

NATIONAL RADIO NEWS



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SEPTEMBER, 1932



EDWARD L. DEGENER
Director of Publicity

EDWARD L. DEGENER

THE first employee to come to work for N. R. I. shortly after Mr. Smith and Mr. Haas started what was destined to become the largest home-study Radio school in the world, was E. L. Degener, our present Publicity Director. In point of service therefore, Mr. Degener is the oldest employee at the National Radio Institute.

Uncle Sam's entrance in the World War back in 1917, brought Degener to Washington from Illinois to work for the Identity Section of the War Department. He had previously attended high school in Percy, Ill., and taken a course in bookkeeping and stenography at Brown's Business College, Centralia, Ill. While working for the Government, he studied Civil Engineering at George Washington University. He resigned from the Government Service to join the Student Army Training Corps, organized at the University for the purpose of training college students to become commissioned officers. The war ended, however, before Mr. Degener could receive a commission.

In December, 1918, Mr. Degener began to work for the N. R. I. and he has been with us ever since. Among the many positions he has held in his fourteen years with the Institute may be listed that of Bookkeeper, Auditor, Student Service Director, Sales Director, Office Manager, and Publicity Director.

Every N. R. I. student and graduate has benefitted from Mr. Degener's competent handling of many of the important problems that constantly arise in running a school the size of the N. R. I. In his present position as Publicity Director he has the important job of keeping the name of the National Radio Institute and its students and graduates constantly before the members of the Radio Industry and the general public.

CHARACTERISTICS of the NEW DOUBLE DIODE TRIODES Nos. '55 and '85

THESE new vacuum tubes are designed to perform the simultaneous functions of a diode detector, triode amplifier and automatic volume control.

Type '55 is a heater type tube designed for 2.5 volt operation. Type '85 is a universal heater type tube designed for A.C., D.C. or storage battery operation.

Both these tubes employ two diodes and a triode in a single bulb. The two diode plates are placed symmetrically around the cathode, the sleeve of which is common to the triode unit. Each diode has its own base pin.

In operation the two diodes and the triode are independent of each other except for the common cathode sleeve, which has one emitting surface for the diodes and another for the triode. This independence of operation permits unusual flexibility in circuit arrangement and design.

For example, the diodes of these tubes can perform at the same time the functions of detection and of automatic volume control with sensitivity control and time delay action confined to the automatic volume control circuit; while at the same time the triode may be used as an amplifier under its own optimum conditions.

APPLICATION

For detection the diodes may be utilized in a full-wave circuit or in a half-wave circuit. In the latter case, one plate only or the two plates in parallel may be employed. The use of the half-wave arrangement will provide approximately twice the automatic volume control voltage as compared with the full-wave arrangement.

For amplification the triode may be employed in conventional circuit arrangements.

J. A. DOWIE
Chief Instructor

Grid bias for the triode (depending upon circuit design) may be obtained from a fixed voltage tap on the D.C. power supply or may be obtained by utilizing the variable voltage drop caused by the rectified current flowing through a resistor in the detector circuit.

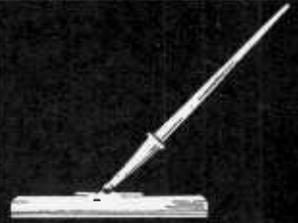
For automatic volume control the controlling bias voltage may be obtained by either of two general methods. In one case, the required voltage is obtained from the detector circuit by utilizing the voltage drop caused by the rectified current flowing through a resistor in the detector circuit. In the other case, the required voltage is obtained by utilizing one diode for the sole purpose of automatic volume control.

This latter method is of particular interest since it confines the sensitivity and time delay function to an automatic volume control circuit. Time delay action is, of course, determined by the use of a resistance and condenser combination having the desired time constant. The sensitivity control action is determined by applying a negative voltage to the automatic volume control diode plate of such a value as to accomplish the desired reduction.

Complete shielding of detector circuits employing these tubes is generally necessary to prevent R.F. and I.F. coupling between the diode circuits and the circuits of other stages. In the case of full-wave detection with circuits balances to ground, shielding and I.F. by-pass filters are not theoretically required. However, due to the practical difficulties of circuit balancing, their use is desirable. In the case of half-wave detector circuits, their use is always necessary.



My Own page



ARE YOU AFRAID OF OLD AGE ?



EMINENT SCIENTIST DIES

I READ an Insurance Company's advertisement the other day which stressed the importance of setting aside a definite sum periodically against the uncertainties of the future.

Can you picture anything quite so sad as an elderly couple, dependent for a meager living upon their children, their other relatives, or upon public charity?

Most young fellows pass off such an unhappy vision by saying, "That will never happen to me." The minority heed the warning, see the "handwriting on the wall," and take positive steps to preclude such possibilities.

What is the best insurance against poverty in later years? Money in the bank? Yes, a very good idea. A policy in a good insurance company, which will pay so much a month after you reach a certain age? Also very good. But the best bet of all is training, your Radio training.

It will not only make possible your savings in bank, your purchase of the proper insurance policy to provide an income, but it will provide employment, possibly in a business of your own, years after the physical strain of other types of work would have forced you into involuntary retirement.

Insure yourself with Radio training. You are studying now—continue to study. Study harder. Think of those future days—those days of old age, to which all of us must eventually come. Will you support yourself and those who may be dependent upon you, or will you be a dependent? Properly pave the way to the future and you have nothing to fear of old age.

IT was with deep regret that National Radio News learned of the death of Dr. George Kimball Burgess, Director of the United States Bureau of Standards.

Dr. Burgess was born at Newton, Mass., January 4, 1874. He was educated in the public schools of his town, the Massachusetts Institute of Technology and the University of Paris. He later served on the faculties of the Universities of California and Michigan.

President Harding appointed Dr. Burgess to the post of Director of the Bureau of Standards in April, 1923. In his nine years of service Dr. Burgess was particularly interested in every field in which the bureau could cooperate with American Industry toward the solution of scientific and technical problems.

Dr. Burgess was stricken at his desk and death came within an hour. Our country—the world has lost an eminent scientist.

