NATIONAL RADIO NEWS

APRIL-MAY, 1933

WLW to Experiment with Super Power.

from the

PRESIDENT'S PEN

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

WHY NOT EQUIP THE AUTOMOBILES WITH RADIO SETS?

A recent survey made by National Radio News regarding automobile Radio will be of interest to all our readers.

A number of car owners were asked "Do you have an automobile Radio?"

95 per cent did not have Radios in their cars.

Each person was then asked "Has anyone ever tried to sell you a Radio for your car?" Not one person to whom these questions were put had ever been approached by a salesman selling automobile Radios. Those who had auto Radios had voluntarily purchased from dealers without any solicitation.

It certainly looks as though the people in the Radio business are passing up some good opportunities. 95% of the new cars are already equipped with aerials when they come from the factory, making it easier to sell those car owners a set.

One man was asked, "Why don't you have a Radio in your car?" and he replied—"I guess its because no one has ever given me a good demonstration of a car Radio and tried to sell me." Another young man stated that he had been in the market for a high grade used car. He had an opportunity to purchase either of two cars which met with his approval and he selected one in preference to the other because it was equipped with a Philco Transitone Radio.

I find it hard to understand why some wide awake Radio men do not make contacts with automobile salesmen or dealers whereby the Radio men would be supplied with a list of the persons buying cars—he in turn to solicit them for automobile Radios. He could make some sort of a commission arrangement with the salesman or dealer for any sets he sold.

Every once in a while we hear of a Radio man who is making a clean up with auto sets—but they are so few and far between—at such widely scattered points—that they do not even scratch the surface of the market which is available.

Automobile Radio does not merely offer an opportunity to make a few dollars here and there—it offers an opportunity for a fellow to get started in a business which can pay high present and future returns. Automobile Radio sets, after they are sold, will need service just like any other Radio set. The fellow who sells the automobile Radio receiver—providing he gives his customer a square deal—is going to get the service work later on.

Chief Dowie has been telling our readers for months and months about the possibilities in the Automobile Radio field. You have had time enough in these months to think the matter over—it is high time now something was done about it. I expect to see a good number of live-wire Radio-Tricians make some real money as the result of the ever growing popularity of automobile Radio.

Reports from the Philco factory to National Radio News state that the Philco-Transitone is exclusively approved by Auburn, Chrysler, Cord, DeSoto, Dodge, Essex, Franklin, Hudson, Nash, Pierce-Arrow, Plymouth, Reo, Rockne and Studebaker.

ELECTRONIC IN GRAVITY STUDIES

By Graduate H. E. McConnell, U. S. Coast and Geodetic Survey

Modern electronic equipment plays an important part in the work the United States Coast and Geodetic Survey is doing in making relative gravity observations as it provides a means of getting accuracies heretofore impossible in the field.

Gravity is of deep and vital interest to geologists trying to discover and map underground strata and structures, and in locating large masses of mineral deposits, such as coal, or oil, etc.; to the isostasist interest in the shape and general structure of the earth; and to the mathematical physicist and scientist because of the many physical formulae depending on gravity.

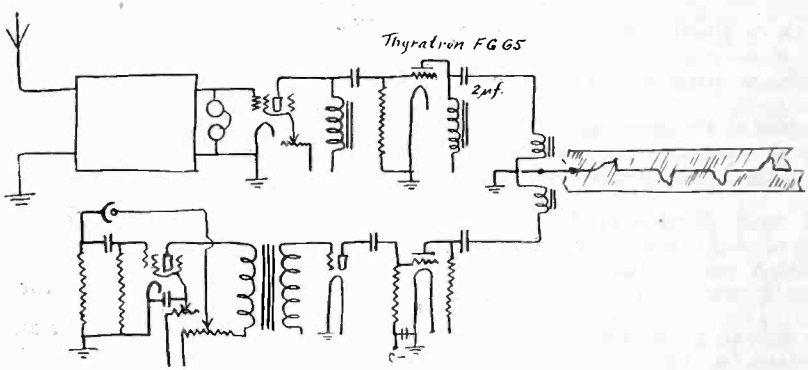
The method heretofore has been to swing pendulums, and through some kind of timing device, arrive at an approximate period for the pendulum. This period, after the necessary corrections have been applied, depends upon the attraction of gravity (or pull of the earth) at that point. Old methods were very slow, it being impossible to observe more than about three stations in a month. Consequently it was possible to arrive at the conclusion that gravity did have a very definite relation to isostasy and geological structures without having a great deal of information as to what the relation is.

About three years ago Lieutenant Brown of the U. S. C. & G. Survey set to work to design new gravity instruments. The essential idea of swinging a pendulum and observing the rate, he kept. In a pendulum apparatus it is necessary, simply to count the number of even beats of the pendulum occurring in a given time interval, and

$\frac{\text{time}}{\text{beats}} = \text{period}$. And of course $\frac{(\text{Period } 1)^2}{(\text{Period } 2)^2} = K \frac{g^2}{g^1}$

Therefore it is possible to solve for g^2 if g^1 is known or assumed at some base station. (K is not a true constant, but depends on certain corrections which we make).

In the Brown apparatus, a pendulum rests and swings on an agate knife edge in a cylindrical air tight case in a vacuum of approximately ten mm. of mercury or less. A heavy plate glass is sealed over the top of this case. The knife edge is in the plane of the center of support for the case, in order to reduce the flexure or minute movement of the supporting edge while swinging the pendulum.



A secondary case rests upon the base and over the glass plate. It contains a light source which focuses a narrow beam of white light upon a mirror on top of the swing pendulum. The motion of the pendulum causes a moving beam to be reflected across a photocell. A fine wire is drawn across the center of the beam so that the beam crossing it will cause a negative or darkening impulse on the cell, thus causing an impulse which is amplified through a fairly orthodox system of amplifiers onto a Chronograph.

Any short wave Radio of modern commercial design is used to receive the scientific time signals from NAA (those being the signals the naval log records so as to furnish absolute

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A FEW WORDS WITH THE N.R.I. DIRECTOR

E. R. HAAS, Vice President and Director, National Radio Institute

SO MAHOMET WENT TO THE MOUNTAIN

They tell a story about a fellow named Mahomet, who for some reason or other wanted to have some dealings with a certain mountain.

So he just ordered the mountain to come to see him. Sounds strange, I know—but they did strange things in those days.

Not getting much service on his call, Mahomet issued a second command for the mountain to pay him a visit. Still—the mountain remained where it was.

Now Mahomet was a prophet, and prophets are usually pretty bright fellows. So he sat down one evening to figure things out. After an analysis of the whole situation he decided that the method didn't count near so much as the result, and that the important point in the matter was for him and the mountain to get together. And since the mountain was either unable or unwilling to make the journey—then Mahomet would go to the mountain. We understand that he did this and accomplished whatever it was he had started out to do.

All of which brings us to the subject of Radio men and Radio work.

There are times, when conditions in Industry are good, when the Radio man can sit back, more or less, and wait for the business to roll in—wait for the mountain to come to Mahomet, so to speak.

But in these times of stress, business, like the mountain, refuses to come to your fireside, while you recline in the easy chair and absorb detective stories.

So, if business refuses to come to you—and since getting business is very important to your success—you've got to go out after it.

You've got to work. You'll have to advertise. You'll have to canvass. You're not interested in bringing a mountain to Mahomet but you are interested in bringing dollars into your bank account.

WHAT DOES AVIATION OFFER THE RADIO MAN?

Not so many years back the occasion of an airplane flight was sufficient cause to send people to the hill-tops and the house-tops in an effort to get a view of the plane in flight.

But now—giant passenger and freight planes thundering overhead attract scarcely a passing glance—so usual have they become.

And the very fact that planes have become the usual thing—something to be expected—nothing to marvel at—is in all probability responsible for the little thought that we give to the mighty industry behind these ships of the air.

And by so overlooking the aviation industry we naturally overlook the Radio branch of aviation which has come to be a real field of opportunity for the red blooded Radio man.

National Radio News feels that it is high time that someone undertook to explain this branch of the Radio and aviation industry—picture it in its true light. We have therefore made plans to bring you an Aviation-Radio issue of National Radio News at an early date. This issue will be devoted almost entirely to the subject of Aviation-Radio and we will endeavor to give a very broad picture of it from various angles.

Be on the look-out for the next issue of National Radio News—the big Aviation issue.

See what Aviation holds for Radio—learn what Radio-Aviation holds for you.

STUDENTS! GRADUATES! HELP IN THIS SURVEY

National Radio News is sponsoring a sur-ey, the results of which will later be pub-shed for the benefit of all its readers.

