial gloom and soapsuds. One of the drunks of the preceding evening enlivens the dreariness by trying to shave with a razor minus its safety guard. Get out of there, quickly, unless you dote on crimson polka dot trousers.

The train grinds to a halt at your station, and your career begins. The porters and redcaps line up baggage on the platform. The redcaps hold formal inspection, comparing the weights of the bags. They regard your stuff suspiciously, not even bothering to heft it. Ignore these proceedings. Wait until the coast is clear, hide all the heavy stuff behind the nearest convenient object, and leave one small handbag in plain view as a decoy. This attracts a bevy of redcaps, and in the ensuing scuffle you should be able to knock down a few of the weaker ones and saddle them with your treasure chests. Smile at their gay jests and comments anent the weight. One of them is bound to exclaim: “Hully cheez! Dis guy's a anvil salesman!”

At the taxi platform, the redcaps abandon you to your own devices. Now you meet the taxi drivers. You stand as far as possible from your equipment, but you don't fool anybody. The drivers immediately couple you with something unpleasant, and many cab doors are slammed in your face. The Inside Man at the Skonk Works gets a cab long before you do. Finally, you coerce one of these four-wheeled banditti to take you—and let's be ambiguous—to your hotel. Something is wrong with his baggage compartment handles, so you and your equipage squeeze into the cab. Enroute, the driver mutters bitterly that he coulda hauled t'ree or

four more suckers on dis ripple if it hadna been for your junk cluttering up his hack.

Now the hotel. Let us pass mercifully over the rumpus with the desk clerk in this high-priced rookery and proceed to your cubicle. Entering cautiously, you are confronted with indisputable evidence that the place was quite recently vacated by three goats and a seal act. There is no trace of soap, towels, tissue or bed linen, and water is splashed all over the bathroom and part of the bedroom. Don't become curious about what is under the bed, behind the radiators, in the dresser drawers, or on the top shelf of the closet; don't walk around barefooted, and don't waste your time telephoning for maid service. Instead, call the broadcast location and learn that you were supposed to be set up for dress rehearsal two hours ago.

Don't worry too much about the broadcast. Regard it as merely incidental to a great many other interesting things that are going to happen to you. Don't expect trouble with your equipment until the following times: thirty seconds before air time; during the first commercial; during the middle commercial, and during the closing commercial.

Your instructions are to feed the P.A.: go into a huddle with the individual in command of this device and agree that you'll feed at a certain level from a certain impedance, and that you'll control the house level. All goes well in this department during the warm-up show and until you get on the air, at which time someone, somewhere, starts boosting gain on the P.A., with feedback that curdles your blood. You pull down your feed level 10 d.b. at a clip, yet the pings and howls persist, because somewhere between you and the P.A. speakers your unknown co-pilot, travelling in opposite direction, has a larger fader with bigger steps.

Because you've forgotten to muffle the bells, your telephone, ten feet away from the cast mike, will ring during a dramatic desert scene being enacted by some costly and temperamental talent. The character on the opposite end will want the time and text of the lead-in to the closing commercial, because somebody somewhere has a tie-in. However, even if you or anyone connected with the show had this information, you wouldn't dare talk loud enough to be understood until the band started playing, after which time you couldn't talk loud enough to be understood. Your only response is an audible reminder of your improperly digested groceries.

At long last, an announcer pronounces the magic words identifying your network and terminating the program. Your immediate project is to get aboard a train scheduled to leave in forty-five minutes. Forethought prompted you to purchase a taxicab and driver earlier in the day, so you arrive at the station with thirty minutes to spare. A twenty minute search confirms your suspicion that the redcaps have retired on the booty garnered from you in the morning. If you're going to catch that train, you'd better start making knots. Don't wish for a mere Superman to help with your burdens—this is no job for a boy. Tuck a case under each

arm, grasp one in each hand, bend forward and sink your bridgework into the handle of your personal handbag. Then run. When the lower cases begin to drag on the platform, it's time to pause to correct for elongation of the arms. Pass each forearm through a handle and allow it to rest in the crook of your elbow.

Boarding the train as it starts rolling toward the end of the station (where it will remain for several hours) you learn that your space has been sold to three second lieutenants, a feeble old lady, and you. Retire to the smoking room and sit there all night dreaming up some watertight excuses absolving you of any responsibility for the thorough fashion in which your broadcast was loused up. Start working on your expense account.

There are two schools of thought on the subject of expense accounts. The disciples of the first school insist upon turning in expense accounts immediately upon arriving at headquarters, hoping their quivering and cadaverous frames will move the intermediary between them and the cash register to view the items through a merciful veil of tears. The advocates of the second school—the Realists—take a couple of days off, fortify themselves with sleep and vitamins, consult a couple of Philadelphia barristers—and achieve exactly the same result as the tearjerkers. The intermediary was trained in a tough school (class of '32) and—but further comment on this subject is the equivalent of drawing a rusty razor across one's trachea.

Return to your usual activities and lick your wounds. Life can hold no further terrors for you.

Book Review

Shop Job Sheets in Radio, by R. N. Auble. MacMillan Co., \$1.50 per book

Book I—Fundamentals. Book I consists of thirty "Jobs" or assignments, extremely elementary in nature, starting with how to make a soldered connection, running up thru the making of an audio oscillator, and the study of power rectification with an oscilloscope.

Book II—Service Problems. A logical follow-up of Book I, starting with the testing of various components such as resistors, condensers, transformers, etc. Construction of a power supply, high gain audio amplifier, the superheterodyne from its fundamental principles to alignment procedures. Concludes with transmitter studies of the oscillator, radio frequency amplifiers and doublers, power supplies therefor, and modulation. The work will obviously provide the student with the "know-how" that can only be gained by doing.

Universal Microphone Company out in Inglewood, Cal., has its own invasion baby. It was borne June 6 at 2 a. m. in the Stork Nest, maternity hospital, the first horn of Julia and James L. Fouch. It weighed in at 8½ lbs. and is named Jon Harvid. The father is President of Universal and was its chief engineer for many years previously. In lieu of cigars, he issued rain checks for free seegars when the tobacco shortage is over.

from . . . HOLLYWOOD . . . By Norman Dewes

WELL . . . the column has changed hands again . . . **Mister Jensen** having been duly elected Chapter Chairman, the chore of collecting the chips from Hollywood has been inherited by your erstwhile Blue reporter . . . chairman **Jensen** will have plenty else to do in his new job, and we anticipate **QUITE** a busy time endeavoring to fill the footsteps of **Jensen, Brooke** and **Ferguson** . . . after reminiscing thru some of the back issues of the Journal, we would like to point out that this will be strictly a **WARTIME** replacement.