President.

RADIO-TRICIAN SERVICE SHEET

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

PHILCO MODEL 71 SERIES

The Philco Radio of the 71 series is a seven tube superheterodyne, employing the high efficiency 6.3 volt filament tubes, automatic volume control and pentode output. The chassis is made in two different types, one known as the 121 code, employing a single dynamic speaker, and the other known as the 221 code, employing twin dynamic speakers. These code numbers appear on the radio chassis as a part of the model number. Chassis of one code are not interchangeable with those of another. The intermediate frequency used in adjusting the superheterodyne circuit of the 71 series is 260 kilocycles. The power consumption of the various models is as follows:

Chassis	Volts	Cycles	Watts
71 -121	115	50-60	63
71 -221	115	50-60	80
71A-121	115	25-40	65
71A-221	115	25-40	85
71E-121	230	50-60	63
71E-221	230	50-60	80

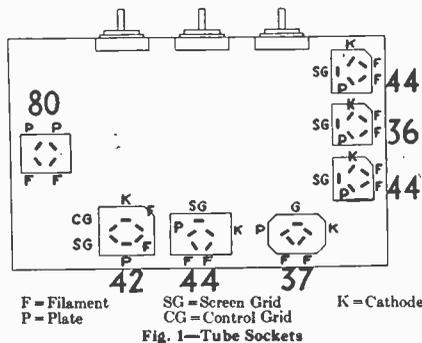


Table 1—Tube Socket Data*—A.C. Line Voltage 115 Volts

Type	Tube	Circuit	Filament Volts—F to F	Plate Volts—P to K	Screen Grid Volts—SG to K	Control Grid Volts—CG to K	Cathode Volts—K to F
44		K. F.	6.3	245	90	4.	20
36		Det. Osc.	6.3	235	90	2.3	20
44		I. F.	6.3	255	90	.2	20
37		Det. Rect.	6.3	0	50	.3	15
44		Audio	6.3	50	50	.2	20
42		Output	6.3	250	260	.2	15
80		Rectifier	5.0	365/plate	..	..	..

*All of the above readings were taken from the under side of the chassis, using test prods and leads with a suitable A.C. voltmeter for filament voltages and a high resistance multi-range D.C. voltmeter for all other readings. Volume control at maximum and station selector turned to low frequency end.

Table 2—Power Transformer Data

Terminals	A.C. Volts	Circuit	Color
1-2	105 to 125	Primary	White
3-5	6.3	Filament	Black
6-7	5.0	Filament of 80	Light Blue
8-10	685	Plates of 80	Yellow
4	.....	Center Tap of 3-5	Black Yellow Tracer
9	...	Center Tap of 8-10	Yellow Green Tracer

Table 3—Resistor Data

No. on Figs. 4 & 5	Power (Watts)	Resistance (Ohms)	Body	Tip	Dor.
(2)	.5	185 & 245	Round	Tubular	Red
(2)	.5	1,000	Brown	Black	Red
(2)(2)	.5	5,000	Green	Black	Red
(4)	(Twin Speaker)	5,620	Round	Tubular	Orange
(1)(2)	.5	10,000	Brown	Black	Orange
(2)	3.	13,000	Brown	Orange	Orange
(2)	.5	15,000	Brown	Green	Orange
(2)	.5	25,000	Red	Green	Orange
(2)	.5	51,000	Green	Brown	Orange
(2)	.5	70,000	Violet	Black	Orange
(2)	.5	99,000	White	White	Orange
(2)	.5	490,000	Yellow	White	Yellow
(17)(2)(2)	.5	1,000,000	Brown	Black	Green

