

NATIONAL RADIO NEWS



VOL. 5—NO. 1

WASHINGTON, D. C.

AUGUST, 1932



JOSEPH KAUFMAN

Supervisor of Education

JOSEPH KAUFMAN

ONE of the most important men in any school is the Supervisor of Education—the man who decides of what a course of study should consist to make the student the type of graduate the school can be proud of. That's just who Mr. Kaufman is—the Supervisor of Education at N. R. I.

We are always interested in knowing something about the lives of our teachers and instructors. You'll want to know about Mr. Kaufman and where he obtained his vast knowledge of Radio.

Mr. Kaufman was born in Boston, Massachusetts, January 7, 1898. He obtained his elementary and secondary schooling in the same city. He was interested in Radio as early as 1910, when he was just a lad of twelve. Since that time he has studied and mastered Radio until he is now a well-known teacher and engineer in the Radio Industry.

He completed his education by graduating from the Massachusetts Institute of Technology, one of the foremost engineering schools in the country, with S. B. and S. M. degrees. From 1918 to 1921 he was Instructor in Electrical Engineering and Physics at M. I. T.

For seven years Mr. Kaufman was General Manager and Chief Engineer for a corporation manufacturing Radio parts and receivers.

From this organization he came to N. R. I. to be our Supervisor of Education. He has charge of the writing of our advanced instruction material and renders the Consultation Service which means so much to you in obtaining your Radio knowledge and becoming an expert Radio-Trician.

Many people have profited by Mr. Kaufman's Radio knowledge for he has written numerous technical books and also contributes to magazines and technical journals.

FEATURES OF THE NEW RECEIVING TUBES

By J. A. DOWIE



J. A. DOWIE
Chief Instructor

are interchangeable with existing types.

The "Wunderlich" Tube is a special purpose detector which combines full-wave rectification with a perfect stage of audio amplification and provides the necessary D.C. bias voltage for automatically controlling the sensitivity of the preceding R.F. tubes. All this within one simple tube structure. The tube employs two input control grids which are symmetrically arranged in co-cylindrical fashion about the cathodes. The standard vertical type of heater and cathode is used. This tube is now in regular production by the Arcurus Radio Tube Company, Newark, New Jersey. It is available with either a five or six prong base and is made to operate with either a heater voltage of 2.5 or 6.3 volts. This five prong tube is supplied with a cap electrode similar to that used on screen grid tubes.

The '46 is a double grid power output amplifier tube, especially designed to operate in push-pull amplifications of A.C. operated receivers but operating as class "B" amplifier tubes. The same tube may be used as a class "A" amplifier. This nomenclature requires a little explanation. Up to the present time, practically all vacuum tubes in radio receivers have been operated as class "A" amplifiers. That is to say, a bias voltage has been selected which will cause normal plate current to flow and the tube itself will operate over the straight portion of the E_p-I_p characteristic. Class "B" amplifier tubes,

however, are so biased that the plate current is just cut off with the result that normally, no or very little plate current flows until a signal is impressed on the grids. The '46 amplifier is so arranged that without any C bias, it will have zero plate current.

The '46 tube has two grids which when connected together make it operate as a class "B" amplifier. However, when the grid nearest the plate is connected to the plate, the tube acts in a class "A" manner. This tube has a high amplification factor when used as class "B" and has a low amplification factor when used as a class "A" amplifier tube.

The '56 is really an improved '27 and is a general purpose three element tube of the indirect heater cathode type. It is suitable for use as a detector, oscillator, or amplifier in A.C. receivers. It is a five prong base tube. Because of its high mutual conductance and high amplification factor, it is especially useful in resistance coupled A.F. amplifiers.

