NATIONAL RADIO NEWS

Vol. 5, No. 9 August-September, 1933

"We're all safe—There's nothing to worry about"

(See page 3.)

A Pointed Message From President Smith

RADIO is an infant industry—it is very young as compared with the other great industries of the world. So far as the general public is concerned, it is only a little more than ten years of age. Yet in those few years it has grown bigger than the motion picture industry did in twenty years. It has made greater progress than the automobile industry did in the same length of time. Radio is the world's fastest growing industry measured by any standard and in my opinion it holds the most wonderful promises for the future.

Radio started as a means of communication —flashing messages from ship to ship or from ship to shore. Then in 1920, a tiny experimental station owned by the Westinghouse Electric and Manufacturing Company at Pittsburgh came into the limelight by broadcasting the returns of the Harding Presidential election. The fortunate individuals who heard these Presidential returns were supplied with crude crystal receiving sets equipped with ear phones, and it can be readily understood that they thought the age of miracles had returned when the squeaky uncertain voice of the speaker came to them right through the air without the use of telephone wires.

The high lights of a Radio talk given by President J. E. Smith of the National Radio Institute over Radio Station WRC, Washington. This talk was made at the request of the Vocational Guidance Committee of the Kiwanis Club.

Those favored few who heard the voice feebly coming to their ears out of nowhere were but a drop in the bucket compared with the millions, in this country and abroad, who a short time ago reclined comfortably in their chairs and by the simple turn of a knob were thrilled with the soul-stiring inaugural address of President Roosevelt.

Radio now encompasses the world. Radio messages have been received from the north and south poles. Ships and planes are guided by it. Millions are entertained and educated by it. It is woven into the very fabric of our daily lives. It is even used to sort fruit, select cigar wrappers, protect buildings from theft, detect flaws in paper during the process of manufacture and for countless other commercial purposes.

From that first experiment at Pittsburgh just a few years ago, Radio broadcasting has grown until in the United States alone there are more than 600 stations in operation—many broadcasting 24 hours a day.

Manufacturers of Radio sets give employment to considerably more than 120,000 people, while sales, distribution, service and repair work enlists the services of nearly a quarter of a million more employees. And the end is not yet.

The service and repair of Radio receiving sets is very attractive to Radio men—it offers opportunities for making money and is a stepping stone to better things. There are more than 15,000,000 Radio sets already in use in American homes and the number is being increased at the rate of about 3,000 every working day. These Radio sets spell opportunity for the Radio mechanic. Old sets are constanly in need of parts and tubes—they require adjusting and servicing from time to time; while the new sets must, of course, be properly installed and carefully serviced if they are to give the proper kind of satisfaction.

This very important and necessary work of upkeep affords a wide field for the young man who is mechanically inclined, for it is work which may be done in one's spare time or at other people's convenience. Many a man starting out in this way has succeeded in building up a healthy, thriving, and good paying business—a business that is very largely independent of economic conditions. I know of many men who are picking up several dollars an evening in this kind or work in a field which is large and constantly growing. If Radio offered no other opportunity than just this interesting work of service and repairing sets, supplying new parts and accessories—this one branch alone would afford opportunities for good, safe jobs that paid in hard cash, and would lead men into businesses of their own.

Another major business exists in the manufacturing of Radio apparatus. Some of the larger Radio manufacturing plants employ several thousand men each. Philco, Atwater-Kent, Stewart-Warner, Grigsby-Grunow, Crosley, General Electric, Westinghouse, and R. C. A.-Victor—to name some of the larger factories, employ a large number of trained men at really good salaries. Here we find men filling such jobs as designers, testers, inspectors, re-

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"We're all safe . . . There's nothing to worry about"

IN THE February-March, 1933, issue of National Radio News we brought our readers an article entitled "Fishing Industry Adopts Marine Telephony." In this story was pointed out a new demand for Radio among the fishing fleets operating along the coasts and their contact stations on shore. In addition to the commercial value of this installation, let's now take a glance at the human side, which will have a great influence upon the expansion of this branch of Radio.

* * * *

The morning newspapers reported the fate of the schooner Dawn-Wilkie as uncertain. For days it had been known that the ship was foundering and that the end was near. Ashore, many miles away, Mrs. Wilkie, wife of the schooner's captain, was frantic—on the verge of a nervous breakdown from the suspense.

Interior of transmitting and receiving station at Green Harbor, Mass., where calls pass to and from fishing boats off the Massachusetts coast. Photo courtesy Western Electric Company.

Just when everything seemed darkest—just when it seemed that all was lost, her phone rang. From far out at sea came her husband's voice: "It's Newt speaking—we're all safe—there's nothing to worry about!"

Fate had been kind after all. Captain Doucette, on the trawler Gertrude M. Fauci, had sighted the distressed schooner just as it was sinking. The Fauci, standing by in heavy sea, rescued every person from the ill-fated vessel.

Captain Wilkie had immediately stepped into the Radio room of the Fauci and called his wife's phone number in much the same manner as we make telephone calls every day.

* * * *

Shortly thereafter, a newspaper reporter, hearing of the rescue from the captain's wife, picked up a phone in the offices of the Boston Globe, called the Fauci, and interviewed the captain of the ship-wrecked Dawn-Wilkie.

It has not been at all unusual, in the past, to hear of Radio rendering valuable aid to distressed mariners. But usually these Radio installations were on large vessels carrying passengers and extremely valuable cargo. It is only recently that the value of Radio installations on small ships of the fishing fleet was fully realized.

Ship operating companies can keep in constant contact with the individual ships of their fleets. They can issue directions, and converse with the ship's officers on important matters and, as shown above, render a helpful service betweet the crews and their families ashore.

The Radio industry is bound to profit by the growing popularity of these installations on small ships. Once more Radio has triumphed over space—by bringing the seafaring man closer to his fireside.

SOME THINGS TO REMEMBER

The value of time.
The success of perseverance.
The pleasure of working.
The worth of character.
The power of kindness.
The obligation of duty.
The wisdom of economy.
The virtue of patience.
The improvement of talent.
The joy of originating.

A Few Words With the N.R.I. Director

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

The man who halted on third base to congratulate himself failed to make a home run.

WHY A DONKEY IS CALLED A JACKASS

According to an old legend some of the business tactics practiced by alleged moderns are not so up-to-date. In fact, they were in vogue in the dim dark ages of the past.

It seems in a certain country the Donkey had the travel market cornered.

And a certain prophet had a journey to make, so he consulted several Donkeys who were in the transportation business regarding terms for their services.

"What," inquired the prophet, "should a Donkey require for a three days' journey?"

The Donkeys talked it over among themselves and make the reply: "For a three days' journey, any Donkey should require six bundles of hay and three bags of dates."

"Very good," said the prophet. "That sounds like a fair and proper price." And the Donkeys wagged their ears in affirmation.

"But wait! I will not pay six bundles of hay and three bags of dates for making a three days' journey. Who will go for less?"

Every one of the Donkeys stood forth and began to talk at once. One said he would go for six bundles of hay and one bag of dates. Finally, one especially long-eared Donkey agreed to go for one bundle of hay only and no dates.

Then the prophet spoke: "Jackass," said he, "you cannot even live for three days on one bundle of hay, much less have a profit on your labor and lay some aside for the future."

"Quite true," replied the long-eared one, "but I want the order!"

And from that far-off day to this, Jackasses have been known as fools, and price cutters have been known as Jackasses.

DETERMINATION

An important factor in success is Determination, never give up—keep on trying in spite of failures.

Take, for instance, F. W. Woolworth. He lost his own fortune and the fortunes of three others—was reduced to poverty on four occasions before he finally put over the ten-cent store idea.

Stick to your guns—until you've shattered the obstacles in your path to success. You can—you're bound to if you have enough ammunition. Your ammunition is DETERMINATION.

ABOUT OUR SUCCESS STORIES

For several issues we have been printing short articles, known as Success Stories. A bonus of $1.00 has been given to each man who wrote such a story which was accepted for publication. (See page 21.)

To have a Success Letter accepted it isn't necessary that your letter report great earnings; a large business built up; a good job obtained, though this is acceptable. Have you a method of advertising; a plan of contacting customers; some business policy that gets good returns—that's what National Radio News wants.

Information that can be passed along to our readers—to help them succeed—has a fine chance to be accepted. Try your hand—send us your pet idea. Help the News and your fellow readers.

7— TUBE CLASSIFICATION

Tubes are assigned names in accordance with the number of active elements which they have. For filament type cathodes there is usually one more connection leading from the elements because although the filament is only one element it has two connections. Thus, for three elements there are four connections. Since the cathode grid of some pentodes is tied to the filament within the tube, the number of elements is the same as the number of pins or connections. For example, the '47 and '33 tubes are of this type each having five elements and five connections.