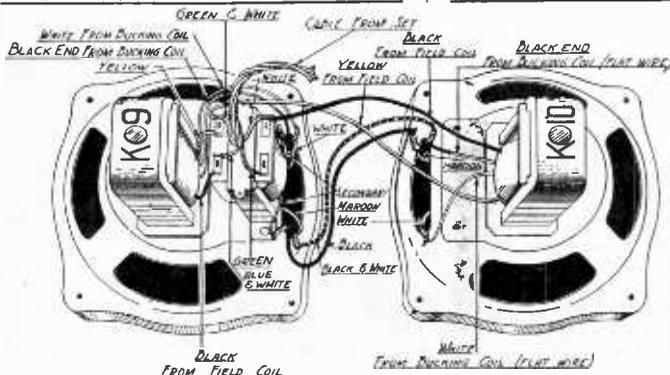


Fig. 2—Twin Speaker Connections—221 Code

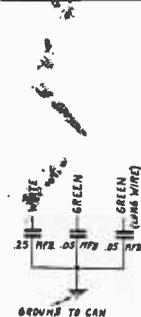


Fig. 3—Internal Connections Filter Condenser

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

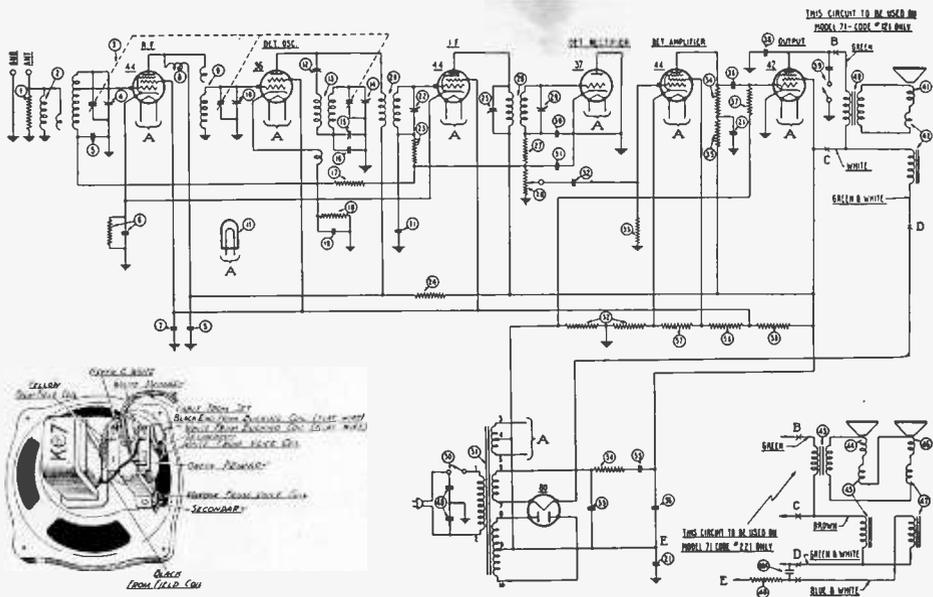


Fig. 6—Speaker Connections—121 Code

Fig. 4—Schematic Wiring Diagram

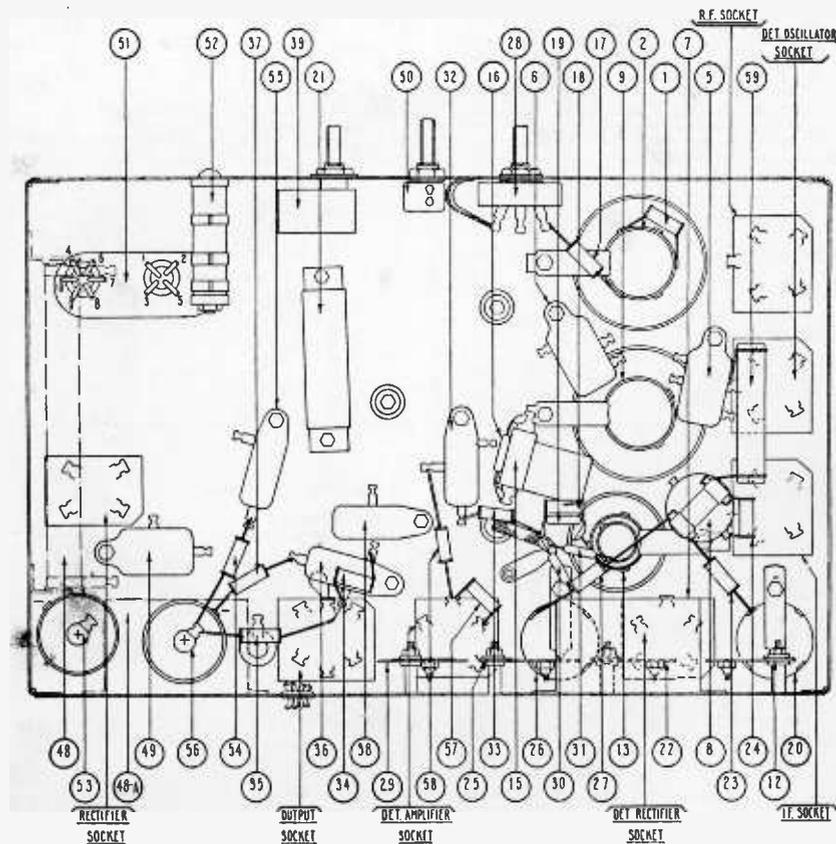


Fig. 5—Parts Diagram

A CHAT WITH THE N.R.I. DIRECTOR

POOR AMERICA

THE Republicans scold the Democrats; Democrats blame Republicans; both fly at throats of the Wets and Drys and all tell us the others have driven the country to the dogs.

This is not a campaign speech; I'm not electioneering—and I'm not blaming any party or organization for anything except the statement that "the country has gone to the dogs."

Poor America; our gloomists have sent her to the dogs. Poor America, whose people only have an income of something over 52 billion dollars a year and carry a mere 109 billion dollars worth of insurance.

Poor America must be broke. Its people have only purchased 16,500,000 Radio receivers, an investment of over 1½ billion dollars, and the Radio Industry feels so bad about America going to the dogs that it is investing another 200 million dollars in its business for the 1933 season.

Of course Americans realize the situation. They realize that their country has been tossed to the dogs—that's why they just recently purchased 2 billion dollars worth of domestic mechanical refrigerators—and incidentally Americans have more telephones than all the rest of the world put together and three times as many automobiles as are owned by all other nations.

There's an automobile in the United States for nearly every family and we Americans have a decided tendency to own our homes—in fact, we have more home owners than any other nation.

And America is so short of spending money that only 75 million people, five-eighths of our entire population, attend moving picture shows each week. In 1931 America only bought and consumed 1¼ billion pounds of candy, about ten and a half pounds for every man, woman, and child in the country.

E. R. HAAS
Vice President
and Director



But—

America has gone to the dogs—Poor America.

We've had a depression, and a bad one. I'll admit that. But we've had others and we lived through them and still climbed to new heights in wealth and prosperity. All we need is courage and a little patience.

The late Thomas A. Edison, to whom the Radio and Electrical Industries owe a great measure of their success, is quoted as saying:

"My message to you is: Be courageous. I have lived a long time. I have seen history repeat itself again and again. I have seen many depressions in business. Always America has come out stronger and more prosperous. Be brave as your fathers before you. Have faith. Go forward."

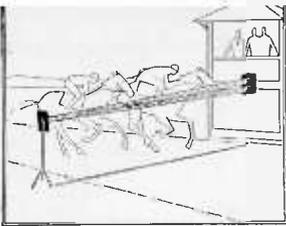
Need I say more?

If America has gone to the dogs—the dogs are lucky.

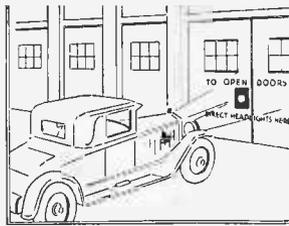
A CORRECTION

On page 3, August, 1932, issue of National Radio News the designations under five of the tubes illustrated had a "B" after the number. This is an error. The "B's" should not be included. The tube numbers are '46, '57, '56, '82, and '58. Please correct your file copy.