BUILDING . . . is undergoing its first major alteration since Radio City was opened for business 'way back in '38 . . . space has always been one of the big problems, for we outgrew Melrose early after its completion in '35 and for some time it has been apparent that additions were needed at Sunset 'n Vine. Material shortages precluded such plans, so crowded conditions were alleviated somewhat by knocking out

walls and shifting offices around . . . but the carpenters have finally set up their tents on the Parking Lot. The lower lot is closed and a big chunk adjacent to Studio "H" has been roped off for construction of a housing project for Sound Effects. Rumor has it that Field Supervisor **Joe Kay** has a priority bid in for space for a new Field Shop . . . this would permit storage and maintenance of field equipment right near the garage and loading dock and bring the field gang and gear up out of the basement . . . which Messrs. **Norman, Foster, Bryant, Ragsdale, Platt** and others will allow would be a **VERY** worthwhile improvement. If you've ever gotten back from a **CAMP SHOW** with a truck load of gear and all by yourself at one ayem and the freight elevator sticks and you can't find the night watchman and . . . well, you know what we mean. Will keep you posted on who gets the space.

SUMMER school for radio students starts . . . classes for the Second Annual

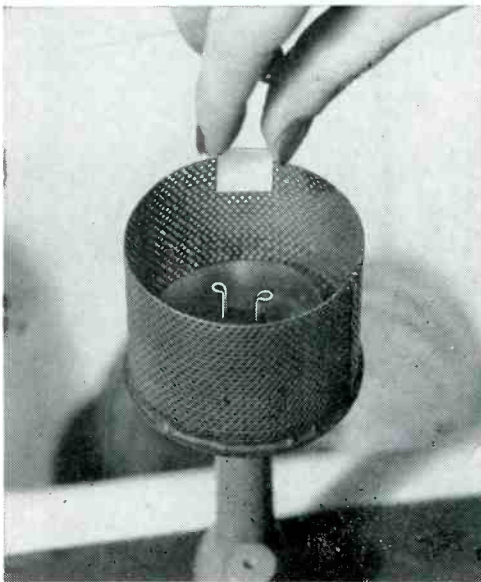
NBC/U.C.L.A. Radio Institute convene the 26th of June for a 6 week summer session . . . **Art Brearley, SE**, will conduct the very excellent engineering courses inaugurated last year by **Lt. Robert Brooke, USN**. Other profs include **Frank Barton**, chief announcer for **NBC Western Division**, **Frank Berend**, general sales manager, **Lew Frost**, assistant to the V.P., and **Andy Love**, production, scribe **Arnold Marquis** and **Don Martin**, news and special events. Classes are interesting **AND** instructive and were well attended last year.

FISHBOWL . . . is back in **MCD** . . . the boards and bars are down and **Master Control** in all its glory is again revealed to the public view, thru invisible glass. Its **QUITE** a thrill coming in on your **DAY OFF** to abruptly find yourself on display . . . without a coat or tie and probably looking **EXTREMELY** silly. Seeing the gaping crowd again makes you feel like holding out your trunk for neanuts or something . . . no more **FEET** on the desk, huh fellows . . .

JUST . . . when we got to thinkin' that the Japs were **FAR AWAY**, along comes a radio alert and silencing of all Coast stations . . . the first in many months. We were off and sitting around home, of **ALL** things listening to the radio and right in the middle of **Bob Hope** comes on the old 1000 cycles, followed by a somewhat agitated voice intoning the "afirm . . ." routine. Just for fun, we turned around the dial to follow the stations off, and some were apparently a **LITTLE LATE** in getting the word . . . a couple were **VERY** late. Programs were resumed after about 33 minutes and we were "returned" to **Red Skelton** . . . if you read the papers you know that it was only some unidentified planes off the coast, which later proved friendly . . . for which we were thankful . . . it would kinda have spoiled **Decoration Day** if they had been decorated with bombs instead of flowers . . .

BLUE . . . buys **KECA** . . . for quite a few years the local Blue outlet, **KECA** was finally parted with by **Mr. Anthony (Earl C.)** for some 800,000 fish . . . deal has been on the fire for some time, since it became apparent that the old-established **KFI/KECA** combine would have to split up to conform to **F.C.C.** regs regarding dual ownership. Station now gives the Blue two coast-owned outlets, the other

A New TWIST TO CRYSTAL CLEANING



THIS is an actual photograph of the centrifugal air drier, or "spinner," used in Bliley production to facilitate clean handling of crystals during finishing and testing operations. Quartz blanks are dried in 5 seconds in this device which is powered with an air motor and spins at 15,000 r.p.m.

Little things like lint or microscopic amounts of foreign material can have a serious effect on crystal performance. The "spinner" eliminates the hazards encountered when crystals are dried with towels and makes certain that the finished product has the long range reliability required and expected in Bliley crystals.

This technique is only one small example of the methods and tests devised by Bliley Engineers over a long period of years. Our experience in every phase of quartz piezoelectric application is your assurance of dependable and accurate crystals that meet the test of time.

BLILEY ELECTRIC COMPANY - - - ERIE, PA.



being KGO in Frisco (pahdon us, SAN FRANCISCO). Shift, a logical one, was consumated by Don Gilman, West Coast Blue V.P. and Earl C. Anthony, subject to F.C.C. approval. Station was formerly five years ago KEHE of Hearst Radio, Inc. who sold out to Anthony, including studios which now jointly house KFI and KECA. Due to split and existing studio shortages, BLUE will probably install temporary headquarters in the Blue Playhouse building, a few blocks up Sunset from Radio City. Pics later, Ragsdale.

SKATING . . . in Studio "D" . . . a rink complete with ICE and CHILLS and about 20 x 30 feet square or whatever was laid RIGHT on the stage of "D" for a recent "People Are Funny" orgy . . . a big gadget looking like an oil well driller parked on the parking lot outside and ran pipes in thru the corridor doors and down the hall . . . it took about a week to freeze the thing and the whole south end of the building took on the aspect of a cold storage plant. During the process, other shows had to go on, ON TOP of the ice, on planks . . . the orchestra looked PRETTY FUNNY playing in mittens and topcoats, but you shoulda caught engineer Brearley skating around setting up mikes . . .

GENERAL meeting of Hollywood Chapter of NABET (National Association of Broadcast Engineers and Technicians) was held May 31st at the Knickerbocker, Parlour "C" . . . first gathering of the clan to be presided over by our new chairman, who DID ALRIGHT. Almost 100% turnout, the next day being JUNE FIRST. Many interesting topics discussed and several committees formed to investigate various things, including one headed by Pickett, MCD Super, to meet with and discuss related interests with other organizations and network groups . . . a GOOD idea.

