

# NATIONAL RADIO NEWS



VOL. 4—NO. 11

WASHINGTON, D. C.

JUNE, 1932



Harris-Ewing Photo

**S. M. ARMSTRONG**  
*Director of STUDENT SERVICE*

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## STUART M. ARMSTRONG

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**H**ERE is the man who sees that you get good service while you are an N. R. I. student. His job involves an intimate knowledge of every phase of the routine at the Institute, close supervision of his own department and cooperation with all other departments at N. R. I.

By reason of his education and experience he is well equipped for his job. He has been associated with the N. R. I. Student Service Department over four years.

Born in the little town of Climax Springs, Missouri, in 1904, he obtained his primary education in the public schools of Carlsbad, New Mexico. Later he attended the University of Kansas for two years and the University of New Mexico for a similar period making a study of Business Administration.


After coming to Washington he rounded out his education by studying Law at George Washington University for three years.

Armstrong served the New Mexico State Highway Department making investigations of various construction projects with regard to the observance of specifications, also the Department of Game and Fish, for the same State, in charge of issuance of licenses for certain sections of the State.

It was to act as Secretary to United States Senator Bratton of New Mexico that Armstrong originally came to Washington and after serving in that capacity for awhile he resigned to come with the National Radio Institute.

# Many Uses for Photoelectricity

By J. A. DOWIE, Chief Instructor



**L**IKE many other fundamental phenomena of science the discovery of photoelectricity was not appreciated in its full importance for many years.

However, the past few years have seen an extraordinary increase in commercial applications of the photoelectric principle.

The term "Photoelectricity Phenomena" has been defined as any electrical effect which is produced by the action of light. In recent years, however, the word photoelectricity and its associated terms have been considered in a more restricted sense; namely, the emission of electrons from the surface of various metals by the action of light or other electromagnetic radiation.

Metals which exhibit the photoelectric effect to the greatest degree are Sodium, Potassium, Rubidium, Caesium, Lithium, Strontium and Barium. Of these, Sodium, Potassium and Caesium are the ones most universally used at the present time.

Under ordinary conditions when the surface of these metals are exposed to the air, electrons will not be emitted from them, but when they are placed in a vacuum, and a beam of light is then allowed to strike the metal, electrons will be emitted, their number being proportional to the intensity of the light. This action made possible the development of the present-day photoelectric cell which is a combination of both radio vacuum tube and an electric eye, because it is a vacuum tube that sees, one that converts this vision into corresponding electric impulses, just as the radio tube converts the sound into similar electric impulses. The photoelectric cell, therefore, when used in the proper circuit with a meter, relay or vacuum tube amplifier can be used to perform the functions of the human eyes as well as many operations of which the eye is not capable.

Sound pictures in their projection require the use of the electric eye to catch the sound tracks alongside of the film and convert these waving lines of light and shade into corresponding sounds.

Picture transmission by wire or radio depends essentially upon the fact that a photo-

electric cell can be made to give a small electric current when light shines on the cell.

In some large paper mills the electric eye is being used to detect flaws in paper as it passes through the rollers so that it can be discarded when it does not come up to specification.

The list of possibilities for this electric eye is almost inexhaustible. In some public schools the electric eye is constantly on watch to determine the need of additional light, and to turn on the general illumination. It is also used to detect the poisonous gas in a tunnel, or a mine, and give the necessary alarm where men are working.

The checking and controlling of traffic over the Ambassador Bridge, across the Detroit River, is now accomplished by means of photoelectric cells. One of these tubes is imbedded in each of the ten incoming traffic lanes at the point where the cars stop to pay toll. Directly overhead in the roof of the toll shed is a light source, directed on the photoelectric tube, causing a small current to flow. Every car stopping at this point intercepts the beam of light, and the current ceases to flow. By this make and break system the cars are counted, and recorded, and the signals indicating the density of traffic are flashed to the control and indicator boards in the office of the chief toll collector and general manager.

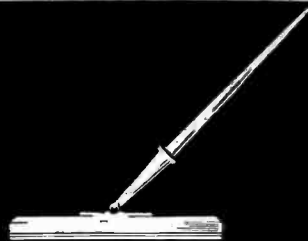
Left to human control, the problem would have called for numerous traffic officers, bookkeepers, adding machines, etc.

In the Holland Tunnel, New York, the condition of air must be determined and regulated according to traffic. Therefore the electric eye is employed to give the necessary information on the density of smoke vapor, gas or general humidity.

In some steel mills, white hot molten metal is being kept within a very few degrees of a constant high temperature with the electric eye, more effectively than man has ever been able to keep it.

Furthermore, warships, airplanes, trains and anti-aircraft guns are being operated automatically by photoelectric cells; banks are being guarded, colors are sorted and many other duties heretofore performed by man, increasing the commercial application of the photoelectric principle.

# My Own page



## Hot Weather

I'VE always claimed that the test of a man's initiative is hot weather. The hotter the weather—the better the test. And to a man studying Radio, Summer is of particular importance. He is preparing for a Radio career and everyone knows that Radio's best season starts with the Fall and Winter.

How he uses his Summer months, therefore, regulates his degree of preparedness for the big season ahead. He will either be ready or he won't.

Maybe you think I don't know much about hot weather. Let me tell you something. It goes up to 98 in the shade down here on the banks of the Potomac and stays there for weeks. And when its 98 here in Washington—it's hot.

And when Summertime comes along I like to get out and enjoy myself just like anyone else, but I've always figured ahead and considered my future. It pays.