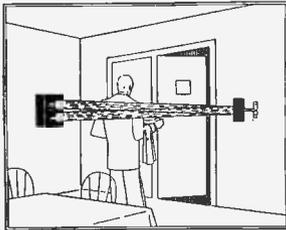
PUTTING PHOTOELECTRICITY TO WORK



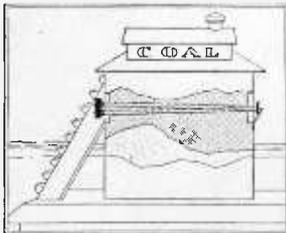
Timing Races



Opening Garage Doors



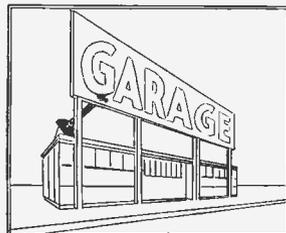
Opening Doors in Restaurants



Controlling Filling Mechanisms to prevent over-filling



Funch-Press Safety Device



Controlling Electric Signs



Checking Theatre Admissions

HOW many progressive, up-to-date stores are there in your city or neighborhood? Ask them how valuable their display windows are. Ask them if they would be interested in making them even more valuable. There is but one answer—yes. You can point out to them the advantage of leaving their windows dimly lighted, until a pedestrian approaches and then have them automatically flooded with light. The attention value of the sudden illumination is tremendous—people simply must look. Besides the advertising value there is a great saving in the cost of the electric current.

Suppose a store wishes to have an electric display in the window which can be turned on and off at will by people looking in the window, simply by holding their hands in front of a mirror. What a method for advertising electric ironers, washing machines, electric trains or other electrical apparatus. Do you think there is any question whether people would stop and use this novel device? Hardly!

Yet such display can readily be put to work with photoelectric apparatus.

And this is not the limit of possibilities. Not by any means. In fact the possibilities for applications for commercial work are practically unlimited.

Restaurants offer a big market. What an advertisement for them as an up-to-date restaurant when they have installed the automatic door control that opens the kitchen door every time a waiter approaches with a tray full of dishes. The first restaurant in any community to install these units will get plenty publicity.

Service station attendants are often inside when a car drives in. Prompt service requires that they receive immediate notice of customers entering the driveway. Consider the advertising that the oil company could work up around a photoelectric installation which would ring a bell when a car passed a certain point, in addition to the great convenience and improved service.

Schools — factories — banks — offices and drafting rooms present a lucrative market for illumination control apparatus. We're all acquainted with the costly results of poor illumination—a rapid increase in errors, weakened eyesight, lowered efficiency. Schools should protect their pupils against eye strain. Factories can increase production and reduce waste through proper illumination. Offices can reduce errors, increase clerical output and efficiency, improve health, and keep their workers in much better spirits by supplying sufficient light at all times. In addition, photoelectric control on lights results in a saving of electricity by eliminating waste.

PHOTOELECTRICS WORK

Are there factories in your community? In addition to light control they can use photoelectrics profitably applied in various ways to production.

A partial list of the possible uses of photoelectrics follows:

I. Electric Counters Controlled by Light Interruptions—

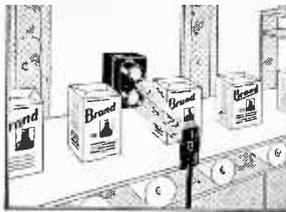
- (a) Counting traffic on Thoroughfares or Bridges.
- (b) Counting persons entering stores.
- (c) Counting persons entering ball parks, theatres, boarding boats, etc.

II. Advertising Displays—

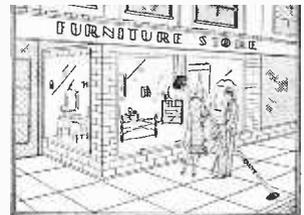
- (a) In banks and store windows.
- (b) Operating washing machines, electric fans, or other electrical devices in appliance stores from a mirror placed directly outside of store window.
- (c) Turning on window lights when infrequent passers-by at night interrupt a light beam across the sidewalk.
- (d) Controlling an automatic electric pick-up to greet customers entering stores, announce daily specials, etc.

III. Signalling Systems—

- (a) For operating alarms when the light beam is interrupted by trespassers.
- (b) Indicating the approach of customers in stores and gasoline filling stations.
- (c) Lighting a store interior upon approach of a trespasser.
- (d) Lighting a store interior by the watchman's flashlight.



Counting Items in Production

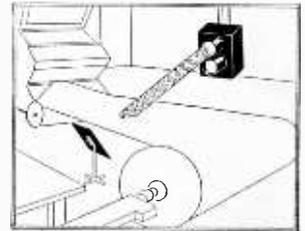


Store Window Illumination Control

IV. Automatic Illumination Control to Turn on Artificial Lights when Daylight drops below a Predetermined Level.

In Offices

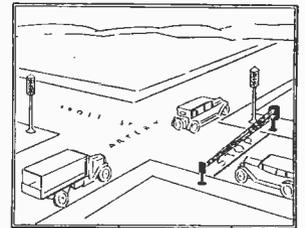
- Banks
- Railroad Stations
- Suburban Stations having no attendant
- Corridors and entrance ways in hotels and apartment buildings
- Electric signs.



Device to Stop Machine if Paper Breaks

V. Door Opening Mechanism—

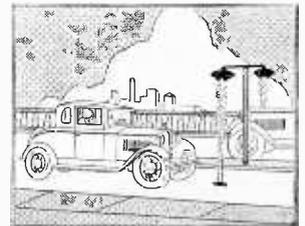
- (a) Controlling door openers in public and private garages from automobile headlights or the interruption of a light beam.
- (b) Opening doors for men or trucks with heavy loads in factories, warehouses, refrigeration plants, etc.
- (c) Controlling door openers in restaurants when a waitress approaches the door.



Traffic Control

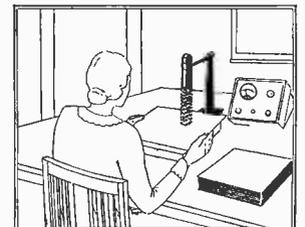
VI. Traffic Control.

