



Army Air pilots making tests with plane equipped with Kruesi Radio Direction Finder. Device permits pilot lost in fog to tune in any Radio station, regardless of the program, and direct himself to that point. The inventor, G. G. Kruesi, of Transcontinental-Western Air Inc., is shown at bottom of picture.

TEAR OFF AND MAIL

Will You Spend Two Minutes To Help Your Friends?

Be a real friend. Share your good habits with others. Give us the chance to point out to them what N. R. I. is doing for you—for ambitious men everywhere; how it is raising incomes by fitting men and young men for good jobs in Radio. List a few names and addresses below, of people interested in Radio, or who are dissatisfied with their present jobs. Your name will not be mentioned when writing to them.

Each man whose name and address you list will receive a free copy of National Radio News. And if the names have not already been received from some other source, you'll receive a \$5.00 commission for each one who enrolls.

Your Name _____

Address _____

Your Student Number _____

— LIST YOUR FRIENDS' NAMES —

Mr. _____

Mr. _____

Address _____

Address _____

City _____ State _____

City _____ State _____

Occupation _____ Age _____

Occupation _____ Age _____

Interested in:

Interested in:

- Amateur Radio
- Service Work
- Set Building

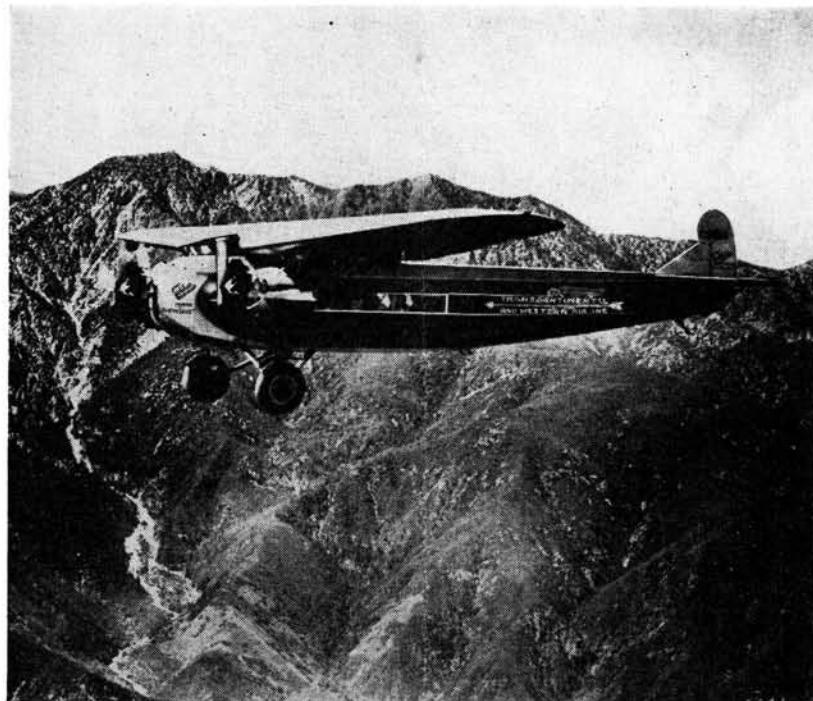
- Amateur Radio
- Service Work
- Set Building



VOL. 3—NO. 12

WASHINGTON, D. C.

JULY, 1931



AN EXPRESS TRAIN OF THE AIR

(SEE PAGES 8-9)

RADIO IN AVIATION NUMBER



J. E. SMITH

The PRESIDENT'S PAGE

RECENT changes and improvements in National Radio News have been responsible for a lot of fine comments from students, graduates and commercial organizations. We're glad "The News" is so popular.

National Radio News

We've gone to quite an expense to make this paper interesting and at the same time helpful. The Editor, following a definite policy for continued improvement, has a number of surprises in store for "News" readers.

This not only means improvements in the articles published, but in the physical features, "News" policy, etc.

While I don't intend revealing the nature of the next improvement, because that would eliminate the Editor's "Surprise idea," I'll tell you this much now—"Watch for the August issue of National Radio News."

WORD has just been received that N. R. I. graduate Herman R. Barrett, of North Attleboro, Massachusetts, has been appointed relief operator on the Nantucket Shoals Lightship.