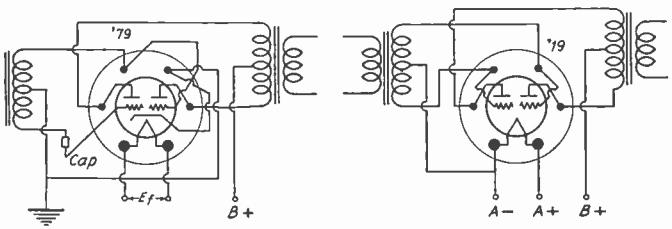
For indirectly heated cathodes there are usually two more connections than elements because the heater is not considered as an active element. It has no connection with the signal circuit but is simply an auxiliary circuit.

Number of Elements	Classification	Number of Elements	Classification
2	Diode	6	Hexode
3	Triode	7	Heptode
4	Tetrode	8	Octode
5	Pentode		

When two separate units are employed in a single bulb a compound name is assigned—double-diode, diode-triode, triple-twin, double-diode-pentode, etc.

8— TWIN CLASS B AMPLIFIERS

These tubes are designed for high efficiency Class B output amplification. One is shown for A.C. and one for battery operation.

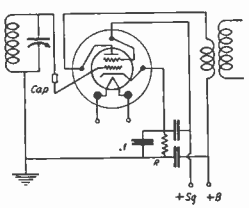


	'79	'19
E_f	6.3	2
I_f	.6	.26
E_p	180	135
I_p	7.5	27 †
E_g	0	0
R_L	10,000	10,000
W_o	5	2.1

†50 volts RMS applied to two grids.

9— SUPER CONTROL R. F. AMPLIFIERS & A. C. SCREEN GRID TUBES

The '39, '44 and '35 tubes are vario mu tubes, the '44 being a "high cut off" tube, i.e., a large bias is necessary to completely cut off plate current. These tubes are highly suitable for cathode volume control.

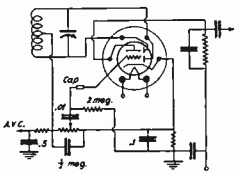


	'39	'44	'24 (24a)*	'35	'36
E_f	6.3	6.3	2.5	2.5	6.3
I_f	.3	.3	1.75	1.75	.3
E_p	250	250	250	250	180
E_{sg}	90	90	90	90	90
I_p	5.8	5.8	4.	6.5	3.1
I_{sg}	1.4	1.4	1.7	2.5	1.7
E_g	3 up	3 up	3	3 up	3
R_p	1 meg.	1 meg.	.6 meg.	.35 meg.	.35 meg.
G_m	1,050	1,050	1,050	1,050	1,050
μ	1,050	1,050	630	370	370
R	415	415	525	330	675

*Quick heater '24

10— DUPLEX DIODE TRIODES

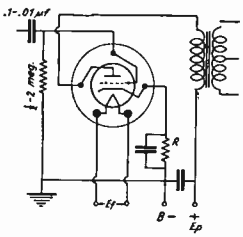
These tubes are suitable for half and full wave diode detection, amplification of audio frequencies obtained, and A.V.C. supply voltages. The '75 differs from the '55 and '85 in that it has a high plate impedance. A general full wave diode detector A.V.C. audio amplifier circuit is shown.



	'55	'75	'85
E_f	2.5	6.3	6.3
I_f	1.	.3	.4
E_p	250	250	250
I_p	8	.8	7.
$-E_g$	20	2	20
R_p	7,500	91,000	8,300
R_L	20,000	100,000	20,000
G_m	1,100	1,100	1,000
μ	8.3	100	8.3

11— CATHODE TRIODES

The circuit shows the use of cathode triodes as audio amplifiers.

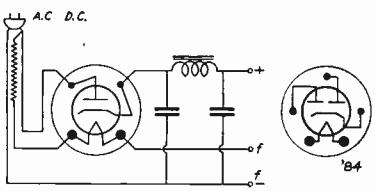


	'27	'56	'37	'67‡	485‡
E_f	2.5	2.5	6.3	6.3	3
I_f	1.75	1.	0.3	0.4	1.3
E_p	180	250	180	135	135
I_p	5	5	4.7	5	6.5
E_g	13.5	13.5	13.5	9	4.5
R_p	9,000	9,500	10,000	8,200	8,900
G_m	1,000	1,450	900	1100	1,330
μ	9	13.8	9	9	11.7
R	2,000	2,700	2,800	1,800	700

‡National Union tubes.

12— CATHODE RECTIFIERS

The half wave cathode rectifier is being widely used for universal (A.C., D.C.) receivers. For A.C., half wave rectification takes place, and for D.C. the rectifier simply floats on the line. The (1) is the mercury vapor style. The '84 tube may be wired just as the filament type tube except havig the + connection to cathode.



	1	1V	12Z3	'84
E_f	6.3	6.3	12.	6.3
I_f	.3	.3	.3	5.
E_p	350	350	350	225
Out ma.	50	50	60	50
Type	Half wave	Half wave	Half wave	Full wave

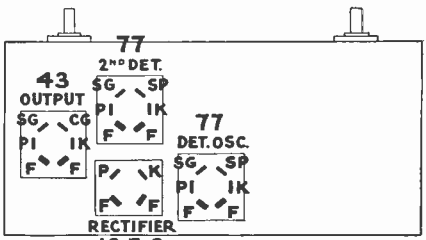
RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF.

COMPILED SOLELY FOR STUDENTS & GRADUATES

PHILCO MODEL 53

The Philco Radio Model 53 is a four tube superheterodyne, employing the new Philco high efficiency tubes with pentode output and a permanent Field Dynamic Speaker.. The set uses a Philco Type 77 tube as a first detector and oscillator, a Type 77 tube as second detector, a Type 43 tube as output, and a Type 12-Z-3 as a rectifier. The set will operate universally on either alternating or direct current, 105-125 Volts. The intermediate frequency for tuning the I.F. transformer is 450 kilocycles. The power consumption on both A. C. and D. C. is approximately 45 watts.



F Filament SG Screen Grid K Cathode
P Plate CG Control Grid SP Suppressor Grid

Fig. 1—Tube Sockets, Under Side of Chassis

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

Circuit	Det. Osc.	2nd Det.	Output	Rectifier
Type Tube	77	77	43	12-Z-3
Filament—Total 49.9 Volts A.	C. Refer	to Note.		
Plate Volts—P to K.....	95	15	94	112
Screen Grid Volts—SG to K...	94	34	102	....
Control Grid Volts—CG to K..	7	4	4	...
Cathode Volts—K to F... ...	18	12	10	112

NOTE:—Refer to Fig. 3. Due to filaments in series, test with suitable A. C. voltmeter across the two points indicated.

*All of the readings above in Table 1 were taken from the under side of chassis, using test prods and leads with a suitable A. C. voltmeter for filament voltage and a high resistance, multi-range D. C. voltmeter for all other readings. Volume control at maximum and station selector set for 550 KC. Readings taken with a radio set tester and plug-in adapter will not be satisfactory.

Table 2—Tube Socket Data*—D.C. Line Voltage 120 Volts

Circuit	Det. Osc.	2nd Det.	Output	Rectifier
Type Tube	77	77	43	12-Z-3
Filament—Total 51 Volts D.C.	—Refer	to Note.		
Plate Volts—P to K.....	95	14	94	10
Screen Grid Volts—SG to K...	93	34	100	....
Control Grid Volts—CG to K..	8	3	4	....
Cathode Volts—K to F.....	7-14	6-12	3-26	58-73

NOTE:—Refer to Fig. 3. Due to filaments in series, test with suitable D.C. Voltmeter across the two points indicated.

*All of the readings above in Table 2 were taken from the under side of chassis, using test prods and leads with a suitable high resistance, multi-range D. C. voltmeter for all readings. Volume control at maximum and station selector set for 550 KC. Readings taken with a radio set tester and plug-in adapter will not be satisfactory.

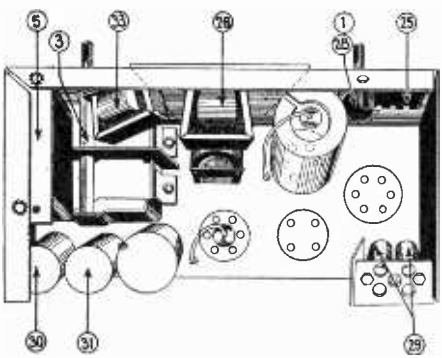


Fig. 2—Top View of Chassis, Showing Parts

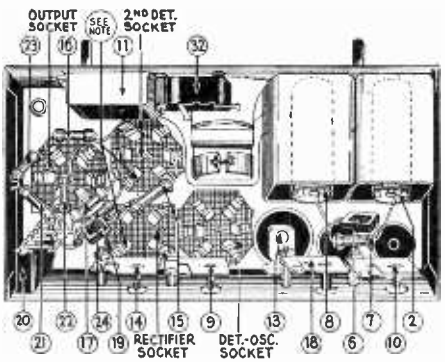


Fig. 3—Bottom View of Chassis, Showing Parts
NOTE:—Place test prods across the two points indicated to test filament voltage.