The photoelectric field is uncrowded. Many sales can be made to enterprising concerns by the wide-awake Radio-Trician. Put Photoelectrics to work making you money.



Counting Traffic Over Toll Bridges

National Radio News acknowledges with thanks the assistance of the G-M Laboratories, Inc., manufacturers of the G-M Photo Switch, 1731-35 Belmont Ave., Chicago, in the preparation of this article. They will be glad to furnish details of their photoelectric products upon request.



Grading Opacity of Paper

ARE YOU TROUBLED by the QUESTION MARK?

By MARK KEYES, National Radio News Staff



to make some money?

Well, it's time to stop that thinking; time to do something about it. You've had all summer to think and lay your plans for your fall Radio work. Now it's time to put those thoughts into action.

Don't know what to do? Just what have you been thinking about all summer? Have you just been sitting around with a troubled look on your face, complaining all the time, so people will ask you what you are going to do—and you can answer: "I'm thinking about that now"? That's just an excuse to keep from getting right down to action.

Now, here's a happy thought for you. You know most everyone is going to be interested in the World Series this fall, but not everyone who is interested is going to see them. But take it from me they are going to hear them. Perhaps their Radios aren't in perfect condition. That's where you come in.

See that they do hear the World Series by fixing their Radios up properly.

People are always interested in college foot ball games. The most popular ones are broadcast. Make it possible for your customers to think they are right on the fifty-yard line.

There is another event of importance this fall. Election! Your customers will want to hear the campaign speeches; they'll want their Radios in top notch condition so they'll be able to hear every word, to get the returns as rapidly as they are known.

So now, stop thinking and get to work—make every minute of your time pay from now on—talk to your customers—pep them up over the coming events of this fall and winter. They'll want to hear it all and they aren't going to be able to buy new Radios, so they'll want their old ones just as good as new and you're the one to make them that way. Go to it!



Dear Mr. Smith:

Brownsville, Texas.

It is with great pleasure that I tell you that after having completed twenty lessons in the N. R. I. Course, I landed my present job as Flight Radio Operator with the Pan American Airways, Inc.

The N. R. I. Course helped me to take the Government Examination for the Radio Operators License and opened the doors for a splendid position at a good salary.

That is why I recommend strongly your Course for any young man who is interested in this splendid profession. Radio is to me the most interesting and fascinating career that one may choose.

R. SIGLER.

RADIO-TRICIAN SERVICE SHEET

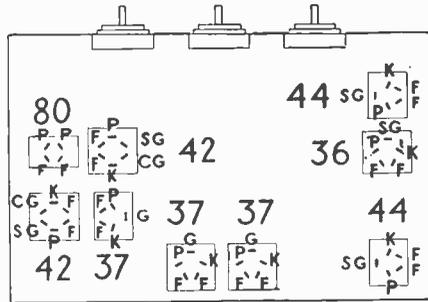
REG. U. S. PAT. OFF. COMPILLED SOLELY FOR STUDENTS & GRADUATES



PHILCO MODEL 91 SERIES

The Philco Radio of the 91 series is a nine tube superheterodyne, employing the high efficiency 6.3 volt filament tubes, automatic volume control, shadow tuning, and push-pull pentode output. The chassis is made in two different types, one known as the 121 type, employing a single dynamic speaker and the other known as the 221 type, employing twin dynamic speakers. These type numbers appear on the radio chassis as a part of the model number. Chassis of one type are not interchangeable with those of another. The intermediate frequency used in adjusting the superheterodyne circuit of the 91 series is 260 kilocycles. The power consumption of the various models is as follows:

Model	Volts	Cycles	Watts
91-121	115	50-60	90
91-221	115	50-60	95
91A-121	115	25-40	92
91A-221	115	25-40	97
91E-121	230	50-60	90
91E-221	230	50-60	95



F = Filament SG = Screen Grid K = Cathode
P = Plate CG = Control Grid

Fig. 1—Tube Sockets

Table 1—Tube Socket Data*—A.C. Line Voltage 115 Volts

Type	Tube	Circuit	Filament Volts	Plate Volts	Screen Grid Volts	Control Grid Volts	Cathode Volts
44		R.F.	6.3	200	50	.6	25
36		Det.—Osc.	6.3	250	80	10	10
44		I.F.	6.3	250	85	.2	5
37		Det.—Rect.	6.3	0	...	.2	2
37		Det.—Ampl.	6.3	60	...	.2	2
37		Audio	6.3	100	...	0	2
42		Output	6.3	240	250	15	15
42		Output	6.3	240	250	15	15
80		Rectifier	5.0	310/Plate	...	...	...

*All of the above readings were taken from the under side of the chassis, using test prods and leads with a suitable A.C. voltmeter for filament voltages and a multi-range D.C. voltmeter for all other readings. Volume control at maximum and station selector turned to low frequency end.

Table 2—Power Transformer Data

Terminals	A.C. Volts	Circuit	Color
1-2	105 to 125	Primary	White
3-5	6.3	Filament	Black
6-7	5.0	Filament 80	Blue
8-10	670	Plates of 80	Yellow
4	...	Center Tap of 3-5	Black Yellow Tracer
9	...	Center Tap of 8-10	Yellow Green Tracer

Table 3—Resistor Data

Nos. on Fig. 4	Resistance (ohms)	Power (Watts)	Terminals	Color		
				Body	Tip	Dot
Ⓜ Single Speaker	900	.5	1-2	LONG	TUBULAR	
	2700	.5	2-3			
	95	.5	3-4			
	205	.5	4-5			
	136	.5	1-2			
Ⓜa Twin Speaker	Blank	.5	2-3	LONG	TUBULAR	
	85	.5	3-4			
	205	.5	1-5			
Ⓜ1	1,000	.5	...	Brown	Black	Red
Ⓜ1	10,000	.5	...	Brown	Black	Orange
Ⓜ1	15,000	.5	...	Brown	Green	Orange
Ⓜ1	25,000	.5	...	Red	Green	Orange
Ⓜ1a	13,000	1.	...	Brown	Orange	Orange
Ⓜ2	99,000	.5	...	White	White	Orange
Ⓜ3	490,000	.5	...	Yellow	White	Yellow
Ⓜ4	1,000,000	.5	...	Brown	Black	Green
Ⓜ5	1,000,000	1.	...	Brown	Black	Green