Within the last few months there have appeared on the market R.F. pentode tubes intended primarily for automobile and battery receivers. The '57 is also a triple grid heater type R.F. pentode tube, designed for normal A.C. receiver use. This tube is essentially an R.F. pentode with characteristics superior to the regular screen grid type of vacuum tube. It may be used in R.F. amplifiers, A.F. ampli-

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WUNDERLICH
(Arcturus)



'46-B



'57-B



'56-B



'82-B



'58-B

JOSEPH KAUFMAN

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FEATURES OF THE NEW RECEIVING TUBES

By J. A. DOWIE



J. A. DOWIE
Chief Instructor

IN looking over the new tubes announced recently by tube manufacturers, we find the "Wunderlich" (Arcturus) and the '46, '56, '57, '58 and '82 (RCA licensed), none of which

are interchangeable with existing types.

The "Wunderlich" Tube is a special purpose detector which combines full-wave rectification with a perfect stage of audio amplification and provides the necessary D.C. bias voltage for automatically controlling the sensitivity of the preceding R.F. tubes. All this within one simple tube structure. The tube employs two input control grids which are symmetrically arranged in co-cylindrical fashion about the cathodes. The standard vertical type of heater and cathode is used. This tube is now in regular production by the Arcturus Radio Tube Company, Newark, New Jersey. It is available with either a five or six prong base and is made to operate with either a heater voltage of 2.5 or 6.3 volts. This five prong tube is supplied with a cap electrode similar to that used on screen grid tubes.

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(Page 10, please)



WUNDERLICH
(Arcturus)



'46-B



'57-B



'56-B

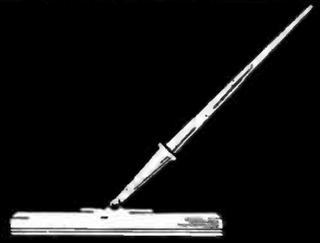


'82-B



'58-B

My Own page



ALUMNI ASSOCIATION ACTIVITIES



LESS THAN A YEAR

IT is particularly pleasing to me to receive a great number of letters from graduates of the Institute commenting upon the good work being done by the N. R. I. Alumni Association.

As we all know, this Association has been responsible for some major improvements in National Radio News, which is their official organ. They were responsible for the test which proved conclusively that the old type National Radio News mailing envelopes were not satisfactory resulting in the use of the envelope which now carries the News. They have caused the mailing of several interesting booklets to their members and they are working hard to keep the editorial and technical content of National Radio News up to a high standard.

At present, the Association is planning the first issue of the "Alumni Association Year Book" which they hope to have ready for mailing to the members by the middle of August of this year. I've seen some material which is intended for this book and I know that every member of the N. R. I. Alumni Association is going to be proud of his copy.

In this very issue of National Radio News the Association is bringing you a new service, by which it will be possible to obtain free of charge, promptly and without a lot of letter writing, interesting literature published by various manufacturers of Radio parts and apparatus. This is brought about by special deals with the manufacturers themselves and with the Calcaterra Catalog Service of Pleasantville, N. Y. This service is described on page 16.

The Alumni Association has more than fulfilled my expectations. It has increased its membership from 72 to 3,000 in a little more than two years. It is growing rapidly. Naturally, the more members, the more service possible to those members.

I want the Graduates who read this column to back the Alumni Association. And I want to tell every student of the National Radio Institute that he should look forward to the day that he can graduate and become a member of this organization. Remember, only graduates of the National Radio Institute can be members of this Association.

IN less than a year now, if things go according to schedule, Radio City, the largest building project of its kind in the world, will be formally opened. The proposed opening date is set for May 1, 1933.

While there is naturally a certain amount of secrecy attached to these matters, indications point to the possibility of the formal introduction of Television at the opening of Radio City. Experiments in Television are being carried forward at a rapid rate and it is quite possible that May 1, 1933, is their objective.

With the introduction of Television from Radio City, there is no doubt whatever that the public will begin taking an active interest in the subject which active interest will result in the sale and service of Television receivers. It has been predicted that eventually every broadcasting company in the country will have to install Television apparatus to illustrate their programs in the same manner as it was found necessary for moving picture theatres to introduce sound as an adjunct to the old time silent pictures.

J. E. Smith

President.