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

Philco

Model 53

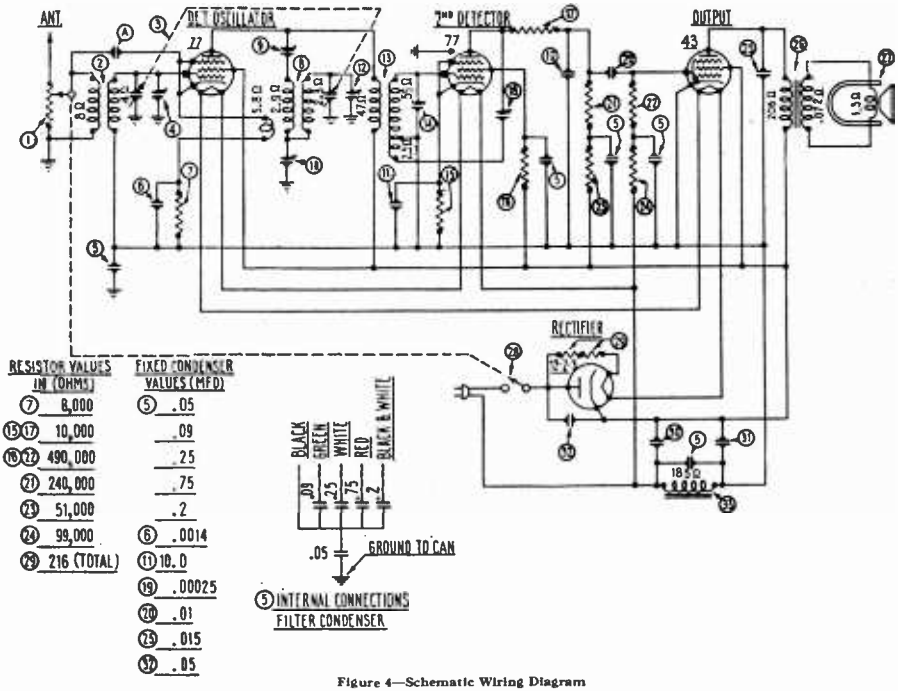


Figure 4—Schematic Wiring Diagram
NOTE Ⓐ—This capacity obtained by pair twisted wires

Replacement Parts for Model 53

No. on Figs. 2, 3 and 4	Description	Part No.
①	Volume Control	33-5001
②	Antenna Transformer	32-1000
③	Tuning Condenser Assembly	31-1000
④	Compensating Condenser (Part of Tuning Condenser Assembly)	
⑤	Filter Condenser Block (.05-.09-.25-.75-.2 Mfd.)	30-4000
⑥	Condenser (.0014 Mfd.)	7007
⑦	Resistor (8,000 ohms) Gray–Black–Red	5838
⑧	Oscillator Transformer	32-1001
⑨	Compensating Condenser (I.F. Primary)	04000-A
⑩	Compensating Cond. (Low Frequency)	04000-S
⑪	Condenser (10.0 Mfd.)	7440
⑫	Compensating Condenser (Part of Tuning Condenser Assembly)	
⑬	I.F. Transformer	32-1002
⑭	Compensating Cond. (I.F. Secondary)	04000-A
⑮	Resistor (10,000 ohms) Brown–Black–Orange	4412
⑯	Resistor (490,000 ohms) Yellow–White–Yellow	4517
⑰	Resistor (10,000 ohms) Brown–Black–Orange	4412
⑱	Compensating Condenser (Regeneration)	04000
⑲	Condenser (.00025 Mfd.)	3082
⑳	Condenser (.01 Mfd.)	3903-AM
㉑	Resistor (240,000 ohms) Red–Yellow–Yellow	4410
㉒	Resistor (490,000 ohms) Yellow–White–Yellow	4517
㉓	Resistor (51,000 ohms) Green–Brown–Orange	4518
㉔	Resistor (99,000 ohms) White–White–Orange	4411
㉕	Condenser (.015 Mfd.)	3793-S
㉖	Output Transformer	32-7000
㉗	Voice Coil and Cone Assembly	36-3000
㉘	A. C. Switch (Part of Volume Control Assembly)	33-5001
㉙	Resistors (2 Wire Wound–108 ohms each)	33-3000 / 33-3001
㉚	Electrolytic Condenser (8 Mfd.)	30-2000
㉛	Electrolytic Condenser (8 Mfd.)	30-2000
㉜	Condenser (.05 Mfd.)	3615-E
㉝	Filter Choke	32-7000
	Tube Shield	7172
	Knobs (Both Controls)	03064
	Four Prong Socket	7544
	Six Prong Socket	7547
	Pointer for Station Selector	28-1019
	Dial	28-1021

QUERIES . . . . . AND ANSWERS ???

Question: In my Superheterodyne which uses an automatic volume control, the tuning seems to be broader in the daytime. I was told by someone who should know better that this was due to the fact that the waves of the station spread out in the daytime because no station was alongside of it to push it back in its channel. Please set me straight.

Answer: The "trouble" is perfectly natural and is due to the A.V.C. action. As you tune off a station the sensitivity of the set increases and the volume will remain the same until the signal input is below the threshold sensitivity —that is, below the value where A.V.C. action cannot boost the signal to the normal value. Nevertheless, if there is no adjacent signal, as in the daytime, the reduced signal is still heard.

At night when there is an adjacent signal, long before you have made the tuned off signal inaudible you have tuned in the adjacent signal and the A.V.C. action is now the result of both the desired and the undesired signal. As the desired signal is strong it has the effect of reducing the entire R.F. system to a lower sensitivity value, with the result that the desired signal is normal and the undesired signal is reduced, due to the sensitivity of the machine.

Obviously, we still have a condition which depends on the ratio of the desired to undesired signals, except that the A.V.C. action further decreases the undesired action.

Question: I have a set analyzer built with sensitive meters, but I find that I cannot use it to test many of the new receivers using the latest tubes and circuits. In my estimation it would not be worthwhile to purchase a new analyzer or to even bring the old one up-to-date, as I believe that more complicated tubes and circuits are on the way. Please tell me what you think will be the best thing for me to do.

Answer: You are quite right regarding the new tubes and circuits which are to come. It would be throwing money away to purchase a more modern analyzer at this time because it would soon become obsolete. Also, the expense of bringing your old analyzer up-to-date would not be worth while in view of the fact that you would have to be constantly revising it.

The most sensible thing to do is to get in touch with the manufacturer of your analyzer and secure from him such adapters as he has that will enable you to check circuits employing 7-prong sockets.

When you come across a receiver which your adapters will not enable you to test, the best thing to do is to develop a new method of approach. First, attempt to localize the trouble. This can be done by tapping the control grids of the various tubes or by entirely lifting the tubes out of their sockets. A click should be heard on lifting out a tube or tapping its control grid. If, for example, you hear a click when lifting out the power tube but no click on removing the tube preceding it, it is obvious that the trouble lies between these two tubes or in the voltage supply system of the one which does not result in a click on removal.

Knowing this, the thing to do is to remove the receiver from the chassis and by using your voltmeter leads externally to check between the various tube socket elements. True, you cannot measure plate current unless you break the circuit, but if the operating voltages are correct and the tube is in good condition, a plate current will exist.

By using your meters individually you can check any circuit now in use or which may be

(Page 10, please)

QUERIES and ANSWERS

(Continued from page 9)

developed in the future. It is the only obsolescent-proof method ever devised and was the first method used in Radio servicing.

True, you do not have the advantages of automatic switching arrangements such as are used in analyzers. It is absolutely necessary to know how the various tube socket elements connect to the tube prongs. With this knowledge, the operating voltages can be measured just as quickly as with an analyzer once the set is turned upside down to expose the tube socket terminals.

If your analyzer has an ohmmeter built into it, you can easily develop the point-to-point resistance method. One should have a wiring diagram of the receiver, showing the values of the parts when using this method. This method is easily applied by disconnecting the receiver from the line, removing the tubes and checking between the tube socket terminals and the chassis with the ohmmeter. By glancing at the diagram you can tell instantaneously what approximate resistance you should obtain. Such a method, however, should not be relied upon entirely.

You should first attempt to localize the trouble by the click method described previously. All three methods, when used together, will make an ideal testing system and once you become proficient I don't think that you will want to go back to the old analyzer procedure. The use of this method will result in a more accurate diagnosis of the trouble and will also make you a better service man, as you will have to think more because your tests will not be automatic. For this very reason they will mean more to you than if you just turned a knob and read a voltage on your meter.