Light Ship

Where impossible or impracticable to build lighthouses at dangerous points, our Government stations lightships to protect and warn ships and serve them as guide posts.

Such is the position assigned our friend Barrett by the U. S. Civil Service Commission.

Some interesting figures which have been received from an authoritative

source regarding Radio Tubes: During the year of 1930, 24,000,000 tubes were sold for replacement purposes. Service men were certainly making some money.

THE dependence placed by Aviation upon Radio has caused an inter-linking of the two industries which is extremely noteworthy. The close of 1930 gave us an opportunity to view a year remarkable for its development in Radio-aids for the industry of the air.

Radio-Aviation

Among the works of the year for the advancement of Aviation by Radio are practical application of Radio range beacon systems for keeping aircraft on course, irrespective of weather conditions; experimentation on Radio aids to blind flying and landing and the compilation of considerable research data toward the development of a practical direction finder for aircraft.

A NEW aid to Radio in connection with its use in automobiles has been developed by Engineers of the A. C. Spark Plug Company.

Eliminates Interference This plug eliminates interference from the automobile's ignition system, and certainly should do a lot to improve Radio reception in automobiles.

In addition to being particularly beneficial in police cars equipped with Radio, this should certainly be a valuable improvement which will tend to popularize Automobile Radio.



WHY THE POWER OUTPUT PENTODE?

By J. A. DOWIE, Chief Instructor

The output tube of a modern Radio receiving set must furnish considerable undistorted power to the load into which it works—the loudspeaker.

It is also desirable that considerable amplification takes place in the output tube. However, usual output tubes deliver the power at the expense of amplification, because they are mostly of the low-mu, low resistance type. The power pentode was therefore developed to overcome this difficulty and is therefore being produced in large numbers to meet the urgent demand of pentode set manufacturers or for use in receivers now using the '45, provided the circuit is suitably changed or designed especially for this power output tube. Figure 2 shows a picture of this tube and figure 1 a typical circuit in which this tube is used with the electrodes arranged in the order of procession from the cathode to the plate. "C" is the cathode; G₁, the control grid; G₂, the space-charge grid; G₃, the cathode grid, and P the plate.

This tube is known as the '47 power output pentode, it has many times the usual amplification of an ordinary power tube, and therefore serves to reduce preceding amplification to a minimum or what is more likely to produce receiving circuits of extreme sensitivity.

The power pentode '47 delivers half again as much output as the usual '45 power output tube (which has been used up to this time almost universally) with only a third as much input voltage. In other words, the '47 pentode properly operated, will be about as effective as two '45 tubes in push-pull for the same power employed.

To be exact, it delivers an output of

2.5 watts with only 11.7 volts input, as contrasted with a maximum output of 1.6 watts with an input of 35.4 volts for the usual '45 tube.

The reason why such a large audio power output is made possible for such a relatively small signal voltage is because this tube has the addition of a space charge grid and a suppressor, or a cathode grid, between the space charge grid and the plate.

The purpose of the cathode grid is to act as a barrier and prevent secondary emission of electrons from the plate (due to the impact of the electrons on the plate) from reaching the space charge grid, which would cause the plate current to drop rapidly when the plate voltage is decreased below the shield grid voltage, limiting the possible swing of plate voltage because of the distortion introduced by the accentuated curvature of the plate current, plate voltage curve. The suppressor grid is kept at zero potential by being electrically connected to the center of the filament within the tube as illustrated in Figure 1 and therefore no attention need be paid to this grid in circuit design.

The amplification factor of the '47 is 95 as contrasted with 3.5 for the usual '45 tube, thus the power pentode '47 may be operated at maximum output directly from the usual detector tube, doing away with the first audio frequency stage. This makes for a simpler circuit using less parts which makes purer tone quality with corresponding economy by the elimination of an audio frequency transformer.

The principle characteristics of the '47 and '45 tubes are given in the Table at the bottom of page 13.

The '47 tube is identical in dimensions of bulb and base (Page 13, please)

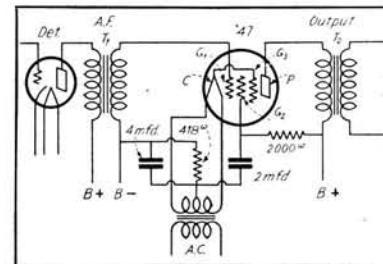


Fig. 1.—Typical circuit using power output Pentode Tube.