LYRIC SUPERHETERODYNE RECEIVERS

BALANCING

FOR the sake of clarity balancing operations are described under two headings, "Radio Frequency Circuits" and "Intermediate Frequency Circuits."

Radio Frequency Circuits

Viewing the variable condenser from the front of the chassis the four sections tune the various circuits in the following order:

- 1st section—Antenna circuit.
- 2nd section—Link.
- 3rd section—Oscillator.
- 4th section—First Detector.

The oscillator being tuned 175 kilocycles above the desired signal at all times its frequency range is from 725 kilocycles to 1675 kilocycles. This is a smaller percentage difference in frequency than the difference between 550 kilocycles and 1500 kilocycles and requires a smaller tuning capacity range. To secure this reduced capacity range an adjustable fixed "padding" condenser is connected in series with the oscillator section of the variable condenser. The adjusting screw for this padding condenser is accessible through a hole in the chassis pan between the shield partitions of the oscillator condenser.

Owing to the complex nature of the superheterodyne receiver, balancing is a critical task and the operations are described in minute detail. The procedure outlined below must be followed without any deviation. Any other routine will take longer and will give less satisfactory results.

Before attempting to balance the variable condenser circuits the service man should be sure that the intermediate frequency amplifier is tuned to EXACTLY 175 Kilocycles.

CAUTION: DO NOT at any time alter the setting of the dial pointer on the condenser shaft.

1. Set R.F. test oscillator to some known frequency between 1400 Kc. and 1500 Kc.
2. Set receiver to this frequency on dial.
3. Adjust trimmer condensers for maximum output on output meter.

4. Set R.F. test oscillator to some known frequency between 550 Kc. and 600 Kc.
5. Set oscillator padding condenser for maximum output on meter.
6. Align circuits at approximately 1000 Kc., 750 Kc. and 550 Kc. by bending segments of condenser rotor end plates.
7. Repeat operations 1, 2, 3, 4, 5 for finer adjustment.

IMPORTANT—Do not attempt ganging with an ordinary screw-driver as capacity effects render accurate settings impossible. Use fibre screw-driver having SMALL metal tip.

The procedure outlined above insures perfect alignment of the antenna link and first detector sections and accurate tracking of the oscillator with these circuits.

Intermediate Frequency Circuits

The sensitivity of the receiver is directly dependent upon the tuning of the four intermediate frequency transformer tuning condensers. These are carefully adjusted at the factory to precision oscillators.

Several very excellent oscillators are available from instrument manufacturers as listed above and we recommend that the best obtainable be purchased.

Do not attempt adjustment of intermediate frequency transformers unless you have an accurately calibrated source of a 175 kilocycle signal for tuning.

Read and understand the following instructions thoroughly before doing any work on the receiver.

1. Remove grid clip from cap of first detector tube.
2. Connect output of 175 kilocycle oscillator between cap of first detector and chassis pan.
3. Tune four I.F. tuning condensers for maximum output on meter.
4. After all four condensers have been adjusted carefully a final check should be made by going over all adjustments a second time to bring them into perfect alignment.

On the production line it has been found that tuning the secondary of the I.F. transformer before tuning the primary results in greater accuracy and speed. Viewing the transformer from the bottom with the adjusting screws toward you, the right hand screw adjust the secondary tuning condenser. We suggest that you follow this routine.

VOLTAGE TABLE

Position of Tube	Type of Tube	Filament Voltage	Cathode Voltage	Plate Voltage	Screen Voltage	Grid Voltage
E.F. Amp.	—51 or —35	2.5 A.C.	2.1	200	70	0
1st Det.	—24	2.5 A.C.		205	70	0
Oscillator	—27	2.5 A.C.	0	70		0
I.F. Amp.	—51 or —35	2.5 A.C.	2.1	200	70	0
2nd Det.	—24	2.5 A.C.	10	125		0
Output	—47	2.5 A.C.		235	250 (note)	—17.0**

Speaker field current —91 M.A.

Volume Control Maximum

Note—Screen of pentode is connected to cathode pin on socket.