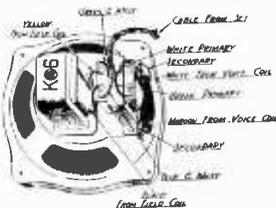


Fig. 2—Speaker Connections—121 Code

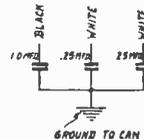


Fig. 3—Internal Connections Filter Condenser

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

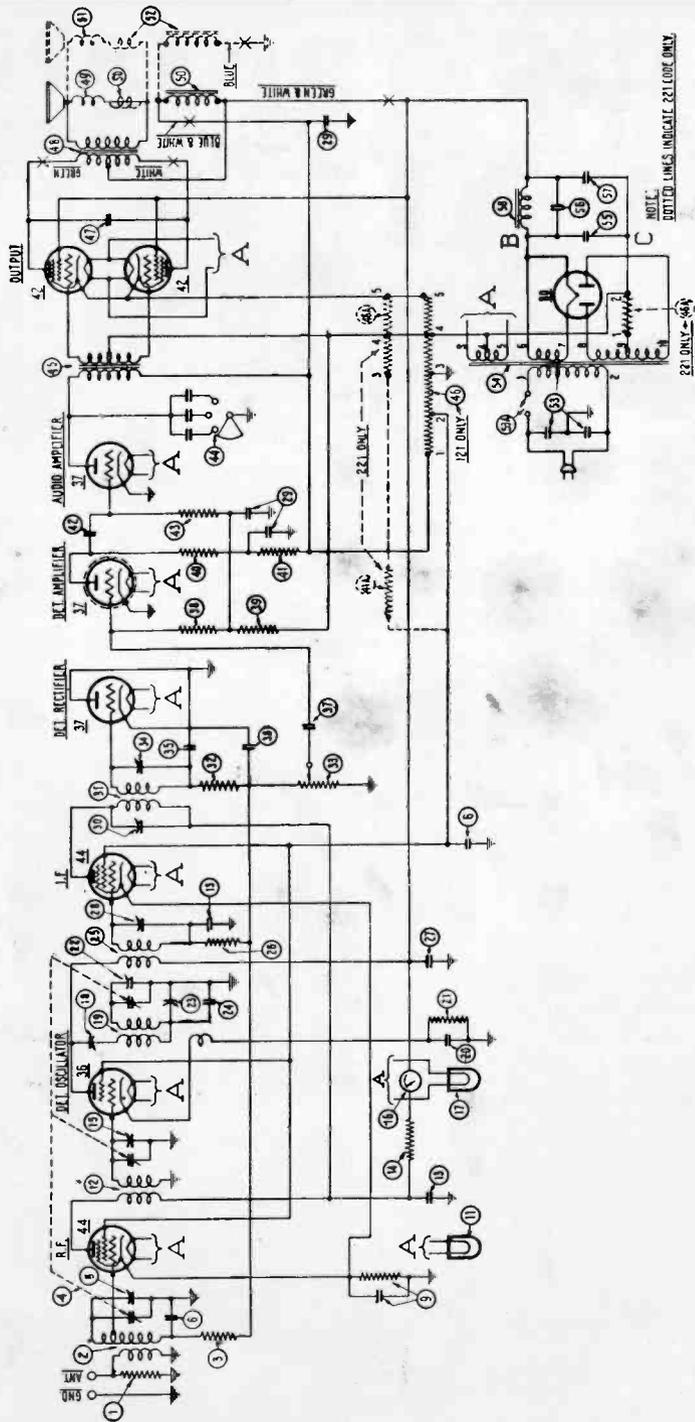


Fig. 4—Schematic Wiring Diagram



MANUFACTURER CHANGES POLICY

Realizing the importance of the trained service man, out in the field, giving full credit to his value in keeping sets sold and operating perfectly, one of the "old line" manufacturers has changed its policy. This change constitutes a definite recognition of the service man as an important link between the manufacturer and the set owner.

The manufacturer is Philco.

It is their desire to see that independent Radio service men are given all possible information on the Philco line so that the great number of Philco set owners may have competent service men available when needed.

It is also a part of their plan to make genuine Philco parts available to the service men, which will of course react favorably to Philco sets in operation and to the benefit of the Radio service men.

Philco would like to hear from every Radio-Trician who is operating an independent Radio service business. It is their desire to contact these service men and supply them with the Philco parts catalog and Philco wiring diagram booklet.

The N. R. I. Alumni Association headquarters and the National Radio Institute are in full accord with this policy and it is hoped that all graduates who are operating independent service businesses will communicate with Mr. J. R. Jackson, Service Department, Philco National Service Station, Allegheny Avenue and "A" Street, Philadelphia, Pa.

DEVELOP HEALTH LAMP

Many Radio-Tricians, especially those in business for themselves, are frequently consulted on matters regarding household electrical equipment.

For that reason, and for the purpose of general information we want to tell you about a new health lamp, known as the Sirian Ultra-Violet Lamp, which has been developed by the Arcturus Radio Tube Company, Newark, N. J. They believe this lamp heralds a new era in healthful lighting since it provides both ultra-violet rays and pleasant illumination.

In laboratory tests by universities, scientists and physicians, Sirian Ultra-Violet Lamps have proved that they are the closest approach to the sun, radiating the same kind of ultra-violet rays. The beneficial rays from this lamp are mild and can be absorbed without danger. The special glass which is used positively prevents all short harmful rays that are apt to prove dangerous, precluding the necessity of goggles or other precautions.

The lamp is designed to fit any lighting socket and does not require transformers or other additional apparatus. It replaces any incandescent bulb and operates without noise or dirt. The lamps are made in 60, 100, 150 and 300 watt sizes and are priced considerably lower than any ultra-violet equipment on the market.