National Radio News

Published monthly in the interest of its students and graduates, by the

NATIONAL RADIO INSTITUTE
16th and U Streets N. W.
Washington, D. C.

J. E. SMITH, Pres. E. R. HAAS, V. Pres. & Director.

Vol. 3—No. 12

July, 1931

A Thought for the Month

*The high souls climb the highway,
And the low souls grope the low;
In between on the misty flats,
The rest drift to and fro.*

*To every man there openeth,
A high way and a low;
And every man decideth,
The way that he shall go.*

Don't Be Like a Fly

There's a tale told of the Indians up in the Northwest. When they are drying their winter's food, they invariably hang their fish from the branches of trees thirty-three feet from the earth. An old buck was asked the reason. His reply was, "Flies no get 'um!"

Upon investigation it was learned that flies do not rise of themselves more than thirty-two feet above the ground. The Indians know this and hang their fish just one foot above the "fly-line."

One would think that flies, getting within twelve inches of that food, would put forth just a little more effort to make the grade, but flies either lack the sense or the power to do this.

How many good things in life hang just out of reach for the fellow who goes after them in the average, matter-of-fact way. How many fellows could have better jobs—more pleasures, if they would put that extra pound of push behind their will power and study—train themselves. It's that extra foot that starves the flies—that extra push that spells the difference between success and failure.

Don't be like a fly!

THE DIRECTOR SPEAKS



E. R. HAAS
Vice President and
Director

He Started Something

An auto salesman sat in his favorite lunchroom about to order his usual steak dinner. His eye fell on the headline of a newspaper—"Hard Times Coming." So instead of a steak he ordered a sandwich.

"Anything wrong with the food?" asked the proprietor, as the check was paid.

"Food's O.K. but have to economize; hard times are coming."

"Hard times," repeated the proprietor, "Then I'll have to make this suit do another season,"—and he called his tailor and cancelled his order for a new suit and topcoat with the excuse that "Hard times were coming."

"So," said the tailor, "Hard times coming. I guess the improvements on this building will have to wait till next year."

When the builder was notified that "Hard times coming" necessitated cancellation of the building order, he called our friend the auto salesman. "Forget that order for a car for me till times get better."

So our auto salesman went moodily back to the lunchroom to brood over his bad luck and his eye fell on the same newspaper.

And glancing at the date line he discovered the paper was two years old.

Folks who growl most about "Depression"—talk about it instead of getting out and working for prosperity, are usually the chief cause for their own predicament.

RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF.

COMPILED SOLELY FOR STUDENTS & GRADUATES

AIRLINE RECEIVERS

Commander (No. 1400)	Cavalier (No. 6200)	Coronado (No. 3035-3037)	Cortez (No. 3665-3067)
-------------------------	------------------------	-----------------------------	---------------------------

The schematic wiring diagram of the Commander and Cavalier receiver is shown in Figure 1. The chassis of the Coronado and Cortez receiver is identical with the one used in the Commander and Cavalier, except for the following differences: The resistance "A," Figure 1, has a value of 8,400 ohms in the Coronado and Cortez receiver. The resistance "B" has a resistance of 10,700 ohms and the resistance "C" is omitted. At the point "D" on the diagram a resistance

of 3,500 ohms and at the point "E" a resistance of 15,000 ohms is inserted in the Coronado and Cortez receivers. In the Coronado and Cortez receiver there is a .2 microfarad condenser placed across the 200,000 ohm resistance at the point "F." Otherwise the wiring diagram for the four receivers are identical.

The operating voltages of the Commander and Cavalier are shown in Table 1, while the voltages for the Coronado and Cortez are shown in Table 2.

TABLE 1
OPERATING VOLTAGES

Voltages at Sockets—Volume Control at Maximum—Line Voltage, 115 Plug in Socket of Receiver—Tube in Test Set.