So when you feel the urge to push things aside—when you feel the call of the outdoors—it's well to think twice before giving in to the inclination. Some play is necessary, but it's easy to play too much at the expense of things which count more.

Keep a picture of what you want to be in mind. Keep your goal in sight. Then when you feel the urge of a fishing rod or swimming pool—peel off your coat—roll up your sleeves and grab a lesson paper and pencil. It will mean much more in the end.



## The Institute of Radio Service Men

I WISH to call to the attention of National Radio Institute's advanced students and graduates, who are engaged in service work, the newly organized Institute of Radio Service Men, with Mr. Kenneth A. Hathaway as Executive Secretary, and main headquarters at 538 South Clark Street, Chicago, Illinois.

Mr. Hathaway has been closely associated with Radio activities from the early days of Radio, and is highly regarded in the Radio profession.

The aims of the Institute of Radio Service Men are to promote educational activities, both by printed means with a monthly bulletin and by meetings held by the various sections in the large-cities, for the purpose of elevating the profession and inspiring its members to higher standards of service.

A large number of N. R. I. graduates are already members and some of them are very active in promoting its growth.

Just recently I attended a meeting of the Washington Section and found the program, "Servicing the Superheterodyne," very practical and beneficial to the service man.

Full information may be obtained by writing direct to executive headquarters—Institute of Radio Service Men, Inc., 538 South Clark Street, Chicago, Illinois.

*J. E. Smith*

President.

# RADIO-TRICIAN SERVICE SHEET

REQ. U. S. PAT. OFF. COMPILÉ SOLELY FOR STUDENTS & GRADUATES

## PHILCO 70 AND 70A RECEIVERS

Model 70 Receivers are for operation on 100-130 volt, 50-60 cycle AC lines  
 Model 70A Receivers are for operation on 100-130 volt, 25-60 cycle AC lines

**Table 1—Tube Socket Readings Taken with AC Set Tester AC Line—115 volts**

Tube		Filament Volts	Plate Volts	Screen Grid Volts	Control Grid Volts	Cathode Volts	Plate Milli-amperes
Type	Circuit						
24	1st R. F.	2.25	250	85	3.	19.5	3.
24	1st Det.	2.25	250	87	5.5	21.5	.5
27	Osc.	2.25	85	...	2.	19.5	2.5
24	1st I. F.	2.25	250	87	3.	19.5	3.
24	2nd Det.	2.25	105	75	6.	22.	.1
47	Audio	2.25	245	255	1.	...	...
80	Rectifier	4.7	...	...	...	...	40/plate

Note—Volume Control Off; Station Selector turned to Low Frequency End.

**Table 2—Power Transformer Voltages**

Terminals	A. C. Volts		
1-2	105 to 125	Primary	White
3-5	2.5	Filament of 47	Dark Green
6-8	2.5	Filament of 24	Black
9-10	5.	Filament of 80	Light Blue
11-13	700.	Plates of 80	Yellow
4	.....	Center Tap of 3-5	Black, Green Tracer
7	.....	Center Tap of 6-8	Black, Yellow Tracer
12	.....	Center Tap of 11-13	Yellow, Green Tracer

**Table 3—Condenser Data**

No. on Figs. 1 and 2	Capacity (mfd.)	Color
(15)	.00011	Blue and Golden Yellow
(20)	.00025	Yellow
(6)	.00041	Yellow and Orange
(12)	.0005	Green
(10)	.01	Black Bakelite
(11)	.015 (Double)	Black Bakelite
(12)	.05	Black Bakelite
(13)	.09 (Double)	Black Bakelite
(14)	.09 (with 250 ohms)	Black Bakelite
(16)	.09 (50-60 cycles)	Black Bakelite
(17)	.18 (25-40 cycles)	Black Bakelite
(18)	.25	Metal
(19)	.5	Metal
(21)	6 (50-60 cycles)	Electrolytic
(22)	10 (25-40 cycles)	Electrolytic
(23)	6 (50-60 cycles)	Electrolytic
(24)	10 (25-40 cycles)	Electrolytic

**Table 4—Resistor Data**

No. on Figs. 1 and 2	Terminal	Power (watts)	Resistance (ohms)	Color		
				Body	Tip	Dot
(25)	Combined with 1-2	.09 mfd.)	250	Black Bakelite		
	1-2		1060			
(17)	2-3		2300			
	4-5		70			
	5-6		240	Long Tubular		
(14)	.....	.5	5,000	Green	Black	Red
(19)	.....	1.	13,000	Brown	Orange	Orange
(20)	(50-60 cycles)	.5	45,000	Yellow	Green	Orange
(11)	.....	.5	51,000	Green	Brown	Orange
(21)	(25-40 cycles)	.5	99,000	White	White	Orange
(22)	.....	.5	240,000	Red	Yellow	Yellow

