

NATIONAL RADIO NEWS

December 1932 - January 1933 Issue

Washington, D. C.

A Merry Christmas
A Happy New Year





from the
PRESIDENT'S PEN

by J. E. SMITH, President, National Radio Institute

IN last month's National Radio News we promised you a special announcement regarding the policy of this magazine.

For sometime it has been the idea of the editorial staff, and many others who have expressed themselves on the subject, that among the various improvements we've been making in the News, should be a plan for longer articles.

We tried out, in several instances, the use of continued articles, and while they were favorably received, it was evident that this was not the solution. We had to go further.

So after extensive study a decision has been reached and a plan decided upon, which has met the favor of all to whom we've talked, and which we know will have your hearty approval.

In order to give our readers these longer articles—the more meaty articles—carrying the abundance of details which technical men demand, National Radio News starts with this issue to be a 24-page publication, instead of 16 pages as heretofore.

This increase in size of the News will not impose any additional tax on our Alumni Association, which sponsors National Radio News, as part of the plan calls for making the News a bi-monthly publication. This larger National Radio News will be published every two months. It will be noticed that this issue is for "December and January." The next big issue, which will be mailed the latter part of January, will be for "February and March." We give you the detailed information on the News changes so you will not have to write us about it.

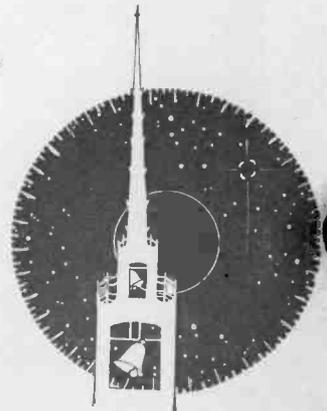
We want every reader of the News to realize that the Alumni Association is doing a mighty good job of National Radio News and they deserve a lot of credit for these forward strides.

EACH time Christmas and New Year's Day roll around thousands of N. R. I. students and graduates send us greeting cards of the season. We appreciate the spirit.

But this year we're going to ask you to handle your greetings in another way. Instead of buying cards and spending postage—give that money to someone who needs it. Give it to a needy family; the charity society of your church or to any one of the organized charities.

Here at N. R. I. we intend to do the same thing. We realize that there are many needy persons this year, so instead of sending Christmas cards or letters as heretofore—we're going to donate that amount to a good local charity.

President.



1933

What Of It?

BY the time this goes to press we will be on the threshold of a new year—1933. We will be at the beginning of a year which has been held up before us as one of hope—one which will see the return of prosperity and the end of almost four years of depressed business conditions.

What 1933 means to us is going to be to a great extent measured by what we put into 1933. The year itself will not prove a magic age in which conditions will automatically, with no effort on our part, turn from bad to good. It will not rain gold dollars. Good jobs will not grow on trees. But it will be a reconstruction period which will offer untold opportunity for everyone.

What will America do with 1933?

The national elections will be out of the way. Probably the political party, then in power, will not be able to live up to all its campaign promises. Frankly, we don't expect them to. All we ask of them is just laws, particularly those concerning business—proper tariff legislation—and a good measure of properly directed governmental economy.

Then it will be necessary for the people of this country to back up the government in this program. They must quit hoarding. They must spend money, get it into circulation. After all, that's one of the biggest moves toward getting back to prosperity. Employers must stop cutting personnel. They must work to keep up their businesses and create work for others. They must take a far-sighted view of the situation—look to the future rather than the immediate present—thereby helping us all to build up, rather than to tear down our economic structure.

What will Radio do with 1933?

The Radio manufacturer must get into production—but exercise care and not over produce. He must help develop Television and endeavor to get it around to a commercial basis. He must push automobile Radio sales to the distributors.

The Radio dealer must adopt stable policies—he must standardize—he should organize. He will learn the value of service—get away

from the idea that the sale of a Radio is a signal to forget his customer. He will agree with the manufacturer that the Radio service man is all important in the Radio Industry and consequently pay as much attention to the service end of his business as to the sales division. We hope he will eliminate all cut-throat dealings and that he will really make an effort to sell automobile Radios.

The broadcasters must continue to expand—keep up the fine research work that they have been doing in the past. They must keep their programs entertaining, thereby holding the public's interest in Radio.

What will you do with 1933?

Insofar as you are concerned—insofar as your family is concerned, “you” are the public we have referred to in this article. You have a responsibility in this reconstruction program. You have a responsibility not only to yourself, to your family—but you have a responsibility to your community and to your country. It is the action of the individual, after all, which will govern the outcome.

Do you intend to remain in the rut—to let time slide by and do nothing ~~about it~~ or do you intend to put forth a real fight? Will you be content with what knowledge you have at present—or will you continue to study—never being satisfied with what you know as long as you know there is additional information available?

Are you going out and put yourself across? Are you going to give full play to initiative—your own ability—or are you going to depend on someone else? There's going to be Radio work this year—no doubt—but all Radio men won't share it. And the big reason is that they are not going to know that it exists. They'll be sitting with their feet propped up to the fire waiting for opportunity to turn the corner and they'll continue to sit there for a long, long time not knowing that their wide-awake brother Radio man has made big profits during the reconstruction period—not by waiting for opportunity to turn the corner—but by going around the corner to meet opportunity.

While dreaming of the heights, are you building the ladder?

Going Places



Loud Speaker over entrance tells of various bargains to crowd awaiting beginning of department store sale.
—Courtesy Wright-DeCoster Co., St. Paul, Minn.

THE growing popularity of the Public Address System was forcibly brought to our attention during the election campaigns.

These systems were used at the National Conventions. They were used for acceptance speeches. They were used at campaign gatherings, far and wide; large and small.

But their connection with political matters is only one phase of their usefulness, far surpassed by other applications.

Just a few days ago we saw the pictures of a beautiful installation in a Cathedral. The canopy of the pulpit was made to conceal the horns, and the entire job, functioning perfectly, was entirely out of sight and few of the congregation realized its existence—while they marvelled at the carrying power of the speaker's voice. National Radio News will try to bring you the full story of that installation in a later issue.

We already know from articles in this paper the wide use of the P. A. System in Auditoriums and other such meeting places.