** Owing to the high resistance of the circuit these voltages can be measured accurately only with an electrostatic voltmeter.

A CHAT WITH THE N. R. I. DIRECTOR



E. R. HAAS
Vice President
and Director

PLAYING SAFE

I was watching a baseball game one afternoon, not so long ago, and I learned an important lesson from it.

The score was very close and the game practically ended. The batter hit a short single to center field. The fielder came tearing on desperately in an attempt for the final put-out. Seeing that he could not quite make it, he dove at the ball with his gloved hand and missed. Naturally, while the ball was being recovered, the batter had been streaking around the bags and had stretched the single into a three bagger. He later scored with the winning run.

In an effort to obtain immediate results, that little center fielder threw caution to the winds and the result was a loss. Had he looked ahead—played safe, taken that hit on the bounce and held the hitter to a single, the result might and probably would have been entirely different.

Of course that was only a baseball game and one has to expect to lose ball games occasionally but what a moral can be drawn and applied to real life.

We all know plenty of persons who are blinded by the near dollar; fellows who must see immediate definite results in order to think they are succeeding; fellows who can't look to the future and play safe.

Look ahead ten years, what do you see? Will you be driving your own car, will you own your own home, will you be happy—and will those dependent upon you be happy? Or will you be reading the Daily "Help Wanted" ads, travelling from pillar to post begging for employment which offers meager recompense?

Well let me tell you, the answers to those questions will depend to a great extent upon how you field your position in the great game of life, right now. If you can see nothing but the immediate earning power which you have

at your command and fail to play safe for your future, chances are you're going to be in that latter classification.

I know just as well as you do that this country has been going through a serious depression and folks have been hit hard—but we've got to play safe. We've got to look for that future. Getting your training and getting it right is playing safe. Getting after the Radio work in your community is like getting warmed for your time at bat. It helps you play safe—it prepares you for the future.

There are more Radio receiving sets in existence today than ever before in the history of our country. People who do not have money to buy new sets are having their old ones serviced, because people will have their Radios. How you work and how you study today will determine whether you will be the winner or the loser, later on.

LETTERS WANTED

A short time ago in National Radio News was published a notice that we wanted copies of testimonial and good will letters written by customers of students.

We have gotten quite a number of these letters, but we want some more of them—in fact we want as many as we can get.

Any student who has done a job for a customer and pleased him so well that he has written the student a letter praising the work, should send that letter to the Editor of National Radio News with a note on the bottom "Permission for publication granted," and sign your name.

THE Public Address System Installation in the Saint Paul Auditorium, Saint Paul, Minnesota, offers an interesting study for the Radio-Trician, as it portrays the length to which organization will go to provide adequate facilities for carrying voice and music in buildings of this nature.

It will be interesting to note the flexibility of this system together with its ruggedness and the simplicity with which problems, heretofore regarded as extremely intricate, have been handled.

The installation consists of the racks and panels as designed by the Samson Electric Company, Canton, Massachusetts, twenty-seven loudspeakers, manufactured by Wright DeCoster, Inc., of Saint Paul, Minnesota, one Bullet condenser microphone, and two double button carbon microphones.

Figure 1 shows a rear view of a single

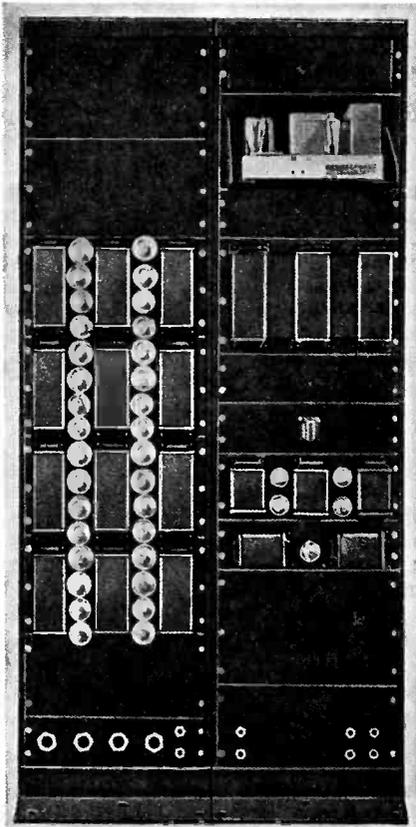


Fig. 1. Rear view single channel sound system for St. Paul Auditorium. Samson design.