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

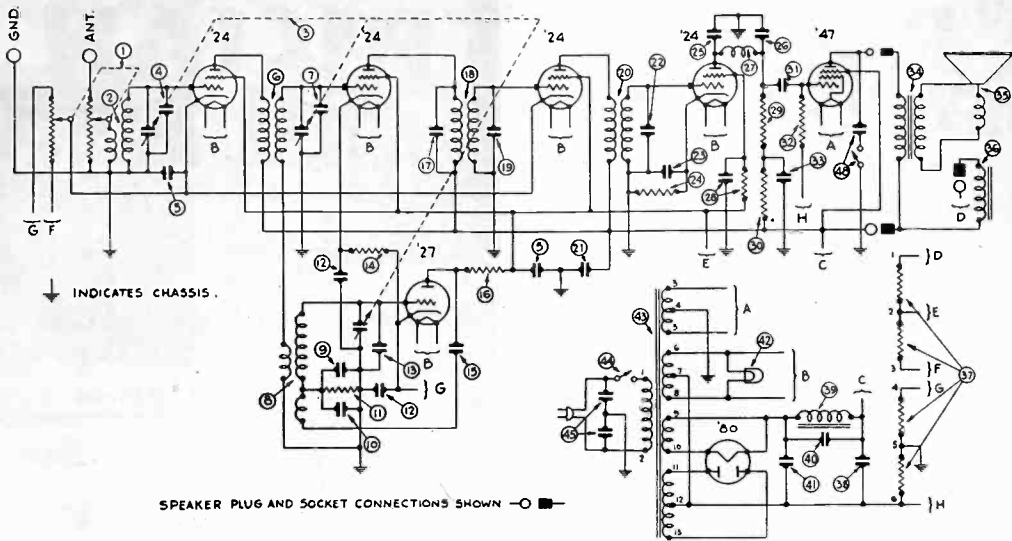


Fig. 1

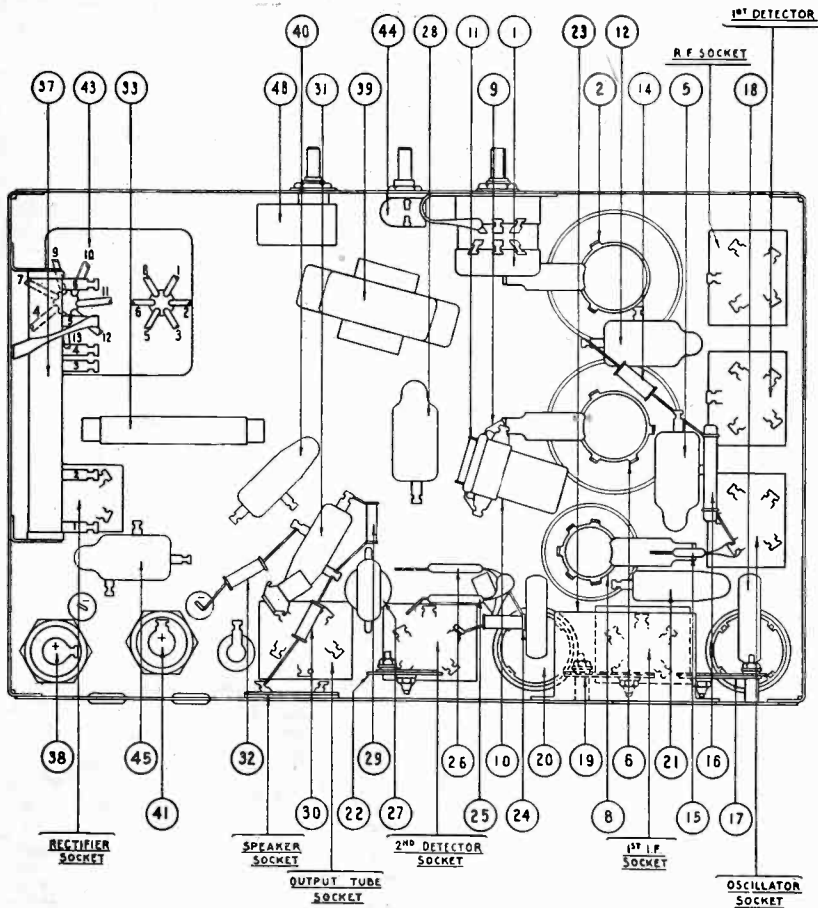


Fig. 2

# NATIONAL RADIO NEWS



Vol. 4—No. 11

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Published monthly in the interest of the students  
and Alumni Association of the  
**NATIONAL RADIO INSTITUTE**  
Washington, D. C.

J. E. SMITH, President. E. R. HAAS, Director.  
The Official Organ of the N. R. I. Alumni Association



E. R. HAAS  
Vice President and Director

## A Chat with the N. R. I. Director

### Speaking of Radio City . . .

I read an article this morning which stated on good authority that it will be populated by over 30,000, or about half the number of people in the State of Nevada.

And the outlying interests of those with offices in Radio City will probably employ many times this number.

This city within a city will be, in addition to a thing of beauty, a monument to an industry, Radio.

### I called my Secretary . . .

and asked her what she knew about Guatemala. She told me something to the effect of a jungle country where they have hot weather, wild animals and earthquakes. She thought they raised bananas, and the people—maybe they are Indians.

All of which proves that we get wrong impressions.

For instance, my secretary was surprised to learn that there is a highly intelligent race of people in Guatemala, and they think as much about Radio as we do. This was proven by a letter from an N. R. I. student, Juan Pierri of Guatemala, who is doing a thriving Radio business. Pierri has cleared over \$700 in spare-time Radio work in three months. And \$700 is a lot of money down there.

### The other day . . .

Robert Halliday, an N. R. I. graduate, down in Hattiesburg, Mississippi, wrote, "Many thanks for the letter of recommendation you wrote for me. I had no trouble at all getting the job over fifty-four other applicants.

"I have charge of the Radio Repair Department of the Joyce Auto Equipment Company of Hattiesburg, and it looks like a good future in it for me."

Good work, Bob, and lots of luck on the new job.

### Only twelve years ago . . .

Radio Station KDKA sent its first broadcast over the air. And it has just been eleven years since WJZ placed its signals in the ether.