KEYHOLE DEPT . . . who was it among the BRAIN TRUST in MCD who was setting up the sync for the next deal during the lull between things and INADVERTENTLY punched chimes for the two studios instead . . . just as their programs were about to start . . . that's a seegar he owes US . . .

CHIPS . . . as time (or PAPER) will allow . . . Denechaud, Blue engineering chief, a PROUD PAPA . . . a 7.312 lb. boy, born 2:35:28 a.m. June 4th . . . this makes TWO for the Dennys' and as we go to press mother and son doing fine at Queen of Angels . . .

(Continued on Page Sixteen)

Broadcast Engineers' **15**
Journal — July, 1944



Where Commands are Vital . . .

At high altitudes and under all temperature and humidity variations, Permoflux Dynamic Headphones meet pounding battle requirements with rugged mechanical strength and the utmost in communication intelligibility. The same engineering principles that set the pace for improved headphone performance under adverse noise conditions are making their contribution to the superior line of Permoflux Speakers, Microphones, Transformers and other electronic apparatus.

BUY WAR BONDS FOR VICTORY!

TRADE MARK
PERM-FLUX

PERMOFLUX CORPORATION
4916-22 W. Grand Ave., Chicago 39, Ill.

PIONEER MANUFACTURERS OF PERMANENT MAGNET DYNAMIC TRANSDUCERS

Los Angeles News

By H. M. McDonald

"Microphones, Their Performance and Calibration" was the subject of an address by F. L. Hopper, System Supvr. E.R.P.D., W.E., at the March meeting of the I.R.E., which was attended by about 140 members and guests.

Floyd W. Everett, Supvr. at KFI-KECA studios, is also secretary of the Sheriff's Communication Reserve. George A. Whitney, long with the Sales Dept. of KFI-KECA, has joined the Engineering Department.

Who's Who at Mutual stations hereabouts: Wilbur Thorpe and Thornton Chew, formerly at W6XAO Television station, are in the Navy, Thorpe a lieutenant and last heard of at New London. Maurice Schmitz, ex KDB Santa Barbara and KVEC Obispo, and

Jerry Satchell, are now holding down Master Control at KHJ; Charles J. Sherburne, long at that "desk", is now handling studio maintenance. Before coming to KHJ Sherburne was at KBC San Diego, KHSL Chico and KVCV Redding. The stork left a girl at his home recently. Ray Bailey and John Vincent, formerly at KPAS Pasadena, are now at KHJ studios. Leslie Vaught, Menroy Meyer, and Bob Arne are at KHJ transmitter, the latter Supervisor. Two KDB Santa Barbara men have been commissioned, Val Shannon a lieutenant in the Navy, and Forrest Choate a lieutenant in the Signal Corps. Rodney Meyers, formerly at KVEC, Obispo is a Captain in the Coast Artillery, at present in England.

Maurice Kennedy, Communication Engineer for the Los Angeles County Flood Control District, has recovered from an appendectomy, and pneumonia

which followed, and returned to his work, which includes supervision of 16 fixed stations on flood control dams and 53 mobile stations. He was Chief Engineer at KFSG here for nine years before going to Flood Control seven years ago.

John F. Palmquist, formerly with KFI-KECA, and now Supvr. at KHJ-Mutual, and Herbert Pangborn, Transmitter Supvr. at CBS-KNX, are teaching ESMWT courses at U.S.C.

Engineers recently visiting KFI-KECA studios included: Jay Eisman, ex KYW Philadelphia, and Edward Frank Goodson, formerly at several Texas and Oklahoma stations.

Other Engineers reported seen here recently: Robert Barnes, exKPO San Fran and now doing NDRC work at Harvard; Ernie Roberts, former Los Angeles engineer, now radio supt. for the RAF ferry command at Montreal; Glen Turner, long at KHJ here, presently with Western Electric in New York. (Johnny Ganzenhuber, former sales engineer with Graybar here, is also with W.E. in N. Y.)

HOLLYWOOD

(Continued from Page Fifteen)

they're going to call him "Guy" and Denny is VEDDY BUSY assembling non-priority items of glasswear, yard goods and rubber goods . . . donations of SAFETY PINS gratefully received . . . Hal Platt, NBC Field, is also a recent new father, daughter, "Katie May," April 4th . . . HAL came thru fine . . . lots of changes these days . . . Ken Hicks, Recording Maintenance, in for Jimmy Brown, Master Control . . . seems ODD to hear a new voice when you dial 5 . . . Ross Miller to recording maintenance to replace Ken . . . NEW man on the Blue, one Jimmy Banks, vacation relief from the movies . . . MGM . . . a mighty good move. Jimmy is taking HOLD of things right and left and having lotsa new experiences . . . Les Culley, Western Division Radio Recording chief back from conference trip to the east . . . covered Chicago, Indianapolis and N. Y. . . Mrs. Saxton back from several weeks sojourn in Santa Monica hospital and recovering nicely . . . Max Burnam, Recording, recently married AFTER vacationing for three weeks . . . Bill Comegys, Maintenance, buying new coveralls after being caught out in the open in MCD viewing gallery in DISREPUTABLE old ones . . . Nicolay, Recording, building an addition on the family homestead . . . Jensen looking for an inner-spring mattress with more than ONE spring . . . Heffernan, Blue SE, gets

pic in radio mag for remoting Jimmy Fidler program from hospital bedside . . . a toss-up as to who looks the best . . . card from Bill Moyer, former NBC SE telling that he is giving out with the guff over microphones of KIRO in Seattle . . . likes the country fine . . . we'll be WAITING for that box of APPLES . . . Ragsdale, Blue engineer-at-large, showing some FINE PHOTOS taken on vacation trip to desert country around Twenty-nine Palms . . . Mc-Gaughey, NBC soap opera kid, challenging one and all at LOUNGE CHESS . . . he's been reading up on the Queen's Gambit and stufflikethat there and knows some CLEVER MOVES . . . Eddie Miller still checkers champ, with La Croix 'n Lorenz close behind . . . vacations in full swing . . . summer should be here ANY day now . . . WEATHER . . . usual fine California varieties, enhanced by a couple of gentle real-estate re-adjustants (often crudely called EARTHQUAKES by easterners) . . . no harm done, except to nearly shake OUR TEETH . . . off the bureau . . .

DON'T . . . forget that extra bond . . . between the fellows overseas and us . . . BCNU.

Sports Announcers

Your ether bark, some people say,
Suggests a harmless pun;
Who else can swing a verbal bat
And score the winning run?

— Bert Pruitt.

TOAST TO AN ENGINEER

There is a man you never hear
Upon the radio,
Although he plays a major part
In ev'ry single show;
He is no singer with a throb
Within a golden throat;
He plays upon no instrument,
He never strikes a note;
He never speaks an actor's line
With feeling or with violence;
Yet were it not for what he does,
You'd get just lots of silence!