County fairs; outdoor religious services; railroad and bus terminals (for announcing trains and departures); hospitals and hotels (for paging individuals) are among the many organizations coming more and more to the use of Public Address Systems.

Right here in Washington we see a fine example of a permanent installation, at the Washington American League Baseball Park. Mounted on top of the center field fence is

a battery of horns, directly connected to the ball park office. Players names can be announced; spectators can be paged to the office for phone calls; future athletic contests announced; and phonograph music played for the entertainment of the fans before and between contests.

Department stores are among the most recent converts to this system of advertising. During a big sale, if the perpetual inventory shows that an item is not selling as rapidly as it should, an announcement over a "store-wide" system calling attention to the item will stimulate sales. In a letter to the president of the Wright-DeCoster Co., manufacturers of P. A. equipment, a large department store owner stated: "We used your loud-speakers during our sale, which lasted 51 days. I can't begin to tell you how effective they were in helping us get rid of our merchandise."

This same department store executive had one of the speakers installed over the front door to interest the crowd before opening time, prior to a big sale. It was necessary to call

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The mobile public address system of Graduate Fred Nichols, Greeley, Colo.

A FEW WORDS WITH THE DIRECTOR

The Most Important Service Problem

E. R. HAAS
Vice President
and Director



THE most important servicing problem has nothing to do with Radio—but it has a lot to do with YOU.

You know from recent study, observation and experience what a delicate mechanism the modern Radio set is. You know that no matter how perfectly it is made, it cannot continue to operate indefinitely without requiring the services of a skilled Radio-Trician. Connections get loose. Tubes deteriorate. The aerial corrodes. Parts burn out. In fact, only a Radio man knows how many things can go wrong.

Yet many a man—even the Radio-Trician with this marvelous object lesson in front of his eyes all of the time—goes year after year without giving his own body the careful examination that he gives every Radio set that comes into his hands.

Your body is more important to you than any Radio set—than all the Radio sets in the world. It is more important to you than all the money in the world. If you allow your body to deteriorate just a little too much—nothing else will matter to you very much. Will it?



Yet—just as the average set owner will let his set go until he cannot operate it at all—so does many a fellow, otherwise very capable and clever, let his body go without regular, periodic inspections and such “servicing” as may be necessary.

Not one man in a thousand is 100% sound and healthy. The best you can hope to be is nearly perfect. If you have definite physical handicaps, slight or large, you owe it to yourself all the more to care for what you have—protect your present margin of health.

If most people spent one-tenth of the energy in guiding their health that they do in worrying about it—half the doctors would go out of business tomorrow.

How many clever Radio-Tricians will tell a customer he should call on them for regular inspections of their Radio receivers—but will never go to a doctor until he is too sick to walk? Isn't it truly important for you to keep well—at least as important for you to keep well as it is for a Radio receiver to keep operating satisfactorily?

The answer is YES—a thousand times over yes. Study your health. Guard it. Have a thorough physical examination once every year.

Intelligent interest in your health, study of your own needs, and sensible, daily attention to your physical requirements, will kill foolish worry about your health, add many years to your span of life—and make every year more worth living.

He who would climb a tree must grasp its
Branches—not the Blossoms.

—Thackeray.

THE SERVICE FORUM

THE increased size of National Radio News makes it possible to bring you this valuable new department. The Service Forum will be devoted to discussions of everyday service problems. It will not deal with the "unusual" cases, but with the things which happen frequently in servicing and which are therefore of most value to the Service Man.

You are invited to contribute to this page. The editor reserves the right to select articles for their reader-interest. No manuscripts will be returned. Communications must be addressed to "The Service Forum," National Radio News, 1536 You Street, Washington, D. C. Sent in with letters or other communications they will not be considered.

PHILCO RECEIVERS INTERMITTENT RECEPTION

Almost invariably intermittent reception and fading has been traced to defective coupling condensers which couple successive stages of amplification. You will notice in many Philco Models the output of the detector or detector amplifier is fed to the grid of the first audio tube through a coupling condenser having a value of about .01 mfd., while this audio tube in many cases also feeds other audio tubes, coupling being obtained by means of a condenser.

It has been found that these condensers develop intermittent short circuits or opens which cause the receiver to fade and distort. In many cases the intermittent short or open is not evident all the time and therefore, when testing the coupling condensers by the usual method for opens or shorts the trouble is not located. In all cases where trouble of this type is encountered, it is advisable to substitute other coupling condensers in the circuit and operate the receiver for an hour or more to see whether or not operation is improved.

F. L. SPRAYBERRY,
N. R. I. Consultant.

VICTOR MODELS R-35, R-39 and RE-57 NO SIGNALS

No signals, or extremely weak signals on strong local broadcast stations is generally caused by an open 70,000 ohm resistor in the power unit. This is a small green resistor with one end colored red and is in series with the plate of the '27 tube (first audio). A defective resistor will, of course, show no plate voltage on the '27 tube. If a 70,000 ohm resistor is not available, a 50,000 ohm can be used quite successfully.

D. B. LOONEY,
N. R. I. Consultant.

EARL MODELS 31 and 32 (Freed Models 78 and 79) NO SIGNALS

No signals and no plate voltage on any of the '27 tubes is generally caused by an open

in the large enamel wire wound resistor, either the 5,000 ohm or the 4,000 ohm. The defective section can be shunted with any 5 watt resistor of the proper resistance.

The same trouble is often encountered in the Earl Models 21 and 22 (Freed 55 and 56). This is caused by a defective 4,700 ohm resistor. This is a large yellow carbon resistor. Any 5,000 ohm, 5 watt, resistor may be used as a substitute.

STUDENT J. S. L.,
Baltimore, Md.

The appearance of the name of any Receiver in these columns together with service information must not be construed as a disparagement to that set or its manufacturer. It is merely in recognition of the well-known fact that everything mechanical, or electrical, must at some time be serviced. One of the purposes of this Institute is to develop men who can quickly and efficiently remedy service difficulties—in that way providing the manufacturers a valuable asset . . . The Service Man in the Field.

EDITOR.