Question: I have a receiver of very recent design, which I believe to be of good quality. I notice a hum attending the received signals from some stations. How can I ascertain whether this is due to the transmitter or my receiver?

Answer: You can estimate the origin of this hum roughly by tuning in some station having as nearly as you can determine by ear the same strength of signals for a given setting of the volume control. If the hum is evident with one signal and not with the other, it is probable that the hum is caused by the transmitter.

Again, the signal from a battery operated oscillator, unmodulated, may be tuned in and if a hum occurs at any setting of the volume control the source is definitely in the receiver.

Remember that although high quality modern receivers have good low frequency response they also have good filter systems and their R.F. system is so designed to prevent hum modulation in the receiver. We still have the problem of hum produced at the transmitter, modulated on its carrier, which is easily reproduced by a high quality receiver.

The Pembleton Laboratories, 921 Parkview Ave., Fort Wayne, Ind., have prepared a new catalog on their Coil and Transformer rebuilding service. They will be glad to send this catalog to any N.R.I. student or graduate who writes them direct—requesting a copy.

Clough-Brengle Company, 1134 W. Austin Ave., Chicago, Ill., is marketing a new type noise-reducing antenna system, known as "Staticlear." Full information may be obtained by writing Clough-Brengle Co. direct.

We have just received notice of the death of Graduate A. E. Smith of Monroe, La., following an operation. Our sincerest sympathy to the family of Graduate Smith and our thanks to the N.R.I. student in Monroe who sent us the information.

It is with deep regret we learn of the death of student Fred S. Hicks, Radioman First Class, U. S. Navy. Mr. Hicks served on the U. S. S. Sturtevant, of the Pacific Fleet.

The man who radiates good cheer, who makes life happier wherever he meets it, is always a man of vision and of faith. He sees the blossoming flower in the tiny seed, the silver lining in every cloud, and a beautiful tomorrow in the darkest today.—Edwin Osgood Grover.

New Tube Shielding Offers Money Making Possibilities For Radio Servicemen

Form Fitting Metal Jackets Shield Any Tube

IT SEEMS that a problem which has bothered service men for years has been solved—and in the solution rests the possibility for some nice profits for the Radio-Trician.

The cumbersome tin can shields and metallic partitions which easily became lost and damaged will now take a back seat with the advent of the individual form fitting metallic jacket which fits snugly around any tube, thus forming a perfect shield.

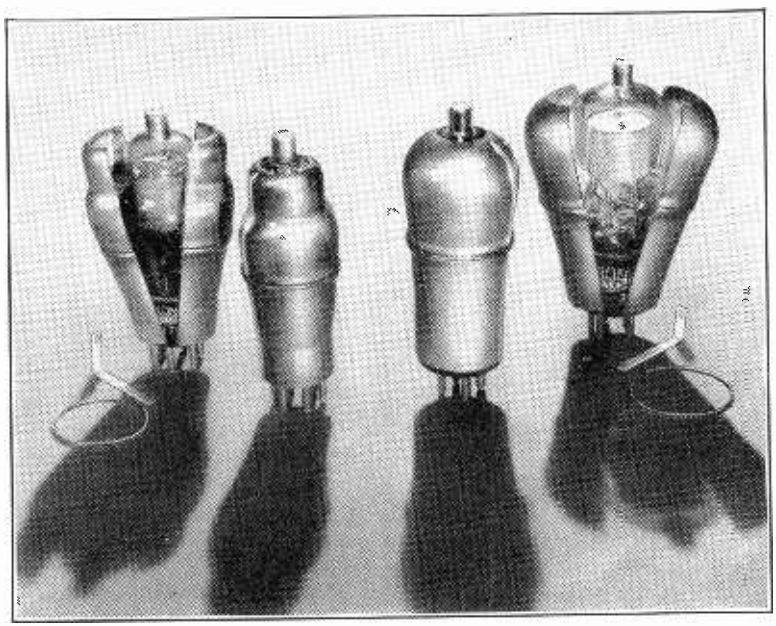
The jackets come in two styles so that all requirements of the straight side and the dome type bulb are provided for. They can be used on Radio frequency and detector circuit tubes where shielding is desirable—and the installation requires merely a matter of moments.

They are designed so as not to alter the tube characteristics—they will not vibrate, and are non-microphonic. The tone quality of the Radio receiver can be improved to give the finest reception—quiet, clear, full-toned—by combining the new shield jacket with new, high-grade tubes. It is recommended that these shields be sold as a part of any tube replacement job—and the customer will be more than satisfied.

Spray-shield Radio tubes heretofore presented a real problem to dealers and service men in necessary duplication of tube lines. This problem is eliminated by the introduction of these new shield jackets.

The price is low—listing at 12 cents each and a dealers' discount of 40 per cent and 10 per cent can be obtained.

These shields were developed by the National Union Radio Corporation of New York. The tubes at dealers' discounts may be obtained from any of their jobbers—all over the country. If you cannot locate a jobber near you—a postcard to the National Union Radio Corporation of New York, 400 Madison Ave., New York City, will bring you the name of your nearest jobbers.



IS A SALESMAN Bo

SALESMANSHIP is a high paying profession. Salesmen are among the men of highest earning capacity in every community.

Good Radio salesmen make exceptionally fine livings because of the popularity of Radio; the desire of everyone to own a set; the frequent new models rendering obsolete the old. Radio salesmen have little difficulty obtaining jobs. They are paid on a commission basis (incidentally a good producer will not work on any other plan because he wants no limit on his earnings) and by working on such a plan of remuneration the employer has nothing to lose and everything to gain by employing salesmen.

Men who qualify as first-class salesmen are rapidly promoted. The position of sales manager is usually open to the man who makes the grade and it is not at all unusual to see the sales manager taken into the firm as a partner.

Of course, there are thousands of fellows who style themselves as salesmen, who are practically "starving to death." You've probably seen many such and possibly listened to their tales of woe. But there is a vast difference between the salesman and the "order taker."

The "order taker" relies chiefly on making the greatest possible number of calls, trusting blindly to luck that he will close enough sales to make a living. Not so, however, with the real salesman. This man knows the principles of salesmanship and applies them in every instance—and therein lies the secret of successful salesmanship.

"Salesmen must be born" is an excuse we hear frequently from men who are unsuccessful in the field of salesmanship. This is absolutely untrue. Salesmen are men who have applied certain principles to their work, even as the doctor, lawyer, accountant, machinist or Radio-Trician. You've never yet heard of a man who was born a doctor; why then should salesmen be governed by any such law.

What is necessary for the man who would make good at salesmanship?

He must be a willing worker.

He must present a neat, prosperous appearance.

He must know the product he sells.

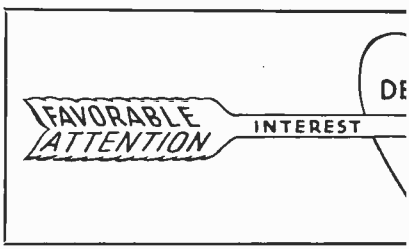
He must know the products of his competitors.

He must be tactful.

He must like to meet and mingle with people.

He must know the processes involved in making a sale and be able to apply these principles in practice.

The salesman working away from the confines of the office, away from the immediate supervision of his sales manager, must guard against frequent tendencies to "let down." He must give his job just as many hours actual conscientious work as if he were working at a desk; repairing Radios at a bench, or operating a machine in a factory. He must remember that at least eight hours of his time each day must be devoted to his company's business, whether he is working one city block from the office—or in a different town.



No one cares to do business with a person who is unkempt; whose very appearance radiates failure. "To be prosperous you must look prosperous."

The majority of salesmen study their own proposition, to a greater or less degree, but there they stop. The successful salesman knows as much about the product and service of his competitor as about his own—by which means he may overcome sales resistance and outsell his competitor.

Tactfulness in a salesman's make-up is responsible for many a sale otherwise lost. Tactfulness in salesmanship may be defined as "strategy"—or again as "plain common sense." It is a sort of sixth sense, which tells the salesman when to say "yes"; when to say "no";

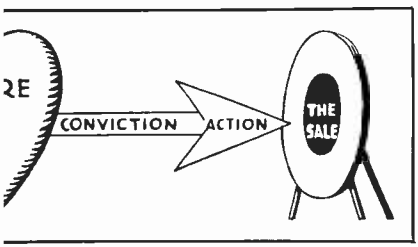
n or Made

By E. L. DEGENER, *Director of Publicity, National Radio Institute*

always to appear to agree—never to argue. Tactful salesmen may find it necessary to agree to a prospect's likes and dislikes in music, art, literature. They may be called upon to humor ill-behaved children—to pat the head of a mangy-looking dog—but what matters all this so long as the sale is made and the order signed?