THE PUBLIC ADDRESS IN THE SAINT

An article of extreme interest to acknowledges, with thanks, the assistance of Mr. D. H. Wright, The Wright Samson Electric Co.; Mr. H. M. Ri

channel rack of the sound installation in the Auditorium. Note the neatness and convenience of design. The wiring is totally enclosed and conduit terminations are at the base of the racks.

Figure 3 shows two 83" racks, which is one channel of a four-channel installation. Included are a Radio tuner, double turnable and five-position mixer with all positions at two hundred ohm level which makes for extreme flexibility of program makeup and control. The control is further extended by tone modification equipment, output line volume adjustment, power and field switching. Included are facilities for inter-channel connection, making any channel program available for any or all other channels.

The control equipment is mounted in an especially designed broadcast room which is built into the balcony at the horseshoe end of the Auditorium. This broadcast room is lined with acoustic material, in a most efficient manner, has a large window through which the operator can observe the Arena floor, and also a balcony from which he can listen to the program coming from the speaker horns direct. He is equipped with a monitor telephone with call stations in



Fig. 2. An interior view of a broadcast room speaker installation

INSTALLATION AUDITORIUM

and-Tricians. National Radio News
 rendered in preparing this article
 Coter Co.; Mr. R. W. Cotton, The
 sa, United Sound Engineering Co.

different parts of the Auditorium by
 which he is kept in touch with everthing
 through his monitor man who has charge
 of the microphones and is responsible for
 checking up on the sound in different parts of
 the Arena.

A steel gondola covered with screening car-
 ries twenty-one of the loudspeakers. While this
 gondola usually hangs in the center of the
 Arena about fifty feet from the floor it is sus-
 pended on a monorail system that carries it
 to one end of the Auditorium or the other, and
 raises and lowers it as necessary. Pull boxes
 are installed at five different points above the
 monorail system so that the loudspeakers can
 be plugged in at any one of these five positions.
 Twenty of the speakers in the gondola use the
 Wright DeCoster No. 9 horn, and the twenty-
 first speaker is pointed face downward on baffle.
 These speakers have 110 volts D.C. fields which

current is avail-
 able in the build-
 ing. This elimi-
 nates the use of
 rectifiers. They
 are divided into
 seven groups,
 the volume of
 each of which is
 controlled separ-
 ately and inde-
 pendently, from
 the main panels.
 They are mount-
 ed with eleven
 horns in a circle
 on the upper
 tier to take care
 of the balcony
 and nine horns
 on the lower tier
 to take of the
 main floor of
 the Arena. The
 back ends of the



the Auditorium showing the loud
 monorail mounting.

speakers are hinged to the gondola, the
 front ends supported by adjustable chains, thus
 allowing the horns to be properly focused
 regardless of the position or height of the
 gondola.

Figure 2 is an interior view of a portion of
 the Saint Paul Auditorium taken while the
 General Motors Automobile show was in prog-
 ress. The size of the hall may be estimated
 by comparing it to the size of the automobiles
 and persons looking over the exhibit. At the
 top of the picture may be seen the twenty-one
 adjustable loud speakers on their monorail
 system.