MAJESTIC SERIES 20 LOW PLATE VOLTAGES

In the Majestic 20 series of receivers, which includes the Models 21, 22, and 23, a common trouble is a lack of plate voltage on the R. F. amplifier, first detector and intermediate amplifying tubes. Tests made on the 500 ohm series resistance in the common plate circuit, the 4,125 ohm resistor in the voltage divider, and the 1 mfd. condenser connected across the voltage divider indicate that all of these units are in good condition. If a measurement is made between plate of tube and B+ terminal of the intermediate frequency unit, it is found that a complete circuit is shown. Therefore, the circuit seems to be and is complete. The real trouble is that the .1 mfd. condensers incorporated in the intermediate frequency transformer containers are shorted.

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RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF.

COMPILED SOLELY FOR STUDENTS & GRADUATES

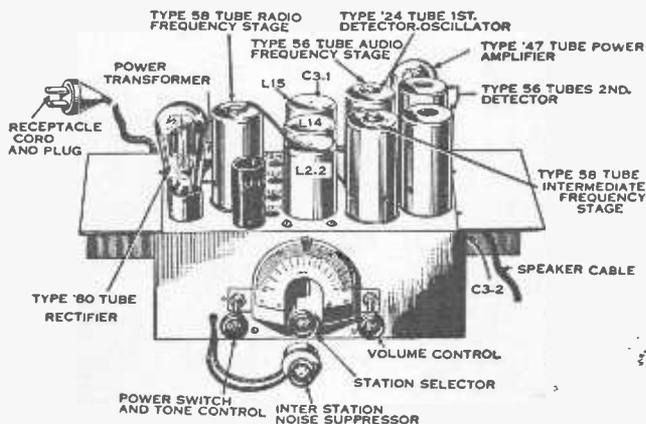
Sparton Model 14 Super-Heterodyne Schematic Diagram and Voltage Analysis

VOLTAGE ANALYSIS

Line Voltage <u>115</u> —Position of Voltage Compensator <u>100-115</u> —Position of Volume Control <u>Full</u>						
Tube	Location	Heater or Filament	Plate	Control Grid —	Screen Grid +	Plate Current M. A.
58	R. F. Stage	2.2—2.5	218—242	2—4	95—105	5.5—7.0
'24	1st Det.-Osc.	2.2—2.5	218—242	—	95—105	0.7—8.0
58	I. F. Stage	2.2—2.5	218—242	2—4	95—105	5.5—7.0
56	2nd Det.-AVC	2.2—2.5	•	•	—	•
56	2nd Det.-AVC	2.2—2.5	•	•	—	•
56	A. F. Stage	2.2—2.5	20—40	Zero	—	0.5—0.7
'47	Power Stage	2.2—2.5	205—225	†18—20	218—242	20—24
'80	Rectifier	4.5—5.0	315—345	—	—	19—23 per Plate

* Present only when signal is applied.
† Measured from tap on field coil to ground.

MODEL 14 CHASSIS



C2-1 Antenna Equalizing Condenser
C2-2 R. F. Stage Equalizing Condenser
C2-3 1st Detector Equalizing Condenser
C2-4 Oscillator Equalizing Condenser
C3-1 I. F. Input Stage Adjustable Condenser

C3-2 I. F. Output Stage Adjustable Condenser
L1 1st Tuning Coil
L2 Second Tuning Coil
L14 R. F. Transformer
L15 I. F. Transformer

Readers who file Service Data in separate binders remove page carefully; trim on dotted line for same size as Data published heretofore.

Queries and Answers

Question: On several superheterodynes which have come into my shop for repair, squeals and howls have been very noticeable. This condition was not due to a defect in the oscillator stage as it checked O.K. throughout. What do you think would cause this trouble?

Answer: In the modern A. C. receiver, every I. F. plate has a common supply, each plate series fed through the R. F. tuned circuit. Instead of a direct connection to the B+, the plate circuit is fed through a resistor by-passed to ground. The latter is referred to as a decoupler or resistive filter. It is quite possible for the by-pass or filter condenser to open, making coupling with the next stage possible and in this way set up regeneration and oscillation in another stage of the receiver.

Consider the condition in a super where the second detector and I. F. tubes obtain their plate voltage from a common tap on the voltage divider. The second detector almost invariably has a higher plate voltage than the I. F. tube. Then between the common point on the voltage divider and the plate circuit of the I. F. tube there will be a resistance to reduce the voltage to the required value. This resistance will be by-passed with a .25 or 1 mfd. condenser. If this condenser opens, then howls and squeals will be pronounced. No amount of adjustment of the tuning circuits will eliminate this trouble. The remedy is to replace the condenser causing the trouble.

To check such circuits for open condensers, obtain one known to be in good condition. Connect leads to it. Now connect this condenser in turn across each by-pass condenser used in the receiver. If oscillations, squeals, and howls stop when you have connected across any one condenser, then the original condenser is defective and another one should be used in its place.—F. L. Sprayberry, N. R. I. Service Consultant.

Another special department made possible by the increased size of National Radio News. Here we will discuss publicly, questions which have been asked us a number of times—denoting general interest.

Question: Why is it necessary to use two tubes for Class "B" amplification in an audio frequency amplifier whereas only one tube may be used in a Radio frequency amplifier?

Answer: Obviously, it is necessary to maintain the wave shape in the plate circuit of an audio amplifier as nearly identical with the grid voltage wave shape as possible. In a Class "B" amplifier, the tubes work alternately, one tube handling one-half of the wave and the other tube handling the other half. If we used only one tube, we would rectify the voice signal, making the plate signal valueless as a signal. Because of this alternate operation of tubes operated as Class "B" amplifiers in what appears to be a push-pull circuit, the operation has been termed "push-push."

In an R. F. circuit where Class "B" operation of a tube is employed, the plate of that or a successive tube must be a resonant or tank circuit. During the cycle of cut-off due to Class "B" operation, the tank circuit supplies the remaining half wave by virtue of its own oscillation. Of course, some distortion (2nd, 3rd, etc., harmonics) takes place, but this is not serious as the harmonics of the carrier are suppressed before reaching the antenna.—Henry Bradford, N. R. I. Transmission Consultant.

Question: I have noticed that copper-oxide rectifier elements are used in conjunction with a C. milliammeter to measure the output current of A. F. amplifiers. Can this same arrangement be used for measuring R. F. currents?