Frequently we receive requests from stu-ents and graduates of the National Radio In-itute for information concerning the layout nd typography of different business forms sed by Radio men.

In order to give the best possible informa-on along this line, we desire to make a col-ction of such forms which are being used by tudents and graduates of the Institute in neir regular Radio work.

So, any student or graduate of the National adio Institute who is in business for himself -or working for someone else in the Radio isiness, is requested to send us a copy of any all forms of that nature which he may have to which he may have access.

We are particularly interested in letter-eads, business cards, envelopes, service con-acts, circulars, form letters, hand bills, job rds, stock cards, shipping tags, and any other ems of that nature you may have available.

Please send such material to National Radio ews direct. Please do not put it in with les-ns, letters to various departments here at e Institute, consultation blanks, etc. We also ant a collection of Amateur Q. S.L. cards. ut it in a separate envelope and address it to The Survey Editor, National Radio News, 536 U St., N.W., Washington, D. C."

The D. R. Bittan Sales Company Inc., 27 ark Place, New York City, is the representa-ve for the products of the American Micro-hone Co., Inc.

For complete information write the Bittan ompany at the address above or the American icrophone Company, Inc., Ltd., 251 West 58th treet, Los Angeles, Calif.

FEDERAL RADIO COMMISSION SUGGESTS METHOD TO REDUCE RECEPTION NOISE

An interesting article prepared and released on January 31st, 1933, by the Federal Radio Commission, through Commissioner Harold A. Lafount is as follows:

"Much has been done by the Federal Radio Commission and the broadcasters of this country to eliminate interference with the reception of broadcast programs. There is, however, a form of interference which neither can remedy, but which can be materially reduced and perhaps entirely eliminated by the installation of a proper antenna.

"There are three general sources of interference to broadcast reception, not including interference between stations. They are: natural static, which originates in the atmosphere; man-made interference, such as that caused by street cars, power lines, etc.; and man-made interference caused by the operation of electrical devices in buildings. Obviously the latter cannot be eliminated by either the broadcaster or the Commission. However, recently several manufacturers have placed inexpensive antenna kits on the market, designed to eliminate or greatly reduce the interference caused by these electrical devices in the same or in adjacent buildings.

"These outfits consist essentially of a short antenna wire to be suspended in the clear as far above the roof as practicable with a small transformer connected to the antenna and from the transformer shielded lead-in conductors to the broadcast receiver. In some cases a filter in the power line supply is also desirable. This type of antenna should give reasonably clear reception from nearby stations to many listeners now troubled with local electrical noise caused by local electrical machinery.

"There is no provision in the Radio law or any other federal statute for the control or elimination of interference due to electrical devices. Some cities have local ordinances designed to control man-made interference but locating the sources of such interference is a tedious, difficult and expensive matter.'

If you want to be respected, respect yourself—and others.

WLW TO HAVE 500 K. W. POWER

CROSLEY STATION TO EXPERIMENT WITH SUPER POWER TO OVER-RIDE STATIC . . . WILL BE HEARD ALL OVER THE WORLD

As we go to press we learn that final contracts for the equipment to go into the new giant 500,000 watt transmitter of WLW have been awarded to the RCA-Victor Company of Camden, N. J.

These contracts call for building the Radio Frequency Amplifier, the High-powered Modulation Unit and the Power Supply and Controls of what will be, when completed, the world's most powerful Radio broadcasting transmitter.

Construction of new buildings to house the 500 kilowatt transmitter and of the huge 840-foot all steel "vertical radiator" antenna structure are already under way at the Crosley transmitter plant located at Mason, Ohio, twenty-two miles north of Cincinnati.

Involving a total cost of approximately $400,000.00, the construction of this modern goliath of the air will not only mark a major development in Radio engineering, but will also give concrete evidence of the optimism with which officials of the Crosley Radio Corporation view the economic horizon.

Some conception of the tremendous electrical energy the new Crosley transmitter will be capable of unleashing is to be gained from the fact that, according to Mr. Crosley, its power will be ten times greater than that of the present 50,000 watt WLW transmitter. Another signal strength increase of nearly fifty percent will come from the new 840-foot antenna structure.

Our front cover shows a partial view of Station WLW as it is at present. This fine broadcasting plant will soon be superseded by one of ten times its power.

As the result of thus extending the radius of WLW's signal, it is pointed out that the new Crosley equipment will provide for an area coverage of about twenty-five times that of the present transmitter and antenna equipment. Translated into terms of miles, WLW's reliable service area will be expanded to include a gigantic circle whose diameter is more than 5,000 miles. Mr. Crosley adds, however, that his station will have thousands of listeners beyond even these distant limits. With a good receiving set and in a good receiving location, a listener will be able to tune in WLW anywhere in the world, he predicts.

As viewed both by Mr. Crosley and by members of the Radio Commission the new transmitter, permit for which has been issued for experimental purposes, will serve as a practical laboratory for the scientific development of actual broadcasting in the heretofore unexplored field of extreme super-power. The full 500,000 watt power will be utilized experimentally for broadcasting between the hours of 1:00 to 6:00 A. M. E.S.T. It is estimated that from eight to nine months will be required to complete the construction of this transmitter.

Research and experimental work preliminary to the design of a practical broadcasting transmitter of 500,000 watt power have been in progress at WLW, under the direct supervision of Joseph A. Chambers, chief of the WLW Engineering Staff, for over a year. Little more than six months ago the results of this activity were submitted to the Radio Commission and that body was sufficiently impressed to authorize the Crosley concern to proceed with the construction of the transmitter. However, due to various intricate engineering problems still to be solved, the time limit placed on the completion of the development proved inadequate.

According to engineers, WLW's present cleared channel of 700 kilocycles is admirably suited for the use of high power. At this frequency fading is neither as severe nor as close to the station as at higher frequencies. Due to the ten-fold increase of its present power, WLW—with its new transmitter—is expected to "over-ride" all static, atmospheric noises and other interference and to provide Radio listeners with a quality of reception heretofore unattainable.

It has long been Mr. Crosley's contention that the only satisfactory method for eliminating static noises in Radio reception was to provide a broadcasting signal strength sufficiently powerful to "over-ride" these interferences. As the result of that conviction this pioneer in Radio has for ten years championed the cause

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RADIO-TRICIAN SERVICE SHEET
COMPILED SOLELY FOR STUDENTS & GRADUATES
REG. U.S. PAT. OFF.
CROSLEY MODEL 157