The salesman who likes to meet people will have a slight advantage because he will not find it necessary to cultivate this essential. But it must be included in the salesman's make-up—either by desire or cultivation—because it is really a matter of tactfulness to radiate pleasure at meeting the prospect.

We repeat at this point the importance of knowing the process of the sale and its application. This process we have graphically illustrated to show the various steps of the process. The salesman's approach, sales presentation and closure should follow this process if he is to obtain the greatest possible results from his efforts.



In our design we show the feathered balance of the arrow as favorable attention, which enables the salesman to get started "right foot first." This favorable attention may be caused by advertising done by the salesman's organization or the manufacturer of the product—or it may be due to the approach used by the salesman in contacting the prospect.

Regardless of how great the degree of attention, however, unless the sales presentation builds and maintains an interest in the product or service to be sold, the plan will fall short of its mark. Because it is the building up of the interest in the proposition which will, with the proper prompting by the sales presentation lead to a "desire."

When the prospect has reached the point where "desire" is created, the hardest part of the job is done. From there on the prospect is no longer on the defensive. He wants the product and waits only to be shown that he should buy. Right here is where "the ability to buy" (financial reasons) may enter the picture, in which case "conviction" is necessary. Here is where many successful salesmen stress the point that "the prospect cannot afford not to buy" due to the benefits to be derived—and by such presentation, by painting rosy word pictures of the benefits and advantages, induce the "action" required—the placing of the order which results in the salesman's goal—THE SALE.

No, salesmanship is not so hard as many picture it. The ability to sell CAN BE DEVELOPED; it is not necessary that "A salesman be born." Even if it were true that to be a salesman one must be born with the instinct for sales—it would work in our favor—because every last one of us has the inclination, from the very beginning, to SELL.

The child not yet able to talk clearly learns that it can SELL itself into good graces of its elders by being cute—clever—or through appeals to love and sympathy. Every person who has ever held a job SOLD the employer on accepting his services. And you married men—believe it or not—you did a big piece of selling when you induced your wife to share your fortunes for the balance of her natural life. That really requires salesmanship. You sold YOURSELF—*you* put it across. And the man who can sell himself can sell anything.

E. L. Degener

Director of Publicity
National Radio Institute

The Stationery Survey

(*Continued from the last issue of National Radio News*)

John J. Reider, St. Paul, Minn.

In our opinion you have too much on your card — giving it a crowded appearance. It might be well to do away with the illustration, also rewrite the copy for your card to eliminate everything not absolutely essential. Furthermore, you are probably paying extra to have these cards made in the form of blotters. We believe that business cards are too small to serve this purpose; the average person requiring a larger blotter, therefore this extra expense is not justified.

Weber's Radio Service, Bellevue, Pa.

It might be well to do away with the use of the Old English type face headlines wherever they are used and substitute an ordinary Gothic or the type face you have used on your business cards and circular. Old English type is too decorative; it is harder to read than some of the other type faces and consequently is not well regarded by modern business men. In all, however, you have a very good stationery layout.

Lloyd's Radio Service, Willmar, Minn.

Your business card is one of the best we have seen in this survey. It is easy to read—it tells exactly the story that it should and shows a judicious use of type. Your letterhead is also good. The layout on your statement might easily be used for a rich looking letterhead—particularly if it were reproduced in two colors. However, we feel that your material should serve its purpose very well in its present form.

H. E. Monroe, Putney, Vt.

We have no criticism whatever to offer on your stationery. Your envelope, letterhead and billhead all present a well-balanced appearance and show care in arrangement.

Gordon D. Brooks, Chatham, Ont., Canada.

The stationery of Radio Station CFCO, which you sent in, is good, snappy material. One suggestion occurred to us—that the periods should be omitted between the call letters of the station on the envelope and on the two cards where such punctuation is used. It has become the general procedure in the Radio industry not to use periods to separate call letters of broadcasting stations. They are not abbreviations of any sort, hence a period is not justified. One other point occurs to us—that it might be better to substitute a straight Gothic type face in place of the Old English used in some parts of the stationery. This is merely to make the message more readable.

Allen L. R. Waltz, Pocono Lake, Pa.

The only suggestion we have to offer you is with reference to the post card circular. In one instance you use the word "Cheap." We suggest that in any case where you want to use the idea conveyed by this word, you use "inexpensive" instead. "Cheap" always gives the impression of something that is not worth very much, whereas "inexpensive" does not have this drawback.

Parkhurst Radio Service, Manchester Depot, Vt.

Neat and to the point. No useless frills or decorations. Your letterhead could carry two small lines of copy—one in the upper right and one in the upper left-hand corner, mentioning some form of service without injuring your layout and might be valuable. However, the stationery is very good in its present form.

Jack's Radio Shop (A. Clark), Iliss, Colo.

Good work. We have no comments on your stationery—it seems to be O. K.

Horace B. Conway, South Nyack, N. Y.

We believe that your business card would present a better balance if the three center lines—the ones with the name, the address and the term "Expert Radio-Trician"—were closed in a bit—without so much white space in between them. The line "Endorsed by National Radio Institute, Washington, D. C." could then be dropped down toward the bottom of the card. The "FIRE SIGNALS" card that you had published is very good. More Radio men should take advantage of special opportunities for building good will. It is easy to understand how people in your community appreciate this list.

Mr. Conway resides in a small rural community. They have a fire signal that can be heard three miles and naturally everyone is interested in knowing the location of a fire when one occurs. No general list had ever been published in this town to show the meaning of the various fire signals until Mr. Conway struck upon the idea of publishing a card of the folder type containing these signals and an ad for his own Radio service organization. It is a big business builder for him because it has been very favorably received by the public in his community.—EDITOR.

A Message From President Smith (Continued from page 2)

search engineers, and department managers. Since there are hundreds of Radio manufacturers of sets, parts, and tubes, you can readilly see that there are many excellent jobs in this branch of the Radio industry.

If you are interested in Aviation, you will perhaps be surprised to know that Radio has become practically indispensible for safe flying. So much progress has been made in Aviation-Radio that the United States Government now issues a special Radio operators license for Airplane service. If you like thrills, adventure and good pay, here you can get all three in one job.

And now Radio is invading the automobile field. The American people have been quick to appreciate the delights of motoring plus Radio entertainment at the same time. Many automobile manufacturers are equipping their cars with antennas, while some forty manufacturers are now engaged in turning out complete automobile Radio sets. The job of installing these thousands of Radio sets is more difficult than the installation of an ordinary home receiver, and requires more technical knowledge—knowledge, however, which may be acquired by study.

Hundreds of cities are putting their Police Departments on a Radio basis. This work calls for men with specialized training in both ends of Radio—transmitting and receiving. Only trained men are entrusted with the work of installation and service.

Another field where Radio is rendering a very great and important service is in the Talking Moving Picture industry. There are about 22,000 moving picture theatres in the United States and the large majority of these are now showing talking movies. A large proportion of the remainder will probably be equipped with sound apparatus within the next few years. As this comes about, it will mean many additional opportunities for trained men who can install, operate and service talking picture equipment. The pay for this work runs well above that of a skilled mechanic, depend-

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KEEP RECORDS OF YOUR BUSINESS . . . . . .

by Graduate R. L. Mackenzie, Brooklyn, N. Y.

A SURVEY recently made by the Department of Commerce to determine the causes of failure of thirty retail stores revealed that twenty-one of the thirty merchants never made up a profit and loss statement or balance sheet. Three had no books whatever and eighteen used only a notebook to record purchases and sales.

It is a well known fact that the owner who manages his own business feels that because of his intimate contact with the details of his enterprise, accounting records are not essential to profitable operation. The numerous casualties among retail stores emphasizes the common knowledge that too many businesses are being operated on guesses and estimates.

Every person in business, regardless of whether he devotes all or part of his time, should know whether he is operating at a profit or loss. Records alone will show when costs are excessive, when working capital is depleted, and when too much is invested in equipment and merchandise.

We must be careful when installing books of record to make the system fit the business and not do as so many do, make the business fit the system. Most merchants realize that it is necessary to keep records, but they, as a general rule, either are too busy or feel that they do not know enough about bookkeeping to set up their own system, therefore they employ the services of some bookkeeper or accountant who may or may not be qualified to open up a set of books that will supply the required information. Oftentimes the system installed is so complicated that it requires the services of an accountant or bookkeeper to keep it up-to-date, usually the business is in no position to stand the extra expense involved in hiring an outsider, the merchant becomes discouraged and lets the whole thing drop.

The average merchant, with a little help, can install and operate a simple system that will supply him with all the information necessary in the proper conduct of his business. By

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Keep Records of Your Business

(Continued from page 15)

devoting fifteen or twenty minutes a day to writing up his records he will not only be in a position to supply his bank or creditors with information pertaining to his financial condition, but will know from time to time his exact progress.