Answer: The copper-oxide rectifier elements are usually connected in bridge fashion so that rectification of both halves of an alternating current takes place. The capacity between elements usually is sufficiently large to by-pass a considerable amount of high audio frequency current so that the meter is inaccurate except for a normal deviation from the frequencies for which it was calibrated. At R. F. frequencies, the capacity is sufficient to make the amount of rectification of no account. Recent developments in rectifier elements have resulted in lowering the capacity between the elements so that the system may be used at R. F. In addition, it has been found that the system is a very good R. F. detector giving a very small amount of distortion even at a high percentage of modulation. Several engineers appear favorable to its adoption. It will also supply automatic volume control potential.—George Parrich, in charge N. R. I. Laboratory.

the fire department to keep the crowd from breaking down the door and trampling people under foot.

If the department store has a phonograph record department a small, attractive sign may be hung on each horn, stating, "This record may be secured at our record department, 4th floor."

Radio-Tricians are watching closely the trend and growing popularity of Public Address Systems. It spells opportunity. Many of them have made profitable connections in-

stalling, maintaining and operating such systems. Others are getting into businesses of their own selling and renting this equipment.

Nothing can fall so flat—be such a dismal failure, as an improperly installed or poorly operated P. A. system. So important has the field become that N. R. I. has developed a special Advanced Course on the subject.

We suggest that Radio-Tricians keep their eyes on this branch of the Radio Industry. It is going places.



Interior view of department store sale. Loud speakers call attention to particular items.
—Courtesy of Wright-DeCoster, Inc., St. Paul, Minn.

A BIT OF HUMOR

A Chinese truckman in Vancouver sent the following bill to a grocer for delivering orders:
10 goes
10 comes—at 50 cents a went.....\$5.00

"Is he a good rabbit dog?" inquired the hunter after inspecting the animal.
"I'll say he is!" the dealer replied with pride. "You should have seen the way he went after my wife's new sealskin coat!"

Cop: Madam, didn't you see me hold up my hand?
Woman at the wheel: I did not.
Cop: Didn't you hear me blow my whistle?
W. A. T. W.: I did not.
Cop: Didn't you hear me holler at you stop?
W. A. T. W.: I did not.
Cop: Well, I guess I might as well go home. I don't seem to be doing any good here.

RADIO IN AVIATION

THE progress of Aviation has to a great extent been regulated by the forward march of Radio. It is Radio which has taken so much of the chance element from flying; made possible the carrying of mail and passengers; removed most of the hazards from flying at night and in bad weather.

Our country has many miles of established airways over which there is a continual movement of aerial traffic. Huge planes leave the ground in Washington and land their valuable cargo in New York in two hours. A plane will make the trip from New York to Chicago in seven hours. It can be stated with slight fear of contradiction that this speedy transportation would not exist in its present state of development were it not for the safety factors—and the flying aids injected into the scheme by Radio.

Let us now consult the map on pages 12 and 13, noting the many air routes, and consider the difficulties presented in keeping planes flying these routes properly directed—as to their course and weather conditions. We now get a better picture of what Radio must and does accomplish for the flyers—and for the safety of the passengers.

Radio is responsible for the Visual Beacon. This consists of a double vibrating reed arrangement which shows a pilot when he is "off" his course and furnishes information to guide him back "on" the course.

Then Radio has given Aviation the Aural Range Beacon, which is a signal broadcast from the ground station for the same purpose as the Visual Beacon signal—keeping the pilot on his course. The station sends a signal which is received as an "A" (. —) if the pilot is to the right of the course; as an "N" (— .) if to the left; the signals merging and being received as a "T" (—) when the plane is exactly on the course.

It is not hard to see what dangers would be involved in night or stormy weather flying if it were not for these safety features provided by the Radio.

If this were all Radio had done for Aviation it would well have justified its connec-

tion with the flying industry. But it is far from the limit of Radio's contribution.

Every few minutes, during a flight, pilots receive Radio-phone messages giving weather reports and other pertinent data. This information is obtained in the following manner:

Ground stations are connected by teletype lines with other stations in each group or division. (A Teletype may be described as a machine which transmits typewritten messages by telegraphic means.)

At regular intervals these stations exchange weather and traffic information and at equal regular intervals transmit the information by Radio-phone to planes in the air.

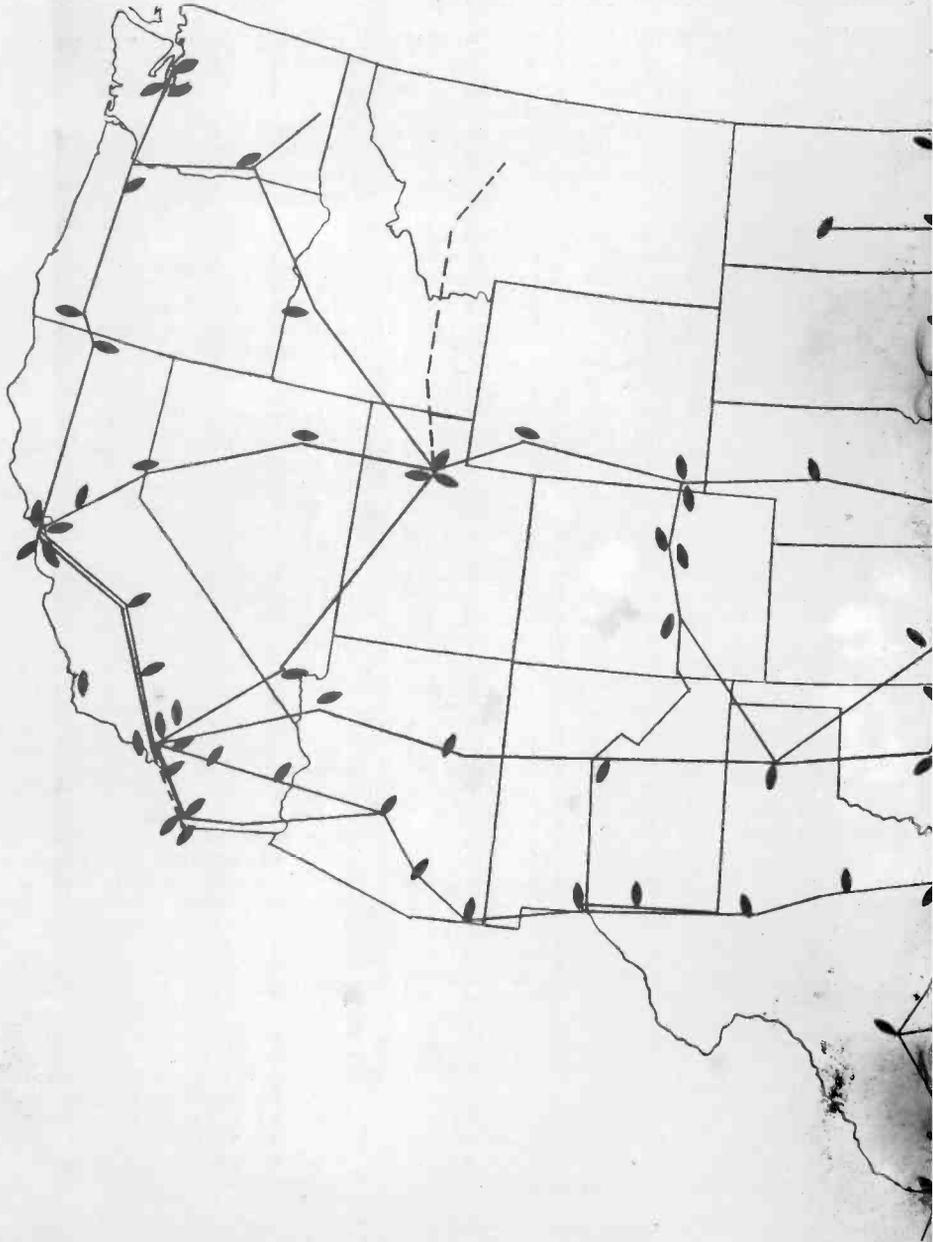
Of course, there are valuable aids to air navigation other than Radio. For instance, the light towers located ten miles apart along the airways; the landing lights on the airport fields, etc. But in the majority of cases these are "fair weather friends," only valuable when they can be seen.