Model 157

1	G1-24995	ANTENNA COIL
2	G2-25968	INTERSTAGE COIL
3	G4-24996	OSCILLATOR COIL
4	G5-24065	FIRST I.F. TRANS.
5	G10-24065	SECOND I.F. TRANS.
6	C-26442B	TUNING CONDENSER
7	G3-25948	I.F. TUNING CONDENSERS
8	W-27203	0.02 MFD.
9	W-22180	1650 Ω
10	W-25857	.8 MFD.
11		.8 MFD.
12	W-25970	15,000 Ω
13		10,000 Ω
14	W-25937	275 Ω
15	W-22215	.3-MEGOHMS
16	W-21454	1-MEGOHM
17	W-21455	300,000 Ω
18	~~W-25452~~	~~TUNING UNIT MFD.~~
19	W-26559	0.006 MFD.
20	W-25666	LEVEL CONT. 3-MEG.
21	W-23013	2,000 Ω
22	W-21237	60,000 Ω
23	~~W-27203~~	~~0.02 MFD.~~
24	W-21455	300,000 Ω
25	W-22514	750 Ω
26	W-22873	220 Ω
27	W-25517	0.008 MFD.
28		0.05 MFD.
29	W-25594	TONE CONT. & SWITCH ASSY.
30	W-26118A	.8 MFD.
31		.8 MFD.
32	W-22221	2.5 V DIAL LIGHT
33	B-21491A	CORD & PLUG
34	LW-20264	ANT. GND. POST
35	27869	337-4 SPEAKER-8"
36	G24-26614	-58 SOCKET
37	G23-26614	-57 SOCKET
38	G18-26614	-56 SOCKET
39	G25-26614	-42 SOCKET
40	G6-26614	-80 SOCKET
41	G10-25669	POWER TRANS. 60CY.
42	G11-25669	POWER TRANS. 25CY.
43	G12-25669	POWER TRANS. 220V.
44	W-22417A	10 Ω - 10 Ω
45	27870	337-S SPEAKER-10"
46	W-27932	.0001 MFD.
47	W-27932	.0001 MFD.
48	W-25537	.03 MFD.
49		.001 MFD.
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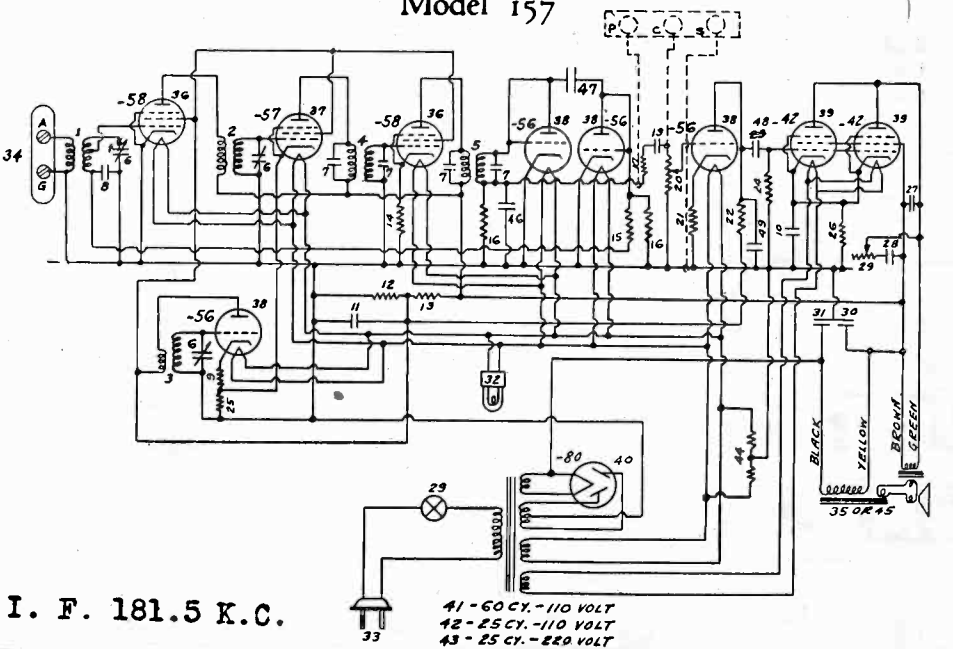


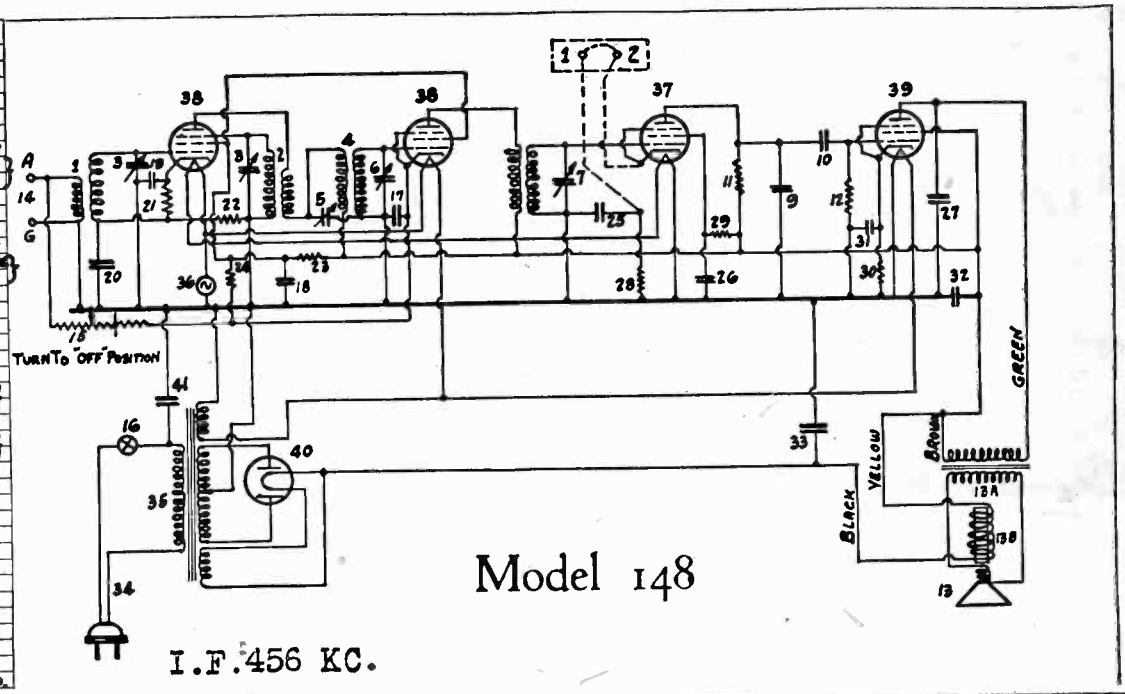
I. F. 181.5 K.C.

41 - 60 CY. - 110 VOLT
42 - 25 CY. - 110 VOLT
43 - 25 CY. - 220 VOLT

Tube	Position	Voltages Plate	Screen Grid	Supp. Grid	Bias	Fil.
-58	R. F. Amplifier	240	110	0	0	2.5
-57	1st Detector	240	110	0	6.0	2.5
-56	Oscillator	110			20.0	2.5
-58	I. F. Amplifier	240	110	0	2.8	2.5
-56	Detector	0				2.5
-56	AVC Rectifier	0				2.5
-56	A. F. Amplifier	40			2.0	2.5
-42	Parallel Output	250	260		17.5	6.3
-42	Parallel Output	250	260		17.5	6.3
-80	Rectifier	350				4.8

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

1	W-27474	ANTENNA COIL
2	W-27475	OSC. COIL
3	W-27425	4-56 VAR. COND.
4	W-24203-D	I.F. TRANS. COIL
5	W-25948	I.F. TRANS. COND.
6	W-25008-A	I.F. TUNING COND.
7	W-25008-A	I.F. TUNING COND.
8	W-25448	I.F. TRANSFORMER
9	W-25537	.0005 MFD. COND
10	W-25537	.03 MFD. COND
11	W-21456	500,000 Ω RESIS.
12	W-23798	500,000 Ω RESIS.
13	27610	SPEAKER
14	W-27644	5-9 TERM. BOARD
15	W-26573	5-53 VOLUME CONTROL
16	W-26573	SWITCH
17	W-25438	.1 MFD. COND.
18	W-25438	.1 MFD. COND.
19	W-25438	.1 MFD. COND.
20	W-25438	.1 MFD. COND.
21	W-25937	275 Ω RESIS.
22	W-26690	4500 Ω RESIS.
23	W-27120	8500 Ω RESIS.
24	W-27120	25000 Ω RESIS.
25	W-24784	.28 MFD. COND.
26	W-25517	.05 MFD. COND.
27	W-25517	.008 MFD. COND.
28	W-21463	40000 Ω RESIS.
29	W-26577	3 MEG. RESIS.
30	W-28907	750 Ω RESIS.
31	W-27488	8 MFD. COND.
32	W-27488	8 MFD. COND
33	W-23704-A	7 MFD. COND.
34	B-21491	CORD & PLUG
35	G11-23559	POWER TRANS.
36	W-4099A	DIAL LIGHT G.E.
37	G13-27456	'57 SOCKET
38	G14-27456	'58 SOCKET
39	G15-27456	'42 SOCKET
40	G6-25456	'80 SOCKET
41	W-27540	.0005 MFD. COND.



Tube	Position	Plate	Screen Grid	Voltages Supp. Grid	Bias	Fil.
-58	Osc. Detector	230	110	33	2.7*	2.5
-58	I. F. Amplifier	255	140	0	3.0	2.5
-57	Detector	180	40	0	5.8	2.5
-42	Output	240	255	0	17.0	7.0
-80	Rectifier	330				4.8

*Across 275 ohm resistor in cathode circuit.

QUERIES . . . . . AND ANSWERS ???

—Question: How do these Universal AC-DC sets work?

Answer: Recent advancement in tube and circuit design has made it possible to build small but capable universal receivers. These receivers will work on either 110 volt A.C. or D.C. sources.

Of fundamental importance is the introduction of low voltage high vacuum rectifier tubes. These rectifiers may deliver as much as 100 ma. output at 90 to 110 volts D.C. when the source is 120 volts (A.C. or D.C.). These rectifiers are of the cathode heater type and require a filament voltage of 25 volts. (Type 25Z5-R.C.A.)—filament current 0.3 ampere. (Many of these receivers use a 37 type tube as a rectifier. A large series filament resistor is needed.