His is the skill, the polished art
Of blending tone and speech;
With wizardry, he measures out
His precise parts of each;
He lifts the mumbling speaker's voice,
To make it clear and strong;
He makes the blaring trumpet soft,
Adds brilliance to the song;
In radio, no other skill's
More valued than his job,
His mastery of volts and ohms
And rheostat and knob!
So join me, friends—here's to the man
Who guards each sound you hear!
The alchemist of radio—
Here's to THE ENGINEER!

(This poem was written by J. H. Johnson and was used on the Falstaff Show, sponsored by the Falstaff Brewing Corporation and is reprinted by permission of the author.)



(Left) A Happy Threesome at the Ten-Year Party — Left to right: Art Dingle, "Senator" Thomas Watson, and George "Doctor Kate" Dewing. Watson just got thru defining "Status Quo". (Center) What Makes a Ten-Year Party Go???? Maybe this picture tells the story. Left to right: Donn Tatum, NBC legal counsel; Charlie Kilgore, SF MCD Supervisor; John W. Elwood, KPO Manager, it's his house; George Greaves, KPO Chief Engineer; and Dorothy "Jane Lee" Rankin, KPO's Woman's Magazine of the Air. (Right) Lieutenant Commander E. C. Callahan gets a warm reception at KPO after returning from two years in the Pacific. Left to right: George Greaves, Chief Engineer, KPO; Mrs. E. C. Callahan, Lieut. Cmdr. Callahan, and John W. Elwood, manager KPO.

From SAN FRANCISCO

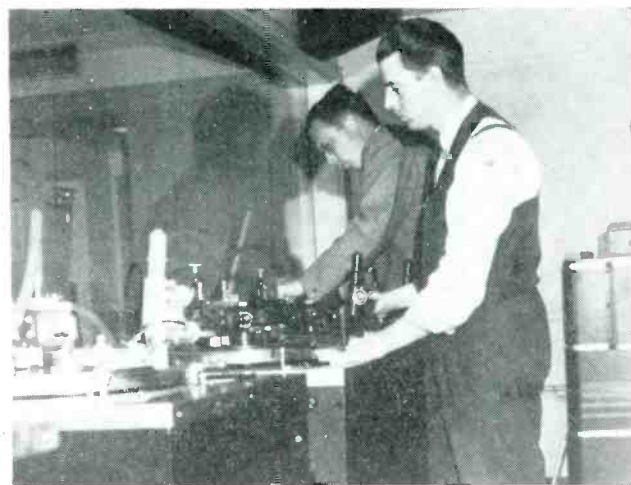
By S. A. Melnicoe, K. Martin, A. Wauchope

THE big occasion this month was the ten year party which, despite "A" coupon limitations, was held at the palatial Elwood home in Palo Alto. Manager John W. Elwood of KPO proved that wartime restrictions are not necessarily a limitation on a good time. The following group of engineers helped him prove this contention: O. A. Berg, Maintenance Supervisor and head man of the Ten Year Club; Frank "the knight in shining armor" Barron, SE, who rescued the damsels in distress; Thomas "Senator" Watson, SE, whose dignity enfolded him like a cloak as the evening wore on; Charlie "we turn here" Kilgore MCD; George "Kuuipo" Dewing, SE; J. W. Baker, KPO transmitter chief; A. O. Dingle, TE; E. L. "Parky" Parkhurst, ME; E. A. Poage, TE; Jim "where's my food" Summers, MCD; and George Greaves, chief engineer. The boys report a wonderful time but don't seem to recall things that happened later in the evening, hi!

Carl G. Dietsch, who supervised the design and construction of the short wave facilities at Bound Brook, was welcomed in San Francisco the other day when he arrived to take over similar duties at the Dixon installation. Four big fellows going in up there and some of the local engineers wondering who is going to man the job. Carl plunged right in and is hard at it. Hope you like the California sunshine, Carl; the valley really gets it.

Lieutenant Commander E. C. Callahan dropped in on us after a couple of years in the South Pacific, and has been entertaining the gang with some real yarns. He was on a heavy cruiser when her bow was shot away. He saw the battle of Midway, the original landing on Funafuti, and the battle of Tassafaronga in Guadalcanal. The best one is about the time he and another fellow went into the interior on some anthropological (?) research. They met a native and tried out their best brand of pidgen English on him. By the way he looked at them they were

sure they had found the original aborigine. Just then a plane flew high overhead. The native squinted, grinned, and said proudly, "Ours, Corsair!" Anthropological studies ended abruptly. Yeah, there are others but that's the one we can print. "Cal" is awaiting orders which may take him to Chicago as an instructor. He has been in radio and radar and hopes to take over the post recently vacated by Lieutenant Commander P. A. "Bud" Sugg, another



J. Alan O'Neill, Reference Recording Supervisor, and Jack Van Wart, SF's newest Recording Engineer, hard at it in San Francisco's reference recording room.

Ex-NBC SF engineer, who, we hear, has been transferred to Florida.

You Chicago guys can corner him when he arrives there and find out that there is really a war going on in the Pacific. Get him to tell you the end of the native story, hi.

B. "Dee" DeWolf, up from Hollywood while on vacation, dropped in a few times to see the boys.

Andy Mitchell, RE, back from a vacation spent at his

peninsula home picking strawberries and straightening up that terrace. Nice shade of tan, too. **Frank Barron** did the same thing but the tan is so deep on Frank now we couldn't notice any change. Besides, Frank came in Sundays on those symphony pickups.

George Dewing is up in the hills near Healdsburg, miles from a telephone, for his vacation; while E. E. "Efficiency" **Jefferson** is spending his at Carmel on the Monterey peninsula.

Hal Ashby, ex-SE, has transferred his affections to the KPO Sales Department. Good luck, Hal.

Sid Blank and **Don Hall**, still consulting on that speaker deal, now inform us that it is past the blue print stage.