It probably will be only a matter of a short time before Marker Beacons will be placed every ten miles along the airways. They will be ten watt stations continually broadcasting their particular call letters. Pilots passing above, knowing the call letters of the Marker Beacons on the course, will be able to navigate much more accurately than heretofore.

So—as Navigation grows, Aviation Radio must grow. As the development of flying has been regulated by the development of Radio safety features, so it will continue. The National Radio Institute considers the field so important that an entire Advanced Specializing Course has been written on the subject.

And being young—needing improvements, Aviation Radio offers one of the best fields of today for new ideas and inventions. There will be Radio devices in use on the airways ten years—even five years from now—which are unthought of at the present. A wonderful field for the man with imagination.

THE AIRWAYS DEVELOP



Adapted from a publication of
(See

MENT IN THE U. S. A.



Commercial Airlines, Aeronautical Radio
and Airport Stations of the U. S. A.

(Broken lines - - - indicate proposed
lines)

Information courtesy Federal Radio
Commission.

the Federal Radio Commission
(p. 11)

AN ANTENNA MAST THAT STAYS PUT

AN antenna mast that can be constructed for less than \$10.00; be very durable and look attractive has always been the hope and ambition of every radio enthusiast, the world over. In this brief article, I hope to point out how inexpensively one can be assembled; one that will withstand strong winds of any clime.

This antenna mast has a height of 40 feet and will make any radio enthusiast or amateur a proud owner. First steps are to purchase the equipment listed. The local second-hand dealer in pipe and the corner hardware store need be your only purchase points.

Parts needed:

- 13 feet—2 inch galvanized pipe.
- 10 feet—1¾ inch galvanized pipe.
- 10 feet—1½ inch galvanized pipe.
- 10 feet—1 inch galvanized pipe.
- 1 reducer—2 to 1¾ inches.
- 1 reducer—1¾ to 1½ inches.
- 1 reducer—1½ to 1 inch.
- 1 Tee—1 inch.
- 2 galvanized pulleys—1½ inches.
- 250 feet galvanized guy wire.
- 200 feet heavy clothes line.
- Cement, sand and gravel for basis of F, H, E, G.

Approximate costs should be something like the following:

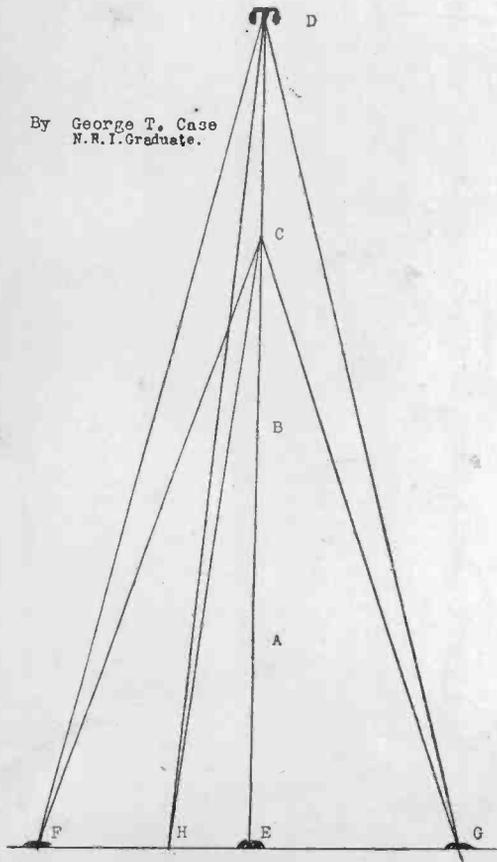
Pipe (four pieces)	\$3.80
Reducers and Tee75
Pulleys25
Galvanized wire	1.25
Clothes line	1.00
Cement, sand and gravel	1.75
Breaking insulators50
Total cost	\$9.30

These prices, however, are only estimated. Costs in your local community may be greater or smaller but nevertheless the cost will be very close to \$10.00. Items such as breaking insulators, pulleys and clothes line are generally found around the house, thus saving that portion of the cost.