Suppose a 25 volt filament pentode output (R.C.A. type 43), a 236 or 237 detector, and a 239 R.F. amplifier are used. A good R.F. or super can be designed. The total filament voltage will be $(25 + 25 + 3 \times 6.3) = 69$ volts, when connected in series. Then with a series 170 ohms resistor to produce a 51 volt drop will permit the filament of all four tubes to be operated directly from a 120 volt supply.

The rectifier connected as a half-wave rectifier may be directly connected to the supply without the aid of a transformer, and by use of a simple brute filter, filter the A.C. pulsating voltage in case of an A.C. supply or filter the commutation ripple for D.C. supplies. The D.C. output of this simple rectifier will be greater when connected to a D.C. power supply.

The rectifier will pass a unidirectional current when the receiver plug-in is connected with the proper polarity to the D.C. mains, and a rectified current when connected in any manner to the A.C. main. The filaments of the receiver tubes will operate independently on either A.C. or D.C.

Question: What is meant by "parasitic oscillations" in transmitters? How may they be overcome?

Answer: Parasitic oscillations are oscillations of lesser amplitude and usually of higher frequency than those intended by the transmitter circuit. They may occur in almost any of the transmitter circuits. They may be caused by undesired feedback or stray fields from the antenna or any of the transmitter stages, or from excessive grid excitation or excessive plate voltage. Where two R.F. grids are connected for parallel operation of tubes parasitic oscillations may arise due to uneven voltage distribution of the grid voltages with tube characteristic dissimilar. This may be prevented by using parasitic resistors or chokes. The latter are commonly used in plate circuits as well.

Adequate shielding of each stage will insure against parasitic oscillation due to external and stray pick-up and proper circuit design and adjustment, especially proper neutralization will insure against the production of parasitic effects within the circuit. Proper bias values and moderate grid excitation and plate voltage values should be used to protect against parasitic effects.

Question: In a Zenith 35 receiver I can only get an A.C. hum from the speaker, all voltages and currents test O.K. With an ohmmeter I get zero resistance between the grid of the second audio tube and the chassis. Should I replace this audio transformer as being shorted?

Answer: The trouble may not be in the transformer. Remove the R.F. coil shields which are mounted directly under the tubes. There are slots in these shields so the wires from the tube socket terminals may get to their circuits. Possibly the shields were put on carelessly and some of the wires were

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SUCCESS STORIES

In the December-January issue National Radio News asked for success stories of students and graduates. Quite a number have been received by your Editor and have been carefully read. For this issue of National Radio News we have accepted two letters. They go into detail on points which may be of value to other N.R.I. men. The writers of each of the letters below have received our check for $1 in appreciation.

SUCCESS STORY NUMBER 1

When I started to do Radio work I was unable to advertise in the newspapers on account of low finances so I set about doing my own advertising.

I asked a local newspaper if they would give me a free ad in each edition if I would run a "question-answer" box for them. My ad appeared in the next issue. It gave me plenty of good publicity.

Then I joined a lodge. I placed one of my cards on the lodge bulletin board to show the members there was a Radio-Trician in their midst. The first week of this plan netted me more than $6 in profits. Getting on various committees in the lodge gives me a lot more publicity.

House to house soliciting has always been one of my methods. I purchased a Hectograph for $2 and with it I made my own circulars. I then used these circulars in my house to house work.

I have another plan which I will shortly put into use. I intend to purchase a receiver and by connecting a slot machine to it I will have it making money for me. It will be placed in the lodge of which I am a member. Arrangements will also be made to sell these sets to public buildings or to rent them, giving a percentage of the income.

I hope these ideas will be of benefit to my brother students and graduates of N.R.I.

Herbert J. Stadler,
6 Blaser Court,
Lawrence, Mass.

SUCCESS STORY NUMBER 2

As soon as I graduated from N.R.I. in 1931 I started a Service Radio business of my own, opening my shop in a garage. I had only a set analyzer, a soldering iron, and a few small tools.

I erected three signs, one out front next to the street—one on the lawn and the other one right next to the garage. I ran a few ads in the local paper and business started. It's been growing every day.

I have just taken an accounting of the business I did and the money I made from September 10, 1931, to November 15, 1932—just a little over a year.

I service a lot of sets in the country—and I charge $2.50 per trip when the call is not over five miles. The income on this was $1080. I serviced 2646 sets in the city of Flint at $1 per call and 728 sets in the shop at $2.50 per set. My total income from servicing was $5546. Taking into consideration that I made a profit of $3195.58 on parts you will see that I collected $8741.58. In addition to that I installed 47 automobile sets, for which I have the agency which adds another $1000 approximately, a grand total of over $9700. Not bad for the times we have been passing through.

Business is getting better all the time for me and I consider that all of my success may be attributed to the following:

1. I guarantee my work.
2. I am honest in all my dealings.
3. I am prompt in all my service calls and I do not keep a customer waiting too long for his set when I take it to the shop.
4. I do the job thoroughly—I don't fix one trouble and then stop. I test thoroughly to make sure everything is okay.
5. I am frank and I don't make promises I cannot fulfill.
6. I don't overcharge.
7. I convince the customer that I know what I am doing. I invite him to my shop and get him to come in to see me whenever possible. It is good advertising.
8. I took my Course from N.R.I. Without it I would be hunting for a job.

FORD R. LEARY,
1633 Davison Road,
Flint, Michigan.

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National Radio News wants more success stories. We will pay $1 for each success story published. Send in your story right away to the "Success Editor." A few minutes' time may be worth $1 to you.

WLW TO HAVE 500 K. W. POWER

(Continued from page 6)

of increased power. The soundness of Mr. Crosley's theory has been substantiated in the steady trend towards increased power during the past several years.

The Crosley pioneering activities in the use of increasingly greater power has covered the entire range from the original 20-watt transmitter, located in Mr. Crosley's home in 1922, through increases to 50 watts, 500 watts, the pioneer remotely controlled 5000 watt transmitter located at Harrison, the first 50,000 watt broadcasting transmitter in the world, the present WLW located at Mason, Ohio. And now the logical step for this pioneer organization is the new 500,000 watt equipment.

"The early belief that an increase in power causes interference with other broadcasting stations has been definitely disproved over the period of years and the many power increases of WLW", Mr. Crosley said, adding the assurance that "listeners may expect a definite all round improvement in service without any sacrifice in any way."

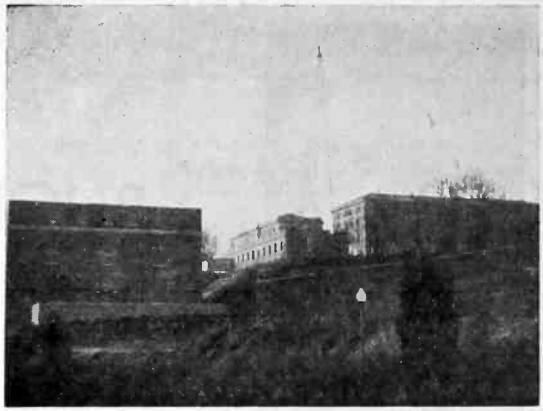
As a manufacturer of Radio receiving equipment, Mr. Crosley has always felt an obligation to provide satisfactory programs to people living in areas remote from local broadcasting stations and has always believed that there should be two types of broadcasting stations—first, those covering a local area; second, one or more powerful enough to deliver satisfactory signal strength to places remote from local broadcasting stations and dependent entirely on these high-powered clear channel, static over-riding stations.

SPECIAL

Currency should never be sent through the mails unless it is registered. It can easily be lost and we have no way to trace it.

It is a simple matter to register a letter or to send a Post Office Money Order and the cost is slight when the protection is considered.

The Institute and the Alumni Association **cannot be responsible for money lost in the mails.** Protect your money. Send it by Post Office Money Order, check or register your letter.



A partial view of the United States Bureau of Standards, Washington, D. C. The picture, obtained by the staff photographer of National Radio News, shows this very important group of government buildings situated on a hill overlooking the exclusive Connecticut Avenue residential section. It is here that a great deal of valuable Radio research work is done for every branch of the Industry.

(Continued from page 10)

SUCCESS STORY NUMBER 3

I started repairing Radios after I finished the first few lessons of the course. Within a few weeks my friends started asking me questions about Radios and how I got my quick start. I was encouraged by their questions, such as "how do you find the trouble so quickly and easily?" Of course the answer was simple. From the very first I had followed the lessons closely—to get everything out of them.

Within a few months my business was very good and in spite of hard times I have had plenty of work. I have a friend in Chattanooga who has been in the Radio service business for several years and I have, on several occasions, been of service to him in locating trouble on Radio jobs. Needless to say, that he has great respect for my N.R.I. training.