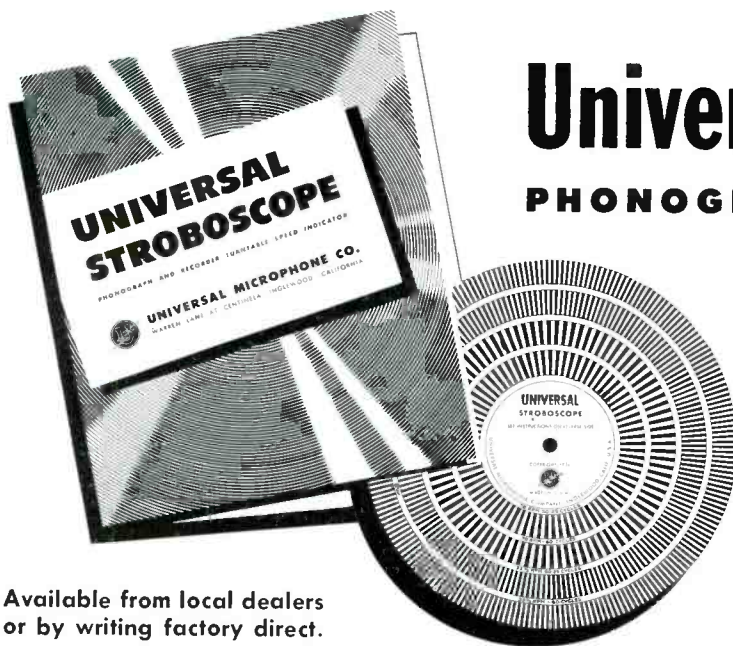
Hank Dunton, KGO TE, back from vacation with "painters puss" and housemaid's knee after a grueling time painting his house and waxing floors and car. **Ken Martin**, TE, a sadder and wiser man, after giving Dunt a tow. Ken's Chevie dented somewhat but nary a scratch on the Chrysler.

Herb Kraemer, KGO TE, is the new councilman. Gang thanks **George Irwin** for a faithful year's service. Rumored that **Shorty Evans** turning down fabulous offers for his filly Millinair. Wonder what the colors will be?

KPO transmitter has a new coat of paint. It's the well-known gray, and really easy on the eyes. **Andy Wauchope** busier than a bird dog doing the necessary for a 14 year old daughter's graduation. **Bob Barnes**, ex-KPO TE, sent word to **Joe Baker** and the gang that California's climate beats England's by a big margin and he hopes to see some of the famous sunshine soon.

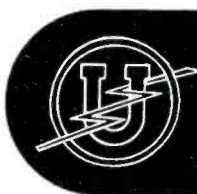
STATIC—E. L. "Parky" **Parkhurst**, ME, subbing in at the desk during vacations and struggling with the skeds.—**C. E. Kilgore**, MCD, and **Guy Cassidy**, SE, discussing current events with a unique slant.—**A. McDermott**, SE, finally off the nite shift; **N. B. Tapper**, ex-apprentice, taking his place.—**Elma "Glamour Girl" Oddstad**, engineering secretary, flashing that ring so that everyone would be sure to see it. He's in the Coast Guard, Congratulations, **Elma**.—**R. C. Butler**, getting a little relief from recording by doing "Doctor Kate" serial, while **Geo. Dewing** on vacation.—**Clark "Red" Sanders** taking over the Coca-Cola shows while "**Andy**" **Andresen** is on vacation.

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Universal Microphone Co., pioneer manufacturers of microphones and home recording components as well as Professional Recording Studio Equipment, takes this means of rendering a service to the owners of phonograph and recording equipment. After victory is ours—dealer shelves will again stock the many new Universal recording components you have been waiting for.

Those Dixon Transmitters

By S. A. Melnicoe

WELL, the news is out. No longer do the San Francisco engineers discuss with bated breath the new short wave installation which was to be started shortly at a location "close" (?) to San Francisco. They know now that the location is near Dixon, California, and that the installation will consist of four 50 KW transmitters which will be operated by NBC and programmed by OWI. The cost is approximately a million dollars.

With the completion of this layout, San Francisco becomes one of the largest short-wave distributing centers in the world. The facilities, as well as others already built or being built in this area, will play an important part in the American psychological warfare in the Pacific and will, at the same time, form a strong link between Latin America and the United States.

While the initial installation will consist of four 50 KW transmitters tied together as dual transmitters, in the near future the power of two of these transmitters may be stepped up to 200 KW, according to John Elwood, NBC's San Francisco manager. This will be the highest power yet used by any American short wave facilities and will

insure improved service to American and allied forces in the Pacific and Far East.

Discussing post-war possibilities of the plant, Elwood said: "San Francisco from the earliest days has been the Pacific Coast center for communications of all kinds—telephone, telegraph, transoceanic cables, and radio—as well as for transportation—rail, motor, shipping, and air. After the war, San Francisco will be directly connected with the entire Pacific Basin, containing two-thirds of the world's population, as well as all the Latin-American countries."

Carl G. Dietsch, NBC engineer, who supervised the design and construction of the company short wave facilities at Bound Brook, will fill a similar post in connection with the Dixon installation. Dietsch will remain at the plant as chief transmitter engineer. He is a graduate of the University of Michigan and of NYU, and supervised the construction of WTAM and WEAJ's Port Washington transmitter.

Call letters KNBI and KNBC have been tentatively allocated to two of the transmitters.

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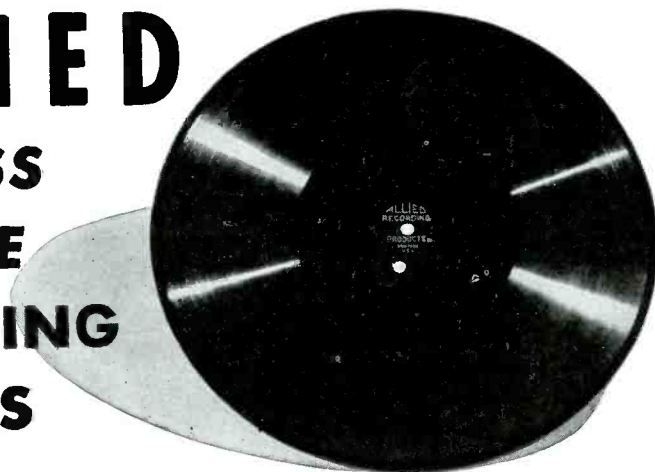
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THE HALLICRAFTERS CO., MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 16, U. S. A.

THE poem "Toast to an Engineer" elsewhere in this issue, was obtained for us by Bert O'Leary and Ed Watkins. The poem was used on the "Falstaff Show" on June 12th and was broadcast over the Blue Network. If my information is correct Bert was the engineer on the show when it was broadcast and Ed obtained the permission to use it in the Journal. Many thanks to both.

Arrivals: Ralph and Lucile Bennett announce the arrival of Elaine Ruth Bennett on April 16th. Elaine arrived with seven pounds-eleven ounces to her credit. Ralph is a Studio Engineer for NBC.

"D" Days arrival brought many hours of overtime and much discussion. It is difficult to describe what the situation was here in New York, except to say that phones were ringing madly, people rushing here and there and orders being issued and countermanded as soon as they were issued. It can be said that but for the excellent cooperation of the Engineering Department, chaos would have been the result.