The following appears in the report previously mentioned made by the Department of Commerce: "The chances of permanent success are indeed remote unless a merchant knows his operating costs and maintains inventory records. The absence of an adequate system of accounting records is also an indicator of unprogressive and inefficient management. While the use of the best accounting system does not insure the success of a business, yet, if used intelligently, it will enable a manager to guide the future course of his business from a knowledge based on results of past efforts."

Out in Oregon they have a weather man who doesn't believe in doing things half way. When he says "SNOW" he means just that! As proof of this we present a picture supplied National Radio News' Photographic Department by student Arthur M. Parsons, Cascade Summit, Ore. When this photo was taken they had 124 inches of snow on the ground. The building is Mr. Parson's home. O. K. Arthur, if one of your lessons is delayed a bit next winter we'll know the mail man is buried ten feet under.

A Message From President Smith

(Continued from page 15)

ing upon the kind of service rendered. In the making of every talking moving picture, the services of a number of sound equipment experts are required. And the sound equipment is operated entirely on Radio principles—the principle of the vacuum tube. This work not only pays well, but it is also full of thrills and action.

Allied to talking pictures are public address systems, as adapted to auditoriums, hotels, schools, churches, etc. This work provides profitable employment for Radio men with a thorough knowledge of public address equipment.

For those who have a flare for that branch called merchandising and for the great field of commerce—who like to meet people in a business way—traveling for a Radio manufacturer or distributor is delightful work. The technically trained salesman who thoroughly knows his business is always in demand, and is well paid. There is a big future in this Radio merchandising field.

Then, for the fellow who craves adventure and travel and the glamour and romance of foreign lands, the job of Radio operator on board ship is very attractive. The pay is good. The work is easy, and the operator ranks with the ships' officers. No wonder that lads with the lure of the wanderlust racing through their veins are eager to become licensed operators and sail the Great Lakes and the Seven Seas, where romance and pleasure and new sights are waiting at every port.

Now, Television comes knocking at the door for admission. A few years ago, Television was considered merely a fantastic dream. Today it is an amazing reality—approaching the point where it will be commercially practicable. Already there are some twenty stations engaged in transmitting pictures by Television for experimental purposes. And several stations are already broadcasting Television programs on regular schedules for reception in those homes equipped with Television receiving sets. While these sets are as yet by no means

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

Philco Model 81

The Philco Radio Model 81 is a four tube superheterodyne receiver combining Standard broadcast and police reception and employs the new Philco high efficiency tubes with pentode output and electro dynamic speaker. The same superheterodyne circuit is used for Standard broadcast and police reception. The intermediate frequency for tuning the I. F. transformer is 460 kilocycles. The power consumption of the Model 81 is 46 watts.

Table 1—Tube Socket Data*
Power Line Voltage 115 Volts

Circuit	Det. Osc.	2nd Det.	Output	Rectifier
Type Tube	**77**	**77**	**42**	**80**
Filament Volts–F to K	6.3	6.3	6.3	5.0
Plate Volts–P to K	240	75	240	425
Screen Grid Volts–SG to K	85	40	250	..
Control Grid Volts–CG to K	5.6	.6	2.3	..
Cathode Volts–K to F	24.5	16	16.2	..

Table 2—Power Transformer Data

Terminal	A. C. Volts	Circuit	Color
1–2	105–125	Primary	White
3–5	6.3	Filament	Black
6–7	5.0	Filament of 80	Blue
8–10	630	Plates of 80	Yellow
4	..	Center Tap of 3-5	Black-Yellow Tracer
9	..	Center Tap of 8-10	Yellow-Green Tracer

*All of the above readings were taken from the underside of the chassis, using test prods and leads with a suitable A. C. voltmeter for filament voltages and a high resistance multirange D. C. voltmeter for all other readings. Volume control at maximum and station selector turned to low frequency end. Readings taken with a radio set tester and plug in adapter will not be satisfactory.

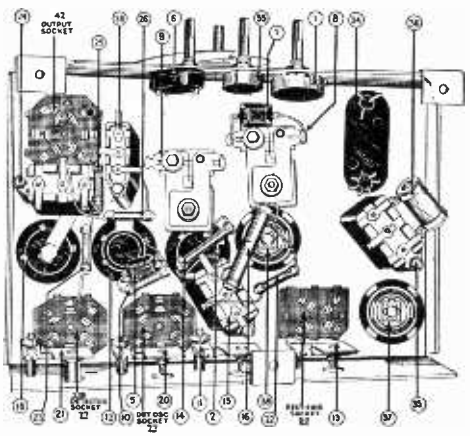

Fig. 1—Parts Diagram

77 Sockets

42 Socket

80 Socket

Terminal Arrangement of Tube Sockets Viewed from Under Side of Chassis.

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

Philco Model 81

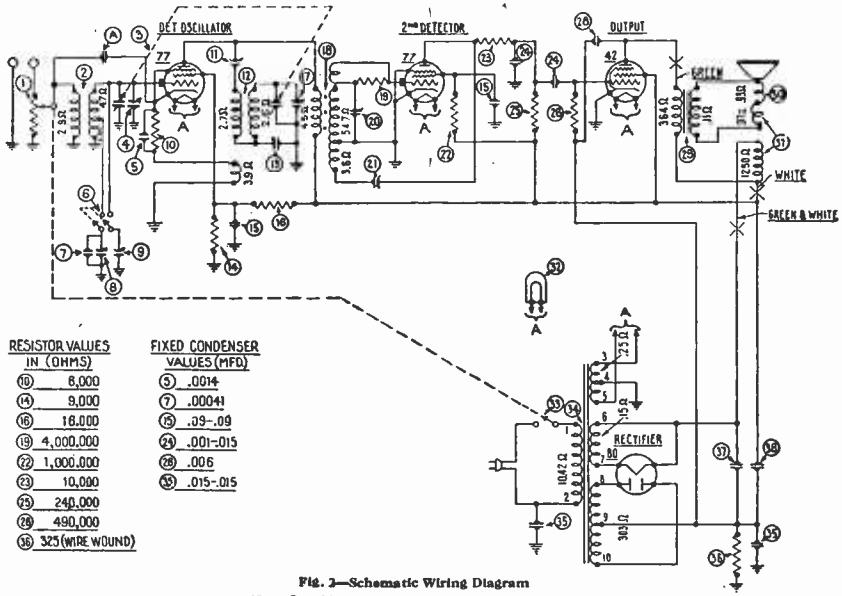

Fig. 3—Schematic Wiring Diagram

Note Ⓐ—This capacity obtained by pair twisted wires.

REPLACEMENT PARTS MODEL 81

No. on Figs.	Description	Part No.	List Price
①	Volume Control*	33-5002	.75
②	Antenna Transformer	32-1030	.50
③	Tuning Cond. Assembly	31-1006	
④	Compensating Condenser (Part of ③)		
⑤	Cond. (Red and Black)	7007	.25
⑥	Frequency Switch	42-1000	
⑦	Cond. (Orange and Yellow)	30-1000	.20
⑧	Compensating Condenser	04000-S	.25
⑨	Compensating Condenser	04000-X	.16
⑩	Resistor (Blue-Black-Red)	7352	.25
⑪	Compensating Condenser (I.F. Primary)	04000-A	.12
⑫	Oscillator Coil	32-1031	.75
⑬	Compensating Condenser (Low Frequency)	04000-S	.25
⑭	Resistor (White-Black-Red)	7501	.25
⑮	Condenser	4989-B	.22
⑯	Resistor (Brown-Blue-Orange)	7500	.40
⑰	Compensating Condenser (Part of ③)		
⑱	I.F. Transformer	06100	1.25
⑲	Resistor (Mounted on I.F. Transformer)	6010	.25
⑳	Compensating Condenser (I.F. Secondary)	04000-D	.10
㉑	Compensating Condenser	04000	.16
㉒	Resistor (Brown-Black-Green)	4409	.25
㉓	Resistor (Brown-Black-Orange)	4412	.25
㉔	Condenser (Double)	7762-B	.20
㉕	Resistor (Red-Yellow-Yellow)	4410	.25
㉖	Resistor (Yellow-White-Yellow)	4517	.25
㉘	Condenser	7625-B	.12
㉙	Output Transformer	2660	1.25
㉚	Voice Coil and Cone Assembly	02861	.60
㉛	Speaker Field and Bucking Coil (with Pot)	02667	2.00
㉜	Pilot Light	6608	.14
㉝	"On-Off" Switch*	6416-W	.40
㉞	Power Transformer—50-60 Cycles	7421	2.75
	Power Transformer—25-40 Cycles	7422	4.00
	Power Transformer—50-60 Cycles, 250 Volts	7423	2.75
㊱	Condenser (Double)	3793-R	.25
㊲	Resistor (Wire Wound)	7465	.12
㊳	Electrolytic Condenser (8 Mfd.)	7558	1.25
㊴	Electrolytic Condenser (4 Mfd.)	7467	1.25
	Bezel	7417	
	Tube Shield	7172	.12
	Knob (Large)	03063	.08
	Knob (Small)	03064	.06
	Knob Spring	5262	.35 per C
	Grid Clip	4897	.30 per C
	Four Prong Socket Assembly	5026	.08
	Six Prong Socket Assembly	6417	.10
	Chassis Mounting Screw	W-567	2.40 per C
	Chassis Mounting Washer	W-315	.40 per C
	Pilot Lamp Shield	5760	

*On later production (run No. 3 and above, rubber stamped in a star on back of chassis) volume control ① and on-off switch ㉝ was combined. This new volume control and on-off switch is Part Number 7439.