It has not been necessary for me to do much advertising to get business. In fact, about all that I have done was distribute a few business cards. I have been able to do such good work for my friends and acquaintances—that they recommend me to their friends and I get new customers in that way.

As an adjunct to my service business I have obtained the franchise for a Philco agency here in my city. Needless to say, that is a real money maker for me, too.

JOHN W. CLIFT,
Box 41, Soddy, Tenn.

THE SERVICE FORUM

It is practically impossible for any man to consistently read the SERVICE FORUM without learning something. The SERVICE FORUM does not deal with "unusual" cases, but with things which happen frequently in servicing and which are therefore of most value to a Service man. Information in the SERVICE FORUM is the result of practical experience in servicing receivers in the field and in the laboratory.

This is your page. Contribute to it whenever you have something worthwhile to offer. Address articles to "THE SERVICE FORUM, National Radio News, 1536 U Street, N. W., Washington, D. C." Do not send material in with any other type of communication.

Atwater Kent 55 and 55C, Crackling Noise

Fading in the Atwater Kent models 55 and 55C when accompanied by a crackling noise is generally due to a defect in some of the carbon resistors. The detector coupling resistor, the second A.F. bias resistor No. 1, and the second A.F. bias resistor No. 2 are the ones to replace. The detector coupling resistor is black and has a value of 50,000 ohms. The second A.F. bias No. 2 is yellow and has a value of 7,500 ohms, while the second A. F. bias No. 1 is maroon and has a value of 10,000 ohms. Each of the three should have a rating of 1 watt or better.

While the case is off the bottom of the set it is well to gently pull on the various wires. Sometimes a wire becomes loose and might cause noises. Resolder any which seem loose. It is well to play the set for an hour or more in the shop after it is fixed to make sure the job has been done properly—J. R. BROWN, Tampa, Florida.

RCA Victor R35, Fading

In the RCA-Victor R35, fading and then no reception is often caused by an open in the 1.5 megohm screen resistor in the detector stage. Very faint signals may be heard. The resistor has a white body with a red end. If this resistor is open you won't be able to measure any screen voltage on the detector tube. If you have low resistance meters watch out, because if the resistor is good the reading you get may be low enough to fool you. Check the continuity of the resistor with a voltmeter and a battery. A 45-volt battery will do.

J. B. STRAUGHN,
N. R. I. Consultant.

RCA 44 and 46, Fading

Fading on an R.C.A. 46 or 44 may be caused by the speaker blocking condenser opening up. The remedy is to replace it with a new one. The old unit is located at one end of the condenser block in the power supply unit. The new one should have a value of one mfd. and should have a voltage rating of 600 volts D.C. This last is important if repeat calls are to be avoided.

The new condenser may be located outside the power supply unit by running wires through the hole in the front of the unit. Use rubber covered wire. It is also wise to replace the screen grid by-pass condensers under the receiver chassis. There are three of these condensers located in three separate containers which also contain the plate and cathode bypass. The plate and cathode condensers in each case may be left alone—just cutting off the leads to the screen condensers and substituting uncased ones in thin places.

Condensers having a value of .1 mfd. or more will do. They should be rated at 300 volts D.C. Be sure to tape all connections so they won't short. D. B. LOONEY,
N. R. I. Consultant.

Philco 65, No Plate Voltage

Lack of plate voltage and current on one of the 45 type tubes in a Philco model 65 is not necessarily due to an open in the primary of the output transformer. A poor contact in the speaker plug will cause this difficulty. The bottom of the chassis must be removed and the contacts on the socket part of the plug bent so good contact will be assured when the speaker plug is inserted.

GRADUATE D. R. CONROY,
Austin, Texas.

Window Displays Operated By Photoelectric Relays

(Continued from page 13)

G. M. Foto-Switch No. 125-LL

This is a complete Photoelectric Relay which contains not only the photoelectric cell and amplifier but the light source as well. A standard 6 volt automobile head light lamp takes its voltage supply from a special winding on a transformer, this lamp is mounted in an adjustable socket so that it can be moved forward or backward, up or down, or rotated, to obtain the proper focus position behind the upper lens. The light from this lens is focused on a mirror located at any distance up to twenty feet from the Foto-Switch and from this mirror is reflected into a large 3-inch lens in the lower half of the unit. This lens acts as a light collector and focusses all the light available from the 3-inch aperture on the photoelectric cell which is mounted directly behind it.

Alden Products Catalogue

We have just had an opportunity to read a copy of the 1933 edition of the "Adapter and Analyzer Equipment Catalogue of the Alden Products Co." Copies may be obtained by sending 10 cents to the Alden Company at 715 Center St., Brockton, Mass.

QUERIES and ANSWERS

(Continued from page 9)

pinched between the chassis and shield. If this happened to the grid wire, the secondary of the audio transformer in question would be shorted.

To test the transformer, disconnect it from the circuit—if there is an internal short, replace it with a new one. When shields of this type are used, it is always well to look for cut and shorted wires.

Question: Is it possible to use new tubes in old receivers? I am especially interested in adding an extra tube to act as an automatic volume control.

Answer: It is the general feeling with most servicemen that a Radio receiver is a very flexible device and that they can quickly change from old to new tubes, add automatic volume control, noise suppression, add another R.F. stage to get more pick-up, and the like. I feel sure that many a receiver designer would revolt at the attempts made to improve a machine which took him months to design. We usually hear about the wonderful things a 58 tube will do and immediately say let's change the '24's in our set to 58. But the story is that you get the wonderful results from the 58 tubes because you have designed the R.F. circuits to take advantage of their remarkable characteristics.

The same conditions apply to automatic volume control. When the designer decides to build in A.V.C. he immediately realizes that he must have more R.F. gain. If the machine is completed and you add A.V.C. you must sacrifice sensitivity and volume. Then, too, if the A.V.C. system is to be successful, you must use variable mu tubes ('35, '51 and 58). You must have room for an additional tube, and you need more supply voltage. Of course you may change to the diode or duo-diode-triode detector. In this case you actually lose sensitivity and selectivity even before A.V.C. is applied and for this reason it is not advisable to add the A.V.C.

National Radio News wishes to thank those students and graduates who have written their appreciation of the "Queries and Answers" Department.

ELECTRONICS IN GRAVITY STUDIES --- continued from page 3

corrections) on any of several bands. These time impulses are then amplified and recorded on the Drum chronograph opposite the pendulum beats. It is then possible to pick any even pendulum beat and with a mechanical scaling device find the time at which it occurs to the nearest thousandth of a second or better. If the same thing is done ten hours later it is then possible to get the actual time over which a certain number of beats occurred and thus the period. In actual practice it is not necessary or practical to count thirty or forty thousand beats, nor are the instruments kept working except at frequent intervals for we have a mathematical method of keeping track of every single beat.

Most of the electrical equipment is permanently mounted in a truck. The pendulum case must be firmly mounted on a concrete or plaster base in the ground or pier of some sort. The photocell and pre-amplifier is of course in the case, and a short cable takes the impulses over to the truck for amplification and recording.

This is a brief but incomplete description of our apparatus and method. Lieutenant Brown was transferred to other work, so Lieutenant Hoskinson and myself have been engaged on the actual field work and tests. We have made a number of gravity observations in the Appalachian Mountains from Pennsylvania to Alabama (several profiles) and more recently a large number of the Black Hills of South Dakota out to and across the Bighorn Mountains of Wyoming. The purpose of our selection of stations was two fold—viz: to set up over many known formations, and also over a certain amount of unknown or suspected formations. Some very interesting anomolies were observed, and our results undoubtedly contain definite and important data. This work has been carried out in cooperation with Princeton University and the National Research Council.

I might mention some of the circuits and difficulties we have yet to overcome. In this kind of work it is necessary to limit the response of all elements to micro-seconds. We found that a wire across the PE cell was slightly superior in response to a slit opening, due to the different rates of the beam, but we are still trying to improve this. Such is the accuracy that we suspect that even the time differential of various wave propogations causes error when we are at great distance from the sending station. That is, the heaviside layer probably reflects various frequencies over paths varying appreciably in length, where an earthly distance of a thousand miles or more must be taken into effect.

We are using a commercial PE cell unit, but this gives considerable trouble, and I am at present rebuilding it in an improved but conventional design. And of course in tropical countries, the moisture and beat raise havoc with socket insulations and all kinds of transformer connections. Some time we are going to get a cathode ray outfit to put into the output of the photocell and satisfy ourselves as to the relative response of the cell. None is available at present.