The problem of acoustics was met very
 simply by avoiding the problem. The horns
 of the gondola are pointing directly into the
 section of seats. When any section is full,
 naturally the sound from the horns is absorbed
 and when it is empty, the individual volume
 control on that group of horns allows the ad-
 justment to be made. The fact that the horns

(Page 14, Please)

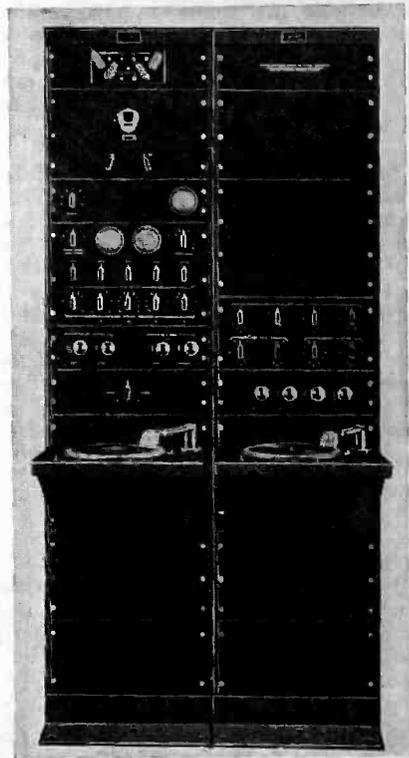


Fig. 3. Two 83-inch type SB Sam-
 son design racks showing tuner,
 double turntable and five position
 mixer.

FEATURES OF THE NEW RECEIVING TUBES

(Continued from Page 3)

fiers and as first and second detectors in any radio receivers. It is particularly satisfactory for resistance coupled or impedance coupled A.F. amplifiers.

This tube, when used as an R.F. amplifier, should preferably be used on low signal inputs. It is also particularly adaptable as an A-V-C tube to supply the control grid bias for the radio or intermediate frequency stages in automatic volume control circuits. It employs a 6-prong base and cap. The cap is the control grid connection.

The '58 is also a triple grid R.F. pentode, having variable mu features. The tube is therefore especially useful in R.F. and I.F. amplifiers where it is essential to keep cross-modulation and modulation distortion down to a minimum. It can also be used as a first detector for superheterodyne receivers, where it aids in volume control. This tube, like all of the variable mu tubes, is not particularly recommended as a dynatron oscillator or grid bias detector. This tube is identical in appearance to the '57 and is intended as a companion tube. It is expected that this tube will replace the '35 and '51 in radio receivers.

The last of the tubes is the '82 full-wave hot-cathode mercury-vapor rectifier. This tube is designed especially for supplying A.C. receivers with D.C. power of constant voltage, this voltage to be independent of the load drawn from them within reasonable limits. This is another way of saying that the tube has low internal resistance and has good regulation. The internal voltage drop of this tube is approximately 15 volts. This rectifier tube is very valuable for use with class "B" power amplifiers where large powers are desired and where regulation must be of the highest order.

WHAT NEXT?

It is now rumored that the police of London will be equipped with Radio receiving sets small enough to fit into a helmet or coat pocket. We'd like to be able to look ten years into the future to see what uses will be made of Radio.

IDLE THOUGHTS

Speaking of unemployment, the average man has 12,000,000,000 brain cells.



YOU

You are the fellow that has to decide
Whether you do it or toss it aside;
You are the fellow who makes up your
mind
Whether you lead or will linger behind;
Whether you'll try for the goals afar
Or just be contented to stay where you are.
Take it or leave it, here's something to
do—
Just think it over, it's all up to you!
—Forbes.

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DUPLEX—DIODE TRIODE TUBE No. 55

A new tube which will be ready for distribution in a few months combines the features of full-wave diode detection, triode amplification, and automatic volume control.

The diode unit has two equal plates placed symmetrically about the cathode. The cathode is common to these plates and to the triode element.

When the tube is used as a full-wave detector it offers possibilities of an unoverloadable diode detector. When it is used as a half-wave detector then the companion plate may be circuited for automatic volume control.



N.R.I. ALUMNI News

A NEW SERVICE

The Alumni Association of the National Radio Institute is glad to have the opportunity to bring a new and helpful service to readers of National Radio News.

It is known as the Calcaterra Catalog Service and is a system whereby you can obtain helpful technical data from the manufacturers of Radio equipment, free of charge and very promptly.