Pittsburgh Local

T. A. Deschantz, who is so ably conducting the business of the Alumni Local Chapter in Pittsburgh, Pa., announces a change of meeting rooms.

Until further notice meetings, both regular and special, will be held at Local Headquarters, 1216 Coal St., Wilkinsburg, Pittsburgh, Pa.

Arrangements are being made for a big banquet and outing with the entire local membership behind the movement to make it a success.

You students in Pittsburgh and the surrounding territory, drop in at Local Headquarters—meet Mr. Deschantz—attend a meeting—get acquainted. Last January your editor had that opportunity—to meet all the Pittsburgh members—and you'd have to travel a long way to find a finer group of boys.

Cleveland Local

Definite plans are being laid for a worthwhile organization in the Cleveland section, where the Local is under the direction of Charles Jesse—an old timer in the Radio and Electrical fields.

Jesse has found it necessary to move very cautiously with his Local organization, due to some particularly adverse economic conditions in that locality, but knowing Charlie as we do we can promise a wide-awake, up-to-the-minute organization. We've already had some experience with him as an organizer and he'll show the Cleveland Local boys a real plan for making money.

Buffalo and Pittsburgh must look to their laurels when Charlie goes into action.

Buffalo Local

Well, the boys in Buffalo put across that card party and entertainment they had been planning. From the program we received it must have been a good party. (Sorry we missed it, Ted.)

Ted Telaak, the Kingfish of the Buffalo Chapter, had the hearty cooperation of every man in his Local—and we want to take this opportunity to publicly thank and congratulate every one of them for the loyalty shown.

* * * *

Things have been progressing very well with the three Local Chapters which were organized to test the feasibility of the plan. There's a possibility of one or more new Chapters being organized between now and the first of the year. Where? You guess—we don't know either—YET.

"My own observation leads me to believe that in many parts of the country we have tended to an educational system devised too greatly for academic training and professional careers. We know that already many of these professions are over-supplied and it is a fair guess that in the coming generation we shall devote more attention to educating our young men for vocation pursuits . . ."—FRANKLIN DELANO ROOSEVELT (Oct. 13, 1932).

Give Some Thought to the Coming Elections

AS we come to the end of another year, according to the constitution and by-laws of the N. R. I. Alumni Association it becomes the duty of all members to nominate and later to elect men to fill the various offices of the Association.

A number of the existing officers feel that having served one term it is time for other members to step in and take up the reins.

The present officers are as follows: K. W. Griffith, President, Little Rock, Ark.; Harry Barschdorf, Vice-President, Adams, Mass.; F. A. Parkins, Vice-President, Oglethorpe U., Ga.; Hoyt Moore, Vice-President, Indianapolis, Ind.; Fred A. Nichols, Vice-President, Denver, Colo.; Earl Merryman, Secretary, Washington, D. C.; P. J. Murray, Exec. Secretary, Washington, D. C.

The selection of officers from a group of three thousand—many of whom are strangers to each other, is not easy. However, our Local Chapter organization is a step forward to acquaint members, one with another. As this move progresses we'll all be better acquainted --and our elections much simpler.

The Chairmen of these Locals are in a fair way to become officers of the National Association by reason of the admiration they have created for themselves among brother Alumni members—for the courageous, whole-hearted organization work they have done.

We have received many suggestions as to officers for the year of 1934. Some of the more prominently mentioned are the following: Theodore Telaak, Chairman of the Buffalo Local; T. A. Deschantz, Chairman of the Pittsburgh Local; Charles Jesse, the man who is getting the Cleveland Chapter in line; James Kearns, a live-wire in Brooklyn; Heinz Mueller, of Chicago, who was prominent in last year's voting; John Gantt, of Washington, a candidate for the secretaryship last year.

But according to the constitution and by-laws, no nomination or election can be made except in the prescribed manner as follows:

The entire membership must be requested to submit the names of two men for each office. The two high scorers for each office will be selected as candidates for the final run-off and it is then the duty of the members to choose between these finalists and thereby elect officers for the year.

Our members usually select men for *their known service to the Radio Industry—their known service to our Association.*

The next issue of National Radio News will bring to each member a nomination blank. You are expected to fill in this blank and return it within forty-eight hours of its receipt.

The next following issue of National Radio News will bring the final ballot. Again you are expected to return the ballot in forty-eight hours. Bear in mind the responsibility of every member of this Association in connection with the nomination and election. We've always had the finest cooperation in the past—in fact, that cooperation is one of the traditions of this Association. It must continue as the keynote of the N. R. I. Alumni Association.

This has been the most successful year in the existence of our Alumni Association, despite the economic stress on this country during 1933. With business on the up-grade, money being released by banks, the wheels of industry turning again, Radio preparing for another big boom season, we will push our Association to a new high peak in 1934. I'll do my best here at National Headquarters to carry our program to a satisfactory conclusion, but as our Association President K. W. Griffith has so wisely said: "This is our job, not mine." It is only with the hearty cooperation of every last one of you men out in the field that we can put it across. I'm counting on you!

Success Stories

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.

Success Story No. 5

Under success story No. 5 we are granting the $1 prize to Graduate H. Vernon of Winnipeg, Canada. Graduate Vernon submitted a copy of a sales letter he uses successfully. We are passing it along to our readers:

RADIO REPAIR SERVICE

Phone 72051 885 Ashburn Street

H. VERNON

Certified Radiotrician

Are you satisfied with your present Radio repairman? Does he give you the service you expect of him? Is he reasonable in his prices and does he guarantee his work? If your answer to all these questions is "Yes", then I advise you to stick to him.

But on the other hand if your answer is "No" to any of these questions, (and it probably is) why not try a dependable Radiotrician; one who has been trained to do Radio repair work by the National Radio Institute of Washington, D. C., the oldest and largest school of its kind in the world; a man who has also had two years experience rendering satisfactory Radio repair service.

You would send for a good, reliable doctor if anyone in your family should be ill. Give your Radio the same advantage.

I give you a first class guaranteed service. My prices are most reasonable. That's the kind of service you've always wanted—can you afford to get along with less.

Will you give me a call the next time your Radio needs the attention of a Radiotrician?

Batteries recharged. Tubes tested free. Ask about our Service Agreement.

Recognize These Gentlemen?

The staff photographer of National Radio News caught an intimate "close-up" of three of your old friends as they returned from lunch the other day. Know them? From left to right they are Vice-President E. R. Haas; President J. E. Smith and Chief Instructor J. A. Dowie.

The Chief helped the smiles along by whispering a funny one to President Smith. Mr. Haas didn't catch the joke and was too busy watching the birdie to give us his ususal smile. But we promise to catch him grinning sometime and we'll pass it along to you in picture form.

Real Cooperation

Here are two fellows who really believe in cooperating with the National Headquarters of our Alumni Association. Both of these men have signed up for five year memberships in their Alumni Association.

Frank A. Thompson, Camden, N. J.
Honorato Bernardino, Buffalo, N. Y.

Incidentally, Mr. Bernardino is a member of the Buffalo Local Chapter of the N. R. I. Alumni Association.

A Message From President Smith (Continued from page 16)

perfect, they are more than adequate to show that satisfactory home reception by Television is not far off. Elaborate provision is being made by broadcasting companies for the reception and transmission of Television in a big way and one does not have to stretch his imagination to realize the changes which will take place when Television is perfected. Millions of receiving sets now in use will be replaced by new types equipped for Television reception. The forward looking young man of today, who sees the wonderful opportunities of Television and gets himself ready, will have no cause to worry about his future. Broadcasting is, of course, the trunk of the tree from which all branches of Radio have sprung. The growth of broadcasting has been amazing. Starting from nothing ten years ago, there are now 611 broadcasting stations in this country; 2,000 ship stations; 300 point-to-point stations; 90 trans-oceanic stations; 150 experimental stations; to say nothing of a great number of aviation Radio stations which are coming into being very rapidly. While most of the stations give employment to one or two men, the larger broadcasting stations employ as many as thirty to fifty, including announcers, program managers, chief operators, assistant operators, production men, control engineers and so on.