We can be proud to be associated with an industry which has made such rapid progress. Consider that in this country alone we have today over six hundred broadcast stations, several hundred Radio manufacturers, about forty thousand dealers and jobbers of Radio products—giving employment to tens of thousands, and in times when industry is crying depression Radio is working on the world's largest building project—Radio City—costing hundreds of millions of dollars.

**GRADUATES — Boost your Alumni Association**



# WEIGHING WITH A BEAM OF LIGHT

By T. A. LAMBERT

Assistant Supervisor of Education

*The commercial applications of the Radio principle march forward continuously. Scarcely a week passes that does not show some new use for Radio vacuum tubes, amplifiers and light-sensitive cells. In this article you are brought information regarding an ingenious device for weighing with a beam of light.*

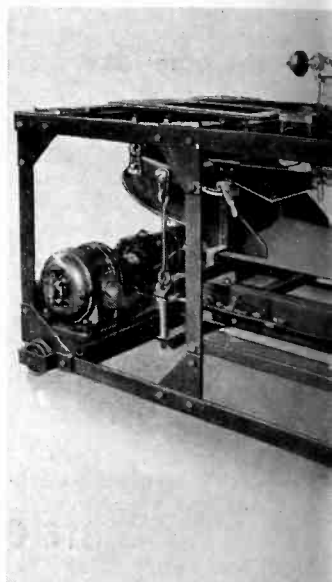
**A**CCURATELY weighing the steady flow of material passing by on a conveyor belt; keeping careful count of the tons that have been handled; and, finally, recording on a time chart the belt loadings through the twenty-four hours of the day—such is the latest job assigned to electric eyes and ingenious electric brains. While the general scheme of weighing a continuous flow of material remains the same, the means whereby passing weights are converted into corresponding electrical impulses for the operation of the integrator, have been radically changed with the introduction of the light-sensitive cell;

Better to understand the latest light-control application, let us begin with the main principle. To determine the weight of a continuous flow of material, it is necessary to consider the size of the stream and the speed at which it moves. The speed may be constant, but the size of the stream may range from zero pounds per foot to the full capacity of the conveyor. Consequently, any variation of load must be instantaneously noted at the controller so that true integration of weight may be obtained.

At the point where the continuous stream of material is to be weighed, a short section of belt is installed, mounted in such manner that its varying weight is communicated to the weight checking equipment placed directly above. With the varying weight of the load on the conveyor belt, the beam of the weight checking mechanism is actuated. The scale load at one end causes the fulcrumed beam to

swing over the scale of the load indicator at the far or free end. This of course indicates the instantaneous weight, but there is still need for some device to keep tally of the continuous procession of varying weights. It is at this point that the electric eye does its work.

Close to the free end of the swinging beam is mounted a cross arm carrying a Burgess Radiovisor Bridge or simplified form of light-sensitive cell, and a light source lamp. These members are so mounted that one is outside and the other inside a revolving light-chopper cylinder which is driven in step with the speed of the belt. The light-chopper cylinder derives its name from the fact that it carries 32 parallel longitudinal slots which serve to interrupt the passage of the beam of light between light source and bridge. However, the slots are of varying lengths. The first is equal in length to the distance traveled by the scale beam from zero to full load. Each succeeding slot is shortened an equal amount at the bottom, so that a line drawn from the bottom of slot

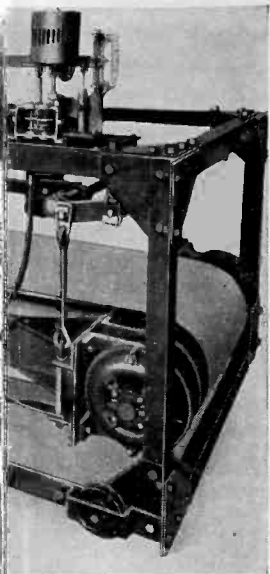


How Electric Eye and Bridge record steady flow of material



1 around the cylinder to the bottom of slot 32 would form a true helix, touching the bottoms of all slots.

The bridge or cell is mounted in a housing provided with a window directly opposite the sensitive plate. The condensing lens of the light source is adjusted to concentrate an intense beam of light through the window on to the light-sensitive plate. However, the wall of the rotating chopper cylinder comes between, allowing the light beam to pass only when a slot is in line. Each line of light reaching the bridge sets up an electrical impulse, which impulse in turn drives the mechanism of the integrator or electric brain that keeps tally, as well as the time chart recorder.



Light and record the moving conveyor belt.

With no load on the belt the free end of the beam is down, with the focused point of light just below the bottom of slot 1 of the chopper cylinder. Hence no impulses result since no light reaches the bridge. However, as load is placed on the belt the beam swings upward proportionately, bringing the focused point of light higher and higher on the chopper cylinder, so that more and more slots admit light and

cause a corresponding number of impulses to actuate the electrical integrator. The number of impulses is always proportional to the load, from zero to the capacity at which the scale is calibrated. At full load there are 32 contacts per revolution of the chopper cylinder. With 350 contacts per minute and a belt speed of 350 feet per minute, an impulse is obtained for each foot of belt, which is representative of a certain amount of material passing over the scale.

Balancing the scale is a simple operation. A test weight is provided which represents exactly half load when hung on the beam. A switch serves to cut out the integrator and throw in a small lamp which flashes at each impulse. A reduction gear is provided, which slows up the revolutions of the chopper cylinder so that the flashes may be counted. With no load on the moving belt, there should be 16 flashes for each complete cycle if the machine is properly balanced. If out of balance, the scale is balanced with a balance ball as required, until 16 flashes are obtained per revolution. The test weight is then removed.