In order to take advantage of this service it is only necessary to follow the instructions given on page 16 of this issue where the detailed information of the plan is published.

This plan will be tested for several issues and if it meets with the approval of readers of the "News" it will be accepted as a standard department in our paper.

The coupons used in the Calcaterra Service must be sent direct to their Pleasantville, N. Y., address and not to the National Radio Institute or the manufacturers direct. Any correspondence which might arise should also be directed to the Calcaterra Service.

Your Alumni Association is continually working for you and we sincerely hope you'll find this new service helpful.

IN MEMORIAM

The Alumni Association of the National Radio Institute extends its sincere sympathy to the family of its fellow-member, Adam Oswald, of Ellenton, South Carolina, who passed away May 16, 1932. A fine student; a good friend.

OUR NEW MAILING ENVELOPE

Your Alumni Association is always on the lookout for new ways and means to improve service to N. R. I. men, insofar as National Radio News is concerned.

Consequently, when reports were received that in some cases National Radio News was arriving in bad condition we immediately started to investigate the cause. It turned out that the envelope we were using was one designed to carry National Radio News before its size was increased. The additional weight was too much for the old type envelope, consequently they became torn in the mails, in many cases.

Now we have a container which we believe will get your News to you in good condition. It is stronger, heavier, and incidentally a different color.

A new book, "The Outlook for Television," has been announced by Harper & Brothers, 49 East 33rd Street, New York City. The author is Mr. Orrin Dunlop. Details may be obtained from Harper & Brothers.



THE PUBLIC ADDRESS SYSTEM IN THE SAINT PAUL AUDITORIUM

(Continued from Page 9)

are semi-directional prevents the sound from spreading up into the ceiling to any extent.

Figure 4 shows speaker volume control for Saint Paul Auditorium. This panel provides control of speaker lines permitting central control of the volume of various groups of loud speakers to meet the requirements of audiences varying in density, distribution and disposition.

Figure 5 illustrates the Saint Paul Auditorium Public Address System five-position mixer and master gain control panel. Here is shown a five position mixer for five two-hundred ohm sources. Each position is subject to individual button current and volume control. Button current may be read in each position. A master volume control permits regulation of the entire

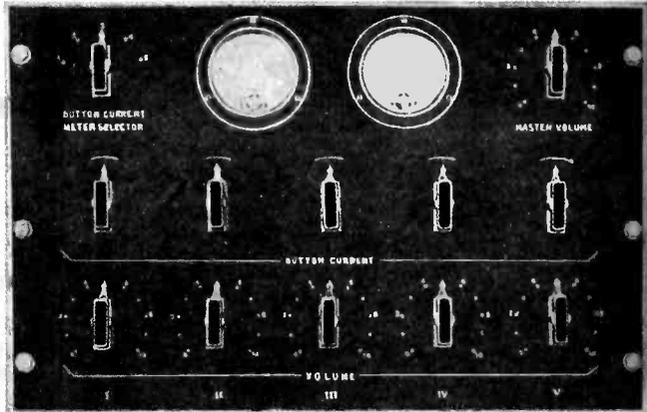


Fig. 5. Five position mixer and master gain control panel.

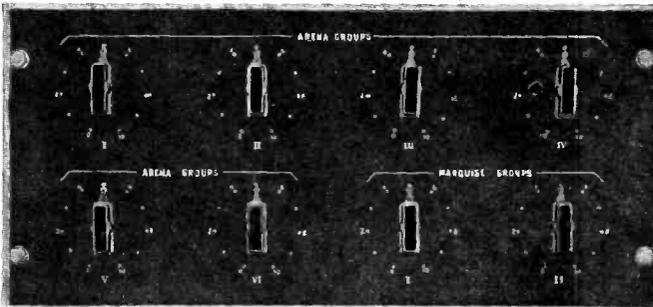


Fig. 4. Speaker volume control panel providing control of speaker lines.

program, without altering the relative intensity of the sources.