Type of Tube	Position of Tube	Function	A Volts	B Volts	Control Grid Volts	Screen Volts	Screen Current MA	Cathode Volts	Plate MA
224	1	1st Radio	2.3	247	4.0	103	.75	4.0	4.6
224	2	2nd Radio	2.3	247	4.0	103	.75	4.0	4.6
224	3	3rd Radio	2.3	247	4.0	103	.75	4.0	4.6
227	4	Detector	2.3	160	17	-----	-----	17	.35
227	5	1st Audio	2.3	223	15	-----	-----	15	5.9
245	6	2nd Audio	2.25	243	29.2	-----	-----	-----	27.5
245	7	2nd Audio	2.25	243	29.2	-----	-----	-----	27.5
280	8	Rectifier	4.9	-----	-----	-----	-----	-----	-----
								Per plate	-----

TABLE 2
OPERATING VOLTAGES

Voltages at Sockets—Volume Control at Maximum—Line Voltage, 115 Plug in Socket of Receiver—Tube in Test Set.

Type of Tube	Position of Tube	Function	A Volts	B Volts	Control Grid C Volts	Screen Volts	Screen Current MA	Cathode Volts	Plate MA
224	1	1st Radio	2.25	178	3.0	86	.45	3.0	3.4
224	2	2nd Radio	2.25	178	3.0	86	.45	3.0	3.4
224	3	3rd Radio	2.25	178	3.0	86	.45	3.0	3.4
227	4	Detector	2.25	60	9	-----	-----	9	.25
227	5	1st Audio	2.25	160	12	-----	-----	12	4.5
246	6	2nd Audio	2.35	246	40	-----	-----	-----	25
245	7	2nd Audio	2.35	246	40	-----	-----	-----	25
280	8	Rectifier	4.9	-----	-----	-----	-----	-----	-----
								Per plate	-----

I

What Radio Means to Aviation

N the early days of Aviation, flying was a hazardous undertaking. Mechanical imperfections in planes and motors greatly retarded progress. Only a few brave pioneers of the industry would venture from the ground.

When a pilot "hopped off," his chances for getting back to solid ground in safety were just about one in six. Flying at night and in bad weather was unheard of. Foolhardy indeed was the aviator considered who dared beyond a point where he could see his landing field.

But the danger element is rapidly passing. Inventions, refining and improving various elements, make planes trustworthy of their human cargo. Practically unlimited finance has gone into making the air a swifter and more safe place to travel.

The front cover of this issue of National Radio News shows what modern science and invention has done for safety in aviation. The photo shows a passenger plane of the Transcontinental and Western Air, Inc., flying high and in comparative safety over the rugged San Bernardino mountains in California, literally an "Express Train of the Air."

Keeping pace with Aviation is the safety feature of that industry, Radio.

The pilot, flying through night, fog, snow, must depend upon Radio communication between his plane and the ground station for his bearings, weather reports, etc. The increasing relation of Radio to Aviation, as pointed out by Mr. E. T. Cunningham, of the Cunningham Radio Tube Company, was demonstrated recently by the Federal Radio Commission in their ruling which increased the number of aeronautic Radio communications frequencies from 14 to 46.

Our Government has foreseen the value of Radio to Aviation. A number of valuable contributions have been made by its experimental stations. According to a recent Government publication, development of a Radio system to prevent collisions between airplanes, especially those flying Radio-beacon courses which may be depending on Radio signals to guide them through storms and fog, has begun at the Bureau of Standards. The aim is to give automatic warning to a plane of the presence and approximate position of any other airplane within a radius of three miles from it.

They propose the use of ultra-high waves which will be continuously transmitted from the plane in

flight. Directivity of reception or transmission or both, will inform the pilot of the direction of the potential danger.

Although communication between aircraft and ground

traffic will constitute a major portion of the work—to such an extent, in fact, that all passenger planes will of necessity carry a licensed Radio operator exclusively for this activity. This will also necessitate an increase in ground station Radio personnel.

The expenditures for Radio equipment and personnel, by large air transportation lines, indicate conclusively that Radio is in Aviation to stay. It will be of the same importance to aerial as to marine navigation.

Two airways of the Boeing Company's system total 3,300 miles. Along these routes are 22 ground stations rendering Radio communication service to 55 mail-passenger planes, equipped for two-way communication on short wave for Government weather reports.

Officials of the Boeing system regard Radio as one of the outstanding steps in recent years in the direction of utmost safety in modern air transportation. It has been truthfully stated "the guiding hand of the aviator in the clouds is the Radio man on the ground."