Assemble all parts on ground, making sure that reducers are at correct points A, B, C and that Tee connection is at D. Attach guy wires and pulleys at D and also guy wires at C. Thread clothes line through pulleys, leaving enough that each may be reached after pole is in place. Guy wires DF, CF, DG, and CG pull to both sides of pole while DH and CH pull to rear of pole. Additional guy wires may be connected between BF, BH, and BG. Sink the pole in three (3) feet of cement and lay all guy wires fastenings at F, H, G, in cement bases. After pole is assembled on ground, and hole is dug, slide pole slowly along ground into hole. Before doing this have a six (6) inch base of cement in hole. After pole is up and in place fill hole with cement, making sure that pole is straight and cement is packed in tightly. This pole will be very substantial and will last a lifetime if proper precaution is taken in assembling and putting in place. If desired, a pulley may be used at C or B for additional aerial connections. Insert breaking insulators in guy wires about every ten (10) feet. And there's a pole that will keep your antenna 40 feet in the air for less than \$10.00.

Not only is this a good mast for your own aerial but it can be sold at a profit.

By George T. Case
N.R.I. Graduate.



THIS AUTOMOBILE RADIO FIELD by J. A Dowie, Chief Instructor

SELLING, Installing and Servicing auto radios is a big business right now and will continue to be in the future, because it is a business in which the surface of the real market has scarcely been scratched.

A consideration of the fact that cars on the road greatly outnumber the radio sets in America's homes will enable you to appreciate the tremendous possibilities that this new and already profitable business offers.

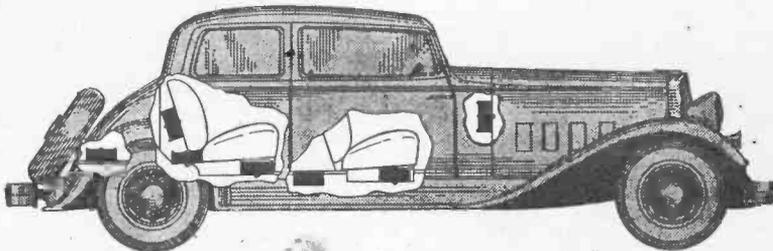
Fortunately for the far-sighted men of the auto radio manufacturers there has been no attempt to urge the buyer of an auto radio to install the set in his car himself.

Usually the cost of an expert radio installation is so reasonable that the car owner does not hesitate to have the set installed properly

is fed into a step-up transformer, where it is converted to a higher voltage. It is then rectified, filtered, and passed to a voltage divider to give the proper steady high voltage direct current necessary for the plate of the various tubes used in the set. In other words, it is just like that obtained from any B battery.

The other type of B eliminator consists of a small motor-generator. The motor operates direct from the storage battery of the car, the motor being coupled to a D. C. generator. This generator feeds into a filter and voltage divider resistor; these eliminate noise and gives the necessary smooth high D. C. plate voltage.

Either of these B eliminators can be mounted in any desirable location in the car or in a



Batteries or "B" Eliminator can be located in these out-of-the-way places.

by a service station which is equipped to do this work.

Auto radios obtain their filament voltage (A supply) from the storage battery of the car, which stands up very good under ordinary conditions.

The plate voltage (B supply) may be obtained from a bank of heavy duty B batteries placed in a convenient place in the car or housed in a water-tight box under the car floor. Or the B supply may be obtained from B eliminators. There are two types of B eliminators on the market for this purpose.

One consists basically of a vibrating device which changes the direct current from the car storage battery into a pulsating current. This

water-tight metal box under the car floor. They both work very satisfactory especially if the car's generator charging rate is advanced to take care of the small additional load.

Despite the constant rough treatment to which auto sets are subjected, the life of tubes and apparatus appears to be the same as in receivers for the home. Corrosion of parts has been stopped by making the metal housings for the chassis absolutely waterproof and weathertight. These and the new auto tubes have greatly extended the ability of automobile receivers. I still maintain that the auto Radio field has been neglected by Radio men and offers a world of possibilities for wide-awake Radio-Tricians.

GRADUATES

Join your Alumni Association. Plans are underway for big things in the Association. Be ready! Join now!

The Service Forum

(Continued from Page 6)

There are two ways of correcting this trouble. One is to use a new intermediate frequency transformer unit, and the other is to place the containers in a pan of hot water until the tar melts. Then lift out the complete assembly from the container and cut the leads to the .1 mfd. condenser. The unit may then be replaced in its container, after being properly heated, and reconnected to the circuit. A .1 mfd. condenser may then be connected externally across the B+ circuit to ground which will take the place of the previous condenser in the intermediate frequency transformer container.

GRADUATE P. R. M.,
Louisville, Ky.

BRUNSWICK RECEIVERS LOW DETECTOR VOLTAGES

In the Brunswick 15, 22, S14, S21, S31, S81 and S82 Models, the coupling condensers in the R. F. stages often short, particularly the one between the last R. F. tube and the control grid circuit of the detector tube. These coupling condensers are mounted directly on the gang condenser housing and it is necessary to trace the control grid circuit carefully in order to find them. After they are found, disconnect the condenser from the circuit and then connect it in series with a voltage source of about 90 volts and a meter capable of measuring that voltage. If this condenser is shorted, a reading will be obtained on the voltmeter. This trouble in the 15 and 22 Models often makes itself evident in the form of low detector plate voltage. Shorting the 1 megohm resistor in the grid return of the detector tube seems to correct the trouble. However, the trouble is really in the coupling condensers previously mentioned.

F. L. SPRAYBERRY,
N. R. I. Consultant.

A Radio rescue in mid-air which parallels the thrilling stories of Radio rescues at sea. Two Navy fliers were stranded in the air by fog and darkness. When Naval officials figured their gas would keep them up only 20 minutes longer the United Air Lines instructed its plane dispatcher to get in touch with a Transport Pilot flying in the vicinity. Talking to the Pilot over his Western Electric Radiotelephone, the dispatcher directed him towards the missing planes and told him to guide them to safety.

The Pilot located the planes and, blinking his landing lights, spelled out to the Navy fliers the words, "Follow me." He then guided them to a safe landing.

Merry Christmas

National Radio News Will Pay for Success Stories

READERS of National Radio News are interested in your success and we want you to tell them about it.

We want stories about how you built a Radio Service business; we want articles telling about advertising or publicity plans you used successfully and we want to know about jobs which you handled successfully after they had been turned down or mishandled by other Radio men.

Our readers are also interested in what you said in an application letter which landed you a job in Radio.

These letters should be between 200 and 300 words in length and they should give details to support the statements. If your advertising campaign about which you are writing produced results the amount should be given; if your application letter got you a job the name of the firm should be mentioned and all letters must be accompanied by a memorandum giving National Radio News permission for publication.