Habit is a cable; we weave a thread of it every day, and at last we cannot break it.—
Horace Mann.

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The service man knows, perhaps better than any other person, the false economy of "cheap" Radio tubes. In the majority of his service problems, the trouble can be traced directly to inferior tubes, as the cause. These poor tubes, in order to compare favorably with better makes (usually, only as far as volume is concerned) draw excessive current from the source of power supply. If this source be batteries, then frequent replacement is the resultant necessity; if the power pack of an electric receiver, then a heavy demand is placed on the rectifier tube, thereby decreasing that unit's number of hours of service, while the increased current flowing through resistors causes erroneous voltages to be applied to the various circuits as well as breakdown of the resistors, themselves. Even one poor tube may cause improper voltage to be applied to the remaining good tubes, making them incapable of giving perfect cooperation.

The average listener cannot, of course, know these facts, but, once told of them can take the future precaution of seeing that his receiver is equipped with EVEREADY RAYTHEONS.

And now that the listener has been warned, let me also add a word of warning to those service men who are impartial in their replacement of tubes (unfortunately, there are a few): "Always make certain before replacing with any other kind of tube, that there are no EVEREADY RAYTHEONS in the receiver, or have ready a good answer (if possible) for, 'Is it as good as an EVEREADY RAYTHEON?'"

This letter, written by Graduate Orville Buser, Pasadena, Calif., won a prize in the National Carbon Co. best letter contest.

DID WE ASK YOU TO ENROLL AGAIN?

By S. M. Armstrong
Student Service Director



AFTER you enrolled with N. R. I., did you ever get literature asking if you were interested in N. R. I. training, and again advising you to enroll?

You have possibly received such literature—and you may get more. So let me explain how this happens.

First. Some N. R. I. student, who does not know that you are already a member of N. R. I., may send in your name as a prospective student. Your name may even be sent to us by some fellow you do not know personally.

Second. Manufacturers and distributors of Radio apparatus and accessories frequently supply us with names of their customers, believing that these customers might be interested in the N. R. I. Course. We naturally write to each man whose name we receive.

Whenever you buy Radio apparatus, it is possible that we may later receive your name as a prospective student.

Now that you understand how it happens, I feel pretty sure that you won't mind if you occasionally get "sales literature" from us. Of course, we could check our files with the name of every prospective student we receive, and prevent this literature from going out to you. But this would take time that we'd rather use in giving you the very best of service on the THINGS THAT REALLY COUNT—your lessons!

So if you ever get a "sales letter" from N. R. I., don't bother to write us. Just note your name and student number on the "sales letter" and return it to me—then I'll see that the matter is properly handled.

Thanks for your cooperation!



ALVIN PAGEL, ST. PETER, MINNESOTA

I thought the fellows might be interested to know I have been experimenting with television. I have a television image receiver, also a radio visor. For several weeks I have been receiving television images from Station W9XG, Lafayette, Indiana, operating on a frequency of 2800 K. C., 1500 watts. They have been televising news reels and under favorable weather conditions I receive them with fairly good results. It surely is an interesting field. It won't be long before every home will have television. My friends here think that I am some kind of a magician; they don't understand the principle of television. I am the only one here who has a television receiver.

PAUL W. SEELY, UPPER DARBY, PA. ✱

I ran across a Radio recently in an apartment house. Some of the favorite stations could not be heard at all and the rest were weak. By merely improving the aerial and ground wire all of the stations came in fine. This resulted in a delighted customer and three other jobs for me netting \$27.00.

RALPH H. WALKER, COLUMBUS, OHIO

Here is a little note on service of an Atwater Kent A. C. Job, 224-227-245-280 tubes a T. R. F. radio. There had been service men from the dealers, and also from the jobbers try to service this set, with no satisfaction. The set was very noisy, fading, and almost intermittent reception. Tubes tested O. K., voltages O. K. So I took the pan off and found three bolts holding the gang condenser were not absolutely tight. This being done, set worked fine without oscillations, and no fading.

ALBERT FABER, HUNDSONVILLE, MICHIGAN

The story, "Beware of the Tin Roof," by Andrew Ney, which appeared in the July News under Alumni News, prompts me to relate that I once serviced a receiver that had a fading and crackling noise in the speaker caused by the ground wire being twisted around a rusty nail.

Always look for the LITTLE things.

Here's a Canadian Ham. Harry C. Heywood operates amateur station VE4KS at 928 Montgomery St., W., Moose Jaw, Sask., Canada.

A COMEBACK AT BILL STEFFEN

I have just read the suggestion of Mr. William F. Steffen of Milwaukee.

I have tried the idea which Mr. Steffen suggests a number of times during the past five years and it falls when done just as he suggests. Here's why:—

On a new battery where terminal posts are absolutely tight the idea is good. But as a battery gets older the terminal posts loosen slightly; there is sufficient acid which creeps up around the posts, to reach the Fahnstock clips and destroy them; cause the copper wire to be eaten away, destroy the insulation, etc.

Now here is the method which I use:

Solder a strip of 1/16" sheet lead 1/2" wide and about 8" long to the Fahnstock clip and solder the strip to the battery terminal post. Properly done, this keeps the Fahnstock clips and the wire far enough away from the battery so that the acid or the fumes do not attack the clips and wires.

Soldering lead is about the most trying soldering anyone can attempt. I had all sorts of trouble until a man who made acid vats told me that if I would use resin I would not have much difficulty soldering lead, if the work is cleaned properly. Soldering acids and many soldering pastes corroded the lead before the soldering could be done. †

A last hint about the disagreeable actions of the acid in batteries. If the acid from a battery insists on creeping up the posts on to your connections, a little band of hot paraffin brushed around the lead connecting strip will stop the acid at the paraffin band if it is a half inch to an inch wide. Paraffin is cheap; make the band wide enough and the acid will not creep over it.—Aubry N. Dunn, Elkhart, Ind.

Rudolph W. Raabe, 4523 West Seminary Ave., Richmond, Virginia, operates amateur station W3ZU.