In a "V" mail letter to Harry Hiller, Lt. Phil Falcone AUS, reports that he and Lt. Bill Perry are looking Africa over. Phil reports that Lt. Victor Tervola has returned to that area and that he and Vic emptied a bottle of Scotch that Vic had brought from home. Vic is now back in Italy.

Captain C. P. F. Dixon is now reported to be in the South Pacific (Marshall Islands) combat area with his Combat Photo Unit, and Major Walter Brown is on the European soil at this moment.

We were very sorry to hear that Robert Massell is sick in England, but he is receiving excellent care in a Navy



Our roving cameraman recently caught two former members of NBC's Engineering Staff enjoying themselves in New York. Left to right: Lt. Dave Kempkes just back from Brazil, Mrs. Tom Gootee, and Capt. Tom Gootee just back from the men's room.

NEWS

By
G. F. Anderson, Jr.

Hospital in London and he will be sent home soon for further convalescence.

For the forthcoming Presidential conventions the following from New York are going to Chicago. **Tony Hutson** and **I. Grabo** for the Blue, and **Yens (Al) Weis** and **Art Poppele** for NBC.

GB Butler had quite an experience a few weeks ago, when, arriving at a nemo point, he was informed that the room at the hotel that he was to occupy was to be used by six others also. There had been installed in the room two double beds, two Murphy beds and a pair of cots. Of course a discussion arose and GB emerged with a double room for himself. A little latter, he was informed that he had to be ready at a certain minute, to eat at a prearranged spot. This was also quickly nixed. Incidentally this was not an Army or Navy broadcast.

In the recent Chapter Chairman election, **Harry Hiller** was reelected Chapter Chairman for another term.

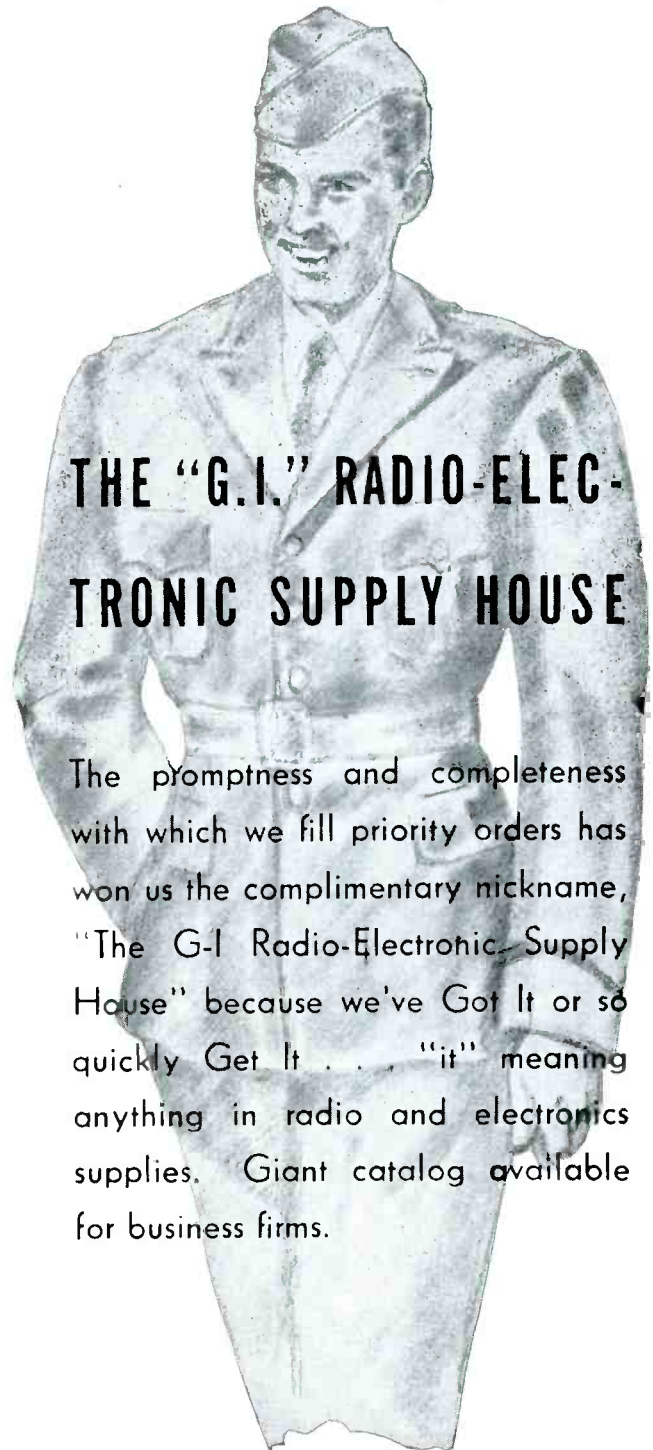
Well, it's a dreary day here and I must retire with a tall glass of Happy Juice. Bye now.

Two senior engineers have been added to the staff of the Hoffman Radio Corp., Los Angeles. Donald M. Campbell was formerly with the Wurlitzer Company and later an electronics engineer with the Bell Aircraft Corp., Niagara Falls. Jay L. (Pete) Taylor was with the Colonial Radio Corp., for more than 15 years, except for a brief period of time with Wurlitzer in North Tonawanda. His last ten years at Colonial was in the research laboratory, while the work at North Tonawanda was in charge of power transmission designing.

Alan Frame, Signal Corps resident inspector-in-charge at the Universal Microphone Co., Inglewood, the past year and previously in the same post at the Packard Bell Co., Los Angeles, has terminated the army position and joined the Hoffman Radio Corp., Los Angeles, as special assistant to the company chief inspector.

Aerovox Insurance Plan in Effect

Over 3,000 employees of Aerovox Corporation, manufacturers of electrical capacitors or condensers, of which S. I. Cole is president, with plants in New Bedford and Taunton, Mass., are now protected by group insurance. The corporation pays the entire premium. The plan also provides for the automatic enrollment of new employees after three months' continuous employment. The protection provides eligible employees with life insurance, accidental death and dismemberment coverage, weekly accident and sickness benefit, daily hospitalization expense benefit, and maximum reimbursement for certain miscellaneous charges occurring as a result of hospitalization. The accidental dismemberment coverage is for both occupational and non-occupational accidents whether in or out of the plant.



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Fay Evans Biggs (Mrs. Bryson R. Biggs) comes to us fresh from the field of journalism . . . where she started as a telephone ad solicitor for a Hearst newspaper in Milwaukee, Wisconsin . . . and progressed to Managing Editor of The Myrtle Beach News, and Associated Press Correspondent for the Town of Myrtle Beach, South Carolina.



Fay Evans Biggs

Mrs. Biggs is new to radio . . . having joined the WPTF continuity staff in January of this year. In March she was made secretary to the Program Director (that lovely lady, Miss Virginia Tatum!).