This article brings out several points of interest to Radio-Tricians, in addition to the technical aspects of the matter. It shows the demand, which is ever increasing, for the better grade material and workmanship in public address systems. No longer is hit and miss work acceptable. Organizations needing apparatus of this nature know what is necessary and they are willing to pay the price to get what they require.

There are thousands of opportunities for jobs like this, some larger, some smaller, throughout the land. They create work for the trained man.

TRADE NOTICES

SUPER-THRU

A new method of installing Antenna and ground has been provided by Woodruff & Co., Meridian, Miss. This neat, handy device is known as the Super-Thru. Details on request from Woodruff & Co.

TRANSMITTING TUBES

The DeForest Radio Co., Passaic, N. J., announce a substantial reduction in the most popular transmitting tubes.

Trade Notices are published only for the information of readers. No responsibility is assumed in passing this information along — and all transactions and correspondence MUST BE WITH THE FIRMS DIRECT



THE MAILBAG

HEADS SERVICE DEPARTMENT

Graduate R. B. Cherry is head of the Radio Service Department of Spurrier's, Inc., State Distributors for Philco in Oklahoma.

HI U HAMS

The Mailbag has received several requests for information regarding the call letters of students and graduates operating Amateur Radio Stations. If you own and operate such a station send your call letters to THE MAILBAG EDITOR, National Radio News, for publication.

W8DIB

Russell H. De Jonge, N. R. I. graduate, operates W8DIB Grand Rapids, Michigan. You amateur operators, look him up.

A FUZZY SPEAKER

The M type speaker of a Crosley had developed a fuzzy noise. I centered the cone but this did no good. I looked at the voice coil and it seemed O. K.. I varnished the voice coil good and let dry. The set has been operating for two months just like new.—John A. Hulholland, Muncie, Indiana.

ATWATER KENT 20

Here is a tip for The Mailbag that might help someone. I was called out the other day to service a model D Atwater Kent for a squeal that was present in it. I removed it from the cabinet and tested it out and found that everything tested out O. K.. I was puzzled so I hooked it up again and the squeal was gone—that puzzled me more than ever, so I put it back as before, then found that the speaker ground was under the cabinet and was causing all of the squeal. I removed it from under the cabinet and the squeal was gone. The speaker cord was feeding back to the R. F. stages and causing a regenerative squeal. The customer was well pleased with my work.—Herman E. Stephens, Pickens, S. C.

Author Brisbane said, "A home without a Radio is like a house without a window."

HARMAN W. KIMMELL, KEWANEE, ILL.

I had a seven-tube Imperial Superheterodyne to service. After the set had been in operation for about five minutes the music or speech would become distorted if the volume was turned low.

I checked the receiver and tubes which proved to be O. K., then changed the tubes around where I could, but still had the distortion. I noticed quite a bit of blue glow in the pentode 247 but it checked O. K. I tried a new one and the distortion was gone.

Another little experience that might help was with an Airline. When the set was jarred a little it produced an awful clatter in the speaker. I looked the set over but found nothing wrong; tubes checked O. K. After turning the set on again I tapped the machine and happened to be looking at one of the 245 when I noticed a very small blue spark in the tube which proved that it would short when jarred. A new tube remedied the trouble.

Don't take for granted that tubes are O. K. if the trouble can not be located elsewhere. Sometimes a tube will require a vibration such as is produced by the speaker before its defect can be detected.

Most servicemen, when testing a Radio at the service bench, usually jar the receiver or rock it violently to see that no loose connections or loose tube elements are present.—Editor.

MORE SPEAKER TROUBLE

Here is a tip that I like to pass to some other students. While servicing an A. K. using a dynamic speaker (the complaint was intermittent reception) I found after a complete test the trouble in the loud speaker. One of the voice coil leads was broken under the glue that holds it in place on the cone and was making a contact part of the time. I resoldered the wire, put new glue on it and everything was O. K.—Phillipp Belanger, Lewiston, Maine.

Send Mailbag Contributions in a separate envelope, addressed Mailbag Editor, National Radio News, 1536 You Street, Washington, D. C.