A number of these letters will be accepted for publication for each issue of the News and for each letter so accepted the writer will receive \$1.

Letters must be sent in a separate envelope addressed to the "Success Column," care of the Editor of National Radio News, no lessons or other communications enclosed with the letter. Decision for the acceptance of the letters will rest with the Editor of the News and shall be final. No letters can be returned.

We would like writers to send us a snapshot of themselves with their letters, but this is not absolutely necessary and will have no bearing on the selection of letters.

This letter contest is open to any student or graduate of the National Radio Institute and you may submit as many letters as you desire.

It is better to spend what time we can making new experiments than in disputing those already made.—Benjamin Franklin.

RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF.

COMPILED SOLELY FOR STUDENTS & GRADUATES

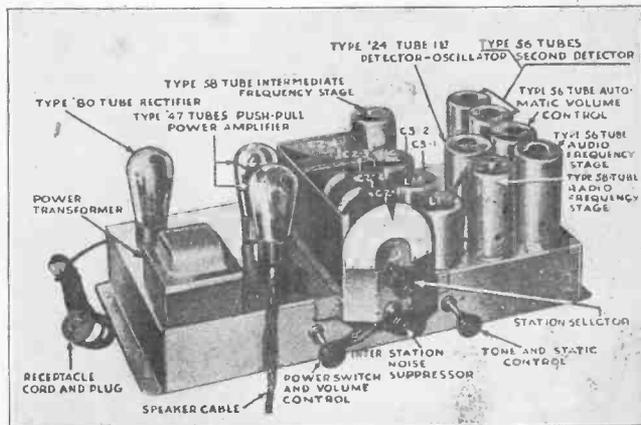
Sparton Model 18 Super-Heterodyne Schematic Diagram and Voltage Analysis

VOLTAGE ANALYSIS

Line Voltage 115—Position of Voltage Compensator 100-115—Position of Volume Control Full						
Tube	Location	Heater or Filament	Plate	Control Grid —	Screen Grid +	Plate Current M. A.
58	R. F. Stage	2.2—2.5	260—305	1.9—2.5	70—88	4.5—8.0
'24	1st Det.-Osc.	2.2—2.5	260—305	5—9	70—88	0.8—1.4
58	I. F. Stage	2.2—2.5	260—305	1.9—2.5	70—88	4.5—8.0
56	2nd Det.	2.2—2.5	*	*	—	*
56	2nd Det.	2.2—2.5	*	*	—	*
56	A. F. Stage	2.2—2.5	245—285	10—14	—	4.5—8.0
56	AVC	2.2—2.5	35—50	40—50	—	Zero
'47	Power Stage	2.2—2.5	250—295	19—25	260—305	18—25
'47	Power Stage	2.2—2.5	250—295	19—25	260—305	18—25
'80	Rectifier	4.2—5.0	360—440	—	—	33—45 per Plate

* Present only when signal is applied.

MODEL 18 CHASSIS



C2-1 Antenna Equalizing Condenser
 C2-2 R. F. Stage Equalizing Condenser
 C2-3 1st Detector Equalizing Condenser
 C2-4 Oscillator Equalizing Condenser

C3-1 I. F. Input Stage Adjustable Condenser
 C3-2 I. F. Output Stage Adjustable Condenser
 L1 1st Tuning Coil
 L14 R. F. Transformer

Readers who file Service Data in separate binders remove page carefully; trim on dotted line for same size as Data published heretofore.



ALUMNI News

ASSOCIATION NOMINATIONS COMPLETE ELECTION OF OFFICERS NEXT ON PROGRAM

Griffith Looms Big Favorite In Nominations

It looks like a landslide for our old friend K. W. Griffith. The hundreds of votes being cast for him as presidential nominee prove his popularity and in a measure forecast the final outcome of the elections.

Hood Dark Horse

However, it must be admitted that Norman R. Hood has his backers. While not polling nearly so many nomination votes as his opponent he made big strides, particularly in the late balloting. So its Griffith the favorite, against Hood the Dark Horse, for president.

Both men have fine records in Radio. Griffith has been an N. R. I. man since the early part of 1926. He's been a "ham" operator, his old amateur station being W5LK. He built Station KGJF and was later its managing director. And he's been a service man, too. A 100% sure-fire N. R. I. man.

Hood is another old-timer in the Radio. He also started with N. R. I. in 1926, while he was a Radio operator. He has been closely associated with the A. R. R. L. He rebuilt KGCU. He was connected with the Firestone short-wave station. Hood supervised the installation of the City of Akron, Ohio, Police System and is now Chief Operator of that system. And he's an N. R. I. booster first and always.

May the best man win.

Nichols, Barschdorf, Moore, Merryman, and Murray Also Poll Big Vote

In addition to the enormous vote piled up by the presidential nominees there was also heavy balloting for the four vice presidencies and the two secretarial offices. Fred Nichols, Harry Barschdorf, Hoyt Moore, running for the vice president offices, are heavy favorites, as are Earl Merryman, Secretary, and Phil Murray, Executive Secretary.

But all now have opponents, for the final tilt, who have sufficient backing to make it a good and interesting contest. Here's the way the friendly rivals line up for the finals:

For President—

K. W. GRIFFITH vs. N. R. HOOD

For Vice President—

FRED NICHOLS vs. R. E. HARTZOG

For Vice President—

HARRY BARSCHDORF vs. J. A. VAUGHN

For Vice President—

HOYT MOORE vs. L. J. VANEC

For Vice President—

DONNELL O'CONNOR vs. F. A. PARKINS

For Secretary—

EARL MERRYMAN vs. JOHN GANTT

For Executive Secretary—

PHIL MURRAY vs. I. M. DAVIDSON



Alumni Members will receive with this issue of National Radio News a final Election Ballot. Vote for one man for president; four vice presidents; one secretary; and one executive secretary, and rush your ballot back.





Christmas Customs

AN ancient custom in Switzerland had Santa Claus, on the sixth day of December, visit every house where there were children. However, Saint Nick in the land of the Alps did not always appear as the jovial old man known to the youngsters in the United States. He frequently looked cross and threatened disobedient children with punishment with the big stick he carried.