Now that we have considered the matter from the point of "what Radio means to Aviation," let's reverse the topic and see what Aviation means to Radio.

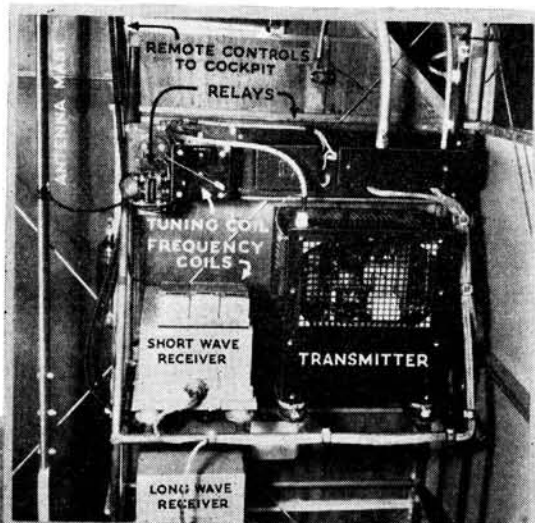
At strategic points along the air-ways are located Radio stations. Aviation has created the demand for the building and installation of this Radio equipment and is also responsible for the employment of trained Radio men to operate these stations, both from a point of view of obtaining weather reports, and communications with planes.

At various airports, plane receivers and transmitters are constantly checked and serviced to insure accurate and continued operation. Here again is a field of Radio employment created by the Aviation industry.

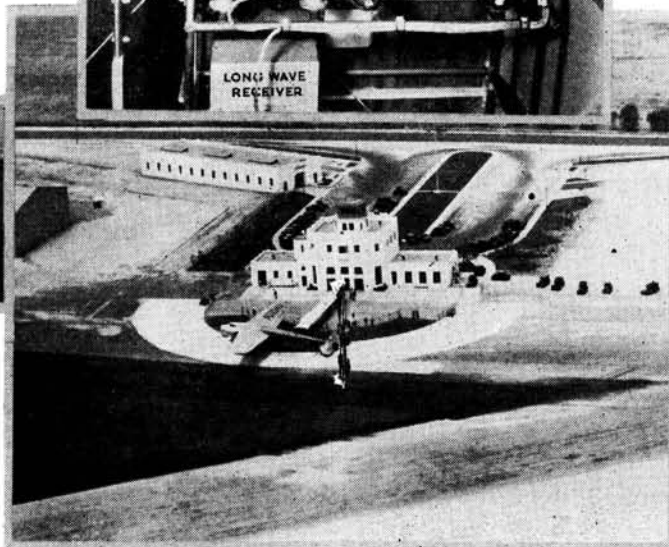
Aircraft operators are constantly scouring the market for Radio equipment showing worthy improvements, particularly emphasizing reduced weight especially in receivers. Therefore, a rich field is open to the inventor of Radio apparatus in connection with aviation.

So placing the evidence on the scales of derived benefit, it appears that the two industries, Radio and Aviation, owe each other a lot. Yet neither is indebted to the other and both will be mutually benefited by the forward stride of combined Aviation-Radio industry.

Top: Radio telephone installation on a Boeing tri-motored transport, flying over the Chicago-San Francisco airway.



Above: Radio compartment of mail plane on outside of plane for tuning the set.



Below: Pilot's Radio-equipped helmet, with earphones built into the headgear and transmitting microphone attached to the helmet and suspended in front of the pilot's lips.

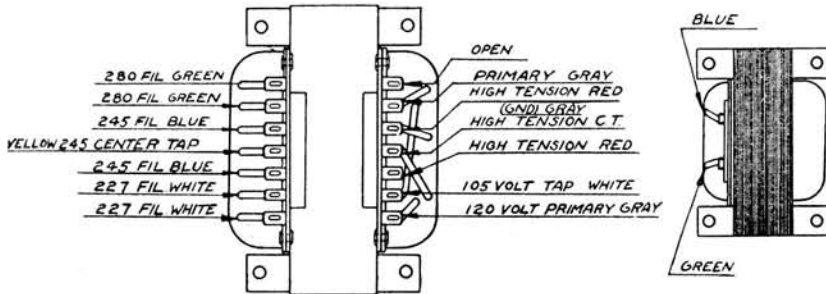


Left: Transcontinental and Western Air, Inc. Terminal at Alhambra, California.