The bridge, light source and chopper cylinder serves to produce the necessary electrical impulses which are amplified by means of a two-stage amplifier designed and built by the engineering staff of the Burgess Battery Company of New York City. The amplifier output operates a Burgess vacuum contact relay capable of handling all the current required for the operation of one or more integrators or counters, which may be located at any distance from the scale. A rectifier converts stepped down A. C. into low voltage D. C., for the operation of the integrator and scale chart, in accordance with the makes and breaks of the vacuum contact relay. The integrator is simply an electromagnetic counter with a number of units to represent the grand total of integrated weights.

The device is finding many applications in mines, power plants, warehouses, factories and other establishments where bulky materials must be weighed while in motion.

National Radio News wishes to acknowledge with thanks the assistance of the Engineering Department of the Burgess Battery Company and John Chatillon & Sons, manufacturers of scales and conveyors, in the preparation of this article.

# They Do Good Radio Work

In a previous issue of the News, we asked all men who had received testimonial letters from their customers to send them in for publication.

The result was better than we had anticipated. It seems the public is pleased with the work of N. R. I. trained Radio-Tricians.

Below are a few of the letters sent in by students and graduates of the Institute. It is easy to see from the tone of the letters that these men are on the fairway to building profitable Radio businesses in their communities.

Milwaukee, Wisc.

Mr. C. V. Tews,  
Milwaukee, Wisc.

Dear sir:

For several weeks I have been planning to drop you a few lines to tell you how our Radio has been working. It is giving splendid service, thanks to your patient efforts.

I hope that this letter will help show prospective customers that they should give you a trial. We are apt to be quick in complaining, but never so prompt to praise when praise is due, so please forgive this tardy acknowledgment and accept my sincere best wishes for your future.

Cord ally yours,  
Albert Stocker.

Mr. Bernard Holeney  
511 S. Champion Ave.  
Columbus, Ohio.

DR. E. R. CARLSTEAD, DENTIST  
107 EAST WISCONSIN STREET  
CHICAGO, ILL.

*To Sylvan McDonald  
Sumner  
Mo.*

*I am writing this letter as a testimonial to the expert service you rendered me in repairing my radio. The work you did showed thorough knowledge of your work and shows your training has been thorough and painstaking!*

*E. R. Carlstead, D.D.S.*

There is nothing like good will to make a business prosper. Good work develops good will. The N. R. I. students and graduates who received these letters may well be proud of their accomplishment.

Dear Sir:

I wish to take this means to thank you and to show my appreciation for the wonderful service you rendered on my Majestic radio.

When you took my set away for repair I thought it would be of no use and that it would never perform in the same manner as it did when I first purchased it three years ago.

I had made up my mind to have you fix it up enough so that I could trade it in on some other make radio as no one would have traded or bought my radio in its former condition but now it would take a GOOD salesman to sell me a new radio.

The rattle noise in the speaker is no more, and such performance and tone quality, I believe could not be found in a new set.

I am more than pleased with the work which you have done on this set and I shall surely be glad to recommend your services to any of my friends whenever possible.

If you have any prospects who are in doubt as to your ability to repair radios, just give them my address and I will be glad to tell them about the work on my Majestic radio.

Thanking you very much, I remain,

Letters like these are a good basis for your advertising. If a customer gives you such a letter, obtain his written permission to publish it and then show it as a testimonial in getting business.

*My dear Mr King*

*I want to thank you again for the fine condition you put both of my radios today. They both work like new in action. W. night. I want you to know I appreciate you work*

*Wm M. Huen*

10 GARD STREET  
SALEM, N. J.

Yours very truly,  
*Ruby J. Brown*

Milwaukee, Wisc.

Mr. C. V. Tews,  
497 Walker Street,  
Milwaukee, Wisconsin.

Dear Mr. Tews:

Since you repaired my Radio two months ago I have had no trouble with it and can get California, Seattle, Washington, New York, Cuba and the Republic of Mexico. I was never able to get those places before.

One man worked on my set before you took on the job. He was supposed to be a Radio Expert. When he got through with it it was worse than before. The machine is now as good as new.

Mr. Tews you know your business and I will recommend your work as an A-1 Radio man to all my friends.

Very truly yours,  
MAX MC CLAIN.

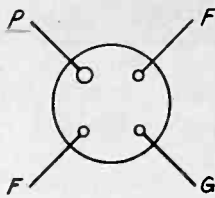
# RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF. COMPILER SOLELY FOR STUDENTS & GRADUATES

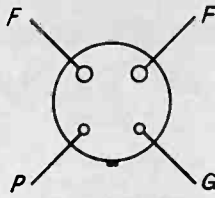


## TUBE SOCKET CHART

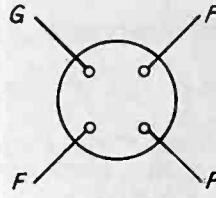
Showing connections to all kinds of vacuum tube sockets as they are seen when looking down into the chassis from above.