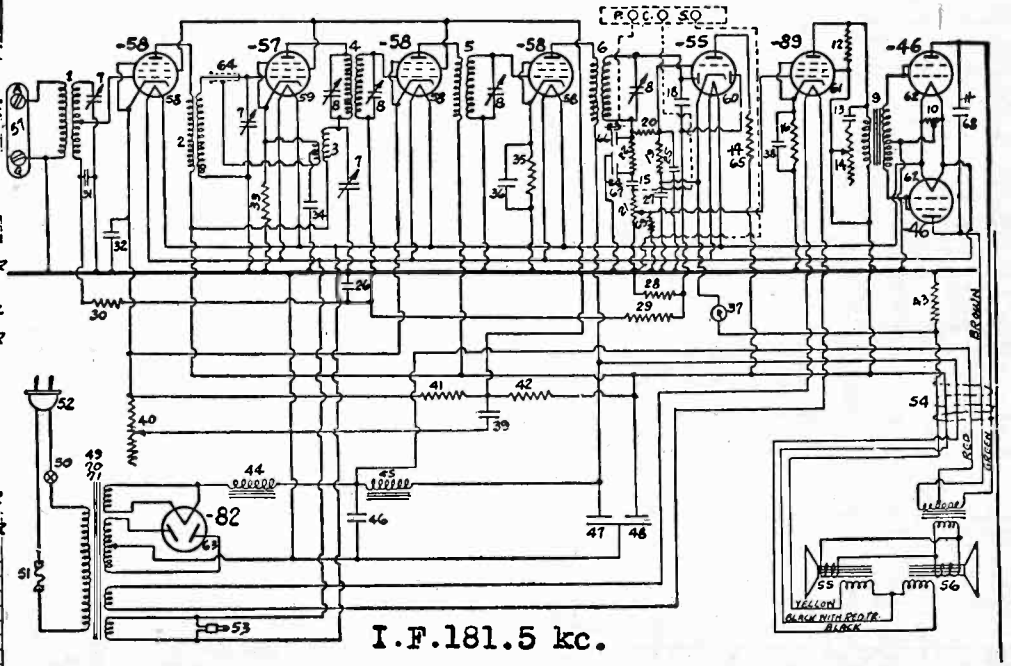
We use thyratron tubes in our relay circuits, since they draw a heavy enough current to drive the sensitive pen relays when the signal is applied to the grid, and their response in micro-seconds is very good. However, they are hard to work in all weather, and I think I can eventually design an amplifier incorporating a final class B stage which will be enough to drive the relay direct, and eliminate the uncertainty of the thyratrons.

We measure the flexure with a parallel plate interferometer at each station. A thermograph plus hourly inner case temperature readings help us keep control on the invar pendulum expansion and consequent correction. There is a correction for pressure, and the damping of the arc (which is never greater than ten mm. at the start and damps to about one or two mm. in ten to twelve hours). It is necessary to know the latitude, elevation and topographical features at each station, and we take this information when not supplied us.

With the Brown Gravity instruments it is possible to average about four stations a week if they are not too far apart, and it is possible to make one station per day where Radio reception is good. There is only one of these instruments in our possession, and so far no one has ever been able to duplicate the agate knife edge and plane used to support the pendulums regardless of price.

We are at present preparing to leave for Cuba, where we will make gravity observations on an International gravity expedition in cooperation with several interested parties.

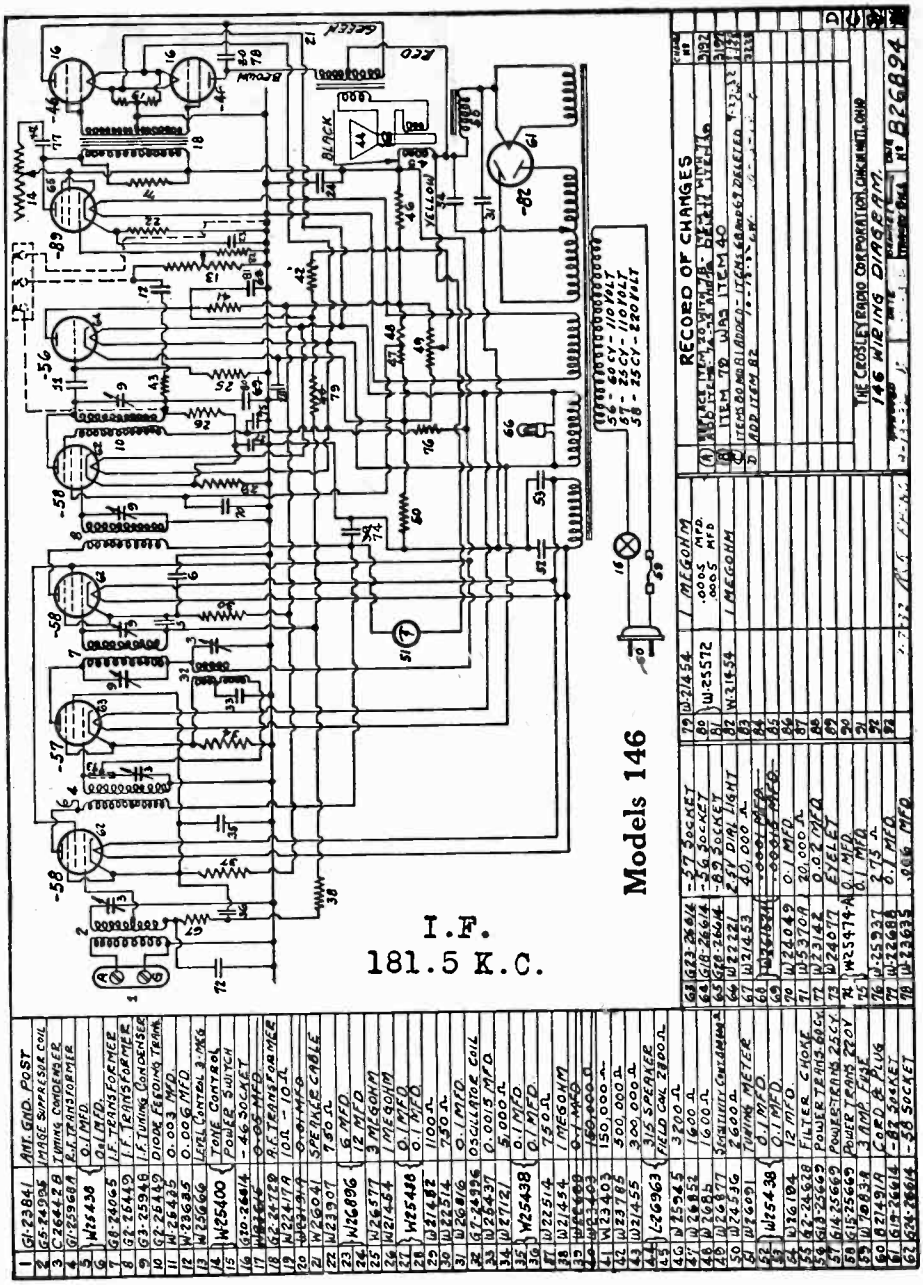
The author of this article, Graduate H. E. McConnell, of the U. S. Coast and Geodetic Survey, is now in Cuba on another expedition. He is a member of the N. R. I. Alumni Association.—Editor.