Radio employment created by the Aviation industry.

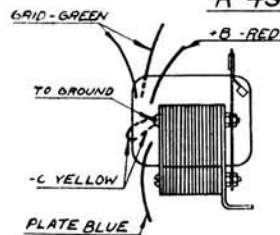
Tube No. in Order	Position of Tube	Type of Tube	A Volts	B Volts	C Volts	Cathode	Plate MA	Screen Grid Volts
1	1st R.F.	224	2.2	175	3.5	3.5	3.9	90
2	2nd R.F.	224	2.2	175	3.5	3.5	3.9	90
3	3rd R.F.	224	2.2	175	3.5	3.5	3.9	90
4	Detector	227	2.2	110	10	11	.5	
5	1st A.F.	227	2.2	145	1.	9.5	4.6	
6	Push-Pull	245	2.45	215	43		21	
7	Push-Pull	245	2.45	215	43		21	
8	Rectifier	280						

Line Voltage 120. Set on 120 Volt Tap. Volume Control FULL ON.

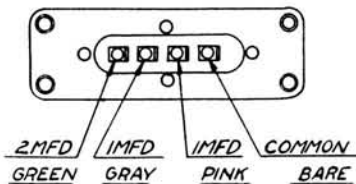


POWER TRANSFORMER
R 4933A

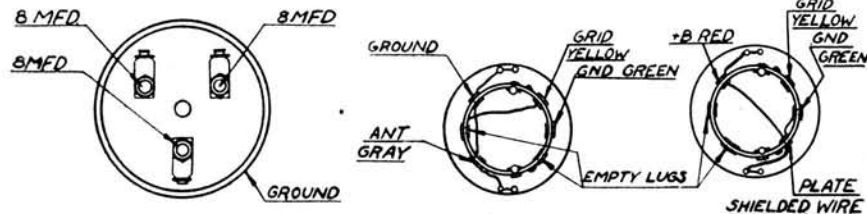
CHOKE
R 4959A



PUSH-PULL TRANSFORMER
R 4962 B



FILTER CONDENSER
R 4952



MERSHON CONDENSER
R 5047

ANTENNA COIL
R 5004
BOTTOM VIEW

RF COIL
R 4939A
BOTTOM VIEW

**DETAILS OF TRANSFORMER, COIL MERSHON AND
FILTER CONDENSER LEADS - MODEL 112**

Why The Power Output Pentode?

(Continued from page 3)

to the '45, except for the fact that a standard 5-prong base is provided. The filament, plate, and control grid leads are the same as for type '27 tubes. The space charge grid lead is brought out through the prong normally used for cathode connection in cathode types. This tube employs an oxide coated filament design for 2.5 volts A.C. operation.

In order to fully utilize the characteristics of the power output pentode, the load impedance should be maintained fairly constant at the recommended value of 7,000 ohms. Which means that the proper output devices, either transformer, choke-condenser, or loudspeaker, must be used with this tube. The reason that this value has been chosen is because it limits harmonic distortion to a minimum. It is interesting to note that the recommended load impedance is less than one-fifth that of the tube resistance (7,000 compared to 38,000). Compare this with the '45 tube which has a recommended load impedance of 3,900 ohms in comparison to plate resistance 1,750 ohms more

than twice its value. Grid bias for this tube may be obtained either by an automatic self-biasing resistor in the filament lead or by a fixed voltage source. Two other pentodes are also available, known as the '33 and '38 types.

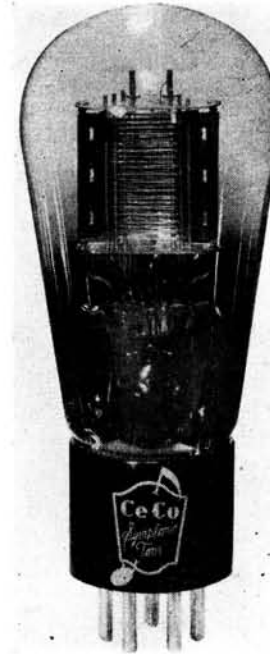


Fig. 2—Photo of —47 type power output Pentode showing part of plate cut away to show the construction of the tube.