Last week, Stewart Spencer, erstwhile Publicity Director - Associate Program Director, decided he'd prefer singing "Anchors Aweigh" to waiting around the studios for D Day . . . and joined the Navy! Mrs. Biggs was picked from the Program Department as one most likely to succeed as "Spencer's Successor" . . .

She doesn't know beans about the control room . . . but asks a million questions a day . . . which the fellows answer in great detail! She likes using radio "slanguage" and loves to bandy such words as "fundamental" and "harmonic". She reads all the radio books she can find—from the Production Manual to the "ASCAP Bible"! Like we say . . . she's new to radio!

'What, No Pressure Cookers?'

Wartime shortages and the general scarcity of certain consumer goods reared it's head this week in the form of human interest at The Daven Company, manufacturers of the Daven potentiometers and attenuators.

Common to most plants or agencies that come in frequent contact with technical terms, short cuts immediately replace unpronounceable tongue-twisters. So it was that the term "potentiometer," in common usage, is referred to as "pots". Since the Daven "pots" are nationally known, the Daven Company of 191 Central Ave., Newark, New Jersey, recently received a strange request from a non-priority source.

A young bride-to-be wrote the following letter to the Daven Company: "Gentlemen: I've heard that you made or carried aluminum pots and pans. I expect to get married soon, and I can't seem to find any more aluminum pots. If by any chance you may have any in stock, I would appreciate it very much if you could let me know what you have and the price of them. Thank you."

A reasonable enough plea, indeed, but . . . !!!!

WASHINGTON

By R. E. Shenton

Word from Private Gus Lynch informs that he is in Texas operating with the medical corps. (This is not necessarily an allusion to surgery.) We submit this as a masterpiece of classification; Gus has been chief engineer of two broadcast stations and worked in radio in some phase or another for a good many years, so now he is an Army medico. Happy ending is that Gus is to be transferred to the west coast to work for the Special Services Overseas Radio Division, so he'll be right back in his preferred field after all. Gus, you'll remember, worked as a Studio Engineer here in Washington for a few months before being inducted into the Army.

* * *

Final item of the month comes from Clarence Allen, honorary president of the NBC Northern Virginia Gentleman Farmers' Association, and one of the few local engineers to carry two smokin' pipes at the same time.

Recently, CAA reports, a neighbor and fellow chicken raiser accused him of trying to poison some chickens by putting a dreaded drug in their drinking water. This diabolical imputation roused Col. Allen's fightin' blood, so he demanded in his best Northern Virginian dialect just why this neighbor should make such a charge. The irate poultry protector produced a bottle of disinfectant designed to be placed in chicken drinking water, dared Clarence to deny he'd been using it. Allen had, he assented. Thereupon the neighbor pointed a grimy forefinger at the label; it read: "kills bacteria." "If," the accuser orated "it kills bacteria, what'll it do to my hens?"

Clarence will now spend several days bargaining with the OPA as an emotional relief from the pressure of farming.

As we believe that the egg followed the chicken, here follows the evidence. If YOUR cigarette tastes different lately, why don't you throw the butt away and light a new one?

Chicago Chatter

By Arthur Hjorth

MARSHALL W. RIFE, NBC Field Supervisor, found a way to spend an enjoyable and profitable vacation traveling long distances, yet helping instead of hindering the war effort. Marshall "Sparks," signed on as a member of the Chicago, Duluth and Georgian Bay Steamship Company de-luxe liner, the S/S North America. Making two special pre-season trips, totaling more than a week using his fist twice to handle the terrific traffic over WTBA on 425 kc. (Sez they don't use wavelengths any more, wonder what ever happened to them?) Sparks was properly chaperoned by his wife Lenore. Marshall spent two years as Sparks at sea eons ago . . . without a chaperone.

Hunter Reynolds, traveling around the country with the Blue "Quiz Kids" show, came sweltering back from New Orleans loaded down with the usual portable (?) equipment plus twenty-five pounds of shrimp and a gallon of sauce to go with 'em.

Lu (Lou?) or (Lew?) Heiden of NBC studio and Ada (his wife) spent his vacation and their money visiting kin folks in a twenty-five cycle suburb near Phoenix, Arizona.

D. R. "Tex" Fitch with wife Ann and two pretty little daughters, Donna Ann and Frances Jeanette, vacationed on their papa's goat ranch near Lampasas, Texas.

Minor and Inez Wilson vacationed at numerous parks near Chicago, watching fiery steeds chase each other around an oval enclosure and wondering why some didn't run as fast as others.

W. K. Cole, NBC Supervisor, very proud of his son, "Bill," junior, now in the Navy.

New Television Stations

From FCC Report No. 1569

Loyola Univ., New Orleans, Channel No. 6.

From FCC Report No. 1575

United Detroit Theatres, Detroit. Channel No. 4.
General Television Corp., Boston. Channel No. 1.

From FCC Report No. 1576

Utah Broadcasting Co., Salt Lake City. Channel No. 2.

From FCC Report No. 1577

WEBR, Inc., Buffalo. Channel No. 1.

From FCC Report No. 1578

Jam Handy Organization, Detroit. Channel No. 1.
WFIL Broadcasting Co., Philadelphia. Channel No. 7.
WJR, Detroit. Channel No. 6.

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HUDSON CHAPTER NEWS

By Richard H. Davis

WE of the Hudson Chapter knew that the month of June was going to be a fateful one but little did we know what was being prepared for us. First with the WLB order restraining the various actions due to the "pancake turners" and Petrillo. We all were 100 per cent in back of NABET and now feel that we have a firmer grip on the situation. Also the various flock of rumors have died a natural death.

Then came the invasion of France. The WOR engineers took it all in stride although in the first couple of days the MC engineers were on the point of running out of patch cords. A phone call might mean almost anything.

Your editor was one of those people who had been waiting for the news to break at anytime and then turned off the radio at 12:30 PM on the eve of the "big things". When we checked the radio the next AM it was apparent that the invasion had taken place but for a half hour we couldn't find out where! We knew all about the generals, etc., before the official communique that announced the place.

Ed Franke, ex-TE, is part of the Mutual Team covering the bullet by bullet story of the invasion. The shows are recorded on "sound on film" tape and sent to England for broadcast. Heard a number of the shows and certainly felt that they were doing a "bang-up" job. **Larry Meier** is the announcer half of the team. Ed will have some great stories when he returns.

Johnnie Cook, who normally comes in at 3:30 AM, walked right into the MC before he heard the news. **Bill Wernicke**, SE, was called in at 4 AM and as transportation is doubtful at that hour thumbed a ride from a passing car. The car contained a soldier going to his post in New York. Upon hearing the news that the invasion had started, the soldier stomped on the gas making the Queens Boulevard stop lights look like a neon sign. Bill claims the fastest trip from Jackson Heights, 13 minutes from slamming the door to Master Control!