The young man who wants to make a definite success of his life, must have plenty of ambition, possess enthusiasm which will make play out of hard work, have a fresh viewpoint, and be able to grasp opportunities as they are presented.

To such a man, with a knowledge of theoretical and practical Radio, there is no limit to the height to which he may climb in this the most fascinating industry of modern times—RADIO.

"They conquer who believe they can. He has not learned the lesson of life, who does not each day surmount a fear."—EMERSON.

NATIONAL RADIO NEWS

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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

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From the Other Side of the World

As you will see, I have moved to Auckland. I am very pleased to be able to tell you that I now have a job with Johns Ltd. of Auckland as one of their Radio servicemen. I am now receiving almost double the salary I was getting a month ago. Johns Ltd. is one of the oldest and easily the best known Radio firm in New Zealand. There are six men employed on Radio servicing alone and thanks to N. R. I. training, I am not the junior of the work shop. Once again I thank you Mr. Smith and the N. R. I.—E. B. Menzies, Auckland, New Zealand.

You may add another ham to your list of students and graduates who operate amateur stations: W1GZN owned and operated by Delvin W. Smith, Passadumkeag, Maine.

Harry L. Arnold, Bonita, La., operates Amateur Station W5CRV.

Praises The News

Just a word in regard to National Radio News. The Calcaterra catalog service is good. Success stories are fine—let me have more of them. I always particularly enjoy the page contributed by President J. E. Smith. In fact, I think National Radio News is a gem.—Edward S. Perrine, Girard, Ill.

My Amateur Station is W1GHD.—Everett Ladd, Reading, Mass.

Reports Success

I have been a first class Radio operator for the past five years. Getting the Government's first class ticket requires quite a bit of study. However, I had no trouble as I had completed your Course in Radio operating. I have been working steadily ever since.

At present I work seven hours a day and get a day off a week and also three weeks holiday with pay each year. Duties are light; the wages are very satisfactory. I sure did myself a lot of good when I started your course. N. R. I. put me on the right track and is due all the credit for my present position.—Thomas B. Linklater, Sioux Lookout, Ont., Canada.

Alumnus Abe says: "Don't talk about your ability—prove it."

Selectivity of Midgets

The "Queries and Answers" Page of the June-July National Radio News prompts this suggestion.

I have a 4-tube R-F Midget and I have increased the selectivity from six to twelve or thirteen stations by attaching a tightly wound coil of about 25 turns of No. 28 D.C.C. wire between the antenna, and the antenna post on the set. Having experimented with different antennae, I find that antenna and lead-in should total between 50 and 60 feet. I have a 30 foot antenna and 20 feet lead-in.—George S. Dunbar, U. S. S. Rail.

Watch Those Tubes

Here is some trouble I had with an A. K. Model 85. The set would play fine for about 2 minutes after it was turned on. Then it would make a fluttering sound at high or real low volume. After 5 or 10 minutes the set was hardly audible at full volume. By turning the volume control back to a certain point the set would play loud again; you could then increase the volume again to that certain point when it would drop in volume.

Two Radio men besides myself worked on this set unsuccessfully. The trouble seemed to be in the A.V.C. circuit but resistors, condensers and everything tested O. K. All tubes tested O. K. I tried new tubes except the 35's which I did not have in stock.

As I did not like the idea of giving up a job, I decided to make one more try at it. I turned the set on and let it play until the trouble showed up. When it began to give trouble I removed the oscillator tube and let it cool for about 5 minutes, upon replacing it the trouble showed up immediately. I did the same to the 1st detector; then the I.F. tube. After letting the I.F. tube cool for about 5 minutes upon replacing it the set played fine for about 2 minutes. I was then sure it was in the I.F. tube or circuit for I had left the set on all the while so that only the circuit and tube from which tube was removed would cool. To determine whether it was in the tube or circuit I swapped 1st detector and I.F. tubes which showed it to be the tube. I purchased a new tube to replace the bad one; the set has been playing fine since. WATCH THOSE TUBES EVEN THOUGH THEY TEST O. K.—W. S. Hillsman, Victoria, Texas.

Build Yourself a Valuable Radio Library with these Helpful

FREE MANUFACTURERS' BOOKLETS and CATALO

A FREE SERVICE DESIGNED TO SAVE YOU TIME AND MONEY

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

All that is necessary for you to obtain the catalogs or other literature listed on this page is to write the numbers of the items in which you are interested on the coupon, fill in the information asked for and MAIL IT TO THE CALCATERRA CATALOG SERVICE. DO NOT MAIL COUPONS TO THE NATIONAL RADIO INSTITUTE AS THAT WILL DELAY THE FILLING OF YOUR ORDER.

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

1. WHOLESALE RADIO SERVICE CO. 1933 CATALOG No. 54. A 152-page book of illustrations, descriptions and specifications with list and net prices of Radio parts, replacement items, receivers and Radio and electrical supplies carried by this old, reliable mail order house.

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

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.

10. INFORMATION ON THE SUPPRESSION OF MOTOR RADIO NOISES. Circuits and data published by International Resistance Co. on how to overcome troublesome motor noises in auto Radio installations.

16. LYNCH RMA STANDARD RESISTOR COLOR CODE CHART. Handy postcard size. Simplifies job of identifying resistance values of coded resistors. Gives a list of most commonly used resistor values and colors.

18. CENTRALAB VOLUME CONTROLS, FIXED RESISTORS, MOTOR RADIO NOISE SUPPRESSORS AND POWER RHEOSTATS. A 1933 catalog containing descriptions, specifications and prices of the complete line of Centralab standard, special and replacement volume controls, etc. Details are given on how to obtain, without charge, a copy of the 64-page Centralab Volume Control Guide for Servicemen.

25. LYNCH NOISE-REDUCING ANTENNA SYSTEMS. Technical details of two types of inexpensive antenna systems which effectively eliminate the majority of electrical noise interference in broadcast and short wave reception.

34. ELECTRAD SERVICEMEN'S REPLACEMENT VOLUME CONTROL GUIDE. A 44-page vest-pocket size booklet containing a revised, complete list, in alphabetical order, of over 2,000 different receiver models with the proper type of Electrad Control to use for replacements.

42. HOW TO BUILD USEFUL SERVICING AND TESTING INSTRUMENTS WITH SIMPLE, STANDARD METERS. A folder prepared by the Lynch Mfg. Co. giving circuits and explanations showing how to increase the usefulness of simple meters to measure current, voltage or resistance through any desired range.

43. HOW TO MODERNIZE OLD SET ANALYZER. A valuable folder prepared by the Supreme Instruments Corp. which describes a new plan for the conversion of obsolete set analyzers and testers into modern instruments.

45. POTTER CONDENSER BULLETIN FOR 1933. Complete descriptions, specifications and prices of the Potter line of paper and electrolytic condensers for by-pass, filter and replacement use and Potter interference filters and tone controls.

47. UNITED SOUND ENGINEERING LOW-COST PORTABLE PUBLIC ADDRESS SYSTEM. A bulletin containing specifications and price of a very efficient, low-cost portable public address system, using the latest tubes and a 10-inch dynamic speaker. Designed for use with crowds up to 1,000 people. Can be used for crowds up to 3,000 people with auxiliary equipment.

48. THE FORDSON LOW-COST SUPERHETERODYNE RECEIVER. A well illustrated folder which describes a remarkably efficient midget Radio especially designed to fill the need of servicemen who are seeking a well-designed chassis for replacement purposes. The set is sold on a 30-day free trial basis.

49. COMMONWEALTH HOME AND PORTABLE TYPE RECEIVERS. A very complete folder giving descriptions and prices of the complete line of receivers and chassis made by the Commonwealth Radio Mfg. Co. Models range from the most inexpensive midget sets to the higher cost console models and offers many profitable opportunities for dealers and servicemen.

51. HOW TO BUILD A FIVE-TUBE PORTABLE A. C.-D. C. RECEIVER AT LOW COST. This folder gives complete details of the "Pal" kit, designed by Wholesale Radio Service Co. to meet the need for a low-cost, efficient universal portable receiver. Servicemen and experimenters can build and sell this receiver at a profit.

52. THE I. R. C. SERVICER. A free monthly house organ published by the International Resistance Co. A sample copy will be sent on request through this service, after which you can subscribe to it, if you like it, by writing direct to the International Resistance Co.

(Please Use Pencil and Print in Filling in Coupon)
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Thornwood, N. Y.

Please send me, without charge or obligation, the catalogs, booklets, etc., whose numbers I have filled in below.

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