In those early days Santa Claus, in the land of the Alps, was supposed to personify winter. The rather noisy parades which used to be held on December 6th, and in some villages on December 31st, were supposed to have originated in a desire to drive Jack Frost away and hasten spring. (It must be remembered that many centuries ago the seasons were much advanced, spring beginning in February.)

At one time Santa Claus used to bring the Christmas tree to the children in Zurich (now-a-days it is Christkindi, a white angel, who performs the task) and in other parts of the country it was even customary for the big boys to parade a wooden donkey through the streets, which by means of a quaintly conceived mechanism manipulated by its rider, could snap at passers-by. Several "assistants" to Santa Claus, carrying huge cow bells on their backs, followed; also another party of "helpers," all wearing colorfully lined hats made of cardboard into which curious figures had been cut. Inside of this headgear was a lighted candle, which produced a most fascinating picture.

In order to revive this ancient custom which almost died out during the World

War, a professor in Zurich instructed the boys of his school to make these illuminated hats and for the last five years a regular little army of these quaintly garbed "helpers" of Santa Claus have held their merry procession on December 6th. All the boys wear long, white nightshirts; each is equipped with a horn or bell in order to make the traditional terrific noises. At the end of this curious parade marches Santa Claus with his flowing white beard, his big stick and bag.

It is to be hoped that Christmas will always continue to be celebrated. Few of us are there, regardless of age, who do not feel the Christmas spirit and are happy in memories of our own childhood at Yuletide.

MORE ABOUT THE ALUMNI ELECTIONS

NOTHING one-sided about these nominations. Naturally, we had to select the two highest men to run for each office. But here's a list of the fellows who also received votes for the various offices. They are to be congratulated; their fellow-members have confidence in them.

Below are the members who received votes for the presidency:

G. W. PAGE
R. B. SMITH
E. F. DOWNEY
E. E. WINBORNE
R. L. HANSON
H. J. MUELLER
R. DeJONGE
L. T. NEWELL
M. J. REEFF
V. L. OSGOOD
D. L. WARNER
T. S. NORTON
H. HOUSTON
F. E. BRATTAIN
R. S. LEWIS
H. A. WILMOTH
E. R. BALDWIN
N. HACKINS
N. HERENSCHACK
J. G. DuBOIS
J. E. HOLGATE
P. T. FARNSWORTH
A. SMITH
G. F. JOHNSTON
J. F. HIMES

The following list is of members of the Alumni Association who received votes for nomination for the office of Secretary:

J. F. HUFF
E. F. DOWNEY
E. E. WINBORNE
H. J. MUELLER
L. ANDERSON
C. STEINHOFF
M. J. REEFF
D. W. BURRELL
F. GOLDEN
J. E. RYAN
J. H. SHEW
S. F. HICKS
J. F. KIRK
J. E. SHREWSBURY

The following Alumni Members received votes for nomination for Executive Secretary:

R. B. SMITH
G. C. KING
J. J. MOLOOF
L. ANDERSON
L. T. NEWELL
T. S. NORTON
L. L. BROWN
H. L. PENIE
L. GONDREAU

Alumni Members receiving votes for Vice President:

R. B. SMITH
I. N. SAVASTONE
E. BENNETT
H. RAMM
S. J. EBERT
A. NEY
H. HOUSTON
E. W. NEDERHOUSER
F. E. DeMERSE
J. F. HUFF
G. C. KING
P. REISS
E. F. DOWNEY
W. E. RIDDLE
O. PRESCOTT
W. W. NIXON
E. E. WINBORNE
T. J. KELLY
J. P. M. SMITH
J. J. MOLOOF
A. YENANIS
F. BATTLES
L. H. MARSHALL
R. L. HANSON
H. J. MUELLER
L. ANDERSON
F. McCLELLAN
H. J. STADLER
R. B. CHERRY
A. L. BAILEY
W. J. WHITE
G. L. CHANDLER
H. H. GRAEF
E. VAN GILDER
J. C. VESSELS
L. T. NEWELL
C. STEINHOFF
H. C. HEYWOOD
H. BOLLMANN
R. COMPTON
E. A. MATTHAIS
M. J. REEFF
J. F. KIRK
C. W. LINSEY
H. JONES
V. L. OSGOOD
D. L. WARNER
M. C. CLEMENS
S. L. MAHAFFEY
M. M. KISSEL
T. S. NORTON
L. A. CANNING
C. ALLDAY
F. E. BRATTAIN
J. H. ANDERSON
B. L. SELLERS
A. P. HEDDEN
R. S. LEWIS
M. I. LEIBY
H. H. LANCE
D. HOAG
P. PURDUE
J. E. SIOVIC
E. L. CHAMBERS
G. MEDVED
H. A. WILMOTH
J. K. JONES
A. L. HISSONG
H. SAVILLE
L. F. HUNTZINGER
R. COPENHAVER
L. McCONNELL
W. E. EVANS
J. E. McLAURINE
A. R. KREUZER
E. L. ROWE
C. L. COON
H. A. LOGSDON

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MORE ABOUT THE ALUMNI ELECTION

(Continued from Page 21)

W. I. WARNER
N. HACKINS
J. M. WILCOX
R. SPINDLER
S. F. HICKS
E. P. SIDDALL
W. C. SCOTT
F. HAUSHALTER
J. L. STULL
C. S. MAO
M. GOTTLEIB
H. PARR
B. STIGERS
F. SAGER
J. E. SHREWSBURY
H. F. HAYES
R. W. PERCY
A. H. CARTER
G. JOHNSTON
K. E. WHITE

BULLETIN

Alumni Members will join the News in congratulating Earl Merryman, Alumni Association Secretary, on his new position.

When it became known that the Columbia Broadcasting System was to have WJSV, Mount Vernon Hills, Va., as a C. B. S. station (Mount Vernon Hills is just outside of Washington, D. C.), applications began to pour in from Radio men desirous of locating with the new station.

Earl's long experience and the valuable work he has done for WRC of this city have created a reputation for him and he was given the position of Control Engineer at the new station over all applicants.

Congratulations, Earl—and Good Luck.

A bride telephoned her husband: "Oh, John, do come home. I've mixed the plug things in some way. The radio set is all covered with frost, and the electric refrigerator is singing!"

Merry Christmas



Peace on earth --- good will
toward men

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