H. A. Logsdon, Salina, Kansas, reports that he has just succeeded in putting two sets in operation upon which a Radio man of eleven years experience had failed.

Just a few lines to inform you that during these depression days have been busy with service work.—J. H. Thompson, Tampa, Fla.

Build Yourself a Valuable Radio Library with these Helpful FREE MANUFACTURERS' BOOKLETS AND CATALOGS

A FREE SERVICE DESIGNED TO SAVE YOU TIME AND MONEY

The cooperation of the manufacturers whose catalogs, literature and booklets are listed on this page, and the courtesy of the Calcatera Catalog Service has made it possible for the N. R. I. Alumni Association to offer to readers of National Radio News a unique and money-saving service in obtaining Radio manufacturers' literature.

All that is necessary for you to obtain the catalogs or other literature listed on this page is to write the numbers of the items in which you are interested on the coupon, fill in the information

asked for and MAIL IT TO THE CALCATERRA CATALOG SERVICE. DO NOT MAIL COUPONS TO THE NATIONAL RADIO INSTITUTE, AS THAT WILL DELAY THE FILLING OF YOUR ORDER.

Stocks of the publications listed are kept on hand and they will be sent to you promptly, as long as the supply lasts.

To avoid waste and needless postage expense, PLEASE DO NOT SEND FOR ANY MATERIAL IN WHICH YOU ARE NOT ACTUALLY INTERESTED or of which you already have a copy.

2. **HAMMARLUND 1933 CATALOG.** An 8-page folder which gives complete information on the new Hammarlund line of broadcast, short-wave, ultra-high frequency, band-spread, transmitting, midset and dual midset variable condensers, equalizing, trimming and padding adjustable condensers, sockets, coils, intermediate frequency transformers, shields for both new and old tubes, broadcast and transmitting chokes and flexible couplings.

5. **ELECTRAD 1932 CATALOG.** Complete specifications and list prices, on the entire line of volume controls, voltage dividers, fixed and adjustable resistors, public address systems, amplifiers and replacement resistors together with valuable data on volume control circuits, are given in this 10-page book.

6. **AMPERITE LINE VOLTAGE CONTROL.** This folder gives complete description of the characteristics and uses of the Amperite automatic voltage regulator and a chart showing the proper unit for all the popular receivers now in use.

9. **INTERNATIONAL RESISTANCE CATALOG.** A handy catalog giving complete information and list prices of Metallized and precision wire-wound resistors, motor radio suppressors, handy servicemen's resistor kits and valuable technical data.

11. **FLECHTHEIM 1932 CONDENSER CATALOG.** This 4-page folder gives complete specifications and list prices on the Flechtheim line of both high and low voltage paper condensers for by-pass and filter use in transmitting and receiving equipment.

12. **CERTIFIED TRIAD TUBE PLAN FOR SERVICEMEN AND DEALERS.** This folder explains in detail a special plan which makes it possible for servicemen and dealers who maintain a service department to obtain Certified Triad Tubes direct from the factory at very attractive discounts.

16. **LYNCH RMA STANDARD RESISTOR COLOR CODE CHART.** This handy post-card size resistor color code chart has been designed to simplify the job of identifying the resistance values of resistors used in most of the standard receivers. It also contains a com-

plete list of the most commonly used values of resistors with their corresponding color designations.

17. **WESTON AND JEWELL 1932 RADIO INSTRUMENT CATALOG WJ.** This 20-page book on radio measuring and testing instruments, containing specifications on the complete lines of both the Weston and Jewell organizations is without doubt the most complete of its kind and covers all types of instruments together with much valuable technical information.

18. **A BAPTISM OF FIRE.** This interesting, 16-page illustrated booklet describes the materials and processes used in making Centralab Fixed Resistors. It gives many useful and little-known facts on the research work, facilities and skill required to manufacture these small but important units.

19. **MAKING AUTO RADIO SETS ALL-ELECTRIC WITH THE CARTER GENEMOTOR.** This circular gives complete description and specifications on the Carter Genemotor which is designed to eliminate all necessity for the use of "B" batteries in connection with Automobile, Aviation, Farm and other similar sets.

20. **SHALLCROSS BULLETIN NO. 110.** This useful bulletin gives circuits and data which show how to make Multi-Range Voltmeters, Milliammeters and Ohmmeters, Wheatstone Bridges and Capacity Bridges and a table listing stock values of Shallcross Super Akra-Ohm resistors.

21. **STANCOR EXACT DUPLICATE REPLACEMENT TRANSFORMERS.** This folder gives complete information, together with receiver name and model numbers, on a very complete line of replacement power transformers, chokes, audio transformers and output transformers made by the Standard Transformer Corp. The units listed are exact duplicates, electrically and mechanically, of the originally installed transformers used in many popular sets now in use.

22. **OHMITE RESISTOR STOCK LIST NO. 8.** A 6-page folder giving complete specifications on the complete line of fixed and semi-variable resistors which are carried in stock at all times by the Ohmite Mfg. Co. All resistors are of the vitreous enamelled type.

24. **SYLVANIA SERVICE KIT.** This piece of literature explains how it is possible for any serviceman or dealer to obtain, without actual charge, a Sylvania Service Kit, 17" long, 7" wide and 10" deep, built of 3-ply veneer, covered with black leatherette and provided with decorative brass fittings, lock, key, kit for small parts, tool tray, literature rack and space for 20 assorted tubes.

25. **LYNCH NOISE REDUCING ANTENNA SYSTEM.** A detailed description of a new, interference eliminating antenna system, which is equally efficient on both broadcast and short waves and is therefore particularly adapted for use on all-wave receivers which have heretofore given unsatisfactory reception because of noise interference on the shorter waves. This system can be applied to existing installations and offers a big field for jobs for servicemen in their installation. Its use on amateur receivers makes possible more and better QSOs.

CALCATERRA CATALOG SERVICE, NRN-932
Pleasantville, N. Y.

Please send me, without charge or obligation,
the following catalogs, booklets, etc.

I am a _____
(Please fill in your connection in Radio)

Name _____
(Please print)

Address _____

City _____ State _____