1	GS-24985	ANTENNA COIL
2	G1-25946	R.F. INTERSTAGE COIL
3	G1-24996	OSCILLATOR COIL
4	G8-24065	1ST I.F. TRANSFORMER
5	G2-25449	2ND I.F. TRANSFORMER
6	G2-25449	3RD I.F. TRANSFORMER
7	C-26442B	VARIABLE CONDENSER
8	G3-25348	I.F. TUNING CONDENSER
9	G2-24729	A.F. TRANSFORMER
10	W-22417A	10-10 Ω FIL. POTEN.
11	W-23191	.01 MFD. CONDENSER
12	W-22196	20,000 Ω RESISTOR
13	W-23615	.05 MFD. CONDENSER
14	W-25594	80,000 Ω TONE CONTROL
15	W-23635	.006 MFD. CONDENSER
16	W-23907	750 Ω RESISTOR
17	W-25540	15,000 Ω RESISTOR
18	W-25435	.003 MFD. CONDENSER
19	W-23403	150,000 Ω RESISTOR
20	W-21454	1 MEGOHM RESISTOR
21	W-25666A	3-MEGOHM LEVEL CONTROL
22	W-21455	300,000 Ω RESISTOR
23	W-25538	.0015 MFD. CONDENSER
24		.0015 MFD. CONDENSER
25	W-25438	.1 MFD. CONDENSER
26		.1 MFD. CONDENSER
27	W-23142	.02 MFD. CONDENSER
28	W-21454	1-MEGOHM RESISTOR
29	W-21454	1-MEGOHM RESISTOR
30	W-21454	1-MEGOHM RESISTOR
31	W-25438	.1 MFD. CONDENSER
32		.1 MFD. CONDENSER
33	W-27121	5000 Ω RESISTOR
34	W-25437	.0015 MFD. CONDENSER
35	W-22514	750 Ω RESISTOR
36	W-23142	.02 MFD. CONDENSER
37	W-26091	TUNING METER
38	W-25857A	8 MFD. CONDENSER
39		8 MFD. CONDENSER
40	W-25578	4500 Ω SEN. CONTROL
41	W-27120	25,000 Ω RESISTOR
42		8500 Ω RESISTOR
43	W-25945	3200 Ω RESISTOR
44	G2-24628	1ST. FILTER CHOKE
45	LW-23213	2ND. FILTER CHOKE
46	W-26194	12 MFD. CONDENSER
47	W-25542	8 MFD. CONDENSER
48		4 MFD. CONDENSER
49	G13-25669	60~ POWER TRANS.
50	PART OF W-25594	POWER SWITCH
51	W-7983A	3 AMP. FUSE
52	B-21491A	CORD & PLUG
53	W-22221	2.5 V. DIAL LAMP
54	W-26600	SPEAKER CABLE
55	L-26109	SPS-4 SPEAKER 5500 Ω FIELD
56	L-26999	SPT-4 SPEAKER 650 Ω FIELD
57	G1-23841	ANT.-GND. STRIP
58	G24-26614	-58 SOCKET
59	G24-26614	-57 SOCKET
60	G29-26614	-55 SOCKET
61	G28-26614	-89 SOCKET
62	G20-26614	-46 SOCKET
63	G19-26614	-82 SOCKET
64	W-24077	EYELET CONDENSER
65	W-4921	10,000 Ω RESISTOR
66	W-26152A	.0001 MFD. CONDENSER,
67		.0015 MFD. CONDENSER
68	W-23635	.006 MFD. CONDENSER
69	W-21454	1-MEGOHM RESISTOR
70	G14-25469	28~ POWER TRANS.
71	G18-25662	220 V. POWER TRANS.
72		
73		
74		
75		
76		
77		
78		

Model 146-1

Tube	Position	Voltages Plate	Grid Screen	Grid Supp.	Bias	FH.
-58	R. F. Amplifier	310	130	0	4.5	2.5
-57	Osc. Detector	290	130	0	6.0	2.5
-58	1st I. F. Amplifier	310	130	0	4.5	2.5
-58	2nd I. F. Amp.	310	130	0	6.0	2.5
-56	Diode Detector and A. V. C.	80				2.0
-89	A. F. Amplifier	250	255		28.0	6.0
-46	Class B Output	355			0	2.5
-46	Class B Output	365			0	2.5
-82	Rectifier	380				2.5



Model 146

Tube	Position	Plate	Screen Grid	Voltages Supp. Grid	Bias	Fil.
-58	R. F. Amplifier	195	62	0	2.5*	2.5
-57	Osc. Detector	195	132	0	9.0	2.5
-58	1st I. F. Amplifier	200	62	0	2.0*	2.5
-58	2nd I. F. Amp. and Diode	0	105	200	5.0	2.5
-56	A. V. C.	60			70.0	2.5
-89	A. F. Amplifier	180	200	0	20.0	6.0
-46	Class B Output	350			0	2.5
-46	Class B Output	350			0	2.5
-82	Rectifier	380				2.5

* Measured across cathode resistors of each tube.

N.R.I. ALUMNI News

A Message from the Alumni Association's New President

President K. W. Griffith
Little Rock, Ark.

I wish to thank my fellow members of the N. R. I. Alumni Association for electing me President of this organization. I wish to thank them for their expression of confidence and esteem and I enter into the new duties with the knowledge that it is a privilege to serve them and at the same time with a knowledge of the obligation placed upon me.

While a student of the National Radio Institute it was my constant aim and desire to reflect a spirit of progressiveness and optimism that refused to give place to discouragement; to complete a worthy project, and to conduct myself in such a way as to be a credit to the Institute and an inspiration to those who were contemplating the same course. How well this has been accomplished remains for others to say.

As a graduate, all of this spirit still prevails. With the diploma came no trace of severance of an established mutual cooperation that had its firm rooting in the soil of those months of study incident to the accomplishment of the task and goal.

As a graduate I have never thought I was "through;" that from then on I could recline in sluggish inactivity and allow the world to

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Alumni Members Organize Locally

Buffalo, Cleveland, Pittsburgh Members Granted Charters

P. J. Murray
Executive Secretary

Again we're first!

The graduates of N. R. I. were the first group to organize an Alumni Association of a home study school. Now they go ahead again—as the first to organize local chapters of such an organization.

We promised our members that big things would be afoot during this year and we let no grass grow under our feet. At the request of hundreds of our members, we, at National Headquarters of the Association, decided to give the Local Chapter plan a trial.

In the early part of January, I had the pleasure of visiting our Alumni members in Buffalo, N. Y., Cleveland, Ohio, and Pittsburgh, Pa., and assisting in the organizing of the three Locals. These Locals have each been issued an official Charter by National Headquarters.

They are making arrangements for local meeting places, where they can get together at regular intervals—discuss Radio and Business problems—maintain Radio Libraries of their own—and operate for their mutual advantage and pleasure. Each chapter will have

(Page 21, please)

A Message From The Alumni Association's President

(Continued from page 19)

bring its laurels to my feet on a silver platter. On the contrary, I felt that a "plow, to be bright, must turn the soil."

And now my Alumni brothers bring me a totally new enterprise. In contemplation thereof I can see no reason to formulate any new ideas of fundamental principle, but feel that the same spirit that has seen me through the successive stages of entrant, student, graduate and alumnus, shall continue to serve in this new connection with which you have honored me.

And so, I stand ready, not with folded hands, but with up-rolled sleeves and outstretched arms—awaiting an opportunity to embrace any duty—any opportunity to be of service to any and all with whom I am privileged to be associated.

I now address myself to the pleasant task of trying to be of service and pledge to this association an adherence to a constructive program as suggested by those who have with wisdom led me thus far, and a dauntless spirit of progressiveness. I take over this new job with no misgivings, as I know I have the loyal counsel of all my fellows.

This is **our job—not mine.**

There are 728,623 farms in Canada, and 16 out of every hundred has a radio.

In the larger cities:

	Per 1,000 population
Montreal	86
Toronto	145
Winnipeg	87
Vancouver	117
Hamilton	144
Ottawa	101
Calgary	94
Victoria	130
Moose Jaw	100
Edmonton	71
Regina	91
Saskatoon	83
Brandon	92
St. Boniface	71
Portage la Prairie	65

Taking both rural and urban settlements into consideration, Prince Edward Island has 74.32 radios per 1,000 population; Nova Scotia has 50.1; New Brunswick, 38.6; Quebec, 52.4; Ontario, 106.2; Manitoba, 64.6; Saskatchewan, 60; Alberta, 60.6; British Columbia, 95.2, and the Yukon, 16.5.

It is with deep regret that the Alumni Association of the National Radio Institute learns of the death of one of its valued members, Mr. J. Speyer, of Cicero, Illinois.

With extreme sorrow we bring our readers news of the death of Graduate Herman Woods, who passed away October 30, 1932. Graduate Woods, who was 25 years of age, was a resident of Zanesville, Ohio. He started his N. R. I. training back in October, 1926.

On December 3, 1932, Alumni Member Edwin M. Wright, of 925 Kingston Road, Toronto, Ontario, Canada, died at Toronto General Hospital. We extend our sympathy to the family of our deceased Alumni Brother.

N. R. I. has lost a good student in Albert A. Haas, Jr., who was instantly killed in an automobile accident in Thomaston, Georgia. We wish to extend our thanks to his mother for the fine letter she has written us.

Atlas Resistors

A complete line of Wire Wound Resistors has been placed on the market by the Atlas Resistor Company, of 423 Broome Street, New York City.

The Resistance wire is wound on special process porcelain tubes and is of the finest grade enameled nichrome. The range of resistances available are from 50 ohms to 100,000 ohms, and varies from the small 2-watt sizes to the large 100-watt units. Special sizes can be made up on application.