The '33 is a power amplifier pentode for use in the power output stage of two volt battery operated receivers designed for its characteristics. It is capable of delivering to the loudspeaker a relatively large amount of power for small input signal voltages. The '38 (heater type) is a power amplifier pentode for use in power output stages of automobile receivers especially designed for it. Because of the special cathode employed in this tube it gives satisfactory performance over the normal charge and discharge cycles. The heater is designed for D. C. operation only.

The increasing popularity of the Pentode tubes—their widespread use by manufacturers—makes it important for the Radio-trician to have this information.

CHARACTERISTICS

	'47	'45
Filament Voltage	2.5 Volts	2.5 Volts
Filament Current	1.5 Amperes	1.5 Amperes
Plate Voltage	250 Volts	250 Volts
Space Charge Voltage	250 Volts	
Grid Voltage	-16.5 Volts	-50.0 Volts
Plate Current	32 Milliampères	34 Milliampères
Space Charge Current	7.5 Milliampères	
Plate Resistance	38,000 Ohms	1750 Ohms
Mutual Conductance	2,500 Micromhos	2000 Micromhos
Load Resistance	7,000 Ohms	3900 Ohms
Amplification Factor	95	3.5
Power Output	2.5 Watts	1.6 Watts

More **SUCCESS** Stories

Letters which won Prizes in the N. R. I. Results Contest

The "News" will publish the letters which were awarded prizes in the Results Contest until all have been printed. We hope they will be inspirational and that the ideas contained in them will help every reader.

We also hope you will tell the "News" about your own work—your Successes, as they come along. Who knows but that the letter you write may start some fellow student on the up-grade—may be just the push he needs to give him the ambition you have—make him start a steady climb up the ladder of SUCCESS.

The Story of Herbert Jones, Chicago, Which Won a \$10 Prize

I have absolute proof that in less than ninety days after I completed my course (was graduated from the National Radio Institute) I had made during my spare time \$1,468 in cash.

I sold twenty-eight Sparton Radios and received \$40 commission on each set which netted me a profit of \$1120 and the rest I made in spare time service calls in my neighborhood.

Herbert Jones,
Chicago, Ill.

Old Phil Philosopher
says:

"Pull doesn't count
near as much in business
as Push."

"It's no disgrace to
be defeated—the humiliation
is in staying
licked."

"The most profitless
occupation is the manufacturing
of excuses."

Frank McClellan's Formula For Success Won Him Third Grand Prize, \$15.00

Here is a record of my holiday business with Ozarka and Viking Radios:

Sold eight Vikings at a profit of \$215; three Ozarkas at a profit of \$180. Add to that about \$50 worth of service work and you will have my record.

My regular job is that of a locomotive engineer, and during the time that I was setting up the above record I traveled about thirty-five hundred miles on a B. & M. locomotive. It is easy to see that I did not have a whole lot of time to put on my Radio work.

I am thoroughly sold on the Ozarka sets—they are the "berries." Just mix a good portion of Ozarka—a full measure of N. R. I. training, and as a side dish a large serving of pep and I don't see how any N. R. I. man can escape prosperity.

Frank McClellan, Troy, N. Y.

Wins \$10 Prize

I thank N. R. I. for my success. I am service man for R. C. A. Photophone, Inc., servicing talking picture equipment. Without N. R. I. training I would never have been able to obtain such a position—a fellow must "know his stuff" to get and hold a job like this.

Before enrolling with N. R. I. I couldn't get a job.

S. L. Mahaffay,
Salt Lake City, Utah.

INDEX	
Article	Page
National Radio News	2
Light Ship	2
Radio-Aviation	2
Eliminates Interference	2
Why the Power Output Pentode?	3-13
A Thought For the Month	4
Don't Be Like a Fly	4
He Started Somethings	4
Service Manual—Airline Receivers	5-6
The Plugger	7
What Radio Means to Aviation	8-9
An Aerial Stunt	10
Results Contest	10
Service Manual—Silvertone Receiver	11-12
More Results Contest Letters	14
The Mail Bag	15
Kruess Direction Finder	16
Help Your Friends	16



If you have an Atwater Kent Model Number 35 which has no volume, take the antenna choke out and order an antenna coupling transformer Number 13482. Replace with this part. I have done this to three sets in town and my customers were well pleased. It sure does work. After you make this change you should have enough volume to fill the house.—H. G. Hedden, Odon, Indiana.