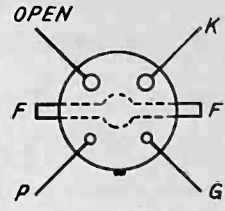
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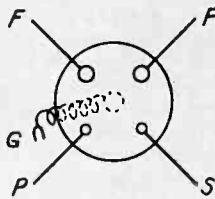
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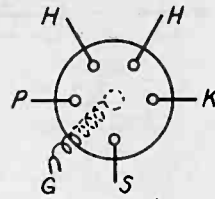
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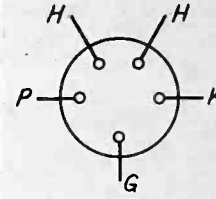
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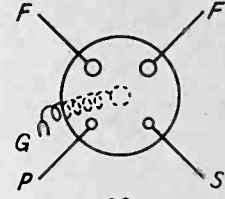
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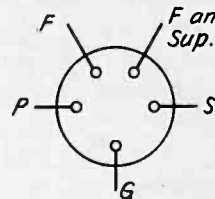
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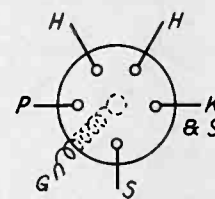
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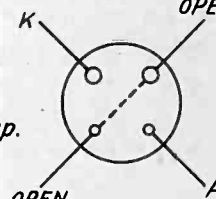
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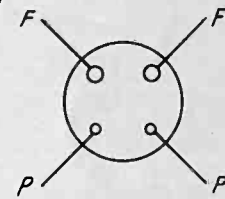
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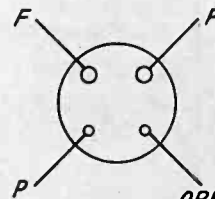
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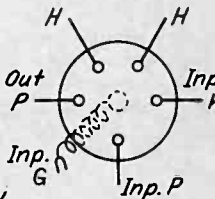
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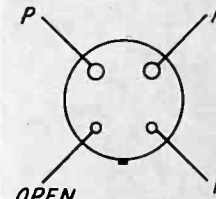
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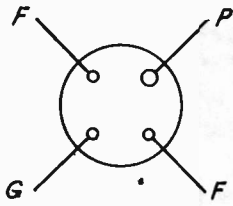


BA-(BH)

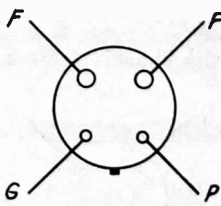
- F = Filament
- H = Heater
- K = Cathode
- G = Grid
- P = Plate
- S = Screen
- Sup. = Suppressor Grid

# TUBE SOCKET CHART

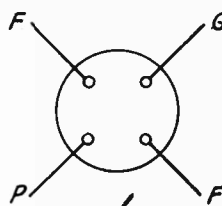
Showing connections to all kinds of vacuum tube sockets as they are seen when looking up into the chassis from below.



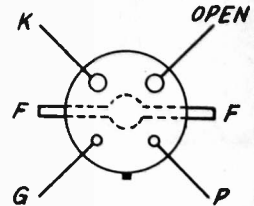
WD-11



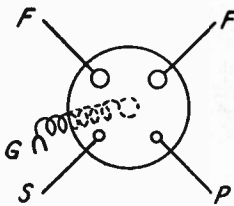
WX-12, 12-A, 20, 71-A,  
UX-99, 00-A, 01-A, 10,  
26, 30, 31, 40, 45, 50,  
182, 182B



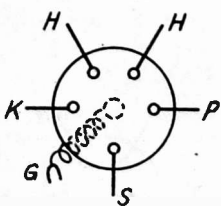
UV-99



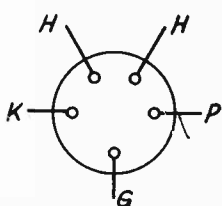
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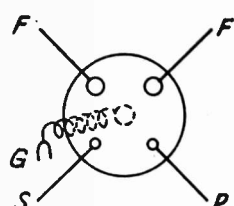
22



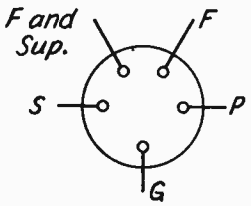
24(24-A)  
35(51), 36



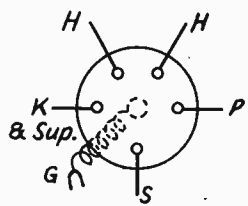
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485



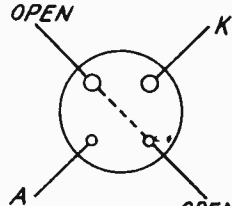
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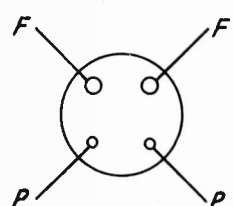
33, 47



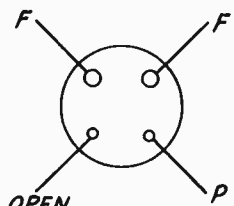
38, 39



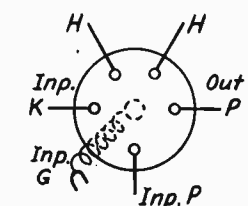
74



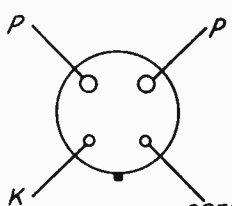
80



81



95



BA-(BH)

F = Filament  
 H = Heater  
 K = Cathode  
 G = Grid  
 P = Plate  
 S = Screen  
 Sup = Suppressor Grid



# ALUMNI News

## SPEAKING OF WORK BENCHES

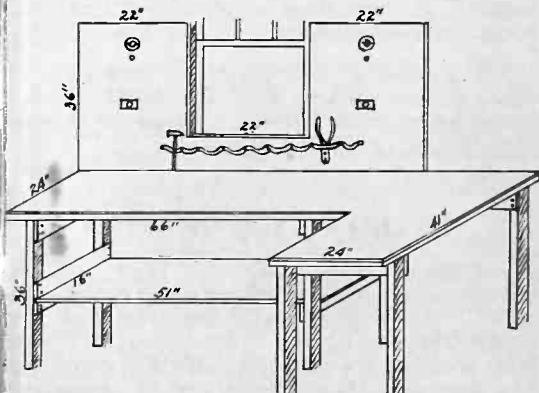
By **FRANK McCLELLAN**, Troy, N. Y.  
Member, N. R. I. Alumni Association

I've built a new work bench to suit my particular need. The cost was very small and I feel that every graduate may be able to make use of the idea.