The 1933 catalogue is now available and will be sent upon request. Address the Atlas Resistor Company, 423 Broome Street, New York City.

ALUMNI MEMBERS ORGANIZE LOCALLY

(Continued from page 19)

ts own local officers, who will cooperate with National Headquarters.

It will be the policy of each Chapter to arry out the plan of the National Associaion and to promote better Radio Ethics in he locality.

The activities of these three Locals will be vatched closely by the officers of the Alumni Association. No new charters will be issued ntil we are absolutely certain of the benefits he members will derive. We have little doubt, owever, as to the outcome, because the move has the enthusiastic support of the members, and that's what it takes to make successful organizations.

On this page we are reproducing a photograph of the Buffalo, New York Chapter, the first to be issued under our "Local" plan. Names of the Alumni who are members of the Buffalo Chapter are given on page 22. The Cleveland and Pittsburgh membership will be printed in a future issue. Names of new "Local" members will also be printed as they become available. Any Buffalo graduates who are not yet members of their Local should get in touch with the Buffalo Local Chairman,

Granted by National Headquarters of

THE NATIONAL RADIO INSTITUTE ALUMNI ASSOCIATION

at Washington, District of Columbia, to its Local Chapter in

Buffalo, New York

Subject to the Constitution and By-laws of the Association and the Regulations for Local Chapters, and valid for one year from date of issuance.

Given under our hand this Seventeenth day of January in the year Nineteen Hundred Thirty Three

PRESIDENT

EXECUTIVE SECRETARY

(Page 22, please)

Alumni Members Organize Locally

(Continued from page 21)

Mr. T. J. Telaak, 657-659 Broadway, Buffalo, New York. Buffalo membership is available to all graduates in the City of Buffalo, all of Erie County, New York, and Niagara Falls, New York.

The following is a list of the members of the Buffalo, New York, Local:

T. J. Telaak	Charles T. Barr
H. Bernardino	Geo. W. Clohessy
J. G. Ernst	Claude W. Fay
Geo. Gavey, Jr.	Geo. Haunfelder
John E. Kreitner	Albert E. Lillie
F. H. Perau	John T. Pollard
A. Schumacher	H. W. Wagner
L. M. Weber	Howard Ward
Fred L. Cutler	Edgar Ray

Thos. R. Collins

Wego Fulltime Condensers

Wego Condensers, Inc., of 729 Seventh Ave., New York City, has available a complete line of high grade paper dielectric condensers.

The condensers are available in a complete range of capacities and sizes from 200 volts to the large 7,000 volt transmitting condensers. Very attractive prices, which will be welcomed by all classes of radio men, characterize the line.

The Wego line of condensers was first introduced twenty years ago, back in 1913, and the factory has been specializing in condensers alone since then. The new catalogue No. 26 will be gladly mailed upon request to Wego.

As we go to press we've just received a late flash from Buffalo. Ted Telaak, Chairman of the Buffalo Local, reports a very successful meeting of his Chapter, and four new members. We'll have their names later.

NATIONAL RADIO NEWS

Vol. 5—No. 7 Apr.-May, 1933

Published bi-monthly in the interest of the students and Alumni Association of the

NATIONAL RADIO INSTITUTE
Washington, D. C.

The Official Organ of the N. R. I. Alumni Association

P. J. Murray, Washington, D. C., Managing Editor
Thos. A. Deschantz, Pittsburgh, Pa., Associate Editor
T. E. Telaak, Buffalo, N. Y., Associate Editor

INDEX

More About The Sonora D-50

I want to call attention to an item appearing in the bruary-March issue of National Radio News by Mr. fred Orchard, of Toronto. I was employed by the nora Company and have had considerable experience th this model. Most service men have a hard time operly correcting the condition of distortion in e D-50.

You will note from the article that the grid bias sistor was found to be open. In the D-50 the detor is resistance coupled to the pentode. The pende grid bias is obtained by connecting a six megohm nd a 750,000-ohm resistor in series across the speaker eld. The grid of the pentode is connected to the unction of the above mentioned resistance through a ne-half megohm resistor. All these resistors are of o high a value to be checked on the ordinary continuity tester.

The real trouble in this set is a high resistance leak the coupling condenser. In some cases this resistance approaches one megohm and it is difficult to heck. However, the effect is to apply a positive bias o the pentode grid and this naturally produces disortion. Many service men replace resistors and apparently "fix" the set, but as soon as the condenser ecomes sufficiently leaky to swing the pentode grid ositive the trouble appears again.

The easiest way for a service man to check for a lefective coupling condenser is to check the plate urrent in the pentode. If this is more than 20 mils. he coupling condenser should be replaced temporarily with one that is known to be good. If this corrects he trouble it should be permanently connected in he circuit.

It is usually unwise to replace what is considered a lefective resistor with one of a different value. The manufacturer usually knows what value should be used. Please don't get the idea that I am trying to belittle a fellow member of N. R. I. This is not my idea—it is just to pass along some more information on the subject.

L. S. Goodspeed, Toronto, Ont., Canada.

A TIP

I've found an effective remedy for Radio-frequency sets which have trouble with the shorter waves (1200-1500 kc.) Erecting a net antenna of four wires less than 25 feet in length, instead of a long single wire helps a lot.

RALPH YOCKEY,
Norwood, Ohio.

More Ham Stations

The following N. R. I. students and graduates report ownership of Amateur Stations:

VE4LM—Wm. Marsh, Drumheller, Alta., Canada.
W8DJT—John J. Werbinski, Birmingham, Mich.
VE4KX—Harry L. Eddy, Winnipeg, Man., Canada.
W8ENH—Clem E. Wolford, Dayton, Ohio.
W8FOZ—Ernest R. Baldwin, Port Huron, Mich.
W9IBC and W9KBK (Portable)—D. L. Warner, Harvey, Ill.
W9EZK—A. J. Murden, Riverdale, Ill.
W9DEG—M. McGlothlen, Stockport, Iowa.
W8HYE—John J. Pernal, Beaver Falls, Pa.
W9JVM—Charlie Siever, Cassoday, Kans.
W3BRZ—Elmer K. Denlinger, Lancaster, Pa.
ZL4BV—J. R. McConnell, Dunedin, N. Z.
W7BOD and W7AOY—Frank Bloss, Portland, Oreg.
W7BYX—Vernon R. Anderson, Kalispell, Mont.
W3CDG—H. Enniss Royer, Westminster, Md.
W5CAY—James E. Thompson, Fort Smith, Ark.
W9LAF—Milan Rafajko, Norwood Park, Ill.
W9KX—M. J. Reeff, Alton, Iowa.
W4ZX—J. R. Ramsey, Montgomery, Ala.
W9FGS—Eugene H. Heitkotter, Deshler, Nebr.
W8IAE—Stanley A. Jensen, Belding, Mich.
W9IZY—Arthur C. Harris, Kenosha, Wis.

Anyone Else Have Anything To Say About This?

Dear Mailbag Editor: Why not cut out the Mailbag and give the space to something more important. I think the quality of the material put in the Mailbag is very poor—compared with the rest of National Radio News.

Student H. S., of Columbus.

We'd like to hear from someone else on this subject. Address replies to "Mailbag Editor, National Radio News, 1536 You St. N. W., Washington, D. C."

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2. HAMMARLUND 1933 PARTS CATALOG. 8 pages. Variable and adjustable condensers, sockets, coils, intermediate frequency transformers, chokes, etc., for broadcast and short wave work.

4. HAMMARLUND-ROBERTS 15 TO 200 METER COMET "PRO" SUPERHETRODYNE. Details of a receiver designed especially for laboratory, newspaper, police, airport and steamship use.

5. ELECTRAD 1933 CATALOG. 14 pages. Standard and replacement volume controls, Truvolt adjustable resistors, vitreous enamel fixed resistors, voltage dividers, public address systems, etc.

6. AMPERITE REAL LINE VOLTAGE CONTROL. Characteristics, uses and chart showing correct Amperite recommended by set manufacturers for their sets. Tells how to improve customers' sets and make a profit besides.

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- ☐ Laboratory Technician
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40. I. R. C. RESISTANCE INDICATOR. This folder contains a complete description of a small, handy instrument designed by the International Resistance Co. to enable service men and other radio men to determine the exact resistance value of a defective resistor without the use of meters, wiring diagrams or specifications of the receiver circuit.

41. HOW TO BUILD THE ECONOMY "EIGHT." A folder prepared by the Wholesale Radio Service Co. which gives complete data on how to build this efficient 8-tube receiver from a kit costing only $13.75. These receivers can be built and sold in spare time at a profit.

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