I have been informed by dealers and service stations that the only cure for FUZZY SPEAKERS is to replace the cone with a new one. I find by removing the cone and dipping the "neck" in hot paraffin for a few seconds, the speaker works as well as ever.

I've tried this scheme on the speakers of two popular sets and I'm well satisfied with the results.—Oliver Prescott, Vinton, Iowa.

A "fuzzy speaker" is one where the apex of the cone becomes soft and pliable and will not hold adjustment. It bucks and bends out of shape with heavy volume.

Radio is getting greater in my country every day. I sure have had fine luck.

I have been doing repair work since October 18, 1930—just spare time, and have made over \$275 clear money.

I distributed the cards among my friends and the work began to roll in. They certainly are great advertisers for the beginner. Now I have a little shop of my own.—Logan McConnell, Mt. Olivet, Kentucky.

Do any of you N. R. I. fellows ever run across a Sparton, Model 931 or 301 that oscillates and motorboats between the 550 and 850 kc.? Here is a tip. I find that nine-tenths of the trouble is a burnt out choke coil. Always test the choke in the amplifier unit. A lot of people think that when a set oscillates or motorboats it is out of balance. When it oscillates only on the low kc., watch your choke.—J. L. Temple, Upper Darby, Pa.

Robert Hale, N. R. I. graduate, after helping to build Radio Station WNAT and WNAJ, has been retained as an operator at the WNAJ Station of the National Air Transport, Inc., at Angola, Indiana.

My A. K. Model 35, 6 tube battery set, had little volume or selectivity. I improved it 100% attaching an ordinary wave trap in a series with the aerial. Rotor of condenser is toward aerial. This provides a means of first stage tuning, which was originally untuned, increasing both volume and selectivity.

Pass this wrinkle along to my fellow students. Many of them probably have sets with first stage untuned.—Robt. W. Embt, Varysburg, N. Y.

"Where Radio-Trician Meets Radio-Trician"

A local Radio shop has a Service man who told people I could not learn Radio from books. I have surprised him.

I recently had a call to check over a set installed in a large cafe. This other man had worked on it, but could not find the trouble. As a last resort the cafe man called me. Upon testing I found a defective volume control; this model used a double control. I could not get another one in town, and the owner did not want to be without his machine, so I took my Philco up and told him to use it.

When I started it he was surprised at the number of stations he could pick up, and wanted me to fix his set to do the same. I assured him I would try. Well, I got the control, then checked the tubes and found it needed several new ones, balanced it, and took it back. He is well pleased with it, and is a good booster for me.

While the Philco was in his place I had a card printed with the following: "Loaned by courtesy of F. Deede, Radio Trician, Phone 295."

I had several calls for repair work and had 14 calls wanting to know if I sold the Philco. After the third call I wrote the Beckwith Company and took the contract. Out of the 14 that called I sold five Radios and to date have sold 11 Philcos and one auto Radio.

The fellow who said I didn't know Radio has only sold 10 sets in the past year.—F. Deede, Carlington, N. Dak.

I have a rubber stamp with my name and telephone number on it. It is always in my service kit. Before leaving the home of a customer, I stamp either the cover or first page of the telephone directory.

The next time that party needs a serviceman, my name and phone number is handy.—John F. Rice, Kansas City, Mo.

Graduate Lyman Newell is operator in charge of Airways Radio Station, Bellefonte, Pennsylvania.

This position, which involves operation and maintenance of Radio apparatus to supply weather reports and other pertinent data to planes, comes to Newell after a colorful Radio career.

Starting out as an amateur operator in 1921, he has seen service in the U. S. Navy, including submarine duty in Panama.

Following experience on ship between the U. S. and Scotland, he shipped with the Bull West African Line. Then he operated WGO, which kept him busy till his present job materialized. A varied experience, we'd say.

Mr. P. J. Murray, Manager of N. R. I.'s Employment and Graduate Service Department, has prepared an article on "Wholesaling Radio Service" which will appear in the August issue.

WATCH for the **AUGUST** issue of the **"NEWS"**