The bench proper is a 2" pine plank, 24" wide, that was once the side of an old cart. It is 66" long and very solid. The legs of the bench are two by fours purchased at a lumber yard. The extension at the right end is an old sewing machine stand top and while the end legs in the drawing I have made are shown as two by fours, they are really a part of the old sewing machine stand. The corner of this extension was made to fit into the corner of the room.

The back of the bench, as illustrated in the drawing, was built around the window of the shop, which gives me an abundance of light in the work I am doing. Then, of course, at the back of the bench I have a light socket

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A rough drawing of the bench McClellan finds so useful in his Radio work.

## WHAT I SEE IN RADIO'S FUTURE

By **J. F. HINES**, Atlanta, Georgia  
Member, N. R. I. Alumni Association

Radio is rapidly becoming as much a part of civilization as our electric lights and automobiles. In the next ten years I see a complete revolution of every industry and of the mode of living, from that of today—and all these changes will be brought about by the influence of Radio.

To be brief, let's take one field; for instance, that which is today known as our telegraph industry.

Thousands upon thousands of miles of wire on land and on the bed of the ocean are required by the present telegraph system for national and international communication. These will be replaced by Radio.

Vast armies of Radio men will be required for this field alone, to maintain operation. There will also be required Radio engineers, Radio draftsmen, inspectors and repairmen by the thousands. The problem which confronts us at this time is simply this: will we, the Radio men of today, reap the harvest, or will the fruit go to the Radio generation of tomorrow?

It depends upon the individual Radio man—it depends upon you—it depends upon me. Will we be ready for it when it arrives—or will we leave profits, which are justly ours, to a new order of Radio men who will be prepared?

Speaking in the language of the baseball player, the bases will be loaded with Radio opportunities. The individual Radio man will come to bat in the clean-up position and everything will depend upon his ability to deliver a hit in the pinch. Upon this ability will rest his degree of success in the Radio era of tomorrow.

## SPEAKING OF WORK BENCHES

(Continued from page 13)

on each side of the window at the top, to furnish additional light. Below each of these light sockets is an A. C. line outlet with a double plug socket, so that I have four A. C. outlets on the bench. These are wired up with BX cable just behind the bench. The cable runs from the light socket at the right side of the drawing down to the A. C. outlet—then across to the A. C. outlet on the left side of the drawing and up to the lamp socket above. From there a short lead with an ordinary electric plug attached runs to the main light circuit outlet. All the light and power fixtures are permanent parts on the bench—which is entirely portable. The top of the bench and the shelf have been covered with beaver board cut to fit exactly. This makes a sort of a pad over the hard board—makes it easier to work upon—and with less chance to damage Radio parts. In addition to the possibility of installing meters and other equipment on the back boards, they are very handy in the fact that when working on a Radio receiver the diagram of a particular set can be pinned in a vertical position with thumb tacks, allowing me to have the schematic diagram directly in front of me while doing the job.

This makes the handiest bench I have ever worked upon.

The N. R. I. Alumni Association has grown from 72 to nearly 3000 members.

National Radio News wishes to congratulate the Wholesale Radio Service Company, 100 Sixth Avenue, New York City, for their confidence in the future of Radio as evidenced by their expansion which gives them three times the sales space formerly used. This firm offers maximum dealer discounts to N. R. I. men.

**I**T is not certain that a man can make opportunities for himself. But he can put himself into such shape that when opportunities come, he will be ready to take advantage of them.

—Theodore Roosevelt.

# Trade Notices

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.

## LINCOLN RADIO

Lincoln Radio Corporation, 329 South Wood Street, Chicago, Ill., are building in their laboratory high-powered receivers with a range from 15 to 550 meters, capable of receiving stations from any distance with loud speaker volume.

Lincoln receivers are used by MacMillan Polar Expeditions, broadcasting stations and news organizations for press news direct from foreign countries.

## TRIAD TUBES

The Triad Manufacturing Company, Inc., Pawtucket, R. I., is offering a special discount to Radio Servicemen to handle their line of high-grade Radio Tubes. Full information is available by writing them at the address above.

## GLOBE COMBINATION

The Globe Television and Phone Corporation, 26th Street and 11th Avenue, New York City, report that they are putting on the market at this time a combined sight and sound console receiver.

This combined Television and broadcast receiver is expected to meet a demand which is becoming more and more evident for a complete sight and sound receiver.

## LYTRON CORPORATION

An unique sales plan for service men and radiotricians enabling them to get into the radio tube business in a big way has been evolved by the Lytron Corporation, 260 Sherman Avenue, Newark, N. J. This organization has branches in many key cities throughout the country and complete details of the plan can be had upon request to the above.

# THE MAILBAG



## JOHN C. FATE, PLYMOUTH, OHIO

Since the last time I wrote I have opened two Radio service shops. I now have one in Plymouth and one in Greenwich. Anyone that says that business is rotten is sure wrong or else they do not go after it. I am working even days a week and most of the nights.