The trans-Atlantic telephone circuits for the American networks sounded like the opening days during a ham DX contest, remember? There were a lot of ex-hams doing the work, too. **Hadden**, MC, tells one how during the "false" invasion report he was quaffin' a cool one at a local pub when the flash came over. As he was in his best Victory garden clothes, his problem became whether to go home and change or go into the studio as is . . . fortunately the correction came over a minute later . . . he ordered another.

Passing through . . . **Lowell Frank**, ex SE, stopped in

. . . now radio man second class in the Navy . . . looks very trim in his blue. **Ed King**, also ex-SE, stationed with Frank out Chicago way.

Same Morse, who handles the engineering assignment for the "Double or Nothing" was on the other side of the mike for a change. At Baltimore for the celebration of the 100th anniversary of the sending the first message over the telegraph Sam did a trick on the show. Sam is the great grandson of Samuel B. Morse, the inventor of the telegraph. That first message "What God Hath Wrought" was a prophecy when one considers what developed from that crude start. It seems that we should give thanks to Sam's great grandpappy.

Bill Hoffman, of Sound Effects, claims his son has definite interior decorating talents. The youngster got some nail polish recently and proceeded to decorate chairs, walls, rugs and etc. Bill is now taking a course in the removal of spots. Hi!

Si Gamblin, TE, is rigging up a booby trap for a flock of bunnies that take his victory garden as their private vitamin supply. He thinks that it will do away with the bunnies but is doubtful that the plants will stand the shock.

Dick Quodomine, TE, who covered the Army Air Show at the Newark Air Port recently had some experiences similar to what happens to the GI radioman. The wind changed so the P47's and transports had to use a runway that came in right over the pick-up point. He claims that its some what disconcerting to have those fast ships aiming right at you at a distance of 35 feet.

WOR's FM station now known as WBAM running 10 KW on 47.1 megacycles. The old call was W71NY.

Jack Byrne, MC, saving gas coupons and anticipating his vacation looking for a flea power outboard motor.

Ralph Schlegel, Recording, says that if the record chips of the first two days of invasion recording were laid end to end, they would measure about 25 miles.

There are seven ex-service men in the Hudson Chapter at present: **Penner** and **Cooney** of sound effects; **Breitteger**, **Chapman**, **Garlinger** and **Pollack**, Studio Engineering; **Ryan** at the transmitter at Carteret . . .

The councilmen of the Hudson Chapter of NABET were appointed as BOND salesmen for the FIFTH WAR LOAN drive. We can expect to report 100 per cent in the next issue.

Donniez, MC, chairman of elections, with **Ruckstul**, TE, and **Tower**, MC, as able assistants, reports progress and that we should know who the new chairman will be, any day now.

GN es 30.



History of Communications Number Five of a Series

NIGHT COMMUNICATIONS ON THE HIGH SEAS



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THROAT MICROPHONE



In those early days when our Navy was first organized night communication was made by lantern from the masthead. This was the only communication between ships at sea during through which many times news from home was transmitted.

Today, through the use of Universal Microphones and voice communication components, vital communications of War are speedily transmitted equally as well from small sea-craft and battle cruiser to home port.

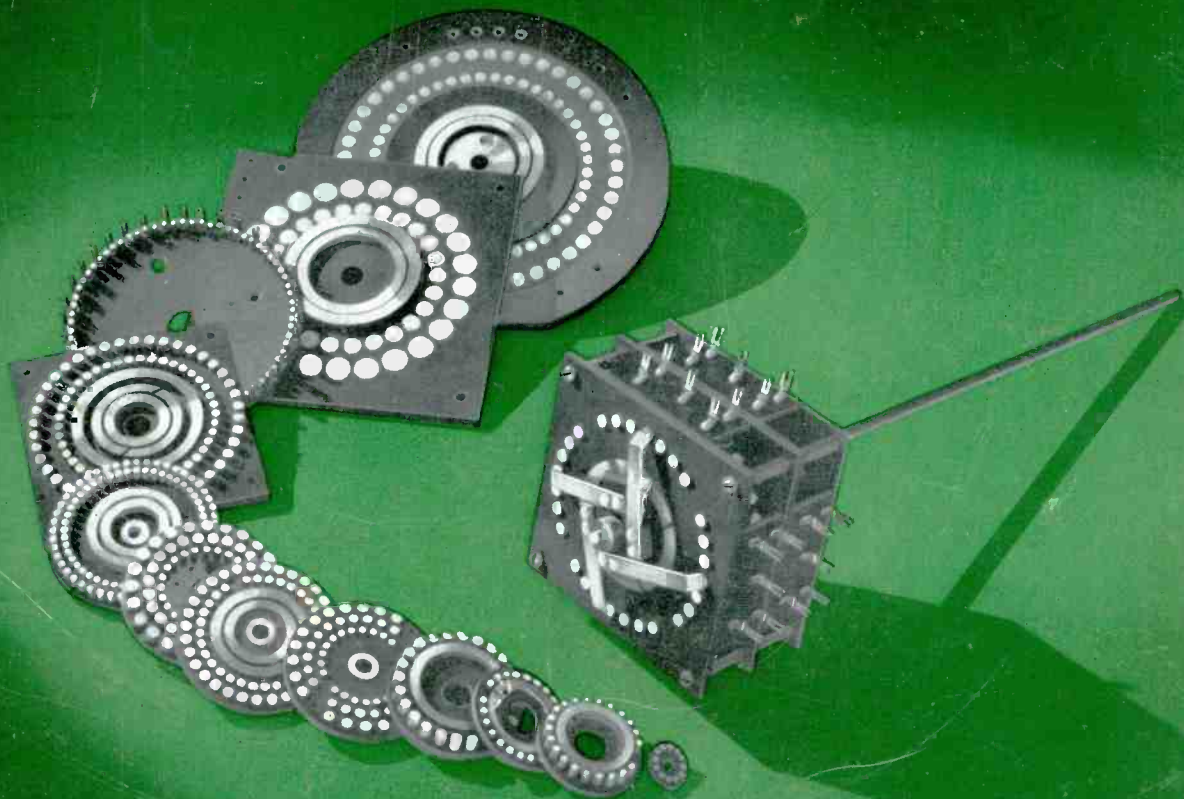
Many new types of Universal microphones shall be developed from the experience obtained from the production of military units, for the private citizens in the marine pleasure-craft in the days after Victory is ours.

< Model T-30-S, illustrated at left, is but one of several military type microphones now available to priority users through local radio jobbers.

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