## B. C. HOLENCY, COLUMBUS, OHIO

Here is some information on a Fada 10 receiver. If the power transformer heats up, and the pitch melts out, don't blame it on a defective transformer right away. As the UX-280 is only  $\frac{3}{4}$ " away from the transformer, the heat from this tube thus heats up the pitch and it runs out, and when this condition occurs you get a bad A. C. hum in the receiver. The remedy for this is, unsolder all the connections from transformer and melt the pitch back, by putting the transformer in a slow oven; then allow same to cool for at least five hours. Put the transformer back, and solder all connections to their proper places, make an asbestos case between the transformer and the UX-280, then your trouble is over. This works very effectively for me.

## HARRY HUGHES, TONAWANDA, N. Y.

Every person for whom I've done a job so far, has looked at a customer on the Service Contract Plan. Expect to have quite a business built up within a year. Thanks to National Radio News for the tip.

## OSCAR E. CARLSON, SEASIDE PARK, N. J.

In battery receivers one often finds audio transformers a source of trouble. Due to defects that come with age, audio transformers in these sets often go bad.

## A. FAIRWEATHER, BRITISH HONDURAS

It is with great pleasure I inform you that I have been appointed Superintendent of Radio Telegraph of this Colony. I was appointed over an operator much senior to me.

Allow me to say my rise in Radio is due entirely to having taken the N. R. I. Course, and to the encouragement given to me by you, for which I shall be ever grateful.

I have found that by placing a high voltage (350 volts) across the windings for a few seconds these "bum" transformers will sometimes be ready to resume work again. Of course this does not hold true with transformers with open windings, but it often cures a transformer with shorted windings.

## ORVILLE VAIL, CRISMAN, ILLINOIS

In servicing a Crosley Showbox model 706 receiver I found that the stations would cut off at one end of the dial; on the other end, they were all right. I found that a small particle of metal was protruding from one of the stator plates of the condenser. When the rotor plates were closed the metal particle came in contact with the rotor plates of the condenser, thus killing the reception at this point of the dial. I removed this metal particle and the set worked fine.

This set always did cut off at one end of the dial. The owner had the dealer from whom he bought it, work on it twice; each time it came back, not fixed. The owner decided to try me. I had the set fixed in a short time and he told me it worked better than ever before.

## C. A. JACKSON, LAFAYETTE, INDIANA

Before I enrolled with the National Radio Institute, I asked myself, "Will it pay me to study Radio?" Well, here is the answer: In the City of LaFayette the population is twenty-six thousand and the survey shows that more than ten thousand are out of employment. I can truthfully say that I have not missed a day this winter and I have all the work that I can do.

I have built a shop with the most modern test panels in this town. I have also bought a Supreme Diagonometer model AAA1 which cost me \$147.50 net (and it is sure a real instrument) and for my desk I have bought a new Underwood Typewriter which cost me \$102. There are seventeen Radio repair shops in this town, but, believe me, I am getting my part of the repair work and besides I have sold several new sets.

The way N. R. I. teaches, any one with some good common sense can soon master Radio. I can proudly say that I have never found a set yet that I could not fix. Radio has pulled me out of the rut that I was in for several years. So instead of walking the streets and being disgusted, I am working in my shop every day and happy.

Address all communications for this page direct to the Mailbag Editor.

To avert pain later in life, take pains now.

## OPERATES SERVICE AND PUBLIC ADDRESS BUSINESS

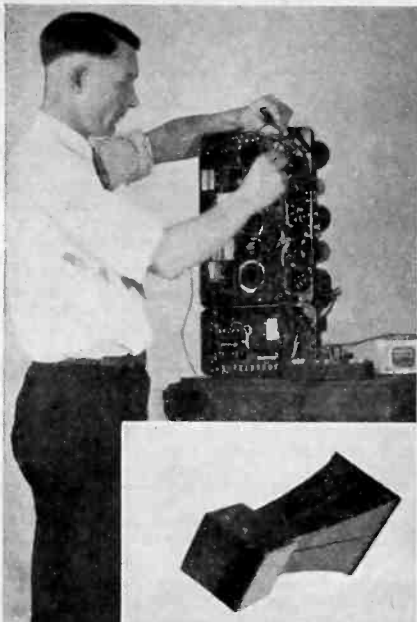
When William Patelnas enrolled with N. R. I. he had no idea that the railroad for which he had worked for five years would shortly put him on reduced time and thereby cut his salary in half. But he knows it now, and thanks his lucky star that he was prepared for the crash.

Yes, prepared. He stepped right out in the Radio business. He also handles Public Address System work and is making good. Let's let him speak for himself:

"I took my Radio course in the nick of time. I worked for a railroad for five years. A few months ago I was cut to three days a week.

"Just to show you the money that can be made, I did one job that had a short in the power pack. The receiver was back in service in three hours and netted me a profit of \$18. A few hours later I took over another job with a bad audio transformer. This one netted me \$12.50, so in one day I made \$30.50.

"The Public Address System I installed in one of the local dance halls made me \$284, which represented \$2.80 per hour. Public Address Systems are getting very popular and good profits can be made on these jobs.



William Patelnas doing a service job.

Inset shows speaker he built for Public Address System.



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## AN IMPORTANT MESSAGE FROM THE STUDENT SERVICE DEPARTMENT

One day last week three letters were brought to my attention. In each case the student had sent in a payment—and each payment had been in cash. The money had all been lost.

Those fellows had worked for that money. They were paying for their education with it. It's quite a blow to pay a bill, then find the bill is not paid at all because the money has not reached its destination.

There is no way to trace those payments. A check or money order can be traced. You are safe when money is sent that way, but if cash is sent through the mail you have no assurance of its safety unless the letter is registered. Send money by check, money order or registered mail and be safe.

Plant the seeds of Radio Study in June and reap in the Radio harvest next fall and winter.